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Same-sex sexuality and psychiatric disorders in the second Netherlands Mental Health Survey and Incidence Study (NEMESIS-2)

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Abstract

Purpose—Sexual orientation has been shown to be a risk factor for psychiatric disorders. This study compared whether sexual orientation-related disparities in the prevalence of psychiatric disorders are similar based on homosexual behavior versus attraction and tested whether, with increased acceptance of homosexuality, these disparities have diminished over time.

Methods—The Composite International Diagnostic Interview 3.0 was administered with a total of 6,646 Dutch persons, aged 18 to 64 years.

Results—Between 2.0% and 2.5% of the participants reported same-sex sexual behavior in the preceding year or same-sex attraction. Homosexually active persons and persons with same-sex attraction reported a higher prevalence of disorders than heterosexual persons. There were more disparities in the prevalence of disorders based on sexual attraction than based on sexual behavior. Comparing these results with a previous study, showed that no significant changes over time have occurred in the pattern of health disparities.

Conclusions—Sexual orientation continues to be a risk factor for psychiatric disorders, stressing the need for understanding the origins of these disparities.

Keywords

Sexual orientation; mental disorders; epidemiology; health status disparities; Netherlands

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ETHICAL STANDARDS

The study proposal, field procedures and information for respondents were approved by the Medical Ethics Review Committee for Institutions on Mental Health Care (METIGG). Respondents provided written informed consent to participate in the interview, after full written and verbal information about the study was given before and at the start of the baseline assessment.

AUTHOR DISCLOSURE STATEMENT

No competing financial interests exist.

Based on data collected in 1996 for the first Netherlands Mental Health Survey and Incidence Study (NEMESIS-1) [1], we reported on sexual orientation-related differences in the prevalence of psychiatric disorders in the Dutch population. In this paper, we report upon a replication and expansion of this study and test for differences over time in observed disparities. Data for this second study were collected in 2007-2009 [2, 3].

As a first expansion, participants were not only categorized based on their sexual behavior but also on sexual attraction, allowing us to include people who had not been sexually active. Inclusion of sexually inactive persons based on attraction might result in different patterns of disparities [4, 5]. Furthermore, categories of sexual orientation based on behavior and attraction do not completely overlap [6, 7], which might further affect the pattern of disparities.

A second expansion is the inclusion of impulse-control disorders and anti-social personality disorder, facilitated by the further development of the Composite International Diagnostic Interview (CIDI) [8], used in this study. Based on our earlier findings suggesting that homosexual men were more likely to internalize problems (compared to heterosexual men), while homosexual women were more likely to externalize them as alcohol and drug problems [9], we hypothesized heterosexual men and homosexual women to have a higher prevalence of impulse-control disorders and anti-social personality disorder. As far as we know, no study has reported on these disorders in relation to sexual orientation.

Since the publication of our study in 2001, several other population-based studies conducted in other countries confirmed that a homosexual orientation is a risk factor for mental health disorders [10-17]. In a meta-analysis it was shown that there is a twofold excess in suicide attempts in lesbian, gay and bisexual people [18]. The prevalence of 12-month and lifetime major depression and anxiety disorders, and 12-month alcohol and other substance dependence was at least 1.5 times higher in lesbian, gay and bisexual persons compared to heterosexual persons. Lesbian and bisexual women seemed to be particularly more likely to report substance dependence.

This consistency in findings across national cultures suggests that the association between sexual orientation and mental health is strong. Several studies indicate, though, that observed mental health disparities are partly explained by structural factors, including a supportive climate and legal protection of sexual orientation [19-21]. For example, in a national U.S. study, sexual orientation-related health disparities were smaller in states that had policies extending protections against hate crimes and employment discrimination based on sexual orientation, suggesting that protective policies modify the effect of a homosexual status on psychiatric disorders [19]. Given the increasing acceptance of homosexuality in Western societies [22], one might expect that sexual orientation-related mental health disparities have diminished over time. In the Netherlands, social acceptance of homosexuality has increased since the first NEMESIS study was conducted in 1996 [23]. A recent study concluded that the proportion of the population that could be considered “homonegative” decreased between 2006 and 2010 from 15% to 7% [23]. This change in social climate has brought about changes regarding the legal status of gay and lesbian

persons, which in turn will have reinforced the acceptance of homosexuality. In 2001, the Netherlands became the first country where persons of the same sex could legally marry. This study offers a first opportunity to test whether disparities have indeed diminished over time.

