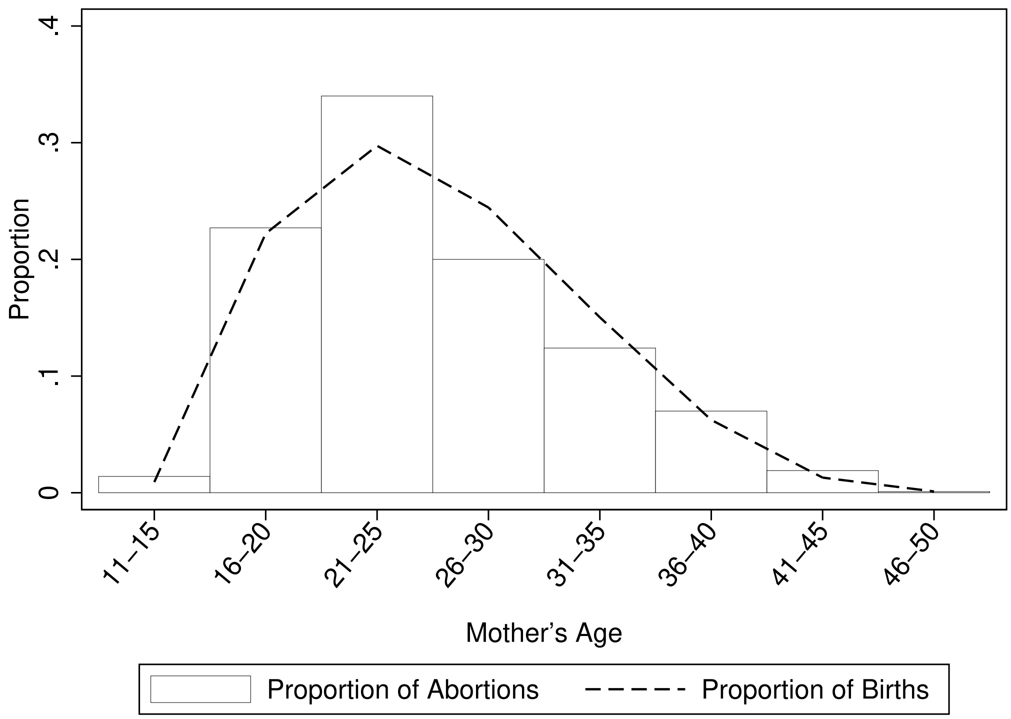
Online Appendices

"Abortion Laws and Women's Health"

Damian Clarke & Hanna Mühlrad

A Appendix Figures and Tables

Figure A1: Proportion of all births and abortions by age in Mexico DF



Notes: Plots display the proportion of all births in each age group (histogram) and the proportion of all abortions in each age group (dashed line). Proportions sum to 1 in each case. The proportion of all births occurring in each age group are generated from administrative data provided by INEGI. The proportion of all abortions occurring in each age group are compiled from summary data released by the Ministry of Health of Mexico DF. Referenced on page [6].

Table A1: Changes in Penal Codes Surrounding Abortion Laws in Mexico

State	Pre-Reform Sanction	Post-Reform Sanction	Additional Changes
Chiapas	1-3 years prison	1 to 3 years prison	Added detail to the penal code, increased sentences for “collaborators”
Chihuahua	3 months to 5 years prison	6 months to 3 years prison	Added detail to the penal code, increased sentences for “collaborators”
Colima	1-3 years prison and fine	1-3 years prison and fine	No changes to penal code (only state constitution)
Durango	1-3 years prison	1-3 years prison and fine	Increased sentences for “collaborators”
Guanajuato	6 months to 3 years prison and fine	6 months to 3 years prison and fine	Increased sentences for “collaborators”
Jalisco	4 months to 1 year prison	4 months to 1 year prison	Added possibility of psychological treatment in commutation of prison
Mexico DF	1-3 years prison	3-6 months prison or community work	Added possibility of community work in commutation of prison
Morelos	1-5 years prison	1-5 years prison and fine	Added possibility of psychological treatment in commutation of prison
Nayarit	1-3 years prison and fine	1-3 years prison and fine	No changes to penal code (only state constitution)
Oaxaca	6 months to 2 years prison	6 months to 2 years prison	No changes to penal code (only state constitution)
Queretaro	1-3 years prison	1-3 years prison	No changes to penal code (only state constitution)
Quintana Roo	6 months to 2 years prison	6 months to 2 years prison	No changes to penal code (only state constitution)
San Luís de Potosí	1-3 years prison and fine	1-3 years prison and fine	Monetary amount of fine altered
Sonora	1-6 years prison and fine	1-6 years prison and fine	No changes to penal code (only state constitution)
Tamaulipas	1-5 years prison	1-5 years prison	Added possibility of psychological treatment in commutation of prison
Yucatan	1-5 years prison	1-5 years prison	Changed sanctions in certain specified circumstances

Notes: This table summarises changes in penal codes when a reform to abortion laws was enacted in Mexico in the period under study in this paper. All details are collated from a side-by-side reading of penal codes existing prior to and posterior to the reform. In cases where no changes were made in the penal codes, this implies that changes were only made in the State Constitutions, which were altered to recognise life as beginning at conception. Referenced on page [7,29].

Table A2: Constitutional Changes Following Mexico DF's ILE Reforms

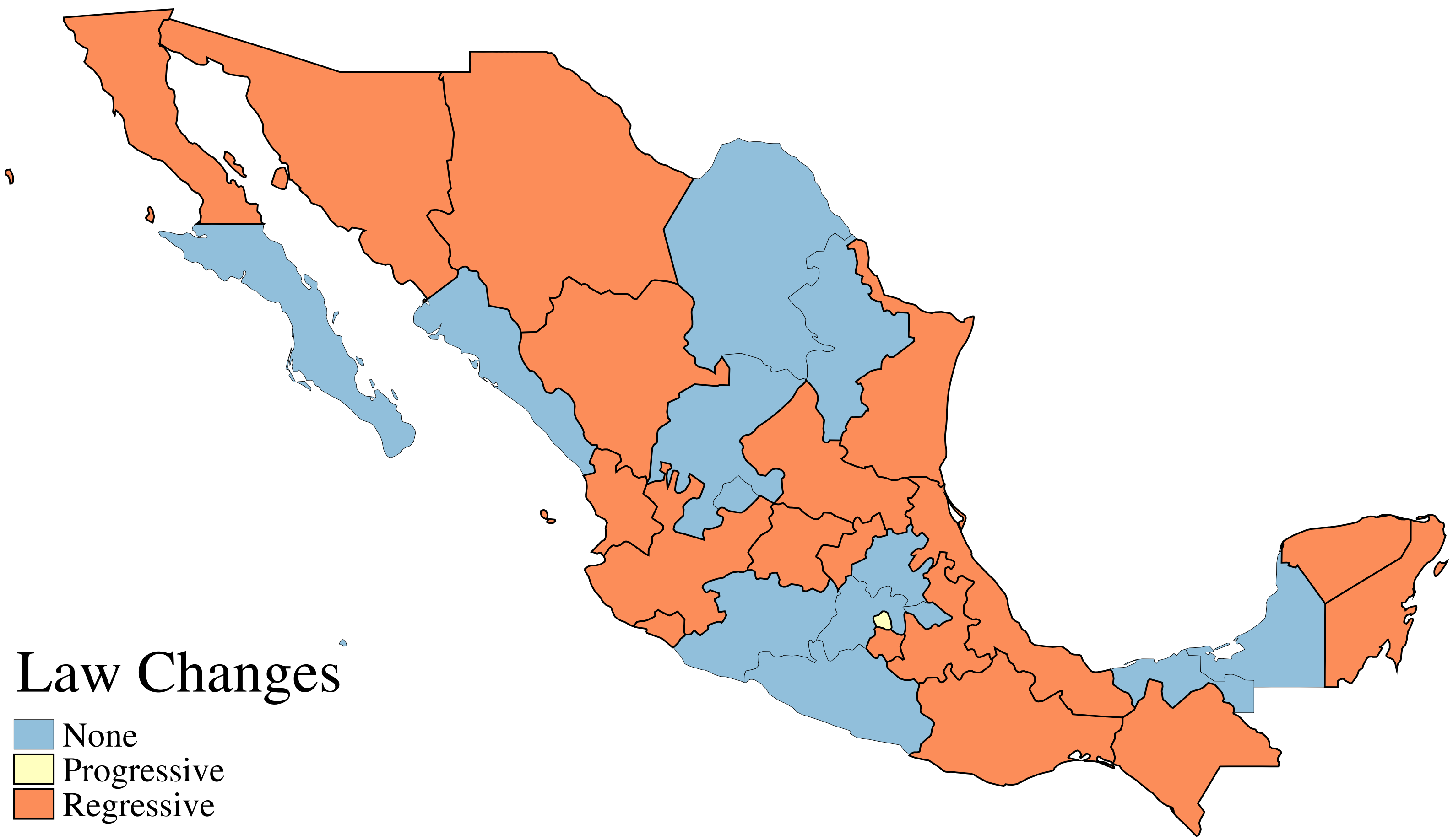
State	**Reform Date**	**Constitutional Decree**	**Article in Question**
Baja California	Dec 26, 2008	Decree 175	7
Chiapas	Jan 20, 2009	Decree 139	178
Chihuahua	Jun 21, 2008	Decree 231-08	143
Colima	Nov 25, 2009	Decree 296	187
Durango	May 31, 2009	Decree 273	350
Guanajuato	May 26, 2009	Dictamen 836	158
Jalisco	Jul 02, 2009	Decree 22361	228
Morelos	Dec 11, 2008	Decree 1153	115
Nayarit	Jun 06, 2009	Decree 50	335
Oaxaca	Sep 11, 2009	Decree 1383	312
Puebla	Jun 03, 2009	SPI-ISS-27-09*	136
Querétaro	Sep 18, 2009	P. O. 68‡	339
Quintana Roo	May 15, 2009	Decree 158	92
San Luis Potosí	Sep 02, 2009	Decree 833	128
Sonora	Apr 06, 2009	Law 174	265
Tamaulipas	Dec 23, 2009	Decree LX-1850	356
Yucatán	Aug 07, 2009	Decree 219	389
Veracruz	Nov 17, 2009	G. L. 155‡	150

Notes: All states which formally altered their constitutions following Mexico DF's ILE reform are indicated above. Constitutional decree refers to the law composed to alter the state constitution, and article in question refers to the article altered in the constitution or penal code which was altered by the decree. Dates, decrees and articles are collated by the authors from various state government sources. The official document approving each decree and its associated date is available in a zipped folder on the authors' websites.

* Decrees or official newspapers for the State of Puebla could not be located by the authors. The date and article in question is suggested by Gamboa Montejano and Valdés Robledo (2014).

‡ P. O. refers to the official newspaper where laws are published in Querétaro, and G. L. refers to the same newspaper in Veracruz. The law was published without number (pp. 9857-9859) in P. O. 68 and in G. L. 155 (pp 2-5) in Querétaro and Veracruz respectively. Referenced on page [7,31].

Figure A2: Geographical Distribution of State Law Changes (post August-2007)



Notes: The August 2007 ILE reform occurred in Mexico DF (yellow). Posterior (regressive) reforms in other states are indicated in red, with states highlighted in blue indicating that no law change occurred between 2007 and 2016. Referenced on page [7].

Table A3: Maternal Morbidity in Mexico – Frequency of Each ICD-10 Class in Hospitalization Data

ICD-10 Code	Private Code	Name	Cases	Percent
O00	236	Ectopic pregnancy	187,315	0.534
O01	236	Hydatidiform mole	30,190	0.086
O02	236	Other abnormal products of conception	650,198	1.852
O03	234	Spontaneous abortion	335,081	0.954
O04	235	Medical abortion	7,268	0.021
O05	236	Other abortion	53,928	0.154
O06	236	Unspecified abortion	2,153,004	6.133
O07	236	Failed attempted abortion	996	0.003
O08	236	Complications following abortion and ectopic/molar pregnancy	12,047	0.034
O10	237	Complications due to Pre-Existing Hypertension	81,301	0.232
O11	237	Pre-existing hypertensive disorder with superimposed proteinuria	2,504	0.007
O12	237	Gestational oedema and proteinuria without hypertension	967	0.003
O13	237	Gestational hypertension without significant proteinuria	592,387	1.687
O14	237	Severe pre-eclampsia	666,635	1.899
O15	237	Eclampsia	49,263	0.140
O16	237	Unspecified maternal hypertension	145,099	0.413
O20	242	Haemorrhage in early pregnancy	677,757	1.931
O21	242	Excessive vomiting in pregnancy	60,311	0.172
O22	242	Venous complications in pregnancy	7,322	0.021
O23	242	Infections of genitourinary tract in pregnancy	792,372	2.257
O24	242	Diabetes mellitus in pregnancy	252,069	0.718
O25	242	Malnutrition in pregnancy	956	0.003
O26	242	Maternal care for other conditions predominantly related to pregnancy	86,511	0.246
O28	242	Abnormal findings on antenatal screening of mother	1,354	0.004
O29	242	Complications of anaesthesia during pregnancy	1,104	0.003
O30	239	Multiple gestation	116,853	0.333
O31	239	Complications specific to multiple gestation	4,178	0.012
O32	239	Maternal care for known or suspected malpresentation of fetus	377,630	1.076
O33	239	Maternal care for known or suspected disproportion	1,237,260	3.524
O34	239	Maternal care for known or suspected abnormality of pelvic organs	1,483,859	4.227
O35	239	Maternal care for known or suspected fetal abnormality and damage	16,046	0.046
O36	239	Maternal care for other known or suspected fetal problems	737,348	2.100
O40	239	Polyhydramnios	33,782	0.096
O41	239	Other disorders of amniotic fluid and membranes	694,761	1.979
O42	239	Premature rupture of membranes	1,079,039	3.074
O43	239	Placental disorders	12,270	0.035

O44	238	Placenta praevia	98,225	0.280
O45	238	Premature separation of placenta (abruptio placentae)	54,260	0.155
O46	238	Antepartum haemorrhage, not elsewhere classified	8,770	0.025
O47	239	False labour	1,214,865	3.461
O48	239	Prolonged pregnancy	85,304	0.243
O60	242	Preterm delivery	436,889	1.244
O61	242	Failed induction of labour	74,634	0.213
O62	242	Abnormalities of forces of labour	235,129	0.670
O63	242	Long labour	263,861	0.752
O64	240	Obstructed labour due to malposition and malpresentation of fetus	255,257	0.727
O65	240	Obstructed labour due to maternal pelvic abnormality	478,134	1.362
O66	240	Other obstructed labour	134,555	0.383
O67	242	Labour and delivery complicated by intrapartum haemorrhage	9,832	0.028
O68	242	Labour and delivery complicated by fetal stress (distress)	761,623	2.169
O69	242	Labour and delivery complicated by umbilical cord complications	133,400	0.380
O70	242	Perineal laceration during delivery	82,045	0.234
O71	242	Other obstetric trauma	22,141	0.063
O72	241	Postpartum haemorrhage	91,844	0.262
O73	242	Retained placenta and membranes, without haemorrhage	51,166	0.146
O74	242	Complications of anaesthesia during labour and delivery	4,832	0.014
O75	242	Other complications of labour and delivery	167,982	0.478
O80	243	Single spontaneous delivery	14,383,652	40.972
O81	242	Single delivery by forceps and vacuum extractor	57,556	0.164
O82	242	Single delivery by caesarean section	2,465,467	7.023
O83	242	Other assisted single delivery	98,323	0.280
O84	242	Multiple delivery	46,596	0.133
O85	244	Puerperal sepsis	25,599	0.073
O86	244	Other puerperal infections	35,657	0.102
O87	244	Venous complications in the puerperium	2,418	0.007
O88	244	Obstetric embolism	1,147	0.003
O89	244	Complications of anaesthesia during the puerperium	8,855	0.025
O90	244	Complications of the puerperium, not elsewhere classified	76,866	0.219
O91	244	Infections of breast associated with childbirth	7,497	0.021
O92	244	Other disorders of breast and lactation associated with childbirth	791	0.002
O94	244	Sequelae of complication of pregnancy, childbirth and the puerperium	1,809	0.005
O95	244	Obstetric death of unspecified cause	38	0.000
O96	244	Death from obstetric cause >42 days but < 1 year after delivery	10	0.000
O97	244	Death from sequelae of direct obstetric causes	10	0.000
O98	244	Maternal infectious and parasitic diseases	97,048	0.276
O99	244	Other maternal diseases complicating pregnancy, birth and the puerperium	491,279	1.399

TOTAL	35,106,332	100.000

Notes: Each ICD-10 code is listed in the "O" class, as well as the total number of events (and their relative proportion of all ICD "O" codes) observed in the administrative data used in this paper. Referenced on page [10,32,A29,A29,A30,A30,A42,A42].

Table A4: Year by State Level Summary Statistics of Principal Variables

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Panel A: Morbidity Outcomes					
Total Number of Deliveries in Public Hospitals	384	44405	34708	7109	211999
Total Inpatient Cases for ICD O codes, except births	384	47018	32696	9085	172656
Total Inpatient Cases for Abortion-Related Causes	384	8366	6587	1454	37857
Total Inpatient Cases for Haemorrhage Early in Pregnancy	384	1765	1208	252	6426
Total Inpatient Days for Abortion-Related Causes	384	11841	9681	1805	49671
Total Inpatient Days for Haemorrhage Early in Pregnancy	384	3812	2961	495	14781
Total Inpatient Cases for Obstetric Complications	384	468	619	10	3601
Total Inpatient Cases for Post-Partum Depression	384	1	1	0	11
Panel B: Mortality Outcomes					
Total Number of Maternal Deaths	512	36	33	1	182
Total Number of Maternal Deaths due to Abortion	512	3	3	0	15
Panel C: Demographic Outcomes					
Population of 15-49 Year-old Women	512	860298	741558	116430	4196244
Total Number of Births	416	73074	58625	10991	300349
Birth rate per 1,000 women	416	88	10	64	129

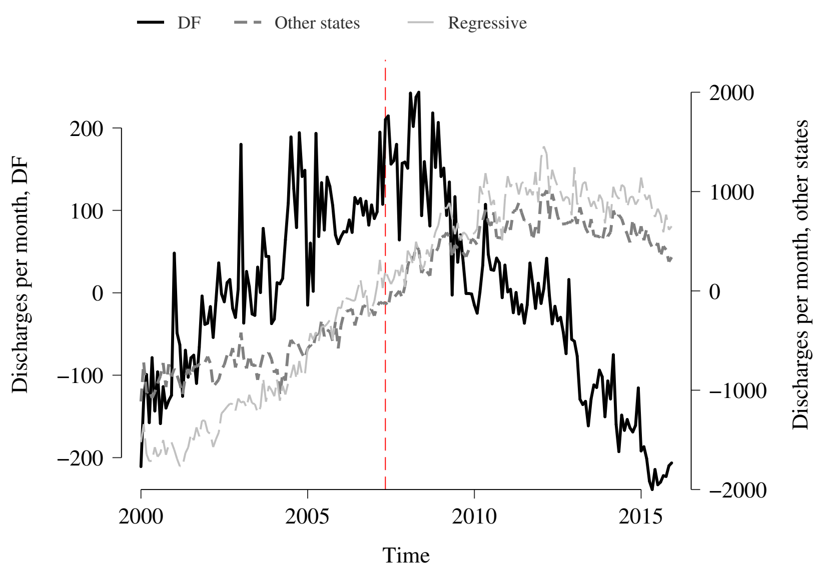
Notes: Each observation is a state×year cell. Mexico is composed of 32 States. The number of cells varies due to the number of years of data availability. In panel A, morbidity data is displayed for 12 years (2004-2015). Values are generated from all inpatient cases as classified from microdata from the primary care (hospital) records from all public hospitals, both those administered by the Secretariat of health and the social security system. Each type of morbidity is classified by ICD-10 codes. In Panel B, mortality outcomes are displayed for 16 years (2001-2016). In panel C, data on population is displayed for 16 years (2001-2016), and data on births is displayed for 13 years (2001-2013). Following CONAPO, the last four years of birth outcomes are suppressed to account for reporting outside of the period of birth. Referenced on page [12,13,A44].

