The Impact of Institutional Discrimination on Psychiatric Disorders in Lesbian, Gay, and Bisexual Populations: A Prospective Study

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Objectives. We examined the relation between living in states that instituted bans on same-sex marriage during the 2004 and 2005 elections and the prevalence of psychiatric morbidity among lesbian, gay, and bisexual (LGB) populations.

Methods. We used data from wave 1 (2001–2002) and wave 2 (2004–2005) of the National Epidemiologic Survey on Alcohol and Related Conditions (N=34653), a longitudinal, nationally representative study of noninstitutionalized US adults.

Results. Psychiatric disorders defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, increased significantly between waves 1 and 2 among LGB respondents living in states that banned gay marriage for the following outcomes: any mood disorder (36.6% increase), generalized anxiety disorder (248.2% increase), any alcohol use disorder (41.9% increase), and psychiatric comorbidity (36.3% increase). These psychiatric disorders did not increase significantly among LGB respondents living in states without constitutional amendments. Additionally, we found no evidence for increases of the same magnitude among heterosexuals living in states with constitutional amendments.

Conclusions. Living in states with discriminatory policies may have pernicious consequences for the mental health of LGB populations. These findings lend scientific support to recent efforts to overturn these policies. (*Am J Public Health.* 2010;100:452–459. doi:10.2105/AJPH.2009.168815)

Few legal policies in recent memory have been as contentiously debated as gay marriage.[1] In 1996, the US Congress passed the Defense of Marriage Act, which defined marriage as a legal union solely between a man and a woman.[2] Subsequently, policy debates over gay marriage have been waged at the state level. In October 2008, gay marriage became legal in Connecticut, the third state to grant such rights. One month later, California voters reversed a state Supreme Court decision allowing gays and lesbians to marry. This was followed by constitutional amendments in Florida and Arizona that banned marriage rights for same-sex couples. These legal changes continued a trend begun during the 2004 election, when citizens in 14 states approved constitutional amendments limiting the definition of marriage to the union of a man and a woman.

The Defense of Marriage Act deprives same-sex couples of many benefits and privileges that a heterosexual married couple has under federal law.[1] Thus, bans on gay marriage—together with the social environments that give rise to them—are examples of institutional discrimination, that is, societal-level conditions that constrain the opportunities, resources, and well-being of socially disadvantaged groups.[3] Because institutional discrimination can disadvantage individuals in the absence of discrimination at the individual level, most investigators consider individual and institutional forms of discrimination to be independent phenomena.[3–5] Much research has examined associations between individual discrimination and population health.[6,7] However, interest in the impact of institutional discrimination on health outcomes has increased.[8–11] Importantly, because institutional discrimination includes fateful experiences (conditions that occur outside the control of the individual), such forms of discrimination are not confounded with mental health status[5] and therefore provide a stronger test of the effect of discrimination on mental health than do measures of individual discrimination.

Despite the existence of multiple forms of institutional discrimination toward lesbian, gay, and bisexual (LGB) populations, few studies have examined the consequences of this form of discrimination for the mental health of LGB populations. In 1 recent population-based study, the prevalence of psychiatric disorders was higher among LGB persons living in states with policies that did not extend protections to LGB individuals (e.g., failures to ban employment discrimination based on sexual orientation).[12] However, such policies differ from laws that deprive LGB individuals of certain rights (e.g., marriage). Deprivation of rights, as well as extended and heated public discourse focusing on the legitimacy of such deprivation, may also create stress that harms mental health.

One study showed that LGB respondents living in states that passed antigay marriage amendments in 2006 had higher psychological distress than did LGB individuals in states without such an amendment on the ballot.[13] That study provided important insights but relied on cross-sectional data, self-reported distress symptoms, and a convenience sample. To establish clearer inferences, prospective studies with representative samples of LGB respondents that examine changes in the prevalence of psychiatric disorders as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM-IV*), are needed.

