

Internalised homonegativity predicts HIV-associated risk behavior in European men who have sex with men in a 38-country cross-sectional study: some public health implications of homophobia

Michael W Ross,^{1,2} Rigmor C Berg,³ Axel J Schmidt,⁴ Harm J Hospers,⁵ Michele Breveglieri,⁶ Martina Furegato,⁶ Peter Weatherburn,⁴ The European MSM Internet Survey (EMIS) Network

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For numbered affiliations see end of article.

Correspondence to

Dr Michael W Ross;
michael.w.ross@uth.tmc.edu

ABSTRACT

Objectives: Internalised homonegativity (IH) is hypothesised to be associated with HIV risk behaviour and HIV testing in men who have sex with men (MSM). We sought to determine the social and individual variables associated with IH and the associations between IH and HIV-related behaviours.

Design and setting: We examined IH and its predictors as part of a larger Internet-delivered, cross-sectional study on HIV and health in MSM in 38 European countries.

Participants: 181 495 MSM, IH data analysis subsample 144 177. All participants were male, over the age of consent for homosexual activity in their country of domicile, and have had at least one homosexual contact in the past 6 months.

Methodology: An anonymous Internet-based questionnaire was disseminated in 25 languages through MSM social media, websites and organisations and responses saved to a UK-based server. IH was measured using a standardised, cross-culturally appropriate scale.

Results: Three clusters of European countries based on the level of experienced discrimination emerged. IH was predicted by country LGB (lesbian, gay and bisexual) legal climate, Gini coefficient and size of place of settlement. Lower IH was associated with degree the respondent was 'out' as gay to others and older age. 'Outness' was associated with ever having an HIV test and age, education and number of gay friends, while IH (controlling for the number of non-steady unprotected sex partners and perceived lack of control over safe sex) was associated with condom use for anal intercourse.

Conclusions: IH is associated with LGB legal climate, economic development indices and urbanisation. It is also associated with 'outness' and with HIV risk and preventive behaviours including HIV testing, perceived control over sexual risk and condom use.

ARTICLE SUMMARY

Article focus

- Internalised homonegativity (IH) has been implicated as a variable associated with HIV risk behaviours.
- We examined the paths associated with IH in a study of over 140 000 MSM in 38 European countries.
- We established several social structural variables acting through IH to influence HIV testing and condom use.

Key messages

- Gay legal discrimination, size of place of residence and measure of economic inequality were macro-level or country-level variables that influenced IH.
- Low IH, in turn, influenced being 'out' and through 'outness' HIV testing.
- Perceived control over safe sex and condom use was predicted by IH and the country-level residence, legal and economic variables.

Strengths and limitations of this study

- The study had a large *n* and with 38 countries, we were able to demonstrate that countries clustered onto a discrimination continuum.
- We demonstrate linkages between macro-level (country), meso-level (community) and micro-level (individual) variables including HIV-associated risk behaviour.
- Effect sizes were sometimes small and of theoretical rather than practical importance.

Homonegative climate is associated with IH and higher levels of HIV-associated risk in MSM. Reducing IH through attention to LGB human rights may be appropriate HIV reduction intervention for MSM.

INTRODUCTION

Disease has classically been associated with disadvantage, with lower socioeconomic and occupational status being associated with chronic disease.¹ Infectious disease has also been disproportionately associated with disadvantage, along with access to health services (expressed by Hart's inverse care law that those who are most in need of healthcare have the lowest access to it²). These patterns of disadvantage extend to targets of discrimination, including women and racial and ethnic minorities.³ More recently, structural inequalities such as income distribution have been implicated in poor health outcomes and access.⁴

Discrimination is largely based on obvious stigmatising characteristics such as race or appearance,⁵ and little attention has been paid to less visible or invisible stigmatising statuses, such as homosexuality and homosexual behaviour. As Ross⁶ found, there is no close link between *experienced* discriminatory acts and *expectation* of discrimination, because those homosexual men who anticipate the worst outcomes remain the most hidden and are thus less likely to *experience* discrimination. Poor mental health has been hypothesised⁷ to result from internalisation of negative attitudes and assumptions about homosexual people, commonly described as 'homophobia'. Internalised homonegativity (IH), internalisation of negative attitudes and assumptions about homosexual people by homosexuals themselves lead to feelings of guilt, inferiority and lack of self-worth. Meyer⁷ summarises the evidence and places IH into the conceptual framework of minority stress, in which prejudice, stigma and discrimination create a hostile and stressful social environment that may cause mental health problems.

Recent data indicate that IH is directly associated with mental health outcomes,⁸ with avoidance of HIV testing and identification as bisexual or straight in men who have sex with men (MSM) (but not HIV-risk behaviours when sexual identification and race/ethnicity were controlled for),⁹ and indirectly through the mediators of discomfort with discussing HIV status and condom use.¹⁰ Ryan *et al*¹¹ found that family rejection of gay and lesbian adolescents was associated with an 8.4 times higher likelihood of attempting suicide, 5.9 times higher likelihood of depression, 3.4 times higher levels of using illegal drugs and a 3.4 times higher risk of engaging in unprotected intercourse compared with teens who reported no or low levels of family rejection. A recent review of US studies¹² concluded that IH has minimal effect on risk behaviour, although that conclusion has been criticised for being based largely on US data and for assuming a linear relationship between the two variables.¹³ However, Ross *et al*¹⁴ have demonstrated that IH predicts sexual risk behaviour in gay men in Uganda, where homosexuality is heavily stigmatised. The data suggest that IH may vary significantly from country to country as a function of levels of discrimination at legal and structural levels as well as individual experience:

that is, ambient homophobia is a major determinant of IH. European data from over a decade ago indicate that general population homonegativity is negatively associated with religion and immigration, and positively associated with urbanisation and economic development.^{15 16} The European MSM Internet Survey (EMIS) is a European study with a unique opportunity to research IH in a range of political and social settings.

