ANTI-BULLYING LAWS AND SUICIDAL BEHAVIORS AMONG TEENAGERS

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NBER Working Paper No. 26777
February 2020
JEL No. I12,I18

ABSTRACT

The CDC reports that the association between bullying and suicides among teenagers has generated "concern, even panic," but polices aimed at combatting bullying have received little attention from researchers. Using a difference-in-differences estimation strategy, we find that state-level anti-bullying laws (ABLs) reduce bullying victimization, depression and suicidal ideation, with the largest estimated effects for female teenagers and teenagers who identify as lesbian, gay, bisexual, or questioning. In addition, ABLs are associated with a 13-16 percent reduction in the suicide rate of female 14- through 18-year-olds. Event-study analyses and falsification tests provide evidence that these estimates can be interpreted causally.

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"There is a lot of concern, even panic, about the ongoing problem of bullying and suicide-related behavior among school-age youth."

- Centers for Disease Control and Prevention

1. Introduction

State-level anti-bullying laws (ABLs) require school districts to develop policies that define bullying, encourage students to report victimization, and punish offenders. If ABLs can reduce bullying at school, then their adoption could help improve the mental health of teenagers and, ultimately, lead to fewer suicides. Suicide rates among American teenagers have been trending upward for more than a decade (Miron et al. 2019), and observers are, with some frequency, using the word "epidemic" to describe the situation (Carroll 2019; Resnick 2019; Friedman 2020).

There are several routes through which ABLs could insulate teenagers from adverse mental health shocks. If ABLs reduce the likelihood of victimization, this could, in turn, relieve stress and obviate the need to engage in unhealthy coping mechanisms (Newman et al. 2005; Hamilton 2008). ABLs could also encourage victims of bullying to come forward and share their problems with teachers, parents and mental health professionals (Nansel et al. 2001, 2004) or better equip school faculty and staff to identify students who are suffering from mental health issues (Hall and Dawes 2019). Finally, ABLs could lead to improvements in the school environment, perhaps through increasing comradery among students and reducing social exclusion (Kull et al. 2015).

On the other hand, it is possible that ABL adoption has unintended consequences, negatively affecting the mental health of teenagers and leading to more suicides. Because ABLs are focused on behavior at school, they could simply shift bullying to off-campus locales or online, perhaps increasing its intensity (Sabia and Bass 2017). Even if ABLs do reduce bullying, shielding students from victimization could impede long-run social

development. Learning to cope with negative social interactions could help students to develop "thicker skin" and become more resilient, improving self-esteem in the long run (Hillard et al. 2014).

Using Youth Risk Behavior Surveys (YRBS) data for the period 2009-2017 and a difference-in-differences regression framework, we begin by exploring the effects of ABLs on bullying victimization and suicidal behaviors among American high school students. Throughout the analysis, we pay special attention to students who belong to historically marginalized groups, including those who identify as lesbian, gay, bisexual, or questioning (LGBQ). One recently published study found that more than a third of gay, lesbian, and bisexual high school students reported being bullied at school in the past year (Kann et al. 2016). Such bullying often takes the form of homophobic slurs, harassment, and physical violence (Poteat and Espelage, 2005; Poteat and Rivers, 2010), which may, at least in part, explain why LGBQ teenagers are more likely to exhibit depressive symptomatology and have suicidal thoughts as compared to their heterosexual-identifying counterparts (Remafedi et al. 1998; Bontempo and D'Augelli 2002; Eisenberg and Resnick 2006; Anderson et al. 2019). Ours is the first study to provide credible estimates of the effects of ABLs on bullying victimization and suicidal behaviors among LGBQ-identifying students.[1]

We find that ABLs are associated with reductions in bullying victimization, depression and suicidal behaviors among high school students, especially among female high school students. These effects appear to be largest — and extend to the most serious suicidal behaviors, including planning how to commit suicide and attempting suicide — for members of historically marginalized groups such as non-white female students and those who identify

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[1] The only other study on ABLs and suicidal behaviors among LGBQ youth, Meyer et al. (2019), relied on cross-sectional policy variation for identification. Using data from the 2015 wave of the national Youth Behavior Survey, these authors found a negative association between ABLs focused on sexual orientation and suicide attempts among American high school students.

as LGBQ. For instance, among female students who identify as LGBQ, ABL adoption is associated with a 21 percent reduction in being bullied at school and an 18 percent reduction in planning how to commit suicide.

We turn next to the relationship between ABL adoption and completed suicides among 14- through 18-year-olds. During the past decade, suicides committed by victims of bullying have received a great deal of media attention. Many of these high-profile cases involve members of historically marginalized groups, including members of the LGBQ and transgender communities (O'Kane 2018; Nedelman 2018; Malafronte 2019), youth with disabilities (Bult 2016; Ghose 2019), racial and/or ethnic minorities (Rosenblatt and Burke 2018; Mathews 2019), and females (Meacham 2009; Yee 2012; Chuck 2017; Schwartz 2019). Although LGBQ teenagers and teenagers with intellectual and physical disabilities are at increased risk of committing suicide (Kaplan et al. 2007; Ludi et al. 2012), the suicide rate among white male teenagers is considerably higher than the suicide rates among their female, black and Hispanic counterparts, at least in the United States (Child Trends 2019).

Using data from the National Vital Statistics System (NVSS) for the period 1993-2016 and a difference-in-differences regression framework, we find no evidence that ABLs deter suicides among male 14- through 18-year-olds. By contrast, ABL adoption is associated with a 13-16 percent reduction in suicides among female 14- through 18-year-olds, a result that may be related to their being more likely to seek social support and being more prone to express their emotions as compared to their male counterparts (Matud 2004; Eschenbeck et al. 2007). Among non-white 14- through 18-year-olds, ABL adoption is associated with an even larger reduction in suicides: 26 percent relative to the mean. We find no evidence of pre-ABL changes in suicides, nor is there any evidence that ABLs are associated with non-suicide deaths among 14- through 18-year-olds or suicides among individuals old enough to have graduated high school (e.g., individuals ages 19-23). Based

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on these results and those obtained using the YRBS, we conclude that ABLs are effective at combatting bullying and reducing suicidal behaviors among teenagers, especially among teenagers who belong to historically marginalized groups.

2. Background

The prefrontal cortex, which helps regulate our responses to emotional stimuli (Banks et al. 2007; Gongora et al. 2019), is in the process of developing through adolescence and into early adulthood (Casey et al. 2008; Arain et al. 2013). This makes adolescents and young adults especially vulnerable to psychiatric disorders including depression, drug addiction, and schizophrenia (Casey et al. 2008; Arain et al. 2013). It could also put them at risk of committing suicide if they suffer from a negative emotional shock such as being bullied at school.[2]

Bullying can be written, verbal, or physical in nature. The U.S. Department of Health and Human Services (2019) describes it as "unwanted, aggressive behavior among school-aged children that involves a real or perceived power imbalance, and the behavior is repeated or has the potential to be repeated."[3] Bullying can also cross criminal thresholds (Cornell and Limber 2016). For instance, some types of bullying can constitute harassment under civil rights law or, in extreme cases, even assault and battery.

In 2017, the most recent year for which data are available, 20 percent of students ages 12-18 reported being bullied at school (National Center for Education Statistics 2019). The most common forms of bullying include name-calling, public insults, being pushed, and

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[2] According to economic theory, suicides occur when expected discounted lifetime utility falls below some threshold, perhaps due to an information or health shock (Hamermesh and Soss 1974).

[3] This definition of bullying is available at: https://www.stopbullying.gov/what-is-bullying/index.html, a website managed by the United States Department of Health and Human Services (2019).

rumor-spreading, including spreading rumors online (National Center for Education Statistics 2017). Although bullying victimization crosses demographic boundaries, female students (Faris and Felmlee 2011) and racial/ethnic minorities (Sawyer et al. 2008; Goldweber et al. 2013) are disproportionately victimized, as are youth with disabilities (Blake et al. 2014) and LGBQ youth (Kann et al. 2016).[4] In the analysis below, we report separate estimates of the effects of ABLs for members of these groups whenever the data allow.

The Centers for Disease Control and Prevention (2014, p. 8) has argued that descriptions of teenagers committing suicide in newspapers and on television can cause "panic" among parents, at least in part, by positing a direct link between bullying victimization and suicide. However, establishing such a link is difficult because victims of bullying are obviously not chosen at random and could be targeted precisely because they are psychologically vulnerable.[5]

In 2012, the Departments of Education and Health and Human Services launched the website Stopbullying.gov with the goal of encouraging school-aged children, parents, and school staff to combat bullying. The website provides detailed information on state anti-bullying laws and policies as well as strategies for young people on how to cope with being bullied. It also provides practical strategies for school faculty and staff to create safer environments, with particular attention paid to at-risk teenagers, including those who are military-connected and LGBQ-identifying (DHHS 2017).[6]

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[4] See also Craig (1998), Kumpulainen et al. (1999), Fox and Stallworth (2005), Friedman et al. (2006), Carlyle and Steinman (2007), Daley et al. (2008), and Cappadocia et al. (2012).

[5] The CDC (2014, p. 3) explicitly cautions parents and policymakers:

> We don't know if bullying directly causes suicide-related behavior. We know that most youth who are involved in bullying do NOT engage in suicide-related behavior.

[6] At the White House Conference on Bullying, held in 2011, participants urged that greater attention be paid to the relationship between bullying victimization and teen suicidal behaviors among sexual minorities (Espelage 2011). The U.S. Department of Health and Human Services (2017) observed that:

Growing concern about bullying and suicide, particularly among historically marginalized populations, has also prompted private campaigns aimed at curbing bullying. In September 2010, Dan Savage, a popular columnist and LGBQ activist, launched the *It Gets Better Project* to "inspire hope for young people facing harassment," particularly LGBQ youth.[7] This project has recruited celebrities, prominent businesspersons, and political leaders, including President Barack Obama, to share personal experiences through YouTube videos to convince bullied youths that their lives will improve. The *It Gets Better Project* also provides legal advice to bullied youth and advocates for the adoption of anti-bullying laws and policies.[8]

Previous studies provide evidence, albeit descriptive, that being the victim of bullying leads to worse mental health outcomes (Wilkins-Shurmer et al. 2003; Gini and Pozzoli 2009; Hinduja and Patchin 2010; Rothon et al. 2011; Hepburn et al. 2012; Wolke et al. 2013). For instance, being the victim of bullying is associated with suicidal ideation, depression and being emotionally distressed (Card et al. 2008; Kim et al. 2005; Gladstone et al. 2006; Menesini et al. 2009; O'Brennan et al. 2009; Van Geel et al. 2014).[9] These associations, although suggestive, are arguably of limited use to policymakers because they could be driven by unobservables at the individual, school or community levels.

Several recent studies have examined the effects of school-level anti-bullying policies, which can be thought of as shifting the expected costs and benefits of bullying

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"Lesbian, gay, bisexual, transgender, or questioning (LGBTQ) youth and those perceived as LGBTQ are at an increased risk of being bullied…. Bullying puts youth at increased risk for depression [and] suicidal ideation…. For LGBTQ youth, that risk is even higher."

[7] This phrase comes from the *It Gets Better Project* website, https://itgetsbetter.org/about-it-gets-better-project/.

[8] Along the same lines, Lady Gaga and Oprah Winfrey established *Born This Way,* an organization with the mission of increasing awareness about the adverse mental health effects of bullying victimization after a teen fan committed suicide. Other high profile anti-bullying advocates include Melania Trump (*Be Best*), and Monica Lewinsky (*#DefyTheName*).

[9] Suicidal ideation is defined as having thoughts of suicide. YRBS respondents are asked if they seriously considered suicide in the past year.

(Fekkes et al. 2006; Jeong and Lee 2013). ABLs, the focus of the current study, impose requirements on school districts that could, at least in theory, reduce bullying by (i) increasing the probability that it is detected, (ii) increasing punishments, and (iii) stigmatizing the behavior (Sabia and Bass 2017). However, as noted above, ABLs could also have the unintended consequences of displacing bullying to off-school locales or diverting resources from other bully-deterring school investments. Moreover, ABLs could raise awareness of what constitutes bullying, resulting in a greater willingness to report such behavior (Jeong and Lee 2013).

