

Article

## Cross-National Investigation of Health Indicators among Sexual Minorities in Norway and the United States

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**Abstract:** A cross-national study of young adult sexual minorities was conducted in order to explore the associations between sexual orientation and measures of depression, suicidality, and substance use. Two nationally representative data sets were explored from the United States ( $N = 14,335$ ) and Norway ( $N = 2423$ ). Results indicated that sexual minorities experienced multiple health disparities (depression, suicidality, and substance use) compared to their heterosexual counterparts. We found similar patterns of depression, suicidality, and substance use for sexual minorities in both the United States and Norway. The highest odds of substance use were among heterosexual-identified Norwegian youth who reported same-sex sexual activity, and the highest odds of suicidality were found for bisexual young adults in Norway. These findings have implications for how we consider culture and social policy as barriers and/or opportunities for sexual minorities.

**Keywords:** LGB; health disparities, MSM; WSW; culture; psychosocial adjustment

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## 1. Introduction

Population studies in the United States (U.S.) have identified patterns of multiple mental health problems experienced by those identified as sexual minorities (e.g., lesbians, gays, bisexuals), such as higher rates of depression, suicidal ideation, suicide attempts, and self-harm, compared to heterosexuals [1]. Experiences of discrimination among sexual minorities have been explored as explanations for these disparities [2,3]. A parallel body of research identified similar patterns of mental health outcomes experienced by sexual minorities across Europe [4–8].

Developmentally, adolescence is a meaningful time to capture the experiences of sexual minorities, as it is a time when many disclose their sexual identities to others and move away from the communities and relationships that served as the contexts for their early development. Research suggests that this is a particularly vulnerable developmental period for sexual minority youth [9–12]. The continual process of disclosure and concealment of one's sexual identity can be a source of significant stress to sexual minority youth and may explain observed mental health disparities [13,14].

The minority stress framework postulates that these patterns of psychosocial distress arise from the experience of discrimination, harassment, and stigma that occur as a result of social and institutional marginalization [15]. Many of the disparities found in sexual minority populations are attributed to minority stress [16]. As such, the minority stress perspective is often used as a theoretical framework in studies of psychosocial adjustment among sexual minorities [17].

Cross-national comparisons of the prevalence of negative mental health outcomes among sexual minority populations can help strengthen our understanding of the robustness of current theoretical frameworks (e.g., minority stress framework) as well as sociocultural factors that may jointly influence sexual identities, behaviors, and psychosocial adjustment. These are likely a combination of both macro- and micro-level factors that interact to create the observed patterns of mental health problems among this population. At the macro-level, “structural stigma” is theorized to operate through systemic and institutionalized practices, including social policies, which either directly (e.g., banning same-sex marriage) or indirectly (e.g., health insurance policies that only benefit heterosexual couples) relates to mental health problems [18,19]. More proximal factors, such as microaggressions, sustain a constant level of distress through daily interpersonal interactions [20]. National-level data—through prevalence estimates of mental health problems—can help provide an ecological exploration of the potential impact of these interacting forces [21].

Studies from regions with more tolerant and progressive political and social environments also identify compromised health for self-identified lesbian, gay, and bisexual (LGB) young adults [22]. An example of a “socially progressive” society where LGB young adults face compromised health is Norway [6]. Norway has led the U.S. in multiple legislative actions aimed at ensuring equal protection and decreasing discrimination of sexual minority populations, including anti-discrimination laws, open service in the armed forces, domestic partnerships, and ultimately marriage rights. Norway was the first country in the world to enact a law in 1981 that prohibited discrimination against LGB people, and in 1993 became the second nation in the world to recognize to same-sex relationships [23]. In addition, disapproval of homosexuality has been historically low in Norway among the general population and lower than in many other European nations [24]. Though the U.S. is much more racially heterogeneous and larger (in terms of population and geographic size) than Norway, the sexual minority-specific

policy differences between the two countries are vast. Because of the differing social environments between North America and Scandinavia, Norway is well positioned as a contrast to the U.S. for investigating the ecological implications of sociocultural context to the experiences of sexual minority individuals.

The main objective of this study was to examine the cross-national evidence from the U.S. and Norway for the association of sexual minority status and psychosocial adjustment. As such, we investigated whether the depression, suicidality, and substance use patterns were similar for sexual minorities in the United States and Norway.

## 2. Method

### 2.1. Participants

This study compares sexual minority and heterosexual young adults across health indicators over a similar time frame with prospective, representative data from Norway and the U.S. Two research projects have collected nationally representative data that includes sexual orientation measures in both the U.S., The National Longitudinal Study of Adolescent Health to Young Adulthood (Add Health) [25], and Norway, Young in Norway [6,22]. Though patterns in mental disorders are similar across cohorts of sexual minorities, we restrict these analyses to the wave corresponding to young adulthood for participants in order to assess the data most reflective of the current state of young adults. This allows the ability to focus on a population of young adults that had almost entirely graduated from secondary schools.