EMIS¹⁷ in 38 European countries is the first pan-European survey of MSM by European researchers. It provides an opportunity to examine IH and both its structural predictors and its associations with HIV risk behaviour in a large and geographically diverse sample, with sufficient countries to enable analysis by country-level (macro) as well as local-level (meso) and individual-level (micro) variables. A short form of Ross and Rosser's IH scale has recently been developed with culturally stable items^{18 19} to make this possible. We report on an analysis of IH levels by country structural variables including legal discrimination and income inequality, and levels of experienced discrimination and, in turn, its associations with HIV testing and preventive sexual behaviour. We hypothesise that IH will be influenced by legal climate regarding LGB (lesbian, gay and bisexual) variables and possibly other structural issues, and that IH will itself be associated with MSM's visibility and social context and HIV-related prevention behaviours including HIV testing and condom use.

METHODS

The methods of the EMIS have been described in detail elsewhere¹⁷. In brief, EMIS is a joint project of academic, governmental and non-governmental partners from 38 countries in Europe (EU and neighbouring countries) to simultaneously run an online survey in 25 different languages during summer 2010. EMIS was designed to inform the planning of prevention interventions for MSM by identifying prevention needs commonly unmet across MSM (priority aims), as well as subgroups of MSM who have many prevention needs poorly met (priority target groups).

Promotion and recruitment

The Internet-based self-completion survey study was promoted online and offline through various media for gay, bisexual and other MSM under the slogan 'Be part of something huge!' More than 235 local, national and international lesbian-gay-bisexual transgender websites undertook online recruitment, and many of these organisations also promoted the survey offline via posters, recruitment cards and face-to-face interaction. By visiting a promotion website, men were exposed to banner advertisements inviting them to participate in the study. PlanetRomeo, Manhunt, Quiser, Qguys and Gaydar sent individual messages to their users inviting them to complete the survey. By clicking on the banner or the study link, potential respondents were directed to a

survey 'landing page' and asked to choose 1 of the 25 languages for completion. Once they had chosen a language, the first page described the study, including its purpose, its voluntary and anonymous nature, and gave contact information on how to contact the researchers.

Men were eligible to participate if they were living in Europe, at or over the age of homosexual consent in the country they lived in, sexually attracted to men and/or having sex with men. They also needed to indicate that they understood the nature and purpose of the study and consented to take part.

The survey was physically located on servers owned and administered by the company Demographix.com, whose staff was responsible for testing it across different computer platforms/operating systems and with different web browsers, and managing the technical aspects including back-ups and data delivery to the researchers. The data were protected with a 128-bit SSL encryption server not accessible to the public. We neither collected the IP address of participants' computer nor installed any cookies on it. The survey was available online between 4 June 2010 and 31 August 2010. EMIS could be completed in any of the 25 languages and the questions were identical in each language version. It took 21 min to complete the survey on average. No study recompense was offered. All study procedures were approved by the Research Ethics Committee of the University of Portsmouth, UK (REC 08/09:21).

Data preparation and analysis

At the close of fieldwork, there were 184 469 cases in the consolidated file. Partially completed surveys (moving away from the web page before pressing 'submit') were not captured. When downloaded three cases were lost because of data corruption, and 2427 cases were removed from the dataset because they gave no country of residence or a country of residence outside the study area. A further 544 cases were removed on the basis that they were women, or men with no homosexual desire or experience, gave no age or were under 13 or over 89 years old. This left a total of 181 495 cases meeting the qualifying criteria. Data from 291 cases from European countries and states that did not reach 100 qualifying cases were removed as were 6995 cases with more than one inconsistency, defined as answers to two questions which could not both be valid. Inconsistent data could be submitted by moving backwards and forwards in the survey and changing previously given answers. It could also be submitted simply by supplying inconsistent answers across one or more questions. Given the length and complexity of the survey, we allowed respondents to have one inconsistency in their given answers; but we excluded all cases with more than one inconsistency, suggestive of random answers being given, which is to be expected in a low-threshold questionnaire like EMIS. This left an analytical sample of 174 209 MSM from 38 European countries.¹⁷

MEASURES AND ANALYSES

Measures

IH was scored according to the criteria described by Ross *et al*¹⁸ and Smolenski *et al*¹⁹ as an additive scale of 7 items, ranging from 0 to 6 (Cronbach's $\alpha=0.70$).

Education was measured using the six levels of the International Standardised Classification of Educational Degrees (ISCED), corresponding to the educational system of each country.

'Outness'—defined as the proportion of people one is out to as gay or bisexual (family, friends, work or study colleagues)—was measured on a 5-point Likert scale from 'all or almost all' to 'none'.

