THE EFFECT OF STATE BANS ON GENDER INTERVENTIONS FOR MINORS ON TEEN SUICIDE RATES

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EXECUTIVE SUMMARY

The following study examines the widespread belief that banning so-called gender-affirming care for minors increases suicide rates among gender-dysphoric youth. It finds no evidence that such prohibitions have any such effect. Across three analyses employing three distinct modeling approaches, we find no statistical support for the claim that state bans on gender interventions for minors have led to a spike in suicide rates.

INTRODUCTION

Although gender-dysphoric youth experience **markedly elevated** rates of mental-health distress, the evidence linking so-called gender-affirming medical care to reductions in suicidality has been remarkably tenuous. Available studies feature serious limitations: They either rely on weak observational designs that cannot isolate the causal effects of medical interventions or related policies, or they use proxies for suicide (e.g. Google searches for the word "suicide") that may not be reliable measures of completed suicides. In fact, no study to date has used a quasi-experimental design to assess whether policy restrictions on pediatric "gender-affirming care" affect the incidence of completed suicide.

The sections that follow document how claims concerning such a link have been advanced by scientific and medical authorities, amplified by media, and asserted in the legal arena — despite the weakness of the underlying evidence. To test the claim empirically, we examine whether state prohibitions on surgical or pharmaceutical interventions for minors with gender dysphoria have actually affected adolescent suicide rates. Using multiple statistical approaches, including difference-in-differences models and a national time-series analysis, we find no evidence that these bans have increased suicide rates.

The alarmist prediction that restricting medicalization of gender-distressed minors would produce a spike in youth suicides is not supported by the data.

CLAIMS MADE BY SCIENTIFIC AND MEDICAL AUTHORITIES

The transgender suicide-prevention narrative traces its roots to early clinical observations in the Netherlands. Researchers at the Amsterdam Gender Clinic proposed the "Dutch protocol," which involved puberty suppression for carefully selected adolescents, followed by cross-sex hormones. **De Vries et al. (2011)** reported improvements in psychological functioning post-treatment in a small cohort, noting reductions in behavioral and emotional problems. While the study did not consider suicide as an outcome, it is routinely cited as the seminal evidence that puberty suppression improves mental health in gender-dysphoric youth, which proponents extrapolate to suicide-prevention claims.

Puberty Suppression in Adolescents With Gender Identity Disorder: A Prospective Follow-Up Study

Annelou L.C. de Vries MD, Thomas D. Steensma MSc, Theo A.H. Doreleijers MD, PhD, Peggy T. Cohen-Kettenis PhD

First published: 26 July 2011 | https://doi.org/10.1111/j.1743-6109.2010.01943.x | VIEW METRICS

However, as noted in a **previous Do No Harm report**, the seminal study in youth gender medicine is afflicted with profound methodological limitations. Most notably, patients received psychotherapy alongside puberty blockers, and there was no control or comparison group. It is therefore impossible to discern whether the self-reported and modest improvements in mental health were due to the puberty blockers, the psychotherapy, or some other factor. Nevertheless, the study ultimately laid the groundwork for the affirmative model of care in the United States.

Subsequent U.S. research accelerated the prominence of the claim that gender "transition" is preventative against suicide. **Turban et al. (2020)**, published in *Pediatrics*, analyzed retrospective self-reports from the 2015 U.S. Transgender Survey (a large but non-representative convenience sample recruited largely through advocacy channels).

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Pubertal Suppression for Transgender Youth and Risk of Suicidal Ideation

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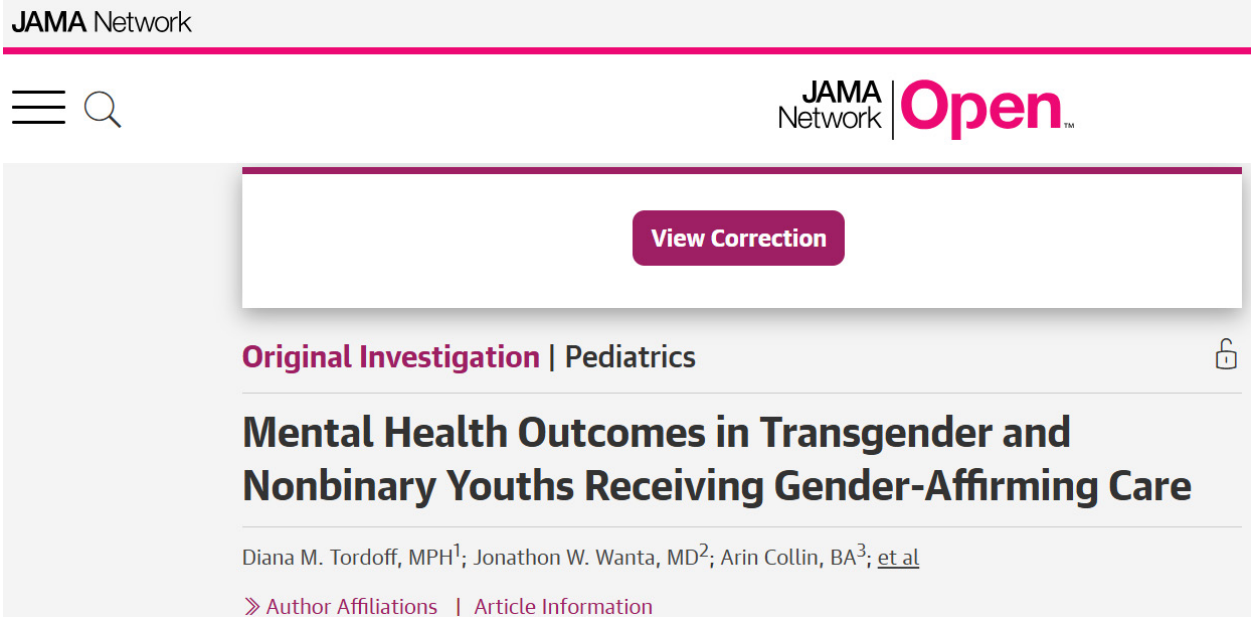
https://doi.org/10.1542/peds.2019-1725 **Article history**