Previous studies have produced mixed evidence on the effectiveness of state-level policies designed to reduce bullying. Exploiting temporal and geographic variation in ABL adoption, Sabia and Bass (2017) found that ABLs were associated with small and statistically insignificant reduction in the probability of being bullied on school property. It should be noted, however, that these authors only had access to three waves of YRBS data (2009, 2011, and 2013).[10]

Nikolaou (2017) examined the effects of anti-cyberbullying laws (ACBLs), which, unlike traditional ABLs, specifically target online harassment. He found that ACBLs were associated with a 7 percent reduction in the probability of being the victim of cyberbullying (i.e., being bullied through email, chatrooms, instant messaging, websites, and texting). After establishing this "first-stage" relationship, Nikolaou (2017) used an instrumental variables (IV) approach to examine the effects of cyberbullying on several second-stage outcomes. The IV results showed that cyberbullying is associated with substantial increases in

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[10] Sabia and Bass (2017) also found that that the strongest ABLs (as measured by the ratings produced by the U.S. Department of Education) were associated with a .019 reduction in the probability of being bulled, which represents a 9 percent reduction relative to the mean.

completed suicides and suicidal behaviors (e.g., having suicidal plans and attempting suicide).[11]

Nikolaou (2017) makes a genuine contribution to the bullying literature. However, this study suffered from several limitations that are worth noting. First and most importantly, ACBLs could directly affect the mental health and suicidal behaviors of high school students, violating the exclusion restriction. For instance, ACBLs could encourage online monitoring by school personnel and parents, which in turn could help identify students at risk for depression and suicide. To take another example, ACBLs could encourage communication between students and faculty (as well as students and their parents), directly affecting mental health.[12] Second, because just three waves of state YRBS data (2011, 2013, and 2015) with information on cyberbullying were available to Nikolaou (2017), he was only able to exploit a maximum of 8 state policy changes when estimating the effects of cyberbullying on suicidal behaviors. Third and finally, while cyberbullying is of obvious interest to policymakers and parents, cyberbullying rarely occurs independently of "traditional" bullying (Waasdorp and Bradshaw 2015; CDC 2017). Being the victim of traditional bullying, which may take the form of verbal harassment, stalking, physical intimidation, theft or violence, could also have important psychological consequences for teenagers.

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[11] See also Fekkes et al. (2006) and Dasgupta (2019). Fekkes et al. (2006) found that a school-based anti-bullying program in The Netherlands reduced bullying behavior by approximately 25 percent and generated short-run reductions in depression. Using YRBS data, Dasgupta (2019) found that anti-cyberbullying laws were associated with increases in electronic and physical bullying. Other studies of the relationship between anti-bullying policies and bullying behavior have used cross-state or cross-school variation to identify their effects (Jeong and Lee 2013; Hatzenbuehler et al. 2015; Meyer et al. 2019).

[12] Nikolaou (2017) did not examine the reduced-form relationship between ACBLs and suicide rates.

3. Data and Methods

To study the impact of state anti-bullying laws on youth mental health and suicides, we use data from two sources: (i) state and national YRBS data, and (ii) multiple cause-of-death mortality data from the National Vital Statistics System (NVSS).

3.1. Youth Risk Behavior Surveys

The YRBS is focused on the health and health behaviors of U.S. high school students. The national YRBS is conducted by the Centers for Disease Control and Prevention (CDC), and, when weighted, is designed to be nationally representative of students attending 9th through 12th grades. State YRBS surveys are coordinated by the CDC, but are typically administered by state health or education agencies.[13] Following previous studies, we combine national and state YRBS data, maximizing policy variation.[14] All of our estimates are weighted using age-by-gender-by-race population weights generated using the Surveillance Epidemiology and the End Results (SEER) program.[15] Our analysis is restricted to YRBS respondents ages 14-18, although the results are qualitatively similar if we include younger YRBS respondents, ages 12-13, in the analysis.

The YRBS is conducted on a biennial basis. Since 2009, its questionnaire has included an item about bullying.[16] Specifically, YRBS respondents are asked, "During the

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[13] Hansen et al. (2013) showed that the state and national YRBS surveys capture the same basic trends in risky behaviors among U.S. high school students.

[14] See, for instance, Hansen et al. (2013), Anderson and Elsea (2015), Anderson et al. (2015), Sabia and Anderson (2016), Hansen et al. (2017), Sabia and Bass (2017), Anderson et al. (2019) and Sabia et al. (2019).

[15] Following Anderson et al. (2015) and Sabia and Anderson (2016), estimates based on state YRBS data can be weighted so as to be nationally representative using population weights generated from SEER.

[16] During the period 2009-2017, 5 waves of the YRBS were administered (2009, 2011, 2013, 2015, and 2017). Because the YRBS is administered at school, if ABLs affect the decision to drop out then our estimates may be contaminated by sample selection bias. This concern is a common one faced by scholars using YRBS data for policy analysis. Below, we investigate whether ABLs are related to dropping out. The results, which are reported in Appendix Table 1, suggest that sample selection is not a major issue for our analysis.

past 12 months, have you ever been bullied on school property?" Bullying victimization appears to be more common among female students: 21.5 percent of female students, as compared to 17 percent of male students, reported being the victim of bullying.[17] Bullying trends in the YRBS for the period 2009-2017 are shown in Figure 1. During this period, the fraction of male students who reported being bullied on school property fell from 19 to 16 percent, while the fraction of female students who reported being bullied remained fairly stable.

The YRBS questionnaire also includes a series of items designed to measure the mental health and suicidal behaviors of high school students in the United States. Respondents are asked how many times they attempted suicide in the past year. They are also asked whether they "seriously considered" attempting suicide (i.e., whether they engaged in suicidal ideation) and whether they made specific plans about how to commit suicide.[18] Finally, YRBS respondents are asked, "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?"

In our sample, 10 percent of female students and 6 percent of male students reported attempting suicide in the past year; 20 percent of female students and 11 percent of male students engaged in suicidal ideation; 16 percent of female students and 10 percent of male students made plans about how to commit suicide; and 36 percent of female students and 20

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[17] The YRBS questionnaire has included an item about cyberbullying since 2011. Specifically, respondents are asked, "During the past 12 months, have you ever been electronically bullied (bullied through texting, Instagram, Facebook, or another social media)?" During the period 2011-2017, 14.8 percent of U.S. high school students were victims of cyberbullying.

[18] Specifically, YRBS respondents are asked, "During the past 12 months, did you ever seriously consider attempting suicide?" and "During the past 12 months, did you make a plan about how you would attempt suicide?"

percent of male students reported being depressed (i.e., feeling so sad or hopeless that they stopped doing usual activities) in the past 12 months.[19]

3.2. Data from the National Vital Statistics System

The multiple cause-of-death mortality data from the NVSS are based on death certificates. Every death in the United States is recorded and reported, along with information regarding the cause of death (i.e., the ICD-9 and ICD-10 codes) and demographic information (i.e., age, sex, race, ethnicity, education, marital status, and state of occurrence). We use these data to construct the state-by-year suicide rates among 14- through 18-year-olds. During the period 2009-2016 the suicide rate among male 14- through 18-year-olds (10.2 per 100,000 population) was almost 3 times that of their female counterparts (3.7 per 100,000 population).

Figure 2 shows how suicide rates among 14- through 18-year-olds evolved during the period 1993-2016. From 1993 to 2007, the suicide rate fell by approximately 40 percent, but then began to trend upwards. In the YRBS data, suicidal ideation and making plans to commit suicide were on the decline through the late 2000s but then began to trend upward, roughly mirroring what we observe in the NVSS suicide data (Appendix Figure 1).

3.3. Anti-bullying laws

The first ABL was adopted by Louisiana on August 1, 2001. Since then, every other state and the District of Columbia have followed suit and passed their own ABLs. Information on ABLs comes from a variety of sources, including the U.S. Department of Education (2011), the U.S Department of Health and Human Services (2016), Sabia and Bass (2017), and our own search of state legislative records. Effective dates for every state ABL

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[19] Figure 1 also shows trends in depression (i.e., feeling "sad") and suicidal behaviors for the period 2009-2017. These trends are based on data from the state and national YRBS.

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are reported in Table 1. Although ABL adoption is now universal (at least in the United

States), researchers are just beginning to explore their effects.

In the empirical analysis below, we distinguish between ABLs based on their

comprehensiveness. Specifically, "strong" ABLs are defined as those that include at least

three of the following 5 requirements: school districts must (i) provide written records of

bullying and how each incident was resolved; (ii) implement strict investigatory procedures

for bullying incidents; (iii) implement graduated sanctions for bullying; (iv) offer training to

teachers, staff, and parents; and (v) clearly define the behaviors that constitute bullying.[20]

ABLs that include zero through two of these requirements are considered to be "weak".

ABL comprehensiveness (strong vs. weak) for every state is reported in Table 1.

3.4. Empirical strategy

Using the combined state and national YRBS data for the period 2009-2017, we

estimate the following equation using ordinary least squares (OLS):

(1) $y_{ist} = \beta_0 + \beta_1 ABL_{st} + \mathbf{Z}_{ist}\boldsymbol{\beta_2} + \mathbf{X}_{st}\boldsymbol{\beta_3} + \alpha_s + \tau_t + \varepsilon_{ist},$

where y_{ist} is one of the outcomes available in the YRBS, i indexes individuals, s indexes

states, and t indexes years. During this period, 26 states adopted an ABL (Table 1). Our

focus is on β_1, the coefficient of the ABL indicator; the vector $\mathbf{Z}_{ist}$ includes individual-level

controls such as gender, age, grade, and race; and the vector $\mathbf{X}_{st}$ includes state-level controls

such as the pupil-to-teacher ratio, the median teacher salary, the presence of a zero-tolerance

school violence policy, per capita income, the unemployment rate, sociodemographic

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[20] See Sabia and Bass (2017, p. 485) for a detailed description of each of these ABL provisions. Table 1 shows which states passed strong versus weak ABLs.

characteristics, and other policies that could influence youth risky behaviors.[21] State fixed

effects, α_s, ensure that identification is based on within-state variation and year fixed effects,

τ_t, account for common (i.e., nationwide) shocks.

We begin our analysis of ABLs and suicide rates by restricting our attention to the

period for which we have YRBS data on bullying, 2009-2016.[22] Next, we expand our

analysis to include the years 1993-2016. In both of these periods, we estimate the following

equation using OLS:

(2) $S_{st} = \gamma_0 + \gamma_1 ABL_{st} + X_{st}\gamma_2 + \alpha_s + \tau_t + \varepsilon_{st}$,

where S_{st} is equal to suicide rate of 14- through 18-year-olds, defined as the number of

completed suicides per 100,000 population belonging to this age group. Again, we are

interested in the coefficient of the ABL indicator, γ_1; the vector X_{st} is composed of controls,

state fixed effects ensure that identification is based on within-state variation, and year fixed

effects account for common shocks.[23]

4. Results

Weighted OLS estimates of β_1 and γ_1 are shown in Tables 3-11. Standard errors are

corrected for clustering at the state level throughout the analysis (Bertrand et al. 2004).

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[21] The vector X_{st} also includes the share of population with a baccalaureate, beer taxes, cigarette taxes, an indicator for an anti-cyberbullying law was in effect, an indicator for whether a zero-tolerance drunk driving law was in effect, an indicator for whether a child access prevention gun safe storage law was in effect, and an indicator for whether a shall-issue gun law was in effect. See Table 2 for a list of the controls and their summary statistics.

[22] The final year in which the restricted-use mortality data are available as of this paper's writing is 2016.

[23] The control include state-level demographic characteristics (share of black and other races, share of ages 14-18, and share of males), economic controls (bachelor degree rate, unemployment rate, and natural logs of personal per capita income), policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance violence laws, zero tolerance drunk driving laws, and electronic bullying laws), and school characteristics (pupil teacher ratio and natural logs of teacher salary).

4.1. ABLs and bullying victimization

In Table 3, we explore the relationship between ABLs and being the victim of bullying on school property using combined state and national YRBS data for the years 2009-2017. We begin by estimating a simple, bare bones version of equation (1), with state and year fixed effects on the right-hand side but no other controls. ABL adoption is associated with a (statistically insignificant) 0.017 reduction in the probability that female students were bullied, or an 8 percent reduction relative to the mean. When the sample is restricted to male YRBS respondents, it is associated with a 0.021 reduction in the probability of having been the victim of bullying, or a 12 percent reduction relative to the mean.

