

# NON-HETEROSEXUAL STUDENTS' HEALTH DISPARITIES: DATA PROFILE Olmsted County, Minnesota

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## Definitions

### **Heterosexual**

This refers to 8<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup> grade students in Olmsted County who answered “straight” to the question, “how do you describe your sexual orientation?” in the 2022 Minnesota Student Survey.

### **Non-Heterosexual**

This refers to 8<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup> grade students in Olmsted County who answered, “gay, lesbian, or homosexual, bisexual, queer, asexual, pansexual, other, and/or questioning/not sure” to the sexual orientation question in the 2022 Minnesota Student Survey. Students who chose one of these responses made up 85% of those categorized as non-heterosexual. The remaining 15% answered, “I don’t describe myself in these ways” or “I am not sure what this question means” and were included in the non-heterosexual group to be consistent with the methodology of Minnesota Department of Health. We acknowledge that such grouping may not accurately represent the sexual orientation of these respondents. We use the term “non-heterosexual” throughout the report only when referring to Olmsted County results from the 2022 Minnesota Student Survey.

### **LGBTQ**

This is an abbreviation for “Lesbian, Gay, Bisexual, Transgender, Queer/Questioning.” It collectively describes the sexual orientations and gender identities of individuals who do not identify as “heterosexual” and is the most common term used in the literature at this time. We use this term throughout the report when discussing the findings of other studies and LGBTQ issues more broadly.

## Overview

In recent years, more attention has been paid to the experiences of non-heterosexual adolescents and teens who face discrimination in many areas of their lives. Olmsted County has a population of about 164,000 people according to the most recent U.S. Census estimates (U.S. Census 2022). The most recent Olmsted County Community Health Needs Assessment survey found that approximately 7% of adults in our community are non-heterosexual. Among youth, 23% of 8<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup>-grade students are non-heterosexual according to the 2022 Minnesota Student Survey.

This data profile examines health disparities faced by non-heterosexual youth in the county and identifies opportunities for interventions that can turn the curve on current trends. It provides a detailed analysis of multiple factors that influence health status and health outcomes among non-heterosexual youth in communities across Olmsted County and highlights key disparities to be addressed.

## Summary

Non-heterosexual teens living in Olmsted County experience statistically significant health disparities in several key areas compared to heterosexual teens. These disparities include higher rates of long-term mental health problems, behavioral or emotional problems, and higher rates of chronic disease and poor health. Students who are non-heterosexual also are more likely to experience more negative social determinants of health, such as adverse experiences at home and school. Some of the key findings include:

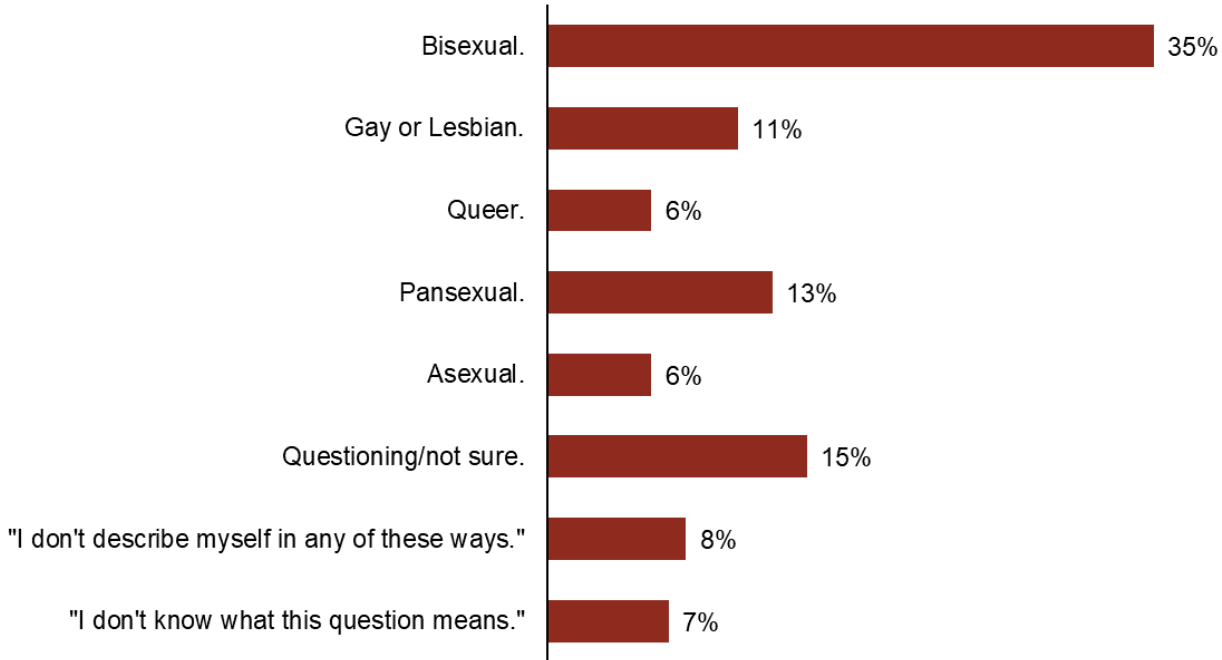
1. **School Environment:** The percent of students reporting that they earned “mostly A’s” was significantly lower for non-heterosexual (48%) than heterosexual students (53%). A smaller percentage of non-heterosexual students reported plans to attend a four-year college (57%) than their heterosexual peers (65%). Overall, more non-heterosexual students viewed their school environment negatively compared to heterosexual students (79% vs. 70%) and a higher percentage of non-heterosexual students reported being bullied in the last 30 days (59% vs. 41%).
2. **Adverse Childhood Experiences (ACEs):** Students who are non-heterosexual were significantly more likely to feel unsafe at home, at school, traveling to/from school, and in their neighborhood compared to heterosexual students (23% vs. 13%), and were significantly more likely to have experienced one or more ACEs (66% vs. 37%). Almost twice as many non-heterosexual students have experienced relationship violence (22% vs. 12%).
3. **Social Connections and Self-Perceptions:** When asked questions about how often students felt positively about themselves and their lives, non-heterosexual students responded “not at all or rarely” at significantly higher rates than heterosexual students for 13 out of 17 questions. A significantly higher percentage of non-heterosexual students expressed the belief that adults in the community cared about them “not at all” or “only a little” compared to heterosexual students (46% vs. 30%).
4. **Mental Health:** Non-heterosexual students had significantly higher rates of any emotional distress in the past two weeks (91% vs. 72%) and significantly higher rates of moderate to high levels of emotional distress (40% vs. 13%) compared to heterosexual students. In addition, non-heterosexual students were significantly more likely to report ever being treated for a mental health problem (48% vs. 18%) and significantly more likely to have seriously considered suicide (45% vs. 15%).
5. **Physical Health:** Non-heterosexual students were significantly more likely than heterosexual students to report being in poor or fair health (23% vs. 10%) and have physical disabilities or long-term health problems (18% vs. 14%). A significantly higher percentage of non-heterosexual students reported visiting a dentist more than a year ago or never (22% vs. 16%) compared to their heterosexual peers. Three-fourths (75%) of these students also reported not getting enough sleep on school nights compared to 58% of heterosexual students. Non-heterosexual students also reported engaging in negative behaviors (32% vs. 22%), using tobacco products (12% vs. 6%), and using drugs (19% vs. 12%) at significantly higher rates than their heterosexual peers.