Aims of the Study

The aims of this study are to replicate and expand on an earlier study that assessed sexual orientation-related differences in the prevalence of psychiatric disorders in the Dutch population by comparing different conceptualizations of sexual orientation and including impulse-control disorders and anti-social personality disorder, and to assess changes in sexual orientation-related disparities over time.

Materials and Methods

Participants

NEMESIS-2 is a prospective study among Dutch-speaking subjects aged 18-64 from the general Dutch population. A multistage, stratified random sampling procedure was applied. First, a random sample of municipalities was drawn. Second, a random sample of addresses of private households from postal registers in these municipalities was drawn, each address with the same probability of selection. Third, based on the most recent birthday at first contact within the household, a random individual aged 18 to 64 years and sufficiently fluent in the Dutch language was selected to be interviewed. Addresses of institutions were excluded; thus institutionalized individuals (i.e. those living in hospices, prisons) were excluded. Those temporarily living in institutions, however, could be interviewed later during the fieldwork if they returned home.

The study sample consisted of 6,646 participants who participated in the baseline wave of NEMESIS-2 (November 2007 - July 2009). The response rate was 65.1%. The sample has a mean age of 44.3 years (SD=12.5) and 55.2% were women. The most common level of education was higher professional/university. 67.8% were married or cohabiting and 20.8% lived alone. 74.6% had paid employment. 5.7% were of non-western origin, defined as respondent or at least one parent not born in Western Europe or North America (mainly of Surinamese, Antillean, Turkish and Moroccan origin). By means of post-stratification, the following population characteristics were used to construct a weighting: sex, age, partner status, educational level and urbanicity. After weighting, the distribution of the demographic variables of the study sample came close to that of the general population [2].

Measures

Sexual behaviors and sexual attraction—Sexual orientation was operationalized in two ways: based on sexual behavior and sexual attraction. Respondents were first asked whether they had sexual contact in the preceding year and the sex of their partner(s). Persons were categorized as homosexually active if they had had sex with someone of the same sex (exclusively or not) or as heterosexually active. Subsequently, participants were asked whether they felt sexually attracted to men, women, or both. They were asked to select an answer from a card listing the following alternatives: (1) To women only; (2) predominantly

to women; (3) to women and men equally; (4) predominantly to men; (5) to men only. We categorized persons as same-sex attracted if they expressed equal attraction to men and women or predominant or exclusive attraction to someone of the same sex; other persons were categorized as heterosexually attracted. The subgroups of bisexually behaving and attracted persons were too small to analyze independently.

Assessment of psychiatric disorders—DSM-IV disorders were assessed with the Composite International Diagnostic Interview (CIDI) 3.0. The CIDI 3.0 was developed and adapted for use in the WHO-World Mental Health (WMH) Survey Initiative [8]. The CIDI 3.0, first produced in English, underwent a rigorous process of adaptation to obtain a conceptually and cross-culturally comparable Dutch version [24]. Clinical calibration studies in various countries [25], found that the CIDI 3.0 assesses anxiety, mood and substance use disorders with generally good validity in comparison to blinded clinical reappraisal interviews. Also, studies on earlier CIDI versions concluded that the CIDI assesses these disorders with generally acceptable reliability and validity [26, 27]. Disorders assessed in NEMESIS-2 include major depression, dysthymia, bipolar disorder, panic disorder, agoraphobia (without panic disorder), social phobia, specific phobia, generalized anxiety disorder (GAD), and alcohol and drug abuse and dependence. In addition, attention-deficit/hyperactivity disorder (ADHD), conduct disorder and oppositional defiant disorder were assessed, including persistency of ADHD into adulthood. Inclusion of impulse-control disorders was limited to respondents aged 18–44 because of concerns about recall bias in older respondents [28]. In NEMESIS-2 questions on anti-social personality disorder from the International Personality Disorder Examination (IPDE) were also administered [29, 30]; the IPDE generates lifetime, but no 12-month estimates. Sociodemographics included sex, age, educational level, partnership status, and urbanicity. The CIDI and the additional questionnaire were administered in a personal interview using a laptop computer.

Statistical analyses

To assess differences in prevalence between homosexual and heterosexual persons, we first assessed the bivariate relationships between potential demographic confounders and sexual orientation, separately for men and women. Although not all confounders differed statistically, we controlled for age, level of education, residency, and having a steady partner in all logistic regression analyses to maintain comparability with the analyses in NEMESIS-1 [1]. Adjusted odds ratios (ORs) were obtained separately for men and women.

