NBER WORKING PAPER SERIES

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Working Paper 31702
http://www.nber.org/papers/w31702

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
September 2023

We thank Professor Brunon Holyst, President of the Polish Society of Suicidology, for providing the data on suicide attempts used in this study, and Kitt Carpenter, participants of the Lehigh University College of Health Research Roundtable and participants of the ASHEcon 11th Annual Research Conference for helpful comments and suggestions. The views expressed in this paper are those of the authors, and no official endorsement by the National Bureau of Economic Research, Lehigh University, University of New Hampshire or the National Institute of Public Health NIH – National Research Institute is intended or should be inferred. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

Implications of the Decline in LGBT Rights for Population Mental Health: Evidence from Polish "LGBT-free zones"

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NBER Working Paper No. 31702
September 2023
JEL No. I12,K38

ABSTRACT

We investigate the consequences of anti-LGBT laws in Poland for suicide attempts and fatalities by applying border-area difference-in-differences models to county-level data. We find that annual suicide attempts increased by 16%, or 5 attempts per 100k capita, after the enactment of anti-LGBT statutes. This rise in suicide attempts was concentrated among men, and was associated with 11 additional suicides per 100k individuals aged 30-49. We also find an increase in suicide attempts in areas that deliberated, but subsequently rejected anti-LGBT resolutions, providing evidence that stigmatization of minority groups leads to declines in population mental health.

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A data appendix is available at http://www.nber.org/data-appendix/w31702

Introduction

The past two decades have seen a flurry of laws addressing the legal entitlements of lesbian, gay, bisexual and transgender (LGBT) individuals.[1] Following the world's first national legalization of same-sex marriage in the Netherlands on April 1, 2001, numerous countries passed similar laws and expanded LGBT rights in the areas of adoption, employment and access to goods and services (ILGA World 2023). For example, by March 2023, 19 countries in Europe, as well as the U.S., Canada, Mexico, Australia and 11 smaller countries recognized same-sex marriage (Shahid 2023; Human Rights Campaign 2023). Thirty-three countries currently permit joint adoption and 77 countries prohibit employment discrimination based on sexual orientation, with 46 of these countries extending protections to gender identity (ILGA World 2023).

Research on the expansion of LGBT rights indicates that adoption of same-sex marriage laws is associated with higher marriage take-up by both men and women, leading to investments in housing and other goods that help same-sex couples increase their incomes after marriage (Badgett et al. 2021; Carpenter et al. 2021; Delhommer and Hamermesh 2021). Studies also find that same-sex couples changed their labor supply behavior following the reduction in discrimination engendered by the new laws, and that gay men benefit from higher wages (Klawitter, M. 2011; Sansone 2019; Hansen, Martell and Roncolato 2019). Other consequences of same-sex marriage laws include increased health insurance coverage and changes in health care utilization among men, and improved mental health of sexual minority adults and adolescents (Hatzenbuehler et al 2012; Carpenter et al. 2021; Chen and van Ours 2022; Raifman et al 2017).

Despite evidence that same-sex marriage laws and similar non-discrimination policies increased the well-being of LGBT people and created economic wealth, there is a growing backlash from conservative political groups against the expansion of LGBT rights. In the U.S., state legislatures passed more than 200 pieces of anti-LGBT legislation between 2015 and 2019 and introduced 417 anti-LGBT bills in the first quarter of 2023 alone (Parris, Fulks and Kelley 2021; Filipovic 2023). Likewise, the EU member states of Hungry and Poland each enacted multiple anti-LGBT statutes (ILGA-Europe 2022a). Religious exemption laws that permit the

[1] We use the acronym "LGBT" in this paper because it is referenced in Poland's legal statutes. Other acronyms commonly in use include LGBTQ, LGBTQI, LGBTQ+, and LGBTQIA+.

refusal of churches, non-profit organizations and business to offer services to LGBT individuals are a common type of anti-LGBT legislation. Other variants include prohibitions on instruction related to sexual orientation and gender identity in schools, and so called "bathroom bills" that deny transgender individuals access to public restrooms that conform to their gender identity (ILGA World 2023; Barron-Lopez and Barajas 2023).

The government of Hungary adopted a more wide-ranging anti-LGBT law on July 1, 2021 that banned information considered to promote homosexuality or gender reassignment from any means of public dissemination, including through the media or in schools. This was followed by an amendment that restricts the sale of products addressing sexual and gender identity [Republic of Hungary, Act LXXIX]. The most severe anti-LGBT laws have been enacted by select countries in Africa and the Middle East. For example, the government of Uganda faced widespread international criticism after passing a law on May 29, 2023 that extends the pre-existing penalty of life imprisonment for same-sex conduct to the "promotion of homosexuality" and imposes the death penalty for "aggravated homosexuality" (Budoo-Scholtz 2023).[2] There are currently six other countries or regions that impose the death penalty for same-sex sexual acts (Brunei, Iran, Mauritania, Saudi Arabia, Yemen, and Northern Nigeria) and five countries where the death penalty is a sentencing option (Afghanistan, Pakistan, Qatar, Somalia and the United Arab Emirates) (BBC News 2023).

Due to the recency of anti-LGBT legislation, studies have not provided an assessment of these laws effects on LGBT individuals, or their friends and family members. One particular concern is that anti-LGBT legislation could have both direct and indirect adverse effects on the mental well-being of the LGBT population. For example, if the laws result in discrimination against LGBT individuals in the labor or goods market, any associated decrease in economic wealth or market access could indirectly worsen mental health (Alam and Bose 2022; Hammond, Gillen and Yen 2010). The laws could also directly worse mental health if individuals feel stigmatized or marginalized by anti-LGBT laws (White Hughto, Reisner and Pachankis 2015; Parris, Fulks and Kelley 2021). Such potential consequences of anti-LGBT laws may result in *minority stress*, whereby stigma, prejudice and discrimination against individuals in the minority

[2] "Aggravated homosexuality" includes same-sex sexual conduct with someone under the age of 18, or where the partner is infected with HIV. The law also extends the prison sentence for attempted same-sex conduct to 10 years (Budoo-Scholtz 2023).

creates a stressful social environment that leads to mental health problems (Meyer 2003; Henderson, Goldbach and Blosnich 2022). For example, theoretical work by Hatzenbuehler (2009) demonstrates how stigma-induced stress experienced by LGBT individuals can lead to psychopathology that is mediated by emotion dysregulation, social/interpersonal problems, and compromised cognition. At baseline, LGBT individuals are at a higher risk than non-LGBT individuals for mental health problems that include depression, suicidal thoughts and attempted suicide, and may be particularly vulnerable to minority stress (Hass et al. 2011; Russell and Fish 2016; Yarns et al. 2016; Remafedi et al. 1998; Safren and Heimberg 1999).

We provide the first comprehensive analysis of the anti-LGBT laws implemented by provincial, county and municipal governments in Poland between 2019 and 2020 on the mental health of the population. Using county-level data from 2017-2010, we estimate difference-in-differences (DID) models to compare changes in suicide attempts, suicides and overall mortality in areas that adopted anti-LGBT laws to changes in these outcomes in areas that did not pass anti-LGBT laws. To address spatial heterogeneity in potentially confounding unobservable factors, we augment DID model estimates using a national sample with those from a sample of geographically contiguous border areas (Dube et al. 2010; Sen and DeLeire 2018; Peng, Guo and Meyerhoefer 2020). We also consider an alternative treatment in the form of anti-LGBT resolutions that were deliberated by local governments, but not adopted. This treatment allows us to measure the effect of the laws through direct channels of minority stress.

We find that the enactment of anti-LGBT statutes increased total suicide attempts by 16 percent, largely due to additional suicide attempts by men. Among those aged 30-34, suicide attempts increased by 68 percent, corresponding to a 61 percent increase in suicides by those aged 30-49. Areas that deliberated, but ultimately rejected anti-LGBT resolutions also experienced higher rates of suicide attempts and deaths, but only models estimated using border areas passed standard specification tests. We find no evidence that anti-LGBT laws caused internal migration, but poor access to pharmacological treatment of mental health conditions and reduced resources for troubled youth may have exacerbated the laws' negative consequences.

Background

As in many parts of the world, resistance to notions of equality between LGBT and heterosexual individuals in Poland is rooted in religious belief and conservative political views.[3] Recent political events have elevated public discourse of LGBT rights, and contributed to policies designed to marginalize the LGBT community. ILGA-Europe (2022b) identifies the pronouncement by Jarosław Kaczyński, leader of the ruling conservative Law and Justice party (PiS), on April 15, 2018 against "homosexual marriages", as the first notable anti-LGBT event of the current political movement. In response to growing anti-LGBT sentiment, the mayor of Warsaw signed a declaration of support for the LGBT community and revised city guidelines to improve the experience of LGBT citizens on February 18, 2019, which elicited a swift backlash from the PiS party and the Catholic Church. Powiat (County) Świdnicki adopted the first resolution against "LGBT ideology" on March 26, 2019, triggering the deliberation of similar resolutions in other municipalities.[4] As a means of bolstering the growing anti-LGBT movement, the conservative newspaper, Gazeta Polska, distributed "LGBT Ideology Free Zone" stickers that individuals could adhere to their homes, businesses and cars (ILGA-Europe 2022b). By the end of 2019, 91 cities, counties or provinces passed resolutions declaring themselves "LGBT-free zones" (Atlas of Hate 2022).