The Add Health survey began in 1994 and is one of the most comprehensive studies of adolescents and young adults in the U.S. The original in-home survey included 20,745 adolescents in grades 7 through 12 [26]. This study includes data from the wave III survey (2001; mean age = 23.05, range = 18–26 years). The number of participants totaled 14,335 young adults; of these participants, 838 participants (6%) reported both same-sex behaviors and/or identities. More than half (57%) of the sexual minority subsample was male. The sample was racially and ethnically diverse: 22% reported their race as Black and 20% of the sample reported their ethnicity as Hispanic.

Young in Norway is a representative national sample of adolescents and young adults that responded to a comprehensive questionnaire beginning in 1992 [6,22]. Every school in Norway was included in the pool from which students were drawn. The sample was stratified in terms of geographical region. We examined data from wave III (1999; mean age = 21.50, range = 19–27). Data were from 2423 young adults; 232 of these participants (9.5%) reported both same-sex attractions and identities. Table 1 displays the percentages of sexual minority participants in both Add Health and Young in Norway.

**Table 1.** Sample characteristics for Young in Norway (1999) and Add Health (2001).

	Young in Norway ( <i>N</i> = 2423, <i>M</i> Age = 21.50)		Add Health ( <i>N</i> = 14335, <i>M</i> Age = 23.05)	
	<i>n</i>	% of sample	<i>n</i>	% of sample
Heterosexual	2191	90.4	13,497	94.2
Gay/Lesbian	57	2.4	223	1.6
Bisexual	84	3.5	230	1.6
SSBH	91	3.8	385	2.7

Note: SSBH = same-sex behavior heterosexual participants.

## 2.2. Measures

All measures were self-reported. We used sexual orientation measures to identify our study population. Measures of depression, suicide attempts, alcohol, marijuana, hard drug use, and smoking (outcome variables) were used to explore whether or not sexual minorities reported different experiences than their heterosexual counterparts in Norway compared to the U.S. These particular measures were chosen because recent research has indicated that sexual minorities across the world experience different rates of mental health and substance use [4–8].

### 2.2.1. Sexual Behavior

For Add Health, two items asked participants: “Considering all types of sexual activity, with how many (female/male) partners have you ever had sex?” To identify young adults that engaged in same-sex behavior, we matched individuals where their response to the sex question (male/female) was concordant with their response to the sexual behavior question indicating they had sex with the same or both sexes. We dichotomized this variable as 0 (*no same-sex experiences*) and 1 (*at least one same-sex experience*). For Young in Norway, one item asked participants whether they ever “had any kind of sexual relations with persons of the same gender as yourself?” Responses were 0 (*no*) and 1 (*yes*).

### 2.2.2. Sexual Identity

For Add Health, one item asked the participant to “Choose the description that best fits how you think about yourself.” Response options included: 1 (*heterosexual*), 2 (*mostly heterosexual, but somewhat attracted to people of your own sex*), 3 (*bisexual—that is, attracted to men and women equally*), 4 (*mostly homosexual, but somewhat attracted to people of the opposite sex*), 5 (*homosexual*), 6 (*not sexually attracted to either males or females*), 7 (*refused*), and 8 (*do not know*). We coded responses of 1 and 2 as *heterosexual*, 3 as *bisexual*, and 4 and 5 as *gay/lesbian*. Because a small body of research suggests that the “mostly heterosexual” participants might constitute a group with significantly different outcomes compared to their heterosexual and LGB counterparts [9], we first separately conducted sensitivity analyses with a separate group for “mostly heterosexuals” using the Add Health data. The patterns in health outcomes for these two groups were similar compared to heterosexuals. In line with other studies that have used this data [26], we grouped together heterosexual and mostly heterosexual participants.

For Young in Norway, sexual identity was assessed using a single item: “How would you rate yourself on a scale from absolutely heterosexual to absolutely homosexual?” Response options included: 1 (*only heterosexual*), 2 (*mainly heterosexual, to a very small extent homosexual/lesbian*), 3 (*mainly heterosexual, to some extent homosexual/lesbian*), 4 (*about as much homosexual/lesbian as heterosexual*), 5 (*mainly homosexual/lesbian, to some extent heterosexual*), 6 (*mainly homosexual/lesbian, to a very small extent heterosexual*), or 7 (*only homosexual/lesbian*). Similar to the Add Health measure, we coded responses of 1, 2, and 3 as heterosexual, 4 as bisexual, and 5, 6, and 7 as gay/lesbian participants.

We used both sexual behavior and identity measures in Add Health and Young in Norway to identify a group of young adults who reported same-sex behaviors and a heterosexual identity (SSBH).

