

# Is Sexual Orientation Related to Mental Health Problems and Suicidality in Young People?

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**Background:** This study examines the extent to which gay, lesbian, and bisexual young people are at increased risk of psychiatric disorder and suicidal behaviors using data gathered on a New Zealand birth cohort studied to age 21 years.

**Methods:** Data were gathered during the course of the Christchurch Health and Development Study, a 21-year longitudinal study of a birth cohort of 1265 children born in Christchurch, New Zealand. At 21 years of age, 1007 sample members were questioned about their sexual orientation and relationships with same-sex partners since the age of 16 years. Twenty-eight subjects (2.8%) were classified as being of gay, lesbian, or bisexual sexual orientation. Over the period from age 14 to 21 years, data were gathered on a range of psychiatric disorders that included major depression, generalized anxiety disorder, conduct disorder, and substance use disorders. Data were also gathered on suicidal ideation and suicide attempts.

**Results:** Gay, lesbian, and bisexual young people were at increased risks of major depression (odds ratio [OR], 4.0; 95% confidence interval [CI], 1.8-9.3), generalized anxiety disorder (OR, 2.8; 95% CI, 1.2-6.5), conduct disorder (OR, 3.8; 95% CI, 1.7-8.7), nicotine dependence (OR, 5.0; 95% CI, 2.3-10.9), other substance abuse and/or dependence (OR, 1.9; 95% CI, 0.9-4.2), multiple disorders (OR, 5.9; 95% CI, 2.4-14.8), suicidal ideation (OR, 5.4; 95% CI, 2.4-12.2), and suicide attempts (OR, 6.2; 95% CI, 2.7-14.3).

**Conclusions:** Findings support recent evidence suggesting that gay, lesbian, and bisexual young people are at increased risk of mental health problems, with these associations being particularly evident for measures of suicidal behavior and multiple disorder.

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**I**N RECENT years, there has been growing concern and debate about the extent to which young people of gay, lesbian, or bisexual (GLB) sexual orientation are at increased risk of mental health problems.<sup>1-5</sup> These issues have emerged in clear relief in the context of debates about whether GLB young people are at increased risk of suicide and suicidal behaviors. Specifically, it has been argued that because of a series of social processes that center on homophobic attitudes, GLB youth are exposed to serious personal stresses that increase their likelihood of suicidal behavior.<sup>6-8</sup> However, a reappraisal of these claims showed them not to be well founded in evidence, and reviews of this issue concluded that problems in existing research were such that no clear conclusions about the role of sexual orientation in suicidal behavior could be drawn.<sup>7,8</sup>

Nonetheless, in the last 2 years there have been an increasing number of studies that have compared representative samples of GLB youth with heterosexual controls, with these studies all suggesting increased rates of suicide attempts among GLB youth. Bagley and Tremblay<sup>1</sup>

in a study of 82 homosexual or bisexual men aged 18 to 27 years and 668 heterosexual men found that rates of suicidal behaviors were nearly 14 times higher among the gay or bisexual subjects. Garofalo et al<sup>2</sup> compared 104 GLB high school students with 4055 high school students identifying themselves as heterosexual. They found rates of suicide attempt among the GLB subjects that were more than 3.5 times

*See also pages 883, 885, and 887*

higher than among the control subjects. Similarly, Remafedi et al<sup>3</sup> compared 394 GLB high school students with 336 heterosexual controls. Their findings showed that the GLB subjects had odds of suicide attempt that were 7.1 times higher than heterosexual controls and odds of suicidal intent that were 3.6 times higher. The weight of evidence from these studies clearly supports the view that GLB sexual orientation acts as a risk factor for suicidal behaviors.