There are two primary versions of anti-LGBT resolutions that constitute a Polish LGBT-free zone. The first version includes "Resolutions against LGBT ideology" that denounce "homosexuality" and sexual education in schools, and declare official opposition to the "ideology" associated with the LGBT rights movement (Atlas of Hate 2022). Unlike past anti-LGBT legislation in other countries, the notion of a LGBT free zone is broad in scope and subject to interpretation. While some may interpret it as a mandate to discriminate against LGBT individuals in all aspects of society, others may view it as largely symbolic. The second common and less contentious resolution is the "Municipal Charter of Family Rights", which was originally drafted by Ordo Iuris, an ultra-conservative legal policy institute based in Warsaw, Poland. This "pro-family" charter promotes traditional families and proposes a set of municipal actions, including mandates of parental control over extra-curricular school activities sponsored

[3] Although Poland has no official religion, approximately 87 percent of Poles are baptized Roman-Catholic (Eurydice 2022).

[4] https://spswidnik.bip.lubelskie.pl/upload/pliki/0stanowisko.pdf. Administrative areas in Poland with functions analogous to counties in the U.S. or the U.K. are termed *powiats*.

by non-governmental organizations and appointment of a "family ombudsman" tasked with protecting family rights (Ordo Iuris 2022; Atlas of Hate 2022).

Local anti-LGBT resolutions implicitly received federal backing in June 2020 when Polish President Andrzej Duda signed an expanded Family Charter during his re-election campaign that included pledges to prevent gay marriage, the adoption of children by LGBT individuals and to ban teaching about LGBT issues in schools (Ash 2020). President Duda also declared that support of LGBT rights was an ideology more dangerous than communism (BBC News 2020). By the end of 2020, an additional three municipalities declared themselves LGBT-free zones, bringing 32% of the population and 31% of the land area in Poland under the umbrella of the zones (Atlas of Hate 2022).

Data

We extracted information on anti-LGBT resolutions and statutes from the *Atlas of Hate* interactive map[5], which indicates whether the municipality deliberated, and subsequently adopted or rejected a resolution against LGBT ideology or the Municipal Charter of Family Rights. In addition, the *Atlas of Hate* indicates whether the anti-LGBT resolution was considered by the voivodeship (province), powiat (county or major city), or gmina (the smallest administrative unit), and the year and month the municipal government voted on the resolution.[6] There are 16 voivodeships, 380 powiats and 2,477 gminas in Poland. We focus on resolutions adopted or rejected by powiats because powiat governments deliberated the majority of anti-LGBT resolutions in Poland, and powiat resolutions better reflect the views of local residents than those at the voivodeship level.[7]

Many powiat governments enacted statutes or voted on resolutions in the middle of the calendar year, particularly in 2019. To account for partial year exposure to the "treatment", we created a variable to measure the proportion of months in the year that the anti-LGBT statute was in effect (or that followed the rejection of a resolution). For example, if the powiat enacted an

[5] https://atlasnienawisci.pl/. After a resolution is adopted by the municipal government, it becomes a legal statute. Therefore, we use the term "statute" or "law" for adopted resolutions and the term "resolution" for rejected resolutions.
[6] A gmina is most often a collection of small villages, but could also be a single district of a large city or a rural area.
[7] Gminas within powiats may have adopted different resolutions than powiats in some cases. We control for discrepancies between powiat statutes and those enacted at the both the voivodeship and gmina levels in our empirical model.

anti-LGBT statute in September 2019, we calculated the treatment in 2019 as (12 – 9)/12 = 0.25, and the treatment in 2020 as 1. We also created a binary variable to indicate whether the voivodership enacted an anti-LGBT statute or rejected a resolution in the given year, and variables to measure the percentage of the powiat population living in a gmina that enacted an anti-LGBT statute, and percentage of the powiat population living in a gmina that rejected an anti-LGBT resolution (independently of the powiat government's policy in both cases).

We collected data on four outcome variables that measure changes in mental health: suicide attempts, suicides, deaths from "external causes" (including suicide) and deaths for any reason. The number of suicide attempts in each powiat is drawn from administrative data recorded at each of the approximately 1,000 police stations operated by the Polish National Police from 2017-2020. These data indicate the overall number of suicide attempts, and the number of attempts separately for men, women and 16 different age groups. Because the name of each police station contains the municipality designation, we were able to assign police stations to powiats.

Our measures of suicides, deaths from external causes and overall deaths are from *Statistics Poland*[8]. Data on suicides are only available at the powiat level from 2018-2020, while data on deaths are available for the same 2017-2020 timeframe as suicide attempts. We analyze deaths from external causes in addition to overall deaths because it is the narrowest powiat-level mortality subcategory that contains suicides. From *Statistics Poland*, we also extracted control data, including variables measuring the powiat demographics (sex ratio, percent of individuals 65 or older [overall and as a percentage of those ages 17-64], percentage aged less than 18, percent aged 17-64, population density, percent urban population, no. families that foster children, primary school enrollment rate, voting share of the Law and Justice (PiS) party in the 2014 [mapped to 2017] and 2018 [mapped to 2018-2020] municipal elections), economic characteristics (average monthly gross wages, employment rate, no. of job offers, share unemployed with a college degree, no. of permanent markets, land area), primary health care use and pharmacy supply (annual no. of primary care visits, and annual total no. of physician visits, no. of pharmacies, no. of pharmaceutical outlets) and per capita deaths due to Covid-19. Finally, we extracted data for our mechanisms analysis on powiat-level migration, crime, social support services and large-scale rallies and events. Our full sample includes observations from 1997-

[8] https://stat.gov.pl/en/

2000 on 366 powiats and cities with powiat status. We excluded 12 powiats from the analysis because they lacked data on suicide attempts and two powiats because they had inconsistent LGBT policies.[9]

We obtained information on select prescription drug sales in each powiat from 2017-2020 from *Pex PharmaSequence*[10]. These data are drawn from 6,200 retail pharmacies, which represent approximately half of all pharmacies in Poland, and are representative at the powiat level. The data contain gross sales of prescription drugs in the following anatomical therapeutic chemical (ATC) drug categories: antipsychotics (N05A), anxiolytics (N05B), hypnotics and sedatives (N05C), antidepressants (N06A), psychostimulants, agents used for AHDH and nootropics (N06B), and drugs used in additive disorders (N07B).

We merged together data from all sources by TERC municipality code and year.

Empirical Approach

Our identification strategy is based on the comparison of changes in mental health measures in powiats that deliberated anti-LGBT resolutions to changes in outcomes in powiats that never deliberated resolutions. We start with a generalized differences-in-differences (DID) model that includes powiat and year fixed effects.[11] The pre-treatment period in the model is 2017-2018, and the post-treatment period is 2019-2020. Most of the anti-LGBT resolutions were deliberated in 2019, but there are a handful of resolutions there were deliberated in 2020. As a result, the standard DID estimator could be a weighted average of heterogeneous treatment effects, which we consider in our specification tests. We specify the model as,

$$Ln\, Y_{it} = \alpha + \beta \cdot D_{it} + \delta_1 \cdot V_{it} + \delta_2{}' \cdot G_{it} + \gamma' \cdot X_{it} + \theta_i + \tau_t + \varepsilon_{it}, \quad (1)$$

where Y_{it} is the mental health outcome (suicide attempts, suicides or deaths per 100K capita) in powiat i and year t and $D_{it} = (12 - M)/12$, where M is the number of the month when the anti-

[9] The set of powiats with missing data on suicide attempts includes: powiats kaliski, koniński, leszczyński, koszaliński, karkonoski, grudziądzki, piotrkowski, skierniewicki, chełmski, krośnieński, przemyski, and ostrołęcki. The two powiats with inconsistent LGBT policies are powiats rawski and zamojski.

[10] https://www.pexps.pl/

[11] Because we scale the treatment by the number of months of exposure when statutes are enacted or resolutions rejected, our model differs from a traditional DID model. However, we still refer to it as a DID model since the marginal effect of interest reflects a unit change from 0 to 1.