The proportion of male friends who are also attracted to men was measured on a 6-point Likert scale from 'almost all of them' to 'almost none of them' and 'I don't have any male friends'.

Having ever had an HIV test was a binary (yes/no). We compared this binary variable with the extended variable of how long the respondent had had an HIV test (24 h, 7 days, 1 month, 6 months, 12 months, 5 years, more than 5 years ago) and found that the two measures correlated 0.88. We thus decided to use the binary measure in analyses, particularly given the non-linear nature of the time measure.

Perceived control over sexual risk-taking was measured on a 5-point Likert scale anchored by 'strongly agree' and 'strongly disagree' with the statement "The sex I have is always as safe as I want it to be."

The relative frequency of condom use with non-steady partners was measured as "In the last 12 months, how often were condoms used when you had anal intercourse with non-steady male partners?" (6-point Likert scale 'all or almost all' to 'none').

The number of non-steady anal intercourse partners was asked as 'How many non-steady partners did you have anal intercourse with in the last 12 months?' (number).

Sexual diversity of practice: EMIS asked for the recency of a range of sexual practices with non-steady partners. Although this set was originally designed to reflect certain transmission routes for HIV and sexually transmitted infections, it can serve as a proxy for diversity of sexual practices, even if sexual practices with steady partners are not included. Sexual diversity was the sum of the nine different types of sexual behaviours with non-steady partners reported in the past 6 months (mutual masturbation, oral insertive, oral receptive, anal insertive, anal receptive, rimming, being rimmed and insertive and receptive 'fist-fucking'). These were re-coded as binaries to reflect engaging in them or not in the past 6 months and summed to form a measure of the relative diversity of the respondents' sexual repertoires (Cronbach's $\alpha=0.77$).

Size of settlement was measured on a 5-point scale from a 'a very big city or town (a million or more people)', to 'a village/the countryside (less than 10 000 people)'.

Legal climate was measured by scoring the presence of the six legislative measures of LGB status (legal

discrimination) listed by Wikipedia,²⁰ with a high score of six for the presence of all legislative protections (homosexual acts are legal, recognition of same-sex relationships, same-sex marriage, same-sex adoption, gays serve in the military, LGB antidiscrimination laws).

The Gini coefficient of income inequality in a country was extracted from the UN Human Development Report coefficient for all countries (2008) with the exceptions of Cyprus, Malta, Luxembourg and Serbia, which were derived from an identical calculation method using the

CIA Gini score (2008). The Gini coefficient ranges from 0 (all people in a country have equal income) to 1.0 (one person has all the income). It serves as a general economic measure of distribution of wealth.

Analyses

Analyses, unless otherwise indicated, were carried out using SPSS V. 19 and V.20 on the 38-country dataset (table 1). Cluster analysis of the 38 countries was carried out using SPSS V.19: a two-step procedure using

Table 1 Demographic characteristics of MSM with internalised homonegativity (IH) scores

Top-level domain	Country	n with IH score*	Median age	Per cent live in City >500000	Per cent tertiary education	Per cent employed†	Per cent now in relationship with a man	IH mean‡
at	Austria	3421	30	48.4	31.2	72.4	41.8	1.32
Ba	Bosnia & Herzegovina	105	28	15.0	53.8	56.7	22.1	2.56
Be	Belgium	3446	33	44.7	67.0	72.7	47.2	1.36
bg	Bulgaria	777	27	66.2	59.7	68.1	36.1	2.58
by	Belarus	299	27	63.4	68.9	79.9	53.5	2.26
ch	Switzerland	4272	36	13.9	46.9	80.3	44.9	1.37
cy	Cyprus	219	30	3.4	64.2	74.4	29.2	2.26
cz	Czech Republic	1937	27	46.8	42.1	65.7	50.7	1.56
de	Germany	45 371	33	43.1	32.5	73.9	44.5	1.29
dk	Denmark	1455	33	54.1	50.9	68.3	37.3	1.26
ee	Estonia	500	30	9.5	47.6	72.4	41.7	1.70
es	Spain	11 083	31	51.8	58.8	65.9	32.9	1.40
fi	Finland	1739	33	39.3	50.5	69.2	44.2	1.57
fr	France	9614	34	52.3	73.8	68.8	48.3	1.46
gr	Greece	2337	30	71.2	65.4	69.9	35.5	1.99
hr	Croatia	422	29	54.6	64.5	63.5	37.9	2.10
hu	Hungary	1576	28	67.3	69.0	79.8	45.3	1.68
ie	Ireland (Republic)	1899	31	50.8	70.8	70.8	30.4	1.61
it	Italy	12 675	33	36.1	43.7	69.1	37.7	1.76
lt	Lithuania	433	27	47.5	73.7	72.3	47.6	2.06
lu	Luxembourg	233	34	3.5	51.7	75.3	44.0	1.40
lv	Latvia	545	30	62.6	49.9	79.6	46.2	2.12
md	Moldova	88	24	62.1	60.2	63.6	50.0	2.50
mk	Macedonia	90	28	62.2	81.1	71.1	28.9	2.24
mt	Malta	100	33	1.1	60.0	85.0	39.4	1.92
nl	The Netherlands	3328	39	43.0	63.0	77.6	47.9	1.22
no	Norway	1749	30	43.7	65.8	69.0	35.8	1.32
pl	Poland	1698	28	64.6	75.1	67.1	46.4	1.99
pt	Portugal	4111	30	44.0	59.6	69.7	39.5	1.78
ro	Romania	1644	27	47.2	58.0	67.3	38.9	2.22
rs	Serbia	842	28	54.2	56.7	54.8	34.4	2.25
ru	Russia	4080	30	79.3	73.4	83.7	52.9	2.07
se	Sweden	2549	35	54.9	55.6	74.5	40.2	1.23
si	Slovenia	701	30	1.8	47.8	64.6	40.1	2.00
sk	Slovakia	437	26	27.4	50.5	62.2	44.2	1.71
tr	Turkey	1358	28	87.9	84.6	65.7	34.9	2.39
ua	Ukraine	1344	29	70.7	75.9	83.3	50.9	2.18
uk	UK	15 700	36	51.8	64.3	75.7	37.7	1.39