Such prospective studies are rare, but we identified an opportunity to examine this research question by using wave 2 of the

National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a longitudinal, population-based epidemiologic survey of civilian, noninstitutionalized US adults aged 18 years and older. NESARC respondents were initially interviewed (wave 1) in 2001 through 2002 and were re-interviewed in 2004 through 2005. Wave 2 of the NESARC assessed sexual orientation, thus providing the largest nationally representative sample of LGB participants to date. Wave 2 coincided with the 2004 campaign and election, when state laws regarding the constitutionality of gay marriage were on the ballots and passed in 14 states (2 more states, Kansas and Texas, passed constitutional amendments in special referenda in 2005, which also overlapped with the period of data collection). Public campaigns in states debating similar policies toward gays and lesbians have fostered a negative social climate for those with a minority sexual orientation.[14] LGB individuals living in these states confronted increased exposure to stressors, including misleading portrayals and negative stereotypes in the media and hostile interactions with neighbors, colleagues, and family members.[13–15] This exposure to antigay attitudes can lead to greater shame about LGB identity and more negative feelings about LGB group membership,[15] a construct known as internalized homophobia.[16]

To address the impact of institutional discrimination on mental health, we examined whether LGB individuals living in states with constitutional amendments banning gay marriage on the ballot in the 2004 through 2005 elections evidenced increased rates of psychiatric disorders from wave 1 to wave 2. Our examination of this research question consisted of 2 parts. First, we compared the change in prevalence of psychiatric disorders from wave 1 to wave 2 between LGB individuals living in states with institutional forms of discrimination (i.e., states with constitutional amendments banning gay marriage) and LGB individuals living in states without such discrimination. We were interested in examining whether LGB individuals living in a state with constitutional amendments had higher rates of psychiatric disorders than did LGB individuals living in states without such amendments, which would suggest that institutional discrimination may have deleterious effects on mental health. Second, we compared the change in psychiatric disorder prevalence between LGB individuals living in states without constitutional amendments and heterosexual individuals living in the same states. We were interested in examining the specificity of the effect of institutional discrimination by examining whether LGB individuals living in a state with constitutional amendments had higher rates of psychiatric disorders than heterosexual individuals in the same states. The prospective design, large sample size, population-based sampling scheme, and detailed measurement of *DSM-IV* diagnoses presented a timely and unique opportunity in which to examine this research question.

METHODS

Data were drawn from waves 1 and 2 of the NESARC. In the wave 1 sample, young adults, Hispanics, and African Americans were oversampled, and the overall response rate was 81%. Of the 43 093 wave 1 participants, 34 653 participated in face-to-face re-interviews at wave 2. The wave 2 response rate of eligible participants was 86.7%. The cumulative response rate at wave 2 was 70.2%. Sample weights for wave 2 respondents were calculated to ensure that the sample represented survivors of the original sample who remained in the United States and were not institutionalized. More information on the study methods is found elsewhere.[17–19]

Measures

Participants were classified as LGB on the basis of self-identification. Participants were asked, "Which of the categories best describes you?" and were given 4 categories: heterosexual (straight), gay or lesbian, bisexual, and not sure. Of the total NESARC sample, 577 (1.67%) respondents self-identified themselves as LGB (men, 1.86%; women, 1.52%), which is consistent with other representative studies of US youths[20] and adults.[21] The sociodemographic differences between the LGB respondents and the heterosexual respondents are summarized in Table 1.

A dichotomous variable was then created that compared those states that voted on and passed constitutional amendments in 2004 to 2005 defining marriage as occurring only between a man and a woman (16 states) versus those states that did not have an amendment on their ballots (34 states).[1]

Past 12-month *DSM-IV*[22] mood and anxiety disorders assessed by the Alcohol Use Disorder and Associated Disabilities Interview Schedule–*DSM-IV* (AUDADIS-IV)[23] included major depression, dysthymia, mania, hypomania, generalized anxiety disorder, panic disorder with or without agoraphobia, social phobia, and posttraumatic stress disorder. Substance-induced disorders and those due to somatic illnesses or (in the case of major depression) bereavement were ruled out per *DSM-IV* definitions. These diagnoses all met the *DSM-IV*[24] criterion requiring distress or social or occupational dysfunction. The reliability and validity (including psychiatrist reappraisal) of mood and anxiety disorder diagnosis has been well documented.[25,26] Diagnoses were further validated by using the Medical Outcomes Study Short Form Health Survey version 2, a mental disability score, in controlled linear regressions.[27,28]

