Pap smear rates among Australian community-attached lesbian and bisexual women: some good news but disparities persist

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Abstract:

Background: Research in the US and UK shows lesbian women are less likely than their heterosexual peers to attend for routine Pap smear tests. This study examined Pap smear test rates among community-attached lesbian, bisexual and queer (LBQ) women in New South Wales, to investigate if rates had changed between 2002 and 2012, compare rates to the general NSW population and identify predictive factors for Pap smear test attendance.

Method: Data was taken from the Sydney Women and Sexual Health (SWASH) survey, a self-completed biennial questionnaire of LBQ women's health and wellbeing.

Results: Of the 4083 respondents, 83% had ever had a Pap smear test. Recent attendance rates were slightly higher than the general population. Significant predictors for ever having attended for a Pap smear test were older age, post-year 12 education, ever having had an STI test, being out about sexuality to a regular doctor and ever having had sex with men.

Conclusions: Pap smear rates for LBQ women are encouraging when compared to rates in similar countries. A significant proportion of LBQ women are *never* receiving Pap smear tests. Predictive factors suggest a continued perception that women who have not had sex with men are not at risk

of HPV, and highlight the importance of health providers providing a safe and welcoming environment for LBQ women to openly discuss their health.

Introduction

Cervical cancer is the second most prevalent cancer among women worldwide.(1, 2) The Papanicolaou (Pap smears) test is used to detect pre-cancerous changes on the cervix before cancer evolves. Since its advance 50 years ago there has been a dramatic decrease in the incidence and mortality of cervical cancer.(2) In many western industrialised countries, women are encouraged to attend for routine Pap smear tests beginning from when they become sexually active or from a set age, and continuing at set regular intervals. The start age and interval period differ across countries. For example, in the US, women are invited to have their first test at 21 then every 3 years until the age of 30 and 5 yearly up to the age of 64(3); in the UK (NHS England and Northern Ireland) women start screening at the age of 25, then every 3 years until 49 and 5 yearly until 64.(4) In Australia, the guidelines advise women to have a Pap smear test every 2 years between the ages of 18 and 70.(5) The screening rate (3 year in the US and 3.5 year in the UK) for the general population ranges from 71 to 82%.(4, 6) In Australia, the 3-year rate is a little lower at 70%.(7)

Non-attendance for screening is the second most attributable risk factor for invasive cervical cancer(8, 9) as it puts women at a higher risk of late diagnosis of cervical cancer which leads to a poorer prognosis.(9) In the 12 years following the introduction of the Australian national screening program in 1991 there was a 33% reduction in the incidence of cervical cancer.(10)

Despite broad agreement that all sexually active women should be screened regularly, there are still "subgroups of women who have under-utilised the pap test".(2) For example, studies in the US and the UK have found that lesbian, queer and bisexual (LBQ) women are consistently less likely than the general population to attend for screening within the recommended time intervals. Screening rates in this population in the US and UK have been reported to be as low as 44-62%.(2, 11-14) An analysis of 2003 cohort data from young Australian women found that 26% of lesbian-identifying women had never had a Pap smear; the rate among their heterosexual peers was 9%.(1)

The main risk factor for cervical cancer is infection with oncogenic strains of HPV as the "virus is present in 99% of cases worldwide".(2) HPV is spread during sexual contact and exposure is considered to be a normal part of being sexually active.(8) There has been some debate as to whether HPV can be transmitted during sexual activities between women and thus, whether there is a need for women who are only sexually active with other women to have Pap smear tests. Research, however, has shown HPV to be present in women who have sex with women (WSW).(15, 16) While this can partly be attributed to a sexual history with men(17), studies have also found HPV in women who have no sexual history with men(15, 17, 18). It seems likely then that HPV can be spread during sexual activity between women as penetrative sexual practices, such as digital-vaginal sex and insertion of sex toys, are common among WSW.(15) As a result of these findings, Marrazzo et al. concluded that Pap smear guidelines should "not differ for WSW, regardless of sexual history with men"(14, 15) and this advice should be clearly stated in all national guidelines. Australian national guidelines state: "All women with a cervix who have ever had sex are at risk of cervical cancer"(5) (although no clarification is provided as to what is meant by 'sex'). Many state-based Cervical Cancer Screening Programs in Australia address the need for LBQ women to have Pap smear tests in the general information section of their websites or have a lesbian specific web page. Several have also run educational campaigns to promote Pap smear testing among LBQ women(19). For example, a 2006 Victorian educational pamphlet, "Lesbians need pap tests too", has been adapted and used in New South Wales (NSW, 2007).(20) After oncogenic strains of HPV and non-attendance for screening, other risk factors for cervical cancer include; lower age of first sexual contact, high number of sexual partners, sex with men, smoking and obesity. Lesbian women have been shown to