# Demographics

## Sexual Orientation

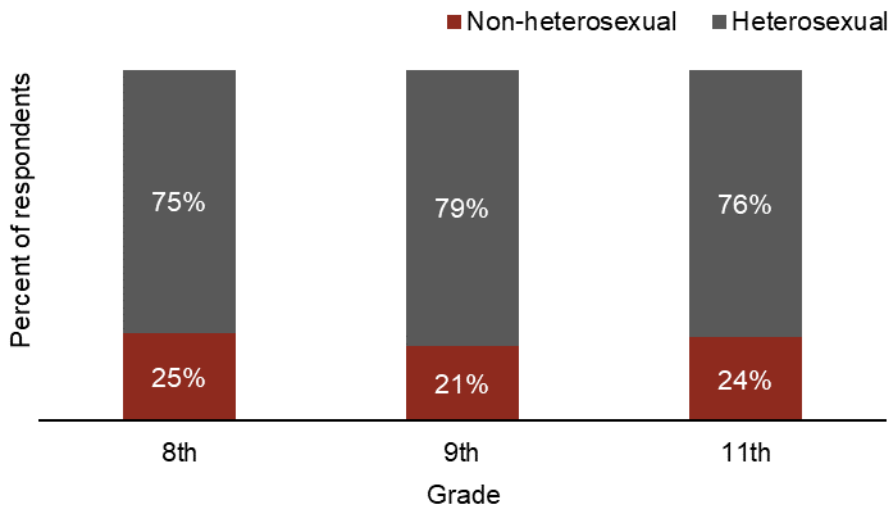
A total of 3,653 students answered the sexual orientation question; 77% of respondents identified as heterosexual and 23% identified as non-heterosexual. Figure 1 shows the breakdown of non-heterosexual students who took the Minnesota Student Survey in 2022.

**Figure 1. Percentages of Olmsted County non-heterosexual students by response type from the 2022 Minnesota Student Survey.**



The percentage of non-heterosexual students was similar among grades (Figure 2).

**Figure 2. Percentages of Olmsted County heterosexual and non-heterosexual students by grade from the 2022 Minnesota Student Survey.**



The table below compares the demographics between heterosexual and non-heterosexual students in Olmsted County who took the Minnesota Student Survey in 2022.

Table 1: Demographic characteristics of Olmsted County heterosexual and non-heterosexual students from the 2022 Minnesota Student Survey.

<b>Demographic Indicator</b>	<b>Heterosexual Students</b>	<b>Non-Heterosexual Students</b>
<b>Race</b>		
Asian/Asian American	8%	9 %
Black/African/African American	11%	6%
Multiracial	8%	12%
White	65%	66%
All others	2%	2%
<b>Ethnicity</b>		
Hispanic or Latino	8%	9%
Not Hispanic or Latino	92%	91%
<b>Biological Sex</b>		
Female	41%	74%
Male	59%	26%
<b>Gender Identity</b>		
Cisgender*	97%	62%
Not cisgender*	3%	38%

\*Cisgender includes any student who only selected “boy” or “girl” when asked their gender identity; not cisgender includes students who selected agender, boy/man (transgender), girl/woman (transgender), non-binary, two spirit, questioning/unsure, and/or identity not listed.

**Race and Ethnicity**

Most non-heterosexual students are white (66%), followed by 12% who are multiracial, 10% who are Hispanic or Latino, 9% who are Asian or Asian American, and 6% who are Black or African American. The percent of non-heterosexual students who are Black or African American was significantly smaller than that of Black or African American heterosexual students (11%). However, the percent of multiracial non-heterosexual students was significantly greater than that of multiracial heterosexual students (12% vs. 8%).

**Biological Sex and Gender Identity**

74% of non-heterosexual students are female, 26% are male, 62% are cisgender, and 38% are not cisgender. 41% of heterosexual students are female, 59% are male. 97% of heterosexual students identified as cisgender and 3% identified as a gender identity other than cisgender.



## Findings

We examined responses to survey questions across several areas of a student’s life, including mental health and emotional distress, physical health and health behaviors, safety at home and school, and social connections and relationships.