### 2.2.3. Depressive Symptoms

For Add Health, depressive symptoms were measured by a summation of a 20-item modified version of the Center for Epidemiologic Studies Depression Scale (CES-D) [27]. The 20 items were scored from 0 (*never*) to 3 (*daily*) and reflected the frequency of depressive symptoms reported during the past week; the CES-D depressive symptoms scale ranged from a possible 0 (*no symptoms*) to 60 (*most frequent depressive symptoms*). Based on previous research [28,29], depression was defined by cut-off scores of 24 for females and 22 for males on the basis of ability to detect Diagnostic and Statistical Manual of Mental Disorders (DSM)-defined depression, which is considered predictive but not diagnostic of major depressive disorders among adolescents. For Young in Norway, depressive symptoms reported during the past two weeks were measured on a four-point scale using a summation of Kandel and Davies's [30] six-item measure of depressed mood, derived from the Johns Hopkins Symptom Checklist [31]. Responses ranged from 0 (*not bothered or troubled by symptoms*) to 24 (*most bothered or troubled*). Symptoms included, for example, "feeling hopeless about the future" and "feeling unhappy, sad, or depressed". According to previous research which has indicated that a cutoff score of 3 yields prevalence rates in line with the estimated prevalence in Norway [6], we dichotomized this variable so that scores below 3 were coded as 0, and scores above 3 were coded as 1.

### 2.2.4. Suicide Attempts

For Add Health, one item asked: "During the past 12 months, how many times did you actually attempt suicide?" Response options included 0 (*0 times*), 1 (*1 time*), 2 (*2 or 3 times*), 3 (*4 or 5 times*), and 4 (*6 or more times*). We dichotomized this item to represent participants that had never attempted suicide (0) and who had attempted suicide one or more times (1). For Young in Norway, suicide attempt was measured using one item that asked: "Have you ever tried to commit suicide?" Responses were 0 (*no*) and 1 (*yes*).

### 2.2.5. Alcohol Use

For Add Health, one item asked: "Over the past 12 months, on how many days have you gotten drunk or 'very, very high' on alcohol?" Response options ranged from 0 (*never*), 1 (*once a month or less*), 2 (*1 or 2 days in the past month*), 3 (*2 or 3 days a month*), 4 (*1 or 2 days a week*), 5 (*3 to 5 days a week*), and 6 (*every day/almost every day*). We dichotomized this item to represent participants that had never gotten drunk (0) and those who had gotten drunk one or more times (1) in the past year. For Young in Norway, one item asked: "Have you taken part in/done any of these actions in the last 12 months?—Drunk so much that you clearly felt drunk." Response options ranged from 0 (*never*) to 6 (*more than 50 times*). We dichotomized this item to represent participants that had never gotten drunk (0) and who had gotten drunk one or more times (1).

### 2.2.6. Marijuana Use

For Add Health, one item assessed marijuana use: "How old were you when you tried marijuana for the first time? If you never tried marijuana, enter '0'." Response options ranged from 0 to 18+ years. We reverse-coded and dichotomized this item to represent participants that had never used marijuana (0)

and who had used marijuana (1). For Young in Norway, one item assessed marijuana use by asking: “Have you ever used hash or marijuana?” Response options were 0 (*no*) and 1 (*yes*).

#### 2.2.7. Hard Drug Use

For Add Health, one item assessed hard drug use: “How old were you when you first tried any other type of illegal drug, such as LSD, PCP, ecstasy, mushrooms, speed, ice, heroin, or pills, without a doctor’s prescription? If you never tried any other type of illegal drug, enter ‘0’.” Response options ranged from 0 to 18+ years. We dichotomized this item to represent participants who had never used hard drugs (0) and those who had used hard drugs at least once in their life (1). For Young in Norway, one item assessed hard drug use: “Have you taken part in any of the following: been using other drugs (like heroin, cocaine, LSD, *etc.*)”. Response options ranged from 0 (*never*) to 6 (*more than 50 times*). For the logistic regression, we dichotomized this item to represent participants that had never done hard drugs (0) and who had done hard drugs (1).

#### 2.2.8. Cigarette Use

For Add Health, smoking was assessed by one item that asked participants if they had ever smoked. Response options were 0 (*no*) and 1 (*yes*). For Young in Norway, one item assessed smoking: “Do you smoke?” Responses to this item were: 1 (*have never smoked, have never smoked regularly and do not smoke at all now*), 2 (*have smoked regularly and have quit now*), 3 (*do smoke but not daily*), and 4 (*smoke daily*). We dichotomized this item to represent participants who had never smoked (options 1 and 2) and participants that had at least regularly smoked in their lifetime (coded 1).