The authors examined adults who recalled whether they had received pubertal suppression as adolescents and compared lifetime suicidal ideation between those who had and those who desired that intervention but did not receive it. They reported a statistically significant association suggesting lower odds of lifetime suicidal ideation among those who accessed puberty blockers.

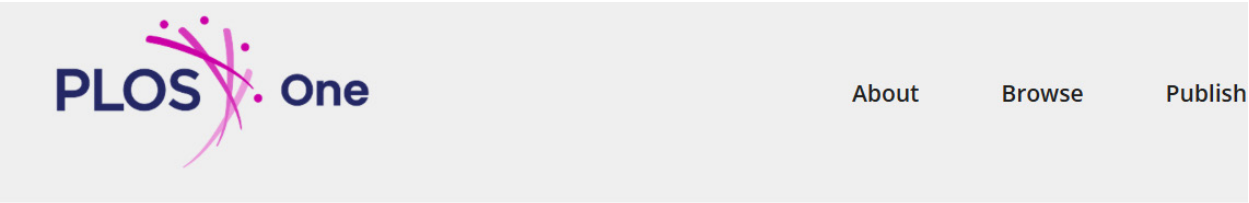
This study has faced **substantial methodological criticism**. Reliance on retrospective recall from adulthood introduces recall bias, especially for events occurring years earlier. That many respondents claimed to have received blockers before they became routinely available as a treatment for gender dysphoria in the United States only compounds the concern. Moreover, the analysis struggled with confounding: Individuals who accessed puberty blockers likely differed in important ways from those who did not, experiencing, for example, disparate family support, access to care, or underlying severity of gender dysphoria. These differences, rather than access to blockers, could credibly explain the differences in mental-health outcomes.

Tordoff et al. (2022), published in *JAMA Network Open*, is perhaps the most influential study in support of the suicide-prevention hypothesis. The researchers followed gender-dysphoric youth receiving care at a single Seattle clinic for one year. The study reported 60-percent lower odds of depression and 73-percent lower odds of suicidality among those receiving interventions compared to those who had not.



Closer examination reveals important limitations. The study was non-randomized and observational; treatment assignment was not controlled, introducing selection bias (those starting treatment may have had better mental fitness). The key finding emerged primarily from comparison to an untreated group that worsened, while the treatment group itself showed no statistically significant within-group improvement on several metrics over time. Also, the non-treated group shrank from 93 at the beginning of the study to seven at the end, reflecting some combination of movement into the treatment group or self-removal from the gender clinic. It is — or ought to be considered — impossible to make judgments based on such high attrition and such a small sample size at the end. Nevertheless, despite these issues, the study was widely cited as evidence that "gender-affirming care" delivers rapid, measurable reductions in suicide risk.

Curiously, Idaho data are critical to the findings of two other studies that purport to find a link between prohibitions against youth gender "affirmation" and suicide. One prominent example is a **2022** *PLOS One* **study** that claimed "anti-transgender" legislation drove increases in Google searches for "depression" and "suicide."



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RESEARCH ARTICLE

Anti-transgender rights legislation and internet searches pertaining to depression and suicide

George B. Cunningham, Nicholas M. Watanabe, Erin Buzuvis

Published: December 22, 2022 • https://doi.org/10.1371/journal.pone.0279420

The alleged positive link between "anti-trans" legislation and searches for "suicide" hinged on just two pieces of legislation passed in Idaho in March 2020 amid the onset of the COVID-19 pandemic: one that **banned boys from participating in girls' sports** and one that **required information on birth certificates to align with biological sex**. The study suffered from **profound methodological flaws** and arrived at a conclusion that is facially impossible: A look at the underlying data reveals that searches for "depression" or "suicide" were typical in Idaho in the time period under consideration relative to national norms or Idaho norms in other time periods.

Similarly, a **2024 Trevor Project study** published in *Nature Human Behaviour* and based on a large online convenience sample asserted that "anti-transgender" laws caused up to a 72-percent increase in past-year suicide attempts among youth who identified as transgender or nonbinary.

However, a 2026 **peer-reviewed critique by Cohn et al.** (also in *Nature Human Behaviour*) revealed that the headline 72-percent figure derived almost entirely from a tiny subsample in Idaho — roughly 60 adolescents per year — responding in the years following the 2020 bills.