In addition to analyzing individual survey questions, we grouped related questions into four composite indicators:

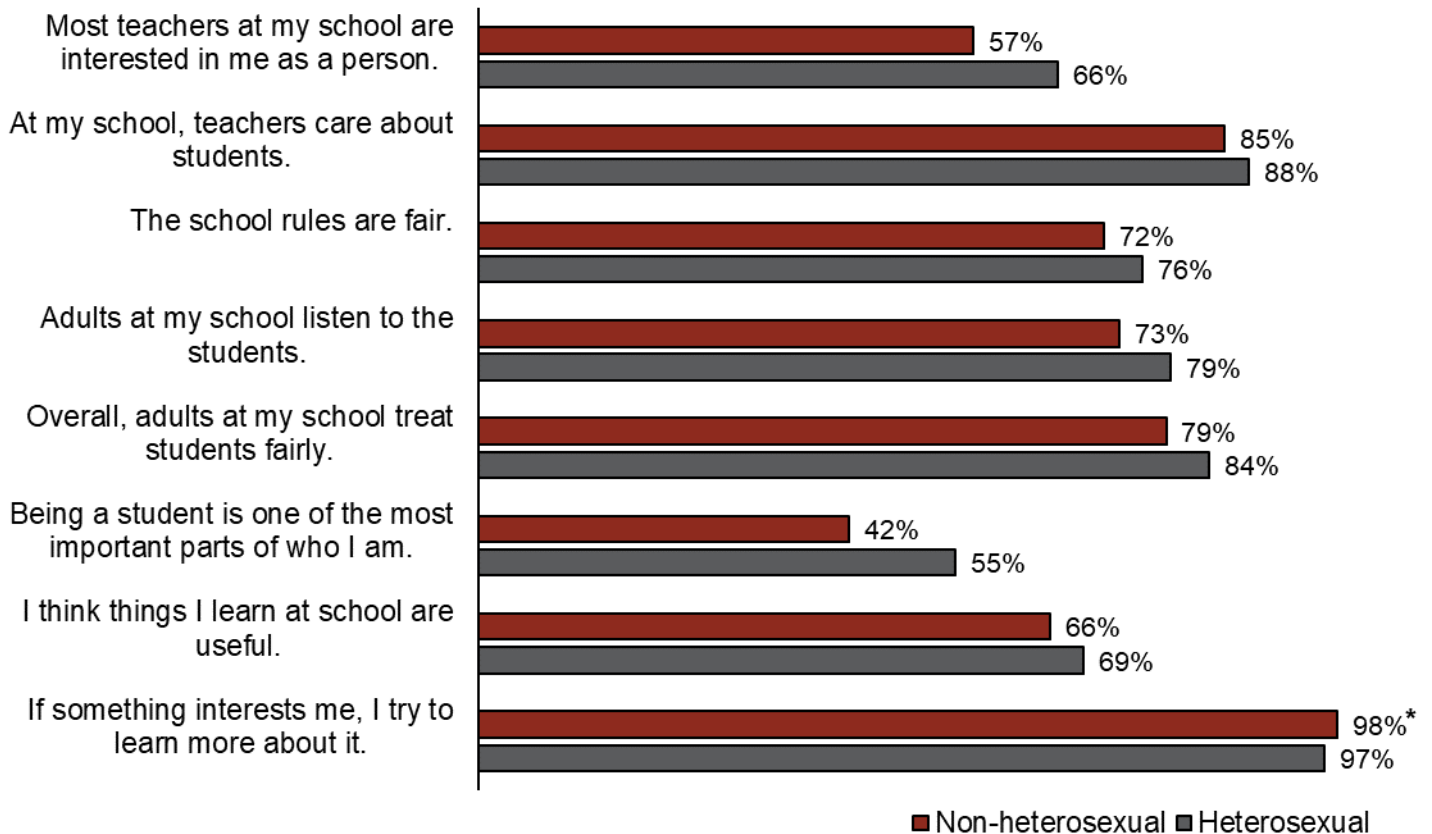
Composite	Definition/Methodology
Positive School Environment	<p>Students who agreed or strongly agreed to all of the following:</p> <ul style="list-style-type: none"> <li>• If something interests me, I try to learn more about it.</li> <li>• I think things I learn at school are useful.</li> <li>• Being a student is one of the most important parts of who I am.</li> <li>• Overall, adults at my school treat students fairly.</li> <li>• Adults at my school listen to the students.</li> <li>• The school rules are fair.</li> <li>• At my school, teachers care about students.</li> <li>• Most teachers at my school are interested in me as a person.</li> </ul>
Adverse Childhood Experiences	<p>Students who experienced any of the following at any point in their lives:</p> <ul style="list-style-type: none"> <li>• Living with someone who is depressed or has mental health issues.</li> <li>• Having a parent/guardian who is or has been in jail or prison.</li> <li>• Verbal abuse by a parent or adult in the household.</li> <li>• Living with someone who drinks too much alcohol.</li> <li>• Physical abuse by a parent or adult in the household.</li> <li>• Sexual abuse by a family member and/or a person outside the family.</li> <li>• Witnessing domestic abuse of parents/adults in household.</li> <li>• Living with someone who uses illegal drugs or abuses prescription drugs.</li> </ul>
Emotional Distress	<p>Students who answered, “several days”, “more than half the days”, or “nearly every day” to any of the following in the 2 weeks prior to the survey:</p> <ul style="list-style-type: none"> <li>• Little interest of pleasure doing things.</li> <li>• Feeling down, depressed, or hopeless.</li> <li>• Feeling nervous, anxious, or on edge.</li> <li>• Not being able to stop or control worrying.</li> </ul>
Negative Behaviors	<p>Students who indicated doing any of the following in the 12 months prior to the survey:</p> <ul style="list-style-type: none"> <li>• Run away from home.</li> <li>• Damaged or destroyed property.</li> <li>• Hit or beat up another person.</li> <li>• Taken something from a store without paying for it.</li> </ul>

### School Environment

Overall, most non-heterosexual students are engaged in school and extracurricular activities. Non-heterosexual and heterosexual students participated in afterschool activities at least one day/week at similar rates (77% vs. 79%, respectively). Nearly half (48%) of non-heterosexual students reported earning “mostly As” and 57% said they planned to attend a four-year college after graduation. However, these percentages were significantly lower than for heterosexual students; 53% reported earning “mostly As” and 65% planned to attend college.

