



Universidad de
San Andrés

UNIVERSIDAD DE SAN ANDRÉS

DEPARTAMENTO ACADÉMICO DE ECONOMÍA

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The impact of same-sex marriage approval on suicide rates

Autor:

Lucrecia Granda y Mackinson

Legajo:

25034

Mentor:

Martín Rossi

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Lucrecia Granda y Mackinson

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Abstract

This paper studies the effect of same-sex marriage approval on suicide rates. It exploits the time variability of the implementation of the law across 48 European countries to identify a causal relationship. With a difference-in-differences estimation, it is found that the legalization of same-sex unions increases suicide rates in about 2.078 deaths per 100 000 people. This coincides with reports that show a further increase in homophobic behavior which suggests a possible mechanism for future research.



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1. Introduction

The purpose of this paper is to identify a link between same-sex marriage legislation and suicide rates. The World Health Organization (WHO), the U.S. National Strategy for Suicide Prevention and other medical institutions have reported lesbian, gay, transsexual and inter sex people (LGTBI) as a risk group when assessing the issue of suicide (WHO, 2016). It is believed that these minorities experience a higher propensity to suicide due to stigmatization and discrimination. The passing or not of the same-sex marriage law could be affecting these feelings and, thus, the suicidal behavior.

1.1. LGB and suicidal behavior

Sexual minorities include lesbian women, gay men, bisexual, transgender and inter sex people. As it is difficult to assess sexual orientation of the later 2 groups, I will focus on the first 3 and use the acronym LGB. This section will explore the evidence of higher suicidal behavior among these minorities.

Assessing the number of LGB people as a proportion of the deceased by suicide is a complicated issue as death reports do not include sexual orientation. To do this, many studies have implemented a “psychological autopsy” using reports from friends and family. This did not give significant conclusions because there are many under-reporting cases either from lack of knowledge or deliberate hiding, as it is a sensitive issue for families (Haas et al., 2010).

Danish researchers have taken another approach: they study whether people in same-sex registered domestic partnered relationships (a proxy indicator of sexual orientation) were over-represented among suicide decedents. Qin et al. (2003) concluded that same sex registered domestic partners were 3-4 times more likely to die by suicide than heterosexual couples.

A stronger association can be seen between sexual orientation and non-fatal suicidal behavior worldwide (Mathy, 2002). Since the early 1990s, population-based surveys of U.S. adolescents that have included questions about sexual orientation have consistently found rates of reported suicide attempts to be 2 to 7 times higher in high school students who identify themselves as LGB, compared to those who describe themselves as heterosexual (DuRant, Krowchuk & Sinal, 1998; Russell & Joyner, 2001). King et al. (2008) concluded that lifetime prevalence of suicide attempts among sexual minorities is about 4 times that of heterosexuals by doing 25 international population based studies. Similar results have been obtained when analyzing suicidal thoughts (King et al., 2008; Gilman et al. 2001).

There are various explanations for this correlation. They are mainly focused on the mental disorders, stigma and discrimination suffered by these minorities. In New Zealand, a birth cohort study used structured interviews to assess for several psychiatric diagnoses, including major depression, generalized anxiety disorder, conduct disorder, and alcohol/substance use disorders. Suicide attempts in LGB youth were related to these syndromes (Fergusson et al., 1999).

The main consensus among researchers is that these elevated suicide attempts and mental disorders are strongly related to discrimination and stigmatization suffered by LGB people because of being a sexual minority. Rosario et al.(2002) use the term “gay-related stress” to summarize the factors that contribute to these health conflicts. The Fundamental Rights Agency (FRA) conducted a survey of 93 000 individuals to assess the situation of LGB people in Europe in 2013. Two in five individuals that took part of the survey (41 %) thought about committing suicide directly because of bullying; the same number said that they had deliberately committed self-harm due to the same reason during adolescence (FRA, 2013).

During their lives, these minorities experience not only individual discrimination in the form of

bullying, harassment, personal rejection and physical violence; but also institutional discrimination: laws and public policies that generate inequities or fail to protect individual rights of sexual minorities. It is under this form of discrimination that many same-sex marriage defenders classify the prohibition of these unions; they show the many disparities that it can bring to homosexual couples compared to heterosexuals (Haas et al., 2010). This takes me to the next topic: the pros and cons of marriage and the questioning of its approval as a significant change in attitude towards LGB people.

1.2. Marriage

Several papers enhance the benefits that marriage can bring to a couple. These are very varied covering from strictly economic reasons to more psychological and personal; related to the well-being and mental health of a person (Waaldijk, 2001; Herdt, 2006).

