

## SEXUAL BEHAVIOUR

# HIV, sexual risk, and ethnicity among men in England who have sex with men

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**Objectives:** To examine ethnic group differences in HIV testing history and sexual HIV risk behaviours that may account for such differences, among men in England who have sex with men (MSM), in order to inform HIV prevention planning priorities.

**Methods:** A self completion survey in the summer of 2001 was carried out in collaboration with community based health promoters. Three recruitment methods were used: "gay pride" festivals, health promoter distributed leaflets, internet version advertised with gay service providers. The leaflet was produced with an alternative cover for targeted recruitment of black men.

**Results:** In a sample of 13 369 MSM living in England, 17.0% were from minority ethnic groups and 5.4% had tested HIV positive. Compared to the white British majority, Asian men were 0.32 times as likely to be living with diagnosed HIV infection, while black men were 2.06 times as likely to be doing so. Among men who had not tested HIV positive, Asian men were less likely to have sex with a known HIV positive partner, while black men were more likely to have insertive unprotected anal intercourse both with a partner they knew to be HIV positive and with a partner whose HIV status they did not know.

**Conclusions:** Among MSM in England, HIV prevalence is higher among black men and lower among Asian men compared with the white British majority. Increased sexual HIV risk behaviour, especially exposure during insertive anal intercourse, accounts for some of this difference. HIV prevention programmes for MSM and African people should both prioritise black MSM.

In order to best direct finite resources, HIV prevention planners need to know which sections of the population they are concerned with are most likely to be involved in HIV transmission. Sex between men continues to account for the majority of HIV infections acquired in Britain.<sup>1</sup> This paper looks at differences in HIV testing and HIV sexual risk behaviours across ethnic groups among a community recruited sample of men who have sex with men (MSM), in order to inform priorities in HIV prevention programmes. Although such associations have been reported in surveys in the United States,<sup>2</sup> this is the first report of its kind from England.

Several data sources indicate differences in this area, particularly between black men and other ethnic groups. In Britain both African men and Caribbean men are over-represented in diagnoses of homosexually acquired infection.<sup>3</sup> Conversely, there are far more MSM in samples of African men with HIV living in Britain<sup>4</sup> than among African men generally. Men account for 66% of HIV diagnoses among black Caribbeans in the United Kingdom and 52% of them acquired their infection through sex with men.<sup>5</sup> The current report provides triangulation for these observations from a large community based survey and provides the first detailed description of ethnic group differences in sexual behaviours among men in England that may account for the differences in HIV prevalence.

## METHODS

The data in this paper come from the fifth national "Gay Men's Sex Survey," an annual, community based self completion survey, which is collaboratively designed and implemented.

### Instrument design

In February 2001 we wrote to 77 health authority HIV prevention commissioners and 31 health promotion agencies

working with MSM to ask them what they thought would be most useful to ask in the survey that summer. Eight replied with suggested questions and verbal feedback was taken from a group of health promoters in East and West Sussex. An initial draft of the survey was drawn up and discussed with the key service provider and commissioner of the research (the Terrence Higgins Trust). The survey instrument is available to download at [www.sigmaresearch.org.uk/downloads/survey08.pdf](http://www.sigmaresearch.org.uk/downloads/survey08.pdf).

### Measures

This paper focuses on ethnic group differences in demographics, HIV testing, and sexual HIV risk behaviours.

### Demographics

#### Ethnicity

We used the 16 category census 2001 question for ethnicity to facilitate comparisons with the general population.

#### Residence

Local authority of residence was sought and then collapsed to four NHS directorates of health and social care for analysis.

#### Age

Free variable sometimes collapsed to 10 year age bands at analysis.

#### Education

Men were asked to indicate which education qualifications they held and were allocated to one of three bands: low (no qualifications, O level/CSEs/GCSEs or equivalent, usually leaving education at 16 years), high (university degree acquired at any age) or medium (the remainder).

**Abbreviations:** IUAL, insertive unprotected anal intercourse; MSM, men who have sex with men; RUAI, receptive unprotected anal intercourse