The AUDADIS-IV[23] used over 40 items to assess the criteria for past 12-month *DSM-IV*[22] substance abuse and dependence for alcohol as well as 10 different classes of drugs, including sedatives, tranquilizers, opiates (other than heroin or methadone), stimulants, hallucinogens, cannabis, cocaine (including crack cocaine), inhalants or solvents, heroin, and other drugs. The substance use disorders showed excellent reliability in clinical and general population studies, with alcohol diagnoses having a minimum κ of 0.74 and drug diagnoses having a minimum κ of 0.79.[24–26,29] The validity of these diagnoses has been documented in numerous studies,[30,31] including psychiatrist reappraisal.[26] To increase power, substance abuse and dependence diagnoses were combined into 1 category.

Statistical analysis

We present the change in the prevalence of past 12-month *DSM-IV* mood, anxiety, and substance use disorders between 2001 to 2002 and 2004 to 2005 within 4 groups: (1) LGB respondents in states with constitutional amendments banning gay marriage in 2004 to 2005 (hereafter referred to as "states with amendments"), (2) LGB respondents in states without constitutional amendments banning gay marriage in 2004 to 2005 (hereafter

TABLE 1—Demographic Characteristics of Respondents, by Self-Reported Sexual Orientation: National Epidemiologic Survey on Alcohol and Related Conditions, Wave 2, 2004–2005

Characteristic	Self-Identified Gay, Lesbian, or Bisexual, % (SE)	Self-Identified Heterosexual, % (SE)	AOR[a] (95% CI)
Sex			
Male	48.7 (2.5)	47.9 (0.4)	1.02 (0.82, 1.29)
Female (Ref)	51.3 (2.5)	52.1 (0.4)	1.00
Age, y			
≤25	13.5 (1.9)	9.2 (0.3)	3.92 (2.43, 6.32)
26–45	49.3 (2.5)	38.8 (0.4)	3.37 (2.26, 5.03)
46–64	31.1 (2.0)	33.5 (0.3)	2.48 (1.67, 3.70)
≥65 (Ref)	6.1 (1.1)	18.5 (0.3)	1.00
Race/ethnicity			
White	72.3 (2.5)	70.9 (1.6)	1.13 (0.81, 1.57)
Black	10.7 (1.6)	11.1 (0.7)	1.05 (0.69, 1.59)
American Indian	3.6 (1.0)	2.2 (0.2)	1.90 (0.95, 3.80)
Asian	3.1 (1.1)	4.3 (0.5)	0.70 (0.35, 1.43)
Hispanic (Ref)	10.2 (1.5)	11.6 (1.2)	1.00
Education			
<High school	5.8 (1.2)	14.1 (0.5)	0.37 (0.23, 0.60)
High school	15.4 (1.8)	23.9 (0.5)	0.54 (0.42, 0.71)
>High school (Ref)	78.9 (2.1)	61.9 (0.6)	1.00
Income, $			
0–19 999	37.1 (2.9)	42.3 (0.6)	1.07 (0.70, 1.63)
20 000–34 999	24.3 (2.3)	23.1 (0.4)	1.13 (0.76, 1.68)
35 000–69 999	27.2 (2.0)	24.3 (0.4)	1.06 (0.76, 1.48)
≥70000 (Ref)	11.5 (1.8)	10.4 (0.4)	1.00

Note. AOR = adjusted odds ratio; CI = confidence interval. The unweighted sample size for self-identified gay, lesbian, or bisexual respondents was n = 577; for self-identified heterosexual respondents, n = 34 076.
[a]Simultaneously adjusted for all covariates.

referred to as "states without amendments"), (3) heterosexual respondents in states with amendments, and (4) heterosexual respondents in states without amendments. The prevalence of comorbidity, which was defined as meeting the criteria for 2 or more psychiatric disorders, is also presented.

To estimate differences in the prevalence of *DSM-IV* disorders from wave 1 to wave 2 within groups of respondents, we used 2 measures. First, the percent change was the difference between the wave 2 prevalence and the wave 1 prevalence, divided by the wave 1 prevalence. For example, an increase from 2% to 4% in prevalence would be a 100% increase. Negative values indicated a decrease in the prevalence from wave 1 to wave 2.