In addition, significantly more non-heterosexual students viewed their school environment negatively compared to heterosexual students (79% vs. 70%). Specifically, these students affirmed positive experiences and perceptions at significantly lower percentages for seven out of eight survey items used in this indicator (Figure 3). A significantly higher percentage of non-heterosexual students reported feeling unsafe at school compared to heterosexual students (24% vs. 9%). Finally, a significantly lower percentage of non-heterosexual students said they felt comfortable going to a School Resource Officer with problems compared to heterosexual students (33% vs. 50%).

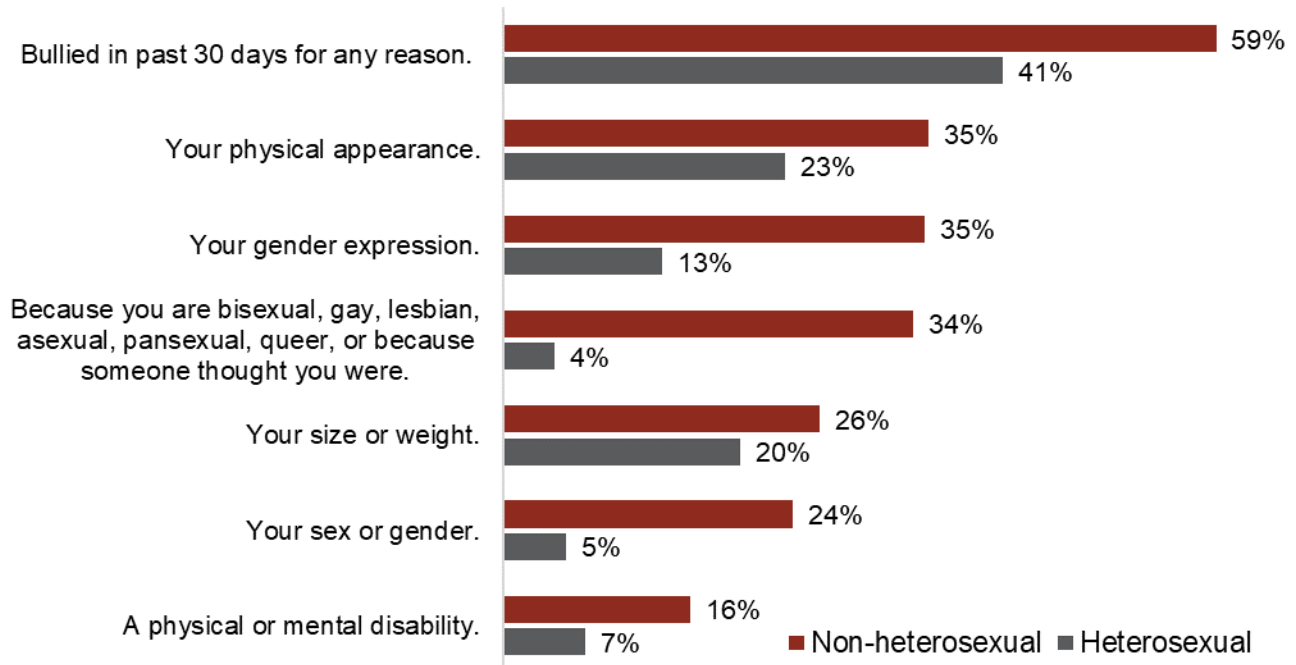
**Figure 3. Percentage of students who agreed or strongly agreed to eight questions on the 2022 Minnesota Student Survey used in the composite Positive School Environment indicator by sexual orientation for students in Olmsted County. \*Responses to this survey item did not differ significantly between groups.**



Nationally, LGBTQ students are more likely to face discrimination and harassment in their schools, both by their peers and adults. In a 2018 study, LGBTQ students who experienced bullying at school were three times more likely to miss school days because they felt unsafe, had lower grade point averages, and felt less connected to their school community, among other negative impacts (Kosciw et al. 2018).

In Olmsted County, we found that a significantly higher percentage of non-heterosexual students had been bullied at least once in the last 30 days compared to heterosexual students (59% vs. 41%; Figure 4). Figure 4 shows the percent of students who reported being bullied in the past 30 days and the breakdown of reasons why students were bullied. Approximately one-third of non-heterosexual students reported being bullied because of their gender expression (34%) or sexual orientation (35%), and nearly a quarter were bullied due to their gender or sex (Figure 4). Non-heterosexual students also were more likely to report being bullied because of their physical appearance, their size or weight, or for having a physical or mental disability compared to heterosexual students (Figure 4).