**Table 1** Ethnic group subsample sizes and comparison with census 2001

Grouping	Census group*	Sample No	% (95% CI)	Census	OR (95% CI)
<b>White British</b>		<b>11 102</b>	<b>83.0 (0.6)</b>	<b>88.2</b>	<b>0.65 (0.63 to 0.68)</b>
	White British	11 102	83.0 (0.6)	88.2	0.65 (0.63 to 0.68)
<b>White other</b>		<b>1406</b>	<b>10.5 (0.5)</b>	<b>4.0</b>	<b>2.82 (2.67 to 3.00)</b>
	White Irish	346	2.6 (0.3)	1.4	1.88 (1.66 to 2.10)
	White other	1060	7.9 (0.5)	2.6	3.21 (2.99 to 3.44)
<b>Black</b>		<b>313</b>	<b>2.3 (0.3)</b>	<b>2.3</b>	<b>1.00 (0.87 to 1.13)</b>
	Black Caribbean	127	0.9 (0.2)	1.0	0.90 (0.70 to 1.10)
	Black Caribbean and white	91	0.7 (0.1)	0.2	3.52 (3.01 to 4.02)
	Black African	42	0.3 (0.1)	0.8	0.37 (0.25 to 0.50)
	Black African and white	32	0.2 (0.1)	0.1	2.00 (1.00 to 3.01)
<b>Asian</b>		<b>21</b>	<b>0.2 (0.1)</b>	<b>0.1</b>	<b>2.00 (1.00 to 3.01)</b>
		<b>329</b>	<b>2.5 (0.3)</b>	<b>4.4</b>	<b>0.56 (0.49 to 0.58)</b>
	Asian Indian	136	1.0 (0.2)	2.0	0.49 (0.40 to 0.60)
	Asian Pakistani	38	0.3 (0.1)	1.2	0.25 (0.16 to 0.33)
	Asian Bangladeshi	4	0.0 (0.0)	0.4	0.00 (0.00 to 0.15)
	Asian and white	69	0.5 (0.1)	0.3	1.67 (1.33 to 2.01)
<b>All others</b>		<b>82</b>	<b>0.6 (0.1)</b>	<b>0.5</b>	<b>1.20 (1.00 to 1.40)</b>
		<b>219</b>	<b>1.6 (0.2)</b>	<b>1.0</b>	<b>1.61 (1.41 to 1.81)</b>
	Chinese	106	0.8 (0.2)	0.4	2.01 (1.50 to 2.52)
	Other mixed	75	0.6 (0.1)	0.2	3.01 (2.51 to 3.52)
	All others	38	0.3 (0.1)	0.4	0.75 (0.50 to 1.00)

\*Proportion of males aged 15 or more living in England and Wales, census 2001.<sup>7</sup>

## HIV testing

### HIV testing history

Men were allocated to one of three groups: never tested, last test result was HIV negative, or tested HIV positive.

## Sexual behaviours

### Gender of sexual partners in the last year

Respondents indicated whether they had sex with men, women, both, or neither in the last year. What counted as sex was left for respondents to decide.

### Expectation of future sex with men

Those men who had not had sex with a man in the last year were asked "Do you expect to have sex with a man in the future?" Those who said "no" were excluded from the sample.

### Number of male partners in the last year

Rather than use a free variable (which we have found elicits an unacceptably high missing value for those with larger numbers of partners), respondents were asked to allocate themselves to one of five bands: 1 partner; 2, 3, or 4 partners; 5–12 partners; 13–29 partners; or 30 or more partners. Again, what counted as a sexual partners was left for respondents to decide.

## Sexual HIV risk behaviours

All men were asked whether, in the last year, they had any kind of sex with a man, insertive unprotected anal intercourse (IUA) and receptive unprotected anal intercourse (RUA) with three different partner types: men they knew to be HIV positive, men they knew to be HIV negative, and men whose HIV status they did not know.

## Recruitment

Three methods of recruitment to the survey were used to diversify the sample and involve the collaboration of health promoters. Ethics committee approval was not sought for community recruitment by community groups.

- (1) Recruitment teams of between four and 12 travelled to seven lesbian, gay, and bisexual community festivals over the summer of 2001 (in Birmingham, Edinburgh,

London, Bournemouth, Brighton, Manchester, and Cardiff). At each event, the team set up either one or two stalls from which they invited men to participate, offering them clipboards with a survey form and a pen attached. The survey covered two sides of A4 (210×297 mm). Men completed them on the spot and returned their own forms to sealed boxes.