### 2.3. Statistical Approach

In order to address our research question (*i.e.*, are the patterns in psychosocial adjustment similar for sexual minorities in the U.S. and Norway?), we examined the patterns of psychosocial adjustment using logistic regressions. We inquired whether sexual minorities differed from their sexual majority counterparts in Norway and in the U.S. separately. We adjusted for age, sex, ethnicity, and region in Add Health and for age, sex, and region in Young in Norway. Though the Young in Norway survey included an item about ethnicity, 99% of the sample was Caucasian; thus, analyses were not adjusted for this variable.

## 3. Results

The correlations among outcome variables were similar between the U.S. and Norway (see Table 2). One difference was in the behavioral correlates of suicide attempts. In the U.S., but not Norway, suicide attempts were correlated with substance use. Overall, suicide attempts were most prevalent for SSBH in Norway and bisexuals in the U.S. In general, reports of getting drunk were more common in Norway compared to the U.S. and reports of using marijuana were more common in the U.S. compared to Norway. In addition, heterosexuals were less likely to smoke in Norway compared to their counterparts in the U.S.

**Table 2.** Bivariate Pearson correlations and prevalence for outcome variables in U.S. and Norway.

Dependent Variable	Suicide Attempts	Got Drunk	Marijuana Use	Hard Drug Use	Ever Smoked	Depressive Sym.
Suicide Attempts		0.10 **	0.07 **	0.12 **	0.05 **	0.19 **
Got Drunk	-0.01		0.01	0.71 **	0.20 **	-0.05 **
Marijuana Use	0.08	0.25 **		0.27 **	0.03 **	0.01
Hard Drug Use	0.03	0.07 **	0.49 **		0.15 **	0.02
Cigarette Use	0.10	0.28 **	0.32 **	0.13 **		-0.01
Depressive Symptoms	0.25 **	0.32 *	0.08 **	0.10 **	0.04	
U.S. Prevalence (%)						
Heterosexual	5.9	57.0	69.0	8.0	72.5	10.0
Gay/Lesbian	19.1	52.2	83.5	20.3	81.5	16.1
Bisexual	21.7	50.6	84.2	18.4	86.9	23.0
SSBH	13.6	59.3	76.7	12.5	78.5	17.4
Norway Prevalence (%)						
Heterosexual	7.0	77.3	16.0	3.1	44.5	5.3
Gay/Lesbian	12.2	87.0	32.3	19.4	64.5	11.6
Bisexual	33.3	86.4	34.8	7.6	60.6	5.3
SSBH	40.1	73.5	47.6	31.1	81.2	37.4

Notes: \*\*  $p < 0.01$ , \*  $p < 0.05$ ; Values above the diagonal (in light grey shading) represent young adults in the United States, values below the diagonal (in dark grey shading) represent young adults in Norway; prevalence percentages for U.S. and Norway indicate the percentage of participants indicating “yes” or “1+ times” to outcome variables; “Depressive Sym.” is an abbreviation of depressive symptoms; SSBH = same-sex behavior heterosexual participants.

### 3.1. United States-Specific Findings

In Table 3, we present the odds ratios of sexual minority young adult outcomes in the U.S. Gay/lesbian young adults had higher odds of reporting suicide attempts, using marijuana and hard drugs, smoking, and depressive symptoms compared to their heterosexual counterparts. Bisexual young adults had higher odds of attempting suicide, using marijuana and hard drugs, and smoking compared to heterosexuals. SSBH young adults had higher odds of attempting suicide and using marijuana and hard drugs compared to heterosexuals.

**Table 3.** Odds of mental health and substance use outcomes among sexual minorities compared to heterosexuals (2001) in the U.S.

	U.S. Young Adults (2001)		
	Gay (n = 223) AOR (95% CI)	Bisexual (n = 230) AOR (95% CI)	SSBH (n = 385) AOR (95% CI)
Suicide Attempts	3.79 (2.52–5.70) ***	4.30 (2.92–6.31) ***	2.42 (1.62–3.61) ***
Got Drunk	0.80 (0.52–1.24)	0.76 (0.49–1.19)	1.20 (0.89–1.60)
Marijuana Use	2.40 (1.50–3.86) ***	2.36 (1.50–3.70) ***	1.60 (1.13–2.29) **
Hard Drug Use (LSD, heroin)	3.25 (2.31–4.56) ***	2.50 (1.75–3.58) ***	1.55 (1.11–2.17) *
Cigarette Use	1.72 (1.21–2.47) ***	2.51 (1.67–3.76) ***	1.28 (0.95–1.66)
Depressive Symptoms	2.33 (1.18–3.31) ***	3.04 (1.72–4.02) ***	1.88 (1.03–3.01) *

Notes: Separate model from logistic regression presented in Table 3; \*\*\* Denotes the odds significant from reference group (heterosexual-identified, other-sex sexual behavior) at  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ ; adjusted for age, sex, ethnicity, and region; AOR = adjusted odds Ratio; CI = confidence interval; SSBH = same-sex behavior heterosexual participants.

