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Disparities in behaviors and experiences among transgender and cisgender high school students — 18 U.S. states, 2021

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Abstract

Purpose: Transgender youth (those whose gender identity differs from their sex assigned at birth) experience stigma and discrimination that can place them at increased risk for poor health outcomes compared with cisgender youth (those whose gender identity aligns with their sex assigned at birth). Limited population-based data exist on disparities among transgender and cisgender youth.

Methods: We examined differences in experiences of violence, substance use, mental health, suicide, sexual behavior, unstable housing, parental monitoring, and school connectedness among 98,174 transgender and cisgender high school students using data from 18 states that included an item to assess transgender identity on their 2021 Youth Risk Behavior Survey.

Results: Overall, 2.9% of students identified as transgender and 2.6% questioned whether they were transgender. Among transgender students, 71.5% reported that their mental health was not good, 32.3% had attempted suicide, and 29.0% experienced sexual violence. Transgender students were more likely than cisgender students to report experiences of violence, substance use, poor mental health, suicide risk, some sexual risk behaviors, and unstable housing, and were less likely to report feeling connected to others at school.

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Disclaimer

The findings and conclusions in the manuscript are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Conclusions: Interventions that can address the causes of these adverse outcomes and promote the health and wellbeing of transgender youths are warranted.

Keywords

Transgender; Adolescent health; Violence; Substance use; Mental health; Unstable housing

Introduction

Gender refers to the socially constructed norms and expectations imposed on persons according to their designation as male or female sex at birth. Gender identity refers to an individual's sense of self and personal experience of gender [1]. Transgender persons are those persons whose gender identity differs from their sex assigned at birth, whereas cisgender describes persons who identify with the gender aligned with their sex assigned at birth [1]. Limited population-based data exist on disparities among transgender and cisgender youths. Previous research analyzed data from 10 states and 9 urban school districts piloting an item to assess transgender identity on the 2017 Youth Risk Behavior Survey (YRBS) and found many health disparities across sexual behavior, substance use, violence, mental health, and suicide for transgender compared to cisgender youth [2]. Eighteen states assessed transgender identity on their 2021 YRBS, the largest number of states to date, providing broader representation of youth across the United States in the first YRBS since the COVID-19 pandemic. Adolescent sexual behavior, substance use, violence, mental health, and suicide have a shared set of risk and protective factors and represent important experiences and behaviors that can lead to health problems during adolescence and through adulthood [3]. This study aims to examine these outcome domains to assess disparities between transgender and cisgender students across the 18 states that assessed transgender identity in 2021.

Methods

This report includes data on 98,174 high school students from 18 states (Delaware, Florida, Hawaii, Iowa, Massachusetts, Maine, Maryland, Michigan, North Dakota, Nebraska, Nevada, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, Wisconsin) that assessed transgender identity in their 2021 YRBS. The state YRBS is a cross-sectional, school-based survey conducted biennially in odd-numbered years since 1991, with data representative of students attending grades 9–12 in each participating state. Additional information on procedures and methods for the 2021 state YRBS, including sampling, data collection, and response rates, are available [4]. Procedures protect students' privacy, and participation is anonymous and voluntary. This activity was reviewed by CDC, deemed not research, and was conducted consistent with applicable federal law and CDC policy.

Measures

A single item was developed by CDC survey methodologists with input from external experts in transgender health to assess transgender identity. Cognitive interviewing was conducted and indicated that high school students understood the transgender identity question as written. Survey participants were asked, "Some people describe themselves

as transgender when their sex at birth does not match the way they think or feel about their gender. Are you transgender?” Based on their responses to this question, students were categorized as transgender (“Yes, I am transgender”) or questioning (“I am not sure if I am transgender”). Students responding “No, I am not transgender” were assumed to be cisgender, though it is possible a small fraction of these students do not identify as cisgender. Among the 18 states that included the transgender identity item, 1.4% (95% CI = 1.2–1.6%) of students responded that they did not know what the question was asking and 3.1% (95% CI = 1.9–4.9%) of students skipped the transgender identity item and were excluded from analyses. Cisgender students were categorized as male or female based on their response to the question “What is your sex?” Since this question does not specify sex assigned at birth, transgender students were not disaggregated by sex in regression modeling because of possible differences in interpretation of this question. Additional student characteristics included grade, race and ethnicity, and sexual identity. Thirty-four outcomes across experiences of violence, substance use, mental health, suicide, sexual behaviors, school connectedness, parental monitoring, and unstable housing were examined (Table 1).