In contrast to the growing body of literature on sexual orientation and suicide, there is less systematic evidence on the extent to which GLB youth are at greater risk of mental health problems, although there

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## SUBJECTS AND METHODS

### SUBJECTS

The data described in this report were gathered during the course of the Christchurch Health and Development Study, a longitudinal study of a birth cohort of New Zealand-born children who have been studied from birth to age 21 years. The cohort was based on an unselected sample of births (635 men; 630 women) occurring in the Christchurch urban region during mid-1977. The cohort has now been studied at birth, 4 months of age, 1 year of age, annual intervals to the age of 16 years, and again at ages 18 and 21 years. The present analysis is based on a sample of 1007 subjects for whom data on sexual orientation were available. This sample represented 80% of the original cohort of 1265 subjects. Comparison of the sample of 1007 subjects with the original cohort of 1265 subjects showed that the obtained sample did not differ from the original cohort in terms of sex, ethnic status, or family size. However, there were small but statistically significant tendencies for the obtained sample to underrepresent children of young mothers ( $P = .046$ ), children born into single parent families ( $P < .001$ ), and children from families of low socioeconomic status ( $P < .001$ ). It is unlikely that these small departures from random sample loss assumptions will materially influence the validity of the present analysis since the factors related to sample loss were uncorrelated with sexual orientation (see the "Social, Family, and Childhood Factors" subsection of the "Subjects and Methods" section).

### SEXUAL ORIENTATION

When cohort members were aged 21 years, they were questioned in detail about their sexual orientation. This questioning involved asking the subjects to nominate their sexual orientation on a 3-fold classification in terms of heterosexual, homosexual (gay or lesbian), or bisexual. Following this, subjects were questioned about their sexual relationships with same-sex and different-sex partners. This questioning covered the numbers of same-sex and different-sex partners with whom the respondent had a sexual relationship since the age of 16 years. All questioning was conducted by trained survey interviewers recruited for the project, and the interview was administered personally and in private. Of the 1007 subjects questioned at age 21 years, 20 (2%) identified themselves as GLB. In addition, a further 8 subjects self-identified as heterosexual but disclosed that they had had sexual relationships with a same-sex partner since the age of 16 years. Using this information,

a classification of GLB orientation was constructed by including into the definition all of those who reported GLB sexual orientation or those reporting having same-sex partnerships. Of the 28 subjects (11 men; 17 women) classified as GLB, 24 (86%) reported having sexual relationships with a same-sex partner since the age of 16 years. Of the 20 subjects reporting that their sexual orientation was GLB, 9 were male and 11 were female.

### PSYCHIATRIC DISORDER

To examine the association between sexual orientation and psychopathology, a series of measures of the prevalence of psychiatric disorder observed over the period from age 14 to 21 years was constructed. The decision to assess long-term psychopathologic characteristics rather than current mental state was made on the grounds that stresses related to GLB sexual orientation were likely to have occurred throughout adolescence and into young adulthood and, accordingly, the effects of these stresses on adjustment would be more accurately reflected in the long-term prevalence of disorder rather than in measures of current disorder. Accounts of the measurement of psychiatric disorder in the cohort over the period from age 14 to 21 years have been given in a number of Christchurch Health and Development Study publications.<sup>12-17</sup> In the interests of brevity, a short summary of these accounts is given below.

When cohort members were aged 15 and 16 years, subjects and their parents were interviewed using structured interview schedules that examined various aspects of the young person's mental health over the preceding year. These interviews combined elements of the *Diagnostic Interview for Children*,<sup>18</sup> the *Diagnostic Interview Schedule*,<sup>19</sup> the *Self-Report Early Delinquency Scale*,<sup>20</sup> and the *Rutgers Alcohol Problems Index*<sup>21</sup> together with some custom-written survey items to assess *DSM-III-R* symptom criteria for common psychiatric disorders. Using this information, the parent and self-report symptom data were combined to classify subjects on the following *DSM-III-R* diagnoses: major depression, generalized anxiety disorder, conduct disorder, nicotine dependence, and alcohol and other illicit substance abuse and/or dependence.

At ages 18 and 21 years, subjects were again interviewed on a structured schedule that examined the young person's mental health over the period from ages 16 to 18 years and 18 to 21 years, respectively. This interview used the *Composite International Diagnostic Interview*<sup>22</sup> and the *Self-Report Delinquency Inventory*<sup>23</sup> to assess *DSM-IV* symptom criteria for the following diagnoses: major depression;

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is a widespread belief that GLB youth are at greater risk of these problems.<sup>2,9</sup> In addition, Hartstein<sup>5</sup> has emphasized the importance of gathering data on the mental health of contemporary cohorts of young people since, because of changing political, social, and health factors, cohort specificity will limit the applicability of research done in previous decades.