Including the various controls described above increases the estimated effects for female students, but decreases the estimated effects for their male counterparts. In the fully specified regression model (i.e., the regression model with all of the controls listed in Table 2), ABL adoption is associated with a .026 reduction in the probability that female students were the victim of bullying, and a (statistically insignificant) .017 reduction in the probability that male students were the victim of bullying.[24] If ABLs raise bullying awareness and encourage the reporting of bullying, then these estimates might be thought of as lower bounds.[25] The effect of ABLs on bullying victimization appears to be stronger for female

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[24] By comparison, using a difference-in-differences approach, but only three waves of YRBS data (2009, 2011, and 2013), Sabia and Bass (2017) found that ABL adoption was associated with a (statistically insignificant) .008 reduction in the probability of having been bullied on school property, which represents a 4 percent reduction relative to the mean. These authors also found that that the strongest ABLs (as measured by the ratings produced by the U.S. Department of Education) were associated with a .019 reduction in the probability of having been bulled. This latter estimate was statistically significant at the .10 level and represents a 9 percent reduction relative to the mean.

[25] It is also possible that ABLs encourage students, who otherwise would have dropped out, to stay in school. In an effort to explore this possibility, we turned to the Current Population Survey (CPS) Basic Monthly Data (1993-2017) and regressed dropout status among 16- through 18-year-olds on an ABL indicator and a set of controls (including personal characteristics, the state unemployment rate, and state-level school characteristics). The results of this exercise are reported in Appendix Table 1. There is no evidence that ABL adoption is related to the probability of dropping out of high school, suggesting that any sample selection bias is likely to be small. In results available upon request, we also analyzed data from the CPS October Educational Supplement. There

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students as compared to their male counterparts, but we cannot reject the hypothesis that these estimates are equal.

In Table 4, we report results from a model in which ABL_{st} is replaced by three mutually exclusive indicators: an indicator for whether the respondent was interviewed in the YRBS wave immediately before adoption, an indicator for whether the interview was conducted in the year of ABL adoption or the year after, and an indicator for whether the interview was conducted in the wave (two or more years) after ABL adoption. The reference category is composed of respondents who were interviewed 3 or more years (i.e., two YRBS waves) prior to ABL adoption.[26]

Consistent with the parallel-trends assumption, there is little evidence of pre-treatment reductions in the probability of being the victim of bullying: the estimated coefficients of the leads are consistently small and statistically insignificant at conventional levels. There is, however, some evidence that the effect of ABLs on victimization grows stronger over time. For instance, there is a .050 reduction in the probability that female students reported being a victim of bullying two or more years after ABL adoption as compared to a (statistically insignificant) .024 reduction the year of adoption or the year after.

Neither Nikolaou (2017) nor Sabia and Bass (2017) focused on members of historically marginalized groups such as LGBQ students.[27] In Appendix Table 3A, we explore for which groups ABLs are most effective. We find that estimates of β_1 are largest

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was no evidence of an association between ABLs and dropping out among respondents who were observed attending school one year earlier.

[26] Because the YRBS survey is conducted biennially, conducting an event-study analysis with one-year leads and lags is challenging. Only those states that adopted an ABL in an odd-numbered year identify the year-of-adoption effect and the effects for even-numbered years (e.g., two years before adoption), and only those states that adopted an ABL in an even-numbered year identify effects for odd-numbered years (e.g., one year before adoption). Nonetheless, we present event-study estimates using years instead of waves in Appendix Table 2.

[27] In fact, Sabia and Bass (2017, p. 497) urge future researchers to use "better data to estimate the effects of ABLs for lesbian/gay/bisexual/transgendered (LGBT) and disabled youth."

for non-white female and LGBQ students.[28] For instance, among female students who identify as LGBQ, ABL adoption is associated with a .065 reduction in the probability of having been bullied, or a 21 percent reduction relative to their mean; among male LGBQ students, ABL adoption is associated with a .168 reduction in the probability of having been bullied, or a 54 percent reduction relative to their mean.[29] Consistent with the parallel-trends assumption, there is little evidence of reductions in bullying victimization prior to ABL adoption; the largest reductions among LGBQ students occur one or more waves after ABL adoption (Appendix Table 3B).

4.2. ABLs and the mental health of teenagers

The results discussed above provide evidence of a first stage, with the largest effects for historically marginalized groups such as LGBQ youth. In Table 5, we explore whether ABL adoption is related to being depressed and the various YRBS measures of suicidal behavior. Again, we are using combined state and national YRBS data for the years 2009-2017.

The results provide some evidence that ABLs improve mental health and reduce suicidal behaviors, especially among female students. For instance, in the fully specified model, ABL adoption is associated with a .019 reduction in the probability that female students reported being depressed (or a 5 percent reduction relative to the mean) and a .017 reduction in the probability that they engaged in suicidal ideation (or a 9 percent reduction

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[28] In 2009, 7 state YRBS questionnaires included the following item: "Which of the following best describes you?" Respondents were given 4 response options: "heterosexual (straight)," "gay or lesbian," "bisexual," and "not sure". Ten state YRBS questionnaires included this item in the next wave, and 30 state YRBS questionnaires included this item by 2017. The national YRBS began including this item in 2015.

[29] We also explored whether ABLs affected the likelihood of identifying as a sexual minority. If the decision to disclose one's sexual identity is impacted by a safer, more secure schooling environment, then our estimated effects on LGBQ youth could be contaminated by sample selection bias. In Appendix Table 4, we report the results of regressing sexual identity on the ABL indicator and the independent variables listed in Table 2. We find little evidence that ABL adoption is associated with self-identification as a sexual minority in the YRBS.

relative to the mean).[30] Among male students, the estimates of β_1 are generally negative, but they are quite a bit smaller (in absolute magnitude) than the estimates we obtained for female students. Moreover, the estimates of β_1 when the sample is restricted to male students are never statistically distinguishable from zero at conventional levels.[31]

In Table 6, we explore whether the effects of ABLs differ by race (white vs. non-white) and sexual orientation. Estimates of β_1 for white students from the fully specified regression model are consistently small and statistically insignificant. By contrast, there is strong evidence that ABLs are especially effective among non-white and LGBQ students. For instance, ABL adoption is associated with a .039 reduction in the probability that female non-white students reported being depressed, or a 10 percent reduction relative to their mean; it is associated with a .062 reduction in the probability that female LGBQ students made plans to commit suicide, or an 18 percent reduction relative to their mean.[32]

4.3. ABLs and suicide rates among 14- through 18-year-olds

We turn next to the relationship between ABLs and completed suicides among 14- through 18-year-olds per 100,000 population. This analysis is based on multiple cause-of-death mortality data available from the NVSS, an important limitation of which is that information on completed suicides by sexual orientation is not available.

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[30] An event-study analysis (Appendix Table 5) shows that the mental health benefits of ABLs are largest in the wave of adoption and one or more years thereafter.

[31] Only for the outcome *Suicide Ideation* is the estimated effect of state ABLs on mental health statistically different for male and female students (p = 0.047).

[32] In Appendix Table 6, we present estimates of the effect of anti-cyberbullying laws (ACBLs) on bullying victimization and the mental health of teenagers. Contrary to the conclusions reached by Nikolaou (2017), we find no evidence that ACBLs are associated with significant changes in cyberbullying victimization. We do, however, find that ACBLs are associated with a statistically significant 2.2 percentage-point (10 percent) reduction in the probability of having been bullied on school property among female students, a 2 percentage-point reduction (5 percent) reduction in the probability that female students reported being depressed, a 1.9 percentage-point (10 percent) reduction in the probability that female students engaged in suicide ideation, and a 1.3 percentage-point (13 percent) reduction in the probability that female students attempted suicide.

Estimates of equation (2) for the period 2009-2016 are reported in the top panel of Table 7. There is strong evidence that ABLs reduce suicides among female 14- through 18-year-olds. For instance, in the bare bones specification, ABL adoption is associated with a .542 reduction in the suicide rate. When the economic and policy controls are added to the right-hand side, the estimates of γ_1 increase in absolute magnitude. In the fully specified model, ABL adoption is associated with a .592 reduction in the suicide rate among female 14- through 18-year-olds, or a 16 percent reduction relative to the mean.

To put this last estimate in perspective, there were 498 suicides among female 14- through 18-year-olds in 2016, and 16 percent of this figure represents 80 lives saved, or somewhere in the neighborhood of 4-5 fewer completed suicides per 10,000 female students deterred from considering suicide because their state adopted an ABL.[33] Hansen and Lang (2011) found that suicides among female 14- through 18-year-olds decline by 22 percent during the summer months, a phenomenon they attribute to students being given a respite from "negative social interactions" (Hansen and Lang 2011, pp. 860-861). If summer can be thought of as providing a complete respite from negative social interactions at school, then our 16 percent estimate suggests ABLs can be thought of providing a respite approximately three quarters as large.[34]

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[33] The 4-5 fewer completed suicides per 10,000 female high school students deterred from considering suicide comes from the following back-of-the-envelope calculation. In Table 5, we report that the adoption of an ABL is associated with a 0.017 reduction in the probability of female high school students engaging in suicidal ideation (i.e., seriously considering a suicide attempt). In 2016, there were approximately 10,271,000 female 14- through 18-year-olds in the United States and 10,271,000 multiplied by 0.017 is equal to 174,607. Eighty divided by 174,607 is equal to 0.00046, or 4.6 fewer completed suicides per 10,000 female 14- through 18-year-olds deterred from considering suicide.

[34] Hansen and Lang (2011) found that suicides among female 14- through 18-year-olds decline by 22 percent during the summer months, while we find that ABL adoption is associated with a 16 percent reduction in suicides among female 14- through 18-year-olds (Table 7); 16 divided by 22 is equal to 0.73, or almost three quarters. Hansen and Lang (2011) found that suicides among male 14- through 18-year-olds decline by 16 percent during the summer months.

Among male 14- through 18-year-olds, ABLs are associated with small decreases in the suicide rate that are statistically indistinguishable from zero at conventional levels. Why might ABLs protect female students, but not their male counterparts, from suicide? One explanation may be that bullying generates more psychological trauma for female students and, as a consequence, the bullying being deterred by ABLs generates larger mental health benefits.[35] Another potential explanation is that ABLs create safe environments in which students are more comfortable seeking social support and expressing their emotions, activities that may deter suicides (Cutler et al. 2001; Hatzenbuehler 2011) and that are disproportionately engaged in by women (Matud 2004; Eschenbeck et al. 2007).

In the bottom panel of Table 7, we report estimates of equation (2) based on NVSS data for a longer period, 1993-2016.[36] These estimates are similar to those based on the shorter time period (reported in the top panel of Table 7). For instance, in the fully specified model, ABL adoption is associated with a .464 reduction in the suicide rate among female 14- through 18-year-olds, or a 15 percent reduction relative to the mean. By contrast, there is no evidence that anti-cyberbullying laws (ACBLs) reduce suicides among 14- through 18-year-olds (Appendix Table 8).[37] This pattern of results echoes those obtained by previous researchers suggesting that cyberbullying causes less psychological damage than traditional bullying (Ortega et al. 2012; Hase et al. 2015).

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[35] Idsoe et al. (2012) found that the symptoms of post-traumatic stress disorder (PTSD) were more prevalent among girls who had been bullied as compared to boys who had been bullied. In a similar vein, Kowalski and Limber (2013) found that girls who had been bullied reported more anxiety and overall health problems than boys.

[36] Estimates of equation (1) based on YRBS data for three different periods (1993-2007, 2009-2017, and 1993-2017) are reported in Appendix Table 7. The results provide evidence that the relationship between ABLs and depression among female high school was strongest in the period 2009-2017. Likewise, the relationship between ABLs and suicidal ideation among female high school appears to be strongest in the period 2009-2017. We cannot estimate the effects of ABLs on bullying victimization prior to 2009 because this question was not asked of YRBS respondents.

[37] Using ACBLs as an instrument for state-level cyberbullying rates in the YRBS, Nikolaou (2017, p. 39) found a strong positive relationship between cyberbullying victimization and state-level suicide rates. See p. 8 for a discussion of why ACBLs may not be a valid instrument in this context.