- (2) The survey form was redesigned for distribution by health promoters. This was a 20 page, A6 size (105×148 mm) booklet whose back cover folded out and over the front, with a gummed edge. The sealed booklet was preaddressed to Sigma Research and no stamp was needed to return it. A copy of the booklet and a covering letter were sent to 185 HIV health promotion agencies in England and Wales and listed in *Nambase*, the UK's HIV service directory<sup>6</sup> inviting them to collaborate in recruitment. Agencies were offered a report on the men they recruited if they recruited 20 or more (which were provided to 30 agencies in February 2002). In total, we delivered 30 610 booklets to 70 agencies. An additional set of booklets was printed with a different cover featuring a photograph of a black man and included the logo of a collaborating London based black MSM HIV prevention project (Big Up at GMFA). This version was distributed by agencies working with black men and at community sites with a large proportion of black users. Local distribution of the booklets to MSM occurred over July–September 2001. At the end of the recruitment period, all booklet distributors were re-contacted and asked how many booklets they had not distributed.
- (3) The survey was available for completion online via the Sigma Research website. The content of the questionnaire was identical to the booklet version. From a link on our homepage the questionnaire appeared as one continuous document. Data were captured when the respondent pressed "submit" at the end of the document and sent in an individual anonymous email to Sigma Research. The web version was available for completion online for 8 weeks (August and September 2001) and was promoted via Gay.com, then the largest "gay specific" internet provider in the United Kingdom, using pop-ups and a recurrent banner advertisement in chat rooms. There was also coverage of the survey in the news

**Table 2** Demographic description of recruitment subsamples (\* $p < 0.05$ )

	All three methods	Web	"Pride" events	Booklet
Sample size	13 369	3909	6977	2483
Residence*				
Valid No	13 369	3909	6977	2483
% North	20.3	24.4	14.6	30.2
% Midlands	24.6	22.4	24.6	27.9
% South	26.5	24.4	28.5	24.2
% London	28.6	28.9	32.3	17.7
Age*				
Valid No	13 257	3893	6910	2454
Mean	33.0	30.6	33.3	35.6
SD	10.4	10.2	9.6	12.0
Median	32	29	32	35
Range	13–82	13–76	15–75	14–82
Education*				
Valid No	13 230	3892	6892	2446
% low	27.7	25.8	27.6	30.7
% medium	28.8	32.6	26.8	28.7
% high	43.5	41.6	45.6	40.7
Ethnicity*				
Valid No	13 369	3909	6977	2483
% white British	83.0	83.8	82.7	82.7
% other white group	10.5	10.2	11.3	8.8
% black	2.5	1.7	2.1	4.2
% Asian	2.3	2.4	2.3	3.0
% all others groups	1.6	1.9	1.6	1.3
Sexual partners*				
Valid No	13 266	3890	6911	2465
% none	3.1	3.9	2.6	3.4
% women only	0.9	1.5	0.7	0.3
% men and women	6.7	13.2	3.0	6.6
% men only	89.3	81.3	93.7	89.7

section of the site. Big Up, a black MSM sexual health promotion group, also undertook some promotion of the web survey to black MSM via internet newsgroups and email lists.

All three surveys asked men if they had already completed the survey that summer using any of the three methods. Surveys which indicated yes were rejected.

### Data input and statistical analysis

The gay pride and booklet returns were input by hand to a custom built data base and then merged with the data automatically captured from emails. The entire merged data set was imported to SPSS-PC (version 11) in which all analyses of data were carried out. Ninety five per cent confidence intervals for proportions were calculated using the formula  $p \pm 1.96 \times \sqrt{(p \cdot q / N)}$  where  $p$  is the proportion,  $q = 1 - p$  and  $N$  is the denominator. We used  $\chi^2$  to compare HIV testing and sexual behaviour in ethnic groups at the univariate level. Multinomial logistic regression was used to calculate ORs across ethnic groups for HIV testing and sexual risk behaviours, adjusted for differences in recruitment method, age, area of residence, and education which were significant at the univariate level.

### RESULTS

The response rate for gay pride events (calculated by observation of recruiters at the Birmingham and Brighton events) was estimated at 71% of approaches. As men who declined may have been re-approached later at the same event by another recruiter (especially at the smaller events) and may have responded on the second or subsequent approach, the overall response rate may be higher than this. Of the 30 610 booklets delivered to health promotion agencies, the post-distribution audit suggested 72% of those had been distributed directly to MSM or placed in leaflet racks in gay bars and clubs. A total of 2713 booklets were

returned, or 12.3% of those estimated to be distributed. Website monitoring data did not allow the rate of response by those who saw the web version to be calculated.

Of a total of 17 205 responses across all three recruitment methods, 13 508 men identified their country of residence as England and gave sufficient information to allocate them to one of England's four directorates of health and social care. Of these, 120 indicated no sex with men in the last year and said they did not expect to have sex with men in the future. A further 19 did not indicate their ethnicity. The sample discussed in this paper consists of the 13 369 men living in England who had sex with a man in the last year and/or expected to in the future, and who gave their ethnicity. In all cases, discrepancies with the denominator is because of missing data on specific questions.

### Ethnic composition of sample

Table 1 shows the ethnic group composition of the final sample (with 95% confidence intervals for the proportions) and the male population.<sup>7</sup> The proportion of black men in the sample was not significantly different from the population of males aged 15 or more. Compared to that population, two ethnic groups (white British men and Asian men) were under-represented and two were over-represented (white other and all others). Within the black group it was men with dual (mixed) black-white ethnicities that predominated, with African and Caribbean men less well represented. Similarly men with dual Asian-white ethnicity were over-represented.