In this article we report the results of a 21-year longitudinal study of a birth cohort of more than 1000 New Zealand young people. The aims of this study were (1) to estimate the proportion of young people in the cohort who by age 21 years reported being of GLB sexual orientation,

and (2) to examine the relationships between GLB sexual orientation and estimates of lifetime prevalence of suicidal behaviors (suicidal ideation and suicide attempt) and common psychiatric disorders (major depression, generalized anxiety disorder, substance use disorders, and conduct disorder). The study is characterized by a number of features that include the use of a relatively large and representative population sample, the measurement of psychiatric disorder throughout adolescence and young adulthood using standardized (*DSM-III-R*<sup>10</sup> and *DSM-IV*<sup>11</sup>) diagnostic criteria, and the collection of prospective social, family, and childhood information.

generalized anxiety disorder; conduct disorder; nicotine dependence; and alcohol and other illicit substance abuse and/or dependence. For the purposes of the present analysis, the diagnostic information from these assessments was combined to construct measures of whether the subject had ever met criteria for major depression, generalized anxiety disorder, conduct disorder, nicotine dependence, other substance abuse and/or dependence, and multiple (>2) disorders during the period from age 14 to 21 years.

#### SUICIDAL BEHAVIORS

At ages 15, 16, 18, and 21 years, subjects were asked whether they had ever experienced suicidal thoughts or made a suicide attempt since the last interview. In addition, at age 15 years, subjects were questioned about whether they had ever had suicidal thoughts or made a suicide attempt. An account of the measurement of suicidal behavior has been given in previous studies.<sup>15,24,25</sup> By age 21 years, 29.1% of the cohort had reported suicidal ideation, and 7.8% had reported making at least one suicide attempt.

#### SOCIAL, FAMILY, AND CHILDHOOD FACTORS

One explanation of elevated rates of disorder or suicidal behavior among GLB youth is that these could reflect social, family, and childhood factors that were associated with GLB status and were also related to later mental health. To examine the equivalence of the GLB and control groups, a large number of comparisons were made on the childhood, family, and social backgrounds of both groups prior to the age of 14 years. These comparisons involved measures of sociodemographic background (maternal age, education, ethnicity, family size, family socioeconomic status, and family living standards); family functioning (quality of early parent-child interactions, frequency of parental change, parental conflict, and frequency of adverse family life events); and parental adjustment (parental illicit drug use, parental history of criminal offending, and parental history of alcoholism or problems with alcohol). These comparisons showed that with respect to most of these measures, the GLB and control groups had similar social, family, and childhood backgrounds. However, the 2 groups were distinguished from each other by 2 factors: GLB youth tended to have experienced a higher rate of parental change during childhood ( $P = .007$ ), and GLB youth were more likely to have parents with a history of criminal offending ( $P = .026$ ) than the control group. The way in which these comparison variables were measured is described below.

As part of the study, comprehensive information on changes of parents was collected at annual intervals throughout childhood.<sup>26</sup> This information was used to construct a measure of the number of changes of parents the child had experienced from birth to age 14 years. A change of parents was counted if a parent left the family as a result of parental separation, divorce, or death, or a parent entered the family as a result of remarriage or reconciliation, or the child had experienced any other change of custodial parents (eg, was placed with foster parents).

When cohort members were aged 15 years, their parents were questioned concerning parental history of involvement in (self-defined) criminal offense. On the basis of this questioning, 12.1% of the sample were classified as having a parental history of criminality. At each point of interview, signed consent was obtained from respondents indicating their willingness to participate in the study, and for all data collection, ethical consent was provided by the local ethics committee.

#### STATISTICAL ANALYSIS

The statistical analysis was conducted in 2 stages. In the first stage, estimates of the odds ratios (ORs) between the sexual orientation measure (GLB vs control group) and each dichotomous mental health outcome were computed.<sup>27</sup> These associations were tested for statistical significance using the  $\chi^2$  test of independence, and the precision of the estimate was measured by the 95% confidence interval.