**Figure 4. Percentages of non-heterosexual and heterosexual students in Olmsted County who answered “yes” to being bullied and reasons for bullying on the 2022 Minnesota Student Survey.**



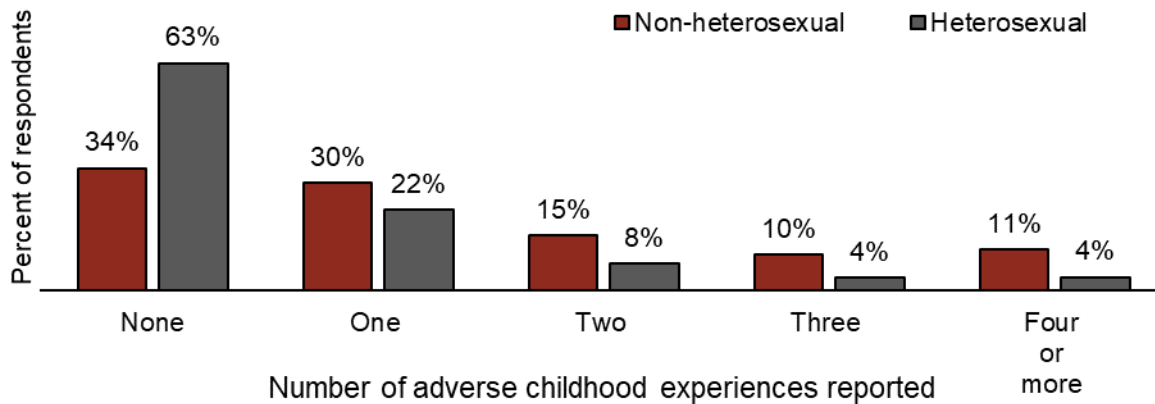
### Adverse Childhood Experiences (ACEs)

Children and teens who experience trauma, often referred to as ACEs, are more likely to have physical, behavioral, and mental health challenges in adolescence and adulthood. Parental incarceration, abuse or neglect, sexual assault, financial insecurity and housing instability, and other traumatic experiences result in higher levels of stress that increase anxiety and depression. ACEs are common and most people have experienced at least one by the age of 18. Statewide, 47% of 8<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup> grade students reported at least one ACE and half of those students reported more than one (FamilyWise 2022). ACEs and the consequences of these experiences are often related. LGBTQ youth who are anxious and depressed are more likely to have low self-esteem, use tobacco and drugs, and engage in other risky behaviors (Hafeez et al. 2017, Kosciw et al. 2018). When combined with the social stigma that many non-heterosexual youths experience, these students are at an increased risk of more victimization, sexual exploitation, and violence.

In Olmsted County, two-thirds of non-heterosexual students reported one or more ACEs compared to 37% of heterosexual students (Figure 5). Approximately half of non-heterosexual respondents reported that they lived with someone who has depression or other mental health issues compared to only 21% of heterosexual students. A significantly higher percentage of non-heterosexual students also have/had a parent in jail or prison (18% vs 12%), had experienced physical abuse from a parent or other adult in the household (14% vs. 7%), and felt unsafe at school, in their neighborhood and at home (23% vs. 13%) compared to heterosexual students.

In addition, students who are non-heterosexual were more vulnerable to relationship and sexual violence. A significantly higher percentage of non-heterosexual students reported experiencing physical, verbal, or sexual violence by a partner compared to heterosexual students (22% vs. 12%). Moreover, nearly 13% of non-heterosexual youth reported being pressured or forced to engage in sexual activity against their wishes compared to 4% of heterosexual youth.

**Figure 5. The number of adverse childhood experiences reported by non-heterosexual and heterosexual students in Olmsted County on the 2022 Minnesota Student Survey.**



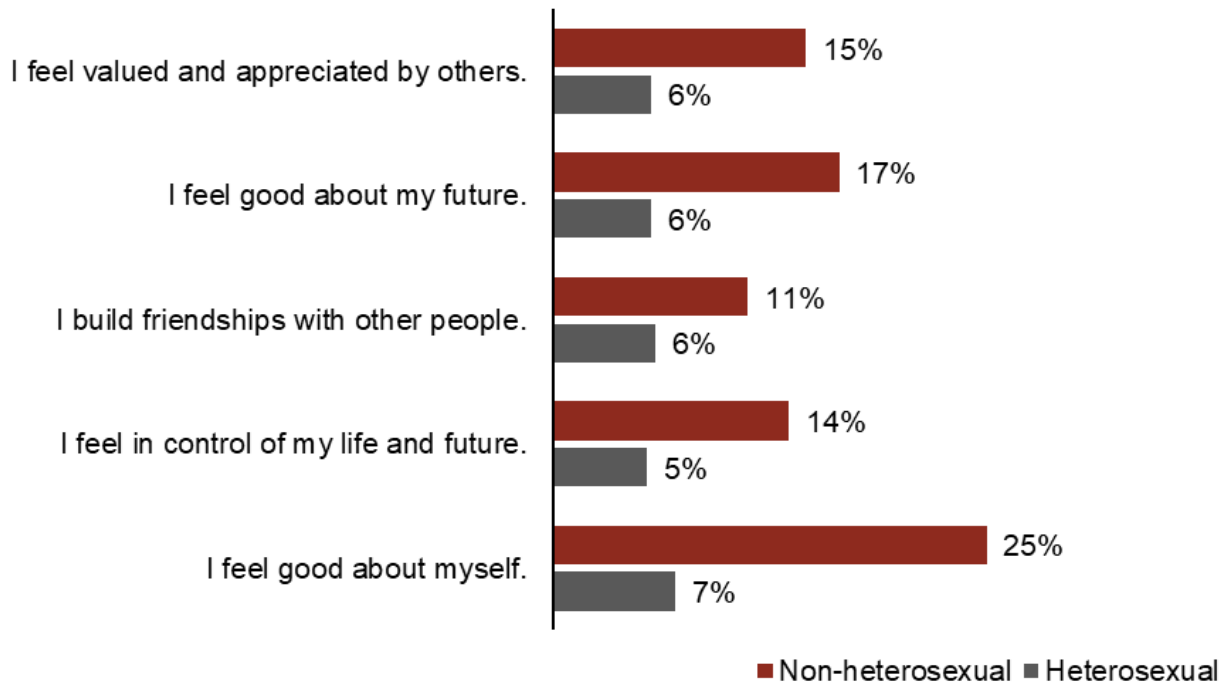
Protective factors help youth cope with ACEs and include things like parental support and financial stability, stable and nurturing relationships, and safe school and home environments. Teens who enjoy and care about school, participate in after-school activities, and have positive relationships with non-parent adults are more likely to be able to cope with past and current adverse experiences. Programs that provide or promote these protective factors can help mitigate the consequences of negative and traumatic life experiences (MDH 2023).