### Recruitment effects

Of the final sample, 52.2% ( $n = 6977$ ) were recruited at Pride events, 18.6% ( $n = 2483$ ) using the booklet and 29.2% ( $n = 3909$ ) via the internet. Which method of recruitment men used significantly varied by where they lived, their age, education, and ethnicity (table 2).

**Table 3** Demographic characteristics, HIV testing and sexual behaviours in ethnic group subsamples of homosexually active men (\*p<0.05)

	White British	White other	Black	Asian	All others
Subsample size	11 102	1406	313	329	219
<b>Demographics</b>					
Residence (%)*					
Valid No	11 102	1406	313	329	219
North	22.1	11.7	9.3	13.4	11.9
Midlands	26.4	12.5	24.0	20.7	14.6
South	28.2	18.9	17.9	14.9	18.3
London	23.3	56.9	48.9	51.1	55.3
Age (years)*					
Valid No	11 017	1387	310	328	215
Mean	33.3	32.3	31.2	28.1	30.2
SD	10.8	8.5	8.5	7.9	8.6
Median	32	31	31	27	28
Range	13–82	15–70	16–66	14–73	17–67
Education (%)*					
Valid No	10 992	1389	308	324	217
Low	30.0	11.9	38.0	16.7	10.1
Medium	30.1	22.3	24.7	21.9	23.0
High	39.9	65.8	37.3	61.4	66.8
Sexual partners (%)					
Valid No	11 025	1392	311	323	215
None	3.2	2.3	2.9	6.5	2.3
Women only	0.9	1.1	0.0	0.9	0.0
Men and women	6.7	6.3	8.7	7.1	4.2
Men only	89.2	90.3	88.4	85.4	93.5
<b>HIV testing</b>					
Ever HIV tested*					
Valid No	11 060	1402	309	327	217
% ever tested	52.9	70.3	64.7	45.9	57.6
No ever tested	5 854	985	200	150	125
HIV test result*					
Valid No	5712	971	192	148	124
% tested positive	9.5	11.7	18.2	3.4	8.1
No tested positive	541	114	35	5	10
<b>Sexual behaviour in last year</b> (men not tested HIV positive who had a male partner)					
Subsample size					
	9889	1219	257	290	198
Any sex					
Valid No	9508	1192	247	284	194
% with positive*	9.3	12.4	9.7	6.7	10.3
% with unknown*	76.6	76.7	74.9	75.4	86.1
% with negative	49.0	50.8	54.3	47.9	41.8
UIAI					
Valid No	9461	1183	236	279	193
% with positive*	1.4	1.9	3.8	0.4	2.6
% with unknown	19.4	20.2	26.3	19.4	18.7
% with negative	19.5	20.0	19.9	17.2	14.0
URAI					
Valid No	9521	1180	242	283	194
% with positive	1.2	1.3	1.7	0.4	1.5
% with unknown	17.8	16.4	18.6	17.3	18.0
% with negative	21.2	22.4	20.2	18.7	16.5

UIAI, unprotected insertive anal intercourse; URAI, unprotected receptive anal intercourse.

All three recruitment subsamples were distributed across the four NHS directorates. However, men living in London (n = 3824) or the south (n = 3544) disproportionately used gay pride events (59.0% in London and 56.1% in the south), those in the Midlands (n = 3284) the booklet (21.1%), and those in the north (n = 2717) the booklet (27.6%) and web (35.0%), ( $\chi^2 = 442.06$ , df = 6, p<0.01). This reflects the

geographic distribution of the gay pride events used and of our health promotion collaborators.

While the three recruitment subsamples each encompassed a wide age range, their age did significantly differ (F = 194.55, df = 2, p<0.001). As groups, the web sample was the youngest, the gay pride sample in the middle, and the booklet sample was the oldest (table 2).