Table A5: Summary Statistics on Time-Varying Controls

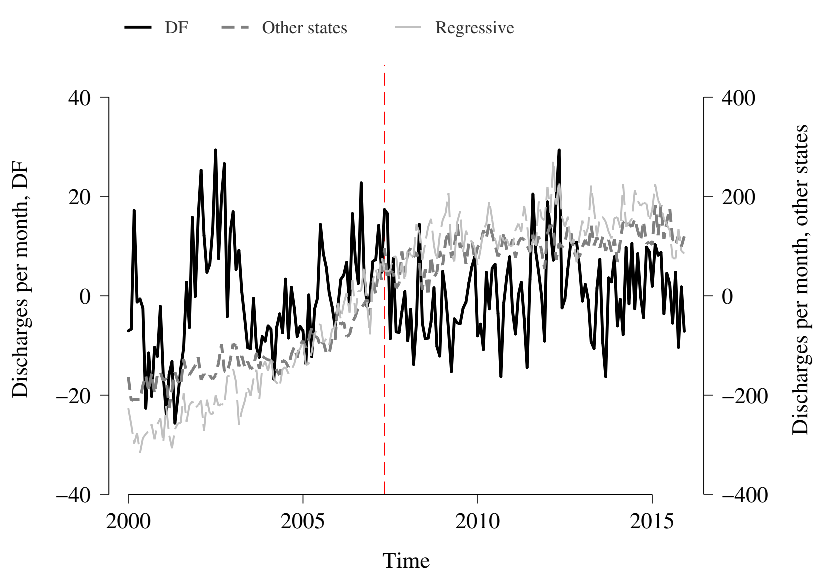
Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Percent of State Living Below Poverty Line	512	46.81	14.58	17.58	83.85
Percent of State Residents with Access to Health Institutions	512	48.88	14.07	20.66	90.69
Average Schooling of Adult Population	512	8.43	0.99	5.71	11.05
Percent of Women of Working Age Economically Active	512	37.05	2.85	26.66	44.69
Average Salary of Full Time Workers	512	5037.28	1089.12	1957.12	8022.83
Proportion of Municipalities with Seguro Popular Coverage	512	0.78	0.38	0.00	1.00

Notes: Each observation is a state×year cell. Mexico is composed of 32 States. The number of observations represents 32 states and years 2001-2016. State poverty is provided by the National Council for the Evaluation of Social Development Policy (CONEVAL). The proportion of residents with access to health institutions is provided by the Mexican Secretary of Health. Years of schooling are compiled from the National Educational Information System (SNIP). The proportion of economically active women and average salaries by state are calculated from the trimesterly National Occupation and Employment Survey (ENOE) provided by INEGI. Seguro Popular coverage is calculated from municipal rollout data, and records the proportion of each municipalities in the state having access. Prior to 2002 this value is always 0, and after 2007 this value is always 1. Referenced on page [12,A44].

Figure A3: Monthly Trends in Residualized Specific Morbidities using Secretary of Health Hospitals Only



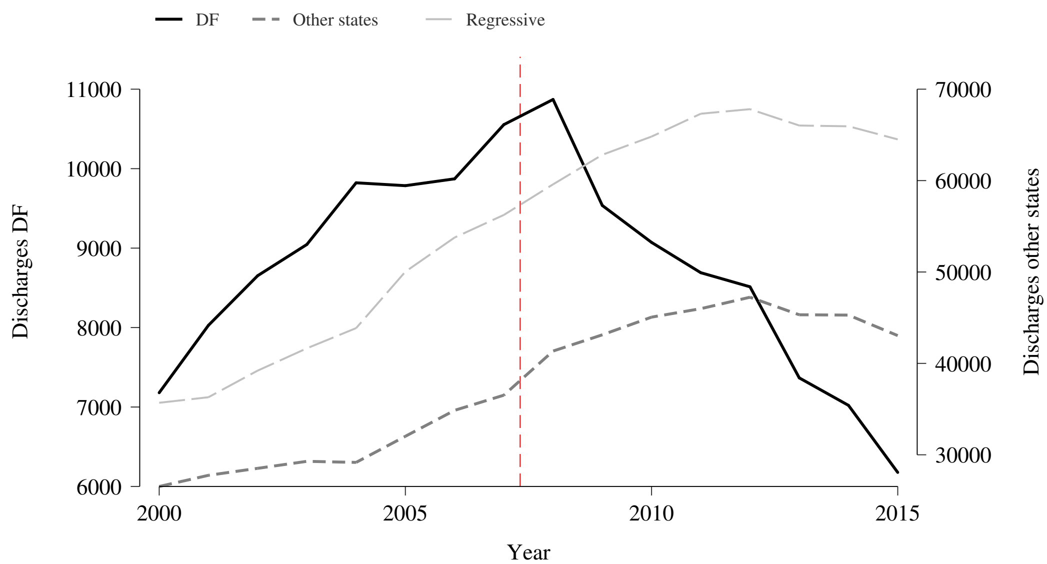
(a) Abortion-related Morbidity



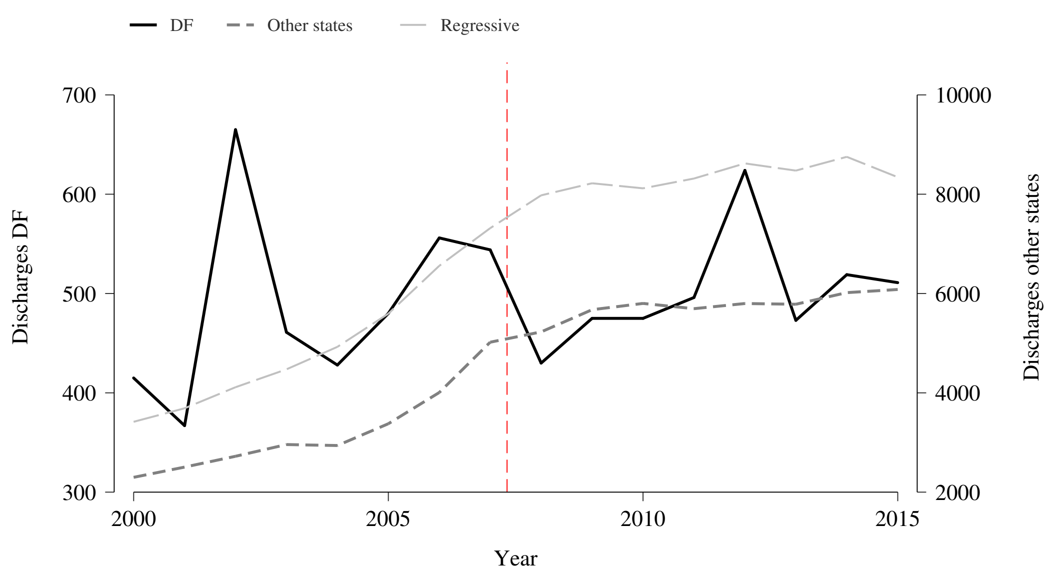
(b) Haemorrhage in Early Pregnancy

Notes: Monthly averages of the residual of the total number of cases of abortion related morbidity and haemorrhage early in pregnancy are presented. The residuals are calculated conditional on state-specific month fixed effects, as well as state fixed effects, to smooth regular monthly variation by state. Raw totals are presented in Figure 1. Monthly averages can only be plotted for data from hospitals administered by the Secretariat of Health. The dotted vertical line is plotted in April of 2007, the date of passage of the abortion reform, and wide-scale rollout of available abortions. Referenced on page [13,13].

Figure A4: Longer Trends in Specific Morbidities using Secretary of Health Hospitals Only



(a) Abortion-Related Morbidity (Total)



(b) Haemorrhage in Early Pregnancy (Total)

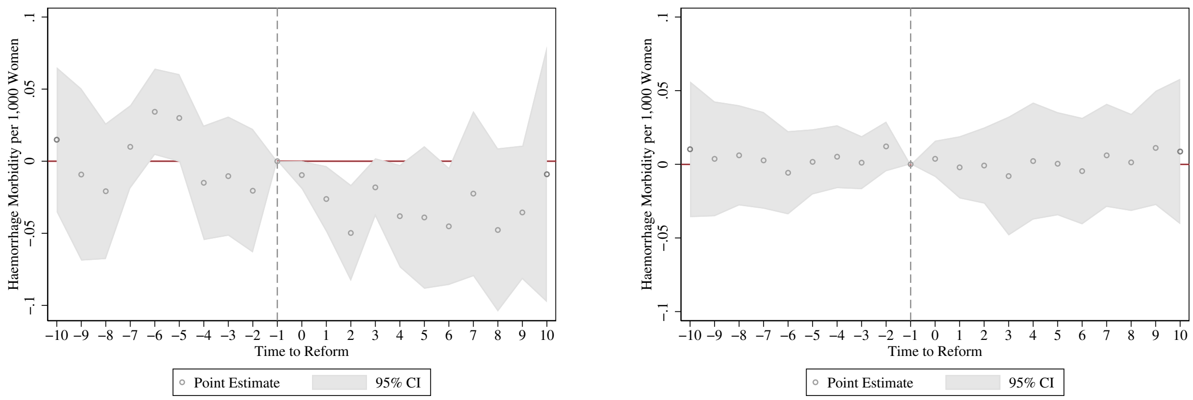
Notes: Figures present the total number of discharges due to abortion related morbidity (panel A), and haemorrhage early in pregnancy (panel B). Each trend is based on data from hospitals administered from the Secretariat of Health only (available from 2000 onwards). Referenced on page [13,13,A47]

Table A6: Difference-in-Differences Estimates of Legal Reforms on Morbidity using Inpatient Days

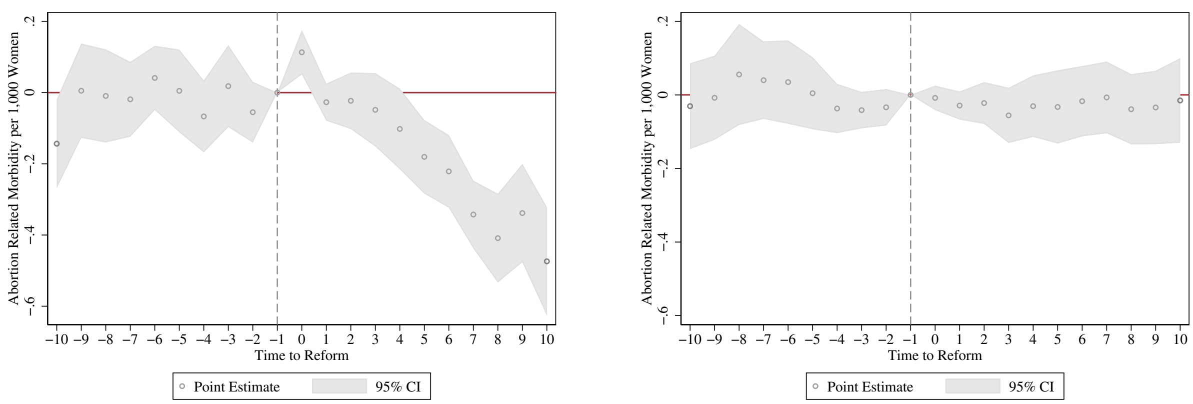
	Abortion Related Morbidity				Haemorrhage Early in Pregnancy			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: ILE versus Non-Reformers								
Post-ILE Reform (DF)	-0.082***	-0.086***	-0.069***	-0.078***	-0.026***	-0.031***	-0.027	-0.027*
	(0.018)	(0.014)	(0.026)	(0.024)	(0.009)	(0.009)	(0.017)	(0.016)
Observations	2,496	2,496	2,496	2,496	2,496	2,496	2,496	2,496
Mean of Dependent Variable	0.444	0.444	0.444	0.444	0.084	0.084	0.084	0.084
Panel B: Regressive Reforms versus Non-Reformers								
Post-Regressive Law Change	-0.011	0.007	-0.022	-0.004	-0.008	-0.003	-0.008	-0.001
	(0.020)	(0.017)	(0.017)	(0.017)	(0.012)	(0.010)	(0.012)	(0.009)
Observations	5,952	5,952	5,952	5,952	5,952	5,952	5,952	5,952
Mean of Dependent Variable	0.433	0.433	0.433	0.433	0.082	0.082	0.082	0.082
State and Year FEs	Y	Y	Y	Y	Y	Y	Y	Y
Population Weights		Y		Y		Y		Y
Time Varying Controls			Y	Y			Y	Y

Notes: Specifications replicate those in Table 2, however now instead of estimating the impact of the reforms on the number of inpatient cases, we estimate impacts on the total number of inpatient days corresponding to these cases. Each column displays a difference-in-differences regression of the impact of abortion reform on total inpatient days per 1,000 fertile-aged women for each morbidity class. Average levels of each dependent variable are presented at the foot of the table. Each regression is estimated using states that adopt reforms (ILE in panel A, regressive reforms in panel B) versus other non-adopting states. All standard errors are clustered at the level of the state. $^{*}p< 0.10$; $^{**}p< 0.05$; $^{***}p< 0.01$. Referenced on page [18].

Figure A5: Event Studies of Morbidity Impacts Based on Trimesterly Registers



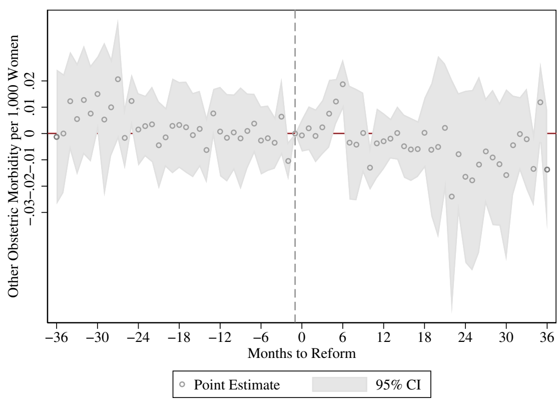
(a) Haemorrhage (Progressive) (b) Haemorrhage (Regressive)



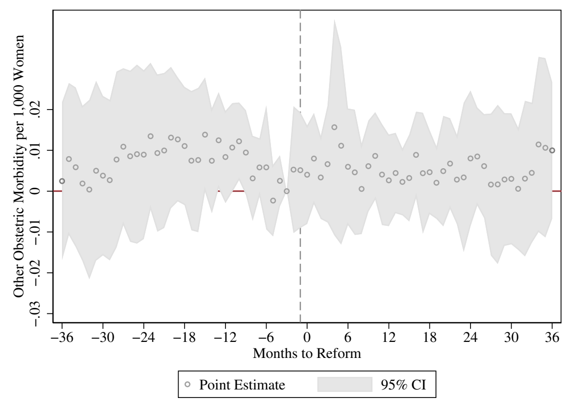
(c) Abortion Related (Progressive) (d) Abortion Related (Regressive)

Notes: Event studies replicate those from Figures 2a and 2b of the paper examening the impacts of abortion reforms on rates of hospitalization, however using trimesterly administrative records. All details follow those indicated in notes to Figures 2a and 2b where we work only with the universe of hospital visits in public (Ministry of Health) hospitals, given unavailability of exact dates (beyond year) in hospital records run by the social security system. Additionally, in each case we include trimester by state fixed effects to flexibly control for seasonality in births. Referenced on page [21].

Figure A6: Monthly Event Studies for the Impact of Abortion Reform on Rates of (Late) Obstetric Complications



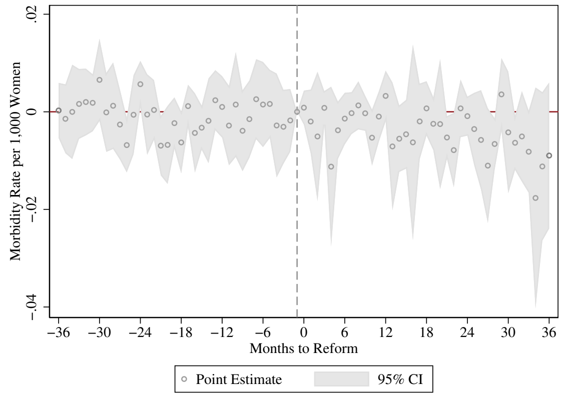
(a) Progressive Abortion Reform (ILE)



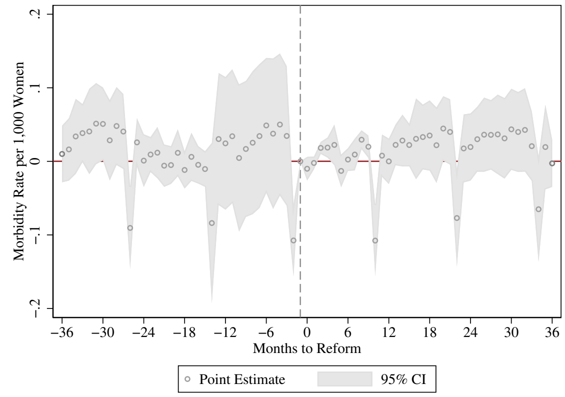
(b) Regressive Abortion Laws (Legal Tightening)

Notes: Event studies document the evolution of rates of obstetric complications (ICD codes O70-O75 inclusive) per 1,000 women surrounding the passage of abortion reforms. Each point estimate refers to the change in rates between treated and non-treated states, compared to their baseline differential (1 month prior to the reform). The left-hand panel shows the difference between Mexico DF and untreated states surrounding the passage of the ILE reform. The right-hand panel shows the difference between regressive policy changers and non-changers around the (time-varying) date that each reform was passed. Regressions are weighted by the population of fertile-aged women, and the full set of time-varying controls are included. Referenced on page [22].