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Matters Arising | Published: 28 May 2026

Methodological considerations for evaluating policy impacts on transgender and non-binary youth suicidality

J. Cohn, Peter Sim & Kathleen F. Kerr ✉

Nature Human Behaviour **10**, 1209–1211 (2026) | Cite this article

Critically, no relevant restrictive laws were actually in force during the period when the increase allegedly occurred: In August 2020, the sports bill (HB 500) was enjoined by a federal court, and the birth-certificate bill (HB 509) was blocked from enforcement as a violation of an existing 2018 permanent injunction. The authors of the original study acknowledged Idaho's outsized role but maintained their conclusions. While the original study did not examine completed suicides or test restrictions on pediatric medical transition, it has nevertheless been invoked to support the broader narrative that affirming a child's gender distress — whether through social "transition," medicalization, or the blocking of "anti-trans" legislation — is preventative against suicide.

Major professional guidelines have amplified the idea that gender "affirmation" is preventative against suicide. The American Academy of Pediatrics' **2018 policy statement** endorsed the affirmative approach, linking timely "gender-affirming care" to improved mental-health outcomes, including reduced suicidality.

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This Policy Statement was reaffirmed August 2023.

FROM THE AMERICAN ACADEMY OF PEDIATRICS | POLICY STATEMENT | OCTOBER 01 2018

Ensuring Comprehensive Care and Support for Transgender and Gender-Diverse Children and Adolescents FREE

Jason Rafferty, MD; COMMITTEE ON PSYCHOSOCIAL ASPECTS OF CHILD AND FAMILY HEALTH; COMMITTEE ON ADOLESCENCE; SECTION ON LESBIAN, GAY, BISEXUAL, AND TRANSGENDER HEALTH AND WELLNESS; Michael Yogman, MD; Rebecca Baum, MD; Thresia B. Gambon, MD; Arthur Lavin, MD; Gerri Mattson, MD; Lawrence Sagin Wissow, MD; Cora Breuner, MD; Elizabeth M. Alderman, MD; Laura K. Grubb, MD; Makia E. Powers, MD; Krishna Upadhya, MD; Stephenie B. Wallace, MD; Lynn Hunt, MD; Anne Teresa Gearhart, MD; Christopher Harris, MD; Kathryn Melland Lowe, MD; Chadwick Taylor Rodgers, MD; Ilana Michelle Sherer, MD

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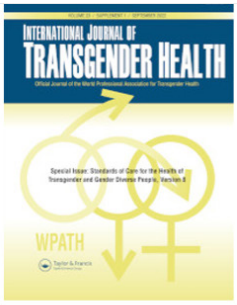
https://doi.org/10.1542/peds.2018-2162

WPATH's Standards of Care Version 8 described interventions as medically necessary for alleviating gender dysphoria and associated psychological distress, including suicide risk.



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Standards of Care for the Health of Transgender and Gender Diverse People, Version 8

E. Coleman, A. E. Radix, W. P. Bouman, et al.

To cite this article: E. Coleman, A. E. Radix, W. P. Bouman, et al. (2022) Standards of Care for the Health of Transgender and Gender Diverse People, Version 8, International Journal of Transgender Health, 23:sup1, S1-S259, DOI: 10.1080/26895269.2022.2100644

To link to this article: https://doi.org/10.1080/26895269.2022.2100644

The **Endocrine Society guidelines** recommended puberty blockers and hormones for eligible adolescents, citing mental-health benefits.

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Article Contents

Abstract

JOURNAL ARTICLE EDITOR'S CHOICE

Endocrine Treatment of Gender-Dysphoric/Gender-Incongruent Persons: An Endocrine Society* Clinical Practice Guideline

FREE

Wylie C Hembree, Peggy T Cohen-Kettenis, Louis Gooren, Sabine E Hannema, Walter J Meyer, M Hassan Murad, Stephen M Rosenthal, Joshua D Safer, Vin Tangpricha, Guy G T'Sjoen Author Notes

The Journal of Clinical Endocrinology & Metabolism, Volume 102, Issue 11, 1 November 2017, Pages 3869–3903, https://doi.org/10.1210/jc.2017-01658

Published: 13 September 2017 **Article history**

Statements from the **American Medical Association**, **American Psychological Association**, and others reinforced a strong consensus narrative: So-called gender-affirming care is evidence-based and lifesaving, while restrictions constitute harm.