**Table 4** Odds ratios for HIV testing and testing positive (controlled for recruitment method, age, residence and education)

	Ever HIV tested		Tested HIV positive of tested		Living with diagnosed HIV	
	OR	95% CI	OR	95%CI	OR	95% CI
White British	1.00		1.00		1.00	
White other	<b>1.83</b>	(1.61 to 2.08)	1.25	(0.99 to 1.57)	<b>1.54</b>	(1.23 to 1.93)
Black	<b>1.54</b>	(1.20 to 1.96)	<b>2.06</b>	(1.39 to 3.04)	<b>2.26</b>	(1.56 to 3.29)
Asian	<b>0.71</b>	(0.56 to 0.89)	<b>0.40</b>	(0.16 to 0.99)	<b>0.32</b>	(0.13 to 0.79)
All others	1.11	(0.83 to 1.47)	0.78	(0.39 to 1.56)	0.82	(0.41 to 1.62)

Which recruitment method respondents used was also significantly associated with their formal educational attainment ( $\chi^2 = 56.60$ ,  $df = 4$ ,  $p < 0.01$ ), although each method recruited across the education range. Men with low education ( $n = 3660$ ) were disproportionately likely to use the booklet (20.5% had), those with medium education ( $n = 3816$ ) to use the internet (33.3%), and those with high education ( $n = 5754$ ) to have been recruited at gay pride events (54.6%).

Similarly, while each method recruited men from a variety of ethnic groups men, the recruitment method was significantly associated with ethnic group ( $\chi^2 = 64.09$ ,  $df = 8$ ,  $p < 0.01$ ). Black ( $n = 313$ ) and Asian ( $n = 329$ ) men were disproportionately recruited using the booklet (33.2% and 22.5% respectively). The white other (that is, not British) men ( $n = 1406$ ) were most likely to use gay pride events (56.0%) and the white British men ( $n = 11\ 102$ ) and remaining "all others" group ( $n = 219$ ) disproportionately used the internet (29.5% and 33.3% respectively). In a multivariate analysis, compared to the white British (and controlling for residence, age, and education), the black men were 2.80 times (95% CI, 2.18 to 3.60) more likely to have used the booklet and Asian men were 1.82 times (95% CI, 1.38 to 2.39) more likely to have done so.

Finally, recruitment method was associated with the gender of men's sexual partners in the last year. The majority of all three recruitment subsamples had sex with men only (table 2). However, web recruited men were least likely to have had sex with a man (94.6% had compared with 96.7% of the gay pride sample and 96.3% of the booklet sample;  $\chi^2 = 29.89$ ,  $df = 2$ ,  $p < 0.01$ ), and were most likely to have had sex with women (14.8% had compared with 3.7% of the gay pride sample and 6.9% of the booklet sample;  $\chi^2 = 437.53$ ,  $df = 2$ ,  $p < 0.01$ ). Consequently, 14.0% of the web recruited men who had sex with men also had sex with women, compared to 3.1% of the gay pride sample and 6.9% of the booklet sample.

**Demographic differences across ethnic groups**

Table 3 shows residence, age, and educational qualifications of the five ethnic groups. All three demographics significantly varied with ethnicity.

While homosexual and bisexual men of all ethnicities were recruited from each part of the country, there were significant associations between residence and ethnicity. Less than a quarter of the majority white British sample lived in London but over half of all four minority ethnic groups did. Ethnic minorities accounted for 9.7% (263/2717) of men in the north, 10.7% (351/3284) in the Midlands, 11.6% (411/3544) in the south, and 32.5% (1242/3824) of Londoners.

All four minority ethnic group subsamples were significantly younger than the ethnic majority (table 3), as in the general population. By contrast, compared to the ethnic majority, the black men in the sample were slightly less well

educated, while the other three minority ethnic groups were considerably better educated.

With regard to the gender of men's sexual partners, the majority of all ethnic groups had sex with men only in the last year. However, Asian men were least likely to have had sex with men while black men were most likely to have had sex with women (table 3). Compared with the ethnic majority (and controlling for recruitment method, age, education, and residence), Asian men were 0.44 times as likely to have had sex with a man (OR 95% CI 0.28 to 0.68). Conversely, black men were 1.53 times more likely to have had sex with a woman (OR 95% CI 1.01 to 2.31).

**HIV testing history**

Overall, 54.9% (7314/13 315) of the sample had ever tested for HIV. The proportion varied by ethnic group being lowest among Asian men and highest among the "white other" group (table 3:  $\chi^2 = 174.4$ ,  $df = 4$ ,  $p < 0.01$ ). Adjusting for recruitment, residence, age, and education (table 4), compared to the white British men, the "white other" group were 1.83 times more likely to have ever tested and black men 1.54 times more likely. Conversely, Asian men were 0.71 times as likely to have ever tested for HIV.

Among all those men who had tested, 9.9% (705/7147) had received a positive result. This proportion also varied by ethnic group ( $\chi^2 = 27.4$ ,  $df = 8$ ,  $p < 0.01$ ), being lowest among Asian testers and highest among black testers. Adjusting for recruitment, residence, age, and education (table 4), compared to the white British men, the black men were 2.06 times more likely to have received a positive result. Conversely, Asian testers were 0.40 times as likely to have done so.