LGBT statute was enacted or resolution rejected.[12] If $D_{it} > 0$ in year t (2019), then $D_{it} = 1$ in year $t + 1$ (2020).[13] V_{it} is a binary indicator that equals one if the voivodeship containing the powiat either enacted an anti-LGBT statute or rejected a resolution; G_{it} is a vector of two variables measuring the percentage of the powiat population residing in a gmina that (1) enacted an anti-LGBT statute, or (2) rejected an anti-LGBT resolution; X_{it} is a vector of time-varying powiat characteristics; θ_i is a powiat fixed effect; τ_t is a year fixed effect; and ε_{it} is a random error term. The parameter β represents the DID estimate of the anti-LGBT statute or rejected resolution on the outcome in percentage terms. Because the outcome variables are measured across the full population, and not the population of LGBT individuals, β measures an *intent-to-treat* effect. Figure 1 shows the treatment and control groups for the DID model where the treatment effect measures the implementation of an anti-LGBT statute, and the model where the treatment is the rejection of an anti-LGBT resolution. Powiats in red enacted anti-LGBT statutes, while those in green debated, and ultimately rejected anti-LGBT resolutions. Among the areas with anti-LGBT laws, 57 percent passed specific resolutions against LGBT ideology, and 10 percent of these also implemented the Municipal Charter of Family Rights. Forty-three percent of areas adopted the Municipal Charter, only.

Identification in the standard DID model is based on the assumption that the treatment and control powiats would have exhibited similar outcome trends in the absence of anti-LGBT resolutions. In other words, there do not exist differential pre-treatment trends in the treatment and control powiats. Compliance with the pre-trends assumption is difficult to achieve using the full national sample of powiats because location-specific attitudes towards LGBT individuals are potentially important determinants of LGBT mental health. Therefore, we estimate a second DID model with an alternative set of control powiats. Specifically, we follow the approach developed by Dube et al. (2010), and applied to the health care setting by Sen and DeLeire (2018) and Peng, Guo and Meyerhoefer (2020), to account for spatial heterogeneity by constructing a control group for each treatment powiat from contiguous (i.e. border) powiats that did not deliberate anti-LGBT resolutions. We specify this model as,

[12] We added one to the dependent variable before applying the log transformation due to the presence of powiats without any suicides or suicide attempts for specific age categories.

[13] We estimated traditional event study models with binary treatment variables and determined that there is a similarly persistent effect of enacting an anti-LGBT statute or rejecting a resolution, suggesting that the treatment effect should be set equal to one in period *t*+1 in both cases.

$$Ln\, Y_{ipt} = \alpha + \beta \cdot D_{ipt} + \delta_1 \cdot V_{ipt} + \delta_2{}' \cdot G_{ipt} + \gamma' \cdot X_{ipt} + \theta_i + \mu_{pt} + \tau_t + \varepsilon_{ipt}, \qquad (2)$$

where p indexes border powiat pair and μ_{pt} is a year-specific powiat-pair fixed effect. Identification in this second model comes from differences in mental health outcomes between each treated powiat and the control powiats that share a boundary with the treated powiat. Note that a control powiat could be contained in multiple border-powiat pairs if it shares a boundary with more than one treated powiat. Figure 2 shows the treatment and control powiat groups for the border-powiat DID models pertaining to the enactment of anti-LGBT statutes or rejection of resolutions. We cluster the standard errors of the estimates in equation (1) at the powiat level, and in equation (2) at the border-powiat level.

One mechanism modifying the impact of anti-LGBT resolutions on mental health outcomes is lack of access to mental health care. We estimate empirical models to investigate the effect of anti-LGBT statutes and rejected resolutions on the use of prescription drugs indicated for the treatment of mental illness. In particular, we use modified versions of equations (1) and (2), where Y_{it} is defined as total sales of a mental health prescription drug, or combination of drugs, and the vector X_{it} is expanded to include the per prescription powiat-level prices of each mental health drug (ATC categories N05A,B,C; N06A,B; N07B). When the outcome is sales of all mental health drugs among the ATC categories we consider, we use budget share weights to construct average drug expenditure.

Results

Table 1 contains means and standard deviations for all of the outcome and control variables we use in our analysis, computed separately for powiats that enacted anti-LGBT statutes, those that rejected anti-LGBT resolutions and those that never deliberated resolutions (the never treated group). We indicate statistical differences between the two treated groups and the never treated group using two-sided tests. Suicide attempts are lowest in never treated areas and highest in powiats that rejected anti-LGBT resolutions, although the differences are not statistically significant for most age groups. Suicide deaths are also lowest in never treated areas, but are similar across the two treated groups, while total deaths follow the opposite pattern. In particular, total per capita deaths are highest in never treated areas and lowest in areas that enacted statutes.

Differences in the control variables across the three areas indicate a higher urban population share, average wages and employment in powiats that rejected anti-LGBT resolutions than powiats that enacted statutes. The areas that were never treated fall in-between the two treated areas along these dimensions. The voting share for the conservative PiS party in municipal elections is higher in powiats rejecting resolutions than never treated areas, but highest in powiats that enacted statutes, as expected.

Main results

Table 2 contains estimates from our generalized DID model estimated using the full national sample and border-powiat sample where the treatment measures the enactment of anti-LGBT statutes. Total suicide attempts increased by 10 percent in the full sample and 16 percent in the border sample after powiats enacted statutes, although the former is not statistically significant. The effect on overall suicide attempts is driven by suicide attempts among men, which increased by 12 percent and 19 percent after the implementation of anti-LGBT laws in the full and border samples, respectively. These laws had no detectable effect on suicide attempts among women, or on suicide deaths for either sex. Nonetheless, both total deaths and deaths from external causes increased in the full sample, and the magnitude of the latter was nearly identical to the 10 percent increase in suicide attempts.

In Table 3 we present estimates from the models of suicide attempts and suicides for specific age categories. The enactment of anti-LGBT statutes increased suicide attempts among those aged 13-18, 30-34 and 45-49 in both the full and border samples and among individuals age 55-59 in only the border sample. The magnitudes of the border sample estimates range from 64 – 94 percent. There was a similar 61 percent increase in the suicide rate following the enactment of anti-LGBT statutes among those aged 30-49 in the border sample, but estimates for the other age categories are not statistically significant. Likewise, there is a decrease in suicides among those age 25-29 in the full sample, but the corresponding estimate is not statistically significant in the border sample.

Table 4 contains analogous estimates to Table 2 when the treatment measures the deliberation and ultimate rejection of anti-LGBT resolutions. Total suicide attempts increased in both samples following the rejection of resolutions, as did suicide attempts for men when the model was estimated using the full national sample. Similar to the enactment of statutes, there is

no detectible effect of rejecting resolutions on suicide attempts among women. The magnitudes of the treatment effect estimates are larger than for the enactment of anti-LGBT statutes. For example, the rejection of an anti-LGBT resolution increased total suicide attempts by 36 percent using the border sample, which is approximately twice as large as the treatment effect of enacting a statute. We find that rejecting an anti-LGBT resolution increased suicides among men and total deaths, but these effects are only statistically significant using the full sample. In contrast, the effect of rejecting resolutions on deaths from external causes is precisely estimated using both samples, with a treatment effect of 21 percent in the full sample and 15 percent in the border sample.

In Table 5 we report the treatment effects of rejecting an anti-LGBT resolution for specific age groups. Analogous to the enactment of anti-LGBT statutes, the rejection of resolutions increased suicide attempts among those aged 13-18, but the treatment effect in the border sample (139 percent) is nearly twice as large as the corresponding estimate from Table 3. The rejection of resolutions also increased suicide attempts among 25–29-year-olds by 184 percent, but the effects on older age groups are only statistically significant when the model is estimated using the full sample. Similarly, the only effect of rejecting resolutions on suicides in the border sample is a 61 percent reduction in suicides among those aged 30-49. In our specification tests, we show this particular estimate is a weighted average of heterogeneous treatment effects.

Specification and falsification tests

There are two important conditions our models must satisfy to estimate the causal effects of enacting or rejecting anti-LGBT laws. First, there must not be differential pre-existing outcome trends across treatment and control powiats, and second, the treatment effect estimates must not change significantly over the two-year treatment period. To check for pre-existing trends, we followed the approach developed by Freyaldenhoven et al. (2021) based on first differences in the treatment over time, which is consistent with our continuous treatment variables. Appendix Table A1 contains estimated coefficients on the leads of the first differences of the treatment measuring the enactment of anti-LGBT statutes. There are some statistically significant estimates on the lead variables in both the full national sample and border sample, indicating violations of the pre-trend test. However, none of these violations correspond to models with statistically

significant treatment effects from Tables 2 and 3. Table A2 contains estimated coefficients on the leads of the first differenced treatment measuring the rejection of anti-LGBT resolutions. Again, there are some statistically significant coefficients on the lead variables, mostly in the full sample. They indicate the presence of pre-trends in total suicide attempts, suicide attempts by men and suicides by those aged 25-29, which correspond to statistically significant estimates in the main models. However, there is no evidence of pre-trends when these models are estimated using the border sample.