To test for differences in disparities between 1996 and 2007–2009, we tested the effect of interactions between time and behavior-based sexual orientation separately for men and women in the 12-month prevalence of the following categories: any mood disorder, any anxiety disorder, any substance use disorder, any Axis I disorder (controlling for age, level of education, residency, and having a steady partner). All statistical procedures were conducted in STATA 11.1 (College Station, TX, 2010) to account for the complex survey design. All *P* values are two-sided.

Results

Based on their sexual behavior, 2.2% of the men (n=60) and 2.0% of the women (n=57) who had been sexually active in the preceding year (n=2,439, 82.0%; and n=2,889, 78.7%, respectively) had engaged in sexual interactions in that period with someone of the same sex. The homosexual group included men and women who also had engaged in sex with a person of the other sex, 10.0% (n=6) and 19.3% (n=11), respectively.

In terms of sexual attraction, 2.5% of the men and 2.5% of the women reported feelings of same-sex attraction (n=73 and n=88; 3.5% of the men and 4.1% of the women did not report their sexual attraction). Of the 407 men and 600 women who had not been sexually active in the preceding year but did report attraction, 2.9% and 3.7% reported bisexual or same-sex attraction.

The sample demographic characteristics are presented in Table 1. Compared to heterosexually active men, homosexually active men were more likely to live in urban areas; there was no such relationship for women. Both homosexually active men and women were less likely to be currently involved in an ongoing intimate relationship compared to heterosexual men and women, respectively. No differences were found for level of education. The same pattern of significant differences was found for the categorization of men and women based on sexual attraction (data not shown).

Men

Men with any homosexual behavior were significantly more likely than exclusively heterosexually active men to have had at least one disorder in the preceding year (first part of Table 2). Homosexually active men had a significantly higher 12-month prevalence of the category of anxiety disorder, but not for mood disorder, substance use disorder or adult ADHD. Of the specific disorders, homosexually active men were more likely to have had social phobia in the preceding year.

In terms of lifetime prevalence, homosexually active men were not more likely to have had any disorder (first part of Table 3). Compared to heterosexually active men, homosexually active men were more likely to have had any anxiety disorder. For the specific disorders, it was found that homosexually active men were more likely to have had panic and drug abuse disorders. Homosexually active men were significantly more likely to have had lifetime comorbid disorders. The impulse-control disorders and the anti-social personality disorder did not show an elevated prevalence for heterosexually active men.

Based on the men's sexual attraction (second part of Table 2 and 3), the same pattern of findings was observed as for the sexual behavior-based differences, although there were more significant differences. Men with same-sex attraction were also more likely to have had major depressive disorder (12-months). Same-sex attracted men also were more likely to have had any mood disorder and the specific disorders major depression, social phobia, and general anxiety disorder (lifetime), but there were no longer significant differences for panic disorder.

Women

Women with any same-sex behavior differed from exclusively heterosexually active women regarding the 12-month prevalence of three specific disorders, but not in any of the categories of disorders (first part of Table 4). Homosexually active women were more likely to have had bipolar, alcohol dependence and drug dependence. Homosexually active women also were more likely to have had alcohol dependence and drug dependence during their life (first part of Table 5). None of the impulse-control disorders showed an elevated prevalence for homosexual women.

As with the men, we observed more differences based on sexual attraction compared to sexual behavior (second part of Tables 4 and 5). Women with same-sex attraction were more likely than heterosexually attracted women to have had the 12-month categories of mood and anxiety disorder. In addition, women with same-sex attraction were more likely to have had social phobia disorder; the difference in the prevalence of bipolar disorder was, however, no longer significant. Finally, same-sex attracted women were now also more likely to have had at least one Axis I disorder.

In terms of lifetime prevalence, there are also several more differences when comparisons were based on sexual attraction. Women with same-sex attraction were more likely than heterosexual women to have had any mood, anxiety, and substance use disorder. In terms of specific disorders, women with same-sex attraction not only had a higher prevalence of alcohol and drug dependence disorder, but also of dysthymia and social phobia disorder. Women with same-sex attraction were also more likely than heterosexually attracted women to have had two or more lifetime Axis I disorders. The impulse-control disorders and the anti-social personality disorder did not show an elevated prevalence based on sexual attraction.