Statistical analyses

Unadjusted prevalence estimates with 95% CIs were calculated using Taylor series linearization for prevalence of cisgender, transgender, and questioning students, overall and stratified by sex, grade, race and ethnicity, and sexual identity. Wald chi-square tests were used to detect differences in demographic characteristics by gender identity. Unadjusted prevalence estimates of each outcome were calculated for cisgender male, cisgender female, and transgender students. Logistic regression models with specifications for predicted marginal proportions were used to calculate adjusted prevalence ratios (aPR) comparing transgender students with cisgender male and cisgender female students, adjusting for grade and race. Results were statistically significant if 95% CIs did not include 1.0. Missing data were not imputed, and all analyses were complete case analysis. Analyses were conducted using SUDAAN (version 11.0.3; RTI International), accounting for complex survey design and weighting.

Results

Gender identity and sexual identity

Overall, 94.5% of students identified as cisgender, 2.9% as transgender, and 2.6% as questioning whether they were transgender (Table 2). Female sex was reported more frequently by transgender students (59.9%) and questioning students (68.1%) than by cisgender students (49.2%). Sexual identity differed significantly between transgender and cisgender students. Among transgender students, 32.5% identified as bisexual, 22.1% as gay or lesbian, and 12.3% as heterosexual; 28.5% described their sexual identity another way.

Experiences of violence

Over one quarter of transgender students reported having experienced physically forced sexual intercourse (25.8%), missing school because of feeling unsafe (27.0%), sexual violence (29.0%), being bullied at school (33.4%), and being electronically bullied (36.7%)

(Table 3). Prevalences of all eight experiences of violence outcomes were higher among transgender students than among cisgender males (aPR range = 3.2 [missing school because of feeling unsafe] to 9.4 [ever forced to have sexual intercourse]) and cisgender females (aPR range = 1.7 [experiencing sexual violence] to 4.2 [being threatened or injured with a weapon at school]).

Substance use

Among transgender students, substance use prevalence ranged from 15.3% for ever used heroin to 36.6% for ever used marijuana. Prevalences of all 10 substance use indicators were higher among transgender students than among cisgender males (aPR range = 1.5 [current electronic vapor product use] to 11.1 [ever used heroin]) and prevalences of seven indicators among transgender students were higher than those among cisgender females (aPR range = 1.9 [ever used cigarettes] to 24.4 [ever used heroin]).

Mental health and suicide

Among transgender students, 71.5% reported their mental health was not good; 50.6% considered attempting suicide; and 32.3% had attempted suicide in the past year. Prevalences of all six mental health and suicide indicators were higher among transgender students than among both cisgender males (aPR range = 2.8 [felt sad or hopeless in past 12 months] to 10.5 [medically evaluated suicide attempt in past 12 months]) and cisgender females (aPR range = 1.5 [felt sad or hopeless in past 12 months] to 6.1 [medically evaluated suicide attempt in past 12 months]).

Sexual behavior

Transgender students differed from cisgender students in prevalence of five of seven sexual behaviors. Compared with cisgender male and female students, prevalence of having four or more sexual partners was higher among transgender students than among cisgender male and female students (aPRs = 1.5 and 2.0, respectively). Among sexually active students, prevalences of condom use and effective contraception use were lower among transgender students (aPR range 0.5–0.7; contraception use was significantly different from that among cisgender female students only). Prevalences of HIV and sexually transmitted disease (STD) testing were higher among transgender students than among cisgender male and female students (aPR range = 1.8–2.3).

School connectedness and home environment

The prevalence of school connectedness was lower among transgender students (32.4%) than among cisgender male (67.4%) and female (54.0%) students (aPRs = 0.5 and 0.6, respectively), and the prevalence of unstable housing (17.0%) was higher than that among cisgender male (3.0%) and female (1.9%) students (aPRs = 5.4 and 8.2, respectively). Parental monitoring did not significantly differ for transgender and cisgender students.

Discussion

Across 18 states assessing transgender identity in 2021, 2.9% of high school students identified as transgender and 2.6% questioned whether they were transgender. Differences

existed in 31 of 34 outcomes examined when transgender youths were compared with male and female cisgender youths. Only HIV and STD testing reflected greater engagement with health-seeking behaviors for transgender youths; other differences indicated an elevated health risk among transgender youths, particularly for experiences of violence, poor mental health, and substance use compared with their cisgender peers, with fewer sexual behavior differences and no difference in parental monitoring. One half of transgender youths reported having considered suicide, and nearly one third had attempted suicide. Over one quarter of transgender youths had experienced sexual violence. These disparities can be understood, in part, through the gender minority stress framework [5], which maintains that in a society that positions cisgender persons as normative and transgender persons as deviant, transgender and gender-diverse persons experience social marginalization and stigmatization related to their gender, including experiences of violence, creating stress that drives poor health and maladaptive coping behaviors, such as suicidality and substance use.