### **Social Connections and Self-Perceptions**

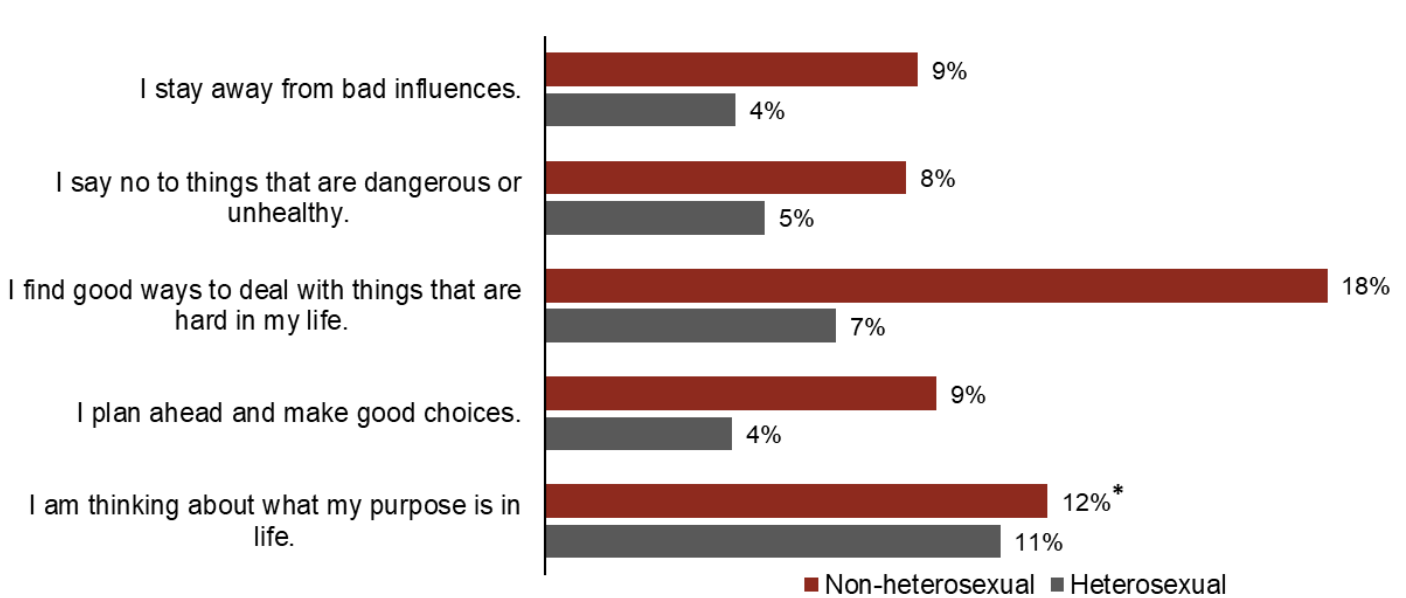
Social connections and developing positive self-perceptions are critical for helping youth cope with adversities. Fortunately, survey responses revealed that over three-fourths of non-heterosexual students have high self-esteem, social connections, and exhibit aspirational thinking about the future.

However, as observed for LGBTQ students nationally, significant percentages of non-heterosexual students in Olmsted County struggle more than their heterosexual peers to feel connected to others, valued by other members of the community, and hold positive views of themselves and their futures. Non-heterosexual students answered “not at all or rarely” at significantly higher percentages than heterosexual students on 13 of 17 survey items related to positive self-esteem and feelings of control. Compared to heterosexual students, non-heterosexual students answered “not at all or rarely” at significantly higher rates for five of the survey items related to self-esteem (Figure 6) and for four out of five items related to feelings of control over one’s life (Figure 7). Finally, a significantly higher percentage of non-heterosexual students expressed the belief that adults in the community cared about them “not at all” or “only a little” compared to heterosexual students (46% vs. 30%).

**Figure 6. Percentages of Olmsted County students by sexual orientation who answered “not at all or rarely” when asked questions related to self-esteem on the 2022 Minnesota Student Survey.**



**Figure 7. Percentages of Olmsted County students by sexual orientation who answered “not at all or rarely” when asked questions related to feelings of control over one’s life on the 2022 Minnesota Student Survey. \*Survey items marked with an asterisk did not differ significantly between non-heterosexual and heterosexual students.**