Replacing the ABL indicator in equation (2) with a series of its lags and leads allows us to explore whether the parallel-trends assumption holds and whether the effects of ABLs grow stronger over time. The results of this exercise are reported in Figure 3. The omitted category is one to two years; 95 percent confidence intervals are shown as light blue bars.

Among female 14- through 18-year-olds, the event-study estimates suggest that the effects of ABLs become stronger over time. In the year of implementation (year 0) and the year after, ABLs are associated with a .494 reduction in the suicide rate of female 14- through 18-year-olds; 6 or more years after implementation, they are associated with a .807 reduction in this rate. Consistent with the parallel-trends assumption, the estimated coefficients of the ABL leads are small and statistically insignificant at conventional levels. Among male 14- through 18-year-olds, the event-study analysis provides suggestive evidence that the effects of ABLs may grow over time.[38]

4.4. ABLs and suicide rates: robustness checks and extensions

In Table 8, we report estimated effects of ABLs on suicide rates among individuals old enough to have graduated high school. Specifically, our focus is on 19- through 23-year-olds and 24- through 27-year-olds. The logic behind these placebo tests is that members of these groups should be unaffected by ABLs unless exposure in high school had long-term effects. Reassuringly, the estimates are consistently small and statistically indistinguishable from zero. Likewise, ABLs are essentially unrelated to non-suicide mortality among 14- through 18-year-olds (Table 8).[39]

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[38] Among male 14- through 18-year-olds, the estimated lead coefficients are positive but statistically insignificant. The year of implementation and the year after, ABLs are associated with a .250 increase in the suicide rate of male 14- through 18-year-olds; 6 or more years after implementation, they are associated with a 1.15 reduction in this rate. Neither of these estimates, however, is statistically distinguishable from zero.

[39] In Appendix Table 9, we report difference-in-difference-in-differences (DDD) estimates of the effects of state ABLs on suicide rates of 14- through 18-year-olds relative to 19- through 23- year-olds, 24- through 27-year-olds, and non-suicide mortality. These DDD estimates are negative and their magnitude is generally consistent

In Table 9, we explore whether the estimated effects of ABLs on suicides differ by race (white versus non-white). As noted above, previous studies provide evidence that non-white students are disproportionately affected by bullying at school (Goldweber et al. 2013). The results provide some evidence that the effect of ABL adoption is larger among non-white teenagers than among their white counterparts: the estimate of γ_1 is -.587 when the dependent variable is the suicide rate of non-white 14- through 18-year-olds, which corresponds to a reduction of 26 percent relative to the race-specific mean; by comparison, an estimate of -.416 is obtained when the dependent variable is the suicide rate of white 14- through 18-year-olds, or 13 percent relative to the race-specific mean. It should be noted, however, that we cannot reject the hypothesis that these two estimates are equal.

We also explore whether the estimated effects of ABLs differ by age group (14- through 16-year-olds vs. 17- through 18-year-olds) in Table 9. The estimate of γ_1 is -.352 for 14- through 16-year-olds as compared to -.636 for 17- through 18-year-olds. Although we cannot reject the hypothesis that these two estimates are equal, they provide suggestive evidence that the effects of ABLs are strongest among older teens.

In Table 10, we report the results of several sensitivity analyses. Following Ludwig et al. (2009) and Carpenter and Dobkin (2009), we take the natural log of the suicide rate in the first column of Table 10. ABL adoption is associated with a 13.8 log point reduction in the suicide rate of female 14- through 18-year-olds, which translates to 13 percent ($e^{-.138} - 1 = -.129$). In the second column, we include census division-by-year fixed effects, which are intended to capture shocks at the census division level that are potentially correlated with ABL adoption. With their inclusion on the right-hand side of the regression model, the estimated effect of ABLs on the suicide rate of female 14- through 18-year-olds becomes, in

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with the DD estimates reported in Table 7. Controlling for state-by-year fixed effects produces a very similar pattern of results.

absolute terms, larger: ABLs are associated with a .676 reduction in their suicide rate, or 22 percent relative to the mean. Including state-specific linear trends on the right-hand side of the regression produces an estimate of γ_1 equal to -.375, which is a little smaller than the estimates reported in Table 7. The estimated coefficient from a Poisson regression is negative and it is of comparable magnitude to the estimates reported in Table 7, although it is slightly less precise.[40]

Finally, in Table 11 we allow the estimated effects of ABLs to differ based on statute comprehensiveness. Specifically, strong ABLs are defined as those that impose at least three requirements on school districts, while weak ABLs impose 0-2 requirements.[41] The results suggest that ABL comprehensiveness matters, at least among female high school students. For instance, the adoption of a strong ABL is associated with a .030 reduction in the probability that female students are bullied, a .021 reduction in the probability that they are depressed, and a .022 reduction in the probability that they engaged in suicidal ideation. By comparison, the adoption of a weak ABL is associated with a (statistically insignificant) .008 reduction in the probability that male students are bullied, a (statistically insignificant) .008 reduction that they are depressed, and a (statistically insignificant) .001 increase in the probability that they engaged in suicidal ideation.

The adoption of a strong ABL is also associated with .564 fewer suicides per 100,000 female 14- through 18-year-olds (or 19 percent relative to the mean), while weak ABLs are

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[40] The Poisson estimated coefficient is -.127 ($e^{-.127} - 1 = -.119$) with a standard error of .065 (p-value = 0.051). By comparison, in the fully specified model ABL adoption is associated with a .464 reduction in the suicide rate among female 14- through 18-year-olds, or a 15 percent reduction relative to their sample mean (Table 7). The unweighted OLS estimates of γ_1 is much larger than estimates that are weighted by state population: ABL adoption is associated with a .862 reduction in the suicide rate of 14- through 18-year-olds, or 22 percent relative to their unweighted mean.

[41] As discussed in the background section, the 5 possible requirements are: (i) provide written records of bullying and how each incident was resolved, (ii) implement strict investigatory procedures for bullying incidents, (iii) implement graduated sanctions for bullying, (iv) offer training to teachers, staff and parents, and (v) clearly define the behaviors that constitute bullying.

associated with .448 fewer suicides per 100,000 female 14- through 18-year-olds, although

we cannot reject the hypothesis that the strong versus weak estimates are equal (p-value =

0.374). The estimated effects for male students of both strong and weak ABLs are generally

small and statistically insignificant.[42]

5. Conclusion

Suicides among teenagers have risen dramatically since the mid-2000s (Miron et al.

2019). By 2017, the latest year for which data are available, there were 11.8 suicides per

100,000 individuals ages 15-19 (Miron et al. 2019), prompting calls for action from experts,

policymakers and the public (Carroll 2019; Fagell 2019; Wan 2019; Resnick 2019; Friedman

2020).

It is not clear why teenage suicides have increased so dramatically, and, in fact,

observers point to a number of factors, including lack of sleep, an increase in bullying, the

rise of social media, and smartphones (McCall 2015; Twenge 2017). Given the complexity

of the problem, it is perhaps not surprising that the proposed solutions run the gamut from

providing easier access to mental health care to reducing access to firearms and medications

(SAMHSA 2012). The CDC (2014, p. 2) notes that bullying is associated with an "increased

risk for suicide-related behavior," but establishing a causal link between bullying and

suicides is made difficult by the fact that bullying is not randomly assigned and its victims

could be targeted precisely because they are suffering from mental health issues and are

therefore at increased risk of committing suicide.

In this study, we side-step the thorny problem of establishing a causal link between

bullying and suicide. Instead, using data from the National and State Youth Risk Behavior

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[42] Unweighted OLS estimates of strong versus weak ABLs on the YRBS mental health outcomes are shown in Appendix Table 10. These estimates are generally consistent with the suicide results based on NVSS data reported in Table 11. Strong ABLs appear to have larger mental health benefits among LGBQ and non-white students than do weaker laws (Appendix Table 11).

Surveys (YRBS) and the National Vital Statistics System (NVSS), we examine a policy that has become popular, at least in part, because it is viewed as an effective method of combatting teen suicides (Rempfer 2017; Gould 2018; Greco 2019). Specifically, our interest is in estimating the effects of anti-bullying laws (ABLs) on the mental health of high school students and suicides among teenagers, ages 14-18. To date, every state in the country and Washington DC has passed an ABL, which, in theory, should shift the expected costs and benefits of bullying and, ultimately, could lead to fewer suicides.

Exploiting geographical and temporal variation in the adoption of ABLs, several important, policy-relevant results are found. First, we find that ABLs are associated with a substantial reduction in the risk of being bullied. This estimated effect is strongest among non-white female students and LGBQ students, two groups that are disproportionately targeted by bullies (Sawyer et al. 2008; Faris and Felmlee 2011; Goldweber et al. 2013; Anderson et al. 2019).

Using the same identification strategy and state and national YRBS data, we provide a series of what can be thought of as second-stage estimates. We find that ABLs reduce self-reported depression and suicidal behaviors among American high school students. For instance, we find that ABL adoption is associated with a 5 percent reduction in depression and a 9 percent reduction in suicidal ideation among female students. Among male students, the estimated effects of ABL adoption on these and similar outcomes are generally smaller and statistically insignificant at conventional levels. Among LGBQ students, ABL adoption is associated with larger and significant reductions in suicidal behaviors, suggesting that ABLs are especially effective at protecting members of this vulnerable group.

Finally, flexibly controlling for state-level factors that are constant over time and common (i.e., nationwide) shocks, we examine the effects of ABLs on the suicide rates of teenagers. Our preferred estimates, which are based on NVSS data for the period 1993-2016,

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suggest that the typical ABL reduces the suicide rate among female 14- through 18-year-olds by .464. That is, their suicide rates fall by 15 percent with the adoption of an ABL. Not surprisingly, given the YRBS results discussed above, this average effect, however, masks considerably heterogeneity. The effect of ABL adoption is larger among non-white 14- through 18-year-olds and it is larger when the ABL is comprehensive (as measured by the number of requirements it imposes on school districts). The adoption of the strongest type of ABL is associated with a 19 percent reduction in the suicide rate of 14- through 18-year-olds, which suggests that if every state had adopted a "strong" as opposed to a "weak" ABL by 2016, there would have been 0.171 per 100,000 fewer suicides among this group.[43]

We close with a brief discussion of data limitations. First, the outcomes available in the YRBS are based on self-reports, which may understate the true prevalence of depression and suicidal behaviors. However, if underreporting is unrelated to the timing of ABL adoption, the estimated effects reported above will be unbiased, at least when expressed in percent terms relative to the mean. Second, because the YRBS data are not longitudinal, we are not able to observe within-person changes in suicidal behaviors; longitudinal data might allow us to better isolate the mental health margins on which ABLs are most effective. Finally, our survey data do not allow us to identify effects of ABLs on the perpetrators of bullying, who themselves may accrue mental health benefits from breaking the "bullying cycle."

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[43] The difference between the weak and strong ABL estimated coefficients is 0.116, or 3.8 percent relative to the mean. The mean number of suicides per 100,000 for females ages 14-18 in 2016 (4.849) multiplied by .038 is 0.171.