Next, we conducted within-group logistic regression to estimate the odds of psychiatric disorders from wave 1 to wave 2, applying generalized estimating equations (GEEs).[32] Because the outcome was dichotomous, we used a logit link function. Parameter estimates from the GEE model can be interpreted as odds ratios (ORs). We created 2 records for each respondent (wave 1 and wave 2) and then modeled predictors of psychiatric disorders, clustering each individual by unique identification number as well as sampling cluster and primary sampling unit. The exposure of interest for these models was wave (1 versus 2).

Control variables included gender, age, race/ethnicity, income, education, marital status (legally married or living with someone as if married), and US region. These covariates were chosen because they are associated with psychiatric disorders in both LGB[33–35] and heterosexual[36–40] samples. Analyses were completed with SUDAAN software version 9.1[41] to obtain weighted estimates and standard errors. Statistical significance was evaluated at $\alpha = .05$.

RESULTS

The prevalence of mood disorders increased more than 30% (from 22.7% to 31.0%) from wave 1 to wave 2 among LGB respondents in states with amendments, and this increase in prevalence was statistically significant (Table 2). In contrast, the prevalence of mood disorders decreased more than 20% among LGB respondents in states that did not have amendments. The odds of mood disorders at wave 2 was 1.67 times the odds at wave 1 among LGB respondents in states with amendments (95% confidence interval [CI] = 1.01, 2.77), whereas the odds at wave 2 was not significantly different than the odds at wave 1 among LGB respondents in states without amendments (OR = 0.69; 95% CI = 0.47, 1.01).

The prevalence of anxiety disorders increased across the 2 waves of the study in LGB respondents in both groups, but this change was not statistically significant in either group. However, a significant increase in generalized anxiety disorder occurred among LGB respondents in states with amendments. The prevalence of generalized anxiety disorder among LGB respondents in these states increased over 200% (from 2.7% to 9.4%) from wave 1 to wave 2 (OR = 4.2; 95% CI = 1.19, 14.76). The increase (48%) in generalized anxiety disorder prevalence among LGB respondents from states that did not have amendments was not statistically significant.

Increases in the prevalence of substance use disorders were evident in both groups of LGB respondents. The prevalence of alcohol use disorders increased significantly from wave 1 to wave 2 among LGB respondents living in states with amendments (OR = 1.8; 95% CI = 1.08, 3.01) but not among those living in states without amendments (OR = 1.41; 95% CI = 0.96, 2.07). In contrast with the study

TABLE 2—Weighted Prevalence Rates for *DSM-IV* Disorders in the Past 12 Months Among Lesbian, Gay, or Bisexual Respondents, by State Constitutional Amendment Status: National Epidemiologic Survey on Alcohol and Related Conditions, Wave 1, 2001–2002, and Wave 2, 2004–2005

	Constitutional Amendment (n = 135)				No Constitutional Amendment (n = 442)			
	Wave 1, % (SE)	Wave 2, % (SE)	Change, %	AOR[a] (95% CI)	Wave 1, % (SE)	Wave 2, % (SE)	Change, %	AOR[a] (95% CI)
Any mood disorder	22.7 (4.7)	31.0 (5.2)	36.6	1.67* (1.01, 2.77)	22.5 (2.5)	17.2 (2.0)	–23.6	0.69 (0.47, 1.01)
Major depression	22.1 (4.7)	27.6 (5.5)	24.9	1.43 (0.77, 2.68)	17.5 (2.2)	15.1 (1.9)	–13.5	0.83 (0.55, 1.25)
Dysthymia	2.9 (0.9)	1.7 (0.4)	–41.9	. . .	6.0 (1.4)	2.2 (0.9)	-63.1	. . .
Mania/hypomania	11.8 (3.9)	12.8 (3.9)	8.5	1.21 (0.47, 3.14)	6.5 (1.5)	4.7 (1.2)	–28.0	0.69 (0.33, 1.45)
Any anxiety disorder	14.4 (4.1)	18.0 (4.3)	25.1	1.34 (0.55, 3.27)	13.2 (1.9)	15.9 (2.2)	21.0	1.27 (0.84, 1.91)
Panic disorder	5.1 (2.8)	8.2 (3.4)	60.8	1.84 (0.33, 10.2)	7.5 (1.5)	8.2 (1.7)	9.5	1.11 (0.6, 2.06)
Generalized anxiety disorder	2.7 (2.6)	9.4 (3.0)	248.2	4.20* (1.19, 14.76)	5.6 (1.2)	8.2 (1.7)	48.0	1.54 (0.75, 3.19)
Social phobia	9.3 (3.1)	9.1 (2.8)	–2.2	0.97 (0.42, 2.22)	3.6 (1.0)	5.8 (1.2)	60.1	1.69 (0.88, 3.25)
Any substance use disorder	40.2 (5.1)	50.7 (4.7)	26.0	1.67* (1.14, 2.43)	30.3 (2.6)	37.8 (2.7)	24.3	1.44* (1.07, 1.93)
Alcohol disorder	21.7 (5.5)	30.8 (5.3)	41.9	1.80* (1.08, 3.01)	16.4 (2.2)	21.2 (2.6)	28.9	1.41 (0.96, 2.07)
Drug disorder	11.0 (3.8)	12.9 (4.6)	17.3	1.25 (0.64, 2.45)	6.0 (1.4)	11.4 (2.1)	88.6	2.11* (1.20, 3.72)
Any disorder	53.9 (5.0)	60.9 (3.7)	13.0	1.44 (0.96, 2.16)	44.9 (2.7)	50.0 (2.7)	11.3	1.25 (0.93, 1.68)
Comorbid disorder	17.6 (4.3)	27.6 (4.9)	36.3	2.00* (1.22, 3.28)	13.7 (1.9)	14.9 (2.1)	8.5	1.11 (0.71, 1.74)