Changes over time

Comparison between the sexual behavior-based disparities in psychiatric disorders reported here and those reported in NEMESIS-1[1] suggests that the number of disparities decreased somewhat and the pattern of disparities has changed. However, testing the effect of the interactions between time and behavior-based sexual orientation in the 12-month prevalence of any mood disorder, any anxiety disorder, any substance use disorder, and any Axis I disorder (controlling for age, level of education, residency, and having a steady partner) indicated that there were no significant changes in the disparities, with *P*-values ranging from .29 to .95 (Table 6).

Discussion

This study found a higher prevalence of various psychiatric disorders in homosexual persons compared to heterosexual persons both regarding the preceding 12-months as well as on a lifetime basis, and based on their sexual behavior as well as sexual attraction. Homosexually active and attracted men were more likely than heterosexual men to have had any disorder in the preceding year; more specifically, homosexually active or attracted men were more likely to have had any anxiety disorder. On a lifetime basis, homosexually active and

attracted men were also more likely to have had any anxiety disorder. Women with same-sex attraction were also more likely than heterosexual women to have had any disorder in the preceding year; there was no difference based on behavior. Standing out for homosexual women are the higher prevalence of alcohol and drug dependence compared to heterosexual women, both on the basis of the preceding year and lifetime.

To our knowledge, this is the first time that a general population-based sample was used to assess sexual orientation-related differences in the prevalence of impulse-control disorders and anti-social personality disorder. Our hypothesis, based on our earlier findings [1], that homosexual men would be more likely to internalize problems and have lower rates of these orders compared to heterosexual men, and that we would find the opposite pattern for women [9] were, however, not supported.

Our findings confirm and complement what has been found in other population-based studies. [11, 12, 14-16, 18]. If we observed significant differences in prevalence of disorders, prevalence was higher in homosexual compared to heterosexual persons. As in other studies, homosexual women seemed to be particularly more likely to report alcohol and drug dependence [18, 31-33].

As has been observed before, sexual orientation-related mental health disparities varied dependent upon whether persons are categorized based on sexual behavior or attraction [4, 5] Comparisons based on sexual attraction showed more significant differences in the prevalence of disorders than comparisons based on behavior. It has, however, never been explored why this would be the case. This discrepancy potentially results from two factors. First, the categorization based on attraction also included persons without sexual partners (419 heterosexually and 13 same-sex attracted men and 611 heterosexually and 23 same-sex attracted women). It could be that not-sexually active, same-sex attracted persons increased the prevalence of disorders in the homosexual group while not-sexually active, opposite-sex attracted persons decreased the prevalence of disorders in the heterosexual group. Inspection of Tables 2, 3, 4 and 5 suggests, however, that inclusion of the large number of heterosexually attracted persons who had not been sexually active did not diminish but rather increased the observed prevalence of disorders.

Second, the observed disparity could result from apparent inconsistencies between both categorizations: sexual attraction and behavior of persons who reported both were not always in accordance. Seven men and 18 women who had engaged in sex with someone of the other sex in the preceding year reported homosexual attraction, while eight men and nine women with heterosexual behavior reported sexual attraction to persons of the same sex. These subgroups are too small to statistically explore how they affect the number of disparities. Bigger samples are needed to better understand how discrepancies between sexual behavior and attraction contribute to disparities in prevalence of psychiatric disorders between homosexual and heterosexual persons.

Although we expected that disparities in rates of psychiatric disorders between homosexual and heterosexual persons would have decreased, as acceptance of homosexuality in Dutch society had increased [34], this was not supported. The absence of change could be

understood in different ways. To the extent that disparities result from minority stress [15], these effects are likely to be more persistent and take more time to fade away. If changes occur they are likely to be first observed in younger homosexual persons; our sample size did not allow for testing that. It is also possible that prejudice and discrimination continue to be an important reality in Dutch society and that observed altitudinal changes are superficial. Furthermore, several studies suggest that other mechanisms than prejudice and discrimination also affect the observed disparities, including genetic and environmental factors associated with both sexual orientation and psychiatric morbidity [11, 12]. Zietsch and colleagues, for instance, found that genetic factors accounted for 60% of the correlation between sexual orientation and depression, while childhood sexual abuse and risky family environment also were predictors of both sexual orientation and depression.