Interventions for transgender youth that alleviate minority stress along with implementation of interpersonal interventions (e.g., health care provider training) are warranted [6]. Additionally, structural interventions that create safe and supportive environments for transgender youth are important to help reduce violence against them and eliminate disparities [5]. CDC's *What Works in Schools* approach [7] addresses adolescent risk and protective factors through comprehensive health education, access to health services, and safe and supportive school environments for all students [8] and has been shown to reduce risk behaviors and experiences of violence among the overall student population [9] and a subgroup of lesbian, gay, and bisexual students [10]. Such programs might help support transgender students and promote health and well-being.

Limitations

The findings in this report are subject to at least six limitations. First, because of YRBS's structure as a comprehensive youth health surveillance system, assessment of transgender identity differs from the two-step method of assessing sex assigned at birth and current gender identity, which might be less prone to misclassification than a single item [11,12]. The single-item approach precludes ascertainment of sex assigned at birth or gender identities beyond "transgender" (e.g., nonbinary) which might mask within-group differences. Furthermore, it is unclear whether transgender students responded to the sex question with their sex assigned at birth or their gender, which limits the ability to reliably disaggregate transgender students by sex. Second, students who responded "No, I am not transgender" were assumed to be cisgender, though it is possible a small proportion of these students identified as another gender identity. Since the question stem defines "transgender" as "when their sex at birth does not match the way they think or feel about their gender," the risk for misclassifying students who are not cisgender (e.g., nonbinary students) as cisgender (i.e., sex assigned at birth matches their gender) may be low. Third, the YRBS is school based, but persons at highest risk for these outcomes might have missed school when the survey was administered or have dropped out of school. Fourth, this study controlled for race and ethnicity but did not explore differences in disparities by these characteristics. Fifth, this study used data from 18 states assessing transgender identity which limits the generalizability of the findings. While the 18 states are geographically diverse, over half of

the states are located on the east coast which may bias results towards this region. Finally, because the YRBS is a cross-sectional survey, causality cannot be inferred.

Conclusions

This study, the first to use YRBS data from over one third of U.S. states, identified disparities between transgender and cisgender high school students across most indicators of risk. Findings underscore the need for multilevel interventions to address social and structural drivers of inequity and promote protective factors. Research into effective family, social, and structural interventions to support transgender youths is warranted.

Abbreviations:

YRBS	Youth Risk Behavior Survey
CDC	Centers for Disease Control and Prevention
CI	Confidence interval
aPR	adjusted prevalence ratio
HIV	human immunodeficiency virus
STD	sexually transmitted disease

References

- [1]. World Health Organization. Gender and health. https://www.who.int/health-topics/gender#tab=tab_1 [accessed 30.1.2024].
- [2]. Johns MM, Lowry R, Andrzejewski J, Barrios LC, Demissie Z, McManus T, et al. Transgender identity and experiences of violence victimization, substance use, suicide risk, and sexual risk behaviors among high school students—19 states and large urban school districts, 2017. *MMWR Morb Mortal Wkly Rep* 2019;68:67–71. 10.15585/mmwr.mm6803a3. [PubMed: 30677012]
- [3]. Centers for Disease Control and Prevention. Youth Risk Behavior Survey Data Summary and Trends Report: 2011–2021. Atlanta (GA); 2023. https://www.cdc.gov/healthyyouth/data/yrbs/pdf/YRBS_Data-Summary-Trends_Report2023_508.pdf .
- [4]. Mpofu JJ, Underwood JM, Thornton JE, Brenner ND, Rico A, Kilmer G, et al. Overview and methods for the youth risk behavior surveillance system—United States, 2021. *MMWR Suppl* 2023;72:1–12. 10.15585/mmwr.su7201a1. [PubMed: 37104281]
- [5]. Tan KKH, Treharne GJ, Ellis SJ, Schmidt JM, Veale JF. Gender minority stress: a critical review. *J Homosex* 2020;67:1471–89. 10.1080/00918369.2019.1591789. [PubMed: 30912709]
- [6]. White Houghton JM, Reisner SL, Pachankis JE. Transgender stigma and health: a critical review of stigma determinants, mechanisms, and interventions. *Soc Sci Med* 2015;147:222–31. 10.1016/j.socscimed.2015.11.010. [PubMed: 26599625]
- [7]. Centers for Disease Control and Prevention. What works in schools. <https://www.cdc.gov/healthyyouth/whatworks/what-works-overview.htm>; 2023 [accessed 30.1.2024].
- [8]. Wilkins NJ, Rasberry C, Liddon N, Szucs LE, Johns M, Leonard S, et al. Addressing HIV/sexually transmitted diseases and pregnancy prevention through schools: an approach for strengthening education, health services, and school environments that promote adolescent sexual health and well-being. *J Adolesc Health* 2022;70: 540–9. 10.1016/j.jadohealth.2021.05.017. [PubMed: 35305791]