Together, these differences meant that compared to the ethnic majority (of whom 8.2% were living with diagnosed HIV), black men were 2.26 times as likely to be living with a positive diagnosis (11.6% were doing so), and the "white other" group were 1.54 times as likely. Conversely, Asian men (of whom 1.5% had been diagnosed positive) were 0.32 times as likely as the white British majority to be living with a positive diagnosis.

**Sexual HIV risk behaviours**

In order to identify possible sexual behaviour differences which may account for observed ethnic group differences in HIV infection, we considered the potential for sexual exposure to HIV among men *not* tested HIV positive. The following considers the 94.6% of respondents who had not tested HIV positive and who did have a male sexual partner in the preceding year ( $n = 11\ 928$ ).

In the last year, 9.6% (1096/10 329) of these men had some kind of sex with a man they knew to be HIV positive. This ranged from 6.7% of Asian men to 12.4% of men in the white other group (table 3). This proportion was also higher among men living in London (13.9%, 450/3234), those with higher education (11.5%, 581/5044), and men in their 30s and 40s

**Table 5** Odds ratios for sex, insertive (IUAI), and receptive (RUAI) unprotected anal intercourse with a known HIV positive partner among men not tested HIV positive (controlled for recruitment method, age, residence, and education)

	Any sex		IUAI		RUAI	
	OR	95% CI	OR	95% CI	OR	95% CI
White British	1.00		1.00		1.00	
White other	1.11	(0.91 to 1.35)	1.23	(0.79 to 2.02)	1.00	(0.57 to 1.75)
black	0.94	(0.60 to 1.45)	<b>2.76</b>	(1.38 to 5.56)	1.31	(0.47 to 3.59)
Asian	<b>0.60</b>	(0.37 to 0.97)	0.25	(0.03 to 1.83)	0.28	(0.03 to 2.01)
All others	0.95	(0.59 to 1.53)	1.75	(0.70 to 4.37)	1.23	(0.38 to 3.95)

**Table 6** Odds ratios for sex, insertive (IUI), and receptive (RUI) unprotected anal intercourse with a partner of unknown HIV status among men not tested HIV positive (controlled for recruitment method, age, residence and education)

	Any sex		IUI		RUI	
	OR	95% CI	OR	95% CI	OR	95%CI
White British	1.00		1.00		1.00	
White other	0.91	(0.78 to 1.06)	1.08	(0.92 to 1.27)	0.92	(0.78 to 1.10)
Black	0.93	(0.69 to 1.25)	<b>1.46</b>	(1.08 to 1.98)	1.01	(0.72 to 1.41)
Asian	0.91	(0.68 to 1.21)	1.00	(0.74 to 1.36)	0.94	(0.69 to 1.30)
All others	<b>1.63</b>	(1.08 to 2.47)	0.89	(0.61 to 1.31)	1.01	(0.67 to 1.48)

(12.4%, 701/5668). Adjusting for these associations and recruitment (table 5), Asian men were 0.60 times as likely as the ethnic majority to have sex with a man they knew to be HIV positive. A much smaller proportion had IUI with men they knew to be HIV positive: 1.5% (167/11 351) overall, ranging from 0.4% of Asian men (n = 1) to 3.8% of black men (n = 9). Adjusting for recruitment, residence, age and education (table 5), compared to the ethnic majority, black men were 2.76 times as likely to have IUI with men they knew to be positive. The proportion of men who had RUI with men they knew to be positive was smaller again (1.2% of men not tested HIV positive, 135/11419) and we found no significant evidence for this varying by ethnic group.

Sex with men of unknown HIV status was common with 76.7% (8762/11425) of those not tested HIV positive having done so in the last year. Adjusting for demographic differences and recruitment, compared to the ethnic majority this was 1.63 times more likely for the all others group (table 6). Insertive unprotected anal intercourse with partners of unknown status was much less common (19.6% of all men not tested positive, 2223/11 351). However, it was again the case that black men were most likely to have done so (adjusted odds ratio with the ethnic majority was 1.46: table 6). Slightly fewer men had RUI with partners of unknown status (17.7% overall, 2020/11419) and this did not significantly vary by ethnic group.

Almost half (49.1%, 5610/11425) had sex with men they knew to be HIV negative in the year before interview. Compared to the ethnic majority, men in the "all others" group were less likely to have had such a partner and were also least likely to have IUI with them (table 7). No ethnic group differences in RUI with known negative partners were found.