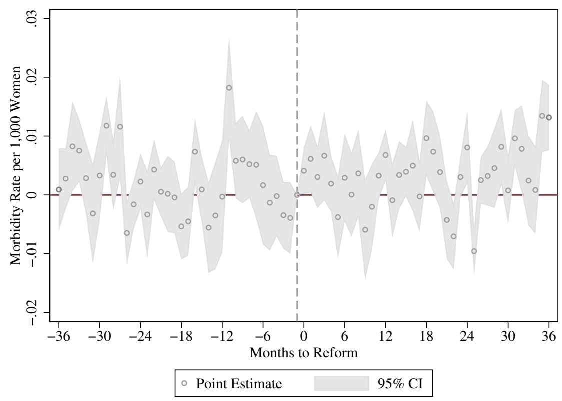
Figure A7: Alternative Event Study Placebo Tests – Non-Obstetric Outcomes (ILE Reform)



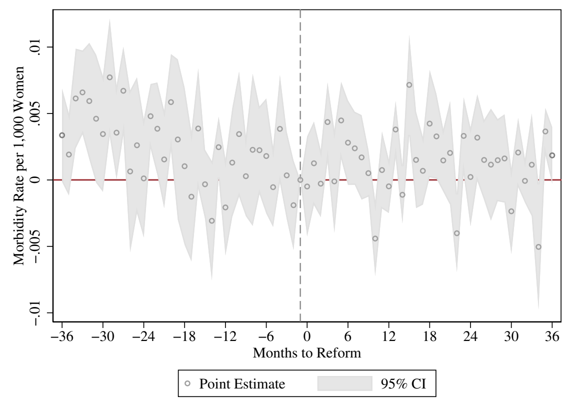
(a) Diseases of the ear and mastoid process



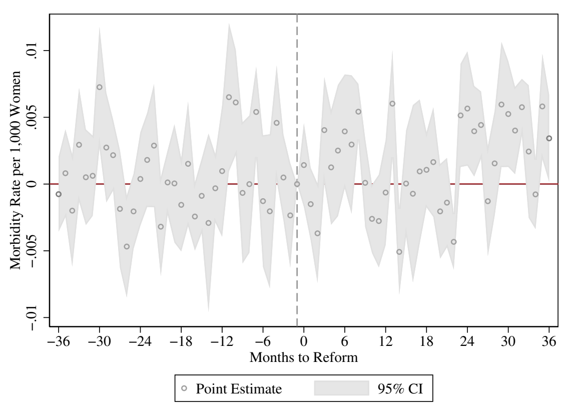
(b) Neoplasms



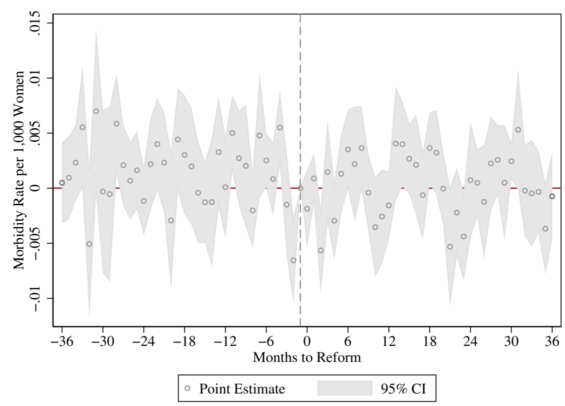
(c) Endocrine, nutritional and metabolic diseases



(d) Diseases of the blood and blood-forming organs



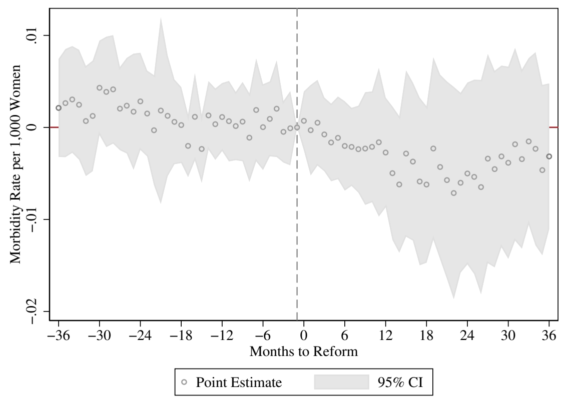
(e) Diseases of the nervous system



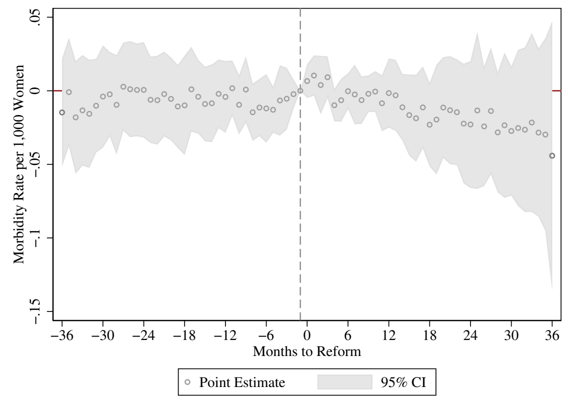
(f) Diseases of the skin and subcutaneous tissue

Notes: Event studies are documented examining the impact of the ILE abortion reform on alternative ICD codes (classes not related to pregnancy, childbirth and the puerperium). Each outcome is measured per 1,000 women aged 15–49 (as per Figures 2a-2b) focusing on the same group of fertile aged women. All additional details follow equation 3. Referenced on page [22].

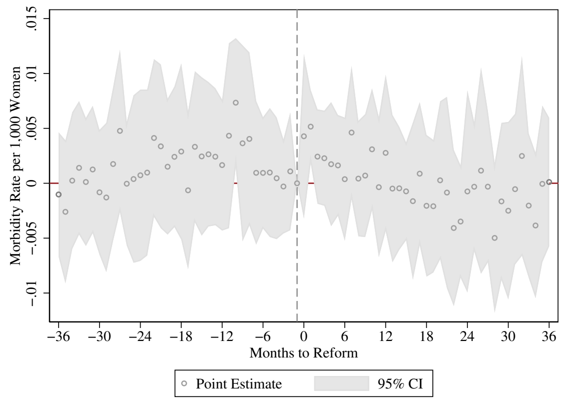
Figure A8: Alternative Event Study Placebo Tests – Non-Obstetric Outcomes (Law Tightenings)



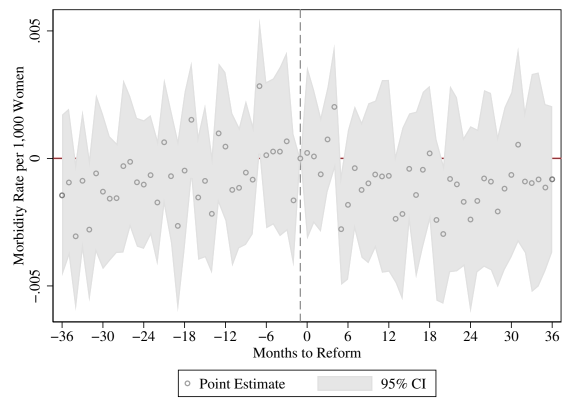
(a) Diseases of the ear and mastoid process



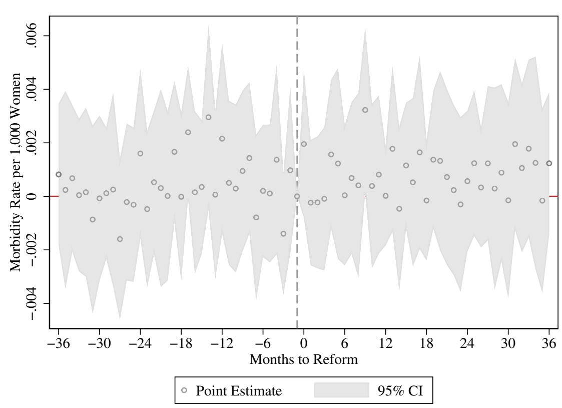
(b) Neoplasms



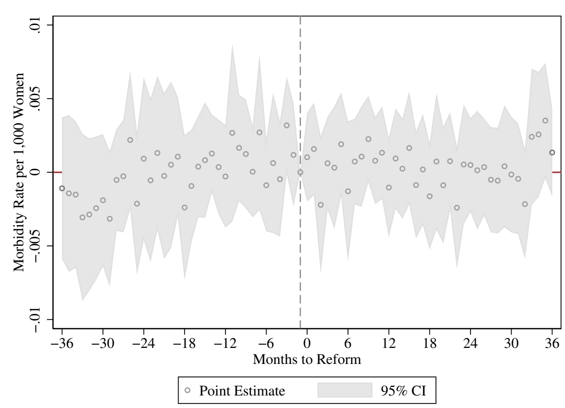
(c) Endocrine, nutritional and metabolic diseases



(d) Diseases of the blood and blood-forming organs



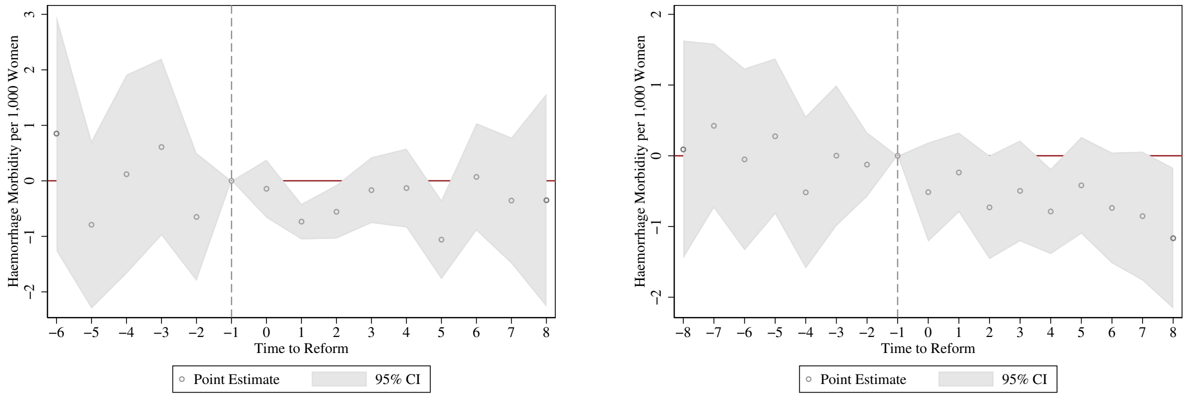
(e) Diseases of the nervous system



(f) Diseases of the skin and subcutaneous tissue

Notes: Event studies are documented examining the impact of the regressive abortion reform on alternative ICD codes (classes not related to pregnancy, childbirth and the puerperium). Each outcome is measured per 1,000 women aged 15–49 (as per Figures 2a-2b) focusing on the same group of fertile aged women. All additional details follow equation 4. Referenced on page [22].

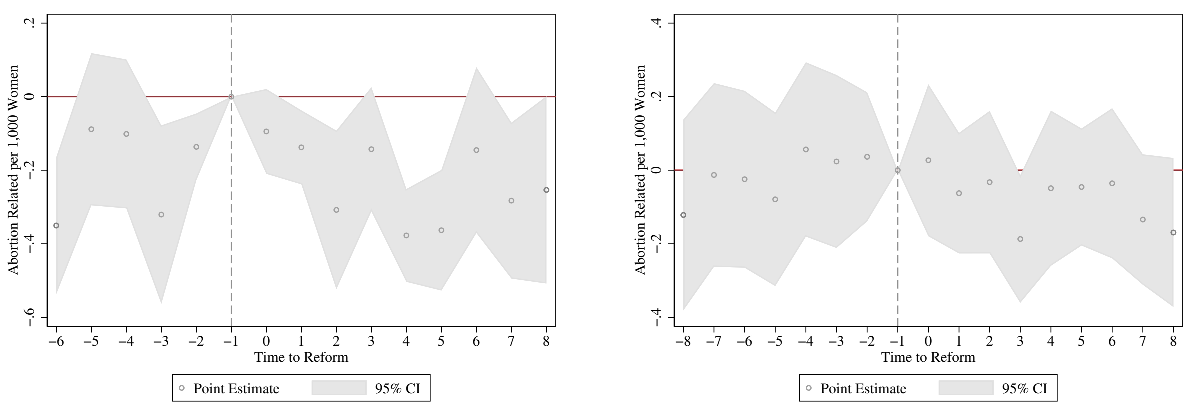
Figure A9a: Event Studies for Rates of Maternal Mortality



(a) Progressive Abortion Reform (ILE)

(b) Regressive Abortion Laws (Legal Tightening)

Figure A9b: Event Studies for Rates of Maternal Mortality due to Abortion



(c) Progressive Abortion Reform (ILE)

(d) Regressive Abortion Laws (Legal Tightening)

Notes: Event studies examine the impact of abortion reforms on all maternal deaths in Figure A9a and all maternal deaths relating expressly to abortion (ICD codes O02-O08) in Figure A9b. In both cases these are measured as deaths per 100,000 women of fertile age. Additional notes related to the estimation procedure are provided in Figure 2a. Referenced on page [23,A14,A14].

Table A7: Difference-in-Differences Estimates of Legal Reforms on Maternal Mortality

	All Maternal Mortality				Maternal Mortality due to Abortion			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: ILE versus Non-Reformers								
Post-ILE Reform (DF)	-0.585*	-0.517	-0.262	-0.370	-0.093*	-0.085*	-0.015	-0.067
	(0.351)	(0.329)	(0.688)	(0.703)	(0.052)	(0.047)	(0.100)	(0.090)
Observations	208	208	208	208	208	208	208	208
Mean of Dependent Variable	3.981	3.981	4.028	4.028	0.278	0.278	0.276	0.276
Panel B: Regressive Reforms versus Non-Reformers								
Post Regressive Law Change	-0.476	-0.421	-0.480	-0.552	-0.095*	-0.063	-0.095*	-0.074
	(0.336)	(0.351)	(0.321)	(0.337)	(0.057)	(0.043)	(0.054)	(0.047)
Observations	496	496	496	496	496	496	496	496
Mean of Dependent Variable	3.976	3.976	4.028	4.028	0.272	0.272	0.276	0.276
State and Year FEs	Y	Y	Y	Y	Y	Y	Y	Y
Population Weights		Y		Y		Y		Y
Time-Varying Controls			Y	Y			Y	Y

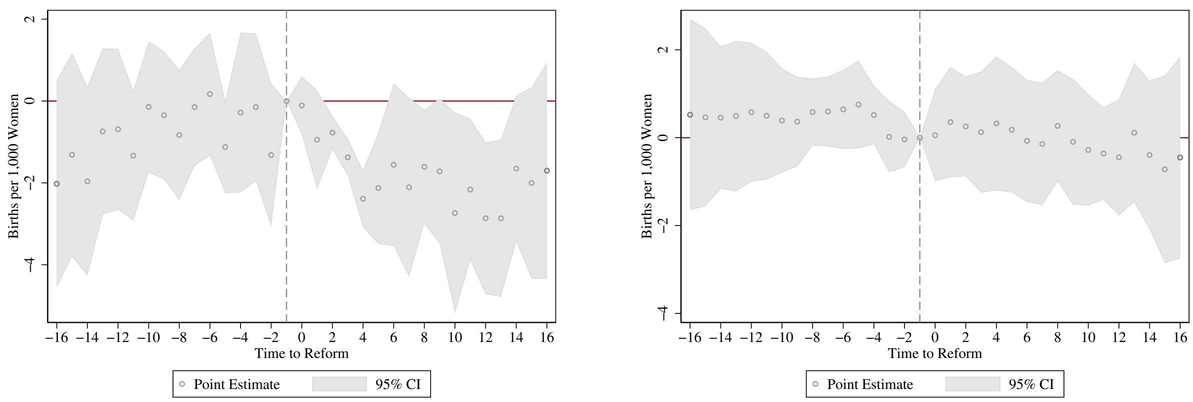
Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on rates of maternal mortality. Maternal mortality (all causes) and maternal mortality for abortive causes are each measured as total deaths per 100,000 fertile aged women each year, and average levels in the full set of data are available at the foot of the table. All standard errors are clustered at the level of the state. $^{*}p< 0.10$; $^{**}p< 0.05$; $^{***}p< 0.01$. Referenced on page [23,23,A34].

Table A8: Review of Estimates of Abortion Reform on Birth Rates

Authors	Context	Reform	Outcome	Estimate
Panel A: Progressive Law Changes				
Angrist and Evans (1996)	United States	1970 abortion reforms	Probability of teen motherhood	−0.045 (0.012) for black women and −0.012(0.04) for white women.[a]
Ananat et al. (2007)	United States	Roe v Wade	Number of children per woman up to age 39.	−0.054 (0.012).[b]
Ananat and Hungerman (2012)	United States	Abortion and the pill	Birth rate for women in ages 14-20.	−0.0476 (0.0135).[c]
Antón et al. (2018)	Uruguay	Abortion	log Number of births	−0.081 (0.038) DD estimate comparing unplanned vs planned.[d]
Bailey (2009)	United States	Abortion and the pill	Probability of first birth before age 21.	Effect of abortion: −0.009 (0.026). Effect of abortion and the pill: −0.013 (0.024).[e]
Gruber et al. (1999)	United States	Roe v Wade	Birth rate for women 15-44.	−0.059 (0.005).[f]
Guldi (2008)	United States	Abortion and the pill	Birth rate for women in ages 15-21.	−0.100 (0.054) for white women −0.030 (0.048) for nonwhite women.[g]
Joyce and Kaestner (1996)	United States	Expansions in Medicaid income eligibility	Probability of abortion.	−2 to −5% points (significant at least at 10% level) among unmarried non-black women aged 19-22 and 23-27.[h]
Joyce et al. (2013)	United States (NY)	Roe v. Wade	Birth rate for women 15-44.	−0.36 births per 1000 given a mean distance of 23 miles.[i]
Levine et al. (1999)	United States	Roe v Wade	Birth rate women 15-44.	−0.050(0.008). [j]
Mølland (2016)	Norway	Abortion in Oslo	Probability of teen motherhood (<20).	−0.029(0.009). [k]
Myers (2017)	United States	Abortion	Probability of giving birth before age 19.	−0.0284(0.0070). [l]
Pop-Eleches (2010)	Romania	Abortion plus contraception	Probability of giving birth.	−0.068(0.015) for women 20-24 with low education.[m]
Valente (2014)	Nepal	Access to an abortion center	Probability of giving birth conditional on conception women aged 15-49.	Living within 28.6 km to an abortion center led to −0.0737(0.0272). [n]
Our Estimate	Mexico	ILE reform	Birth rates women 15-49	−0.054(0.015)
Panel B: Regressive Law Changes				
Kane and Staiger (1996)	United States	Medicaid restriction and parental consent	Number of births to mothers 15-19.	White women, Medicaid: −0.0005(0.0002), parental consent: −0.0012(0.0002). [o]
Cook et al. (1999)	United States (NC)	Abortion funding	Log of birth count.	0.047(0.014) for black women and 0.015(0.010) for white women.[p]
Levine et al. (1996)	United States	Medicaid funding restrictions	Birth Rate women 15-44.	−0.582(0.400).[q]
Joyce et al. (2006)	United States (TX)	Texas Parental Notification Law	Rate ratio of birth among minors 17.50-17.74 years of age.	rate ratio, 1.04 (95 % CI, 1.00 to 1.08).[r]
Lahey (2014)	United States	Laws restricting abortion in the nineteenth century	ln(child woman ratio) for women aged 15-44.	4 − 12% increase.[s]
Our Estimate	Mexico	Regressive law changes	Birth rate women 15-49	−0.019(0.015)

Notes: [a] Columns 5 and 10 (3 years of exposure), table 3, p. 88. [b] Column 4, Table 1 p. 386. [c] Column 1, table 3 p. 43. [d] Table 3, column 2, p. 11. [e] Table 2, p. 12. [f] Column 2, table 1 p. 279. [g] Column 1, table 3, p. 823. [h] Columns 2-4, table 2, p. 186. [i] Section 4.2.2. Regressions of birth rates on distance, p. 813. [j] Column 1, table 2, p. 19. [k] Column 1, row 1, table 1, p. 12. [l] Effect of "abortion legal" and Model 4, table 2 p. 45. [m] Column 2 (estimate: β_2), table 2, p. 983. [n] Table 1 p. 232. [o] Among nonwhite women, Medicaid: 0.0021(0.0011), parental consent: -0.0003(0.0009). Column 4, Table 3 p. 485. column 4, Table 4 p. 486. [p] Table 6 p. 254. [q] Column 8, table 5, p. 33. [r] See text on p. 1030. [s] Table 2 p. 943. Referenced on page [24,24].