*overall 83.2% have IH scores.

†Combines employed full-time, part-time, self-employed.

‡0–6 scale.

Euclidian distances was employed, entering three variables: country LGB legal discrimination scores, proportion of MSM reporting verbal abuse and proportion of MSM reporting physical violence because someone knew or presumed they were attracted to men. Three country clusters emerged including 9, 17 and 12 countries, respectively, with good fit (Silhouette coefficient of cohesion and separation=0.65; figure 1).

Bivariate analyses were carried out using χ^2 with Cramer's Φ as a measure of effect size for ordinal data, and t test (using Cohen's D as a measure of effect size) (table 2). Effect size statistic for univariable analysis of variance (ANOVA) for interval or ratio level data was η^2 . Because of the large size of the subsample with valid IH scores (N=144 177), almost all analyses were highly statistically significant, so p levels were not reported. Means of IH were graphed against selected structural and behavioural variables in figure 2 to illustrate the relationship between variables. Regression analysis in table 3 was carried out by linear regression for interval-level or ratio-level dependent variables using simultaneous entry in hierarchical blocks of individual demographic variables, individual behavioural variables, plus external source country-level variables. Path coefficient calculations, appearing in table 3 and in figure 3, are reflected by β from the linear regressions in table 3, with path arrows indicating the direction of temporal relationship (eg, IH

cannot affect age, so the relationship has to be in the opposite direction) or predicted relationship in the model. Stepwise linear regression was carried out for variables predicting perceived control over sexual risk-taking in table 4 to allow variables to be entered in a forward hierarchical model.

RESULTS

Basic demographic data are presented in table 1 from participants with valid IH data. These data from 38 countries illustrate the *ns* for each country (ranging from 88 in Macedonia to over 45 000 in Germany), median age (ranging from 24 in Moldova to 36 in Switzerland and the UK), per cent reporting living in a city >500 000 population (ranging from 1.1% in Malta to 87.9% in Turkey), per cent with tertiary education (ranging from 31.2% in Austria to 84.6% in Turkey), per cent employed (ranging from 54.8% in Serbia to 85.0% in Malta) and per cent now in a relationship with another man (ranging from 22.0% in Bosnia-Herzegovina to 53.5%). IH scores ranged from 1.22 in the Netherlands and 1.23 in Sweden to 2.58 in Bulgaria and 2.56 in Bosnia-Herzegovina.

Data from the 38 countries clustered into three groups using (1) measures of legal climate supporting LGB rights, (2) proportion experiencing verbal discrimination