## DISCUSSION

The geographic differences in recruitment methods reflect the distribution of the gay pride events used and the location of our health promotion collaborators. However, it is clear that focused recruitment using a different image on the booklet and close collaboration with community based sexual health promoters serving minority ethnic groups facilitated more

men from black and Asian ethnicities to participate using this method. This is a relatively simple and low cost way of diversifying the sample. The multimethod and multisite recruitment also overcomes some of the limitations of generalising from single site recruitment.

On the other hand, of the men in our sample who had sex with a man in the last year, only 7.0% also had sex with a woman. This compares with 36.4% of homosexually active men in the first national survey of sexual attitudes and lifestyles (Johnson *et al*<sup>8</sup> p 209) This difference suggests our findings may be limited to exclusively homosexually active men and should not be generalised to ethnic group differences among behaviourally bisexual men. Similarly, the sample can be expected to under-represent men who are more covert about their homosexual behaviour. Since such men are thought to be less likely to be involved in sexual HIV exposure than men who are more open about their sexuality (Hickson *et al*<sup>9</sup> p 34), the prevalence of both HIV and sexual risk behaviours in the current sample may be elevated compared to the total population of homosexually active men. Another weakness of the study was the difficulty of calculating response rates (especially for the web and booklet versions). In addition, although the questions asked using each method were identical, the context in which men were filling them out will have varied considerably. This can be expected to introduce a varying (but unknown) degree of invalidity to the data by method. However, in terms of geographic distribution and age the sample compares well with population estimates.

It is difficult to establish the profile of homosexually active men in England against which a sample can be compared for representativeness. The prevalence of sex between men in England varies strongly by area of residence. The second national survey of sexual attitudes and lifestyles found the prevalence of sex between men to be 5.5% in Greater London compared with 2.1% in the rest of England.<sup>10</sup> England is divided into four NHS directorates of health and social care: 29.1% of the population live in the north directorate; 29.9% in the Midlands and eastern; 26.2% in the south; and 14.8% in London. Taking 5.5% of the London population and 2.1% of elsewhere this suggests that the distribution of homosexually

**Table 7** Odds ratios for sex, insertive (IUI) and receptive (RUI) unprotected anal intercourse with a known HIV negative partner among men not tested HIV positive (controlled for recruitment method, age, residence and education)

	Any sex		IUI		RUI	
	OR	95%CI	OR	95%CI	OR	95%CI
White British	1.00		1.00		1.00	
White other	1.08	(0.95 to 1.22)	1.03	(0.88 to 1.21)	1.09	(0.94 to 1.27)
Black	1.20	(0.93 to 1.55)	0.97	(0.70 to 1.36)	0.89	(0.64 to 1.23)
Asian	0.88	(0.69 to 1.12)	0.74	(0.54 to 1.03)	0.74	(0.54 to 1.02)
All others	<b>0.74</b>	(0.55 to 0.99)	<b>0.62</b>	(0.41 to 0.94)	0.70	(0.47 to 1.04)

active men in England is 23.5% in the north, 24.1% in Midlands and eastern; 21.1% in the south; and 31.3% in London. These compare well with the proportions in the current study sample (20.3%, 24.6%, 26.5%, and 28.6%, respectively) suggesting a fairly geographically representative sample, possibly oversampling the Midlands and the south and undersampling London and the north.

Similarly, the first national survey of sexual attitudes and lifestyles<sup>8</sup> suggested the prevalence of sex between men to be 1.7% between 15–24 years of age, 2.0% between 25–34 years, 1.0% between 35–44 and 0.9% between 45–59 years (age specific rates for from the second survey have not been published). Applying these age proportions to the number of males in each of these age bands in England<sup>7</sup> suggests that among homosexually active men aged 15–59 years, 25.9% are aged 15–24 years, 34.9% 25–34 years, 18.3% 35–44 years, and 20.9% 45–59 years. The current sample proportions (23.6%, 37.6%, 26.8%, and 12.0% respectively) again suggest a fairly representative sample in terms of age, slightly under-representing men under 25 and (to a greater extent) those over 44 years.

In terms of ethnicity, if the same proportion of each ethnic group has sex with men, then the ethnic group profile of the total male population aged 15 or older can be used to estimate the expected proportions of each ethnic group in a representative sample of homosexually active men. There is no strong evidence to lead us to believe sex between men is either less or more common among any minority ethnic group in the United Kingdom compared with the ethnic majority. The first national survey of sexual attitudes and lifestyles<sup>8</sup> was not powerful enough to significantly discriminate such differences as may exist. However, in that survey fewer Asian men reported sex with men ever (2.4%) or in the last 5 years (0.6%) than did white men (6.1% ever, 1.4% last 5 years) or black men (6.6% ever, 1.0% last 5 years) (p 463). This would accord with the apparent under-recruitment of Asian men in the current study. On the other hand, a community survey of MSM has also shown that the familial, social, and occupational networks of Asian men are particularly unlikely to know of their sexual preference (Hickson *et al*<sup>9</sup> p 22) and this dynamic may be expected to extend to the research context which would result in a similar observation. The ethnic group which appears most strongly represented in this sample (compared with the general population) is the white other group (including white Irish). Since methodological considerations would suggest this group (like other ethnic minorities) should be under-represented, this finding strongly suggests a higher proportion of homosexual and bisexual men in Britain belong to this group than in the general population.