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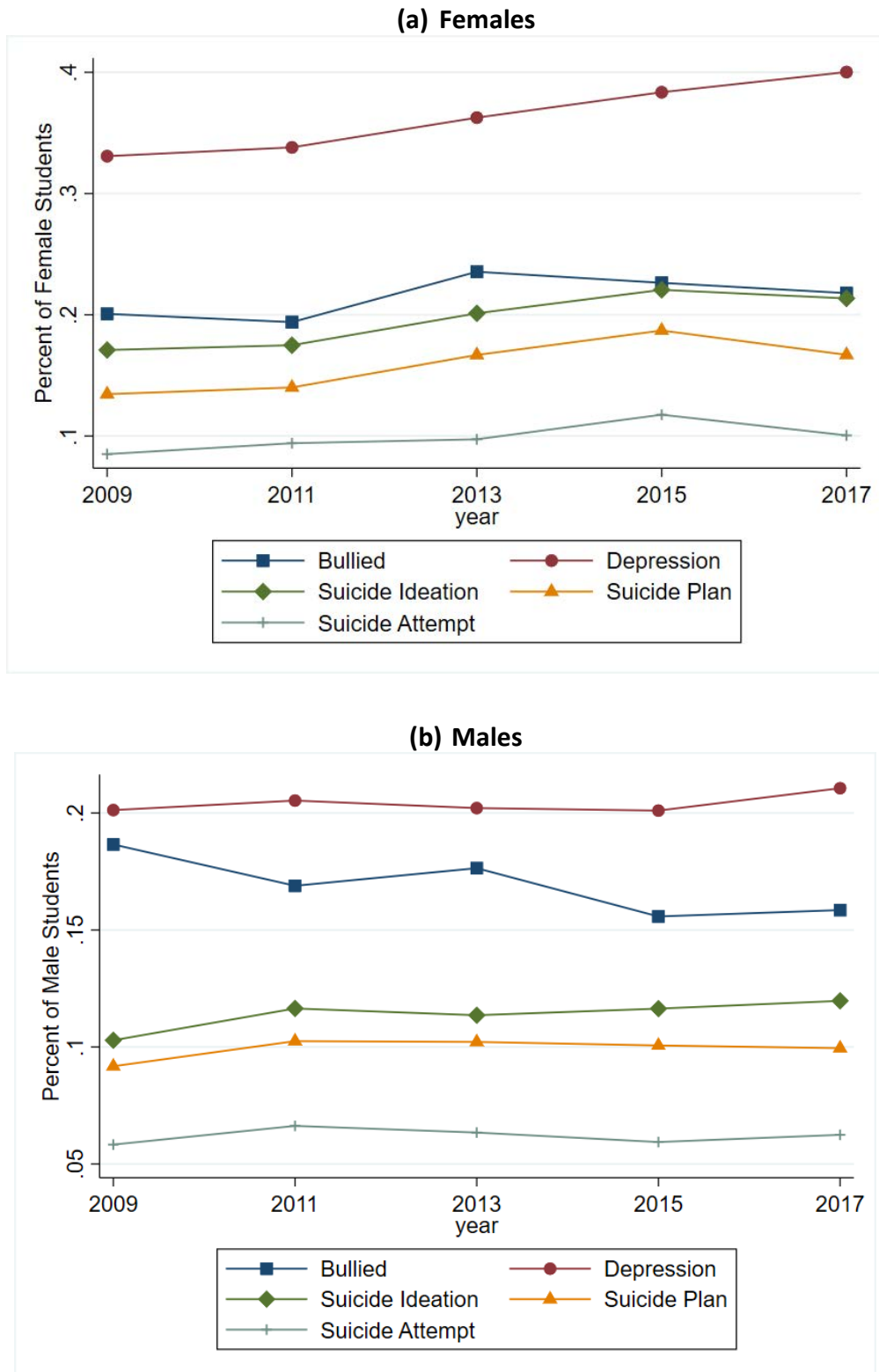
# Figure 1. National Trends in Bullying and Mental Health Outcomes

Notes: Rates are based on data from the state and national Youth Risk Behavior Surveys for the period 2009-2017 and are weighted using adjusted state-level population from the Surveillance Epidemiology and End Results Program (SEER).

Figure 2. Suicide Rates of Teenagers Ages 14-18
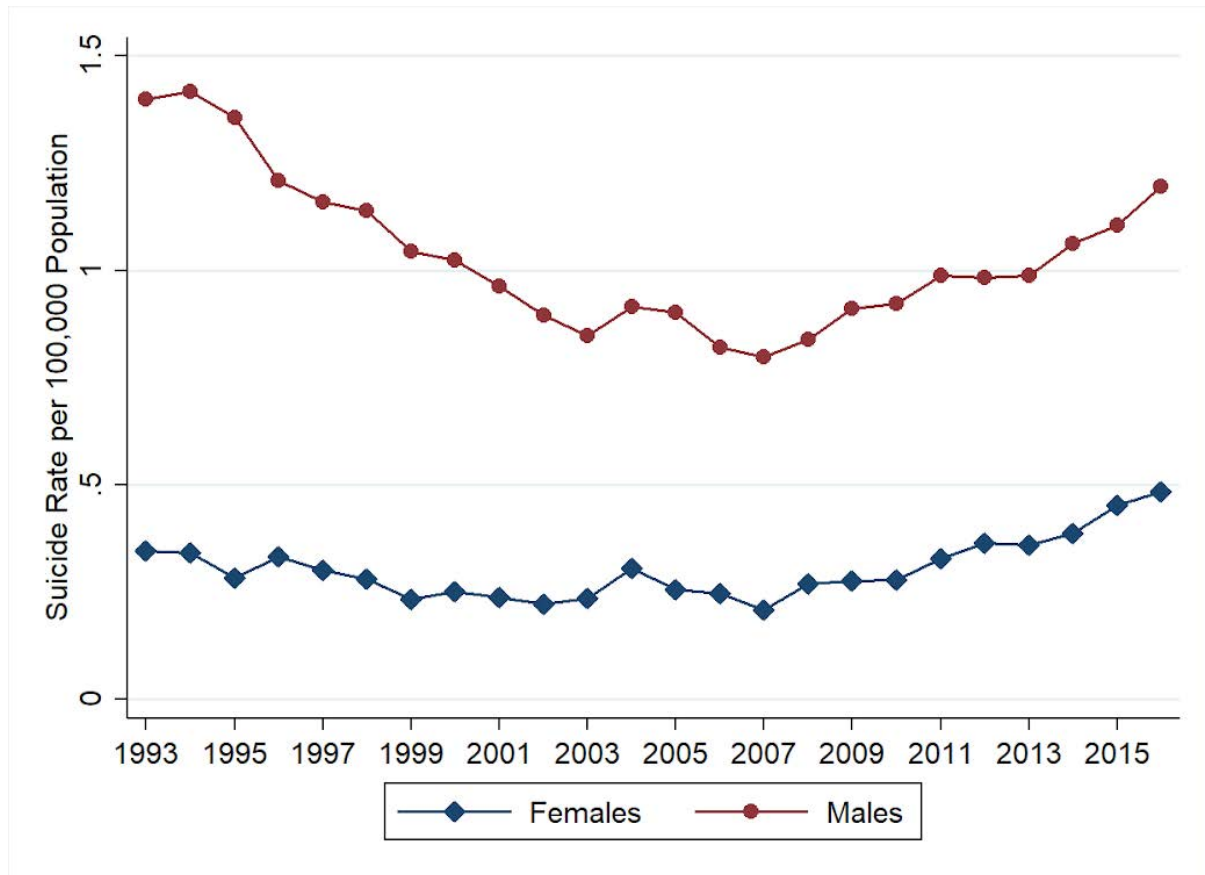
Notes: Rates are generated using the National Vital Statistics System (NVSS) multiple cause-of-death mortality files, 1993-2016. They are weighted using age- and gender-specific population from the Surveillance Epidemiology and End Results Program (SEER).

Figure 3. Event-Study Analysis of Anti-Bullying Laws and Suicides among 14- through 18-Year-Olds

(a) Females

(b) Males
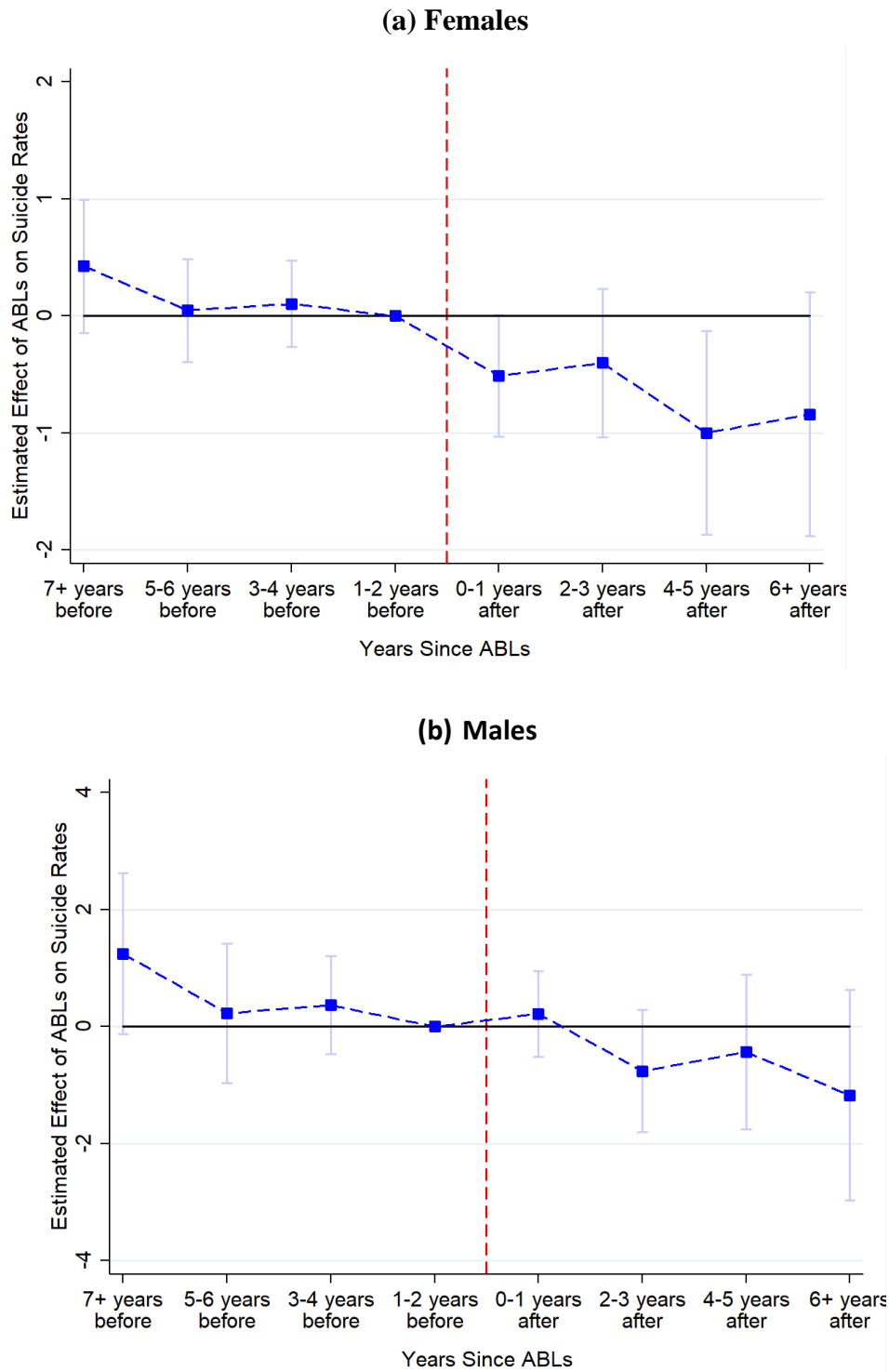
Notes: Population-weighted OLS estimates are reported. Suicides per 100,000 population are from the National Vital Statistics System (NVSS) multiple cause-of-death mortality files, 1993-2016. See Table 7 for a list of controls.

Table 1. State Anti-Bullying Laws (ABLs) by Comprehensiveness, 2001-2017

State	Date	Strength of Statute	State	Date	Strength of Statute
Alabama	July 1, 2010	Weak	Montana	April 1, 2015	Weak
Alaska	July 1, 2007	Weak	Nebraska	July 1, 2009	Weak
Arizona	August 12, 2005	Weak	Nevada	July 1, 2005	Weak
Arkansas	February 16, 2003	Weak	New Hampshire	January 1, 2011	Strong
California	January 1, 2004	Weak	New Jersey	September 1, 2011	Strong
Colorado	August 8, 2001	Weak	New Mexico	April 4, 2007	Weak
Connecticut	February 1, 2009	Strong	New York	July 1, 2010	Weak
District of Columbia	June 22, 2012	Strong	North Carolina	December 31, 2009	Weak
Delaware	January 1, 2008	Strong	North Dakota	July 1, 2012	Weak
Florida	December 1, 2008	Strong	Ohio	September 29, 2010	Strong
Georgia	August 1, 2011	Weak	Oklahoma	November 1, 2002	Weak
Hawaii	July 11, 2011	Strong	Oregon	January 1, 2004	Strong
Idaho	July 1, 2006	Weak	Pennsylvania	January 1, 2009	Weak
Illinois	June 28, 2010	Weak	Rhode Island	September 1, 2004	Weak
Indiana	July 1, 2005	Strong	South Carolina	January 1, 2007	Weak
Iowa	September 1, 2007	Weak	South Dakota	July 1, 2012	Strong
Kansas	July 1, 2008	Weak	Tennessee	January 1, 2006	Weak
Kentucky	November 30, 2008	Weak	Texas	June 17, 2011	Weak
Louisiana	August 1, 2001	Weak	Utah	September 1, 2012	Weak
Maine	September 1, 2006	Weak	Vermont	January 15, 2007	Strong
Maryland	July 1, 2009	Strong	Virginia	July 1, 2013	Weak
Massachusetts	December 31, 2010	Weak	Washington	August 1, 2011	Strong
Michigan	June 7, 2012	Strong	West Virginia	December 1, 2001	Weak
Minnesota	August 1, 2007	Weak	Wisconsin	August 15, 2010	Weak
Mississippi	December 30, 2010	Weak	Wyoming	December 31, 2009	Strong
Missouri	September 1, 2007	Weak			

Notes: Data on effective dates of state anti-bullying laws were obtained from the U.S. Department of Education, U.S. Department of Health and Human Services, and Sabia and Bass (2017). States with 0 to 2 district requirements are classified as having weak policy comprehensiveness. States with 3 or more requirements are classified as having strong policy comprehensiveness. See the discussion on page 9 for more details.