Figure A10: Trimesterly Event Studies for the Impact of Abortion Reform on Birth Rates

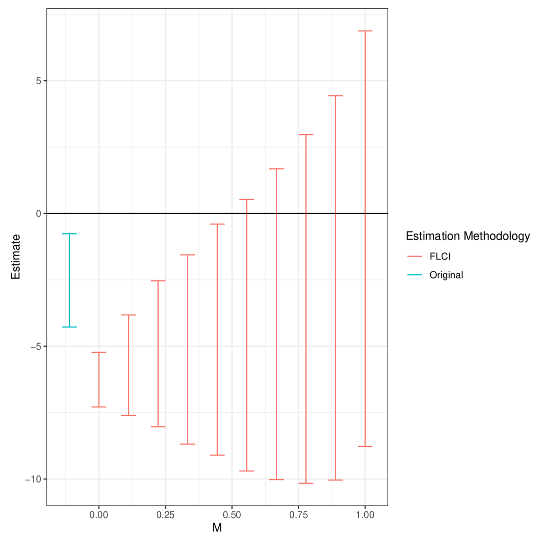


(a) Progressive Abortion Reform (ILE)

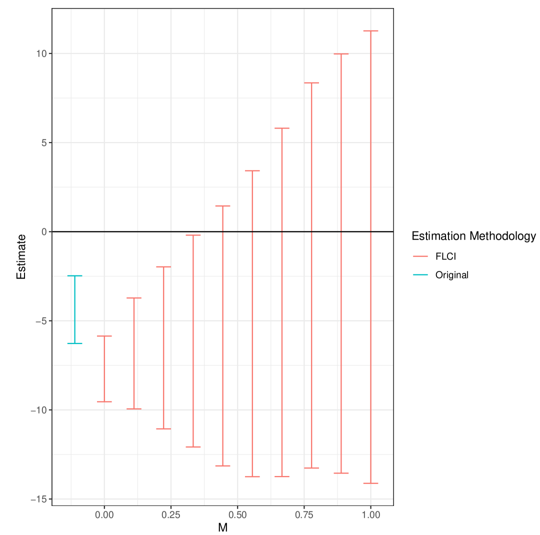
(b) Regressive Abortion Laws (Legal Tightening)

Notes: Event studies document the evolution of birth rates per 1,000 women surrounding the passage of abortion reforms. Each point estimate refers to the change in rates between treated and non-treated states, compared to their baseline differential immediately prior to the reform. Each panel is based on trimesterly birth rates. In each case, the left-hand panel shows the difference between Mexico DF and untreated states surrounding the passage of the ILE reform. The right-hand panel shows the difference between regressive policy changers and non-changers around the (time-varying) date that each reform was passed. Regressions are weighted by the population of fertile-aged women, and the full set of time-varying controls are included. Referenced on page [25,26,26,27].

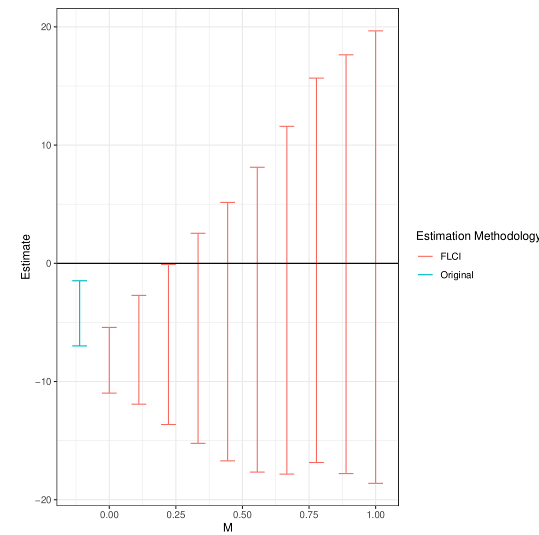
Figure A11: “Honest DiD” Methods Considering Two-Sided Violation of Parallel Trends and Estimated ILE Impacts (Birth Rates)



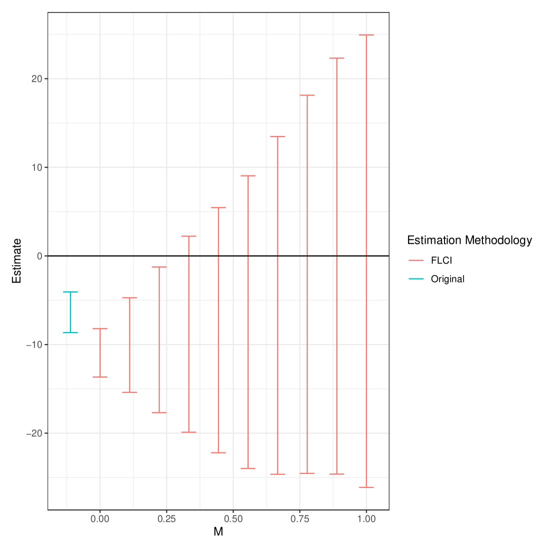
(a) Lead 1



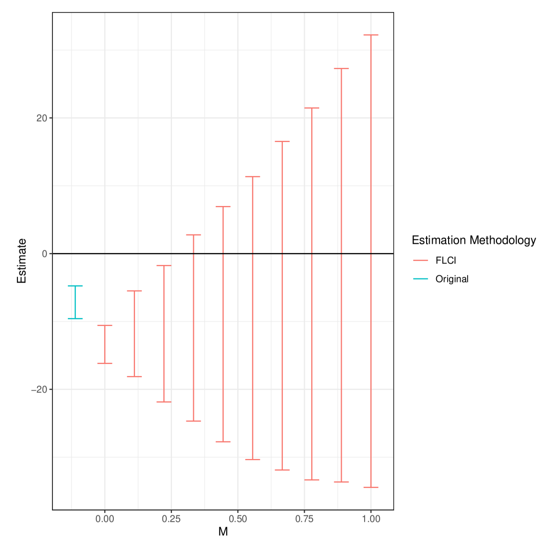
(b) Lead 2



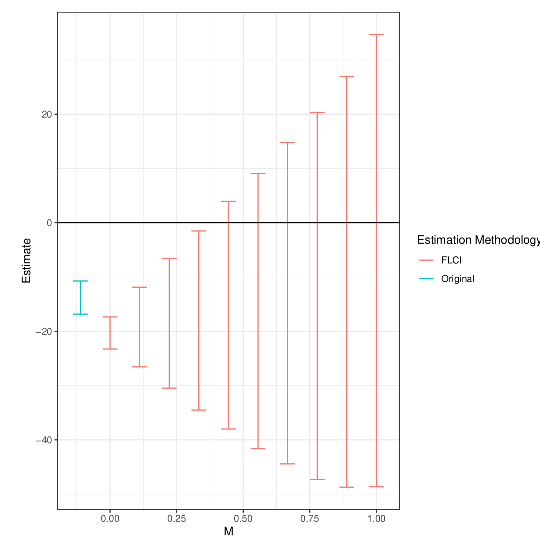
(c) Lead 3



(d) Lead 4



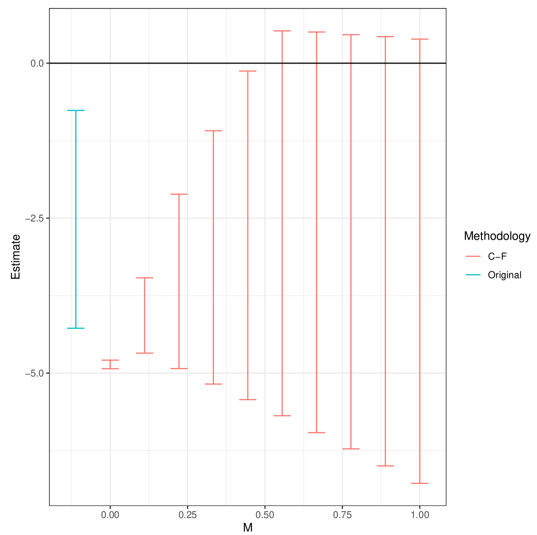
(e) Lead 5



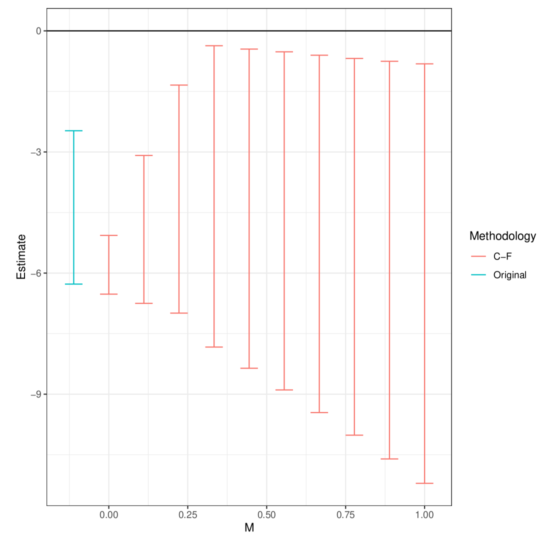
(f) Lead 6

Notes: Each plot presents the estimated event study lead (from leads 1-6) based on alternative assumptions about the evolution of outcomes in Mexico DF versus untreated areas in the absence of the ILE reform. The first (blue) CI is the original event study 95% CI based on a parallel trends assumption. Additional (red) CIs are 95% CIs based on an assumption that the Mexico DF and the untreated states would have continued following a linear trend based on pre-trends, and allowing for this trend to not deviate by more than M units between each period, where M is indicated on the horizontal access. All inference follows Rambachan and Roth (2019)’s Fixed Length Confidence Interval procedure. Referenced on page [26,A20,A20,A21,A21].

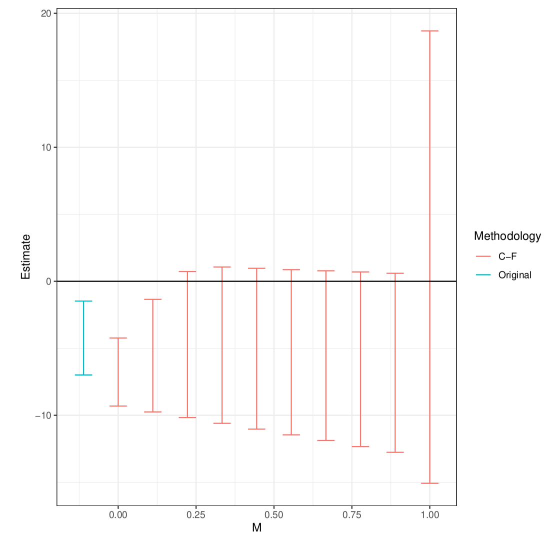
Figure A12: “Honest DiD” Methods Considering Positive Violation of Parallel Trends and Estimated ILE Impacts (Birth Rates)



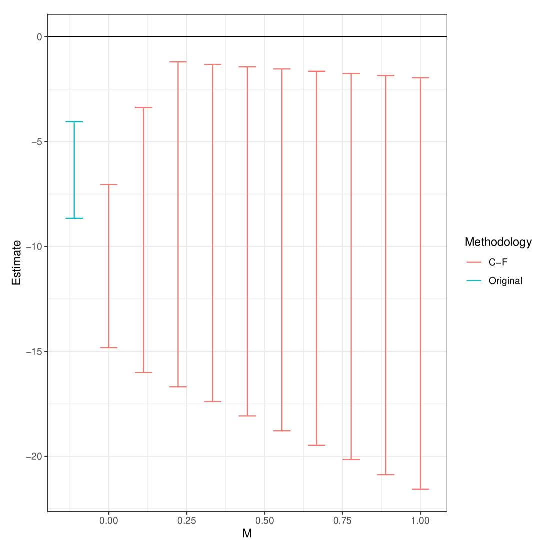
(a) Lead 1



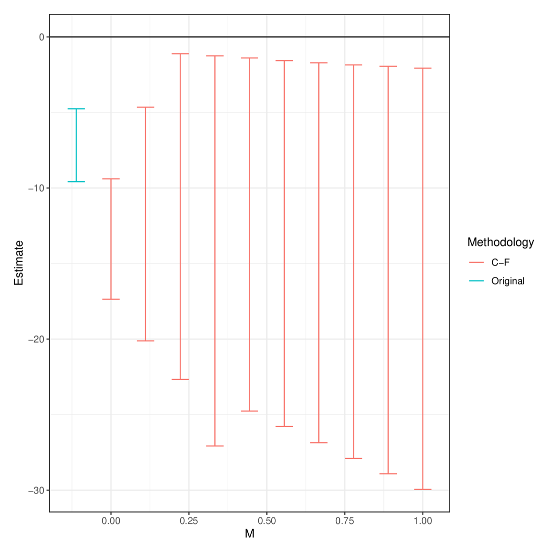
(b) Lead 2



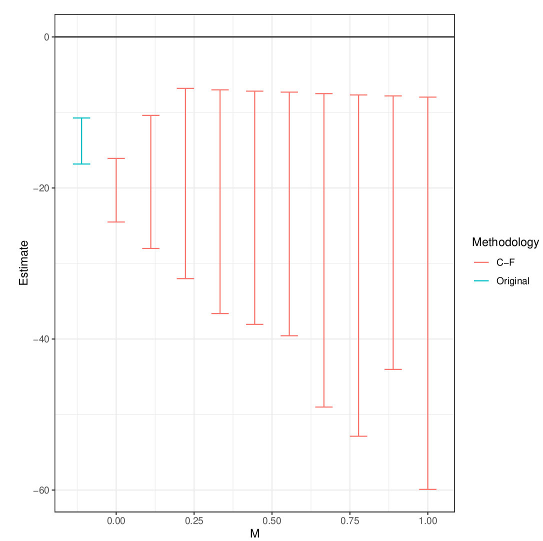
(c) Lead 3



(d) Lead 4



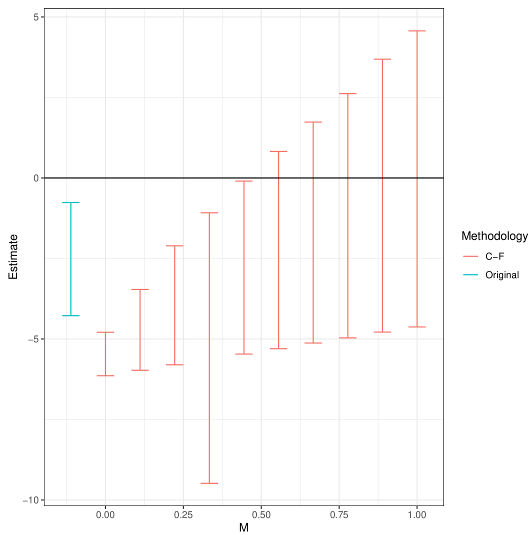
(e) Lead 5



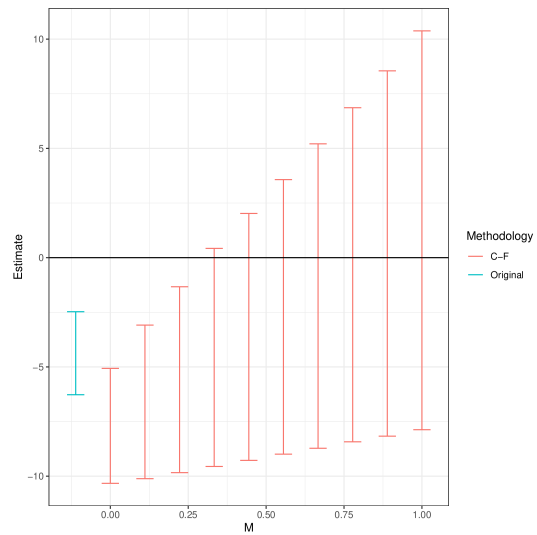
(f) Lead 6

Notes: Refer to notes to Figure A11. Here similar methods are implemented to examine sensitivity of birth rates to the ILE reform in Mexico DF, however in this case only considering positive violations of the linear trend assumption, where outcomes are allowed to (positively) vary by as much as *M* units. Referenced on page [26].

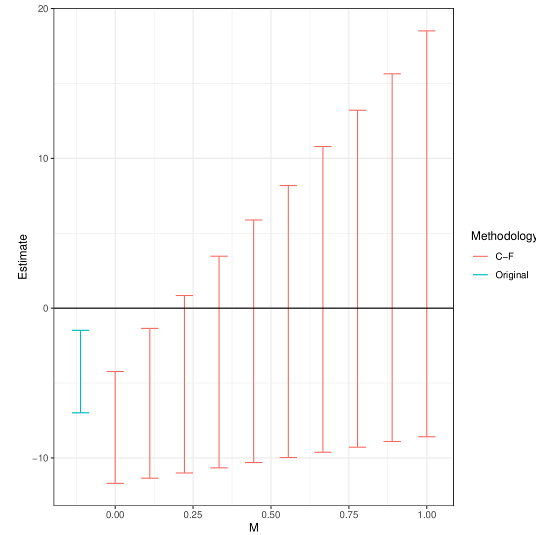
Figure A13: “Honest DiD” Methods Considering Negative Violation of Parallel Trends and Estimated ILE Impacts (Birth Rates)



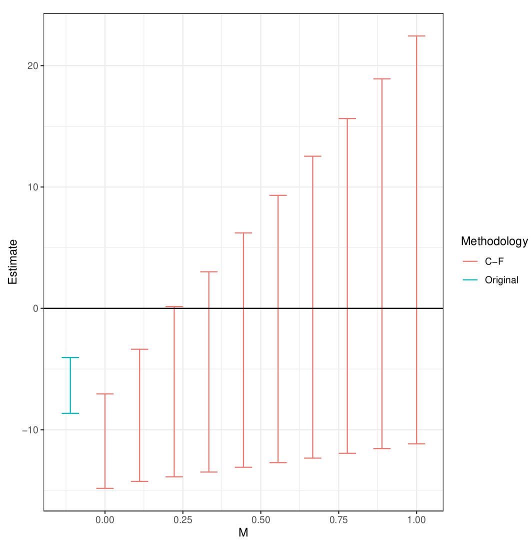
(a) Lead 1



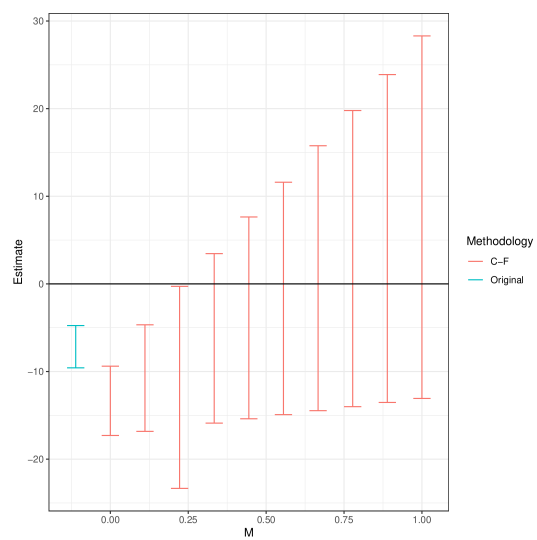
(b) Lead 2



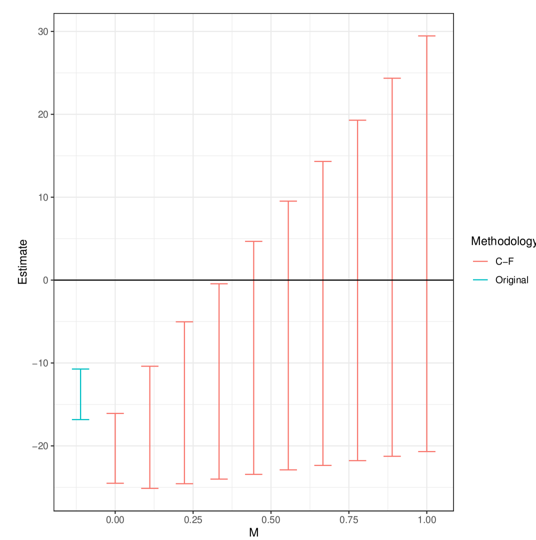
(c) Lead 3



(d) Lead 4



(e) Lead 5



(f) Lead 6

Notes: Refer to notes to Figure A11. Here similar methods are implemented to examine sensitivity of birth rates to the ILE reform in Mexico DF, however in this case only considering negative violations of the linear trend assumption, where outcomes are allowed to (negatively) vary by as much as *M* units. Referenced on page [26].