### 3.2. Norway-Specific Findings

Table 4 presents the odds ratios for sexual minority young adult outcomes in Norway. Gay/lesbian, bisexual, and SSBH young adults had higher odds of using substances including hard drugs, marijuana, and smoking compared to their heterosexual counterparts. In addition, bisexuals had higher odds of attempting suicide compared to heterosexuals.

**Table 4.** Odds of mental health and substance use among sexual minorities compared to heterosexuals (1999) in Norway.

	Norwegian Young Adults (1999)		
	Gay ( <i>n</i> = 57)	Bisexual ( <i>n</i> = 84)	SSBH ( <i>n</i> = 91)
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Suicide Attempts	1.65 (0.46–5.93)	5.47 (1.45–20.67) *	1.71 (0.67–4.42)
Got Drunk	4.57 (0.62–33.85)	2.07 (0.90–4.82)	0.90 (0.50–1.62)
Marijuana Use	4.20 (2.63–6.72) ***	2.79 (1.74–4.47) ***	4.13 (1.85–9.22) **
Hard Drug Use (LSD, heroin)	12.20 (4.70–31.63) ***	5.53 (2.61–11.72) ***	4.85 (2.30–10.23) ***
Cigarette Use	2.59 (1.16–5.79) *	2.10 (1.32–3.36) **	2.51 (1.59–3.95) ***
Depressive Symptoms	7.70 (3.24–18.32) ***	0.94 (0.12–6.90)	10.68 (3.00–37.98) ***

Notes: Separate model from logistic regression presented in Table 4; \*\*\* Denotes the odds significant from reference group (heterosexual-identified, other-sex sexual behavior) at  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$ . Adjusted for age, sex, and region; AOR = adjusted odds ratio; CI = confidence interval; we attribute several large confidence intervals presented to smaller sample sizes and rare-occurring outcomes (e.g., hard drug use). SSBH = same-sex behavior heterosexual participants.

## 4. Conclusions

This was the first study to compare nationally representative data on sexual orientation using measures of behavior and identity from two Western countries at similar time points. Most research on sexual orientation (including nationally representative and non-probability samples) has only used reports of desire, behavior, or identity [32], and scholars are rarely able to measure desire, behavior, and identity within the same sample. In addition, to our knowledge, this is the first study that addressed outcomes of SSBH young adults in comparison to their LGB and heterosexual peers across multiple samples.

Overall, we found similar patterns of health behaviors and outcomes for sexual minorities in both the U.S. and Norway. We found that SSBH young adults reported the worst mental health outcomes in Norway compared to their heterosexual counterparts, and that this population significantly differed on reports of substance use and depression between Norway and the U.S. Our findings corroborated previous studies utilizing the same dataset in the U.S. In these previous studies, sexual minorities reported more depression and were more likely to have attempted suicide [9,33] and to use alcohol [34]. In addition, gays and bisexuals reported a significantly worse adjustment (in terms of depression and suicidality) and more substance use compared to their heterosexual counterparts in both countries.

With regard to these findings, we propose two possible explanations: (1) there may have been differences in outcomes across countries because of differences in progressiveness and political contexts

and/or (2) people who live in cultures where they are stigmatized may report negative adjustment regardless of progressive policies. In short, it is difficult to identify the social influences of sexuality-based disparities. We believe that our findings provide the most support for the importance of societal attitudes and suggest that more proximal influences (such as microaggressions) impact behavioral and psychological factors of minorities. Future research is needed to directly test these propositions.

There are other potential explanations that may explain these findings as well. For example, perhaps some other aspect of being a sexual minority (other than stress incurred as a result of social forces) is related to risk-taking, risk-seeking, or the desire for novelty or sensory stimulation that might be associated with health risks in the long term. This might be especially likely for those who identify as heterosexual but engage in sex with the same gender. Sensation-seeking is a personality trait that may predispose an individual toward substance use and mental health problems [35]. Heterosexual-identified individuals who exhibit higher levels of this personality trait may also be predisposed to same-sex sexual behaviors [36].

The implications of discrimination and pervasive stigma throughout Norwegian and North American culture may potentially explain our findings. Health disparities persist after the implementation of more supportive policies toward sexual minorities [23]. Indeed, there is evidence that the cultural significance of homosexuality in Norway has changed significantly over the past 30 years, as today Norwegians are more accepting toward lesbians and gay men [37]. However, conditions that reproduce attitudes of homosexuality as unwanted, inferior, and shameful still exist. Individuals excluded (e.g., homeless queer youth) from laws that support sexual minorities (e.g., same-sex marriage laws, enumerated harassment policies at school) may not benefit from such policies.