Note. AOR = adjusted odd ratio; CI = confidence interval; *DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*. The total sample size was N = 577. Ellipses indicate that AORs were too unstable to report given the small sample size.

[a]Adjusted odds ratio reflects the odds of having a disorder at wave 2 relative to wave 1, with adjustment for age, gender, race/ethnicity, income, educational attainment, marital status, and region.

*$P < .05$.

hypotheses, increases in drug use disorders were statistically significant among LGB respondents living in states without amendments (OR=2.11; 95% CI=1.20, 3.72).

The prevalence of any psychiatric disorder in both wave 1 and wave 2 was lower among LGB respondents in states without constitutional amendments. The prevalence of comorbidity increased significantly among LGB respondents in states with amendments (OR=2.0; 95% CI=1.22, 3.28) but was unchanged in states without amendments (OR=1.28; 95% CI= 0.71, 1.74).

The significant increase in mood disorders among LGB respondents in states with amendments was not evident among heterosexual respondents living in the same states (Table 3). Increases in the prevalence of panic disorder and generalized anxiety disorder were statistically significant among heterosexual respondents, but the magnitude of these changes (27.0% and 61.0%, respectively) was notably smaller than was the magnitude of the increase in the prevalence of these disorders among LGB respondents (60.8% and 248.0%, respectively). Similarly, the prevalence of alcohol use disorders increased significantly among heterosexual respondents (OR=1.22; 95% CI=1.09, 1.35), but this increase in prevalence was smaller in magnitude than it was among LGB respondents (18% versus 41.9%).

The prevalence of any psychiatric disorder increased to a lesser degree among heterosexuals (8.6%) than it did among LGB respondents (13.0%) in states with amendments, but the increase was statistically significant among heterosexuals because of the considerably larger sample size of this group (OR=1.14; 95% CI=1.05, 1.22). The rate of any psychiatric disorder was considerably higher among LGB respondents relative to heterosexual populations, which is consistent with previous reports.[42] The same pattern of results was present for comorbidity. The prevalence of comorbidity increased significantly among heterosexual respondents from wave 1 to wave 2 (OR=1.16; 95% CI=1.01, 1.34), but the prevalence of comorbidity increased to a greater degree among LGB respondents (14.9% versus 36.3%).

The change in psychiatric disorder prevalence among heterosexuals living in states without amendments are shown in Table 4. These results were consistent with the trends evidenced in Tables 2 and 3.

DISCUSSION

Prejudice and discriminatory actions toward gays and lesbians remain common. A recent example of institutional discrimination was the passage of constitutional amendments banning gay marriage during 2004 to 2005 in 16 states in the United States. Despite the widespread adoption of these policies, however, little is known about their impact on the mental health of LGB populations. The present study addressed this gap in the literature by examining the temporal trends in psychiatric disorder prevalence among LGB and heterosexual respondents living in states with and without constitutional amendments banning gay marriage on the ballot during the 2004 to 2005 elections.