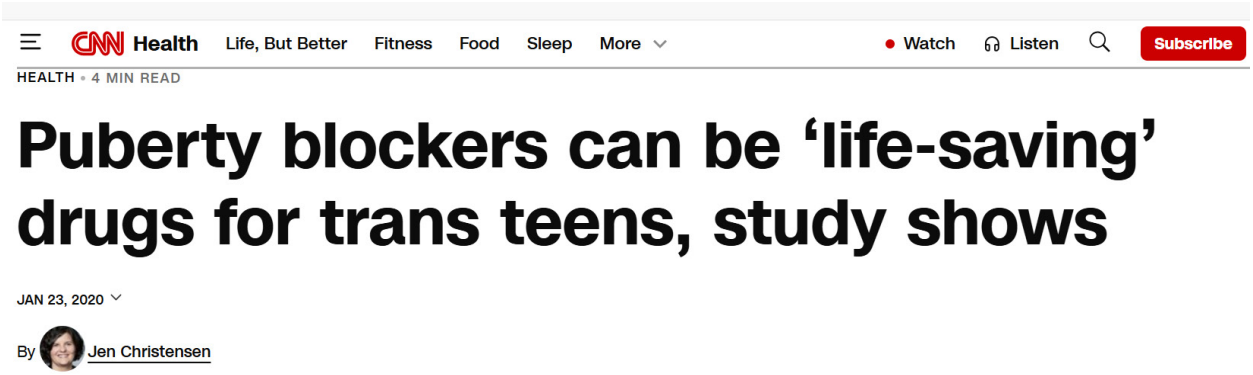
This U.S.-centric endorsement across scientific institutions contrasted sharply with developments in Europe. Systematic reviews commissioned by health authorities in the United Kingdom (**2024**), Sweden (**2022**), and Finland (**2020**), as well as an investigative report conducted by an independent government agency in Norway (**2023**), revealed the evidence base for puberty blockers and hormones for minors to be of low to very low quality. The Cass Review, the most comprehensive independent analysis, concluded that there was "remarkably weak" evidence for benefits on mental-health outcomes, including suicide prevention. It highlighted poor study design, confounding by co-occurring mental-health issues, high rates of loss to follow-up, and the absence of reliable data that these interventions reduce the risk of completed suicide. The Review recommended a shift to holistic psychological care and restriction of the routine use of puberty blockers outside of research settings. England subsequently closed the Tavistock Gender Identity Development Service and implemented regional hubs emphasizing caution. Sweden, Finland, and Norway similarly restricted access, prioritizing psychotherapy and limiting medical interventions to exceptional cases or trials.

MEDIA AMPLIFICATION

The claim that "gender-affirming" medical interventions are essential to preventing suicide among gender-dysphoric youth has been powerfully amplified by U.S. mainstream media and advocacy organizations. Coverage has frequently framed restrictions on puberty blockers, hormones, or related care as literal threats to children's lives, employing stark binary language that has left little room for nuance about study limitations, confounding mental-health factors, or the distinction between suicidality (thoughts and attempts) and completed suicide.

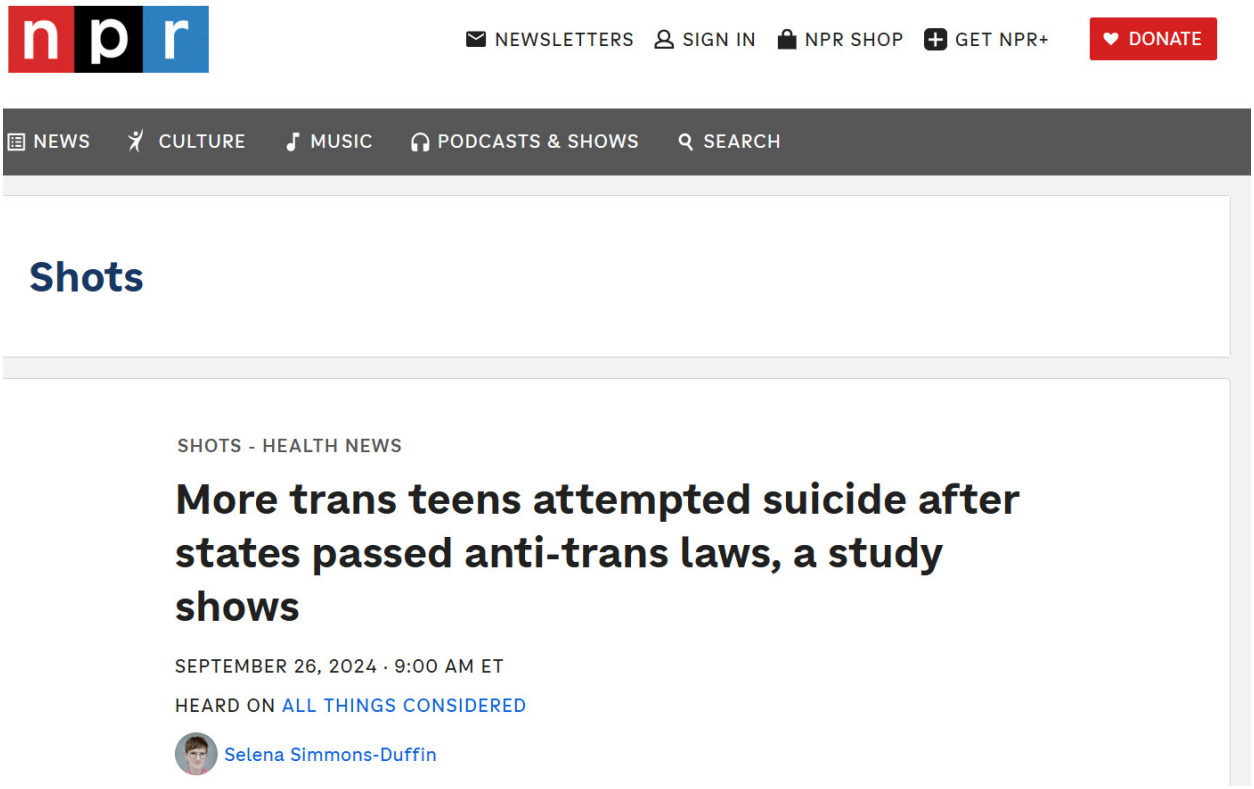
A recurring motif in American reporting and commentary has been the parental dilemma framed as "Would you rather have a living son or a dead daughter?" (or the reverse). This phrasing appeared in U.S. outlets and parental accounts as early as the **mid-2010s**. Coverage in outlets such as *USA Today* featured parents who described the choice in precisely these terms when considering medical transition for their children, presenting hesitation as a potentially fatal risk. Such rhetoric transformed complex clinical decisions into moral imperatives, implying that restriction or delay equated to complicity in a child's potential death.