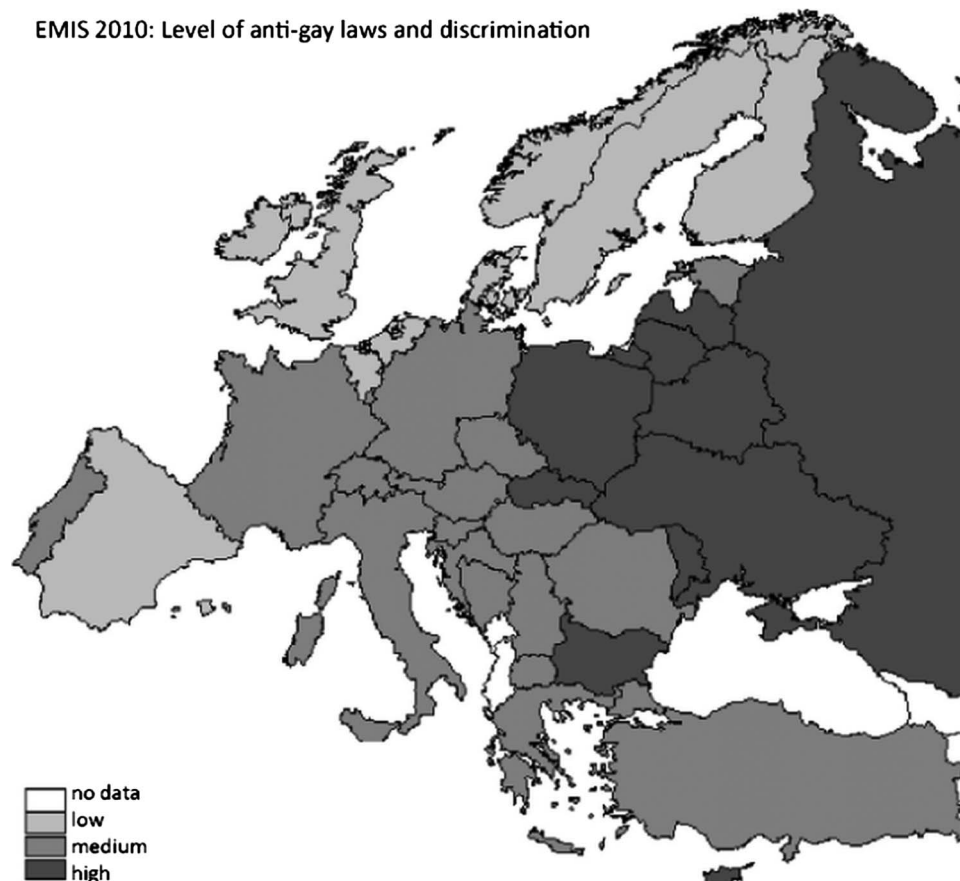


Figure 1 Level of antigay laws and discrimination.

Table 2 Univariable analysis: predictors of ever testing for HIV

Variable	Untested (%)	Ever tested for HIV(%)	Statistic* Cramer's Φ
Being 'out' to family/friends/colleagues (=outness)			
All or almost all	16.2	83.8	0.28
More than half	24.1	75.9	
Less than half	29.7	70.3	
Few	39.4	60.6	
None	57.3	42.7	
Proportion of male friends attracted to men			
Almost all	14.8	85.2	0.26
More than half	16.3	83.7	
Approximately half	20.2	79.8	
Less than half	28.5	71.5	
Almost none of them	44.6	55.4	
Have no male friends	45.6	54.4	
Education (6 levels of ISCED†)			
No secondary qualification	38.5	61.5	0.13
Some high school/trade qualification	34.2	65.8	
Lower secondary education	30.1	69.9	
Upper secondary education	33.2	66.8	
Higher education below degree level	24.4	75.6	
University degree completed	19.1	80.9	
Size of settlement			
Very big city or town (1 million or more)	19.4	80.6	0.15
Big city or town (½ to 1 million)	23.1	76.9	
Medium city (100000 to ½ million)	28.5	71.5	
Small city (10000 to 100000)	35.0	65.0	
Village or rural area (<10000)	36.7	63.3	
	mean±SD		Cohen's d
Internalised homonegativity	1.85±1.31	1.37±1.18	0.40
Age	30.43±11.56	35.56±10.60	0.47

*Given a sample size of 144 177, significance is not shown (144 177 cases with an IH score are 82.8% of the eligible cases with consistent data).

†The six levels of the International Standardised Classification of Educational Degrees (ISCED).

Table 3 Path analysis of internalised homonegativity and HIV-related risk behaviours

	β^*	B	95% CI of B
<i>Analysis 1</i>			
Step 1: Structural variables predicting internalised homonegativity			
LGB legal climate (country level)	-0.14	-0.16	-0.14 to -0.13
Gini coefficient (country level)	0.09	2.81	2.71 to 3.02
Size of settlement (individual level)	0.08	0.07	0.06 to 0.07
Step 2: Individual demographic and behavioural variables predicting internalised homonegativity (IH)			
'Outness'	-0.51	-0.46	-0.45 to -0.46
Age (per year)	-0.08	-0.01	-0.01 to -0.01
Step 3. IH, social and demographic variables predicting having an HIV test			
IH (per 1)	-0.01	-0.01	-0.01 to -0.01
'Outness'	-0.21	-0.07	-0.07 to -0.06
Proportion of gay friends	-0.14	-0.04	-0.04 to -0.04
Education	0.10	0.04	0.04 to 0.03
Age (per year)	0.17	0.01	0.01 to 0.01
<i>Analysis 2</i>			
IH as a predictor of sexual variables			
Perceived control over sexual risk-taking (Y/N)	-0.15	-0.18	-0.17 to -0.19
Sexual diversity	-0.01	-0.01	0.011 to 0.01
Ever had an HIV test (Y/N)	-0.13	-0.40	-0.38 to -0.42
Relative frequency, condom use, non-steady partners in the past year	0.03	0.03	0.03 to 0.03

LGB, lesbian, gay and bisexual.

*Forms path coefficients in figure 3.

β , standardised regression coefficient; B, unstandardised regression coefficient.

Table 4 Stepwise predictors of perceived control over sexual risk taking

	β	B	95% CI of B
Number of non-steady partners in the past 12 months	-0.21	-0.07	-0.07 to -0.06
Internalised homonegativity	-0.12	-0.10	-0.10 to -0.09
Gini coefficient	-0.11	-0.03	-0.03 to -0.03
LGB legal climate	0.03	0.02	0.01 to 0.03
Age	0.03	0.02	0.02 to 0.03
Education	0.02	0.01	0.01 to 0.02
Outness	-0.02	-0.02	-0.02 to -0.01
Proportion of gay friends	0.01	0.01	0.01 to 0.02

LGB, lesbian, gay and bisexual.

and (3) physical violence because of assumed homosexuality. The three clusters of countries ([figure 1](#)) characterised a group of 'liberal' Scandinavian countries (Denmark, Finland, Norway, Sweden) and Western European countries (Belgium, Ireland, the Netherlands, the UK and Spain); a group of 'moderate' Central and Mediterranean countries (France, Portugal, Germany, the Czech Republic, Switzerland, Italy, Austria, Slovenia, Hungary, Croatia, Bosnia-Herzegovina, Romania, Macedonia, Greece, Turkey and Estonia) and a group of 'conservative' Southeastern, Northeastern and Eastern European countries (Poland, Slovakia, Belarus, Lithuania, Latvia, Russia, Ukraine, Moldova, Bulgaria and Cyprus), countries characterised by the highest levels of discrimination (note that IH was not part of the equation for this clustering process). Clustering countries on the basis of legal and self-reported personal discrimination against MSM provided both a potential validation of the measure of IH and a means of conceptualising geographic subsets of levels of discrimination ([figure 2](#)). IH was closely related to the three discrimination-based clusters, with the highest IH in the 'conservative' countries and the lowest IH in the 'liberal' cluster of countries.