have higher levels of both smoking and obesity,(8, 12) which would put this population at greater risk, again, emphasising the need for regular screening.

The aim of our analysis was to investigate Pap smear testing rates among LBQ women in Sydney, NSW, Australia. Data were taken from a ten-year biennial community survey on the health and wellbeing of women who engage with metropolitan lesbian and gay communities; these data are not representative of all Australian women who have sex with women. Our analysis sought to answer three questions: Have the rates of screening among LBQ women changed over the period of the survey (10 years)? How do rates among LBQ women compare to those of the general NSW population? Among LBQ women, what characteristics make them more likely to ever attend for screening?

Materials and Methods

The Sydney Women and Sexual Health (SWASH) survey has been run biennially since 1996. It is a collaboration between ACON (a leading health promotion organisation specialising in HIV and lesbian, gay, bisexual, transgender and intersex health), researchers at the University of New South Wales and at the University of Sydney. The study aims to look at all aspects of health and wellbeing and has resulted in a comprehensive dataset on the LBQ population in Sydney across 18 years. In particular, it has focused on a number of important health issues relevant to LBQ women, such as tobacco use, illicit drug use, alcohol consumption, and cancer screening behaviours.(21) Questions about Pap smear testing were added to the survey in 2002 and repeated in each study year thereafter; consequently this study will look at the data from 2002 to 2012.

Sampling and Participants

SWASH is a repeated cross-sectional survey that takes place in February every two years. It employs a modified version of the Time-Location convenience sampling also used by the HIV behavioural surveillance undertaken by the Gay Community Periodic Survey (22). This is a venue based method often employed for populations that cluster in locations. We drew on the knowledge of ACON Health health-promotion staff to identify venues and events likely to have a high concentration of LBQ women during the Sydney Gay and Lesbian Mardi Gras season. Fair Day – a highly significant community family day with entertainment, stalls, and food attended by up to 80 000 people– has been a core recruitment event at every iteration.

All women who were willing to respond were invited to self-complete a two-sided questionnaire. Those who did not want to participate could simply refuse or avoid the survey recruiters (identifiable by their branded t-shirts and clip boards). Refusal rates were not recorded due to practical reasons. As Pap smear testing is recommended to start between ages 18-20, only those women above the age of 18 were included in our analysis. Those who did not live in NSW at the time of the survey were also excluded.

Measures

Relevant measures from the SWASH survey were used for the current analysis:

Demographics

Women were asked about age, education and employment. Respondents were asked to indicate their sexual identity (heterosexual, lesbian/gay, bisexual or queer/other); heterosexual women (10-15% of respondents) were excluded from the analysis.

Sexual practices

Women were asked about male and female sexual partners, whether they have a regular partner and detail on recent sexual practices with women.

Health practices

Women were asked if they had attended for a Pap smear test (within the last 3 years, over three years ago or never). From 2006 to 2012 women were asked if they had a regular doctor (or attended a regular health centre) and if they were out to their doctor about their sexuality, which were combined into one three-level variable (out to regular doctor, not out to regular doctor, no regular doctor). Between 2006 and 2010 women were asked a true or false knowledge question about the need for LBQ women to have Pap smear tests. In all years respondents were asked about attendance for sexually transmissible infections (STI) testing. Tobacco use was asked from 2004 onwards.