Table A9: Difference-in-Differences Estimates Examining Maternal and Paternal Characteristics

	Mother Age (1)	Father Age (2)	Mother Primary (3)	Mother Secondary (4)	Father Primary (5)	Father Secondary (6)	Married (7)	Number Children (8)	First Birth (9)
Panel A: ILE versus Non-Reformers									
Post-ILE Reform (DF)	0.286***	0.331***	0.055**	0.001	0.042**	0.027*	0.008	0.084	0.001
	(0.054)	(0.112)	(0.021)	(0.019)	(0.019)	(0.016)	(0.025)	(0.073)	(0.022)
Observations	2,028	2,028	2,028	2,028	2,028	2,028	2,028	2,028	2,028
Mean of Dep. Var.	25.618	28.950	0.286	0.659	0.267	0.604	0.492	2.122	0.413
Mean of Dep. Var. (Mexico DF)	26.343	29.390	0.187	0.794	0.152	0.753	0.464	1.896	0.443
Panel B: Regressive Reforms versus Non-Reformers									
Post-Regressive Law Change	-0.003	0.024	-0.001	0.019	-0.001	0.017*	0.024**	-0.011	-0.006
	(0.043)	(0.054)	(0.011)	(0.012)	(0.010)	(0.010)	(0.011)	(0.036)	(0.012)
Observations	4,836	4,836	4,836	4,836	4,836	4,836	4,836	4,836	4,836
Mean of Dep. Var.	25.531	28.982	0.327	0.612	0.298	0.561	0.463	2.160	0.412
Mean of Dep. Var. (Regressive States)	25.557	29.068	0.385	0.557	0.336	0.523	0.480	2.223	0.402

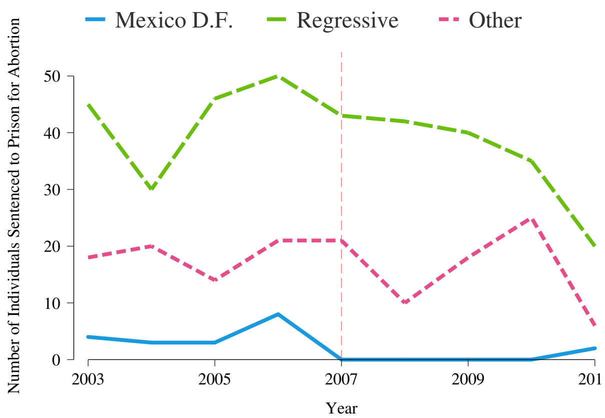
Notes: Each column displays a two way fixed effect model following equation 1 (panel A) and equation 2 (panel B), where the outcome consists of state by month level averages of maternal and paternal characteristics from all birth microdata. Average levels of each outcome are displayed in table footers. All standard errors are clustered at the level of the state. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. Referenced on page [28,28].

Table A10: Examining Channels of Impacts of Abortion Reform on Morbidity

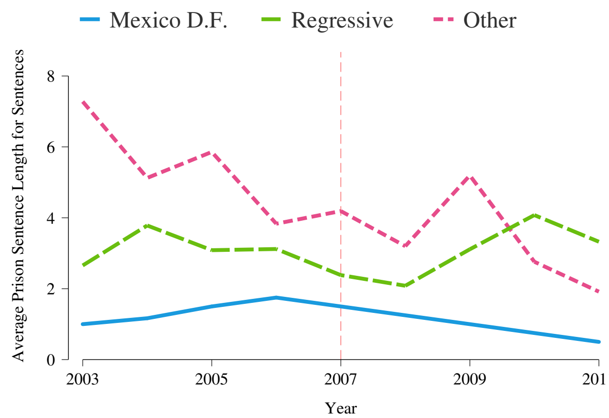
	Abortion Related Morbidity				Haemorrhage Early in Pregnancy			
	No Characteristics		Parental Characteristics		No Characteristics		Parental Characteristics	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: ILE versus Non-Reformers								
Post-ILE Reform (DF)	-0.042***	-0.057***	-0.013	-0.002	-0.012**	-0.012**	-0.009**	-0.013***
	(0.014)	(0.009)	(0.018)	(0.021)	(0.005)	(0.005)	(0.005)	(0.003)
Observations	2,028	2,028	2,028	2,028	2,028	2,028	2,028	2,028
Mean of Dependent Variable	0.341	0.341	0.341	0.341	0.044	0.044	0.044	0.044
Panel B: Regressive Reforms versus Non-Reformers								
Post-Regressive Law Change	-0.010	-0.008	-0.010	-0.013*	-0.004	-0.002	-0.004	-0.003
	(0.010)	(0.010)	(0.008)	(0.007)	(0.005)	(0.004)	(0.005)	(0.003)
Observations	4,836	4,836	4,836	4,836	4,836	4,836	4,836	4,836
Mean of Dependent Variable	0.329	0.329	0.329	0.329	0.043	0.043	0.043	0.043
State and Year×Month FEs	Y	Y	Y	Y	Y	Y	Y	Y
Time-Varying Controls	Y	Y	Y	Y	Y	Y	Y	Y
Population Weights		Y		Y		Y		Y

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on rates of morbidity (inpatient cases). Columns 1 and 2 (and 5 and 6) present weighted and unweighted estimated impacts in baseline models without parental controls. Columns 3 and 4 (and 5 and 7) present identical models, additionally including controls for parental characteristics. Each morbidity class is measured as cases per 1,000 fertile aged women each year, and average levels in the full set of data are available at the foot of the table. Each regression is estimated using states that adopt reforms (ILE in panel A, regressive reforms in panel B) versus other non-adopting states. All standard errors are clustered at the level of the state. $^{*}p< 0.10$; $^{**}p< 0.05$; $^{***}p< 0.01$. Referenced on page [28,28].

Figure A14: *De Jure* Sentencing of Abortion: Trends by State Type



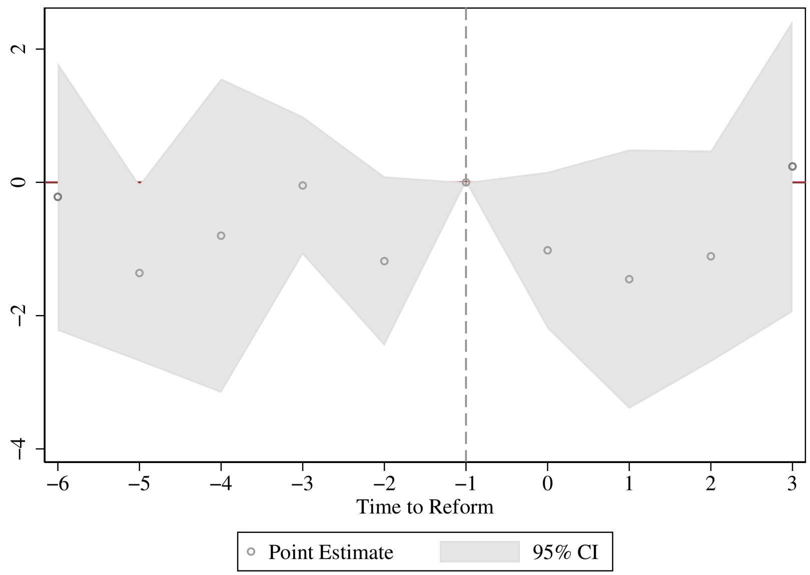
(a) Number of Individuals Sentenced to Prison



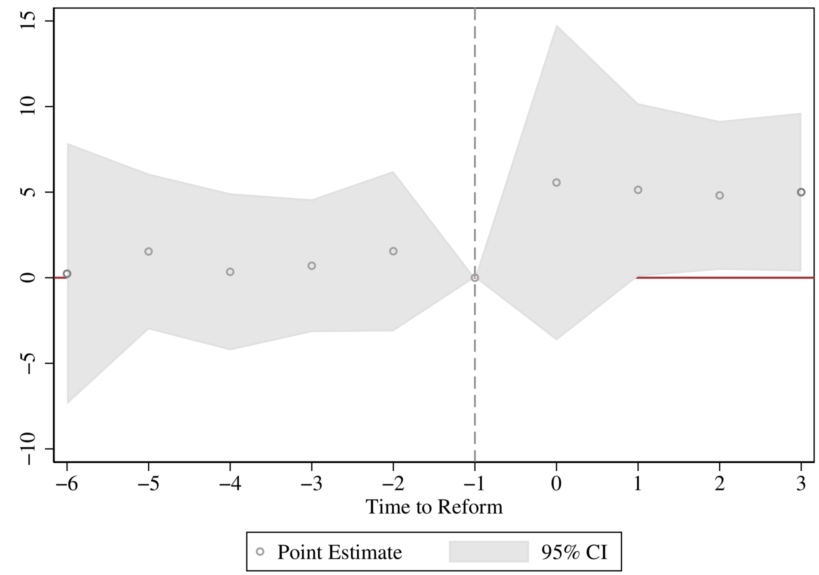
(b) Average Length of Prison Sentences (Years)

Notes: Total number of sentences for crimes relating to abortion and the average length of prison sentences are generated from administrative records captured in Mexico's Judicial Statistics on Penal Matters. This is the universe of judiciary decisions in the country based on the first legal judgment (and here we focus only on cases relating to abortion), and so does not include any subsequent appeals. Prison sentence lengths are calculated from a categorical variable capturing bins of between 6 months and two years, and in each case we record the total years (or fractions of years) based on the midpoint of each bin. Bins are consistently used in the period displayed here. Regressive states refer to any states tightening abortion laws in the period under study. Referenced on page [29,A44].

Figure A15: *De Jure* Sentencing of Abortion: Event Studies for Regressive Law Changes



(a) Number of Individuals Sentenced to Prison



(b) Average Length of Prison Sentence

Notes: Event studies document the evolution or criminal outcomes for cases relating to abortion surrounding the passage of regressive abortion laws in Mexican States. Total number of sentences and the average length of prison sentences are generated from administrative records captured in Mexico's Judicial Statistics on Penal Matters. This is the universe of judiciary decisions in the country based on the first legal judgment (and here we focus only on cases relating to abortion), and so does not include any subsequent appeals. Prison sentence lengths are calculated from a categorical variable capturing bins of between 6 months and two years, and in each case we record the total years (or fractions of years) based on the midpoint of each bin. Bins are consistently used in the period displayed here. Referenced on page [29].

Table A11: Difference-in-Differences Estimates of Abortion Reforms on Judicial Outcomes (Standardized by Population)

	Number of Prison Sentences		Length of Prison Sentences	
	(1)	(2)	(3)	(4)
Panel A: ILE versus Non-Reformers				
Post-ILE Reform (DF)	-0.001***	-0.001***	0.003**	0.002
	(0.001)	(0.000)	(0.002)	(0.002)
Observations	117	117	56	56
Mean of Dependent Variable	0.002	0.002	0.004	0.004
Panel B: Regressive Reforms versus Non-Reformers				
Post-Regressive Law Change	-0.000	-0.001	0.005*	0.004*
	(0.001)	(0.001)	(0.003)	(0.002)
Observations	279	279	171	171
Mean of Dependent Variable	0.002	0.002	0.006	0.006
State and Year FEs	Y	Y	Y	Y
Population Weights		Y		Y

Notes: Refer to notes to Table 4. Models replicate those in Table 4, however now outcome variables are standardized per 1,000 fertile-aged population. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. Referenced on page [29].

Table A12: Difference-in-Differences Estimates of Legal Reforms on Morbidity using Yearly Data

	Abortion Related Morbidity				Haemorrhage Early in Pregnancy			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: ILE versus Non-Reformers								
Post-ILE Reform (DF)	-1.194***	-1.477***	-1.562***	-1.481***	-0.952***	-1.053***	-1.034***	-0.930***
	(0.278)	(0.200)	(0.312)	(0.349)	(0.120)	(0.142)	(0.243)	(0.196)
Observations	156	156	156	156	156	156	156	156
Mean of Dependent Variable	10.474	10.474	10.474	10.474	2.364	2.364	2.364	2.364
Panel B: Regressive Reforms versus Non-Reformers								
Post-Regressive Law Change	-0.241	-0.402	-0.348	-0.394	-0.339*	-0.319**	-0.352**	-0.214*
	(0.314)	(0.262)	(0.278)	(0.287)	(0.182)	(0.147)	(0.176)	(0.117)
Observations	372	372	372	372	372	372	372	372
Mean of Dependent Variable	10.318	10.318	10.318	10.318	2.363	2.363	2.363	2.363
State and Year FEs	Y	Y	Y	Y	Y	Y	Y	Y
Population Weights		Y		Y		Y		Y
Time-Varying Controls			Y	Y			Y	Y

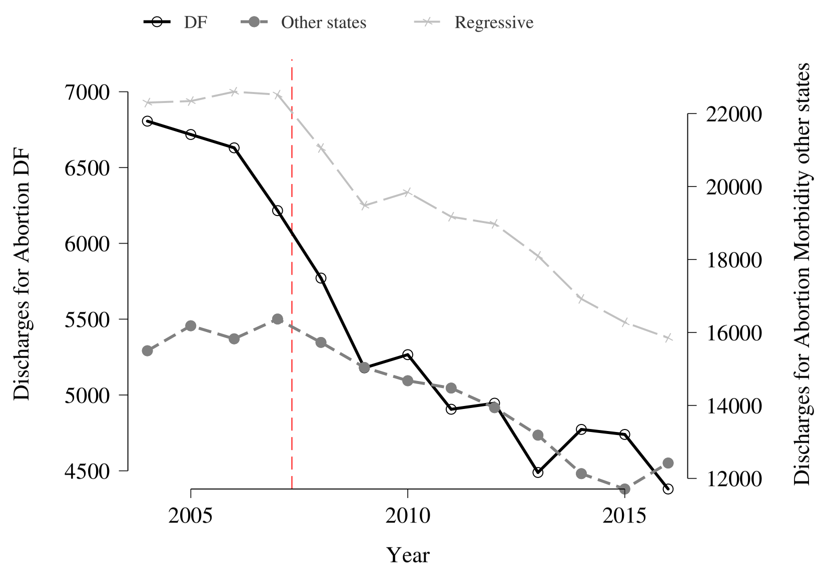
Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on rates of morbidity (inpatient cases) following equation 1 and 2. Each morbidity class is measured as cases per 1,000 fertile aged women each year, and average levels in the full set of data are available at the foot of the table. All standard errors are clustered at the level of the state. $^{*}p< 0.10$; $^{**}p< 0.05$; $^{***}p< 0.01$. Referenced on page [31,31].

Table A13: Difference-in-Differences Estimates of Abortion Reforms on Fertility by Year

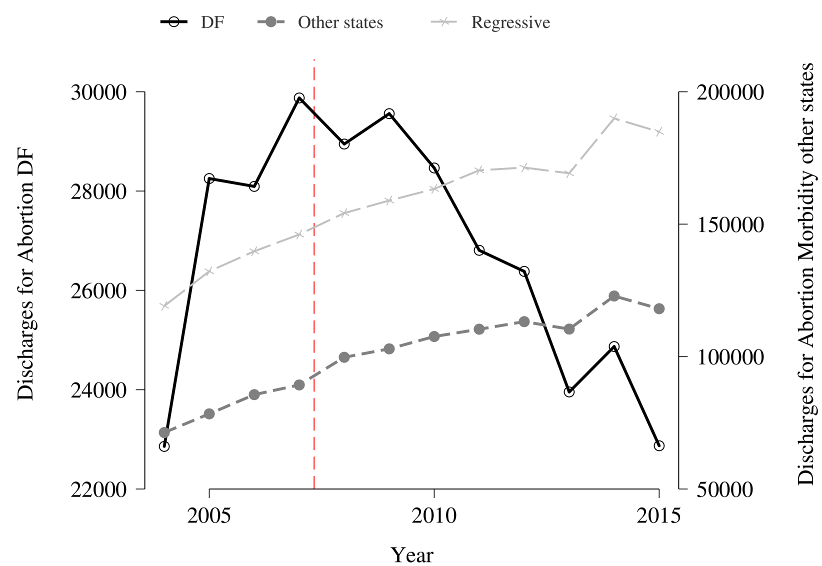
	Births per 1,000 Women			
	(1)	(2)	(3)	(4)
Panel A: ILE versus Non-Reformers				
Post-ILE Reform (DF)	-6.421***	-7.652***	-6.509***	-7.349***
	(0.927)	(1.264)	(1.343)	(1.299)
Observations	169	169	169	169
Mean of Dependent Variable	88.310	88.310	88.310	88.310
Mean of Dependent Variable (Mexico DF)	89.041	89.041	89.041	89.041
Panel B: Regressive Reforms versus Non-Reformers				
Post Regressive Law Change	-2.166**	-3.336***	-2.317**	-2.880**
	(1.090)	(1.230)	(1.044)	(1.290)
Observations	403	403	403	403
Mean of Dependent Variable	88.310	88.310	88.310	88.310
Mean of Dependent Variable (Regressive States)	90.623	90.623	90.623	90.623
State and Year FEs	Y	Y	Y	Y
Population Weights		Y		Y
Time-Varying Controls			Y	Y

Notes: Each column displays a difference-in-differences regression of the impact of abortion reform on birth rates. Birth rates are measured as the number of births per 1,000 fertile aged women each year. Time-varying controls are documented in Section B.2. All standard errors are clustered at the level of the state using a wild clustered bootstrap procedure. $^{*}p< 0.10$; $^{**}p< 0.05$; $^{***}p< 0.01$. Referenced on page [31,31].