They can be summarized in spousal benefits (social security, public pensions, insurance, health care, inheritance, citizenship), economies of scale in the sharing of the living costs, the social legitimization of the couple and personal growth. The last point addresses the cultural meaning of marriage: in western culture one grows up to internalize certain goals: finding love, getting married, having children, building a family. For many people, marriage means reaching a mile-stone in life and contributes to the formation of a feeling of fulfillment (Herdt, 2006).

Herdt (2006) focuses on the mental health consequences that marriage denial can have on a lesbian or gay person. He mentions other research papers that show LGTBI couples as fit to keep relationships. This shows they are capable of forming a family and having long-lasting marriages; just as heterosexual couples. So, he classifies the denial of this possibility as a form of increasing marginalization.

Hatzenbuehler et al.(2012) study the effect of same-sex marriage laws on health care use and expenditure in sexual minority men. They prove that in the 12 months following the same-sex marriage legalization in Massachusetts, medical and mental health visits and costs were significantly reduced. This is independent of the relationship status of the individuals; it has decreased the same for single and married people. With this, they conclude that same-sex marriage policies may have a broad public health effect.

The link seems as a straightforward reasoning: if sexual minorities face a higher suicide risk because of discrimination, then laws towards equality, such as the allowance of matrimony, should reduce feelings of exclusion and, therefore, reduce this risk. However, events after the approval of same-sex marriage in many countries could provide reasons to think otherwise. Several studies show a rise in homophobic behavior in Europe in spite of the same-sex marriage approval.

The whole debate of legalization brings LGB rights to the center of public opinion and, together with it, a radicalization of the conservative groups against it. In 2013, the FRA stated that homophobia was increasing in the EU after what seemed to have been a calmer period. A survey estimated that more than a quarter of LGB people experienced violent attacks or threats between 2008 and 2013 (FRA, 2013; BBC, 2013). This coincides with a period of a great number of same-sex marriage approvals (see Table 2).

The unprecedented marches in France against same-sex marriage are examples of the many forms of discrimination on the basis of sexual orientation that gay men and lesbian women experience. The *manif pour tous* were a series of massive protests during 2013, year in which France legalized same-sex unions. The conservative groups appealed to the Constitutional Council immediately after the approval. The movement extended to other countries; always led by French activists (McPartland, 2013). It was brought to life again three years later, in 2016, hoping to revive the debate during the presidential election year. This shows that even after the approval, marginalization is an ongoing issue for LGB people (RT, 2016; Pennetier, 2016).

In the Netherlands, people gave out flyers inviting the main three religions to join forces against same-sex marriage. This happened in 2016, 15 years after the approval of the law, suggesting that the legal equality is not reflected in practice. The same occurred in Spain and the UK where the complaints on homophobic aggressions increased during the last years. The *Proyecto Pilla Pilla: Capturemos a los pederastas* in Spain was organized to find and ridicule homosexuals. Greece showed very intolerant attitudes even from police forces; 2012 and 2013 were violent years for LGB people who were harassed for holding hands or even lost their jobs because of their sexual orientation (Landa, 2015).

It can be seen that the debate for same-sex marriage can be interpreted as a step towards equality, but, at the same time, it may radicalize conservative groups and exacerbate feelings of discrimination and hopelessness among sexual minorities. Because of this ambiguity, the relationship between same-sex marriage approval and suicide rates deserves to be studied.

It must be clarified that I am working with suicide rates in general so there may be an effect on heterosexual people. It is less likely because of the higher suicidal risk among sexual minorities that has been explained. However, this is not discarded as the mechanisms enacting the relationship can be many and varied, but they exceed the analysis of this paper.

The paper continues as follows. The next segment shows the data and identification strategy used to establish a causal relationship, section 3 shows the results, robustness checks and suggests possible mechanisms. Finally, section 4 concludes.

2. Data and Identification Strategy

2.1. Data

The data panel consists of 1228 observations from 48 European countries with information on suicide rates compromising the period 1985-2014. This has been taken from the WHO regional office for Europe. It is an age-standardized rate per 100 000 people which allows controlling for national and overtime differences in the age structure.

To make the study more robust, control variables that might affect the probability of approving same-sex marriage have been included. These are the previous civil rights of LGB people in each country; they are divided in three: Relationships: if homosexuality is legal or illegal in the country; Registered Partnerships: these are cohabitation rights and the recognition of same sex couples as such. Finally, Adoption rights. This information was taken from the International Lesbian and Gay Association (ILGA) reports that specify the situation of LGB rights in Europe. Countries with these rights are more likely to pass the law as Waaldijk (2001) has shown; many are previous steps to legalizing, so we need to include them as control variables.