- [9]. Robin L, Timpe Z, Suarez NA, Li J, Barrios L, Ethier KA. Local education agency impact on school environments to reduce health risk behaviors and experiences among high school students. *J Adolesc Health* 2022;70:313–21. 10.1016/j.jadohealth.2021.08.004. [PubMed: 34531096]
- [10]. Suarez NA, Cooper AC, Kaczowski W, Li J, Robin L, Sims VM. Associations of a multilevel school health program and health outcomes among lesbian, gay, and bisexual youth. *AIDS Educ Prev* 2022;34:395–412. 10.1521/aeap.2022.34.5.395. [PubMed: 36181496]
- [11]. Lett E, Everhart A. Considerations for transgender population health research based on US national surveys. *Ann Epidemiol* 2022;65:65–71. 10.1016/j.annepidem.2021.10.009. [PubMed: 34757013]
- [12]. Tate CC, Ledbetter JN, Youssef CP. A two-question method for assessing gender categories in the social and medical sciences. *J Sex Res* 2013;50:767–76. 10.1080/00224499.2012.690110. [PubMed: 22989000]

Table 1

Measures for selected health risk behaviors among high school students - Youth Risk Behavior Survey, 2021.

Construct	Measure	Analytic coding for response options
Student characteristics		
Sex	What is your sex?	Female: Female Male: Male
Transgender identity	Some people describe themselves as transgender when their sex at birth does not match the way they think or feel about their gender. Are you transgender?	Cisgender: No, I am not transgender Transgender: Yes, I am transgender Questioning: I am not sure if I am transgender
Grade	In what grade are you?	9thgrade: 9th grade 10thgrade: 10th grade 11thgrade: 11th grade 12thgrade: 12th grade
Race and ethnicity	Are you Hispanic or Latino? What is your race? (Select one or more responses.)	American Indian or Alaska Native: Hispanic – no, race – American Indian or Alaska Native Asian: Hispanic – no, race – Asian Black: Hispanic – no, race – Black or African American Hispanic/Latino: Hispanic – yes, race – any race selected Multiracial: Hispanic – no, race – two or more races selected Native Hawaiian or Other Pacific Islander: Hispanic – no, race – Native Hawaiian or Other Pacific Islander White: Hispanic – no, race – White
Sexual identity	Which of the following best describes you?	Heterosexual: Heterosexual Gay or lesbian: Gay or lesbian Bisexual: Bisexual Questioning: I am not sure about my sexual identity (questioning) Described another way: I describe my sexual identity some other way
Experiences of violence		
Missed school due to feeling unsafe at or traveling to/from school	During the past 30 days, on how many days did you not go to school because you felt you would be unsafe at school or on your way to or from school?	Yes: 1 day; 2 or 3 days; 4 or 5 days; 6 or more days No: 0 days
Threatened or injured with a weapon at school	During the past 12 months, how many times has someone threatened or injured you with a weapon such as a gun, knife, or club on school property?	Yes: 1 time; 2 or 3 times; 4 or 5 times; 6 or 7 times; 8 or 9 times; 10 or 11 times; 12 or more times No: 0 times
Ever forced to have sexual intercourse	Have you ever been physically forced to have sexual intercourse when you did not want to?	Yes: Yes No: No
Experienced sexual dating violence	During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)	Yes: 1 time; 2 or 3 times; 4 or 5 times; 6 or more times No: 0 times; I did not date or go out with anyone during the past 12 months
Experienced physical dating violence	During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon.)	Yes: 1 time; 2 or 3 times; 4 or 5 times; 6 or more times No: 0 times; I did not date or go out with anyone during the past 12 months
Bullied at school	During the past 12 months, have you ever been bullied on school property?	Yes: Yes No: No
Electronically bullied	During the past 12 months, have you ever been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)	Yes: Yes No: No
Substance Use		