In the second stage of the analysis, the associations between sexual orientation and mental health outcome measures were adjusted for potentially confounding differences (parental change and parental history of criminal offense) between the groups. This was achieved by fitting a logistic regression model in which the log odds of each mental health outcome was modeled as a linear function of sexual orientation and the covariate factors. From the fitted logistic regression model, estimates of the covariate adjusted rates of each mental health outcome, the covariate adjusted OR, and the 95% confidence interval were obtained.<sup>27,28</sup> The significance of the adjusted association was assessed using the log likelihood ratio  $\chi^2$  test. All regression models were tested for the presence of interactive relationships, and no significant interactions were found. Owing to the relatively small number of subjects who met the criteria outlined above for GLB, the statistical power of this study was relatively low. Power calculations showed that the sample had 80% power ( $\alpha = .05$ ) to detect an OR of 3.5 or greater for any outcome for which there was a 25% prevalence.

## RESULTS

The GLB subjects had consistently higher rates of all outcomes analyzed in comparison with other cohort members (**Table**). In 7 of 8 comparisons, these differences were statistically significant ( $P < .05$ , exact values are presented in the Table); and in one (substance abuse and/or dependence), nonsignificant ( $P = .086$ ). Odds ratios between sexual orientation and the outcome measures ranged from 1.9 to 6.2 with a median value of 4.5. The weight of the evidence clearly favors the view that GLB young people showed pervasive increases in risks of

common psychiatric disorders, with these increases being particularly evident for measures of suicidal ideation, suicide attempt, and multiple disorders.

In subsequent analysis we divided the sample by sex to examine the relationships between sexual orientation and mental health risks for men and women. Although, because of small numbers when the sample was divided by sex, it was not possible to conduct formal tests on the similarity of results for men and women, inspection of the results suggested that associations between sexual orientation and mental health were similar for men and women. To examine the extent to which the results

### Rates of Suicidal Behavior and Psychiatric Disorders by Sexual Orientation\*

Measure	Sexual Orientation		$\chi^2_1$	P	Odds Ratio (95% CI)†
	Gay, Lesbian, or Bisexual (n = 28)	Heterosexual (n = 979)			
Suicidal behavior (ever)					
Suicidal ideation	67.9	28.0	20.97	<.001	5.4 (2.4-12.2)
Suicide attempt	32.1	7.1	23.99	<.001	6.2 (2.7-14.3)
Psychiatric disorders (14-21 years of age)					
Major depression	71.4	38.2	12.62	<.001	4.0 (1.8-9.3)
Generalized anxiety disorder	28.6	12.5	6.28	.012	2.8 (1.2-6.5)
Conduct disorder	32.1	11.0	11.80	<.001	3.8 (1.7-8.7)
Nicotine dependence	64.3	26.7	19.24	<.001	5.0 (2.3-10.9)
Other substance abuse/dependence	60.7	44.3	2.96	.086	1.9 (0.9-4.2)
Multiple ( $\geq 2$ ) disorders	78.6	38.2	18.59	<.001	5.9 (2.4-14.8)

\*All values are given as percentages unless otherwise indicated.

†CI indicates confidence interval.

were influenced by the definition of GLB status, we also reanalyzed these data comparing the 20 subjects who claimed to be of GLB sexual orientation with the remaining cohort members (excluding the 8 individuals who reported homosexual experience but claimed to be heterosexual). Associations between GLB status and mental health were also evident when this definition was employed, with ORs ranging from 1.9 to 6.9 with a median value of 3.5. These reanalyses clearly suggest that links between GLB status and mental health risks were present for both male and female respondents and that the conclusions were robust to changes in the definition of the GLB sexual orientation.

As noted in the "Subjects and Methods" section, GLB subjects had experienced more frequent changes of parents during childhood primarily as a result of parental separation and/or divorce and remarriage ( $P = .007$ ) and were more likely to have had parents with a history of criminal offense ( $P = .026$ ). To take account of these differences in the backgrounds of the GLB subjects and other cohort members, the associations between GLB status and the outcome measures were adjusted for the potentially confounding effects of parental change and parental criminality using logistic regression techniques. The results of this analysis showed that these statistical adjustments had a negligible effect on OR estimates. After adjustment for confounding factors, ORs ranged from 2.2 to 6.9. As in the Table, all associations were statistically significant with the exception of the measure of other substance abuse and/or dependence.