We found consistent increases in rates of psychiatric disorders and comorbidity (for 11 of 13 outcomes) among LGB individuals living in

TABLE 3—Weighted Prevalence Rates for *DSM-IV* Disorders in the Past 12 Months in States with Constitutional Amendments Banning Gay Marriage in 2004–2005, by Self-Reported Sexual Orientation: National Epidemiologic Survey on Alcohol and Related Conditions, Wave 1, 2001–2002, and Wave 2, 2004–2005

	Lesbian, Gay, or Bisexual (n = 135)				Heterosexual (n = 9963)			
	Wave 1, % (SE)	Wave 2, % (SE)	Change, %	AOR[a] (95% CI)	Wave 1, % (SE)	Wave 2, % (SE)	Change, %	AOR[a] (95% CI)
Any mood disorder	22.7 (4.7)	31.0 (5.2)	36.6	1.67* (1.01, 2.77)	10.9 (0.8)	11.2 (0.5)	2.8	1.03 (0.93, 1.15)
Major depression	22.1 (4.7)	27.6 (5.5)	24.9	1.43 (0.77, 2.68)	8.5 (0.4)	8.9 (0.4)	4.5	1.05 (0.94, 1.18)
Dysthymia	2.9 (0.9)	1.7 (0.4)	–41.9	. . .	2.4 (0.2)	1.3 (0.1)	–46.4	0.53 (0.42, 0.67)
Mania/hypomania	11.8 (3.9)	12.8 (3.9)	8.5	1.21 (0.47, 3.14)	3.5 (0.2)	3.8 (0.3)	9.0	1.10 (0.92, 1.3)
Any anxiety disorder	14.4 (4.1)	18.0 (4.3)	25.1	1.34 (0.55, 3.27)	6.4 (0.4)	7.4 (0.3)	15.0	1.17* (1.03, 1.32)
Panic disorder	5.1 (2.8)	8.2 (3.4)	60.8	1.84 (0.33, 10.2)	2.3 (0.2)	2.9 (0.2)	27.0	1.28* (1.06, 1.55)
Generalized anxiety disorder	2.7 (2.6)	9.4 (3.0)	248.2	4.20* (1.19, 14.76)	2.6 (0.2)	4.2 (0.2)	61.0	1.65* (1.37, 1.97)
Social phobia	9.3 (3.1)	9.1 (2.8)	–2.2	0.97 (0.42, 2.22)	3.0 (0.2)	2.3 (0.2)	–22.1	0.77* (0.64, 0.93)
Any substance use disorder	40.2 (5.1)	50.7 (4.7)	26.0	1.67* (1.14, 2.43)	20.5 (0.7)	22.9 (0.8)	12.2	1.17* (1.09, 1.26)
Alcohol disorder	21.7 (5.5)	30.8 (5.3)	41.9	1.80* (1.08, 3.01)	8.6 (0.4)	10.2 (0.5)	18.0	1.22* (1.09, 1.35)
Drug disorder	11.0 (3.8)	12.9 (4.6)	17.3	1.25 (0.64, 2.45)	2.1 (0.2)	2.1 (0.2)	0	1.0 (0.76, 1.30)
Any disorder	53.9 (5.0)	60.9 (3.7)	13.0	1.44 (0.96, 2.16)	29.4 (0.8)	31.9 (0.8)	8.6	1.14* (1.05, 1.22)
Comorbid disorder	17.6 (4.3)	27.6 (4.9)	36.3	2.00* (1.22, 3.28)	6.2 (0.4)	7.1 (0.4)	14.9	1.16* (1.01, 1.34)

Note. AOR = adjusted odd ratio; CI = confidence interval; *DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*. Ellipses indicate that AORs were too unstable to report given the small sample size.
[a]Adjusted odds ratio reflects odds of having a disorder at wave 2 relative to wave 1, with adjustment for age, gender, race/ethnicity, income, educational attainment, marital status, and region.
*$P < .05$.