Results were entered from the coded questionnaires and analysed using SPSS Version 21.0 (SPSS, Chicago, IL, USA). Ethics approvals were given by the Human Ethics Research Committees at the University of Sydney (2012 survey) and University of New South Wales (2002-2010 surveys) and by the Research Ethics Review Committee ACON.

Analysis

Descriptive statistics with cross tabs were used to look at change in Pap smear testing rates over the period 2002-2012. Cross tabs were also used to look at the change over time for sexual identity, employment, education, regular partner, sex with men, sex with women, use of fingers and sex toys during sex with women, regular doctor/heath centre, tobacco use and knowledge of pap smears. A one-way analysis of variance test was used to examine age change over time. To allow comparison of Pap smear testing rates in the general NSW population, rates among those aged 20-69 in the 2010 survey were calculated (2009-2010 is the most recent triennial data available).

For analysis of characteristics associated with whether women had ever been screened, only data from the latest year, 2012, was used. Univariate analyses were performed using cross-tabs and chi-square tests to assess associations between Pap smear test attendance and age, sexual identity, employment, education, sex with men, sex with women, sexual identity disclosure to regular doctor/health centre and STI testing. Variables were included in multinominal logistic regression (MLR) if they were significantly associated with screening in univariate analysis or if literature suggested they were important explanatory variables. Some variables were collapsed into dichotomous variables (lesbian - bisexual/queer/other; achieved post-school qualification - achieved lower qualification; sex with men ever - sex with men never; STI test ever - STI test never). A backwards stepwise model with removal probability set at $p<0.05$ was used.

Results

There were 4787 completed questionnaires from non-heterosexual women between 2002 and 2012. Surveys were excluded if respondents were aged less than 18 years or had not provided an age (n=246); lived outside NSW (n=237); or had missing data on the variables examined (n= 221). This left 4083 surveys for the analysis.

Population demographics

Over all survey years, the majority of respondents identified themselves as lesbian/gay (79%), 11% as bisexual and 10% as queer/other (Table 1). The proportion of women identifying as lesbian has decreased from 87% in 2006 to 69% in 2012. Concomitantly, more women identified as queer/other; with a difference of 15% seen over the 10 year period. The highest proportion of respondents was

aged 25-34 (40%) and median age was 32 years. The vast majority of respondents (83%) were in either full time or part-time employment and over half had a university degree.

Table 1. Demographics, Sexual practices and health practice

Characteristic	*2002*	*2004*	*2006*	*2008*	*2010*	*2012*	*Total*	X^2	*Sig (p)*
	N (%)	*N (%)*	*N (%)*	*N (%)*	*N (%)*	*N (%)*	*N (%)*		
Sexual Identity									
Lesbian/gay	403(79)	312(82)	738(87)	692(78)	617(76)	450(69)	3212 (79)	133.2	<0.001
Bisexual	69(14)	49(13)	70(8)	108(12)	83(10)	82(12)	461 (11)		
Queer/other	36(7)	18(5)	36(4)	90(10)	105(13)	125(19)	410 (10)		
Age*									
18-25	89 (18)	72(19)	127(15)	201(23)	187(23)	124(19)	800(20)		
25-34	212(42)	158(42)	338(40)	354(40)	293(36)	268(41)	1623(40)		
35-44	152(30)	98(26)	229(27)	216(24)	198(25)	168(26)	1061(26)		
>45	55(11)	51(13)	150(18)	119(13)	127(16)	97(15)	599(15)		
Education									
Up to year 10	63(12)	38(10)	108(13)	99(11)	104(13)	60(9)	472(12)	28.28	0.020
Up to year 12/HSC	82(16)	63(17)	161(19)	179(20)	162(20)	101(15)	748 (18)		
Tertiary diploma/trade cert	108(21)	84(22)	150(18)	178(20)	136(17)	119(18)	775 (19)		
University degree incl. postgraduate	255(50)	194(51)	425(50)	434(49)	403(50)	377(57)	2088 (51)		
Employment									
Employed (FT/PT)	381(75)	320(84)	700(83)	766(86)	653(81)	564(86)	3384 (83)	48.95	<0.001
Student	83(16)	37(10)	71(8)	68(8)	90(11)	43(6)	392 (10)		
Pensioner/other	44(9)	22(6)	73(9)	56(6)	62(8)	50(8)	307 (7)		
Sex with Men									
< 6 months ago	64(13)	63(17)	72(9)	108(12)	101(15)	102(15)	504 (12)	50.57	<0.001
> 6 months ago	286(56)	198(52)	486(58)	412(46)	318(48)	318(48)	2103 (52)		
Never	158(31)	118(31)	286(34)	370(42)	238(36)	238(36)	1475 (36)		
Sex with Women									
< 6months ago	399(79)	313(83)	688(82)	722(81)	690(86)	518(79)	3330(82)		
> 6 months ago	94(19)	61(16)	137(16)	145(16)	98(12)	117(18)	653(16)		
Never	15(3)	5(2)	19(2)	23(3)	16(2)	22(3)	100(2)		
Any fingers/hands during sex with women, last 6 months									
Yes	400(79)	316(83)	698(83)	731(82)	685(85)	537(82)	3367(82)	9.28	0.098
No	108(21)	63(17)	146(17)	159(18)	120(15)	120(18)	716(18)		