To investigate whether our DID estimates are biased by differential treatment effects over time, we followed Goodman-Bacon (2021) and applied the treatment effect decomposition developed by Goodman-Bacon, Goldring and Nichols (2019). Due to sample size limitations, we only implemented this specification test using the full sample. For the models measuring the enactment of anti-LGBT statutes, Table A3 contains the separate treatment effects for the following four component groups and their associated weights: (1) timing groups (comparisons of the treated to the eventually treated and previously treated); (2) those treated in 2019 versus the never treated; (3) those treated in 2020 versus the never treated; and, (4) within group residual variation due to differences in control variables across the treated- and never-treated groups. The component treatment effect with the largest weight (0.74) is the treated in 2019 compared to the never treated, while the second largest weight corresponds to within group residual variation (0.16). Since the individual treatment effects are qualitatively similar across these two component groups for all of the full sample estimates that are statistically significant in Tables 2 and 3, treatment effect heterogeneity is not a significant concern for this set of models.

When the treatment effect measures the rejection of anti-LGBT resolutions, the treated in 2019 versus never-treated group still has the highest weight (0.57), but the treated in 2020 versus never-treated group also influences the overall treatment effect, with a weight of 0.33 (see Appendix Table A4). Moreover, there are a few instances of DID estimates where these two components treatment effects are qualitatively different. In particular, the treated in 2019 versus never treated effect is positive, but the treated in 2020 versus never treated effect is negative for total suicide attempts, and suicide attempts and suicides by men, while the reverse is true for suicides among those aged 25-29 and 30-49 (for suicides). All of these treatment effects, except total suicide attempts, become statistically insignificant when we estimate the DID model using the border sample. This suggests DID estimates from the main sample are susceptible to bias

from treatment effect heterogeneity when the outcome is suicides or suicide attempts. Although we cannot formerly test whether this is the case in the border sample, the lack of statistical significance in the border sample for treatment effect estimates that fail the pre-trend test suggests unobserved heterogeneity is better controlled in the border sample.

Another potential source of treatment effect heterogeneity involves instances when a powiat implements a policy, but one or more gminas (the smallest self-governing units) inside the powiat oppose the policy. This happens most frequently when powiats enact anti-LGBT statutes, but gminas within the powiats reject similar resolutions. We present estimates in Table 6 from DID models where we interacted the treatment effect measuring the enactment of an anti-LGBT statute with a variable measuring the percentage of the powiat population living in a gmina rejecting a similar anti-LGBT resolution, which is a control variable in the main specification. In the case of total suicide attempts, suicide attempts by men and deaths from external causes, rejection of anti-LGBT resolutions by gmina governments mitigates the negative consequences of discriminatory powiat laws on mental health and mortality. We find similar results in the DID models corresponding to specific age groups (see Table 7), but because the percentage of the powiat population living in a gmina with an opposing policy is small (approximately 1 percent), opposing policies do not have any significant impact on powiat-level mental health outcomes.

Finally, we subjected our DID models to falsification and sensitivity tests. In particular, we estimated our models on outcome variables measuring per capita deaths from neoplasm, cancer and infant deaths. Consistent with our expectations, the adoption or rejection of anti-LGBT resolutions has no detectable effect on these categories of death (see Table A5). We also re-estimated our models after dropping variables related to employment, since labor market outcomes could be endogenous. Removing these variables from the models does not have any notable impact on the estimates, other than causing the unexpected negative relationship between suicide and the rejection of anti-LGBT resolutions for those aged 30-49 in Table 5 to become statistically insignificant (see Tables A6 –A9).

Mechanisms

Our main estimates suggest that both the enactment of anti-LGBT statutes and rejection of resolutions led to an increase in suicide attempts and deaths in Poland. We now provide some

evidence of the mechanisms that may underlie this deterioration in mental health outcomes. One possibility is that LGBT individuals, who are more likely to attempt and commit suicide may have moved out of areas that enacted anti-LGBT statutes and into areas that rejected anti-LGBT resolutions. This would cause an underestimation of the treatment effect in the former areas, and overestimation of the treatment effect in the latter areas, relative to effects observed in a stable population. Individuals may have also moved from treated to untreated areas. We estimated all of our DID models with dependent variables measuring out-migration from and in-migration to powiats, and report the results in Table 8. There are no instances where we detect that either the enactment or rejection of anti-LGBT laws led to changes in internal migration across Poland.

Next, we consider whether debates over LGBT resolutions led to broader social conflict that could create a stressful environment. *Statistics Poland* contains variables that measure the number of mass events and the number of criminal offenses, which we used as outcome variables in our DID models. The former implicitly includes the large number of protests across Poland focused on LGBT rights, while the latter includes changes in crime (offenses against LGBT individuals and their supporters, for example) due to the differences of opinion over anti-LGBT laws (ILGA 2022a; 2022b). We find that enacting anti-LGBT statutes was associated with a 126 percent increase in the number of participants at mass events using the border sample. While the point estimate of this effect is similar in magnitude when anti-LGBT resolutions are rejected, it is not statistically significant. We also find that the number of criminal offenses increased by 16 percent when powiats rejected anti-LGBT resolutions.

Statistics Poland provides information on the number of "socialization centers" in Poland and on the number of their residents. These are facilities that provide children without parental care emotional support and activities to promote physical and mental well-being.[14] Using the border sample, we find that there was a 13 percent decrease in the number of socialization centers and a 28 percent decrease in the number of socialization center residents after powiats enacted anti-LGBT statutes. This finding provides evidence that material support for troubled youth decreased after the implementation of anti-LGBT statutes.

Following exposure to mental stress, suicide attempts are often avoidable with adequate access to mental health services (Lang 2013; Jagodič et al. 2013). Given that prescription drugs are pervasive in the treatment of mental illness, models of prescription mental health drug

[14] https://stat.gov.pl/en/metainformation/glossary/terms-used-in-official-statistics/1354,term.html

demand are a useful tool to investigate whether lack of access to mental health care in Poland was a mechanism contributing to the rise in suicides and suicide attempts following the deliberation of anti-LGBT resolutions (Gusmão et al 2013; Terlizzi and Norris, 2021). Table 9 contains DID estimates of the impact of enacting anti-LGBT statutes and rejection of anti-LGBT resolutions on sales of specific mental health drugs and all of these drugs combined. While there are statistically significant treatment effects on one drug when the model is estimated using the full sample (an increase in drugs to treat addiction following the enactment of statutes), there are no statistically significant treatment effects in the border sample models. As a result, there is very limited evidence that debate over anti-LGBT resolutions affected the use of the prescription drugs for mental health problems.

Discussion

Based on estimates from our preferred border sample DID model, the enactment of anti-LGBT statutes across Poland led to an increase in suicide attempts, particularly among men. Epidemiological data from multiple countries indicate that men are more than three and a half times more likely to attempt suicide than women, and suicidal death in the EU is four-to-five times more likely among men than women (OECD 2014; O'Loughlin and Sherwood 2005; Freeman et al. 2017). Our findings suggest that anti-LGBT laws exacerbate these baseline differences in suicidality because the mental health status of men is more susceptible to the negative consequences of the laws than the mental health of women. Carpenter et al. (2021) finds that gay men benefit more than lesbian women from access to legal same-sex marriage. Likewise, Harrell (2022) finds that improvements in self-reported mental health and suicide deaths accrue almost exclusively to young men following conversion therapy bans. Putting our results in the context of these other studies suggests that gay men are most affected by both the imposition and removal of discriminatory policies.

While suicide attempts from the enactment of anti-LGBT statutes rose across the age distribution, our strongest evidence for adverse effects on mental health is among those aged 30-49, for whom suicide attempts increased between 68-94 percent, and suicides increased by 61 percent. Because our measures of suicide and suicide attempts are for the full population, our estimates represent *intent-to-treat effects* if we assume that only the mental health of LGBT individuals was adversely impacted by anti-LGBT statutes. Recent estimates from survey data

suggest that 9 percent of individuals from Poland identify as LGBT, compared to 11 percent of the total population in Austria and Germany (Ipsos 2021). Since only 27 percent of individuals are open about being LGBT in Poland, compared to 47 percent in the EU, there is reason to believe that survey estimates of the LGBT population in Poland are biased downward relative to other EU countries (FRA 2020).