Major U.S. news organizations repeatedly characterized so-called gender-affirming care as "life-saving." **CNN's** reporting on state bans and related "care" access described the interventions as lifesaving, according to parents and advocates, emphasizing mental-health benefits and reduced suicidality. Similar language appeared across coverage of studies such as **Tordoff et al. (2022)** and **Turban et al. (2020)**, with headlines and articles presenting reduced odds of depression or suicidal ideation as clear evidence that interventions prevent suicide.



Advocacy-aligned reporting often omitted or minimized the observational designs, high attrition, selection effects, and lack of data on completed suicides that limited causal inference.

The Trevor Project and allied groups played a central role in disseminating the narrative. Their surveys and reports on elevated rates of suicidal ideation and attempts among transgender-identifying youth were widely cited in U.S. media as evidence that affirmation — and, specifically, medical care — was protective. When the 2024 *Nature Human Behaviour* study claimed sharp increases in suicide attempts following "anti-transgender" laws, outlets including **NPR** reported the findings prominently, linking legislative restrictions directly to rising suicide attempts among transgender teens.



Human Rights Watch and similar organizations further amplified these claims in reports documenting families' accounts of suicide attempts allegedly tied to bans.

Political and institutional voices reinforced the media framing. During debates over state legislation, lawmakers and advocates invoked personal tragedies and general statistics interchangeably, asserting that votes against expansive access amounted to lawmakers **having blood on their hands**. Coverage of high-profile cases, petitions following individual suicides, and statements from organizations such as the **ACLU** or the **Human Rights Campaign** routinely paired elevated distress rates with the assertion that medical affirmation was the primary or necessary remedy.

ACLU

About Issues

NEWS & COMMENTARY

Doctors Agree: Gender-Affirming Care is Life-Saving Care

Arkansas has become the first state to pass a bill banning health care for transgender youth and 16 other states have introduced similar legislation.

This media environment created a feedback loop. Weak or methodologically limited studies were presented as definitive proof of lifesaving effects; European systematic reviews finding the evidence base remarkably weak received comparatively less sustained attention in U.S. outlets; and the absence of reliable data linking access to care with reductions in completed suicide was seldom highlighted. The result was a public narrative in which questioning the strength of the evidence meant that one risked being portrayed as indifferent to youth suicide, even as the most rigorous appraisals — including the Cass Review — found no robust support for the claim that medical interventions reduce suicide risk.

CLAIMS ASSERTED IN THE LEGAL ARENA

The suicide-prevention narrative has been a central feature of legal challenges to state restrictions on so-called gender-affirming medical care for minors. Advocacy organizations and supporting medical groups have repeatedly argued that denying puberty blockers and cross-sex hormones elevates the risk of severe mental-health harm, including suicidality, and that access to these interventions is therefore lifesaving.

In challenges to state bans, litigants have routinely cited elevated rates of suicidal ideation and attempts among transgender-identifying youth and have presented observational studies as evidence that medical interventions reduce that risk. For example, the ACLU and allied counsel in cases such as *L.W. v. Skrmetti* (Tennessee) and related litigation described "gender-affirming care" as critical to preventing deterioration in mental health. In related public statements tied to the litigation, the ACLU characterized the care as "**potentially lifesaving**" and linked denial of treatment to increased risk of suicidal ideation.

Amicus briefs filed by youth-serving organizations reinforced the same framing. The Trevor Project, together with other groups, submitted briefs in *United States v. Skrmetti* arguing that "gender-affirming" medical care improves mental health and decreases suicide risk for transgender youth. These filings cited survey data on high rates of suicidal ideation and attempts, alongside studies such as Tordoff et al. (2022), to assert that restrictions would foreseeably increase harm.

Similar arguments appeared in other state challenges. Medical associations and advocacy groups filed amicus briefs in cases involving **Arkansas**, **Alabama**, and other states, asserting that "gender-affirming care" is the standard of care and is associated with reductions in depression and suicidality. The Pediatric Endocrine Society and related organizations, for instance, described puberty suppression and hormone therapy as "**sav[ing] lives**" in court-related materials, citing lower lifetime suicidal ideation among those who received treatment during adolescence.

Notably, when scrutiny and awareness is at its highest, claims about suicide are tempered. During Supreme Court oral argument in *United States v. Skrmetti* (December 2024), counsel for the plaintiffs, ACLU attorney Chase Strangio, referenced evidence that treatment **decreases suicidality**. When Justice Alito quoted the Cass Review's finding of no evidence that "gender-affirmative" treatments reduce completed suicide, Strangio carefully distinguished between completed suicides and broader measures of suicidality (i.e., ideation and attempts). While low-quality evidence also does not support the alleged link between interventions and a reduction in suicidal ideation, it is notable that, when faced with a direct question on the highest-stakes outcome under oath before the Court, Strangio declined to assert that the interventions reduce completed suicide, instead limiting the claim to protective effects on ideation and attempts.