The stigma associated with homosexuality [38] and the cultural mechanisms associated with stigma and worse mental health [39] may account for the disparities found in both countries. The differences in outcomes for SSBH populations support this interpretation: SSBH participants in Norway report some of the largest disparities in marijuana use, hard drug use, and smoking compared to their heterosexual counterparts. This population engages in same-sex behaviors but does not identify as sexual minorities. This group may be subject to “double jeopardy” minority stress. In other words, these young adults might be stigmatized by both heterosexuals and self-identified sexual minorities. One potential explanation for this may be that the SSBH group of young adults is more likely to experiment with more than just sexual identity. Perhaps same-sex sexual behavior in itself does not represent a causal pathway toward drug use or depression for young adults that tend to experiment more. This has implications for interventions: programs can help these young adults find congruency in their definitions of sexual identity by revealing the implications of the unique components of sexual orientation. In addition, interventions should educate sexual minority individuals about strategies that help to cope with stigma-based discrimination [40] and avoid “blaming the victim” [41].

Despite the strengths of this paper, limitations on examining these data exist. At wave III, Add Health and Young in Norway did not ask about sexual identity milestones, first sexual experiences, disclosing sexual identity, or stigma attributed to sexual orientation. However, this remains a challenge when using nationally representative datasets that are commonly designed to capture the experience of the majority. Typically, only non-population-based sampling techniques have included sexuality-specific measures to understand sexual identity development.

In addition, there are many challenges to comparing nationally representative datasets. There are several instances where measures do not operationalize a construct with consistent items, yet we took special care to choose and dichotomize measures in a way that captured the essence of the health outcome. For example, smoking prevalence was measured in the past year for the U.S., but over the lifetime in Norway. Add Health measured suicide attempts in the past year, whereas Young in Norway asked about lifetime suicide attempts. We acknowledge that these are significant differences in measurement across both countries, but at the same time, we believe that the dichotomization of all variables reduces extreme variability that might have skewed country comparisons.

Sexual minority status is difficult to operationalize and compare across datasets. It is possible that some respondents who endorsed “homosexual” or “mostly homosexual” were reporting their patterns of attraction but did not conceive of themselves as a gay or lesbian person. In some cases, an identity is likely to be accompanied by a sense of belonging to a sexual minority community, which could serve as a buffer from societal stigma. Future studies should continue to examine “mostly heterosexual” participants, as this has been found to be a group of sexual identities with unique outcomes [9].

Researchers should pay special attention to why sexual minorities might be performing better in some areas compared to others, whether across regions in one country or across multiple countries. In addition, when conducting cross-cultural comparisons, scholars should consider what it means to be different (e.g., a gay man) in a country that might be more racially homogenous than another. Ideally, data should be used that incorporates measures of cultural norms, bias-based discrimination, sexuality-specific measures (such as parent support of sexual orientation), and attitudes about social policies designed for minorities. In addition, scholars should consider the role of policy timing and developmental trajectories: research should be sensitive to whether enough time has passed to facilitate developmental (as young adults mature) or historical change (policy changes may need substantial time to have an effect on health at the level of the individual) for differences to be detected between the U.S. and Norway. Other factors that may be important for more complete discussions of these topics are family composition (e.g., number of siblings), targets and timelines of disclosure for youth and young adults (e.g., have individuals disclosed their sexual orientation to family, friends, peers?), gender differences in stigmatization, visibility of LGB role models, and educational differences.

In conclusion, Norwegian young adults were found to report compromised outcomes at rates comparable to the U.S. Norwegian heterosexuals who engage in same-sex sexual activity reported higher rates of these health outcomes compared to their U.S. counterparts. From a public health perspective, stakeholders should investigate strategies in addition to policy-level interventions in order to help sexual minorities cope with the multiple disparities reported in the U.S. and Norway.

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### Author Contributions

Ryan J. Watson was involved in all aspects of the manuscript. Co-authors Stephen Russell and Christopher Wheldon contributed to the conception and design, and critically revised the analysis. Co-author Lars Wichstrøm contributed to acquisition, analysis, and interpretation of the data and critically revised the manuscript.

### Conflicts of Interest

The authors declare no conflict of interest.

### Abbreviations

LGB: lesbian, gay, bisexual;

SSBH: same-sex behavior heterosexuals (individuals with heterosexual identities who also engage in sex with the same gender).