Figure A16: Trends in Public and Private Health System Morbidity: Abortion-Related



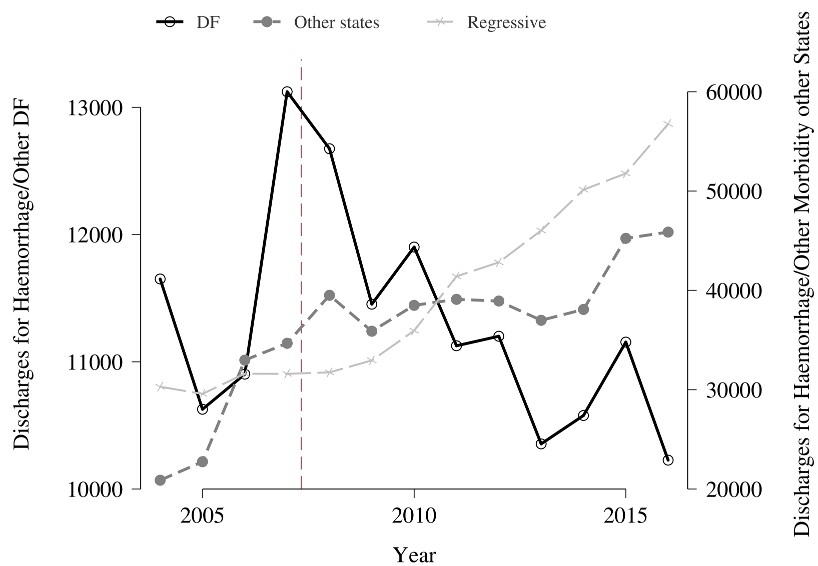
(a) Quantity of Hospital Visits in the Private Sector



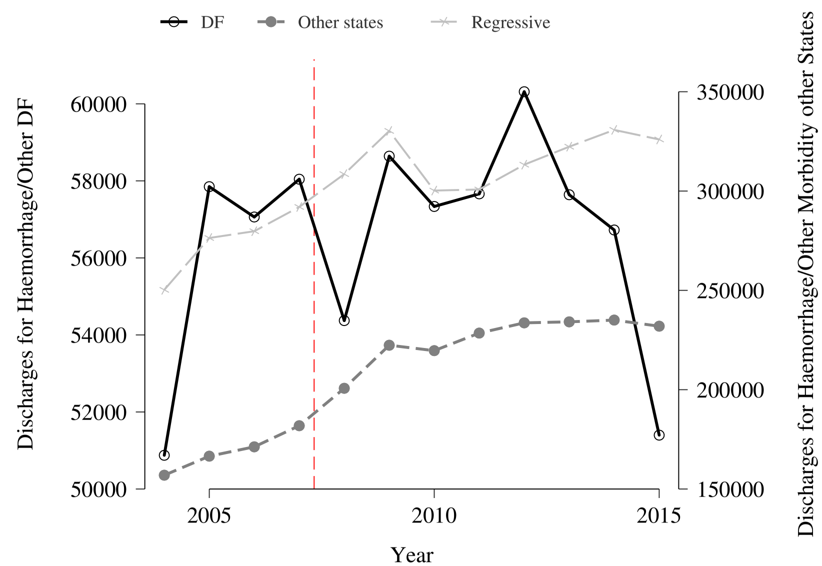
(b) Quantity of Hospital Visits in the Public Sector

Notes: Left-hand panel plots all abortion-related morbidity according to the universe of private health records. Microdata on these records are available by request from INEGI. Right-hand panel plots all abortion-related morbidity coded using the same codes as in private records based on the universe of public hospital records. A description of how these codes are merged between the public and private system is available in Appendix Table A3. Referenced on page [32].

Figure A17: Trends in Public and Private Health System Morbidity: Other Maternal Causes (including Haemorrhage)



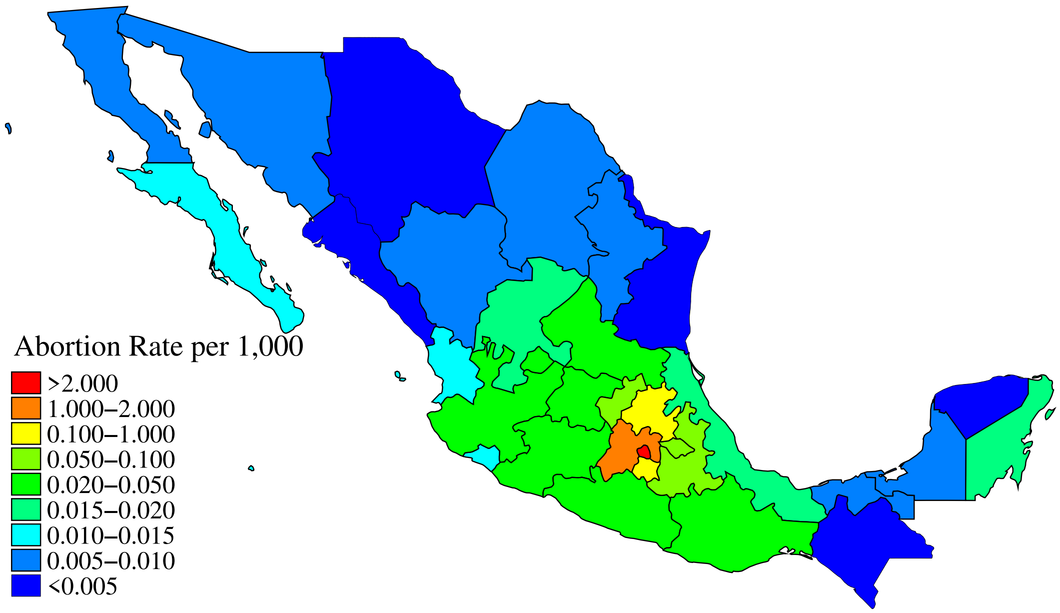
(a) Quantity of Hospital Visits in the Private Sector



(b) Quantity of Hospital Visits in the Public Sector

Notes: Left-hand panel plots all "Other Maternal Causes" (including haemorrhage early in pregnancy) according to the universe of private health records. Microdata on these records are available by request from INEGI. Right-hand panel plots all "Other Maternal Causes" coded using the same codes as in private records based on the universe of public hospital records. A description of how these codes are merged between the public and private system is available in Appendix Table A3. Referenced on page [32].

Figure A18: Geographic Variation in Usage of Mexico DF's ILE Program to Access Abortion



Notes: Each state is shaded according to the rate of abortions per 1,000 women provided under the auspices of the ILE reform. All rates are calculated based on administrative records of state of residence. Refer to Table A14 for the precise number and rate in each state. Referenced on page [33].

Table A14: State of Residence of Users of ILE: 2007-2015

State	Number of Patients	Rate per 1,000 women
Aguascalientes	87	0.036
Baja California	40	0.006
Baja California Sur	19	0.014
Campeche	11	0.006
Chiapas	34	0.003
Chihuahua	31	0.004
Coahuila	28	0.005
Colima	19	0.014
Mexico D.F.	104,048	5.833
Durango	21	0.006
Guanajuato	268	0.023
Guerrero	161	0.025
Hidalgo	637	0.118
Jalisco	334	0.023
Mexico State	34,703	1.084
Michoacán	309	0.035
Morelos	464	0.128
Nayarit	27	0.012
Nuevo León	66	0.007
Oaxaca	230	0.031
Puebla	807	0.068
Querétaro	329	0.085
Quintana Roo	58	0.020
San Luis Potosí	108	0.021
Sinaloa	19	0.003
Sonora	28	0.005
Tabasco	32	0.007
Tamaulipas	30	0.004
Tlaxcala	188	0.078
Veracruz	267	0.018
Yucatán	18	0.005
Zacatecas	52	0.018
Non-Mexican Residents	52	—
Unknown	250	—
Total	143,550	0.628

Notes: The quantity of abortions are provided from administrative data compiled as the Information System for Legal Interruption of Pregnancy from Mexico City's Secretary of Health, and are for the years 2007-2015. Rates per women refer to the number of abortions per 1,000 women aged 15-49. Referenced on page [33,34,A31,A31].

Table A15: DD Estimates Examining Policy Spillovers

		Maternal Morbidity		Maternal Mortality	
	Births	Abortion	Haemorrhage	All	Abortive
	(1)	(2)	(3)	(4)	(5)
Post-ILE Reform (DF)	-5.499***	-0.964**	-0.836***	-0.007	-0.001
	(1.243)	(0.403)	(0.154)	(0.005)	(0.001)
Post-Regressive Law Change	-1.854	-0.199	-0.183	-0.006*	-0.000
	(1.295)	(0.322)	(0.123)	(0.004)	(0.000)
Post-ILE (Spillover State)	3.558**	0.321	0.052	-0.003	0.001**
	(1.774)	(0.373)	(0.159)	(0.003)	(0.000)
Observations	416	384	384	512	512
Mean of Dependent Variable	87.798	10.336	2.343	0.040	0.003
Mean of Dependent Variable (Mexico DF)	89.041	10.519	2.282	0.065	0.005
Mean of Dependent Variable (Regressive States)	90.623	9.783	2.555	0.046	0.003
Mean of Dependent Variable (Spillover States)	85.128	8.071	1.746	0.046	0.003

Notes: DD estimates replicate specification 1, however now additionally control for a post-ILE indicator for states in which residents were recorded as having significant access to the ILE reform (according to administrative records). Each specification includes full time-varying controls, weights by state population, and standard errors are clustered using a wild bootstrap. For additional details, refer to Notes to Table 2. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$. Referenced on page [33].

Table A16: DD Estimates of the Impact of ILE Usage Intensity on Birth Rates and Health

		Morbidity		Mortality	
	Births	Abortion	Haemorrhage	Maternal	Abortive
	(1)	(2)	(3)	(4)	(5)
Abortions per 1,000 Women	-0.939***	-15.634***	-14.212***	-0.113	-0.009
	(0.221)	(5.165)	(2.641)	(0.096)	(0.013)
Post-Regressive Law Change	-2.419*	-24.575	-20.171*	-0.566*	-0.060
	(1.364)	(33.186)	(11.829)	(0.335)	(0.048)
Observations	416	384	384	512	512
Mean of Dependent Variable	87.798	1033.568	234.314	4.028	0.276

Notes: DD estimates replicate specification 1, however the ILE program is measured as the number of abortions accessed per 1,000 women in each state in the post-reform period. Post-Regressive Law Change is measured as a binary variable, so does not capture intensity, and is not interpreted in the same way as abortions per 1,000 women. Each outcome is measured per 1,000 women in the state and year (except Abortion and Haemorrhage, which are displayed per 100,000), and are identical to the outcomes in Tables 2, 3 and A7 in the paper. Each specification includes full time-varying controls, weights by state population, and standard errors are clustered using a wild bootstrap. For additional details, refer to Notes to Table 2. $^{*}p< 0.10$; $^{**}p< 0.05$; $^{***}p< 0.01$. Referenced on page [34].

Table A17: Heterogeneity in DD Estimates by Age and Insurance Coverage – Abortion-Related Morbidity

	Age Groups						Insurance Coverage	
	15–19	20–24	25–29	30–34	35–39	40–44	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: ILE versus Non-Reformers								
Post-ILE Reform (DF)	-0.106***	-0.110***	-0.072***	-0.065***	-0.033***	-0.008**	-0.049*	0.014
	(0.010)	(0.017)	(0.017)	(0.013)	(0.010)	(0.004)	(0.027)	(0.028)
Observations	2,340	2,340	2,340	2,340	2,340	2,340	2,340	2,340
Mean of Dependent Variable	0.402	0.521	0.406	0.301	0.217	0.099	0.144	0.148
Panel B: Regressive Reforms versus Non-Reformers								
Post-Regressive Law Change	-0.020	-0.010	-0.011	-0.003	-0.002	-0.003	-0.006	-0.006
	(0.014)	(0.016)	(0.014)	(0.011)	(0.008)	(0.004)	(0.018)	(0.014)
Observations	5,580	5,580	5,580	5,580	5,580	5,580	5,580	5,580
Mean of Dependent Variable	0.393	0.504	0.389	0.290	0.210	0.097	0.136	0.144

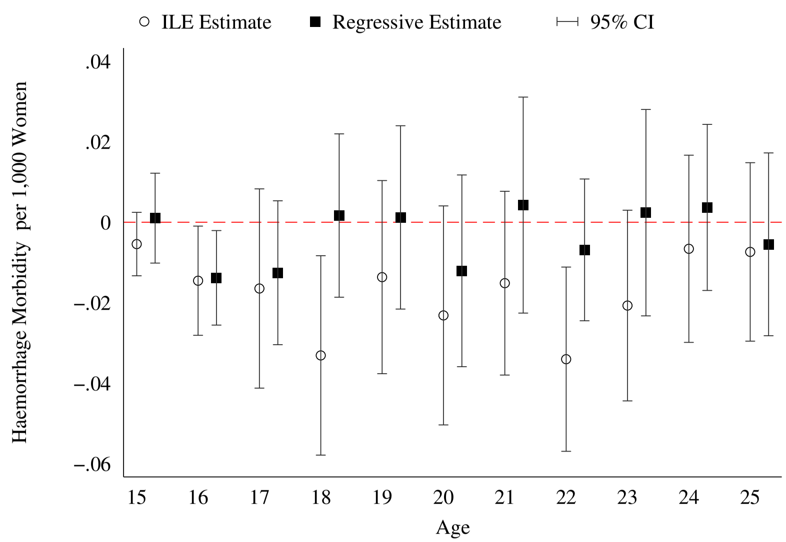
Notes: Each column displays estimated reform impacts on abortion related morbidity based on two-way FE models following equation 1 (panel A) and 2 (panel B), however now only for a specific demographic group (quinquennial ages in columns 1-6, and insurance coverage status in columns 7-8). All additional details follow notes to Table 2. *$p< 0.10$; **$p< 0.05$; ***$p< 0.01$. Referenced on page [34].

Table A18: Heterogeneity in DD Estimates by Age and Insurance Coverage – Haemorrhage in Early Pregnancy

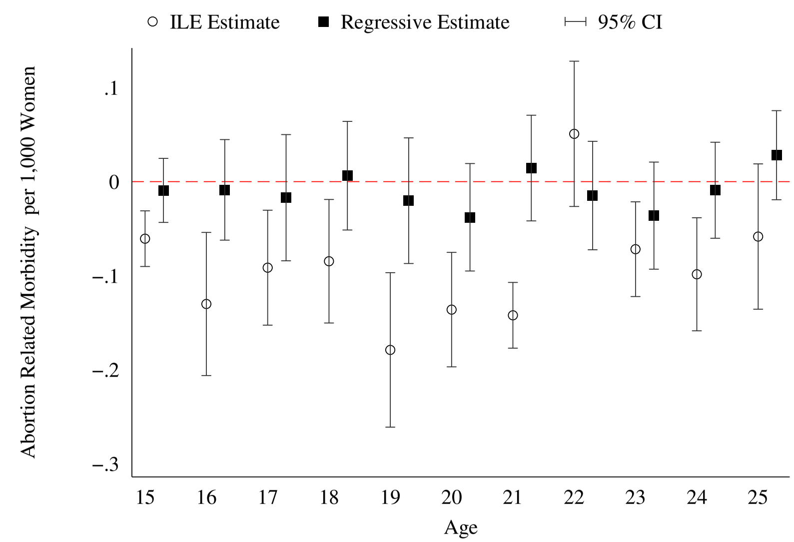
	Age Groups						Insurance Coverage	
	15–19	20–24	25–29	30–34	35–39	40–44	Yes	No
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: ILE versus Non-Reformers								
Post-ILE Reform (DF)	-0.018***	-0.020*	-0.018**	-0.011*	-0.007**	-0.001	-0.015**	0.002
	(0.007)	(0.011)	(0.009)	(0.007)	(0.004)	(0.001)	(0.007)	(0.002)
Observations	2,340	2,340	2,340	2,340	2,340	2,340	2,340	2,340
Mean of Dependent Variable	0.056	0.073	0.058	0.038	0.020	0.005	0.023	0.017
Panel B: Regressive Reforms versus Non-Reformers								
Post-Regressive Law Change	-0.003	-0.005	-0.003	-0.001	-0.000	-0.001	-0.004	0.002
	(0.005)	(0.007)	(0.006)	(0.004)	(0.002)	(0.001)	(0.004)	(0.003)
Observations	5,580	5,580	5,580	5,580	5,580	5,580	5,580	5,580
Mean of Dependent Variable	0.054	0.072	0.056	0.037	0.019	0.005	0.021	0.017

Notes: Each column displays estimated reform impacts on haemorrhage early in pregnancy based on two-way FE models following equation 1 (panel A) and 2 (panel B), however now only for a specific demographic group (quinquennial ages in columns 1-6, and insurance coverage status in columns 7-8). All additional details follow notes to Table 2. $^{*}p< 0.10$; $^{**}p< 0.05$; $^{***}p< 0.01$. Referenced on page [34].

Figure A19: Estimated Impacts by Age Groups Among Young Women



(a) Haemorrhage Early in Pregnancy



(b) Abortion Related Morbidity

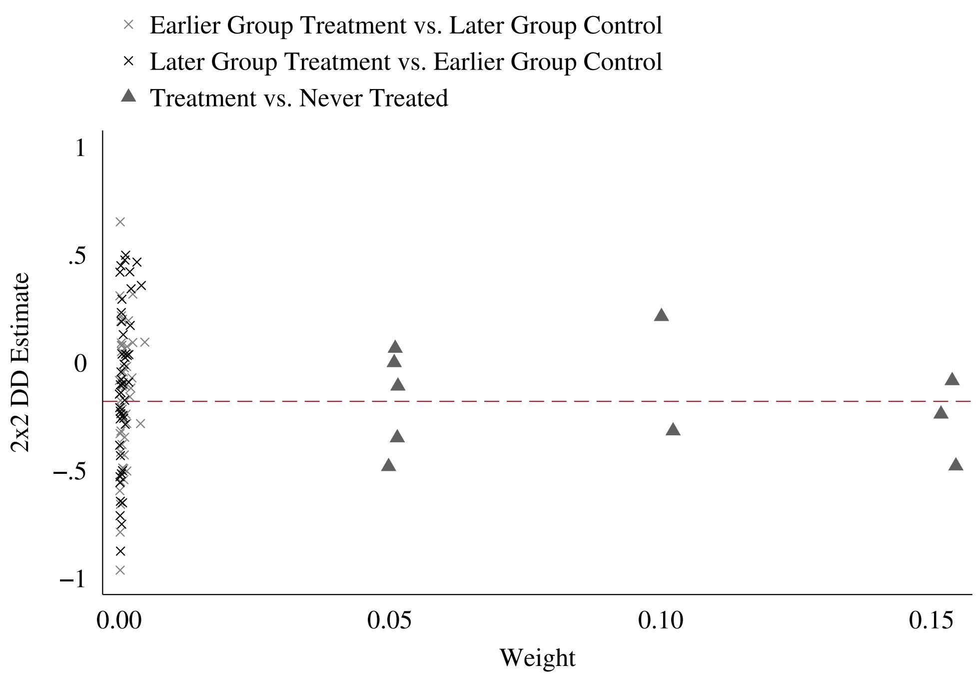
Notes: Figure replicate estimates from Table 2, however now for each yearly age group between 15–25 years. In each case, specifications follow those documented in Panel A of Table 2 (indicated by hollow circles) and Panel B of Table 2 (shaded squares), working only with the proportion of women of that particular age suffering the indicated morbidity outcomes. Each specification is weighted by the population of women of this age. All additional details follow equations 1-2. Referenced on page [35,35].

Table A19: Weights and Estimates from the Goodman-Bacon (2018) Decomposition

	Weight	Estimate
Panel A: Haemorrhage Morbidity		
Earlier Treated vs. Later Control	0.032	0.005
Later Treated vs. Earlier Control	0.039	-0.002
Treated vs. Never Treated	0.929	-0.004
Difference-in-difference Estimate	-0.003	
Panel B: Abortion Related Morbidity		
Earlier Treated vs. Later Control	0.032	0.009
Later Treated vs. Earlier Control	0.039	-0.007
Treated vs. Never Treated	0.929	-0.008
Difference-in-difference Estimate	-0.007	
Panel C: Fertility		
Earlier Treated vs. Later Control	0.045	-0.103
Later Treated vs. Earlier Control	0.038	0.085
Treated vs. Never Treated	0.917	-0.195
Difference-in-difference Estimate	-0.180	

Notes: The Goodman-Bacon (2018) decomposition above displays the weights and components making up the global "single coefficient" DD model where treatment refers to states adopting regressive abortion policies. Decompositions are documented for haemorrhage and abortion morbidity (panels A and B), and for fertility (panels C) where all models follow specification 2. For the decomposition, each components' weight is given along with the point estimate for this comparison. The global estimate is displayed at the foot of each panel. Each of these components is statistically insignificant at the 95% level. A unit-by-unit decomposition is given in Figure 5 (morbidity) and Figure A20 (fertility). Referenced on page [35,36,36,A38,A38].