Construct	Measure	Analytic coding for response options
Cigarettes, lifetime use	Have you ever tried cigarette smoking, even one or two puffs?	Yes: 1 or 2 times; 3 to 9 times; 10 to 19 times; 20 to 39 times; 40 or more times No: 0 times
Electronic vapor product, current use	During the past 30 days, on how many days did you use an electronic vapor product?	Yes: 1 or 2 days; 3 to 5 days; 6 to 9 days; 10 to 19 days; 20 to 29 days; All 30 days No: 0 days
Alcohol, current use	During the past 30 days, on how many days did you have at least one drink of alcohol?	Yes: 1 or 2 days; 3 to 5 days; 6 to 9 days; 10 to 19 days; 20 to 29 days; All 30 days No: 0 days
Marijuana, lifetime use	During your life, how many times have you used marijuana?	Yes: 1 or 2 times; 3 to 9 times; 10 to 19 times; 20 to 29 times; 40 to 99 times; 100 or more times No: 0 times
Cocaine, lifetime use	During your life, how many times have you used any form of cocaine, including powder, crack, or freebase?	Yes: 1 or 2 times; 3 to 9 times; 10 to 19 times; 20 to 39 times; 40 or more times for any included drug No: 0 times for all included drugs
Heroin, lifetime use	During your life, how many times have you used heroin (also called smack, junk, or China White)?	Yes: 1 or 2 times; 3 to 9 times; 10 to 19 times; 20 to 39 times; 40 or more times for any included drug No: 0 times for all included drugs
Methamphetamines, lifetime use	During your life, how many times have you used methamphetamines (also called speed, crystal meth, crank, ice, or meth)?	Yes: 1 or 2 times; 3 to 9 times; 10 to 19 times; 20 to 39 times; 40 or more times for any included drug No: 0 times for all included drugs
Ecstasy, lifetime use	During your life, how many times have you used ecstasy (also called MDMA or Molly)?	Yes: 1 or 2 times; 3 to 9 times; 10 to 19 times; 20 to 39 times; 40 or more times for any included drug No: 0 times for all included drugs
Inhalants, lifetime use	During your life, how many times have you sniffled glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?	Yes: 1 or 2 times; 3 to 9 times; 10 to 19 times; 20 to 39 times; 40 or more times for any included drug No: 0 times for all included drugs
Prescription opioid misuse, lifetime	During the past 30 days, how many times did you take prescription pain medicine without a doctor's prescription or differently than how a doctor told you to use it?	Yes: 1 or 2 times; 3 to 9 times; 10 to 19 times; 20 to 39 times; 40 or more times No: 0 times for all included drugs
Mental health and suicide		
Mental health not good, past 30 days	During the past 30 days, how often was your mental health not good? (Poor mental health includes stress, anxiety, and depression.)	Yes: Most of the time, Always No: Never, Rarely, Sometimes
Felt sad or hopeless, past 12 months	During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?	Yes: Yes No: No
Considered attempting suicide, past 12 months	During the past 12 months, did you ever seriously consider attempting suicide?	Yes: Yes No: No
Made a suicide plan, past 12 months	During the past 12 months, did you make a plan about how you would attempt suicide?	Yes: Yes No: No
Attempted suicide, past 12 months	During the past 12 months, how many times did you actually attempt suicide?	Yes: 1 time; 2 or 3 times; 4 or 5 times; 6 or more times No: 0 times
Had a suicide attempt treated by a doctor or nurse, past 12 months	If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?	Yes: Yes No: No; I did not attempt suicide during the past 12 months
Sexual behaviors		
Ever had sexual intercourse	Have you ever had sexual intercourse?	Yes: Yes No: No
Had 4 sexual partners	During your life, with how many people have you had sexual intercourse?	Yes: 4 people; 5 people; 6 or more people No: I have never had sexual intercourse; 1 person; 2 people; 3 people;
Currently sexually active	During the past 3 months, with how many people did you have sexual intercourse?	Yes: 1 person; 2 people; 3 people; 4 people; 5 people; 6 or more people

Construct	Measure	Analytic coding for response options
		No: I have not had sexual intercourse; I have had sexual intercourse, but not during the past 3 months
Used a condom during last sexual intercourse	The last time you had sexual intercourse, did you or your partner use a condom? (Among students who were currently sexually active)	Yes: Yes No: No
Used birth control pills; an IUD (such as Mirena or ParaGard) or implant (such as Implanon or Nexplanon); or a shot (such as Depo-Provera), patch (such as OrthoEvra), or birth control ring (such as NuvaRing) before last sexual intercourse with an opposite-sex partner	The last time you had sexual intercourse with an opposite-sex partner, what one method did you or your partner use to prevent pregnancy? (Select only one response.) (Among students who were currently sexually active)	Yes: Birth control pills (Do not count emergency contraception such as Plan B or the "morning after" pill.); An IUD (such as Mirena or ParaGard) or implant (such as Implanon or Nexplanon); A shot (such as Depo-Provera), patch (such as Ortho Evra), or birth control ring (such as NuvaRing) No: No method was used to prevent pregnancy; Condoms; Withdrawal or some other method; Not sure
Ever tested for HIV	Have you ever been tested for HIV, the virus that causes AIDS? (Do not count tests done if you donated blood.)	Yes: Yes No: No; Not sure
Tested for STD, past 12 months	During the past 12 months, have you been tested for a sexually transmitted disease (STD) other than HIV, such as chlamydia or gonorrhea?	Yes: Yes No: No; Not sure
Home and School Contexts		
School connectedness	Do you agree or disagree that you feel close to people at your school?	Yes: Strongly agree; Agree No: Strongly disagree; Disagree; Not sure
Experienced high parental monitoring	How often do your parents or other adults in your family know where you are going or with whom you will be?	Yes: Most of the time, Always No: Never, Rarely, Sometimes
Unstable housing	During the past 30 days, where did you usually sleep?	Yes: In the home of a friend, family member, or other person because I had to leave my home or my parent or guardian cannot afford housing; In a shelter or emergency housing; In a motel or hotel; In a car, park, campground, or other public place; I do not have a usual place to sleep No: In my parent's or guardian's home; Somewhere else