Table 2. Summary Statistics

	Mean	S.D.	N
Dependent Variables			
Youth Risk Behavior Survey (2009-2017)			
Bullied (yes = 1, no = 0)			
Female	0.215	0.411	393,616
Male	0.169	0.375	374,730
Depression (yes = 1, no = 0)			
Female	0.362	0.481	429,389
Male	0.204	0.403	410,205
Suicide Ideation (yes = 1, no = 0)			
Female	0.196	0.397	403,476
Male	0.114	0.317	383,988
Suicide Plan (yes = 1, no = 0)			
Female	0.159	0.365	384,135
Male	0.099	0.299	368,294
Suicide Attempt (yes = 1, no = 0)			
Female	0.099	0.298	317,764
Male	0.062	0.241	295,693
National Vital Statistics System			
Suicide Rates per 100,000 (2009-2016)			
Female	3.653	2.104	408
Male	10.184	4.515	408
Suicide Rates per 100,000 (1993-2016)			
Female	3.025	2.196	1,224
Male	10.276	6.054	1,224
Independent Variables			
Student Demographics in YRBS (2009-2017)			
Age	16.038	1.407	839,594
Grade	10.443	1.191	839,594
Female	0.490	0.500	839,594
White	0.557	0.497	839,594
Black	0.152	0.359	839,594
Hispanic	0.227	0.419	839,594
Other Race	0.063	0.243	839,594
State-Level Controls			
Anti-Bullying Laws (ABLs)	0.351	0.470	1,224
Cigarette Tax	0.897	0.817	1,224
Anti-Cyberbullying Laws	0.343	0.475	1,224
Beer Tax	0.247	0.196	1,224
CAP Law	0.631	0.483	1,224
Shall Issue Law	0.564	0.496	1,224
Zero Tolerance Drunk Driving Laws	0.917	0.266	1,224
Zero Tolerance School Violence Laws	0.906	0.283	1,224
Pupil: Teacher Ratio	15.887	3.421	1,224
Teacher Salary	49,127.63	10,850.23	1,224
Unemployment Rates	6.016	1.947	1,224
Personal Per Capita Income	35,407.4	9,388.819	1,224
Share with Bachelor's Degree	0.279	0.054	1,224
State-Level Demographic Controls[a]			
Percent Black	0.117	0.115	1,224
Percent Other Race	0.063	0.102	1,224
Percent 14-18 years of age	0.070	0.007	1,224
Percent Male	0.492	0.008	1,224

Notes: Estimates based on YRBS data are weighted using adjusted state-level population estimates from the Surveillance Epidemiology and End Results Program (SEER). Estimates based on NVSS data are weighted using age- and gender-specific population from SEER.

[a] When analyzing the NVSS data, these state-level demographic characteristics are used instead of individual-level characteristics.

Table 3. ABLs and Bullying Victimization

	(1)	(2)	(3)	(4)
	Panel I: Females			
ABL	-0.017	-0.023**	-0.023**	-0.026**
	(0.012)	(0.011)	(0.011)	(0.012)
	[0.215]	[0.215]	[0.215]	[0.215]
N	393,616	393,616	393,616	393,616
	Panel II: Males			
ABL	-0.021*	-0.021*	-0.021*	-0.017
	(0.011)	(0.010)	(0.011)	(0.011)
	[0.169]	[0.169]	[0.169]	[0.169]
N	374,730	374,730	374,730	374,730
State and year FEs	Yes	Yes	Yes	Yes
Individual characteristics	Yes	Yes	Yes	Yes
Economic controls	No	Yes	Yes	Yes
State policy controls	No	No	Yes	Yes
School characteristics	No	No	No	Yes

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. The mean of the dependent variable, bullying victimization in the past year, is reported in brackets. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER.

Table 4. Lead and Lagged Effects of ABLs on Bullying Victimization

	Females	Males
	(1)	(2)
Wave prior to adoption	-0.009	-0.031
	(0.018)	(0.020)
Wave of ABL adoption	-0.024	-0.033
	(0.019)	(0.021)
One or more waves after adoption	-0.050*	-0.047*
	(0.025)	(0.023)
Mean of DV	0.215	0.169
N	393,616	374,730

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER. The reference category is composed of respondents who were interviewed 3 or more years (i.e., two YRBS waves) prior to ABL adoption.

Table 5. ABLs and Mental Health

	Females				Males			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Depression	-0.011	-0.016*	-0.016*	-0.019*	-0.010	-0.011	-0.013	-0.007
(yes = 1, no = 0)	(0.008)	(0.008)	(0.009)	(0.010)	(0.010)	(0.009)	(0.010)	(0.008)
	[0.362]	[0.362]	[0.362]	[0.362]	[0.204]	[0.204]	[0.204]	[0.204]
N	429,389	429,389	429,389	429,389	410,205	410,205	410,205	410,205
Suicide Ideation	-0.009	-0.013*	-0.013*	-0.017**	-0.001	-0.000	-0.002	0.002
(yes = 1, no = 0)	(0.008)	(0.007)	(0.007)	(0.009)	(0.006)	(0.005)	(0.005)	(0.005)
	[0.196]	[0.196]	[0.196]	[0.196]	[0.114]	[0.114]	[0.114]	[0.114]
N	403,476	403,476	403,476	403,476	383,988	383,988	383,988	383,988
Suicide Plan	-0.009	-0.011	-0.010	-0.013	-0.006	-0.006	-0.008	-0.004
(yes = 1, no = 0)	(0.009)	(0.008)	(0.008)	(0.009)	(0.007)	(0.006)	(0.007)	(0.006)
	[0.159]	[0.159]	[0.159]	[0.159]	[0.099]	[0.099]	[0.099]	[0.099]
N	384,135	384,135	384,135	384,135	368,294	368,294	368,294	368,294
Suicide Attempt	0.000	-0.002	-0.003	-0.007	-0.003	-0.003	-0.003	0.001
(yes = 1, no = 0)	(0.005)	(0.006)	(0.006)	(0.005)	(0.008)	(0.006)	(0.006)	(0.006)
	[0.099]	[0.099]	[0.099]	[0.099]	[0.062]	[0.062]	[0.062]	[0.062]
N	317,764	317,764	317,764	317,764	295,693	295,693	295,693	295,693
State and year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Economic controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
State policy controls	No	No	Yes	Yes	No	No	Yes	Yes
School characteristics	No	No	No	Yes	No	No	No	Yes

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. The mean of the dependent variable is reported in brackets. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER.

Table 6. Estimated Effects of ABLs on Mental Health by Gender, Race, and Sexual Identity

	Non-Whites		Whites		LGBQ		Heterosexual	
	Females	Males	Females	Males	Females	Males	Females	Males
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Depression	-0.039**	-0.019	-0.004	0.004	-0.043	-0.075	-0.022*	-0.007
(yes = 1, no = 0)	(0.015)	(0.014)	(0.010)	(0.008)	(0.038)	(0.053)	(0.011)	(0.010)
	[0.387]	[0.220]	[0.343]	[0.191]	[0.609]	[0.393]	[0.329]	[0.184]
N	196,221	185,281	233,167	224,923	40,306	19,617	201,422	209,623
Suicide Ideation	-0.024**	-0.003	-0.007	0.004	-0.084**	-0.101*	-0.024**	-0.013*
(yes = 1, no = 0)	(0.011)	(0.009)	(0.010)	(0.007)	(0.032)	(0.057)	(0.010)	(0.007)
	[0.201]	[0.112]	[0.192]	[0.115]	[0.425]	[0.299]	[0.155]	[0.095]
N	193,005	181,447	210,470	202,540	36,070	17,587	178,125	183,796
Suicide Plan	-0.028**	-0.014	-0.004	-0.001	-0.062**	-0.114***	-0.012	-0.003
(yes = 1, no = 0)	(0.013)	(0.010)	(0.011)	(0.007)	(0.029)	(0.034)	(0.009)	(0.005)
	[0.166]	[0.101]	[0.153]	[0.098]	[0.352]	[0.262]	[0.129]	[0.085]
N	169,723	161,603	214,411	206,690	35,893	17,666	185,348	192,422
Suicide Attempt	-0.017	-0.014	-0.001	0.007	-0.026	-0.143***	-0.011	-0.012***
(yes = 1, no = 0)	(0.010)	(0.008)	(0.007)	(0.007)	(0.037)	(0.038)	(0.007)	(0.004)
	[0.117]	[0.077]	[0.085]	[0.051]	[0.235]	[0.212]	[0.070]	[0.052]
N	137,102	125,609	180,661	170,083	24,444	11,592	128,533	131,313

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. The mean of the dependent variable is reported in brackets. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER.

Table 7. ABLs and Suicide Rates among 14- through 18-Year-Olds

	(1)	(2)	(3)	(4)
Panel I: 2009-2016				
Females	-0.542*	-0.519*	-0.570*	-0.592**
	(0.287)	(0.277)	(0.293)	(0.293)
	[3.653]	[3.653]	[3.653]	[3.653]
N	408	408	408	408
Males	0.129	0.025	0.057	-0.035
	(0.544)	(0.500)	(0.596)	(0.570)
	[10.184]	[10.184]	[10.184]	[10.184]
N	408	408	408	408
Panel II: 1993-2016				
Females	-0.432**	-0.458**	-0.435*	-0.464**
	(0.204)	(0.204)	(0.233)	(0.225)
	[3.025]	[3.025]	[3.025]	[3.025]
N	1,224	1,224	1,224	1,224
Males	0.018	0.014	-0.055	-0.068
	(0.323)	(0.318)	(0.354)	(0.334)
	[10.276]	[10.276]	[10.276]	[10.276]
N	1,224	1,224	1,224	1,224
State and year FEs	Yes	Yes	Yes	Yes
Demographic controls	Yes	Yes	Yes	Yes
Economic controls	No	Yes	Yes	Yes
Policy controls	No	No	Yes	Yes
School resources	No	No	No	Yes

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Population weighted OLS estimates are reported. Suicides counts are from the National Vital Statistics System (NVSS) multiple cause-of-death mortality files. Standard errors, corrected for clustering at the state level, are in parentheses. Weighted means of the dependent variables are in brackets. Controls include year fixed effects, state fixed effects, demographic characteristics (share of black and other races, share of ages 14-18, and share of males), economic controls (bachelor degree rate, unemployment rate, and natural logs of personal per capita income), policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance violence laws, zero tolerance drunk driving laws, and electronic bullying laws), and school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using age- and gender-specific population from SEER.

Table 8. Placebo Tests using NVSS Data

	Suicide Rate		Non-Suicide External Death Rate
	Ages 19-23	Ages 24-27	Ages 14-18
	(1)	(2)	(3)
Females	0.077	-0.035	0.395
	(0.218)	(0.351)	(0.385)
	[4.019]	[4.619]	[17.110]
N	1,224	1,224	1,224
Males	-0.287	-0.932	-0.396
	(0.606)	(0.597)	(0.985)
	[21.855]	[22.762]	[42.866]
N	1,224	1,224	1,224

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Population weighted OLS estimates are reported. Suicides counts are from the National Vital Statistics System (NVSS) multiple cause-of-death mortality files, 1993-2016. Standard errors, corrected for clustering at the state level, are in parentheses. Weighted means of the dependent variables are in brackets. Controls include year fixed effects, state fixed effects, demographic characteristics (share of black and other races, share of ages 14-18, and share of males), economic controls (bachelor degree rate, unemployment rate, and natural logs of personal per capita income), policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance violence laws, zero tolerance drunk driving laws, and electronic bullying laws), and school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using age- and gender-specific population from SEER.