Using the measures of LGB legal climate (the strongest predictor), the Gini coefficient and the size of place of residence all predicted IH ([table 3](#), [figures 2](#) and [3](#)). IH, in turn, was associated with outness and age. The HIV-associated behaviour most closely associated with IH were (1) ever being tested for HIV (mediated by outness) and (2) a perception of having no control over sexual risk-taking. Sexual diversity had a smaller impact. HIV testing was predicted, following outness as the major component, by the proportion of gay friends, highest educational attainment and age.

A second linear regression limited to the demographics, HIV testing, 'outness' and perceived control over sexual risk-taking onto IH indicated that those most closely associated with IH were lack of control over sexual risk-taking and not being tested for HIV.

Bivariate relationships between IH and country cluster, Gini coefficient septiles and LGB legal climate ([figure 2](#)) show a relationship between these variables and IH. Sexual diversity illustrates ([figure 2](#)) an increase in sexual diversity with decreasing IH and a more limited range of sexual activity with higher IH.

[Table 2](#) illustrates bivariate associations with strong effect sizes predicting ever having had an HIV test, specifically being 'out' and the proportion of MSM friends, followed by education and the size of settlement.

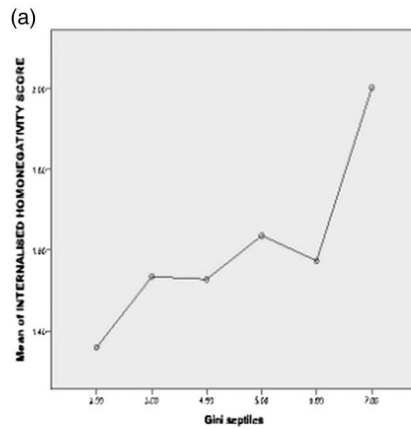
ANOVA of IH score by the relative frequency of condom use with non-steady partners, with covariates, the number of non-steady partners that they had unprotected anal intercourse within the past year and perceived control over sexual risk-taking, demonstrated a small-to-moderate effect size ($\eta^2=0.03$). An accelerating relationship between IH and the relative frequency of condom use (covariates' perceived control over sexual risk and the number of casual partners in the past year) with non-steady male partners was apparent ([figure 2](#)). The strong relationship of perceived control over sexual risk-taking ([figure 2](#)) with condom use led to an additional analysis of the predictors of this perceived control ([table 4](#)). The highest stepwise predictors were the number of non-steady partners one had anal intercourse within the past 12 months, IH, Gini coefficient and LGB legal climate.

DISCUSSION

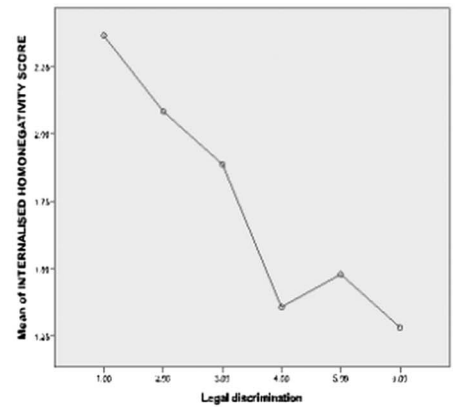
While these data represent 144 177 MSM in 38 countries, their collection via the Internet constitutes a non-random sample. Previous Swedish and UK data comparing Internet sexual data collection with questionnaire data from a large national random sample from a sexuality study in the same country^{21 22 23} indicate that general Internet samples tend to be somewhat younger, more likely to be single, better educated and urban. Internet samples of MSM may be more bisexually identified, worse educated and rural compared with traditional *gay venue questionnaire-based* samples in Sweden. The Swedish data indicate the known biases for Internet samples by comparing them with a national 'gold standard' study. The EMIS data are likely to be biased towards those who are better educated and Internet-literate and probably more familiar with the gay subculture. This sampling bias will be more substantial in Eastern European countries where household Internet access is less common and a smaller proportion of the whole MSM population participated in EMIS. On the other hand, the Law of Large Numbers would suggest that for the larger country samples, range

Figure 2 Relationship of internalised homonegativity to social behavioural variables.