Table 2
Prevalence of student characteristics by transgender identity status among high school students (N = 98,174) — Youth Risk Behavior Survey, 18 States,* 2021.

Characteristic	Transgender identity status, column % (95% CI)		Chi-square <i>p</i> -value [‡]		
	Cisgender [†] (N = 89,791) 94.5 (94.0–94.9)	Transgender [†] (N = 2948) 2.9 (2.6–3.3)	Questioning [†] (N = 2567) 2.6 (2.4–2.8)	Trans vs. cis Trans vs. quest	Quest vs. cis
Sex [§]					
Female	49.2 (48.2–50.2)	59.9 (53.8–65.7)	68.1 (63.0–72.8)	< 0.001	< 0.001
Male	50.8 (49.8–51.8)	40.1 (34.3–46.2)	31.9 (27.2–37.0)		
Race/ethnicity					
AI/AN, NH	0.6 (0.5–0.7)	1.2 (0.6–2.2)	0.6 (0.3–1.3)	0.14	0.01
Asian, NH	6.2 (5.4–7.2)	4.5 (2.7–7.5)	5.0 (3.8–6.7)		
Black, NH	15.8 (13.9–17.8)	14.2 (10.4–19.3)	11.3 (8.6–14.8)		
Hispanic/Latino	21.7 (20.2–23.2)	18.9 (16.0–22.1)	22.2 (18.1–26.9)		
Multiracial	4.7 (4.3–5.0)	6.6 (4.9–8.8)	8.5 (6.2–11.6)		
NHOPI, NH	0.6 (0.5–0.7)	0.6 (0.3–1.3)	0.8 (0.3–2.4)		
White, NH	50.5 (48.1–52.9)	54.0 (48.9–59.0)	51.5 (46.2–56.7)		
School grade					
9	25.8 (23.8–27.9)	25.6 (20.9–31.0)	31.6 (27.1–36.6)	0.98	< 0.001
10	25.3 (23.4–27.2)	25.4 (21.7–29.6)	30.5 (25.5–36.0)		
11	24.6 (22.9–26.4)	25.4 (21.1–30.1)	19.1 (16.0–22.6)		
12	24.3 (22.6–26.1)	23.6 (19.0–28.9)	18.8 (15.5–22.6)		
Sexual identity [¶]					
Heterosexual (straight)	79.3 (78.6–80.0)	12.3 (7.1–20.4)	8.2 (5.6–11.96)	< 0.001	< 0.001
Gay or lesbian	2.7 (2.5–3.0)	22.1 (18.4–26.4)	13.1 (10.3–16.6)		
Bisexual	10.8 (10.2–11.4)	32.5 (27.5–38.0)	36.2 (32.4–40.1)		
Questioning	4.7 (4.3–5.0)	4.6 (3.3–6.4)	12.9 (10.3–16.0)		
Described another way	2.5 (2.3–2.8)	28.5 (23.6–33.9)	29.6 (24.7–35.0)		

Abbreviations: AI/AN = American Indian or Alaska Native; Cis = Cisgender; NH = Non-Hispanic; NHOPI = Native Hawaiian or Other Pacific Islander; Trans = Transgender; Quest = Questioning.

* Delaware, Florida, Hawaii, Iowa, Massachusetts, Maine, Maryland, Michigan, North Dakota, Nebraska, Nevada, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, Wisconsin

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⁷ Gender identity was categorized as transgender for those who responded “Yes, I am transgender” to the question, “Some people describe themselves as transgender when their sex at birth does not match the way they think or feel about their gender. Are you transgender?” Those who responded, “No, I am not transgender,” are assumed to be cisgender. Questioning refers to those who responded, “I am not sure if I am transgender.”

⁸ Wald chi-square test for difference in student characteristics between gender identity groups ($p < 0.05$).