Any sex toys during sex with women, last 6 months									
Yes	199(39)	178(47)	439(52)	498(56)	464(58)	370(56)	2148(53)	57.53	<0.001
No	309(61)	201(53)	405(48)	392(44)	341(42)	287(44)	1935(47)		
Out to regular doctor/practice									
Yes	-	-	503 (60)	608 (68)	479 (60)	394 (60)	1984 (62)	33.29	<0.001
No	-	-	137 (16)	145 (16)	127 (16)	98 (15)	507 (16)		
No regular doctor	-	-	204 (24)	137 (15)	199 (25)	165 (25)	705 (22)		
Smoking status									
Current		128(34)	304(36)	327(37)	298(37)	232(35)	1289(36)	16.12	0.041
Ex-smoker		122(32)	245(29)	266(30)	217(27)	156(24)	1006(28)		
Never smoked		129(34)	295(35)	297(33)	290(36)	269(41)	1280(36)		
Pap Smear test									
< 3 years ago	372(73)	272(72)	582(69)	637(72)	604(75)	495(75)	2962(72)	24.06	0.007
> 3 years	56(11)	47(12)	117(14)	99(11)	68(8)	47(7)	435 (11)		
Never	80(16)	60(16)	145(17)	154(17)	133(17)	114(17)	686(17)		
Pap smear knowledge									
Incorrect	-	-	20(2)	27(3)	37(5)	-	84(3)	6.71	0.035
Correct	-	-	824(98)	863(97)	768(95)	-	2455(97)		
Total	**508**	**379**	**844**	**890**	**805**	**657**	**4083**		

Sexual practices

A large majority (82%) had been sexually active with a woman in the last 6 months; 2% had never had sex with a woman (Table 1). The majority (82%) of women had engaged in sexual practices using fingers or hands with a woman in the past 6 months; slightly over half (53%) reported using sex toys in the same period. Most women (64%) had been sexually active with men (81% of these had been sexually active with a man over 6 months ago).

Health practices

78% of women had a regular GP or attended the same general practice, 62% of women were 'out' to their regular GP about their sexuality; 36% of women were current smokers (Table 1).

Have the rates of screening among lesbian and bisexual women changed over time?

Across the survey years 72% of women had their last Pap smear test less than 3 years ago (range 69-75%). This left 28% overdue for screening; 11% had their last smear more than 3 years ago and 17% had never had a Pap smear. Univariate analysis did reveal a significant difference (p=0.007). Over time, there was no significant variation in the proportion of women who had ever attended for a Pap smear test (range 83-84%) or in the proportion of women who had never had a pap smear test (range 16-17%; χ^2=0.955). There was, however, some variation around timeliness: 69-75% of women

screened within the last three years, compared to 7-14% screened more than 3 years ago. There is no particular trend in the variation. When asked in 2006, 2008 and 2010, the majority (96%) said the statement "lesbians do not need Pap smears" was false (Table 1), suggesting that knowledge is not a problem for this population.