#### COMMENT

In this study we have used data gathered over a 21-year longitudinal study to examine the extent to which GLB young people are at increased risk of psychiatric disorder and suicidal behaviors. In confirmation of a growing number of recent studies,<sup>1-4</sup> our results suggest the presence of elevated rates of psychiatric disorder and suicidal behavior among GLB young people, with this group having ORs for these disorders that ranged from 1.9 to 6.2 times higher than for other cohort members. Risks of suicidal behavior or multiple disorder were most strongly related to sexual orientation with ORs for these

outcomes being in excess of 5. These results appeared to apply to both men and women and persisted when differing definitions of GLB status were applied.

An advantage of the prospective design used in this research was that it was possible to examine the extent to which differences between GLB young people and other cohort members reflected social, family, and other factors that may be associated with sexual orientation in young adulthood. This analysis revealed few differences in the social, family, and childhood backgrounds of GLB youth and other cohort members. Nonetheless, there was some evidence to suggest small tendencies for the GLB group to have experienced more troubled childhoods, with this group having greater exposure to parental change including separation and/or divorce and remarriage and higher exposure to parents with a history of criminal offense. Statistical control of these potentially confounding factors had little effect on the associations between sexual orientation and risks of psychiatric disorder. After controlling for confounding factors, significant associations remained between GLB status and 7 of 8 outcome measures, with estimates of the adjusted ORs that were generally similar to, or slightly higher than, the corresponding unadjusted estimates. These findings add to a growing body of evidence that suggests increased risks of suicidal behavior and mental health problems among young people who disclose GLB sexual orientation.

A potential threat to the validity of this study clearly concerns the accuracy with which respondents reported their sexual orientation. In particular, it seems likely that not all subjects would have disclosed their sexual orientation accurately and that this would have been particularly likely for those facing psychological conflict in reconciling their sexuality with social, family, or personal expectations. While the effects of misascertainment of sexual orientation on the results of this study cannot be fully predicted, it seems reasonable to assume that any bias is likely to be in the direction of the underestimation of associations rather than their overestimation. This is because those who were most troubled about their sexual orientation would have also been most likely not to report that they were GLB. In future studies, we hope to examine this issue by reinterviewing the cohort at age 25 years to examine the stability

of the reporting of sexual orientation over time and the extent to which associations between GLB sexual orientation and psychiatric risk vary with age.

The rate of GLB young people in this cohort (2.8%) is lower than that reported by some authors who have suggested that up to 15% of youth may experience sexual attraction to members of the same sex.<sup>9</sup> However, this may be explained by the fact that in the present study, we have employed a relatively stringent criterion that required that the young person either self-identified as being of GLB sexual orientation or reported sexual relationships with a same-sex partner. In contrast, studies reporting higher prevalence rates have employed measures of same-sex attraction, irrespective of the respondent's reported sexual orientation or sexual experience. The advantage of the stringent definition used in this study is that it avoids the ambiguities of interpreting reports of same-sex attraction but has the potential disadvantage of underestimating the fraction of the population who may experience some degree of homosexual attraction. Furthermore the prevalence of same-sex sexual contact found in this study (2.4%) appears to fall within the range of estimates of same-sex sexual contact found in population studies in the United States and Great Britain, with these studies reporting estimates that range from 2.1% to 6.2%.<sup>29,30</sup> Irrespective of these issues of definition, measurement, and reporting, the present study shows that young people who disclose same-sex sexual contact are at clearly increased risks of psychiatric disorder and suicidal behaviors.

While there is an emerging consensus from recent studies that young people who disclose homosexual behaviors or attraction are at increased risk of suicidal behaviors and mental health problems, the processes that lead to these associations remain unclear. Although such findings are frequently interpreted as suggesting the role of homophobic attitudes and social prejudice in provoking mental health problems in GLB youth, alternative explanations are possible. These include (1) the possibility that associations are artifactual as a result of measurement and other research design problems, (2) the possibility of "reverse causality" in which young people prone to psychiatric disorder are more prone to experience homosexual attraction or contact, and (3) the possibility that lifestyle choices made by GLB young people place them at greater risk of adverse life events and stresses that increase risks of mental health problems, independently of GLB sexual orientation. More generally, while recent research has established the presence of consistent and replicable associations between GLB sexual orientation and psychiatric risk, the extent to which these associations reflect the consequences of social discrimination or the extent to which these associations can be explained in other ways remains to be established.

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