⁹ Sex is reported for transgender and questioning students for descriptive purposes. Since the sex question does not specify sex assigned at birth, there may be differences in interpretation among transgender students. For this reason, transgender students are not categorized by sex for other analyses.

¹⁰ Students who responded “I don’t know what this question is asking” were excluded from analysis of sexual identity

Table 3

Prevalence of health risk behaviors and experiences by transgender identity status and prevalence ratios comparing groups among high school students (N = 98,174) — Youth Risk Behavior Survey, 18 States, * 2021.

Health Behaviors and Experiences	Gender and sex, column prevalence (95% CI)		Transgender (N = 2948)	aPR [‡] (95% CI)	
	Cisgender male [†] (N = 45,161)	Cisgender female [†] (N = 44,240)		Transgender vs. cisgender males	Transgender vs. cisgender females
Total	49.3 (48.3–50.3)	47.7 (46.7–48.7)	3.0 (2.7–3.4)	—	—
Experiences of violence					
Felt unsafe at or traveling to/from school	7.9 (7.1–8.8)	12.2 (10.7–13.8)	27.0 (23.2–31.2)	3.2 (2.7–3.9)	2.1 (1.7–2.6)
Threatened or injured with a weapon at school	5.9 (5.3–6.6)	4.7 (4.2–5.3)	21.5 (18.0–25.5)	3.4 (2.7–4.2)	4.2 (3.3–5.3)
Ever forced to have sexual intercourse	2.8 (2.5–3.1)	12.6 (11.7–13.6)	25.8 (21.6–30.6)	9.4 (7.5–11.7)	2.1 (1.7–2.6)
Experienced sexual violence by anyone	4.9 (4.5–5.5)	16.2 (15.2–17.2)	29.0 (24.2–34.3)	5.6 (4.6–6.8)	1.7 (1.4–2.0)
Experienced sexual dating violence	3.1 (2.6–3.6)	13.2 (12.2–14.2)	24.2 (19.5–29.6)	7.2 (5.3–9.9)	1.7 (1.3–2.1)
Experienced physical dating violence	5.6 (5–6.3)	8.6 (7.7–9.6)	22.0 (15.8–29.8)	3.5 (2.3–5.3)	2.3 (1.6–3.4)
Bullied at school	10.3 (9.5–11.1)	15.9 (14.9–17.0)	33.4 (29.5–37.6)	3.2 (2.7–3.7)	2.1 (1.8–2.4)
Electronically bullied	9.5 (8.9–10.1)	18.3 (17.3–19.3)	36.7 (32.8–40.8)	3.8 (3.3–4.3)	2.0 (1.7–2.2)
Substance use					
Cigarettes, lifetime use	14.9 (13.7–16.2)	14.7 (13.8–15.8)	29.5 (24.6–34.8)	1.9 (1.6–2.3)	1.9 (1.6–2.3)
Electronic vapor product, current use	12.9 (11.8–14.1)	19.9 (18.4–21.5)	21.9 (17.8–26.7)	1.5 (1.3–1.9)	1.0 (0.8–1.2)
Alcohol, current use	12.8 (11.9–13.8)	24.8 (23.2–26.4)	28.2 (23.5–33.5)	1.6 (1.3–1.8)	1.1 (1.0–1.3)
Marijuana, lifetime use	24.8 (23.3–26.3)	31.5 (30.0–33.0)	36.6 (30.4–43.2)	1.5 (1.3–1.7)	1.2 (1.0–1.4)
Cocaine, lifetime use	1.8 (1.4–2.2)	1.3 (1.1–1.5)	16.4 (11.7–22.5)	8.7 (5.9–12.9)	12.3 (8.1–18.6)
Heroin, lifetime use	1.1 (0.8–1.4)	0.5 (0.4–0.6)	15.3 (9.7–23.2)	11.1 (6.7–18.2)	24.4 (14.7–40.4)
Methamphetamines, lifetime use	1.3 (1.0–1.7)	0.6 (0.5–0.8)	15.8 (10.6–22.9)	9.9 (6.5–15.0)	21.8 (13.9–34.2)
Ecstasy, lifetime use	2.7 (2.1–3.4)	1.3 (1.1–1.6)	15.4 (11.0–21.0)	4.5 (3.2–6.5)	9.5 (6.4–14.2)
Inhalants, lifetime use	4.3 (3.5–5.3)	5.1 (4.3–6.0)	19.1 (13.2–26.8)	4.4 (2.9–6.9)	3.7 (2.5–5.6)
Prescription opioid misuse, lifetime	8.7 (8.0–9.5)	13.0 (12.1–13.9)	26.8 (22.9–31.0)	3.1 (2.6–3.7)	2.1 (1.8–2.5)
Mental health/suicide					
Mental health not good, past 30 days	18.5 (17.4–19.8)	41.6 (40.0–43.1)	71.5 (66.4–76.2)	4.0 (3.6–4.3)	1.8 (1.6–1.9)
Felt sad or hopeless, past 12 months	25.3 (24.3–26.3)	49.1 (47.6–50.6)	70.1 (66.2–73.8)	2.8 (2.7–3.0)	1.5 (1.4–1.5)
Considered attempting suicide, past 12 months	11.4 (10.8–12.1)	23.7 (22.6–24.9)	50.6 (46.8–54.5)	4.4 (4.0–4.9)	2.1 (2.0–2.3)