states with amendments. These increases were not observed among LGB respondents living in states without amendments, with the exception of substance-use disorders, which did increase significantly among LGB respondents living in states without amendments. We also found that the magnitude of the increases in psychiatric disorders and comorbidity were consistently greater (for all outcomes) in LGB respondents living in states with constitutional amendments than they were among heterosexuals living in these same states. These findings were particularly pronounced for mood disorders and generalized anxiety disorder. These disorders are characterized by hopelessness, chronic worry, and hypervigilance, which are common psychological responses to perceived discrimination.[43]

These results raise important questions that require further investigation. Research is needed to identify the mechanisms that account for the relationship between institutional forms of discrimination and increased psychiatric morbidity in LGB populations. Social stress theories have suggested that discrimination leads to higher levels of stress exposure among LGB individuals, which in turn is associated with greater psychiatric disorders.[16] More recent research has indicated that experiences of discrimination may also create a cascade of psychological responses, including hopelessness, emotion dysregulation, and social isolation.[44] Some of these psychological processes have been shown to mediate the relationship between stressors resulting from sexual minority status and psychopathological outcomes.[45] Further research is needed to identify additional mechanisms linking institutional discrimination and psychiatric disorders to assist in the development of theory-driven interventions.

Another area for future study concerns whether pro-gay state policies exert protective effects on the mental health of LGB populations. Because only 6 states had some form of protection for same-sex couples when data collection for wave 2 was completed, we did not have adequate statistical power to test whether LGB respondents living in these states had lower rates of psychiatric disorders. If more states enact pro-gay marriage policies, this hypothesis can be empirically evaluated.

Although these findings provide the strongest empirical evidence to date that living in states with discriminatory laws may serve as a risk factor for psychiatric morbidity in LGB populations, the results should be considered in light of the study's limitations. Given that many of the states banning same-sex marriage had passed prior policies that did not extend protection to LGB individuals (e.g., hate crime and employment nondiscrimination), it is possible that the healthier LGB respondents moved to states with more progressive policies. Although there were few sociodemographic differences between the LGB respondents in states with constitutional amendments and those living in states without these amendments (those living in states with amendments had lower personal income [$\chi^2_3 = 4.1$; $P = .01$], but there were no significant differences in gender, age, education, or race/ethnicity), we cannot rule out the potential impact of differential mobility on our results.

Two additional limitations concern identification and classification of our LGB sample. First, sexual orientation was assessed only at wave 2. Research has shown the fluidity of

TABLE 4—Weighted Prevalence Rates for *DSM-IV* Disorders in the Past 12 Months Among Heterosexuals in States Without Constitutional Amendments Banning Gay Marriage in 2004–2005: National Epidemiologic Survey on Alcohol and Related Conditions, Wave 1, 2001–2002, and Wave 2, 2004–2005

	Wave 1, % (SE)	Wave 2, % (SE)	Change, %	AOR[a] (95% CI)
Any mood disorder	7.9 (0.3)	8.2 (0.3)	3.7	1.06 (0.98, 1.14)
Major depression	7.3 (0.3)	7.8 (0.3)	7.2	1.08 (1.0, 1.17)
Dysthymia	2.0 (0.1)	1.1 (0.1)	–45.0	0.57* (0.47, 0.68)
Mania/hypomania	2.8 (0.2)	3.2 (0.2)	14.7	1.15 (0.99, 1.33)
Any anxiety disorder	5.8 (0.2)	6.7 (0.2)	15.4	1.17* (1.07, 1.28)
Panic disorder	2.2 (0.1)	2.3 (0.1)	5.9	1.06 (0.94, 1.21)
Generalized anxiety disorder	2.1 (0.1)	3.5 (0.2)	71.4	1.74* (1.15, 2.02)
Social phobia	2.8 (0.2)	2.5 (0.2)	–8.6	0.91 (0.79, 1.05)
Any substance use disorder	17.3 (0.5)	20.1 (0.5)	16.2	1.22* (1.16, 1.28)
Alcohol disorder	7.9 (0.3)	9.2 (0.3)	15.7	1.19* (1.10, 1.28)
Drug disorder	1.8 (0.1)	2.3 (0.1)	31.8	1.34* (1.15, 1.55)
Any disorder	25.4 (0.6)	28.3 (0.6)	11.4	1.17* (1.11, 1.23)
Comorbid disorder	5.2 (0.2)	6.0 (0.2)	13.9	1.18* (1.08, 1.28)