Across these proceedings, the legal strategy consistently paired general statistics on elevated distress among gender-dysphoric youth with the assertion that medical affirmation constitutes a primary remedy. Expert declarations and organizational briefs treated the observational associations reported in U.S. studies as sufficient to establish the fact that bans would cause measurable increases in suicidality, even as European systematic reviews and the Cass Review had concluded that the evidence for mental-health benefits, including suicide prevention, was weak and methodologically limited. The result was a body of legal advocacy in which the life-or-death framing of medical intervention became a core element of equal-protection and parental-rights arguments against state restrictions.

EMPIRICAL ANALYSIS OF STATE BANS AND ADOLESCENT SUICIDE RATES

To examine whether adolescent suicide rates are affected by the adoption of prohibitions on surgical or pharmaceutical interventions for minors with gender dysphoria, we examine changes in those suicide rates that correspond to changes in state policies. We analyze this issue using three different types of statistical models, each of which has different strengths and weaknesses.

The various permutations of models and outcomes yield results that indicate that state bans on so-called gender-affirming care for minors have had no effect on adolescent suicide rates. Despite the alarmist claims that these policies would exacerbate youth suicide rates, the evidence clearly shows that has not occurred.

DATA SOURCES

Information on which states have enacted laws to limit or prohibit so-called gender-affirming care for minors and when those laws went into effect was collected from **KFF**. Two states had bans on gender interventions for minors go into effect in 2022. Fifteen more states were added to this list in 2023, and another six in 2024. Some states passed legislation during this period, but the laws did not go into effect, as they were being reviewed by courts. We consider only those policy changes that have gone into effect and focus on the date that those policies were put into effect, not when they were enacted. (Our state models group data by year and count the year in which a policy went into effect as a treatment year regardless of the month. In the national time-series model, we focus on the month and year in which a policy went into effect.)

Information on suicide rates by age and state was obtained from the **Centers for Disease Control and Prevention** (CDC). We examine suicide rates by state or nationwide between the years 2018 and 2024.

There are some limitations to the CDC suicide data that affect our analyses. While the CDC reports suicide rates per state, per year, and per age, it censors data if the number is too low. (The minimum reported cell size is 10.) Thankfully, the number of suicides in a given state each year, for a given age, is often too low to be reported. However, the CDC also groups the data for 15–19-year-olds and 20–24-year-olds, which, in almost all states and most years, allows the data to be reported. The challenge for our analysis is that suicide rates for 15–19-year-olds do not perfectly correspond to the set of minors affected by the policies we examine, since the age when one legally becomes an adult is 18 in most (but not all) states.

Information on personal income per capita in a given year **nationwide** and for **each state** was obtained from the St. Louis Federal Reserve. That information is available through 2025.

Lastly, we use an estimate of the 13–17-year-old population in each state that identifies as "transgender," which comes from a **UCLA Williams Institute** report published in August 2025 and based on CDC survey data collected between 2021 and 2023.

THE DIFFERENCE-IN-DIFFERENCE MODEL

A standard approach to examining the effects of policy changes that occur in some states but not others employs what is called a "difference-in-difference" or "DiD" model. This can be thought of as the modern statistical manifestation of Louis D. Brandeis's characterization of our federal system as allowing variations in state policies to "**serve as a laboratory**" to assess the consequences of those policies.

The DiD approach examines pre-policy trends in the outcomes across states. It assumes that the difference between adopting and non-adopting states would have continued without alteration in the absence of the policy change. This is known as the parallel-trends assumption. The model then measures how much the outcomes in the adopting states diverge from the path that would have been expected, following implementation of the policy. It attributes that divergence to the effect of the policy. This type of model is **viewed by social scientists** as capable of isolating the causal effects of newly adopted regulation or law.

In the present analysis, the outcome we are examining is youth suicide rates. Our DiD model identifies the trend in suicides in each state, starting in 2018. When bans on gender interventions for minors go into effect in some states, the model calculates how the suicide trend changes in those states. For two states, that post-policy trend starts in 2022. For 15 more states, it starts in 2023, and, in six more states, it starts in 2024. Since we have CDC suicide data through 2024 only, the post-policy period for these states is between one and three years.

To improve the precision of the comparison in trends between states that put into effect bans on gender interventions for minors, we control statistically for the rates of suicide in each state in the young-adult population, ages 20–24. This young-adult population would not be affected by a ban on gender interventions for minors, so any change in suicide rates among *these* young adults would reflect a general trend affecting young people in that state independent of any effect of a policy change on the primarily affected population, ages 15–19. Adding this control allows us to separate any change in suicide rates among minors caused by the policy change from more general trends affecting all young people in a state.

We also control for a national time trend that would separate any national changes in suicide rates over time from specific trends in states caused by policy changes. Thankfully, the national trend in suicide rates for ages 15–19 has been going down. Adding this time-trend control allows us to distinguish the effects of this national trend from those in states caused by policy changes.