If we assume that 11 percent of Poland's population is LGBT, as is Austria and Germany, the 16 percent increase in total suicide attempts due to the enactment of anti-LGBT statutes, translates to a 145 percent increase in the rate of suicide attempts among the LGBT population.[15] Despite this large percentage increase, suicide attempts and suicides are rare, so the magnitudes of the treatment effects are more modest when measured in per capita terms. For example, the 68 percent increase in suicide attempts among those aged 30-34 translates to an additional 30 suicide attempts per 100k capita per year. Likewise, the 61 percent increase in suicides among those aged 30-49 due to the enactment of anti-LGBT statutes translates to an additional 11 suicides per 100k capita per year.[16]

There are many channels through which anti-LGBT laws could impact mental health, including discrimination in the labor or goods markets as well as stress from living in a prejudicial environment (or minority stress; Meyer 2003). Treatment effects from our models analyzing the rejection of anti-LGBT resolutions should isolate the impact of minority stress on mental health from effects through market discrimination. This is because the primary mechanism when resolutions are rejected is the stressful social environment generated by debate that is propagated through the media and by word-of-mouth. Our a priori assumption was that treatment effects from the rejection of resolutions would be smaller than those from the enactment of statutes, but we find the opposite. Using our preferred border sample, the rejection of an anti-LGBT resolution increases suicide attempts among those aged 13-18 by 139 percent, but the enactment of anti-LGBT statutes only increases suicide attempts by 75 percent. This is surprising because, in addition to isolating the minority stress mechanism, the rejection of an anti-LGBT resolution should be viewed by some as affirming acceptance of LGBT individuals.

[15] It is possible that not all suicides or suicide attempts resulting from anti-LGBT laws were initiated by LGBT individuals. Past studies show that societal conflict can lead to wide ranging impacts on population mental health (Clark 1969; Williams and Medlock 2017; Smith, Hibbing and Hibbing 2019).

[16] These per capita estimates are based on the application of the percentage treatment effect to the average rate of suicide attempts (suicides) in the treated group in 2017-2018 (2018), before the application of the treatment.

The most likely reason for the unexpected high rate of suicide attempts in powiats rejecting anti-LGBT resolutions is geographic heterogeneity. In particular, among the 12 powiats that ever rejected an anti-LGBT resolution, seven of them were cities with powiat status that contain more progressive urban populations and a larger number of media outlets. Furthermore, the full sample models measuring the rejection of resolutions fail some specification tests, and it is possible that estimates from the border sample models are also biased to some extent.

We do find limited evidence that rejecting anti-LGBT resolutions is protective of mental health, but only in cases where the rejection is by small administrative areas within powiats that enacted anti-LGBT resolutions. It is possible that towns with policies opposing anti-LGBT laws were viewed by some as safe havens and engendered a sense of community belonging (Croff et al. 2017). Nonetheless, the protective effect of these opposing policies was very small, suggesting the prejudice and discrimination felt by LGBT individuals emanating from the broader anti-LGBT movement is difficult to overcome. Moreover, debate over a single policy issue, such as LGBT rights, can spark broader social conflict that has additional adverse effects on both the marginalized group and their supporters (Clark 1969; Williams and Medlock 2017; Smith, Hibbing and Hibbing 2019). Consistent with this notion is the increase in crime we find after the enactment of anti-LGBT statutes.

Our findings have implications for the anti-LGBT laws recently enacted in other countries, such as Hungary and the U.S. While these laws are typically focused on prohibiting the instruction or discussion of sexual orientation and gender identity in schools or other public forums, making them narrower in scope than anti-LGBT laws in Poland, they may generate similar levels of stigma. For example, Florida's "Don't Say Gay" law, which was enacted on July 1, 2022, elevated the discussions about the curriculum schools use for sex and gender education into a nationwide debate over access to sexual education, the rights of parents to police school content and the place of LGBT individuals in society (Johnson 2022). Our findings suggest that laws such as "Don't Say Gay" could have adverse consequences for the mental health status of LGBT youth and others if they meaningful increase levels of minority stress.

An important moderator of the effect of anti-LGBT laws on suicide is access to mental health services. We find little evidence that the rise in suicide attempts in Poland following the creation of LGBT free zones was accompanied by great use of prescription drugs for mental health treatment. Previous studies document stigma against psychiatric patients in the Polish

health care system (Świtaj et al. 2012; Babicki, Kotowicz and Mastalerz-Migas 2021), and resources devoted to the treatment mental illness in Poland are more limited than in many other European countries. In particular, Poland ranks second to last among EU member countries in psychiatrists per capita, and wait times to see a psychiatrist are typically several months (Szukalska 2020; EuroStat 2018). The mental health care system in Hungary is also resource constrained and suicide rates are very high, suggesting the adverse effects of Hungary's 2021 law could be compounded by the failure of LGBT individuals to successfully obtain mental health treatment (Kurimay 2010).

Our study has some important limitations. Due to lack of geo-coded data on common mental health problems such as depression, anxiety and mood disorder, we measure how anti-LGBT laws affect suicide attempts and fatalities from suicide. Therefore, we cannot capture the full mental health burden of anti-LGBT laws, which is much larger than indicated by findings using high acuity mental health outcomes. In addition, although we explore some of the mechanisms responsible for our effects, we believe that the intensity of the debate in the traditional news outlets and social media is an important contributor to minority stress. For example, numerous studies have linked exposure to traditional and social media to stress and mental health problems (Bauldry and Stianback 2022; Twenge 2020), and there is evidence that transgender and gender nonconforming youth (TGNC) are particularly negatively affected by negative news stories about TGNC people (Pham et al. 2020). Future research is necessary to untangle the complex mechanisms through which debate over anti-LGBT legislation filters through media channels to LGBT individuals. Finally, if there were political conflicts and anti-minority statements, not directly related to anti-LGBT laws, that occurred in treatment powiats during our analysis period, the effects of these other stressors may be reflected in our treatment effects.

Conclusions

Previous research suggests the creation of LGBT free zones in Poland created a stressful environment for LGBT individuals, their friends and family members. For example, the European Union Agency for Fundamental Rights (FRA; 2020) and Reid (2021) link the global

rise in anti-LGBT political rhetoric to attacks and hate crimes[17], while one in three LGBT youth reported their "mental health was poor most of the time or always due to anti-LGBTQ policies and legislation" in a U.S. survey (The Trevor Project 2023). We confirm that anti-LGBT legislation in Poland was detrimental to population mental health by establishing a direct link between anti-LGBT laws, suicide attempts and deaths from suicide. Therefore, policy makers should consider the mental health costs of anti-LGBT resolutions and laws when they formulate legislation.

[17] For example, anti-LGBT hate crimes in the U.S. hit a record high in 2020, and Germany experienced a 39% increase in hate crimes over the same year (U.S. Department of Justice 2022; ILGA-Europe 2022a)

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Table 1. Summary statistics from full national sample, 2017-2020.

Dependent Variables	Never Treated (N*T= 317*4)		Enacted statute (N*T= 37*4)		Rejected resolution (N*T= 12*4)		
	Mean	S.D.	Mean	S.D.	Mean		S.D.
Suicide attempts per 100k							
Total	31.68	20.72	33.84	19.95	40.05		32.14
Men	50.26	31.76	53.81	29.71	61.01		47.72
Women	13.98	13.18	14.70	13.54	20.81	*	19.66
Age 7-12	1.08	4.73	1.16	5.85	2.39		7.13
Age 13-18	35.45	46.46	42.40	59.96	57.81	*	65.24
Age 19-24	46.33	48.98	44.35	42.11	73.69	*	74.74
Age 25-29	46.78	47.94	45.30	44.06	71.66		87.28
Age 30-34	46.29	47.39	45.84	41.64	59.12		60.62
Age 35-39	42.95	43.45	45.68	40.96	55.78		62.07
Age 40-44	40.48	39.69	42.81	33.85	50.36		52.57
Age 45-49	38.94	40.06	40.98	37.92	52.12		50.69
Age 50-54	37.05	39.21	41.35	34.28	44.65		34.96
Age 55-59	34.70	33.69	38.66	33.93	36.63		34.32
Age 60-64	31.02	29.16	40.26 **	35.82	35.18		35.70
Age 65+	22.49	17.22	23.34	16.98	21.59		15.42
Suicides per 100k[†]							
Total	14.93	7.19	16.56 *	7.74	16.57		8.00
Men	26.62	13.35	29.61	14.04	29.07		14.40
Women	3.79	3.58	4.04	3.98	5.10	*	3.34
Age 0-12	0.15	1.81	0.10	1.07	0.00	**	0.00
Age 13-18	4.74	12.61	4.33	9.82	5.97		11.36
Age 19-24	14.34	19.51	14.74	15.81	21.78		21.88
Age 25-29	15.78	19.10	16.93	21.19	24.52		31.62
Age 30-49	17.63	11.21	19.51	11.65	18.70		10.02
Age 50-69	20.47	13.84	24.51 **	14.46	22.37		12.64
Age 70+	17.56	16.46	17.62	16.21	15.33		12.68

Notes: *, **, *** indicate statistically significant differences from the never treated group at the 1%, 5%, and 10% level. [†]Only available in 2018-2020.

Table 1. Summary statistics from full national sample, 2017-2020, continued.