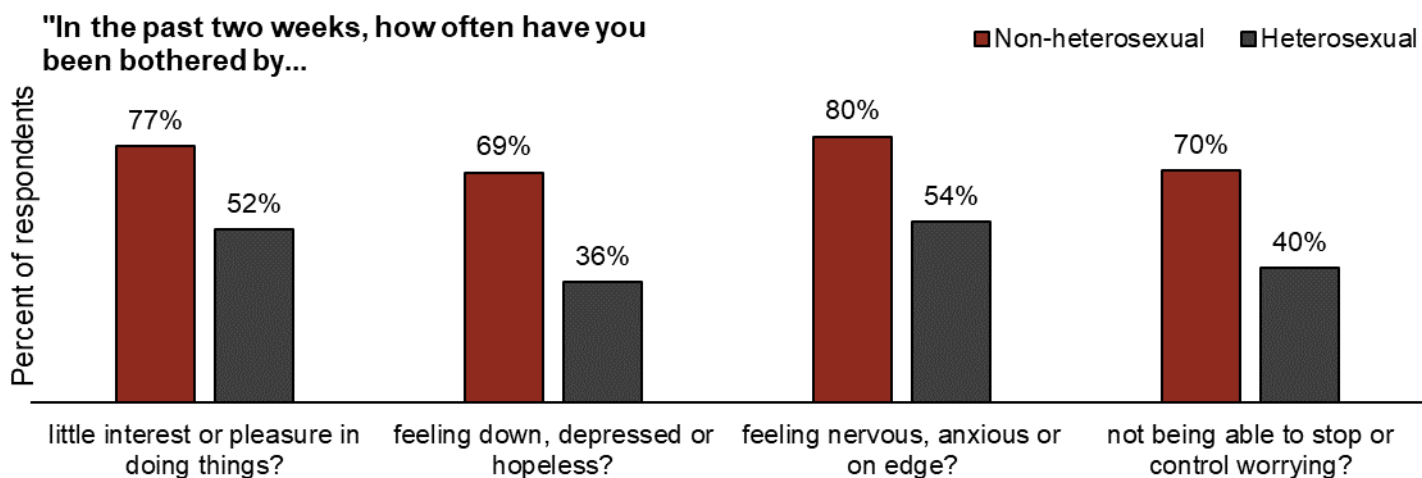


## Mental Health

LGBTQ youth disproportionately face social stigma about their sexual orientation that may include discrimination, harassment, family disapproval, social rejection, and violence (CDC 2020). Such stigma can influence LGBTQ youth's ability to access care, their comfort in sharing their sexual identity with health care providers, and the quality of the health care they receive (Hafeez et al. 2017). Mental health issues have increased among students in Minnesota since the COVID-19 pandemic, especially for females and LGBTQ youth. LGBTQ youth are at an increased risk for depression and anxiety, sexual victimization, substance use, and suicidal ideation (Youatt et al. 2015, Hafeez et al. 2017). Across Minnesota, LGBTQ youth experience high rates of anxiety (70%) and depression (56%), including 43% who had seriously considered suicide (The Trevor Project 2022).

Currently, non-heterosexual students in Olmsted County are significantly more likely to experience emotional distress, and experience it at a higher level, compared to heterosexual students. Responses to four key questions indicated that 91% of non-heterosexual students experienced at least some emotional distress in the two weeks before the survey compared to 71% of heterosexual students (Figure 8). Moreover, a significantly higher percentage (40%) of non-heterosexual students had medium to high levels of stress compared to heterosexual students (13%).

**Figure 8. Students who answered, “several days”, “more than half the days”, or “nearly every day” to four questions used in the Emotional Distress composite indicator for non-heterosexual and heterosexual students in Olmsted County. Data is from the 2022 Minnesota Student Survey.**



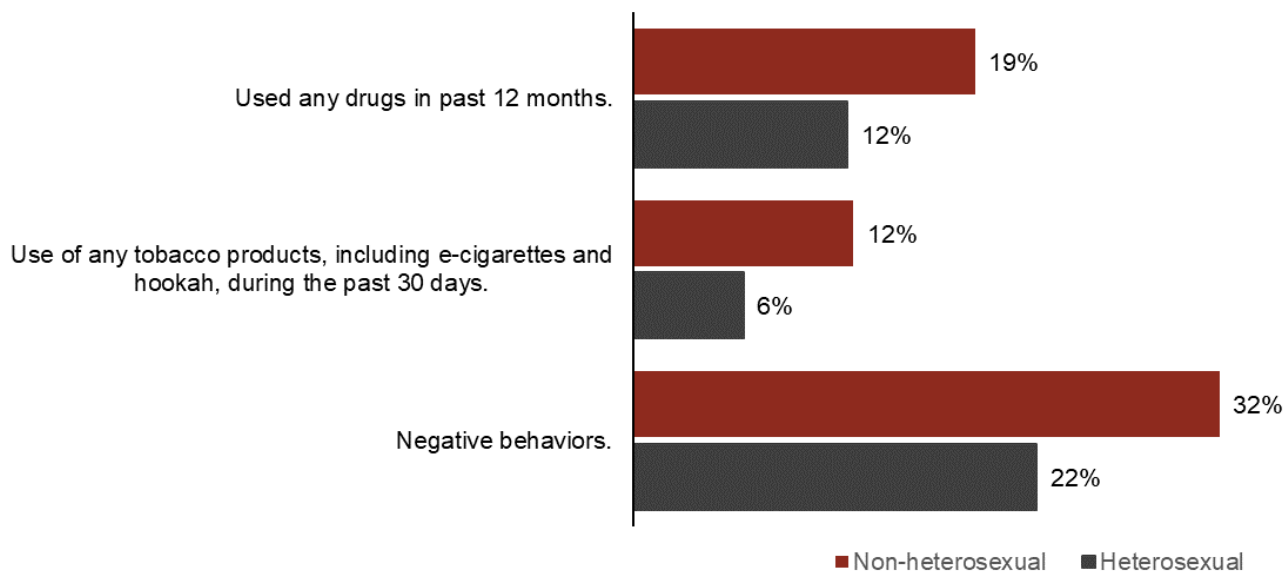
Alongside recent emotional distress, a significantly higher percentage of non-heterosexual students reported that they have been treated for a mental health problem at some point before (48% vs. 18%). Almost half (45%) of non-heterosexual students reported that they had “seriously considered suicide” and 19% reported attempting suicide compared to 15% and 4% of heterosexual students, respectively.

Across Minnesota, LGBTQ youth face challenges accessing mental health care. Approximately half of those surveyed who wanted mental health care could not get it due to several reasons, including reluctance to discuss their concerns with others, the need for parental permission, cost of care, and other fears about seeking care (The Trevor Project 2022). Although nearly half of non-heterosexual students in Olmsted County reported being treated for a mental health problem, 53% said that they did not feel comfortable speaking to a school counselor and 16% said they did not have an adult they could talk to about their problems.