How do rates among lesbian and bisexual women compare to those of the general NSW population?

To compare Pap smear rates among this population with those reported by the NSW Cancer Institute,(23) data was used from the 2010 survey year and the age range restricted to 20-69 years. This left 768 respondents available for analysis; the 3-year participation rate was 77%. The 3-year participation rate for the NSW population for the period 2009-10 was 70%.(23) In the Local Health Districts (LHDs) where the majority of our sample resides (South Eastern Sydney, South Western Sydney, and Sydney) the rates are 73%, 65%, and 68% respectively.(23)

Among lesbian and bisexual women, what characteristics make them more likely to attend for screening?

In 2012, 657 eligible women completed the survey. In univariate analysis sexual identity (p=0.149) was not associated with ever having had a Pap smear test (Table 2). Increased age, education, employment, ever having had sex with men, being out to a regular doctor and ever having had an STI test were all associated with ever having a Pap smear test. These variables and sexual identity, as literature review suggested it was an important variable, were entered into the MLR. In the final MLR model (Table 3) increasing age (Odds Ratio (OR) 1.13 per one year increase, 95% confidence interval (CI) 1.09-1.17), education post-year 12 (OR 1.85, 95% CI 1.11-3.10), ever having had sex with men (OR 2.29; 95% CI 1.41-3.72), ever having had an STI test (OR 3.34; CI 2.05-5.43) and being out to a regular doctor relative to not having a regular doctor (OR 2.47, 95% CI 1.44-4.24) were all significantly associated with ever having a Pap smear test. Sexual identity and employment status were not significantly associated.

Table 2. Univariate analysis of variables with ever or never pap smear (2012 data only)

	Pap Smears			
Characteristic	**Ever** **N (%)**	**Never** **N (%)**	**X^2**	**Sig (*p*)**
Age				
Mean (SD)	35.1 (9.4)	26.2 (8.9)	F(1,655)=85.59	<0.001
Sexual Identity				
Lesbian/gay	365 (81)	85(19)	2.35	0.149
Bisexual/ Queer/other	178(86)	29(14)		
Education				
Post-school	433(87)	63(13)	30.52	<0.001
Up to year 12	110(68)	51(32)		
Employment				
Employed	481(85)	83(15)	25.86	<0.001
Student	24(56)	19(44)		

Other (unemployed/pensioner)	38(76)	12(24)		
Sex with Women				
<6 months	431(83)	87(17)	8.94	0.011
>6 months	99(85)	18(15)		
Never	13(59)	9(41)		
Sex with Men				
Ever	366(87)	53(13)	17.83	<0.001
Never	177(74)	61(26)		
Out to regular doctor/practice				
Yes	358 (91)	36 (9)	48.19	<0.001
No	73 (74)	25 (26)		
No regular doctor/practice	112 (68)	53 (32)		
STI test				
Yes	357(91)	37(9)	43.50	<0.001
No	186(71)	77(29)		

Table 3: Multinominal regression (2012 data only)

Characteristic	Ever have a pap smear VS Never had a pap smear	
	Multivariate	
	OR (95% CI)	***Sig (p)***
Age (per year)	1.13(1.09-1.17)	<0.001
Post year-12 education	1.85 (1.11-3.10)	0.019
Sex with Men, ever	2.29(1.41-3.72)	0.001
Regular Doctor		
Yes	2.47 (1.44-4.24)	0.001
No	1.53 (0.78-3.01)	0.219
No regular doctor	(Ref)	-
STI test, ever	3.34(2.05-5.43)	<0.001

Discussion

Overall, the rates of Pap smear test attendance among LBQ community-attached women in Sydney have not changed significantly over time (2002-2012). There was slight variation in timeliness (screened in the last 3 years compared to screened over 3 years ago), but there was no discernible trend. Comparing survey respondents and women in NSW, a higher proportion of LBQ women are receiving timely Pap smear tests. NSW data is based on clinical reports whereas SWASH data is self-report, which may cause the rates for SWASH respondents to be inflated.(24) However, our finding can be cautiously taken as a good news story as they do not reflect the significant disparities seen in the US(2) – where access to screening requires a physician and health insurance – or UK, where testing guidelines for this population are more ambiguous.(11)