Our model also includes a control for the average number of suicides in each state over the entire period 2018–2024. This number can vary from state to state, so adding this control allows us to separate elevated or lowered suicide rates caused by policy changes from the time-invariant level of suicide rates found in each state.

Lastly, we include in our model a control for personal income per capita in each state. To the extent that rising or falling incomes in a state may affect suicide rates in that state, adding this control allows us to distinguish any trend in suicide rates caused by changing incomes from changes caused by the adoption of bans on gender interventions for minors.

The primary outcome we examine in this model is the natural log of annual suicide rates for ages 15–19 in each state between 2018 and 2024. This is the CDC-reported age group most likely to be affected by state bans on gender interventions for minors.[1] Taking the natural log of that rate allows us to interpret the result of this model as the percentage change in these suicide rates as a result of policy changes.

Our analysis using this model finds that the adoption of bans on gender interventions for minors has an effect on suicide rates for 15–19-year-olds that cannot be distinguished from zero with confidence. The estimated effect is -0.3 percent, which would mean that the policy bans *reduce* suicide rates by 0.3 percent, and the p value of 0.931 means that we cannot be confident that this estimated effect is actually different from zero.

THE CALLAWAY AND SANT'ANNA DIFFERENCE-IN-DIFFERENCE MODEL

In the last few years, concerns have been raised about the traditional difference-in-difference model presented above regarding the mechanics of how it makes comparisons. In particular, **Brantly Callaway and Pedro H.C. Sant'Anna** observed that the standard approach to calculating a difference-in-difference model may have a difficulty when policy changes occur at different times.

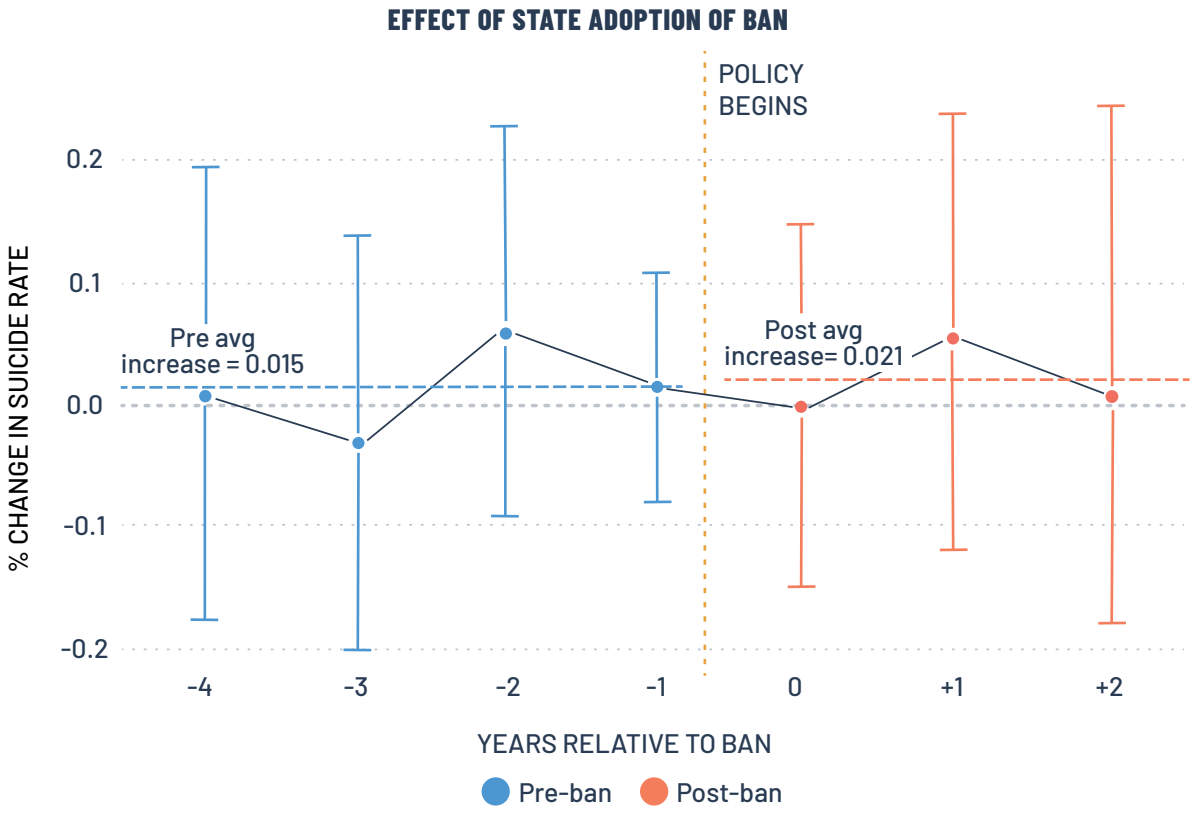
In particular, the standard DiD model (to use our project as an illustration) compares the outcome in a state that has *newly* adopted a ban on gender interventions for minors with outcomes for states that have *previously* adopted those policies, as well as states that have *never* adopted them. The problem is that states that have previously adopted these policies are also in the treatment group, so we might be comparing outcomes for treated states to other treated states, not just to the control group of states that have not made the policy changes.