Dependent & treatment variables	Never Treated (N*T= 317*4)		Enacted statute (N*T= 37*4)			Rejected resolution (N*T= 12*4)		
	Mean	S.D.	Mean		S.D.	Mean		S.D.
Deaths per 100k								
Total	1125.81	176.66	1091.45	*	176.41	1105.98		197.52
External causes	55.54	15.06	57.22		19.20	51.98		16.52
Neoplasm	283.42	40.89	249.40	***	34.19	285.20		42.17
Cancer	412.43	217.79	345.55	***	197.82	277.71	***	187.84
Infant death	3.78	2.44	3.85		2.20	3.79		2.15
Annual prescription drug sales (2015 USD)								
Antipsychotics (N05A)	822,203.00	354,548.30	867,358.20		507,392.80	1,007,162.00	***	300,902.40
Anxiolytics (N05B)	709,845.70	265,311.50	631,305.00	***	253,937.30	807,763.70	**	232,870.60
Hypnotics and sedatives (N05C)	1,207,672.00	412,299.60	1,034,218.00	***	479,404.70	1,635,993.00	***	482,524.90
Antidepressants (N06A)	1,105,664.00	436,714.00	985,327.80	**	446,500.00	1,536,944.00	***	538,495.90
Psychostimulants, agents used for ADHD and nootropics (N06B)	381,852.40	153,047.70	394,416.30		175,736.40	471,835.10	***	118,040.00
Drugs used in addictive disorders (N07B)	114,797.70	58,493.71	98,234.89	***	54,810.49	163,476.00	***	73,461.39
Total for N05A/B/C, N06A/B, N07B	4,328,338.00	1,445,270.00	40,10,860.00	*	1,743,583.00	5,623,174.00	**	1,521,246.00
Other dependent variables (per 100k)								
No. of internal powiat in-migrants	693.46	406.02	568.10	***	305.91	847.49	*	396.34
No. of internal powiat out-migrants	805.03	218.64	779.31		242.46	898.86	*	288.31
No. of participants at mass events	37,483.11	83,506.17	21,123.82		31,052.08	71,210.59	**	69,528.36
No. of criminal offenses	1151.16	480.82	877.77	***	410.44	1376.60	*	658.72
No. socialization centers	1.97	2.09	0.88	***	1.06	2.19		2.63
No. socialization center residents	31.46	32.14	14.45	***	17.02	33.76		41.84
Treatment variables								
No. of months after powiat enacted anti-LGBT statute	0.00	0.00	0.37	***	0.43	0.00		0.00
No. of months after powiat rejected anti-LGBT resolution	0.00	0.00	0.00		0.00	0.25	***	0.38

Notes: *, **, *** indicate statistically significant differences from the never treated group at the 1%, 5%, and 10% level.

Table 1. Summary statistics from full national sample, 2017-2020, continued.

Control variables	Never Treated (N*T= 317*4)		Enacted statute (N*T= 37*4)			Rejected resolution (N*T= 12*4)		
	Mean	S.D.	Mean		S.D.	Mean		S.D.
Voivodership has any LGBT policy	0.11	0.32	0.17		0.38	0.17		0.38
% pop. in gmina w/ anti-LGBT statute	0.00	0.03	0.04	***	0.12	0.00	***	0.00
% pop. in gmina rejecting anti-LGBT resolution	0.01	0.06	0.01		0.06	0.01		0.07
No. of women per 100 men	104.86	3.72	103.86	**	3.65	109.02	***	5.32
% population < 18	18.03	1.82	18.43	**	1.54	17.87		1.75
% population 18-64	60.77	1.48	60.93		1.36	59.82	***	1.74
% population 65+	17.39	2.31	17.09		1.97	18.41	*	2.69
No. aged 65+ per 100 people aged 18-64	25.85	3.90	25.35		3.30	27.83	**	4.70
No. of foster families per 100k	136.41	131.94	99.14	***	44.12	244.88	**	229.57
Primary education enrollment rate	94.19	5.24	93.43		6.82	101.12	***	5.85
Voting share for PiS party	31.16	10.27	42.77	***	10.50	34.27	**	7.69
Powiat area in km^2	799.13	499.99	962.61	**	581.64	526.88	**	534.11
Powiat pop. per km^2	369.08	655.07	253.55	**	457.15	1068.81	***	954.87
% urban population	52.75	26.07	38.02	***	24.71	74.29	***	31.99
No. of permanent marketplaces	5.50	4.39	6.40	**	3.74	7.52	**	3.95
Annual no. of job offers	150.72	248.80	68.57	***	57.49	369.31	*	691.45
Avg. monthly gross salary (zł)	4336.75	672.87	4055.70	***	413.05	4743.35	***	608.36
Employed persons per 1k	208.58	79.48	174.51	***	61.61	305.56	***	107.94
% unemployed college graduates	3.70	1.41	4.72	***	1.38	3.06	***	0.84
No. of pharmacies	32.40	45.26	29.40		12.66	87.29	***	96.29
No. of pharmacy outlets	3.10	2.97	3.77	*	3.10	1.67	***	2.22
No. of primary care visits	434,024.50	470,252.70	396,539.40	*	165,786.20	977,318.00	***	910,567.40
No. of outpatient visits	725,686.00	1,351,235.00	557,866.00	***	241,577.70	2,135,348.00	***	2,343,315.00
Deaths from Covid-19 per 100k	27.16	48.87	29.43		52.92	29.65		52.94

Notes: *, **, *** indicate statistically significant differences from the never treated group at the 1%, 5%, and 10% level.

Table 2. Difference-in-differences estimates of enacting anti-LGBT statutes on suicide attempts, suicides and deaths.

Outcome measures	Full sample		Border sample	
log Suicide attempts per 100k	N*T=366*4		N*T=120*4	
Total	0.101		0.162	**
	(0.067)		(0.081)	
Male	0.119	*	0.187	**
	(0.072)		(0.090)	
Female	-0.029		0.045	
	(0.144)		(0.150)	
log Suicides per 100k	N*T=366*3		N*T=120*3	
Total	-0.100		0.022	
	(0.091)		(0.116)	
Male	-0.098		0.032	
	(0.095)		(0.125)	
Female	-0.141		-0.016	
	(0.232)		(0.258)	
log Deaths per 100k	N*T=366*4		N*T=120*4	
Total	0.016	*	0.003	
	(0.010)		(0.012)	
External causes	0.101	**	0.065	
	(0.047)		(0.050)	

Notes: Full sample models include fixed effects for year and powiat, while border sample models include year and year-specific powiat-pair fixed effects. All models include the set of control variables reported in Table 1. Standard errors, in parentheses, are cluster-corrected at the powiat level. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

Table 3. Difference-in-differences estimates of enacting anti-LGBT statutes on suicide attempts and suicides, by age categories.

	log Suicide attempts per 100k					*log Suicides per 100k*				
Categories	Full sample (N*T=366*4)		Border sample (N*T=120*4)		Categories	Full sample (N*T=366*3)		Border sample (N*T=120*3)		
Age 7-12	-0.159		-0.109		Age 0-12	-0.032		-0.008		
	(0.152)		(0.159)			(0.069)		(0.064)		
Age 13-18	0.890	**	0.745	**	Age 13-18	-0.082		-0.334		
	(0.352)		(0.349)			(0.332)		(0.311)		
Age 19-24	0.189		0.274		Age 19-24	-0.396		-0.492		
	(0.273)		(0.332)			(0.337)		(0.416)		
Age 25-29	-0.041		0.268		Age 25-29	-0.87	**	-0.384		
	(0.293)		(0.246)			(0.377)		(0.472)		
Age 30-34	0.652	***	0.683	**	Age 30-49	0.204		0.611	**	
	(0.204)		(0.290)			(0.209)		(0.290)		
Age 35-39	0.135		0.332							
	(0.262)		(0.329)							
Age 40-44	-0.009		0.075							
	(0.247)		(0.232)							
Age 45-49	0.654	*	0.937	**						
	(0.355)		(0.417)							
Age 50-54	-0.103		0.106		Age 50-69	-0.014		-0.130		
	(0.345)		(0.425)			(0.138)		(0.171)		
Age 55-59	0.233		0.642	*						
	(0.307)		(0.374)							
Age 60-64	0.110		-0.477							
	(0.379)		(0.368)							
Age 65+	0.054		0.076		Age 70+	-0.179		0.241		
	(0.192)		(0.229)			(0.297)		(0.375)		

Notes: Full sample models include fixed effects for year and powiat, while border sample models include year and year-specific powiat-pair fixed effects. All models include the set of control variables reported in Table 1. Standard errors, in parentheses, are cluster-corrected at the powiat level. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

Table 4. Difference-in-differences estimates of rejecting anti-LGBT resolutions on suicide attempts, suicides and deaths.