Significant predictors of ever having had a Pap smear test in this study were STI test attendance (ever), post-year 12 education, ever having had sex with men and having a regular doctor who is aware of the woman's sexuality. Unsurprisingly, the likelihood of ever having a Pap smear test increased with age. Studies in the US and UK have shown that age is associated with frequency of Pap smear testing in both LBQ women (8, 11) and in the general population.(25)

Women with a regular GP who they were out to, were 2.5 times more likely to have ever had a Pap smear test compared to women who did not have a regular GP. Having a regular doctor by itself only increased the likelihood of ever having a Pap smear 1.5 times; that is, the combination of factors is important. We may be identifying women who are engaged with their health – developed a relationship with a regular GP, have had some discussion about their sexuality and proactively sought Pap smear testing. GPs may be contributing to this by creating safe and welcoming environments. On the other hand, some women may be avoiding Pap smears because they are worried about disclosing their sexuality and risking a negative reaction from a clinician; there is some support for this in the literature.(8) We know that disclosure is positively associated with better health care utilisation,(26) and preventative care (26) including Pap smear testing.(8, 27) Disclosure is strongly associated with higher levels of satisfaction with health care, (8, 28) and with higher levels of comfort discussing sexual health with a health care practitioner.(28) Building on this literature, our findings suggest a supportive and safe clinical environment is important for ensuring good coverage of Pap smear testing.

Three findings should be of concern to GPs and public health practitioners; the first two are modifiable risk factors. First, across the 10 years of the survey a significant and consistent proportion of LBQ women had never received a Pap smear test (16-17%). This is lower than the most current Australian comparison(1) but closer to rates reported in a recent international systematic review; reported rates of never screened among LBQ women in the UK were 12-17% and 8-12% among LBQ women in the US.(16) Second, levels of smoking in this sample remained high across the duration of the study (34-36%), more than twice the rate among women in the general population in NSW.(29, 30) Smoking is a risk factor for cervical cancer.(31, 32) Third, ever having had sex with men was a predictor of ever having had a Pap smear test. Similar findings have been reported in the US and UK.(13, 14) In our study, LBQ women were 2.3 times less likely to have ever had a Pap smear if they had never had sex with men.

Various explanations have been posited for the lower rate of Pap smear testing. We know from previous research that lesbian women tend to perceive themselves to be at lower risk of cervical cancer compared to heterosexual women.(1, 16) While our respondents overwhelmingly disagreed (97%) with the statement "lesbians do not need Pap smears", we wonder if a more precise statement about the need for women *who have never had sex with men* to have Pap smears, might have been answered differently. That is, there may still be a belief that HPV is only transmitted during sex with men/penile-vaginal intercourse, despite it being widely accepted that sexual practices, such as using fingers/hands and sex toys allow for the transmission of HPV.(15-18) The majority of women in our study engaged in these practices in the six months preceding their survey participation and thus are at risk of HPV transmission. The theory that the absence of targeted health promotion around cervical cancer screening may explain lower rates among LBQ women in general(16) does not resonate strongly in the Australian context, where the need for lesbian women to be screened is addressed by screening policy, screening programs and several targeted leaflets have been developed.(19) However, cervical screening programs may need to focus less on sexual identity (for example, "lesbians needs Pap smears too"), and more explicitly address the posited perception of no risk among women who have no sexual history with men.

An alternative explanation for lower pap smear rates is that LBQ women are being dissuaded by their health practitioner.(33) There is some evidence that Australian healthcare providers believed lesbian women to be at lower risk of cervical cancer,(34) with 9% of 490 Australian LBQ women reporting they had received this advice.(35) A UK study found one in five LBQ women who had never

had a Pap smear test had been told they were not at risk of cervical cancer.(36) These findings echo earlier research in the US.(14) Knowledge among health care professionals may be changing as evidence around HPV transmission and sex between women becomes more widely promoted.(37) But, LBQ women who received this advice in the past may not have subsequently sought or received updated advice. Or they may be unsure of how to deal with conflicting advice.(16) While cervical screening programs have a role in continued education, it is appropriate for GPs to take the lead to raise and update information their patients received in the past.