Figure A20: Goodman-Bacon (2018) Decomposition Based on 2×2 Difference-in-Difference Models for Birth Rates



Notes: Figures document the Goodman-Bacon decomposition into a series of 2×2 difference-in-differences models depending on the type of comparison unit. Here the "treatment" refers to the passage of a regressive abortion law, and the outcome is the birth rate per 1,000 women. The passage of the ILE reform occurred at a single moment in time, and as such, decompositions need not be performed. The global decomposition is given in Table A19. Referenced on page [35,A38].

Table A20: The Effect of the Abortion Reform on Reported Sexual Behaviour (Panel Specification)

	(1) Modern Contracep Knowledge	(2) Any Contraception	(3) Modern Contraception	(4) Num of Sex Partners
ILE Reform	0.002	-0.012	-0.013	-0.111
	(0.276)	(0.914)	(0.901)	(0.776)
Regressive Law Change	-0.009	0.041	0.014	0.267
	(0.304)	(0.492)	(0.814)	(0.064)
Observations	10007	10007	10007	10007
R-Squared	0.889	0.568	0.558	0.531
Mean of Dependent Variable	0.999	0.569	0.610	1.418

Notes: Each column presents a separate regression of a contraceptive or sexual behaviour variable on abortion reform measures, household fixed effects, year fixed effects and time-varying controls. p-values are presented below coefficients in parentheses. Referenced on page [39].

Table A21: Summary Statistics, MxFLS data on women aged 15-44

	(1) **Mexico City**	(2) **Regressive States**	(3) **Rest of Mexico**	(4) **Full Country**
Contraception knowledge	0.991	0.997	1.000	0.998
	(0.094)	(0.051)	(0.011)	(0.044)
Use modern method	0.676	0.589	0.578	0.590
	(0.469)	(0.492)	(0.494)	(0.492)
Use any method	0.686	0.638	0.617	0.632
	(0.465)	(0.481)	(0.486)	(0.482)
Age marriage	20.535	19.603	19.643	19.668
	(3.891)	(3.825)	(3.827)	(3.834)
Age first sex	18.807	18.957	18.998	18.965
	(3.676)	(3.593)	(3.541)	(3.577)
Number of sex partners	1.762	1.339	1.354	1.367
	(1.545)	(1.088)	(1.037)	(1.101)
Observations	187	5081	3526	8794

Notes: Data on household decision making and sexual behavior is obtained from the Mexican Family Life Survey (MxFLS), which was conducted in 2002-2003, 2005-2006 and 2009-2012. The sample consits of women aged 15-44 who were interviewed in all three rounds, and hence form the panel data sample. Panel A presents summary statistics from household decision making module and Panel B from the reproductive health module. Mean values are displayed with standard deviations in parentheses. Regressive states are those which ever had a regressive law change posterior to 2008. Referenced on page [39,A44].

Table A22: The Effect of the Abortion Reform on Reported Sexual Behaviour (Repeated Cross-Section Specification)

	(1) Modern Contracep Knowledge	(2) Any Contraception	(3) Modern Contraception	(4) Num of Sex Partners
ILE Reform	-0.011	-0.050	-0.057	-0.111
	(0.513)	(0.579)	(0.520)	(0.675)
Regressive Law Change	-0.002	0.093	0.065	0.150
	(0.815)	(0.008)	(0.065)	(0.106)
Observations	10007	10007	10007	10007
R-Squared	0.037	0.027	0.029	0.033
Mean of Dependent Variable	0.999	0.569	0.610	1.418

Notes: Each column presents a separate regression of a contraceptive or sexual behaviour variable on abortion reform measures, year fixed effects and time-varying controls. p-values are presented below coefficients in parentheses. Referenced on page [39].

B Data Appendix

B.1 Maternal morbidity, maternal mortality and birth records

Complete data on morbidity and mortality are available for both the public and private health care systems in Mexico. Microdata on each hospital stay record the age and sex of the patient, the number of nights in hospital, as well as the principal diagnosis based on ICD-10 codes. There are approximately 165 million single records for the period of 2004-2015 accounting for 558 million nights of hospitalisation. Of these, 46 million visits and 84 million nights of hospitalisation are related to "Pregnancy, childbirth and the puerperium" (the ICD-10 "O" code). These data are universal and include all hospital visits in the country.[32]

Complete microdata are released in three different formats depending on the hospital type where treatment is provided. Hospitals in the public health system are administered by one of two types of providers. The first, the Mexican Secretariat of Health, is the ministry of health of the national government, and accounts for 47.0% of all hospital stays related to pregnancy, childbirth and the puerperium in the period under study. The second are hospitals run by public social security providers, principally the Mexican Institute of Social Security (IMSS), and the State Workers' Institute of Security and Social Services (ISSSTE), which account for 29.5% of hospital stays in the ICD-10 "O" class. Finally, the remainder of hospital stays (23.5% of ICD-10 "O" cases) are treated in private hospitals. All private hospitals are required to provide information on each hospital stay in a standardised format, which is reported to the National Institute of Statistics and Geography (INEGI).

All public hospitalisation records are freely available as microdata files. However, data from hospitals run by the Secretariat of Health are available from 2000-2015 with the exact dates of hospitalisation, while data from hospitals run by social security providers are available only from 2004-2015, and only provide the year of hospitalisation. Our analysis of impacts of abortion reform on maternal health use these databases, where we compile state by year measures for key causes of morbidity for each year between 2004-2015. We also undertake monthly analysis with only data from hospitals administered by the Secretariat of Health given that these allow us to examine exact dates of hospitalisation, and hence generate state by year *by month* morbidity measures. Data from the private system are available for remote processing by request from INEGI. We follow a similar process with these microdata files, generating state by year values for the number of events in key morbidity classes defined below. However, while private hospitals provide information on the cause of hospitalisation, this is provided at a more highly aggregated level than public records. In particular, 10 different diagnosis classes are provided which map from the 76 diagnosis codes included in the three digit ICD-10 "O" codes. We document the mapping for each diagnosis in the public and private sector morbidity data in Appendix Table A3. While our principal analysis focuses on the public data given the lower level of aggregation available, we show that results in aggregate private-sector data are consistent with our main results.

We focus on two particular morbidity classes when examining the impact of abortion reform on female health outcomes. These are abortion-related causes, and haemorrhage early in pregnancy. The first outcome is typically examined when considering the impacts of unsafe abortion on women's health in the medical and public health literature. It includes all forms of morbidity classified in ICD-10 codes O02-O08. A full discussion of this coding is provided in Singh and Maddow-Zimet (1999).

[32]The only exception is that these databases do not include standard hospital-stays for newborns following birth.

We additionally consider the impact of abortion reform on haemorrhage in early pregnancy. This is classified as haemorrhage prior to 20 weeks of gestation, and is coded from ICD-10 code O20. We focus on this outcome given that haemorrhage (along with incomplete abortion) is one of the two most common complications of unsafe abortion (World Health Organization, 2018; Gerdts et al., 2013), and given the widespread use of misoprostol as an abortifacient agent in clandestine abortions prior to the ILE reform in Mexico DF. While bleeding is a normal side-effect of misoprostol use as an abortive agent, when taken in unsupervised settings misoprostol can lead to heavy bleeding and haemorrhage (Pourette et al., 2018).[33] Together these two outcomes cover 8 of the 76 ICD-10 code classes, but make up 11.1% of all maternal hospitalisations in the years under study, or 21.5% of maternal morbidity when excluding deliveries (refer to Appendix Table A3 for a full description of all maternal morbidity causes). With the exception of a 'placebo' test based on examining (late term) obstetric complications (ICD code O70-O75), the remainder of the ICD O codes are not examined as outcomes as it is unlikely that they are sequelae of abortion (for example eclampsia or pre-eclampsia), or are morbidities occurring in the puerperium period, and so unable to be sequelae of abortion.

Finally, measures of maternal mortality by state and year are generated from INEGI's full mortality register. This register classifies maternal deaths according to ICD-10 codes.[34] Mexico's register of maternal deaths is recognised to be of high quality, with Mexico being classified as belonging to the "A-class" (World Health Organization, 1987) in the latest WHO report on maternal mortality trends. These data have had particular improvements from 2001, and as such, we restrict our period of analysis to 2001-2016 (see Schiavon et al. (2012b)).

Vital statistics for births in Mexico are compiled by INEGI based on birth registries completed by each parent or guardian at the civil registry, rather than being based on birth certificates issued at hospitals (as is the case, for example with the National Vital Statistics System in the USA and in various developing and emerging economies, like Chile and Argentina).[35] The birth register is released once per year, containing all births *registered* in that year, as well as the year the birth occurred. In order to avoid problems of under-reporting, differential reporting over time, and double-reporting, we collate all birth registers between 2002-2016, and then keep all births registered within 4 years of the date of birth.[36] This implies that we have complete birth registers based on birth years up to (and including) 2013.[37] Unregistered births will only be a problem if rates of birth registration

[33]Accounts of self administered abortion in a case study in Brazil described in Grimes et al. (2006b), suggest that even though the use of Misoprostol as an abortifacient increased safety, hospitalisation due to haemorrhage was the outcome in cases of complications. They state: "Women would self-administer the drug orally and then seek medical assistance if the uterine bleeding did not stop" (Grimes et al., 2006b, p. 1916).

[34]Formally, maternal deaths are defined by the WHO as "The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes".

[35]Using data from the 2010 census and birth records up until 2009, a recent (backward looking) analysis suggests that 93.4% of all births in Mexico were registered within 1 year of birth of the child, and in total, 94.2% of births are eventually registered at the national level (Instituto Nacional de Estadística y Geografía, 2012).

[36]This allows us to record births even when they are registered months after birth (up to 36 months following the birth). Considering additional registration lags results in virtually unchanged estimates, as nearly all ever-registered births are registered within 4 years of birth. This is identical to the methodology employed by Mexico's population authority in their calculation of official demographic trends (Consejo Nacional de Población, 2012).

[37]While these birth registers are not universal, they are considered as being of very good quality compared to many other registry systems in developing economies. On average, dated estimates suggest that across all developing countries 41% of births are unregistered, and this figure for Latin America alone is 14% (UNICEF, 2005).

change differentially between regions of Mexico over the period under study. Empirical evidence on changes in birth records between 1999 and 2009 do not suggest a strong relationship between reform and non-reform areas, and changes in rates of coverage (Instituto Nacional de Estadística y Geografía, 2012).

The INEGI Birth Register contains information about the date of birth, actual birthplace and the official residency of the mother. In addition, information on maternal characteristics such as age, total fertility, educational attainment, marital status and employment status are recorded. In principal analysis we examine full state by month by year aggregate figures for each of the 32 states. Summary statistics are provided in Table A4. In additional specifications we consider birth rates for quinquennial age groups (15-19, 20-24, 25-29, 30-34, 35-39 and 45-49), where state aggregates are calculated in an identical manner, however subsetting only to births occurring to each women aged in the relevant group at the moment she gives birth.

B.2 Administrative records on criminal offenses, survey data on sexual behaviour and additional data sources

To examine *De Jure* sentencing of abortion, we use administrative records from Mexico's Judicial Statistics on Penal Matters provided by INEGI. These records contain microdata registering each prison sentence handed down by the Mexico judiciary, the reason for the sentence, and the length of each sentence. It comprise the universe of judiciary decisions in the country based on the first legal judgment, and so does not include any subsequent appeals. We calculate prison sentence lengths from a categorical variable which records sentence lengths in binned windows (ranging from 0-2 months to > 20 years). These bin widths in microdata do not change over the period under study, and are identical in each state of the country. We consider *all* legal findings related to abortion impacting any individual. Trends in *De Jure* sentencing of abortion are presented in Appendix Figure A14.

For a small number of supplementary tests we use survey data from the Mexican Family Life Survey (MxFLS). The MxFLS is a nationally and regionally representative longitudinal data set that follows the Mexican population over time, covering various topics regarding the well-being of individuals including information on reproductive health.[38] The survey was conducted in three waves during 2002-2003, 2005-2006 and 2009-2012.

We use the reproductive health module from the MxFLS which collects information on contraceptive knowledge and usage as well as information on sexual behavior such as the number of sexual partners. This sample consists of a panel of women aged 15-44 who completed the reproductive health questionnaire resulting in a total of 5,404 women. Summary statistics for reproductive health across regions are provided in Appendix Table A21) and show that average knowledge of at least any kind of modern contraceptive methods are generally high across all regions, while the average usage of any kind of contraceptives and modern contraceptives are higher in Mexico DF compared to other states.

We collect a number of additional variables measured at the level of state and year. These are

[38]The MxFLS dataset is publicly available, developed and operated by the Iberoamerican University (UIA) and the Center for Economic Research and Teaching (CIDE) and also supported by multiple institutions in both Mexico (INEGI and National Institute of Public Health) and the USA (Duke University and Universities of California, Los Angeles).

either used to calculate rates of exposure for health and fertility outcomes (in the case of population), or as time-varying controls in regression analyses. The population of women aged from 15-49 by state is accessed from the National Population Council of Mexico (CONAPO). Time-varying controls are compiled to capture possible confounders of abortion policy, namely education, health investment and access, economic development, and women's social inclusion. We collect measures for each state and year from 2001 to 2016 describing the proportion of each state living in poverty, the proportion of women who are economically active, the average level of completed schooling of the population, the average salary paid to full-time workers, the proportion of the population with access to health-care facilities, and the rollout of the national health insurance program *Seguro Popular*.[39] Summary statistics for each variable as well as a list of sources are provided in Appendix Table A5. In the period under study we observe that state averages for years of schooling of adults is 8.5 years, 37% of women of working age are economically active, and the average salary is slightly over 5000 Mexican Pesos. These variables are merged by year and state to the morbidity, mortality, and birth data discussed earlier in this Section.

[39]Mexico's General Health Law underwent a major reform in 2003, which intended to provide 50 million Mexican citizens lacking social security with subsidized and publicly financed health insurance. The core of this reform was the health insurance program *Seguro Popular* (SP). The "People's Insurance" or *Seguro Popular* was launched in 2002, offering health service free of charge or subsidized to those without formal health insurance.

C Synthetic Control Estimates

The evidence in this paper is based on difference-in-difference and event study models. DD and event study estimates base the control group on all non-reform states. As a consistency check on these results and to ensure that estimates for the impact of the ILE reform are not driven by any pre-existing differential trends, we also compare outcomes in Mexico DF with those in a single synthetic control state. Although specifications 3 and 4 provide evidence in favour of parallel (pre-)trends if we can reject that each $\delta_j = \gamma_j = 0 \; \forall \; j < 0$, we may nonetheless be concerned with unobserved heterogeneity between treated and non-treated states. As an additional test and a plausibility check of estimates from equations 1 and 3 *for the impact of the ILE reform only*, we construct a synthetic control estimate to compare with Mexico DF. This procedure is particularly suitable to quantify the effect of the ILE reform in Mexico DF where there is a single treated unit, however not for the Regressive policy changers where a number of states adopt at different points in time. Our interest is to quantify the impact of the ILE reform, by comparing health outcomes in Mexico DF, the treated area, with outcomes in the rest of Mexico. This consists of determining the counterfactual state for a single treated state, following Abadie et al.'s (2010) synthetic control method where the single counterfactual "synthetic control" unit is generated based on a re-weighted pool of all the untreated states. This counterfactual is chosen to minimise the matrix norm based on the distance between average outcomes in the pre-treatment period, and the estimated ATT is inferred as the difference between the treated unit and the synthetic control unit in the post-treatment period. Our implementation of the synthetic control procedure is standard, as outlined in Abadie et al. (2010). The "donor" pool from which we calculate synthetic controls include each of the remaining states with the exception of neighbouring Mexico State, in which a non-trivial proportion of abortions were accessed by women. We have discussed spillover effects in Section 5.3 of this paper.

In order to conduct inference on the estimated treatment effect, we similarly follow Abadie et al. (2010), and undertake permutation inference. In graphical analysis, we calculate identical synthetic controls for the 30 untreated donor states, and generate placebo reform estimates assuming an identical reform timing. We then compare the true reform impact in each year with the impact for each of the placebo estimates in this year, to determine whether the estimated impact in the treated region is large compared with placebo cases where no substantial impact should be observed. When considering inference on a single ATT based on the mean post-treatment decline, we implement permutation inference comparing our main effect with the effect in all potential control states, and all potential treatment periods, as suggested in Abadie et al. (2010, p. 497).[40] This provides a larger pool of placebo outcomes, giving greater precision to reported p-values resulting from permutation inference.

All results of this consistency check using synthetic control methods are provided in this Appendix.

[40] In particular, the p-value associated with the ATT for the impact of ILE on health outcomes is calculated as:

$$p = \frac{\sum_{s=2}^{31} \sum_{t=2004}^{2014} 1\{|\hat{\alpha}_{1,2007}| \leq |\hat{\alpha}_{t,s}|\}}{N_{s,t}}$$

where $\hat{\alpha}_{s,t}$ refers to the average post-treatment difference between the treated (or placebo) unit and its synthetic control for state s where the (placebo) treatment is assigned as occurring in year t. Here state $s = 1$ refers to Mexico DF and the true treatment year is $t = 2007$, and so $\hat{\alpha}_{1,2007}$ is the true treatment effect, while permutations of each state×year pair $(2,\ldots,31)\times(2004\ldots2014)$ are placebo trials. $N_{s,t}$ refers to the total number of placebo permutations.

Morbidity Effects In Figure A21 we present results based on a consistency check comparing rates of haemorrhage early in pregnancy and rates of morbidity for all abortion related causes in Mexico DF and in a synthetic control state. In Panel A we observe an immediate and sharp fall in rates of haemorrhage early in pregnancy, falling from approximately 2.3 cases per 1,000 fertile aged women to approximately 1.3 cases per 1,000 women. This agrees with DD and event study results documented above. Additionally, this supports claims from the medical literature that haemorrhage is one of the major drivers of maternal morbidity and mortality following unsafe abortions (World Health Organization, 2011), as the appearance of a legal and sterile alternative to clandestine abortion resulted in an immediate a 43% reduction in hospitalisations resulting from haemorrhage early in pregnancy. In the sub-set of data for which the month as well as the year of hospitalisation is recorded (those in hospitals administered by the Secretary of Health), we observe that this fall occurs precisely in the month that abortion was legalised, suggesting that changes in haemorrhage morbidity were immediate with the arrival of new legislation (see Figure 1).

In Panel B of Figure A21 we present trends in rates of morbidity due to abortive causes. In this case we observe a more gradual reduction in morbidity, with a clear difference 4 years post-reform. In longer trends from public hospital data displayed in Appendix Figure A4, descriptive figures do suggest that this was a turning point in Mexico DF, with a peak in 2008, after a steady increase from 2000, and then a steady decline in the total number of cases of hospitalisation up until 2015. In the case of abortion morbidity, as noted in the paper, it is important to highlight that the procedure used for abortions realized under the auspices of ILE has changed over time, from a baseline rate of only 25% medical abortions versus 75% surgical, to around 75% medical abortion by 2011. The large rise in medical abortion has both improved the safety of the program and enabled for the high demand for elective abortion to be met.