Note. AOR = adjusted odd ratio; CI = confidence interval; *DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*. The sample size was n = 24 113.
[a]Adjusted odds ratio reflects odds of having a disorder at wave 2 relative to wave 1, with adjustment for age, gender, race/ethnicity, income, educational attainment, marital status, and region.
*$P < .05$.

sexual identity labels within some individuals over time,[20,46] which may have led to misclassification of a subset of LGB participants. Additional misclassification may have occurred if some participants who lived in states with constitutional amendments banning gay marriage chose not to disclose their sexual orientation at wave 2 because of the hostile environment in those states. However, given that nondisclosure is associated with greater psychological distress,[16] this misclassification would have biased our results toward the null.

Second, the prevalence of self-identified LGB respondents in the NESARC (1.67%) was somewhat lower than that found in other nationally representative studies of US adults (e.g., the National Survey of Midlife Development in the United States [MIDUS]; 2.5%).[42] The questions on LGB status were self-administered in the MIDUS but interviewer-administered in the NESARC, possibly affording MIDUS respondents a feeling of greater anonymity in disclosing sexual orientation. The prevalence of self-identified LGB individuals in the NESARC could also reflect a limitation in the measurement of single-item questions of sexual orientation.[47]

Although the risk of psychiatric disorders among individuals who do not disclose LGB status is unknown,[42] distress associated with hiding one's status could lead to a higher risk of psychiatric disorder. If so, misclassification of LGB status in these data would bias the results toward the null. Thus, our findings should be considered conservative estimates.

Despite the large number of LGB respondents in the NESARC compared with other nationally representative datasets,[42] the number of respondents meeting diagnostic criteria for psychiatric disorders in states with amendments was relatively small, which limits the precision of the estimates. Thus, the results must be interpreted with caution, and they require replication with larger samples of LGB respondents. Additionally, we did not have a large enough sample size to examine how changes in laws influenced onset or persistence of disorder or to document potentially important subgroup differences (e.g., gender, individuals with multiple stigmas) regarding vulnerability to the effects of institutional discrimination. To increase power, we also combined individuals with same-sex and both-sex orientations. However, we reran the analyses removing bisexuals who reported being married (even though the NESARC did not assess the gender of the spouse or partner) because it is possible that they were less likely to be disadvantaged by the passage of the constitutional amendments banning gay marriage than were gay men and lesbians. Importantly, the direction and magnitude of the effects remained the same.

Finally, although the constitutional amendments largely codified policies that existed de facto, the sociocultural environment surrounding the approval of these amendments made them no less psychologically harmful. Creating constitutional amendments banning gay marriage reinforced the marginalized and socially devalued status of LGB individuals.[13–15] Moreover, the negative political campaigns against gays and lesbians by proponents of these amendments, which were well-circulated in the media,[48] further promulgated the stigma associated with homosexuality.

There are several strengths to the current study that make it an important contribution to the literature on social determinants of mental health outcomes among LGB populations. The use of a longitudinal design permitted an examination of the impact of institutional discrimination on the prevalence rates of psychiatric disorders among LGB individuals. The large number of LGB respondents (N = 577) and the use of a nationally representative sample increased the generalizability of the results. This study lends support for current policies that have sought to eliminate discriminatory acts toward LGB individuals. For example, in the United States, the US Congress recently passed the 2009 Matthew Shepard and James Byrd, Jr. Hate Crimes Prevention Act, and the Iowa Supreme Court legalized gay marriage in 2009. Results also indicate that current efforts to restrict the rights of LGB individuals (e.g., Proposition 8 in California) may have pernicious consequences for the health and well-being of the LGB community. Findings from the current study are consistent with an argument that implementing social policy changes to abolish institutional forms of discrimination may ultimately reduce mental health disparities in LGB populations, an important public health priority.[49] ■

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Contributors

M.L. Hatzenbuehler originated the study, assisted in analyses, and wrote the initial draft of the article. K.A. McLaughlin and K.M. Keyes completed the analyses. D.S. Hasin supervised the analyses. All authors interpreted the findings and edited drafts of the article. M.L. Hatzenbuehler had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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