## Physical Health and High-Risk Behavior

Olmsted County students who are non-heterosexual report significantly higher rates of poor or fair health (23% vs. 10%) and physical disabilities or long-term health problems (18% vs. 14%) compared to heterosexual students. Based on students' reported height and weight, Minnesota Department of Health estimated that 30% of non-heterosexual students are overweight or obese compared to only 22% of heterosexual students, a difference that was significant. In addition, significantly more non-heterosexual students did not get enough sleep on school nights compared to heterosexual students (76% vs. 59%). Moreover, significantly higher percentages of non-heterosexual students reported engaging in one or more negative behaviors, using drugs, and using tobacco products compared to heterosexual students (Figure 9).

**Figure 9. Percentages of Olmsted County students engaging in unhealthy and high-risk behaviors by sexual orientation. “Negative behaviors” refers to a composite indicator of four survey questions that ask about running away from home, property damage, shoplifting, and violence against others. Data is from the 2022 Minnesota Student Survey.**



Little is known regarding access to medical care for non-heterosexual students in Olmsted County. The Minnesota Student Survey currently only asks students about dental visits and treatment for mental health problems but does not ask students about medical visits. A higher percentage of non-heterosexual students reported visiting a dentist “more than a year ago or never” compared to their heterosexual peers (22% vs. 16%).

## Additional Resources

This Data Profile provides a high-level overview of the health status of non-heterosexual students in Olmsted County relative to heterosexual students. To explore the data within the non-heterosexual group in more detail, please visit the Minnesota Student Survey Data Dashboard developed by the Epidemiology, Surveillance, and Preparedness Unit of OCPHS. This dashboard includes Minnesota Student Survey data from 2016 - 2022. Users can explore the relationships between indicators among non-heterosexual students and view data from previous years. Please follow this [link to access the Dashboard](#).

## Conclusion

Our findings for non-heterosexual youth in Olmsted County closely match national and state-level findings. Non-heterosexual youth in Olmsted County must contend with higher rates of bullying and violence because of their gender identity or sexual orientation, are victims of sexual harassment and assault at higher rates, and experience higher levels of stress, anxiety, depression, and social isolation compared to heterosexual students.

School engagement, positive relationships with adults, and participation in activities are just a few of many ways to help bolster students' feelings of self-worth and belonging. These, in turn, can help youth cope with negative experiences and, ultimately, thrive as adults. Although non-heterosexual students in Olmsted County appear to be engaged at school and participate in extracurricular activities at rates comparable to their heterosexual peers, over half said that they did not feel comfortable speaking to school counselors or resource officers. National research indicates that LGBTQ students who have had negative experiences at school may feel unsafe and uncomfortable utilizing school and other community resources like school counselors, extracurricular activities, and other resources that benefit and are available to other students (Kosciw et al. 2018).

Community-level strategies are needed to address the disproportionately high mental and physical health problems experienced by non-heterosexual youth in Olmsted County. Policies and programs that promote inclusive language and education are one way to help LGBTQ students to feel supported and valued in the school environment. For example, School Age Services' Sexually Transmitted Infections education program intentionally uses grade-appropriate inclusive language and sexual health education in schools to ensure that all identities are represented and respected. Other programs that specifically support LGBTQ students in schools have the potential to buffer these students from the social stigma they may experience in other areas of their lives.

## References

CDC 2020. [Youth Risk Behavior Survey Data Summary and Trends Report 2009-2019](#). Centers for Disease Control and Prevention.

FamilyWise. 2023. [Factsheet: Adverse Childhood Experiences In Minnesota: 2022 Minnesota Student Survey – Risk & Protective Factors Data](#). FamilyWise and Minnesota Department of Human Services.

Hafeez H., Zeshan M., Tahir M.A., Jahan N., & Naveed S. 2017. Health Care Disparities Among Lesbian, Gay, Bisexual, and Transgender Youth: A Literature Review. *Cureus* 20:1184. doi: 10.7759/cureus.1184.

Kosciw, J.G., Greytak, E.A., Zongrone, A.D., Clark, C.M., & Truong, N.L. 2018. *The 2017 National School Climate Survey: The experiences of lesbian, gay, bisexual, transgender, and queer youth in our nation's schools*. New York: GLSEN.

MDH 2023. *Adverse Childhood Experiences (ACEs) in Minnesota*. Minnesota Department of Health.

The Trevor Project. 2022. [2022 National Survey on LGBTQ Youth Mental Health by State: Minnesota](#).

Youatt E.J., Johns, M.M., Pingel, E.S., et al. 2015. Exploring young adult sexual minority women's perspectives on LGBTQ smoking. *LGBT Youth*: 12:323–342.



## Methods of Analysis

Population: Olmsted County students in grades 8<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup> who participated in the Minnesota Student Survey 2022.

Data Source: Minnesota Student Survey 2022.

The Minnesota Student Survey is administered every three years to students in regular public elementary and secondary schools, charter schools, and tribal school. Participation by school districts is optional. Grades surveyed are 5<sup>th</sup>, 8<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup> grades; however, only data from 8<sup>th</sup>, 9<sup>th</sup>, and 11<sup>th</sup> grade students were surveys about sexual orientation, thus 5<sup>th</sup> graders were excluded from this data profile. The survey includes questions about a wide variety of youth behaviors, including risk behaviors such as alcohol, tobacco and other drug use, violence, and sexual activity, as well as positive behaviors and connection to family, school, and community. Questions about some of these topics are only asked of 9<sup>th</sup> and 11<sup>th</sup> grade students. All survey responses are optional, and students can stop at any point. The survey is anonymous; no names or identifying code numbers are collected, and survey answers cannot be traced to an individual. Students can decline to take the survey.

### Methods:

The data was cleaned using SPSS version 28 and cross tabulated by sexual orientation using WinCross version 23. We assessed statistical significance between groups using independent Z-tests at a 95% confidence level. All figures presented in this data profile include statistically significant differences between groups. Graphs were created using Microsoft Excel.

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