GDP and GDP growth are other control variables. Neumayer (2003) has mentioned income as one of the main determinants of suicide. Table 1 reports the summary statistics.

Table 1. Descriptive Statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
Suicide Rate	1,228	14.58	9.302	0	49.14
Marriage	1,440	0.0479	0.214	0	1
Gdp	1,224	17,651	19,442	139.1	116,613
Growth	1,221	2.042	6.017	-45.33	33.03
Relationships	1,440	0.801	0.399	0	1
Registered partnerships	1,440	0.203	0.403	0	1
Adoption	1,440	0.0674	0.251	0	1
Number of countries	48	48	48	48	48

To construct the treatment, the legalization year has been taken from newspaper articles that summarize the history of same-sex marriage in Europe (Duncan, 2016). Table 2 shows how the implementation year of the treatment changes from country to country; this variability over time and space gives me the possibility to identify a causal relationship with the difference-in-differences scheme explained below.

Table2. Law Implementation

(1) Year	(2) Number of countries with the law
1985	0
1986	0
1987	0
1988	0
1989	0
1990	0
1991	0
1992	0
1993	0
1994	0
1995	0
1996	0
1997	0
1998	0
1999	0
2000	0
2001	1
2002	1
2003	1
2004	2
2005	3
2006	3
2007	3
2008	3
2009	5
2010	7
2011	8
2012	9
2013	11
2014	11
Number of countries	48

2.2. Identification Strategy

To identify the effect of same-sex marriage approval on the suicide rate I exploit the variability in the implementation of the law in different countries over time. Formally, the difference-in differences equation to be estimated is:

$$Suicide\ rate_{it} = \alpha_i + \mu_t + \beta Marriage_{it} + \gamma \chi_{it} + \varepsilon_{it}$$

Where α_i is the country fixed effect, μ_t the year fixed effect, χ_{it} the control variables vector and ε_{it} is the usual error term.

The identification strategy uses countries that have not approved same-sex marriage as a counterfactual of those that have. A cross-sectional analysis would not be proper as countries are different from each other and these characteristics may be correlated with the suicide rates. The advantage of using this method of estimation is that it controls for any time-invariant unobserved heterogeneity as well as by shocks common to all countries in a given moment of time.

The difference-in-differences estimate assumes that the change in suicide rates in control countries is an unbiased estimate of the counterfactual. While this assumption cannot be tested, it is possible to check whether the suicide rates trends of the countries that did not legalize were significantly different from the countries that did, in the pre-treatment period. Table 3 shows the results of estimating a modified version of equation (1) that includes a linear trend and, instead of the treatment variable, an interaction between the linear trend and a binary variable that takes value 1 if the country passed the law in some moment of time and 0 if it has never been treated. It is estimated for the period before the first legalization.

Table 3. Pre-treatment Trends Test

VARIABLES	(1) Suicide Rate
Time	-0.215*** (0.0489)
Eventually Treated* Time	-0.00370 (0.0628)
Observations	1,170
Number of countries	48
R-squared	0.196

Notes: The model includes a country fixed effect

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

It can be seen that the pre-intervention trend of countries that did not pass the law (control group) is not significantly different from the one of those which will eventually pass it. So, it can be said that, in the absence of treatment, both trends would have remained similar. This validates the assumption that the evolution of the trend in the control group is a good counterfactual of the one for the treated countries in the period after the implementation.

3. Results

3.1. Impact of same sex marriage on suicide rates

Equation (1) has been estimated with and without the inclusion of the control variables and with different ways of computing standard errors to assess for the possibility of a false rejection of the null hypothesis. Results are shown in Table 4 below.

Table 4. Impact of same sex marriage on suicide rates

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Suicide Rate	Suicide Rate	Suicide Rate	Suicide Rate	Suicide Rate
Marriage	2.078*** (0.553)	2.078*** (0.732)	2.436*** (0.810)	2.581*** (0.729)	2.611*** (0.742)
Relationships			4.820*** (1.264)		3.281*** (0.933)
Registered Partnerships			0.686 (0.842)		0.691 (0.762)
Adoption			0.596 (0.842)		0.222 (0.754)
Growth				0.0238 (0.0208)	-0.00883 (0.0216)
GDP				-8.81e-06 (2.25e-05)	-1.68e-06 (2.13e-05)
Observations	1,228	1,228	1,228	1,033	1,033
R-squared	0.886	0.280	0.361	0.380	0.413
Number of countries	48	48	48	46	46

Notes: all estimations include a country fixed effect and a year fixed effect
Column 1 shows the approximate randomization test with random sign changes.