Outcome measures		Full sample		Border sample	
log Suicide attempts per 100k		N*T=366*4		N*T=44*4	
	Total	0.198	***	0.356	**
		(0.071)		(0.172)	
	Male	0.197	**	0.411	
		(0.095)		(0.260)	
	Female	0.183		0.314	
		(0.136)		(0.353)	
log Suicides per 100k		N*T=366*3		N*T=44*3	
	Total	0.159		0.162	
		(0.103)		(0.160)	
	Male	0.211	*	0.207	
		(0.118)		(0.172)	
	Female	-0.198		-0.291	
		(0.188)		(0.835)	
log Deaths per 100k		N*T=366*4		N*T=44*4	
	Total	0.03	*	0.019	
		(0.016)		(0.029)	
	External causes	0.206	***	0.154	*
		(0.057)		(0.089)	

Notes: Full sample models include fixed effects for year and powiat, while border sample models include year and year-specific powiat-pair fixed effects. All models include the set of control variables reported in Table 1. Standard errors, in parentheses, are cluster-corrected at the powiat level. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

Table 5. Difference-in-differences estimates of rejecting anti-LGBT resolutions on suicide attempts and suicides, by age categories.

	log Suicide attempts per 100k					*log Suicides per 100k*				
Categories	Full sample (N*T=366*4)		Border sample (N*T=44*4)		Categories	Full sample (N*T=366*4)		Border sample (N*T=44*4)		
Age 7-12	-0.016		0.003		Age 0-12	0.108	*	-0.044		
	(0.181)		(0.369)			(0.061)		(0.173)		
Age 13-18	0.495	*	1.388	*	Age 13-18	0.887		0.453		
	(0.276)		(0.789)			(0.555)		(0.522)		
Age 19-24	0.162		-0.656		Age 19-24	-0.042		-0.272		
	(0.271)		(0.828)			(0.301)		(0.775)		
Age 25-29	0.607		1.844	**	Age 25-29	1.348	***	1.727		
	(0.504)		(0.764)			(0.462)		(1.091)		
Age 30-34	0.665	*	0.002		Age 30-49	-0.108		-0.61	**	
	(0.363)		(0.687)			(0.160)		(0.279)		
Age 35-39	0.182		0.622							
	(0.222)		(0.591)							
Age 40-44	0.577	*	0.679							
	(0.327)		(0.782)							
Age 45-49	0.057		0.561							
	(0.323)		(0.753)							
Age 50-54	0.497		0.037		Age 50-69	0.220		0.160		
	(0.317)		(0.853)			(0.189)		(0.323)		
Age 55-59	-0.116		-0.532							
	(0.642)		(1.258)							
Age 60-64	0.326		1.365							
	(0.620)		(1.503)							
Age 65+	-0.106		0.550		Age 70+	0.485		1.667		
	(0.176)		(0.821)			(0.513)		(1.285)		

Notes: Full sample models include fixed effects for year and powiat, while border sample models include year and year-specific powiat-pair fixed effects. All models include the set of control variables reported in Table 1. Standard errors, in parentheses, are cluster-corrected at the powiat level. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

Table 6. Difference-in-differences estimates of enacting anti-LGBT statutes when gminas reject similar resolutions.

Outcomes	Full sample			Border sample		
	Powiat enacted statute		Powiat enacted statute X % pop. in gmina rejecting	Powiat enacted statute		Powiat enacted statute X % pop. in gmina rejecting
log Suicide attempts per 100k						
Total	0.111		-0.316	0.167	*	-0.135
	(0.071)		(0.312)	(0.086)		(0.474)
Male	0.133	*	-0.403	0.205	**	-0.424
	(0.076)		(0.445)	(0.097)		(0.554)
Female	-0.037		0.265	0.011		0.784
	(0.148)		(0.849)	(0.159)		(0.786)
log Suicides per 100k						
Total	-0.084		-0.426	0.034		-0.269
	(0.095)		(0.511)	(0.122)		(0.642)
Male	-0.079		-0.489	0.049		-0.378
	(0.100)		(0.534)	(0.132)		(0.773)
Female	-0.142		0.027	-0.004		-0.261
	(0.247)		(0.931)	(0.275)		(1.070)
log Deaths per 100k						
Total	0.015		0.047	0.000		0.069
	(0.010)		(0.032)	(0.013)		(0.054)
External causes	0.117	**	-0.456	0.061		0.115
	(0.048)		(0.277)	(0.054)		(0.280)

Notes: Full sample models include fixed effects for year and powiat, while border sample models include year and year-specific powiat-pair fixed effects. All models include the set of control variables reported in Table 1. Standard errors, in parentheses, are cluster-corrected at the powiat level. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

Table 7. Difference-in-differences estimates of enacting anti-LGBT statutes when gminas reject similar resolutions, by age categories.

	log Suicide attempts per 100k								*log Suicides per 100k*							
	Full sample				Border sample				Full sample				Border sample			
Categories	Powiat enacted statute		Powiat enacted statute X % pop. in gmina rejecting		Powiat enacted statute		Powiat enacted statute X % pop. in gmina rejecting		Categories	Powiat enacted statute		Powiat enacted statute X % pop. in gmina rejecting	Powiat enacted statute		Powiat enacted statute X % pop. in gmina rejecting	
Age 7-12	-0.157		-0.046		-0.126		0.410		Age 0-12	-0.039		0.201	-0.040		0.698	
	(0.164)		(0.682)		(0.173)		(0.855)			(0.076)		(0.206)	(0.073)		(0.428)	
Age 13-18	0.981	***	-2.731	*	0.876	**	-3.092	*	Age 13-18	-0.055		-0.715	-0.425		1.951	
	(0.371)		(1.465)		(0.377)		(1.568)			(0.352)		(2.090)	(0.337)		(1.664)	
Age 19-24	0.149		1.218		0.278		-0.088		Age 19-24	-0.337		-1.542	-0.563		1.546	
	(0.289)		(1.056)		(0.352)		(2.977)			(0.355)		(1.247)	(0.448)		(3.478)	
Age 25-29	-0.038		-0.074		0.284		-0.375		Age 25-29	-0.773	*	-2.535	-0.394		0.229	
	(0.310)		(1.124)		(0.269)		(1.515)			(0.397)		(2.201)	(0.519)		(2.326)	
Age 30-34	0.694	***	-1.244		0.705	**	-0.523		Age 30-49	0.261		-1.480	* 0.648	**	-0.805	
	(0.215)		(0.959)		(0.322)		(1.204)			(0.221)		(0.785)	(0.310)		(1.226)	
Age 35-39	0.135		0.006		0.418		-2.027									
	(0.279)		(0.949)		(0.358)		(1.295)									
Age 40-44	-0.011		0.066		-0.065		3.308*									
	(0.264)		(0.796)		(0.243)		(1.887)									
Age 45-49	0.670	*	-0.473		0.853*		1.974									
	(0.379)		(1.321)		(0.449)		(1.920)									
Age 50-54	-0.111		0.256		0.010		2.263		Age 50-69	-0.039		0.667	-0.146		0.351	
	(0.365)		(1.316)		(0.447)		(2.242)			(0.149)		(0.550)	(0.178)		(1.563)	
Age 55-59	0.216		0.506		0.729	*	-2.064									
	(0.328)		(1.247)		(0.408)		(1.790)									
Age 60-64	0.114		-0.101		-0.484		0.162									
	(0.395)		(1.680)		(0.398)		(1.752)									
Age 65+	0.103		-1.487	**	0.112		-0.873		Age 70+	-0.167		-0.312	0.357		-2.507	
	(0.203)		(0.716)		(0.250)		(1.133)			(0.318)		(1.408)	(0.399)		(2.486)	

Notes: Full sample models include fixed effects for year and powiat, while border sample models include year and year-specific powiat-pair fixed effects. All models include the set of control variables reported in Table 1. Standard errors, in parentheses, are cluster-corrected at the powiat level. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

Table 8. Difference-in-differences estimates of enacting anti-LGBT statutes and rejecting anti-LGBT resolutions on internal migration, mass event participation, crime, and socialization centers.

log Outcome per 100k	Enacted statute		Rejected resolution	
	Full sample	Border sample	Full sample	Border sample
No. of internal powiat in-migrants	0.006	0.022	-0.029	-0.083
	(0.020)	(0.019)	(0.020)	(0.054)
No. of internal powiat out-migrants	0.010	0.018	-0.017	0.035
	(0.016)	(0.014)	(0.022)	(0.039)
No. of mass event participants	0.826	1.256 **	0.762	1.817
	(0.573)	(0.581)	(1.300)	(2.703)
No. of criminal offenses	-0.018	0.010	0.092 **	0.16 *
	(0.035)	(0.034)	(0.047)	(0.081)
No. of socialization centers	-0.092 **	-0.129 ***	0.034	-0.110
	(0.043)	(0.035)	(0.053)	(0.130)
No. of socialization center residents	-0.174	-0.281 **	0.025	-0.245
	(0.167)	(0.146)	(0.103)	(0.347)