Study limitations include that homosexual behavior and attraction could have been underreported, despite the relatively high social acceptance of homosexuality in the Netherlands. Homosexual and heterosexual persons might also differ in their willingness to report mental health complaints. Furthermore, we did not assess sexual self-identification. Also, even though the homosexual persons in this study can be considered representative for the Dutch population, their numbers are small, lowering the power to identify significant differences. In addition, small numbers required us to combine bisexual and homosexual persons, making it impossible to look at both groups separately and risking that actual differences might be masked or inflated; studies have shown that disaggregating homosexual and bisexual persons frequently resulted in attenuation of findings that would have otherwise been attributed exclusively to homosexual persons [35]. Furthermore, we decided to control for relationship status to ensure that findings are comparable with our earlier study; this decision is debatable and it is important to know that not controlling for relationship status would increase some of the odds ratios and would also lead to a greater number of significant differences.

Despite these limitations, this study has several strengths, which include the use of the CIDI as a reliable and validated instrument to assess the presence of disorders; the inclusion of impulse-control disorders and anti-social personality disorder, while most comparable studies only assessed mood, anxiety or substance use disorders; the use of a national representative sample; as well as the operationalization of sexual orientation both in terms of behavior and attraction.

This study confirms findings from our earlier and other studies, that a homosexual orientation, assessed as behavior as well as attraction, is a risk factor for Axis I psychiatric disorders. Further research should explore the role of specific personal, interpersonal and structural factors associated with mental health disparities related to sexual orientation. Because these disparities seem to be present at a young age [36, 37], a life course perspective should be adopted. This perspective should include the development of coping styles, given the mediating role of coping in the association between sexual orientation and mental health [38]. A life course perspective will also offer insights in optimal timing of interventions aimed at the prevention of mental health disparities related to sexual orientation.

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Table 1

Demographic Characteristics by Sexual Behavior in Preceding Year (weighted)

	Men		Women	
	Exclusively heterosexually active (n = 2379)	Bisexually and homosexually active (n = 60)	Exclusively heterosexually active (n = 2832)	Bisexually and homosexually active (n = 57)
Mean age, years	42.0	41.5	40.9	38.8
	t = -0.35; P = .72		t = -0.70; P = .33	
Relationship status, %				
No steady partner	25.2	55.0	20.7	48.8
Steady partner	74.8	45.0	79.3	51.2
	X ² = 60.3; P < .001		X ² = 65.5; P < .001	
Education, %				
Primary, basic vocational	5.7	1.8	6.5	12.7
Lower secondary	19.8	15.0	22.0	19.9
Higher secondary	43.0	36.5	43.0	23.4
Higher professional, university	31.6	46.7	28.5	44.1
	X ² = 15.7; P = .24		X ² = 27.7; P = .16	
Urbanicity, %				
Rural	34.3	13.5	33.5	39.1
Urban	65.7	86.5	66.5	60.9
	X ² = 25.1; P = .004		X ² = 1.7; P = .55	

Table 2
Twelve-Month Prevalence of *DSM-IV* Disorders by Sexual Orientation in Men (weighted)

	Behavior-based Orientation				Attraction-based Orientation			
	Exclusively heterosexually active, % (n = 2379)	Bisexually and homosexually active, % (n = 60)	Adjusted OR	95% CI ^d	Heterosexually attracted, % (n = 2799)	Same-sex attracted, % (n = 71)	Adjusted OR	95% CI ^d
Any mood disorder	3.9	9.0	1.75	0.71, 4.33	4.2	15.6	2.79	0.99, 7.89
Major depression	3.2	9.0	2.23	0.93, 5.36	3.5	14.8	3.36	1.14, 9.87
Bipolar disorder	0.7	0.0	...	...	0.7	0.8	0.54	0.05, 5.75
Dysthymia	0.4	1.0	1.93	0.20, 18.88	0.4	0.9	1.37	0.17, 11.18
Any anxiety disorder	7.0	17.9	2.57	1.18, 5.61	7.5	17.6	2.11	1.04, 4.28
Social phobia	2.7	12.3	4.24	1.09, 16.50	2.9	12.1	3.66	1.17, 11.45
Specific phobia	3.2	5.1	1.60	0.38, 6.77	3.6	4.3	1.05	0.24, 4.68
Panic disorder	0.9	2.3	1.84	0.38, 8.93	0.9	2.0	1.39	0.27, 7.20
Agoraphobia (without panic)	0.1	0.0	...	...	0.2	0.0	...	...
General anxiety disorder	1.3	2.3	2.04	0.37, 11.24	1.3	2.7	1.92	0.42, 8.86
Any substance use disorder	7.6	11.7	1.42	0.61, 3.31	7.7	9.8	1.04	0.42, 2.57
Alcohol abuse	5.4	10.7	2.11	0.87, 5.12	5.5	9.1	1.52	0.57, 4.04
Alcohol dependence	1.1	0.9	0.61	0.06, 5.96	1.1	0.8	0.50	0.05, 4.71
Drug abuse	0.9	1.5	1.17	0.13, 10.42	1.0	1.3	0.84	0.09, 7.43
Drug dependence	0.8	0.0	...	...	0.8	0.0	...	...
Adult ADHD ^b	2.4	3.0	1.85	0.34, 10.18	2.6	2.5	0.64	0.08, 5.46
Any Axis I disorder ^c	16.4	32.0	2.06	1.15, 3.71	16.8	36.7	2.28	1.28, 4.08
Two or more Axis I disorders ^c	5.1	9.0	1.32	0.47, 3.68	5.4	8.5	1.03	0.34, 3.16