Table 9. Estimated Effects of ABLs on Suicide Rates by Race and Age

	Non-Whites	Whites	Ages 14-16	Ages 17-18
	(1)	(2)	(3)	(4)
Females	-0.587**	-0.416	-0.352*	-0.636*
	(0.268)	(0.251)	(0.195)	(0.356)
	[2.298]	[3.240]	[2.837]	[3.308]
N	1,224	1,224	1,224	1,224
Males	-0.320	0.030	-0.193	0.094
	(0.469)	(0.379)	(0.381)	(0.500)
	[22.843]	[23.732]	[7.264]	[14.777]
N	7.176	11.171	1,224	1,224

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Population weighted OLS estimates are reported. Suicides counts are from the National Vital Statistics System (NVSS) multiple cause-of-death mortality files, 1993-2016. Standard errors, corrected for clustering at the state level, are in parentheses. Weighted means of the dependent variables are in brackets. Controls include year fixed effects, state fixed effects, demographic characteristics (share of black and other races, share of ages 14-18, and share of males), economic controls (bachelor degree rate, unemployment rate, and natural logs of personal per capita income), policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance violence laws, zero tolerance drunk driving laws, and electronic bullying laws), and school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using age- and gender-specific population from SEER.

Table 10. Estimated Effects of ABLs on Suicide Rates: Sensitivity Analyses

|	Log of Rate	Division-by-Year FEs	State Linear Trends	Unweighted	Poisson
	(1)	(2)	(3)	(4)	(5)
Females	-0.138**	-0.676***	-0.375*	-0.862***	-0.127*
	(0.065)	(0.188)	(0.201)	(0.249)	(0.065)
		[3.025]	[3.025]	[3.835]	[11.896]
N	1,114	1,224	1,224	1,224	1,224
Males	0.011	0.524	0.310	-0.234	0.009
	(0.031)	(0.438)	(0.329)	(0.657)	(0.030)
		[10.276]	[10.276]	[13.094]	[40.622]
N	1,216	1,224	1,224	1,224	1,224

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Population weighted OLS estimates are reported. Suicides counts are from the National Vital Statistics System (NVSS) multiple cause-of-death mortality files, 1993-2016. Standard errors, corrected for clustering at the state level, are in parentheses. Weighted means of the dependent variables are in brackets. Controls include year fixed effects, state fixed effects, demographic characteristics (share of black and other races, share of ages 14-18, and share of males), economic controls (bachelor degree rate, unemployment rate, and natural logs of personal per capita income), policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance violence laws, zero tolerance drunk driving laws, and electronic bullying laws), and school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using age- and gender-specific population from SEER.

Table 11. Distinguishing between ABLs Based on Strength of Statute

	Bullied	Depression	Suicide Ideation	Suicide Plan	Suicide Attempt	Suicide Rates
	(1)	(2)	(3)	(4)	(5)	(6)
			Panel I: Females			
Strong ABL	-0.030*	-0.021*	-0.022**	-0.015	-0.013**	-0.564**
	(0.015)	(0.011)	(0.009)	(0.011)	(0.005)	(0.245)
Weak ABL	-0.016	-0.015	-0.001	-0.006	0.013	-0.448*
	(0.017)	(0.016)	(0.011)	(0.010)	(0.011)	(0.230)
	[0.215]	[0.362]	[0.196]	[0.159]	[0.099]	[3.025]
N	393,616	429,389	403,476	384,135	317,764	1,224
			Panel II: Males			
Strong ABL	-0.008	-0.008	0.001	-0.004	-0.000	0.379
	(0.010)	(0.007)	(0.006)	(0.006)	(0.007)	(0.763)
Weak ABL	-0.044	-0.006	0.005	-0.006	0.006	-0.137
	(0.029)	(0.025)	(0.010)	(0.016)	(0.014)	(0.346)
	[0.169]	[0.204]	[0.114]	[0.099]	[0.062]	[10.276]
N	374,730	410,205	383,988	368,294	295,693	1,224

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors, corrected for clustering at the state level, are in parentheses. The mean of the dependent variable is reported in brackets. Estimates reported in columns (1) through (5) are generated using state and national YRBS data for the period 2009-2017. The sample is restricted to YRBS respondents ages 14-18. The controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and teacher salary). Estimates based on YRBS data are weighted using adjusted state-level population from SEER. Estimates reported in column (6) use suicide counts from the National Vital Statistics System (NVSS) multiple cause-of-death mortality files, 1993-2016. Controls include year fixed effects, state fixed effects, demographic characteristics (share of black and other races, share of ages 14-18, and share of males), economic controls (bachelor degree rate, unemployment rate, and natural logs of personal per capita income), policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance violence laws, zero tolerance drunk driving laws, and electronic bullying laws), and school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using age- and gender-specific population from SEER.

Appendix Figure 1. National Trends in Bullying and Mental Health, 1993-2017
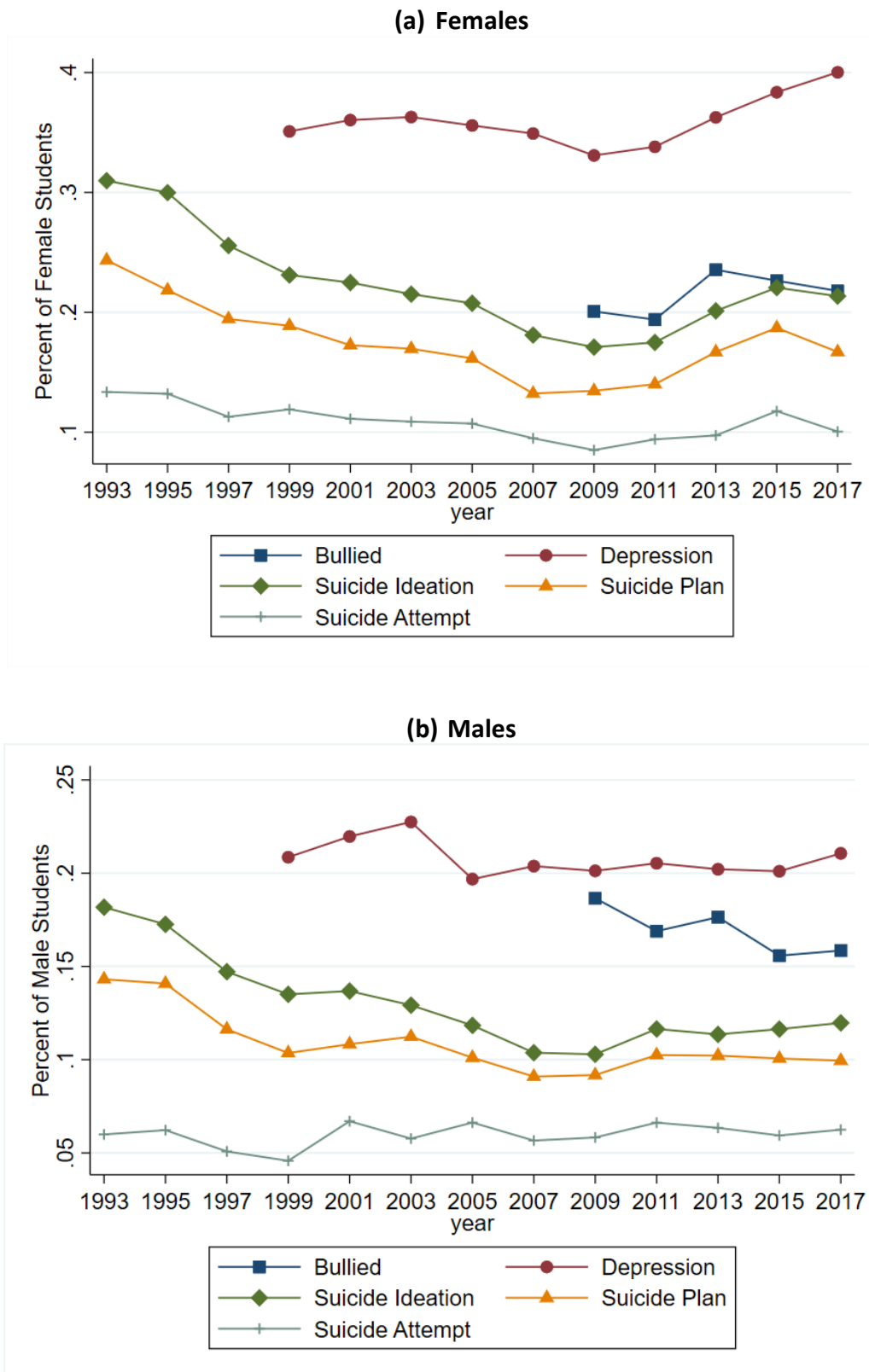
(a) Females

(b) Males

Notes: Rates are based on data from the state and national Youth Risk Behavior Surveys for the period 1993-2017 and are weighted using adjusted state-level population from the Surveillance Epidemiology and End Results Program (SEER).

Appendix Table 1. Estimated Effects of ABLs on High School Dropout

	(1)	(2)
	Female	Male
ABL	-0.001	0.002
	(0.005)	(0.003)
	[0.050]	[0.056]
N	52,962	55,563

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on Current Population Survey (CPS) Basic Monthly Data for the period 2009-2017 are reported. The sample is restricted to CPS respondents ages 16-18. Standard errors, corrected for clustering at the state level, are in parentheses. The dependent variable is an indicator for dropout status (1= dropped out, 0 = not). Controls include year fixed effects, state fixed effects, individual characteristics (age and race), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using the weights provided by the CPS.

Appendix Table 2. Lead and Lagged Effects of ABLs on Bullying Victimization, YRBS 2009-2017

	(1)	(2)
	Females	Males
3 Years Before	0.038	0.013
	(0.031)	(0.054)
2 Years Before	0.018	-0.007
	(0.015)	(0.029)
1 Year Before	0.023	-0.031
	(0.027)	(0.042)
Year of Law Change	-0.020	-0.016
	(0.020)	(0.030)
1 Year After	0.041*	-0.025
	(0.024)	(0.034)
2 Years After	-0.046*	-0.033
	(0.023)	(0.036)
3+ Years After	-0.005	-0.034
	(0.024)	(0.036)
Mean of bullying victimization (DV)	0.215	0.169
N	393,616	374,730

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and teacher salary). Estimates are weighted using adjusted state-level population from SEER. The omitted category is four or more years prior to the adoption of a state ABL.

Appendix Table 3A. Estimated Effects of ABLs on Bullying Victimization by Gender, Race and Sexual Identity

	Non-Whites		Whites		LGBQ		Heterosexual	
	Females	Males	Females	Males	Females	Males	Females	Males
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ABL	-0.024**	-0.018	-0.021	-0.016	-0.065**	-0.168**	-0.032***	-0.020*
	(0.011)	(0.014)	(0.018)	(0.012)	(0.025)	(0.075)	(0.008)	(0.011)
	[0.175]	[0.141]	[0.247]	[0.191]	[0.316]	[0.314]	[0.196]	[0.151]
N	187,076	176,092	206,539	198,637	35,869	17,430	176,439	182,184

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. The mean of the dependent variable, bullying victimization, is reported in brackets. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER.

Appendix Table 3B. Lead and Lagged Effects of ABLs on Bullying Victimization for Non-White and LGBQ Students

	Non-White		LGBQ	
	Females	Males	Females	Males
	(1)	(2)	(3)	(4)
Wave prior to adoption	-0.026	-0.017	-0.039	-0.180
	(0.021)	(0.020)	(0.063)	(0.174)
Wave of ABL adoption	-0.038*	-0.027	-0.108	-0.364
	(0.021)	(0.023)	(0.074)	(0.233)
One or more waves after adoption	-0.047**	-0.033	-0.129*	-0.418*
	(0.020)	(0.028)	(0.074)	(0.231)
Mean of bullying victimization (DV)	0.175	0.141	0.316	0.314
N	187,076	176,092	35,869	17,430

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER. The reference category is composed of respondents who were interviewed 3 or more years (i.e., two YRBS waves) prior to ABL adoption.