### References

1. Michael King, Joanna Semlyen, Sharon See Tai, Helen Killaspy, David Osborn, Dmitri Popelyuk, and Irwin Nazareth. "A systematic review of mental disorder, suicide, and deliberate self harm in lesbian, gay and bisexual people." *BMC Psychiatry* 8 (2008): 70–87.
2. Vickie M. Mays, and Susan D. Cochran. "Mental health correlates of perceived discrimination among lesbian, gay, and bisexual adults in the United States." *American Journal of Public Health* 91 (2001): 1869–76.
3. Susan D. Cochran. "Emerging issues in research on lesbians' and gay men's mental health: Does sexual orientation really matter?" *American Psychologist* 56 (2001): 931–47.
4. Apu Chakraborty, Sally McManus, Terry S. Brugha, Paul Bebbington, and Michael King. "Mental health of the non-heterosexual population of England." *The British Journal of Psychiatry* 198 (2012): 143–48.
5. Theo G. Sandfort, Floor Bakker, François G. Schellevis, and Ine Vanwesenbeeck. "Sexual orientation and mental and physical health status: Findings from a Dutch population survey." *American Journal of Public Health* 96 (2006): 1119–25.
6. Lars Wichstrøm. "The emergence of gender difference in depressed mood during adolescence: The role of intensified gender socialization." *Developmental Psychology* 35 (1999): 232–45.
7. Lars Wichstrøm, and Kristinn Hegna. "Sexual orientation and suicide attempt: A longitudinal study of the general Norwegian adolescent population." *Journal of Abnormal Psychology* 112 (2003): 144–51.

8. Jen Wang, Michael Häusermann, Hans Wydler, Meichun Mohler-Kuo, and Mitchell G. Weiss. "Suicidality and sexual orientation among men in Switzerland: Findings from 3 probability surveys." *Journal of Psychiatric Research* 46 (2012): 980–86.
9. Michael P. Marshal, Sarah S. Dermody, Michelle L. Shultz, Gina S. Sucato, Stephanie D. Stepp, Tammy Chung, Chad M. Burton, Nina Markovic, and Alison E. Hipwell. "Mental health and substance use disparities among urban adolescent lesbian and bisexual girls." *Journal of the American Psychiatric Nurses Association* 19 (2013): 271–79.
10. Assaf Oshri, Elizabeth D. Handley, Tara E. Sutton, Sanne Wortel, and Mandi L. Burnette. "Developmental trajectories of substance use among sexual minority girls: Associations with sexual victimization and sexual health risk." *Journal of Adolescent Health* 55 (2014): 100–06.
11. Emmet Power, Helen Coughlan, Mary Clarke, Ian Kelleher, Fionnuala Lynch, Dearbhla Connor, Carol Fitzpatrick, Michelle Harley, and Mary Cannon. "Nonsuicidal self-injury, suicidal thoughts and suicide attempts among sexual minority youth in Ireland during their emerging adult years." *Early Intervention in Psychiatry*, 2015. doi:10.1111/eip.12249.
12. Amelia E. Talley, Kenneth J. Sher, Douglas Steinley, Phillip K. Wood, and Andrew K. Littlefield. "Patterns of alcohol use and consequences among empirically derived sexual minority subgroups." *Journal of Studies on Alcohol and Drugs* 73 (2012): 290–302.
13. Jane A. Bybee, Eric L. Sullivan, Erich Zielonka, and Elizabeth Moes. "Are gay men in worse mental health than heterosexual men? The role of age, shame and guilt, and coming-out." *Journal of Adult Development* 16 (2009): 144–54.
14. Margaret Rosario, Eric W. Schrimshaw, and Joyce Hunter. "Disclosure of sexual orientation and subsequent substance use and abuse among lesbian, gay, and bisexual youths: Critical role of disclosure reactions." *Psychology of Addictive Behaviors* 23 (2009): 175–84.
15. Perry N. Halkitis, Daniel E. Siconolfi, Christopher B. Stults, Staci Barton, Kristen Bub, and Farzana Kapadia. "Modeling substance use in emerging adult gay, bisexual, and other YMSM across time: The P18 cohort study." *Drug and Alcohol Dependence* 145 (2014): 209–16.
16. Ilan H. Meyer. "Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: Conceptual issues and research evidence." *Psychological Bulletin* 129 (2003): 674–97.
17. Robert M. Kertzner, Mary E. Barber, and Alan Schwartz. "Mental health issues in LGBT seniors." *Journal of Gay & Lesbian Mental Health* 15 (2011): 335–38.
18. Mark L. Hatzenbuehler. "Structural stigma and the health of lesbian, gay, and bisexual populations." *Current Directions in Psychological Science* 23 (2014): 127–32.
19. Mark L. Hatzenbuehler, Katie A. McLaughlin, Katherine M. Keyes, and Deborah S. Hasin. "The impact of institutional discrimination on psychiatric disorders in lesbian, gay, and bisexual populations: A prospective study." *American Journal of Public Health* 100 (2010): 452–59.
20. Kevin L. Nadal, Marie-Anne Issa, Jayleen Leon, Vanessa Meterko, Michelle Wideman, and Yinglee Wong. "Sexual orientation microaggressions: 'Death by a thousand cuts' for lesbian, gay, and bisexual youth." *Journal of LGBT Youth* 8 (2011): 234–59.
21. Ivan Vallier. *Comparative Methods in Sociology: Essays on Trends and Applications*. Berkeley: University of California Press, 1973.
22. Kristinn Hegna, and Lars Wichstrøm. "Suicide attempts among Norwegian gay, lesbian and bisexual youths general and specific risk factors." *Acta Sociologica* 50 (2007): 21–37.