ADHD=Attention Deficit Hyperactivity Disorder

^aOR indicates odds ratio; CI, confidence interval. The OR is adjusted for age, level of education, urbanicity, and relationship status

^bADHD was measured for subjects 18-44 years only

^cFor 'Any Axis I disorder' and 'Two or more Axis I disorders,' impulse-control disorders were coded as absent among subjects 45-65 years old who were not assessed for these disorders

^dCould not be computed owing to a prevalence of 0 in 1 group

Table 3
Lifetime Prevalence of *DSM-IV* Disorders by Sexual Orientation in Men (weighted)

	Behavior-based Orientation				Attraction-based Orientation			
	Exclusively heterosexually active, % (n = 2379)	Bisexually and homosexually active, % (n = 60)	Adjusted OR	95% CI ^a	Heterosexually attracted, % (n = 2799)	Same-sex attracted, % (n = 71)	Adjusted OR	95% CI ^a
Any mood disorder	13.4	25.9	1.78	0.79, 3.98	13.8	33.4	2.40	1.18, 4.90
Major depression	12.3	22.4	1.61	0.74, 3.50	12.6	28.5	2.16	1.04, 4.48
Bipolar disorder	1.0	1.0	0.74	0.08, 6.53	1.2	2.7	1.34	0.24, 7.38
Dysthymia	0.5	3.6	5.56	0.88, 34.93	0.6	3.1	4.31	0.79, 23.50
Any anxiety disorder	14.6	28.2	1.97	1.10, 3.55	15.5	34.0	2.25	1.25, 4.05
Social phobia	6.6	17.8	2.49	0.98, 6.31	7.5	20.1	2.31	1.04, 5.13
Specific phobia	5.4	8.3	1.53	0.54, 4.39	5.5	6.2	1.03	0.29, 3.64
Panic disorder	2.6	7.9	2.80	1.09, 7.18	2.7	4.7	1.50	0.60, 3.73
Agoraphobia (without panic)	0.4	0.0	...	...	0.4	0.0	...	...
General anxiety disorder	3.4	5.5	1.62	0.46, 5.74	3.5	13.7	3.99	1.21, 13.16
Any substance use disorder	27.5	24.4	0.75	0.44, 1.28	27.3	33.0	1.09	0.67, 1.78
Alcohol abuse	21.7	19.2	0.79	0.44, 1.43	21.2	29.2	1.41	0.78, 2.56
Alcohol dependence	2.9	3.1	0.82	0.14, 4.92	3.2	0.8	0.13	0.02, 1.12
Drug abuse	4.8	12.3	2.78	1.42, 5.44	4.8	16.0	3.16	1.43, 6.95
Drug dependence	2.9	1.0	0.32	0.04, 2.62	3.0	1.6	0.34	0.06, 1.81
Any impulse-control disorder ^{b,c}	11.3	16.8	1.60	0.51, 5.04	11.2	22.6	1.75	0.65, 4.78
ADHD ^{b,c}	3.5	3.0	1.11	0.23, 5.59	3.6	2.5	0.41	0.05, 3.21
Conduct disorder ^{b,c}	7.8	7.7	1.12	0.20, 6.33	7.7	17.9	2.11	0.63, 7.05
Oppositional defiant disorder ^{b,c}	3.2	7.6	1.74	0.35, 8.55	3.1	3.4	0.80	0.10, 6.40
Any Axis I disorder ^d	42.7	49.3	1.11	0.68, 1.82	42.6	53.9	1.32	0.79, 2.18
Two or more Axis I disorders ^d	18.3	39.1	2.33	1.17, 4.66	19.0	43.0	2.41	1.37, 4.25
Anti-social personality disorder	4.6	6.1	1.44	0.28, 7.28	4.2	11.1	2.44	0.72, 8.35