Appendix Table 4. Estimated Effects of ABLs on Sexual Identity

	(1) *Sexual Minority* *vs.* *Heterosexual*	(2) *Gay, Lesbian, or Bisexual* *vs.* *Heterosexual*	(3) *Not Sure* *vs.* *Heterosexual*
	Panel I: Females		
ABL	-0.002	-0.005	0.002
	(0.010)	(0.014)	(0.008)
	[0.166]	[0.126]	[0.052]
N	244,542	233,713	214,251
	Panel II: Males		
ABL	-0.011	-0.009	-0.003
	(0.008)	(0.007)	(0.004)
	[0.085]	[0.055]	[0.033]
N	233,039	225,326	220,044

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. The mean of the dependent variable is reported in brackets. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER.

Appendix Table 5. Lead and Lagged Effects of ABLs on Mental Health

	Depression	Suicide Ideation	Suicide Plan	Suicide Attempt
	(1)	(2)	(3)	(4)
	Panel I: Females			
Wave prior to adoption	-0.008	-0.005	-0.010	-0.002
	(0.014)	(0.008)	(0.009)	(0.007)
Wave of ABL adoption	-0.027**	-0.022**	-0.019*	-0.010**
	(0.010)	(0.009)	(0.010)	(0.004)
One or more waves after adoption	-0.023	-0.019	-0.022	-0.005
	(0.019)	(0.013)	(0.014)	(0.009)
Mean of DV	0.362	0.196	0.159	0.099
N	429,389	403,476	384,135	317,764
	Panel II: Males			
Wave prior to adoption	-0.005	-0.004	-0.027***	0.009
	(0.011)	(0.007)	(0.010)	(0.008)
Wave of ABL adoption	-0.013	-0.003	-0.026**	0.005
	(0.013)	(0.008)	(0.011)	(0.008)
One or more waves after adoption	-0.008	0.004	-0.022*	0.013
	(0.019)	(0.011)	(0.012)	(0.009)
Mean of DV	0.204	0.114	0.099	0.062
N	410,205	383,988	368,294	295,693

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER. The reference category is composed of respondents who were interviewed 3 or more years (i.e., two YRBS waves) prior to ABL adoption.

Appendix Table 6. Anti-Cyberbullying Laws and Mental Health

	Females	Males
	(1)	(2)
Panel I: *Bullied* (yes = 1, no = 0)		
Anti-Cyberbullying Law	-0.022*	0.010
	(0.012)	(0.015)
	[0.215]	[0.169]
N	393,616	374,730
Panel II: *Cyberbullied* (yes = 1, no = 0)		
Anti-Cyberbullying Law	0.005	-0.009
	(0.011)	(0.007)
	[0.200]	[0.095]
N	365,405	349,587
Panel III: *Depression* (yes = 1, no = 0)		
Anti-Cyberbullying Law	-0.020*	-0.013
	(0.011)	(0.010)
	[0.362]	[0.204]
N	429,389	410,205
Panel IV: *Suicide Ideation* (yes = 1, no = 0)		
Anti-Cyberbullying Law	-0.019**	-0.007
	(0.008)	(0.004)
	[0.196]	[0.114]
N	403,476	383,988
Panel V: *Suicide Plan* (yes = 1, no = 0)		
Anti-Cyberbullying Law	-0.005	0.008
	(0.008)	(0.007)
	[0.159]	[0.099]
N	384,135	368,294
Panel VI: *Suicide Attempt* (yes = 1, no = 0)		
Anti-Cyberbullying Law	-0.013**	0.015**
	(0.006)	(0.007)
	[0.099]	[0.062]
N	317,764	295,693

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. The mean of the dependent variable is reported in brackets. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER.

Appendix Table 7. Estimated Effects of ABLs on Mental Health for Three Different Periods

	Depression		Suicide Ideation		Suicide Plan		Suicide Attempt	
	Females	Males	Females	Males	Females	Males	Females	Males
	Panel I: 1993-2007							
ABL	0.017	0.008	0.015	-0.003	0.010	-0.001	0.004	-0.005
	(0.011)	(0.012)	(0.015)	(0.006)	(0.010)	(0.008)	(0.012)	(0.006)
	[0.356]	[0.211]	[0.245]	[0.143]	[0.185]	[0.113]	[0.113]	[0.056]
N	219,302	209,073	289,887	275,800	308,075	294,424	288,652	267,352
	Panel II: 2009-2017							
ABL	-0.019*	-0.007	-0.017**	0.002	-0.013	-0.004	-0.007	0.001
	(0.010)	(0.008)	(0.009)	(0.005)	(0.009)	(0.006)	(0.005)	(0.006)
	[0.362]	[0.204]	[0.196]	[0.114]	[0.159]	[0.099]	[0.099]	[0.062]
N	429,389	410,205	403,476	383,988	384,135	368,294	317,764	295,693
	Panel III: 1993-2017							
ABL	0.001	-0.002	0.002	-0.001	0.002	-0.004	0.001	-0.009
	(0.008)	(0.006)	(0.008)	(0.003)	(0.008)	(0.005)	(0.007)	(0.005)
	[0.359]	[0.207]	[0.224]	[0.130]	[0.175]	[0.108]	[0.108]	[0.058]
N	648,691	619,278	693,363	659,788	693,363	662,718	606,416	563,045

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. The mean of the dependent variable is reported in brackets. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER.

**Appendix Table 8. Anti-Cyberbullying Laws and Suicide Rates among
14- through 18-Year-Olds**

	2009-2016	1993-2016
	(1)	(2)
Females	0.006	0.105
	(0.266)	(0.205)
	[3.653]	[3.025]
N	408	1,224
Males	-0.001	0.455
	(0.742)	(0.474)
	[10.184]	[10.276]
N	408	1,224

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Population weighted OLS estimates are reported. Suicides counts are from the National Vital Statistics System (NVSS) multiple cause-of-death mortality files. Standard errors, corrected for clustering at the state level, are in parentheses. Weighted means of the dependent variables are in brackets. Controls include year fixed effects, state fixed effects, demographic characteristics (share of black and other races, share of ages 14-18, and share of males), economic controls (bachelor degree rate, unemployment rate, and natural logs of personal per capita income), policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance violence laws, zero tolerance drunk driving laws, and anti-bullying laws), and school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using age- and gender-specific population from SEER.

Appendix Table 9. Difference-in-Difference-in-Differences (DDD) Estimates of the Effects of ABLs on Suicides

| | Suicide Rates | | Non-Suicide External Death Rate vs. Suicide Rate |
| | Ages 14-18 vs 19-23 | Ages 14-18 vs 24-27 | Ages 14-18 |
	(1)	(2)	(3)
	Panel I: Baseline Model		
Females	-0.551**	-0.449	-0.990**
	(0.256)	(0.298)	(0.476)
	[3.025]	[3.025]	[3.025]
N	2,448	2,448	2,448
Males	0.217	0.893	0.360
	(0.582)	(0.597)	(0.996)
	[10.276]	[10.276]	[10.276]
N	2,448	2,448	2,448
	Panel II: Model with Controls for State-by-Year FEs		
Females	-0.571**	-0.458	-0.990**
	(0.255)	(0.300)	(0.474)
	[3.025]	[3.025]	[3.025]
N	2,448	2,448	2,448
Males	0.238	0.897	0.360
	(0.570)	(0.588)	(0.993)
	[10.276]	[10.276]	[10.276]
N	2,448	2,448	2,448

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Population weighted OLS estimates are reported. Suicides counts are from the National Vital Statistics System (NVSS) multiple cause-of-death mortality files, 1993-2016. Standard errors, corrected for clustering at the state level, are in parentheses. Weighted means of the dependent variables are in brackets. Controls include year fixed effects, state fixed effects, demographic characteristics (share of black and other races, share of ages 14-18, and share of males), economic controls (bachelor degree rate, unemployment rate, and natural logs of personal per capita income), policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance violence laws, zero tolerance drunk driving laws, and electronic bullying laws), and school characteristics (pupil teacher ratio and natural logs of teacher salary. Estimates are weighted using age- and gender-specific population from SEER.

Appendix Table 10. Unweighted Estimates of the Effects of Strong vs. Weak ABLs on Mental Health

	Bullied	Depressed	Suicide Ideation	Suicide Plan	Suicide Attempt
	(1)	(2)	(3)	(4)	(5)
			Panel I: Females		
Strong	-0.020**	-0.010**	-0.010	-0.008	0.009
	(0.008)	(0.005)	(0.013)	(0.011)	(0.005)
Weak	-0.007	-0.001	-0.001	-0.005	-0.005
	(0.011)	(0.014)	(0.007)	(0.009)	(0.005)
	[0.222]	[0.359]	[0.200]	[0.160]	[0.099]
N	393,616	429,389	404,151	384,810	318,367
			Panel II: Males		
Strong	-0.007	0.002	-0.002	0.002	0.007
	(0.006)	(0.004)	(0.005)	(0.006)	(0.006)
Weak	-0.002	0.013*	0.003	-0.000	-0.000
	(0.010)	(0.007)	(0.005)	(0.006)	(0.006)
	[0.172]	[0.198]	[0.115]	[0.100]	[0.065]
N	374,730	410,205	384,663	368,964	296,253

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. The mean of the dependent variable is reported in brackets. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state level school characteristics (pupil teacher ratio and natural logs of teacher salary).

Appendix Table 11. Estimates of the Effects of Strong vs. Weak ABLs on the Mental Health of Non-White and LBGQ Students

| | Non-Whites | | LGBT | |
| | Females | Males | Females | Males |
	(1)	(2)	(3)	(4)
	Panel I: *Bullied*			
Strong	-0.024**	-0.013	-0.072**	-0.221**
	(0.011)	(0.015)	(0.027)	(0.106)
Weak	-0.025	-0.044	-0.026	0.074
	(0.021)	(0.032)	(0.031)	(0.055)
	[0.186]	[0.151]	[0.323]	[0.321]
N	187,076	176,092	35,869	17,430
	Panel II: *Depression*			
Strong	-0.031**	-0.017	-0.041	-0.085
	(0.015)	(0.013)	(0.043)	(0.067)
Weak	-0.077*	-0.029	-0.055	-0.026
	(0.039)	(0.043)	(0.051)	(0.051)
	[0.387]	[0.220]	[0.609]	[0.393]
N	196,221	185,281	40,306	19,617
	Panel III: *Suicide Ideation*			
Strong	-0.024**	-0.003	-0.098***	-0.129*
	(0.012)	(0.010)	(0.035)	(0.073)
Weak	-0.023	0.000	-0.009	0.004
	(0.015)	(0.013)	(0.044)	(0.069)
	[0.201]	[0.112]	[0.425]	[0.299]
N	193,005	181,447	36,070	17,587
	Panel IV: *Suicide Plan*			
Strong	-0.030**	-0.013	-0.065**	-0.092***
	(0.012)	(0.010)	(0.031)	(0.030)
Weak	-0.024	-0.016	-0.042	-0.209***
	(0.026)	(0.020)	(0.028)	(0.072)
	[0.166]	[0.101]	[0.352]	[0.262]
N	169,723	161,603	35,893	17,666
	Panel V: *Suicide Attempt*			
Strong	-0.021*	-0.015	-0.036	-0.143***
	(0.011)	(0.009)	(0.041)	(0.039)
Weak	-0.000	-0.007	0.036	-0.054*
	(0.017)	(0.011)	(0.042)	(0.027)
	[0.117]	[0.077]	[0.235]	[0.212]
N	137,102	125,609	24,444	11,592

Notes: *, **, and, *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Weighted OLS estimates based on state and national YRBS data for the period 2009-2017 are reported. The sample is restricted to YRBS respondents ages 14-18. Standard errors, corrected for clustering at the state level, are in parentheses. The mean of the dependent variable is reported in brackets. Controls include year fixed effects, state fixed effects, individual characteristics (age, race, and grade), state-level economic controls (bachelor degree rate, unemployment rate, and natural logs of per capita income), state policy controls (beer tax, cigarette tax, child access prevention laws, shall issue laws, zero tolerance drunk driving laws, zero tolerance violence laws, and electronic bullying laws), and state-level school characteristics (pupil teacher ratio and natural logs of teacher salary). Estimates are weighted using adjusted state-level population from SEER.