23. Tone Hellesund. "Norway." In *The Greenwood Encyclopedia of LGBT Issues Worldwide*, 2nd ed., Edited by Chuck Stewart. Santa Barbara: Greenwood Press, 2009, pp. 306–20.
24. Hanneke van den Akker, Rozemarijn van der Ploeg, and Peer Scheepers. "Disapproval of homosexuality: Comparative research on individual and national determinants of disapproval of homosexuality in 20 European countries." *International Journal of Public Opinion Research* 25 (2013): 64–86.
25. Stephen T. Russell, and Russell B. Toomey. "Risk and protective factors for suicidal thoughts among sexual minority youth: Evidence from the Add Health study." *Journal of Gay & Lesbian Mental Health* 17 (2013): 132–49.
26. Stephen T. Russell, and Kara Joyner. "Adolescent sexual orientation and suicide risk: Evidence from a national study." *Journal Information* 91 (2001): 1276–81.
27. Elizabeth Goodman, and John Capitman. "Depressive symptoms and cigarette smoking among teens." *Pediatrics* 106 (2000): 748–55.
28. Traci L. Steuber, and Fred Danner. "Adolescent smoking and depression: Which comes first?" *Addictive Behaviors* 31 (2006): 133–36.
29. Robert E. Roberts, Peter M. Lewinsohn, and John Seeley. "Screening for adolescent depression: A comparison of depression scales." *Journal of the American Academy of Child & Adolescent Psychiatry* 30 (1991): 58–66.
30. Denise B. Kandel, and Mark Davies. "Epidemiology of depressed mood in adolescents: An empirical study." *Archives of General Psychiatry* 39 (1982): 1205–12.
31. Leonard R. Derogatis, Ronald S. Lipman, Karl Rickels, Eberhard H. Uhlenhuth, and Lino Covi. "The Hopkins Symptom Checklist (HSCL): A self-report inventory." *Behavioral Science* 19 (1974): 1–15.
32. Stephen T. Russell, Hinda Seif, and Nhan L. Truong. "School outcomes of sexual minority youth in the United States: Evidence from a national study." *Journal of Adolescence* 24 (2001): 111–27.
33. Ann P. Haas, Mickey Eliason, Vickie M. Mays, Robin M. Mathy, Susan D. Cochran, Anthony R. D'Augelli, Morton M. Silverman, Prudence W. Fisher, Tonda Hughes, Margaret Rosario, and *et al.* "Suicide and suicide risk in lesbian, gay, bisexual, and transgender populations: Review and recommendations." *Journal of Homosexuality* 58 (2010): 10–51.
34. Belinda L. Needham. "Sexual attraction and trajectories of mental health and substance use during the transition from adolescence to adulthood." *Journal of Youth and Adolescence* 41 (2012): 179–90.
35. Jonathan W. Roberti. "A review of behavioral and biological correlates of sensation seeking." *Journal of Research in Personality* 38 (2004): 256–79.
36. Karen F. Trocki, Laurie A. Drabble, and Lorraine T. Midanik. "Tobacco, marijuana, and sensation seeking: Comparisons across gay, lesbian, bisexual, and heterosexual groups." *Psychology of Addictive Behaviors* 23 (2009): 620–31.
37. Norman Anderssen, and Tone Hellesund. "Heteronormative consensus in the Norwegian same-sex adoption debate." *Journal of Homosexuality* 56 (2009): 102–20.
38. Ilan H. Meyer. "The health of sexual minorities." In *Handbook of Health Psychology*, 2nd ed. Edited by Andrew Baum, Tracey A. Revenson and Jerome E. Singer. New York: Psychology Press, 2012, pp. 595–615.

39. Erving Goffman. *Stigma: Notes on the Management of Spoiled Identity*. Englewood Cliffs: Prentice-Hall, 1963.
40. Ilan H. Meyer, and Ronald Bayer. "School-based gay-affirmative interventions: First Amendment and ethical concerns." *American Journal of Public Health* 103 (2013): 1764–71.
41. Virginia Uribe, and Karen M. Harbeck. "Addressing the needs of lesbian, gay, and bisexual youth: The origins of PROJECT 10 and school-based intervention." *Journal of Homosexuality* 22 (1992): 9–28.
42. The National Longitudinal Study of Adolescent to Adult Health (Add Health). Available online: <http://www.cpc.unc.edu/addhealth> (accessed on 27 October 2015).

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