In our case, this may not be a very serious concern, given that 15 of the 23 states adopted these policies in the same year (2023), while only two states had done so in 2022. In addition, the six states that joined them in 2024 have limited post-policy change information, since our analysis ends in 2024. That is, our DiD has relatively limited opportunity for comparisons between later- and earlier-adopting states, since the bulk of them did so at the same time.

Nonetheless, it is now conventional to implement an adjustment suggested by Callaway and Sant'Anna to the standard DiD model, typically referred to as CSDID.

1 Suicide rates in ages 10–14 are thankfully low. As such, the CDC suppresses state-level data for many jurisdictions due to small sample sizes.

We employ a CSDID model with the same controls as in the previous DiD model. Our control group consists of states that never adopted policy changes, as well as states in years before they adopted policy changes. Some researchers exclude "not yet treated" observations from their control group out of concern that the outcome in a given year is influenced by anticipation of a later policy change. There is no reason to make this restriction in our case, since it is unreasonable to expect that suicide rates are influenced by policies that have not yet happened.



Bars are 95% confidence intervals

With this CSDID model, we find that state adoption of bans on gender interventions for minors has no effect on suicide rates among people who are 15–19 years old. The average change in state suicide rates is estimated to be less than 1 percent, and the high p values mean that this estimate is indistinguishable from zero. Employing CSDID rather than DiD does not alter the result.

NATIONAL TIME-SERIES MODEL

Rather than focusing on the "laboratory" of states, one could examine the effects of bans on gender interventions for minors on national outcomes. There are some important advantages obtained by this approach. Rather than using the 15–19-year-old grouping provided by the CDC, we could calculate our own age grouping to focus on the 13–17-year-old population most affected by these policy changes.[2] National suicide rates for each age 13–17, unfortunately, are high enough that the CDC can report them, as they do not fall below the minimum cell-size threshold.

In addition to calculating a more precise age group for suicide rates, it is also possible to conduct an analysis with monthly rather than annual data. This allows for a more fine-grained analysis of how trends in adolescent suicide rates change based on the month that policy changes go into effect.

For this model, our measure of the policy change is the percentage of self-identified "transgender" teenagers nationwide who live in a state with a ban on gender interventions for minors. We have an estimate of the self-identified transgender population in each state. When a state's policy goes into effect, that population is added to the percentage of self-identified transgender teenagers affected by these policies nationwide. In effect, we are measuring the dosage of gender-intervention bans for minors to see if national teenage suicide rates are affected as that dosage increases.

In this model, we control for an overall time trend in teen suicide rates unrelated to policy changes. We also control for seasonality in case certain times of year tend to have higher or lower rates of suicide, independent of any policy change. And we control for national personal income per capita, in case economic developments, such as a recession or boom, might alter national suicide rates.

Importantly, our national model includes a control for suicide rates among people ages 18–24, since this population is largely unaffected by state policies focused on minors. This means we are comparing suicide rates for minors to those of age-adjacent young adults. The comparison across age and across time in this national model can support reasonable causal conclusions but is not as strong in identifying causal effects as the DiD and CSDID models that make comparisons across states, as well as across age and time.

The results of our national time-series model find that state adoptions of bans on gender interventions for minors have no effect on suicide rates among minors 13–17 years old. The estimated effect rounds to 0, and the p value is 0.987, meaning that we are unable to distinguish between this estimated effect and zero. Changing the model to focus on how the percentage of self-identified transgender teenagers affected by state bans affects suicide rates confirms our earlier finding that there is no relationship between these policy changes and youth suicide rates.

2 For ages younger than 13, the CDC does not report data for every month we examined because the results fall below the minimum cell size.

DISCUSSION

Very bold claims have been made that state prohibitions on the use of surgeries, puberty blockers, or cross-sex hormones to treat minors with gender dysphoria would lead to a spike in suicides. We have presented the results of three different types of analyses and find no evidence to support these claims. None of these analyses yields a result that is anywhere close to showing a statistically significant change in suicide rates resulting from state policy changes.

The ethical and legal ramifications of our findings are substantial. Given the physiological harms associated with "sex-change" interventions, it would be very difficult to justify their provision to minors unless it were demonstrably true that they were preventative against suicide.

Still, three factors make it clear that this analysis will not resolve this policy dispute. First, the debate over child "sex changes" is rooted in deeply held ideological convictions and backed by nonprofits (e.g., the Trevor Project and the Human Rights Campaign) with enormous war chests. Their convictions and their resources are unlikely to meaningfully change based on our analysis. Second, results could theoretically change over time. It is not guaranteed that the results we observed will continue unchanged with additional years of data, and researchers will look to revisit this question as new data become available. Third, reasonable people can disagree about how to best model the relationship between state policies on pediatric gender interventions and suicide rates. Different techniques could produce different findings. In the interest of transparency and advancing scholarly discourse, we have attached in the appendix the code that we used to produce these findings in the statistical package *STATA*.

CONCLUSION

This study finds no evidence that state prohibitions on surgeries, puberty blockers, or cross-sex hormones for minors with gender dysphoria have increased suicide rates. Across three analyses employing three distinct modeling approaches, the results clearly and consistently show no effects. There is no evidence to support the claim that state bans on gender interventions for minors led to a spike in suicide rates.

APPENDIX: RAW DATA

Monthly Data

Suicide Rate Do File

State Panel

Do No Harm