ADHD=Attention Deficit Hyperactivity Disorder

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OR indicates odds ratio; CI, confidence interval. The OR is adjusted for age, level of education, urbanicity, and relationship status
Impulse-control disorders were measured for subjects 18-44 years only
Lifetime impulse-control disorder means: in childhood or adolescence
For , Any Axis I disorder' and 'Two or more Axis I disorders,' impulse-control disorders were coded as absent among subjects 45-65 years old who were not assessed for these disorders
Could not be computed owing to a prevalence of 0 in 1 group

Table 4
Twelve-Month Prevalence of *DSM-IV* Disorders by Sexual Orientation in Women (weighted)

	Behavior-based Orientation				Attraction-based Orientation			
	Exclusively heterosexually active, % (n = 2832)	Bisexually and homosexually active, % (n = 57)	Adjusted OR	95% CI ^a	Heterosexually attracted, % (n = 3435)	Same-sex attracted, % (n = 88)	Adjusted OR	95% CI ^a
Any mood disorder	7.2	13.2	1.33	0.34, 5.21	7.5	20.8	2.54	1.26, 5.10
Major depression	6.2	3.9	0.44	0.12, 1.67	6.5	13.9	1.90	0.77, 4.69
Bipolar disorder	0.9	9.4	6.70	1.11, 40.44	0.8	6.9	4.78	0.73, 31.13
Dysthymia	1.0	1.1	0.88	0.10, 7.70	1.4	3.3	1.84	0.42, 8.14
Any anxiety disorder	12.1	22.1	1.88	0.75, 4.73	12.4	26.7	2.31	1.09, 4.93
Social phobia	3.9	12.2	2.99	0.66, 13.63	4.2	15.3	3.47	1.15, 10.45
Specific phobia	6.8	5.2	0.73	0.24, 2.25	6.8	6.0	0.82	0.36, 1.86
Panic disorder	1.5	3.3	2.34	0.47, 11.74	1.4	3.0	2.08	0.48, 8.95
Agoraphobia (without panic)	0.6	0.0	...	...	0.6	1.4	2.21	0.21, 23.54
General anxiety disorder	2.2	1.4	0.50	0.07, 3.42	2.2	2.5	0.94	0.38, 2.37
Any substance use disorder	3.4	13.0	2.08	0.27, 16.12	3.3	11.2	2.23	0.52, 9.61
Alcohol abuse	1.9	2.3	0.42	0.04, 4.43	1.8	0.6	0.18	0.01, 1.97
Alcohol dependence	0.3	9.4	18.22	2.05, 161.82	0.3	9.7	23.08	3.15, 168.91
Drug abuse	0.7	0.0	...	...	0.8	0.0	...	...
Drug dependence	0.5	10.7	13.90	2.42, 79.69	0.5	7.9	11.35	2.45, 52.65
Adult ADHD ^b	1.2	2.8	0.97	0.13, 7.48	1.2	3.6	1.74	0.34, 8.94
Any Axis I disorder ^c	18.3	26.1	1.18	0.46, 3.05	18.4	35.7	2.06	1.07, 3.96
Two or more Axis I disorders ^c	5.9	13.2	1.56	0.36, 6.76	6.2	17.1	2.25	0.89, 5.70

ADHD=Attention Deficit Hyperactivity Disorder

^aOR indicates odds ratio; CI, confidence interval. The OR is adjusted for age, level of education, urbanicity, and relationship status

^bADHD was measured for subjects 18-44 years only

^cFor 'Any Axis I disorder' and 'Two or more Axis I disorders,' impulse-control disorders were coded as absent among subjects 45-65 years old who were not assessed for these disorders

[†]Could not be computed owing to a prevalence of 0 in 1 group

Table 5
Lifetime Prevalence of *DSM-IV* Disorders by Sexual Orientation in Women (weighted)