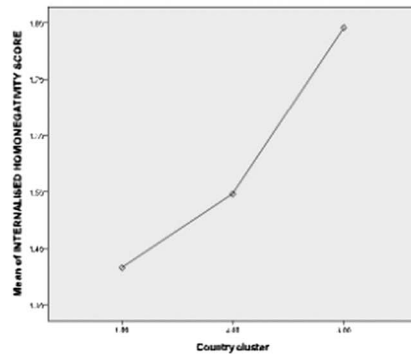
Relationship of Internalized Homonegativity to Gini Coefficient sextiles



Relationship of Internalized Homonegativity to Gay Legal Discrimination Index

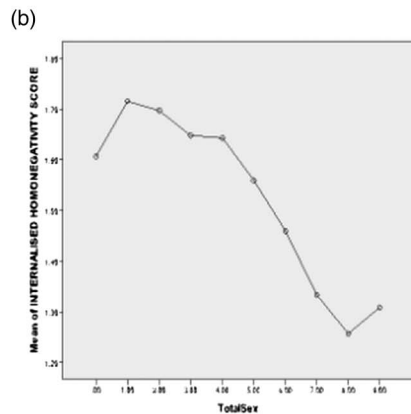


Relationship between IH and Country Cluster

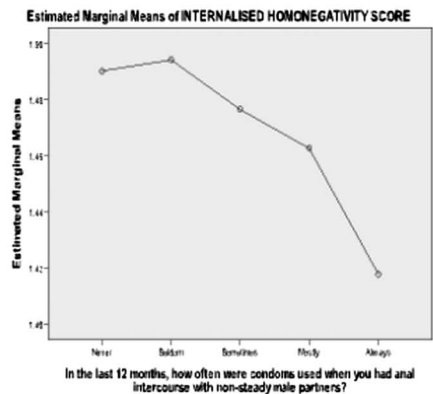


1="liberal"; 2="moderate"; 3="conservative"

Relationship of Internalized Homonegativity to Sexual Diversity Score



Internalized Homonegativity score by Condom use for Anal intercourse with Non-steady Partners in past 12 months

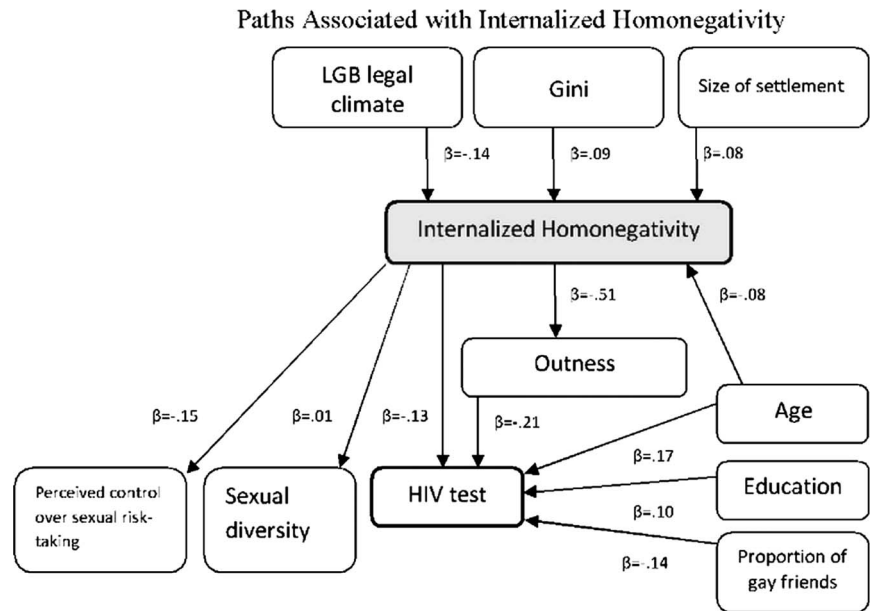


Condoms appearing in the model are analysed at the following values: The sex I have is always as safe as I can get & I use = 4.0; How many non-steady male partners have you had and intercourse without a condom with in the last 12 months? = 2.00

is adequately represented. The three clusters which emerged from countries based on antigay discrimination are consistent with clusters of countries reported by Lottes and Akula²³ on self-expressed sexual values, including justification of homosexuality, in a

pan-European sample. For groups which are discriminated against and highly stigmatised, there is no good alternative to Internet data collection for a study of this size. However, Internet biases are, from previous studies on sexuality, known and quantifiable.

Figure 3 Paths associated with internalised homonegativity.



Structural variable relationships of IH

These data demonstrate the possible paths connecting anti-gay discrimination at legal and demographic levels with IH, along with the size of the place of residence. The relationship is clear despite the relatively low variance in the tripartite cluster-based classification of country by legal and experienced discrimination level. Levels of IH are closely and linearly related to the ‘liberal’, ‘moderate’ and ‘conservative’ clusters, providing criterion validity linking levels of discrimination and IH. IH, in turn, is closely associated with younger age, social measures of being ‘out’ and connected with gay peers, which in turn are associated with HIV test-taking (figure 3). While the effect size of a $\beta < 0.1$ is minor, generally, the greater the distance of a structural variable from an individual, the more difficult it is to achieve a large effect size. Paths from social climate variables to IH and behaviour are measurable and quantifiable, given that this study has the power to detect theoretically important differences from the ‘background radiation’ of structural and social climate factors at a country level. Although the study appears to be overpowered at the individual data level, at the country variable level, the n is only 38. Figure 2 graphically indicates the relationships between IH and both structural and behavioural variables.