Columns 2 to 5 show robust standard errors

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Columns 2 to 5 show the model with robust standard errors and the inclusion of different control variables. It can be seen that the legalization of same-sex marriage increases the rate in 2.078 suicides per 100 000 people and this is robust to the inclusion of previous rights of homosexual people and income levels of the country. The coefficient is significant at 1 percent level in all estimations.

Column 1 shows the results of the approximate randomization test with random sign changes proposed in Canay et al. (2016). They propose an asymptotic framework intended to approximate a small sample phenomenon, very used in regression discontinuity approaches. In this case, the test is used to asymptotically control the probability of a false rejection of the null hypothesis in data with fixed and heterogeneous clusters. It can be seen that the results are still significant at 1 percent level. Therefore, a causal relationship between same-sex marriage and suicide rates can be established.

This outcome can be surprising given that previous literature show that this law reduces mental health usage and expenditure (Hatzenbuehler, et al., 2012), so, one could think that, as suicide is a topic of this department, they should decrease too. However, this approval goes in hand with the rise in homophobic attitudes of the European society; Elordi (2013) supposes that this law is the one that triggers these massive manifestations and the radicalization of the opposition's opinions (Landa, 2015; Maiquez, 2014). As LGB population represents a risk group regarding suicides, an increase of their marginalization by society could lead to an increase in suicide rates.

It would be interesting to conduct this study in places where the approval has been more peaceful such as Argentina or Uruguay; places where the debate did not bring such massive movements against the legislation. This comparison, however, would be a necessary condition to prove the mechanism but not enough to discard all others.

It is necessary to remark that this is only one possible mechanism and it is being analyzed with anecdotal evidence. As I am studying the general suicide rate, there could be another reason that takes the study to this outcome. There could be more gay declarations and thus, more family crisis, leading to an increase in suicide rates not only of the homosexuals, but their relatives, for example. Durkheim (1987) shows that family and the sense of belonging is fundamental for a person's mental health. The dissolution of families could be triggering these deaths. Like these ones, there are many other possible workings behind this link; this could be material for future studies.

Another factor to consider is that the treatment is being analyzed in the short run; as it can be seen in Table 2, most of the implementations were during the last years. It would be interesting to study it in the long run, to see if the results hold and to have a clearer picture of why it is occurring.

3.2. Falsification Tests

In this segment, I exploit the timing of the laws to construct placebo treatments and check that the results obtained are not part of the over-rejection problem of the difference-in-differences estimates remarked by Bertrand et al. (2002). Table 5 shows the results of another modified version of equation (1) where it is assumed that the law has been implemented 1, 2, 3 or 4 years before the date it effectively was. The test is being applied to pre-treatment observations only. If the model is correctly specified there should not be an effect during the years in which the law did not exist. This is what we can effectively see in the table below.

Table 5. Falsification Tests

VARIABLES	(1) Suicide Rate	(2) Suicide Rate	(3) Suicide Rate	(4) Suicide Rate
False1	0.781 (0.663)			
False2		0.845 (0.721)		
False3			1.048 (0.734)	
False4				0.927 (0.723)
Observations	1,170	1,170	1,170	1,170
R-squared	0.280	0.281	0.282	0.282
Number of countries	48	48	48	48

Notes: All estimations include a year and country fixed effect.
The False variables indicate the placebo treatment assuming the law was passed 1, 2, 3 or 4 years before it was effectively passed.
Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4. Conclusions

This paper has studied the impact of same-sex marriage on suicide rates in Europe taking advantage of the time and geographic variability in the implementation of the law. There is evidence of LGB population as a risk group when studying this type of death. Because of this, it is interesting to study how legislation affecting these minorities' rights could affect suicide rates, as it is a topic of public health.

It has been proven that the approval of the law increases suicide rates in 2.078 deaths per 100 000 people. A causal relationship has been established as the pre-treatment trends in both groups are similar; this makes the difference-in-differences approach conceivable. The study is robust to falsification tests, the inclusion of control variables and to different ways of calculating standard errors. Possible mechanisms point towards an increase in discrimination and a radicalization of opposition groups triggered by the approval of the law; this could be material for future research.

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