Health Behaviors and Experiences	Gender and sex, column prevalence (95% CI)			aPR [‡] (95% CI)	
	Cisgender male [†] (N = 45,161)	Cisgender female [†] (N = 44,240)	Transgender (N = 2948)	Transgender vs. cisgender males	Transgender vs. cisgender females
Made a suicide plan, past 12 months	9.2 (8.6–9.8)	18.9 (17.9–19.8)	51.3 (46.9–55.6)	5.6 (4.9–6.3)	2.7 (2.5–3.0)
Attempted suicide, past 12 months	6.1 (5.4–6.8)	10.7 (9.9–11.6)	32.3 (27.2–37.9)	5.2 (4.2–6.4)	2.9 (2.5–3.5)
Had a suicide attempt treated by a doctor or nurse, past 12 months	1.4 (1.1–1.7)	2.4 (2.0–2.8)	14.2 (9.9–20.0)	10.5 (7.1–15.7)	6.1 (4.2–8.8)
Sexual behavior					
Ever had sexual intercourse	27.6 (26.1–29.1)	29.1 (27.5–30.8)	29.5 (25.5–34.0)	1.1 (1.0–1.3)	1.0 (0.9–1.2)
Had 4 sexual partners	6.4 (5.8–7.1)	5.0 (4.4–5.6)	10.0 (7.1–14.0)	1.5 (1.1–2.1)	2.0 (1.4–2.8)
Currently sexually active	17.9 (16.7–19.1)	20.9 (19.7–22.2)	18.2 (14.1–23.2)	1.0 (0.8–1.3)	0.9 (0.7–1.1)
Used a condom during last sexual intercourse	60.8 (57.4–64.0)	48.5 (45.5–51.5)	31.6 (22.3–42.6)	0.5 (0.4–0.7)	0.7 (0.5–0.9)
Used birth control pills; an IUD (such as Mirena or ParaGard) or implant (such as Implanon or Nexplanon); or a shot (such as Depo-Provera), patch (such as OrthoEvra), or birth control ring (such as NuvaRing) before last sexual intercourse with an opposite-sex partner	30.5 (27.4–33.9)	40.9 (38.1–43.7)	18.0 (10.0–30.4)	0.7 (0.4–1.2)	0.5 (0.3–0.9)
Ever tested for HIV	7.7 (6.6–8.9)	7.1 (6.3–8.0)	14.6 (9.6–21.6)	1.8 (1.3–2.5)	1.9 (1.3–2.9)
Tested for STD in past 12 months	5.6 (4.6–6.8)	6.2 (5.4–7.1)	13.6 (8.4–21.2)	2.3 (1.5–3.6)	2.1 (1.3–3.3)
School connectedness and home environment					
Felt close to people at school	67.4 (64.1–70.6)	54.0 (51.1–56.8)	32.4 (23.6–42.7)	0.5 (0.4–0.6)	0.6 (0.4–0.8)
Experienced high parental monitoring	87.2 (86.2–88.1)	90.0 (89.2–90.8)	85.8 (82.9–88.3)	1.0 (1.0–1.0)	1.0 (0.9–1.0)
Unstable housing	3.0 (2.4–3.7)	1.9 (1.6–2.4)	17.0 (11.1–25.2)	5.4 (3.7–7.9)	8.2 (5.4–12.6)

Abbreviations: aPR = adjusted prevalence ratio; STD = sexually transmitted disease

aPR 95% CIs that do not include 1 are considered statistically significant. **Bolded** values indicate statistical significance.

* Delaware, Florida, Hawaii, Iowa, Massachusetts, Maine, Maryland, Michigan, North Dakota, Nebraska, Nevada, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, Wisconsin

[†]Cisgender students were further categorized by sex based on their response to “What is your sex?” Students who were cisgender and responded “male” were categorized as cisgender males; students who were cisgender and responded “female” were categorized as cisgender females.

[‡]Prevalence ratio comparing the prevalence of select health behaviors among transgender students to the prevalence among cisgender male students and cisgender female students, adjusted for race/ethnicity and grade.