We suggest a further explanation specifically related to the sub-group of LBQ women who have no sexual history with men: our analysis demonstrated a significant association between STI testing and Pap smear testing (OR 3.34). While not surprising this important finding suggests sexual and reproductive health is not part of the health care experience for a significant minority of LBQ women. Women who are not having, or have never had, sex with men may indeed have less need to discuss sexual and reproductive health with their GP; in particular they are not requiring access to contraception. The need for contraception has been framed as a cue to action for Pap smears. (8) In this case Pap smear testing may need to be detached from sexual and reproductive health and promoted instead as part of a regular health and wellbeing check-up, like having regular blood pressure checks. Australian guidelines for general practitioners provide mixed messaging on this issue.(31) Pap smear tests are framed as part of a suite of planned general health checks for women aged 45 to 64 years, as "pre-conception care" for women aged 15 to 49, and for the early detection of cervical cancer in women aged 18 to 70 years (where it is repeatedly linked to sexual activity). It is only in this latter section that the guidelines refer to women with female sexual partners also being at risk of cervical cancer. The same guidelines note that GPs need to be able to explain to patients why a particular test is relevant to them. A US study found that among lesbian women who were not regular screeners, there was a low perception of the benefits of screening (and a high perception of barriers to screening). Framing Pap smear tests as a routine screen for the early detection of cervical cancer in all women could help GPs explain to their LBQ patients the benefits (i.e. not simply pregnancy preparation) of these tests for their health. Further research to understand specifically how LBQ women with no sexual history with men are being routinely under-screened is necessary to understand and address this issue.

The recent National Cervical Screening Program renewal process undertaken by the Medical Services Advisory Committee recommended significant changes to the cervical screening regime in Australia. Specifically, primary HPV testing 5-yearly for women aged 25-64 years; changes are slated to take effect after 2016.(38) There is no reason to think these changes will detrimentally affect cervical screening attendance for LBQ women, although recent commentary emphasises the need for successful engagement of women at 25 years of age.(39) However, one change does offer hope for improvement; currently, women receive Pap smear test reminders if they have had a Pap smear test in the past, are now overdue for screening and have consented to be on the Pap Test Register. The renewal recommended a population-based invitation and recall system which means all women would receive an invitation to test, regardless of their history of testing.(38) The benefit of this proactive approach is that every LBQ woman would receive a personal invitation to test, regardless of assumptions (for example, by a GP) about a woman's sexual history and risk of cervical cancer.

Strengths and Limitations

The SWASH study provided a large sample size over a 10 year period which allowed meaningful analysis of the data. The SWASH study captures the heath behaviours and outcomes of community-attached LBQ women in Sydney, the largest city in Australia. It has been conducted using the same methodology, in the same or similar recruitment sites, which allows for robust comparisons across time. A further strength is that it does not rely on a clinical population. Our study does, however, rely on a convenience sample generated in a metropolitan site, and is focused on community-

attached LBQ women rather than all women who have had sexual experiences with women. Analysis of the 2012 survey suggests approximately 12% are repeat respondents, having completed the most recent previous iteration. However, with no comparable datasets available (cervical screening registers do not collect information on sexual identity or practice) it is difficult to identify the underserved population of women who have never had sex with men.

Conclusions

The results of this study with regards to rates of Pap smear testing among LBQ women are encouraging when taken in relation to similar studies of this population. In general, Australian community-attached LBQ women are attending for regular Pap smear tests at slightly higher rates to the general population. Nevertheless, Australian community-attached LBQ women who have never had sex with men are significantly less likely to have ever had a Pap smear compared to women who had ever had sex with men. This is despite clinical evidence demonstrating - and Pap smear testing policy articulating - that sex with a man is not necessary for HPV transmission. Given the vast majority of women diagnosed with invasive cervical cancer had not had regular Pap smear tests or were never- screened, there is important work to be done to address under-screening among this population.

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