HIV testing and IH

Higher IH is also associated with decreased levels of HIV test-taking at any time, as mediated by ‘outness’ (but not directly), and denying that their sexual conduct is always as safe as the respondents want it to be (perceived control over sexual risk-taking). Thus, higher IH appears to both discourage HIV testing (which may be considered a marker of acknowledgement of stigmatised status) and also to reduce the ability to have safe sex despite

the intention to do so. Diversity of sexual behaviour (figure 2) also appears to be restricted by IH, with a lower sexual repertoire, possibly because of the interactions limited by time, locale, anonymity or peer modeling.

Condom use and IH

Condom use for anal intercourse (controlling for the number of non-steady sexual partners for anal sex, and the perceived control over sexual risk-taking) revealed a relationship of lower IH with increasing condom use (figure 2). This suggests that IH is associated with risky sexual behaviour generally and condom use specifically. This unexpected implication of the degree of control over sexual risk-taking bore further investigation. Table 4 examines the stepwise predictors of perceived control over sexual risk-taking and implicates structural variables (Gini coefficient, LGB legal climate), IH and age, plus the existence of social networks and being ‘out’. How these variables amalgamate into lack of control over safe sex may involve fear, lack of access to condoms, surreptitious or no safety negotiations, lack of good preventive information or the need for rapid or anonymous sex, among other factors. Perceived control over safe sex may have similarities to self-efficacy, and the relationships between condom self-efficacy and structural discrimination and its internalisation warrant further investigation.

Paths between structural variables, IH and HIV risks

These data indicate relationships between the levels of legal and experienced discrimination and IH and, in turn, between IH and both outness and gay peer contact and HIV risk behaviours. HIV-risk behaviours associated with high IH include lower levels of HIV testing (not knowing HIV status and/or receiving treatment being a risk), lower levels of perceived control over safe sex and

lower levels of condom use for anal sex when this safe sex volition and the partner numbers are controlled for. The relationship of the Gini coefficient and IH is interesting, and here, the Gini coefficient probably represents a level of attitude to equality beyond the purely economic (figure 2) and is consistent with the association found between sexuality-related attitudes and human development indices^{15 16 24} in previous pan-European research.

Consistency with previous data

These findings on IH are consistent with the previous data of Shoptaw *et al*⁹ on IH, albeit using a different IH measure, in African-American MSM in Los Angeles, including their finding that IH is associated with lower HIV testing and education levels. It is also consistent with the pathways that Ross *et al*¹⁰ described in HIV seropositive US MSM, where IH is associated with risk behaviour through less openness, discomfort with discussion of sexuality, not discussing HIV status and lower condom use. The finding that there is a higher level of risk behaviour (non-use of condoms with casual partners) is also consistent with the data of Ryan¹¹ in relation to the impact of family homonegativity in adolescents, and that of Sandfort on the impact of school psychological environment on the mental health of Dutch LGB adolescents.²⁵

Impact of homophobic climate and IH and potential intervention levels

These data suggest, however, that IH may have pervasive effects on sexual behaviour related to HIV prevention through the association of a homonegative legal and social climate with higher levels of risk and lower levels of preventive behaviours, at both the personal and probably policy levels, although more research is required to elucidate these. Hatzenbuehler *et al*²⁶ note that state-level protective policies modify the effect of sexual orientation on mental health disorders, and it is logical that one of the mechanisms for this may be through the reduction of institutional discrimination, hate crimes, homonegativity and by providing interventions to reduce internalised homonegativity.

The public health implications of these data are four-fold. First, it is clear that interventions must incorporate changes in the legal and policy climate (and perhaps religious climate) with regard to MSM. Second, such climate changes need to be communicated to professionals (including healthcare workers) who are at the government or professional interface with MSM clients, possibly with appropriate in-service training. Third, structural interventions should translate into the provision of specific services or outreach to MSM. Fourth, anti-IH measures for MSM might include individual-level opportunities on the Internet anonymously targeting stigmatised sexual minorities. These could be based on short, easily read informational modules, reduction of pathological stereotypes through pride-enhancing

modules, role-model stories and approaches to respond to the negative 'voice within' or distancing strategies. The success in reaching some 180 000 MSM via the Internet in three months, Europe-wide, in 38 countries and 25 languages, in this study indicates the potential of this medium and for region-wide rather than country-wide approaches. While effect sizes for some structural components are small, Europe has a population of over 802 million and if we assume conservatively that 2% of men aged 15–65 are MSM, the potential public impact on 5.35 million MSM is considerable. Legislative and legal climate changes and human rights protections are not expensive in monetary terms compared with classic medical screening and treatment. Staff and public servant training or re-training costs, however, may be necessary.

As far as we are aware, no study in Europe has previously looked at HIV-preventive behaviour and homonegativity. From these pan-European data, homonegative stigma can be clearly linked through IH to increased HIV risk in MSM at both the population and personal levels. Discrimination is bad law, bad policy, bad psychology and bad medicine: reducing homonegative policy and interactions at the legal and social levels will have a positive impact on the health as well as human rights of MSM populations.

Author affiliations

¹School of Public Health, University of Texas, Houston, Texas, USA

²Faculty of Health and Society, Malmö University, Sweden

³Norwegian Knowledge Center for the Health Services, Oslo, Norway

⁴London School of Hygiene & Tropical Medicine, London, UK

⁵University College Maastricht, Maastricht University, Maastricht, The Netherlands

⁶Regional Center for Health Promotion, Verona, Italy

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