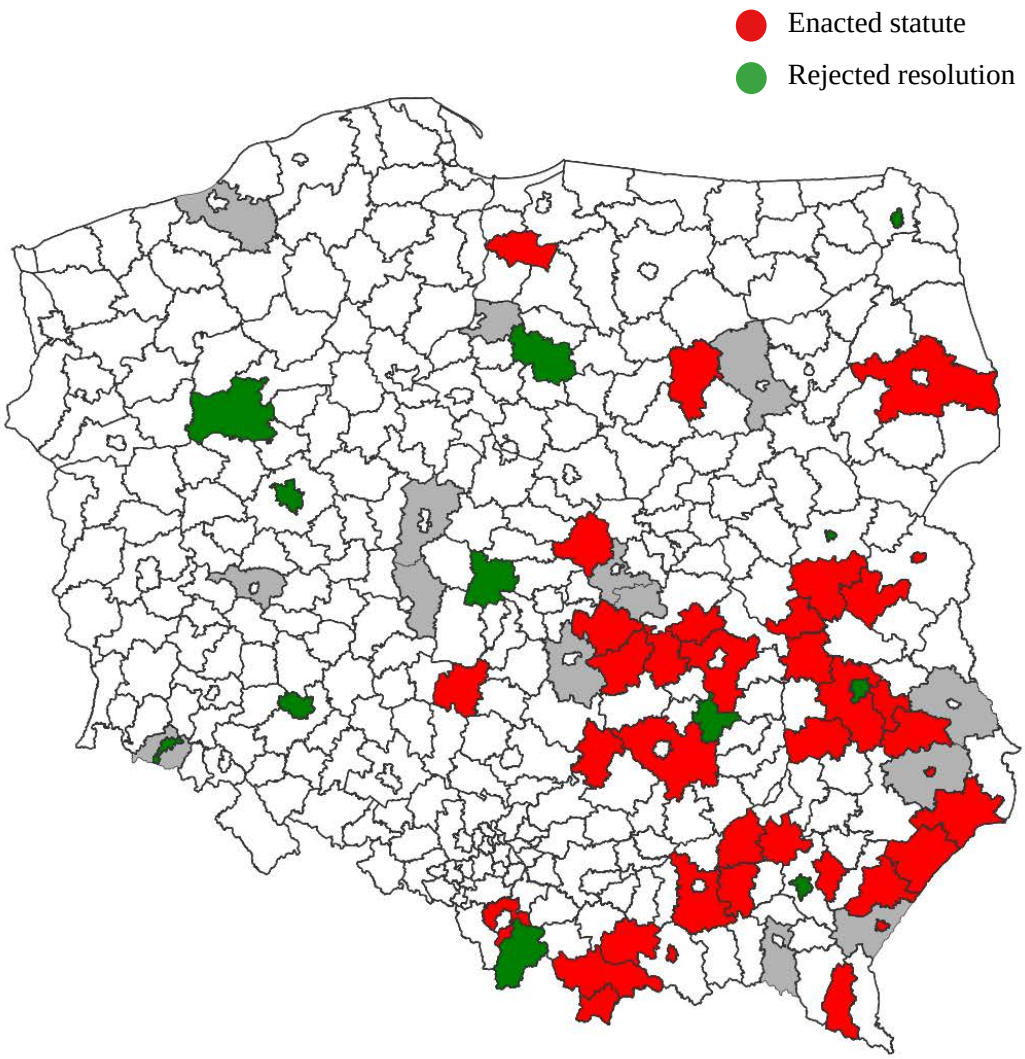
Notes: Full sample models include fixed effects for year and powiat, while border sample models include year and year-specific powiat-pair fixed effects. All models include the set of control variables reported in Table 1. Standard errors, in parentheses, are cluster-corrected at the powiat level. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

Table 9. Difference-in-differences estimates of enacting anti-LGBT statutes and rejecting anti-LGBT resolutions on prescription drug sales.

ATC drug category	Enacted statute		Rejected resolution	
	Full sample	Border sample	Full sample	Border sample
Antipsychotics (N05A)	-0.010	-0.044	-0.042	0.017
	(0.034)	(0.040)	(0.041)	(0.043)
Anxiolytics (N05B)	0.026	-0.002	-0.003	0.012
	(0.021)	(0.024)	(0.024)	(0.034)
Hypnotics and sedatives (N05C)	0.015	0.017	0.014	-0.042
	(0.019)	(0.019)	(0.020)	(0.029)
Antidepressants (N06A)	0.033	0.029	0.034	0.040
	(0.024)	(0.024)	(0.025)	(0.041)
Psychostimulants, agents used for ADHD and nootropics (N06B)	0.007	-0.009	-0.011	-0.008
	(0.018)	(0.022)	(0.024)	(0.034)
Drugs used in addictive disorders (N07B)	0.067 **	0.009	-0.008	-0.002
	(0.034)	(0.037)	(0.036)	(0.093)
Total for N05A/B/C, N06A/B, N07B	0.013	-0.003	-0.003	-0.002
	(0.020)	(0.022)	(0.023)	(0.024)

Notes: Full sample models include fixed effects for year and powiat, while border sample models include year and year-specific powiat-pair fixed effects. All models include the set of control variables reported in Table 1in addition to powiat-level prices of each ATC drug category. Standard errors, in parentheses, are cluster-corrected at the powiat level. ***, **, * indicate statistical significance at the 1%, 5% and 10% level.

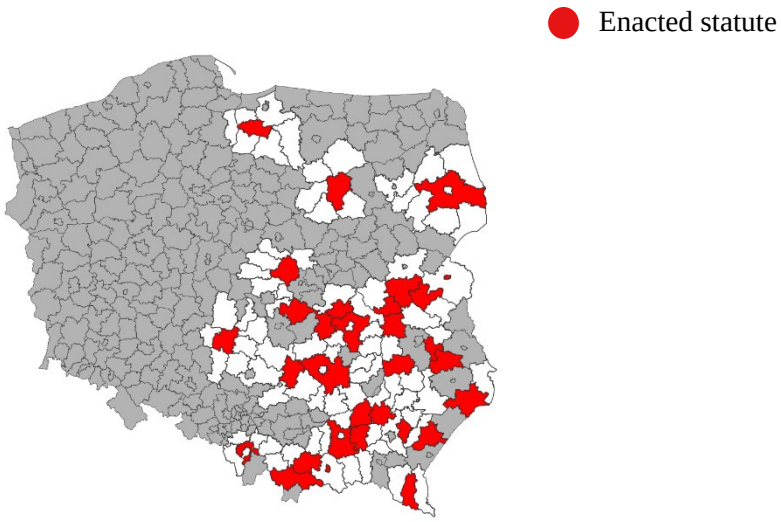
Figure 1. Treatment and control powiats (counties) in generalized difference-in-differences model.



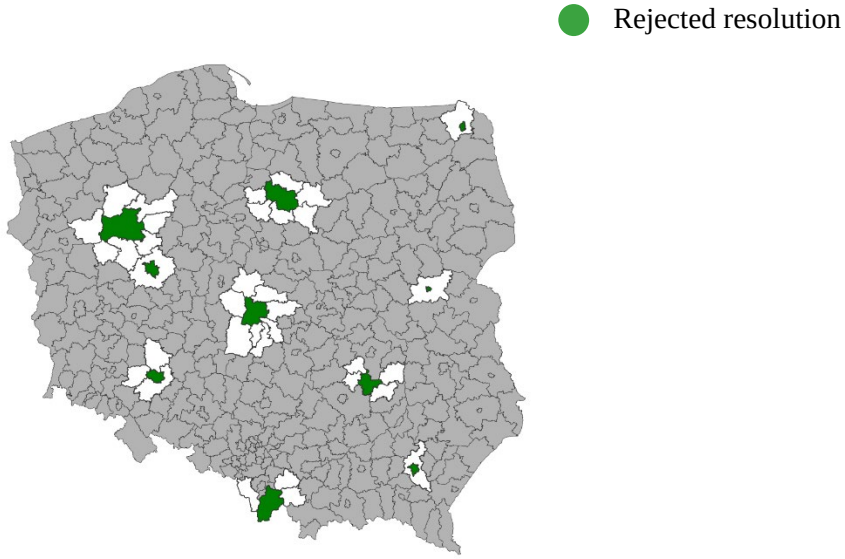
Notes: Red powiats (treatment #1) enacted anti-LGBT statutes and the green powiats (treatment #2) rejected anti-LGBT resolutions. White powiats never deliberated resolutions. Powiats excluded from the analysis due to missing data or inconsistent policies are marked in gray.

Figure 2. Treatment and control powiats (counties) is border-powiat difference-in-differences model.

Panel A: Sample of powiats that enacted anti-LGBT statutes



Panel B: Sample of powiats that rejected anti-LGBT resolutions



Notes: Red powiats (treatment #1) in Panel A enacted anti-LGBT statutes and the green powiats (treatment #2) in Panel B rejected anti-LGBT resolutions. White border powiats never deliberated resolutions. Powiats excluded from the analysis due to lack of a border with a treated powiat, missing data or inconsistent policies are marked in gray.