	Behavior-based Orientation				Attraction-based Orientation			
	Exclusively heterosexually active, % (n = 2832)	Bisexually and homosexually active, % (n = 57)	Adjusted OR	95% CI ^a	Heterosexually attracted, % (n = 3435)	Same-sex attracted, % (n = 88)	Adjusted OR	95% CI ^a
Any mood disorder	25.2	33.1	1.38	0.63, 3.02	25.3	43.7	2.23	1.26, 3.95
Major depression	23.6	23.8	0.99	0.48, 2.0	23.7	36.4	1.84	0.95, 3.58
Bipolar disorder	1.3	9.4	4.19	0.67, 26.26	1.3	7.3	3.72	0.68, 20.25
Dysthymia	1.6	1.1	0.56	0.07, 4.61	1.9	5.3	2.41	1.00, 5.80
Any anxiety disorder	23.3	30.1	1.42	0.63, 3.18	23.4	38.6	2.02	1.03, 3.94
Social phobia	10.3	20.2	2.27	0.85, 6.05	10.4	25.3	2.82	1.41, 5.62
Specific phobia	10.4	15.7	1.64	0.50, 5.32	10.3	16.6	1.73	0.75, 3.97
Panic disorder	4.8	6.9	1.48	0.46, 4.76	4.8	6.0	1.22	0.46, 3.26
Agoraphobia (without panic)	1.5	0.0	...	...	1.4	2.9	...	...
General anxiety disorder	5.5	1.7	0.29	0.06, 1.41	5.6	6.8	1.17	0.56, 2.43
Any substance use disorder	10.7	23.7	2.12	0.76, 5.88	10.1	29.8	3.20	1.57, 6.53
Alcohol abuse	7.1	10.8	1.38	0.55, 3.50	6.5	13.7	1.98	0.87, 4.51
Alcohol dependence	0.7	11.5	8.97	1.60, 50.34	0.7	13.2	16.86	4.74, 59.96
Drug abuse	2.9	0.0	...	...	2.9	2.3	0.70	0.16, 3.12
Drug dependence	1.2	12.9	9.22	1.87, 45.39	1.1	11.2	8.18	2.23, 29.98
Any impulse-control disorder ^{b,c}	6.5	23.3	2.88	0.49, 16.90	6.2	18.1	2.00	0.37, 10.74
ADHD ^{b,c}	1.6	2.8	0.86	0.12, 6.46	1.5	3.6	1.44	0.29, 7.32
Conduct disorders ^{b,c}	3.8	15.2	2.29	0.17, 31.04	3.4	12.0	2.02	0.21, 19.83
Oppositional defiant disorder ^{b,c}	2.0	5.3	3.73	0.70, 19.96	2.1	2.5	0.88	0.09, 8.20
Any Axis I disorder ^d	42.7	46.2	1.05	0.49, 2.25	42.1	55.2	1.60	0.94, 2.75
Two or more Axis I disorders ^d	19.3	21.2	1.70	0.74, 3.88	19.2	46.0	3.32	1.90, 5.80
Anti-social personality disorder	1.5	4.7	2.38	0.63, 9.00	1.5	3.4	1.87	0.50, 6.92

ADHD=Attention Deficit Hyperactivity Disorder

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^bOR indicates odds ratio; CI, confidence interval. The OR is adjusted for age, level of education, urbanicity, and relationship status

^cImpulse-control disorders were measured for subjects 18-44 years only

^dLifetime impulse-control disorder means: in childhood or adolescence

^eFor 'Any Axis I disorder' and 'Two or more Axis I disorders,' impulse-control disorders were coded as absent among subjects 45-65 years old who were not assessed for these disorders

^fCould not be computed owing to a prevalence of 0 in 1 group

Changes in Behavior-based Sexual Orientation-related Differences in Twelve-Month Prevalence of *DSM-IV* Disorders between 1996 and 2007-09 (weighted)

Table 6

	Men			Women		
	AOR ^a Time 1	AOR ^a Time 2	OR ^b	95% CI ^b	AOR ^a Time 1	AOR ^a Time 2
Any mood disorder	2.93	1.75	0.57	0.21, 1.60	1.02	1.33
Any anxiety disorder	2.61	2.57	0.91	0.31, 2.62	0.98	1.88
Any substance use disorder	0.92	1.42	1.21	0.42, 3.59	4.05	2.08
Any Axis I disorder	1.52	2.06	1.21	0.57, 2.59	1.68	1.18

^a AOR indicates adjusted odds ratio ORs are adjusted for age, level of education, urbanicity, and relationship status.

^b AOR indicates adjusted odds ratio of the interaction between time and behavior-based sexual orientation; CI, confidence interval.