Turning to HIV, a higher prevalence of HIV in one group rather than another may reflect a number of processes including: (a) increased incidence in the United Kingdom in the first group; (b) increased migration to the United Kingdom with HIV in the first group; (c) increased mortality from HIV in the second group; (d) increased emigration with HIV in the second group; or a combination of these four factors. If the observed higher prevalence of diagnosed HIV infection in black men in the current study reflects a higher actual prevalence in this group, the first two explanations above are more likely than the second two. The findings on ethnic group differences in HIV prevalence are congruent with other data sources in Britain such as surveys of sexuality among Africans living with HIV and the ethnicity profile of men being diagnosed with homosexually acquired HIV. The current survey lends weight to the hypothesis that among homosexually active men, HIV incidence is higher among black men and lower among Asian men when compared to the ethnic majority.

Our findings on sexual HIV risk behaviours are congruent with those on HIV testing history. For example, Asian men appear to be less likely to have sex with men they know to have HIV. While this may reflect Asian men's lack of awareness of their partners' HIV status it may also be an explanation for the observed lower prevalence of HIV among this group. On the other hand, black men's heightened prevalence of diagnosed infection can be partially explained by their increased exposure to HIV during insertive unprotected anal intercourse, both with known HIV positive partners and with partners of unknown HIV status (a proportion of whom will be HIV positive).

These data support the hypothesis that HIV prevalence (the proportion infected) is higher among black men than among other groups because HIV incidence (the rate at which men become infected) is higher. They also suggest that HIV incidence is higher because black men are more likely to be involved in sexual HIV exposure, especially while engaging in unprotected insertive anal intercourse. The data strengthen the recommendation that HIV prevention interventions targeted at gay and bisexual men should aim to overserve black men, and that those targeted at African people should aim to overserve homosexually active members of that community.

The HIV prevention policy of segmenting the population into priority groups<sup>11</sup> risks excluding precisely those people most likely to seroconvert to HIV. There is a danger that programmes targeted at MSM underserve black MSM and conversely that programmes targeted at black people underserve black MSM. The data presented in this paper provide further evidence that both types of programme should be biased in the opposite directions.

In recommending that black men are overserved by HIV interventions and programmes we stress three points. Firstly, black men who have sex with men are a diverse population.<sup>12</sup> The extent to which it is useful as a target group for interventions will depend on the specific population concerned. Distinguishing African men from Caribbean men may be a useful first step in refining interventions. While we recommend prioritising the HIV prevention needs of black MSM we do not suggest that all such men have the same unmet HIV prevention needs or that they can be reached using the same interventions. These data do suggest it may be particularly fruitful to address black men's knowledge and beliefs about the risks of infection when an uninfected man is insertive in unprotected anal intercourse with an HIV positive partner.

Secondly, migration features prominently in the histories of black communities in Britain and continues to do so in the personal histories of many black MSM, bisexual men and other homosexually active men. Migration has a major impact on health and wellbeing and is often the context in which men's HIV prevention needs are elevated.<sup>13</sup>

Thirdly, and more broadly, it is important to note that the inequalities in the entire population are also reproduced in each ethnic group. We stress the need to ensure that it is the less well off strata of those groups which benefit from health promotion interventions. For example, an intervention is not contributing to health inequalities if all of its recipients are black men who are well educated, employed and relatively privileged members of that minority group.

Even if equality of benefit from programmes is sought, the current context of racial inequality in Britain means particular effort is needed with all black and ethnic minorities. Interventions which are tailored for and/or targeted at men from specific ethnic groups may be required in order to ensure they benefit equally from programmes. Including consideration of ethnicity is a prerequisite of good HIV prevention planning and management.

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## CONTRIBUTORS

FH led the designed of the survey instrument, carried out the secondary analysis, drafted the paper, and carried out the revisions; DR cleaned the data, carried out the initial analysis of the data and contributed to the paper; PW managed the project, contributed to the research design, wrote the second draft of the paper and checked the revisions; MS managed the "pride" event recruitment teams, booklet distribution and data input, and contributed to the paper; WN and PB contributed to both the content of the questionnaire and the design of the distribution mechanisms, and contributed to the paper.

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