In Figure A23 we present a visual representation of permutation inference for synthetic control estimates following Abadie et al. (2010). In the left-hand panel, we compare the difference between haemorrhage morbidity in Mexico DF and its synthetic control with placebo differences in each other state in Mexico compared to its own synthetic control. In the first post-reform year, the true estimate exceeds all other placebo iterations, and this largely remains to be true in subsequent years, although from 5 years post-reform a number of more extreme outcomes are observed in certain (generally smaller) states. To calculate an exact permutation p-value, we follow the state and year permutation procedure, generating the null distribution displayed in Appendix Figure A24. A two-tailed test suggests a p-value of 0.09, and a one tailed test suggests a p-value of 0.06, respectively implying that only 9% of placebo outcomes result in an average post-placebo change which is more extreme than the true post-treatment change in D.F, and only 6% of placebos have a larger reduction. In the right-hand panel of Figure A23 we observe similar placebo estimates for abortion related morbidity. In line with the slower-reduction in abortion-related morbidity, we do not observe that the outcome in Mexico DF is more extreme than all placebo outcomes until multiple years post-reform. Only in 2014 and 2015 is the difference more extreme in the true treated state than each placebo iteration. Complete randomization inference similarly suggests that average treatment effects over the whole reform period are less extreme than in the case of haemorrhage. Specifically, two-tailed tests suggest a p-value of 0.19, or 0.087 in the case of one-tailed tests (Appendix Figure A25).

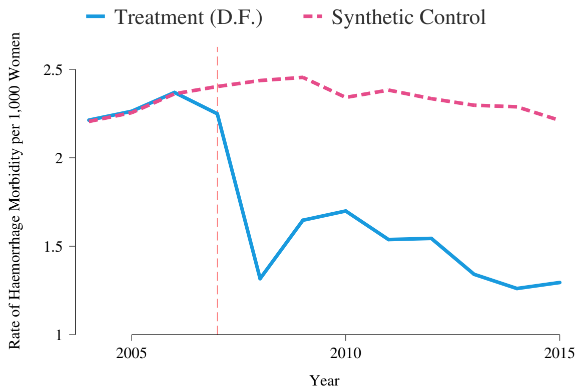
Birth Rates The difference between outcomes in Mexico DF and the synthetic control state are documented in Figure A26. Here we observe that while there was a downward trend in birth rates in DF including prior to the reform,[41] synthetic control results suggest that this decline accelerated following the implementation of ILE in 2007 when comparing Mexico DF with the synthetic control state. Figure A26a shows the trend in Mexico DF (solid line) as compared to the synthetic control (dashed line), where the synthetic control is chosen to minimise the RMSE in the difference between these two rates prior to the reform. The fertility rates in Mexico DF are substantially below those of the synthetic control, and appear to diverge over time. The average difference in rates of birth per 1,000 women over the time-period under study is 6.8 births (comparable to the DD results discussed above), and this difference is as large as 15 births per 1,000 women 6 years following the ILE reform. When cast in terms of the average fertility rates of Mexico DF in the pre-reform period (89 births per 1,000 women), this accounts for approximately a 7.5% reduction.

In Figure A26b, we compare the synthetic control estimates for Mexico DF with a series of placebo reforms for each of the remaining 30 states to determine whether the estimated impacts on morbidity are relatively large compared with contexts in which a zero impact would be expected. In initial years, particularly in 2008, we do not observe that outcomes in Mexico DF are extreme when compared to placebo cases, and so cannot suggest an immediate statistically significant effect. However, in general we observe that over time, differences in Mexico DF become more extreme than all placebo outcomes. From 4 years post-reform, the difference between Mexico DF and its synthetic control is larger in absolute terms than any of the 30 placebo changes. In Appendix Figure A28 we compare this mean outcome with a null distribution based on permutations of treatment by state and year. We observe that the outcome observed in Mexico DF is extreme with respect to the null distribution. Only 4.2% of placebo iterations have a more extreme outcome than that observed in Mexico DF following the ILE reform, and this falls to 0.3% if considering only those which suggest a larger reduction than in Mexico DF (corresponding to two- and one-tailed p-values of 0.042 and 0.003 respectively).

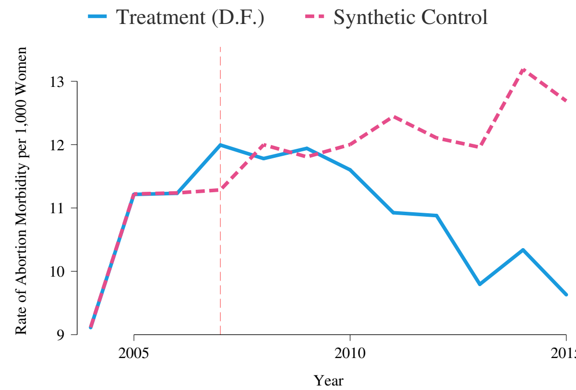
Policy Spillovers with a Synthetic Control Finally, we return to consider the possibility of spillovers from the ILE reform to nearby states where some access to abortion was observed (Mexico State, Hidalgo and Morelos), comparing these states to their own synthetic control state. These are presented in Table A23. Full graphical output and inference is documented in Figures A29, A30, and A31. For comparison we present synthetic control estimates from Mexico DF from Figure A26 (births) and Figure A21 (morbidity). In each case, the synthetic control is chosen from among all remaining states (ie all states except for Mexico DF, Mexico State, Morelos and Hidalgo). Along with estimates, p-values are presented, which quantify the proportion of placebo iterations resulting in more extreme estimates than the difference between the state in interest and its synthetic control. Here, placebos are all permutations of donor states and years. In each of the three non-DF states where the largest proportion of abortions were performed, no significant impact was observed on rates of birth, or maternal morbidity. Point estimates are both considerably smaller in magnitude to those from Mexico DF (the largest is a reduction of 2 births per 1,000 women in the state of Morelos), and p-values all suggest little evidence to reject null hypotheses of no spillover impacts of reforms on these outcomes in this time period.

[41] This is in line with a general trend in declining fertility across the country, which began in the 1960's or 1970's depending on the state (Tuiran et al., 2004).

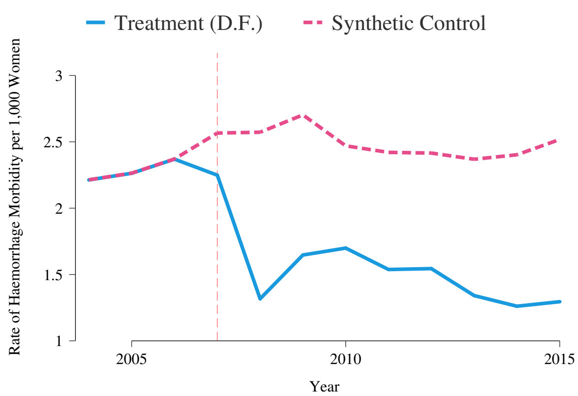
Figure A21: Morbidity Outcomes in Mexico DF and a Synthetic Control Group



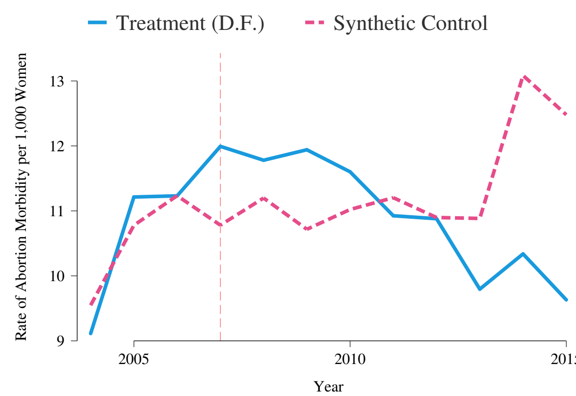
(a) Haemorrhage Early in Pregnancy



(b) Abortion Morbidity



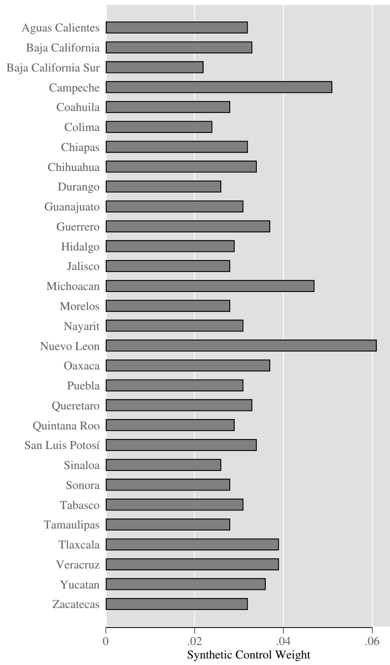
(c) Haemorrhage Early in Pregnancy



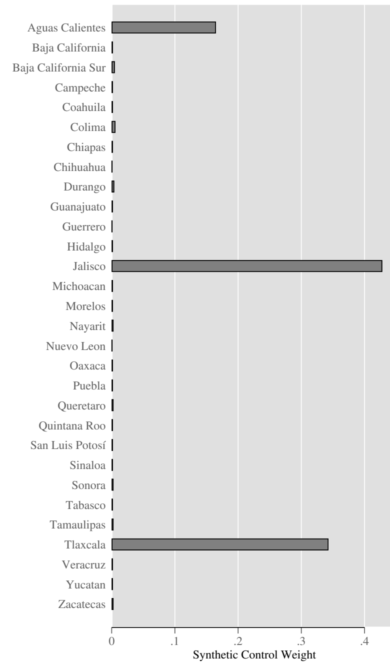
(d) Abortion Morbidity

Notes: Left-hand panel displays all morbidity classified as ICD codes O02-O08 (for reasons relating to abortion). Right hand panel displays morbidity for haemorrhage early in pregnancy (prior to week 20 of gestation). In each case synthetic controls are based on a pool of the 30 other states of Mexico (excluding Mexico DF and Mexico State) in the top row (panels a and b) and based only states which do not subsequently implement a regressive reform in the bottom row (panels c and d). All synthetic controls are selected based on rates of abortion morbidity in all *pre*-reform years. Morbidity is per 1,000 women aged 15-49 residing in the state. The weighting of states to form the synthetic control in each panel is displayed in Figure A22.

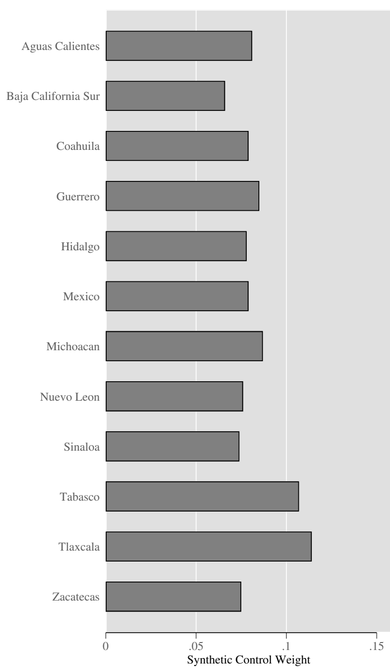
Figure A22: Synthetic Control Weights for Morbidity Outcomes



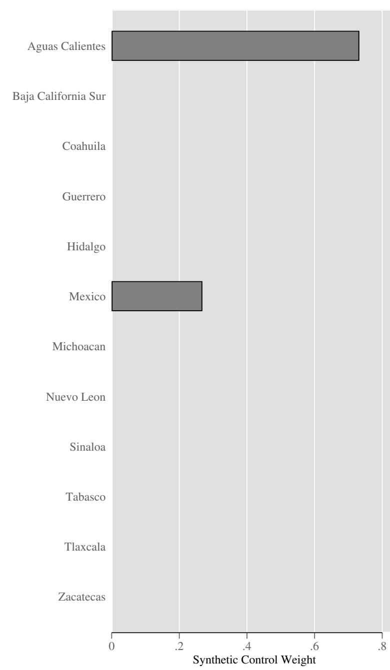
(a) Haemorrhage Early in Pregnancy



(b) Abortion Morbidity



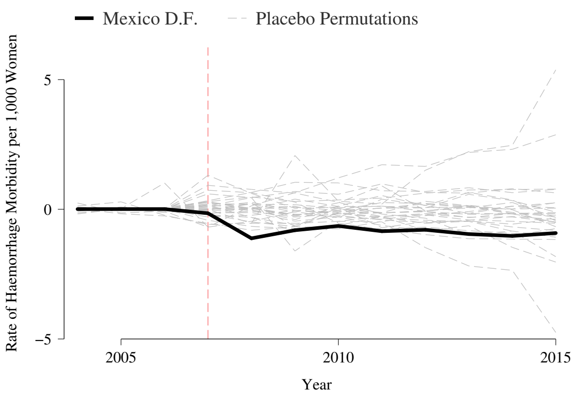
(c) Haemorrhage Early in Pregnancy



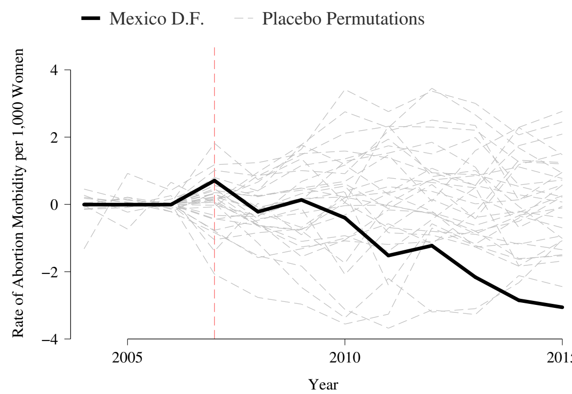
(d) Abortion Morbidity

Notes: The composition of each synthetic control is displayed, where bars refer to the weight given to each state. Weights are greater than or equal to 0 for each state, and sum to 1 over all states. The weights correspond to each panel displayed in Figure A21. Refer to notes to Figure A21 for differences between panels.

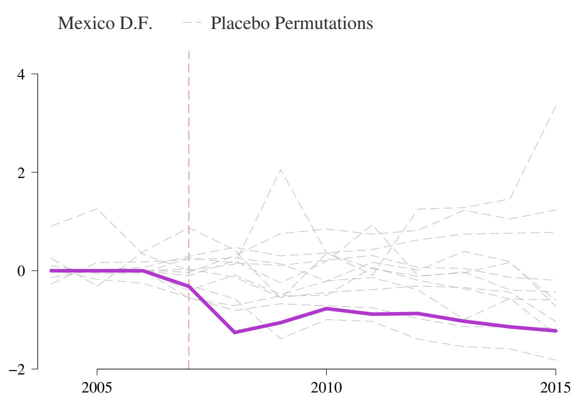
Figure A23: Inference: The Impact of Abortion Reform on Maternal Morbidity



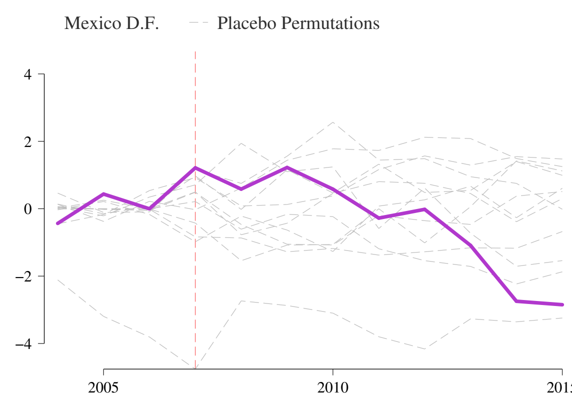
(a) Haemorrhage Early in Pregnancy



(b) Abortion Morbidity



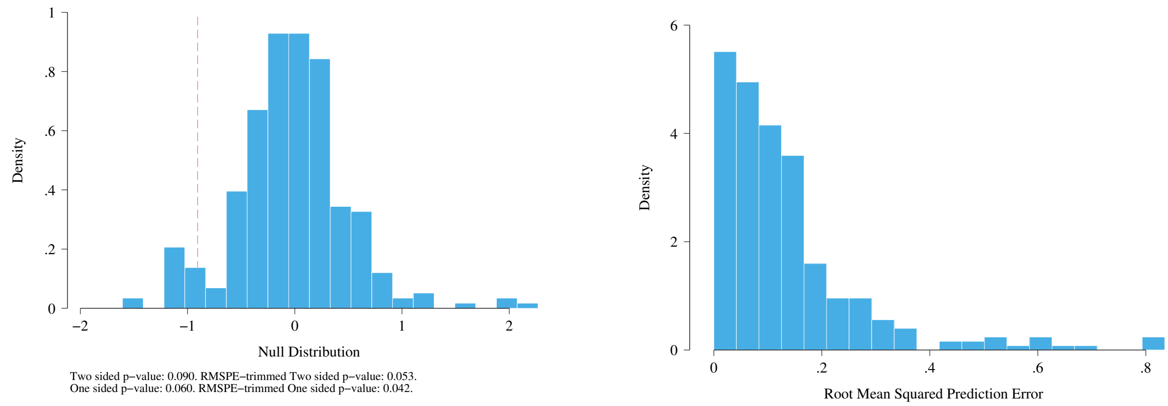
(c) Haemorrhage Early in Pregnancy



(d) Abortion Morbidity

Notes: Inference for synthetic control estimates of the impact of the ILE reform on morbidity based on placebo permutations are displayed. Each panel displays the difference between Mexico DF and its synthetic control (as a thick solid line), and all other placebo permutations, where the remaining states are considered as treated in 2006, and their synthetic control is determined based on an identical procedure as for Mexico DF. These are displayed as thin dashed lines. In the top row, all other states with the exception of Mexico are considered as part of the pool of placebos, and in the bottom row, only states which did not implement a subsequent regressive reform are considered as placebos.

Figure A24: Complete Randomization Inference for Synthetic Control: Haemorrhage Morbidity

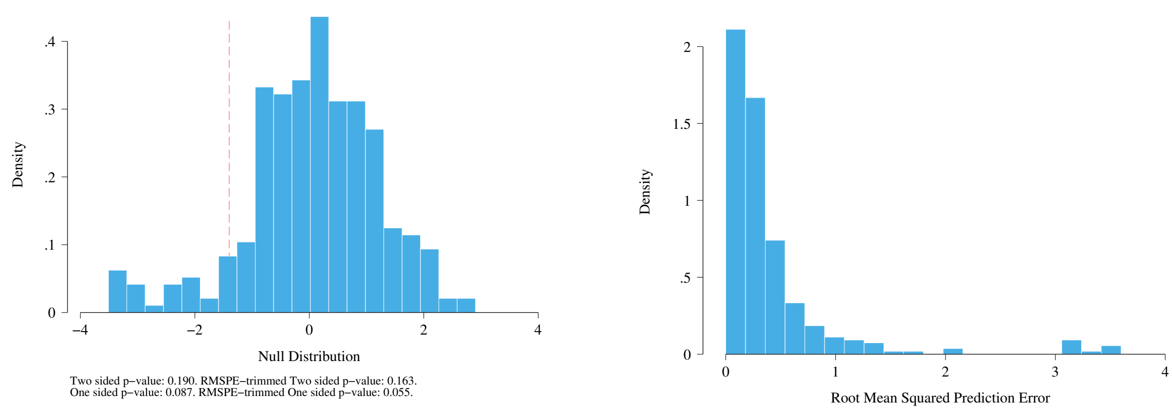


(a) Null Distribution based on Randomization Inference

(b) RMSPE from Placebo Synthetic Controls

Notes: Left-hand panel plots the null distribution of average synthetic control placebo estimates $\hat{\alpha}^*$, and the actual estimate as the vertical dashed line. The actual estimate in this case is $\hat{\alpha} = -0.906$. Each placebo estimate is generated from a synthetic control permutation where the placebo-treatment state is one of the 30 non-ILE states, and the treatment year is one of the years from 2005-2014. Full permutations for each state and year combination are generated. The right-hand panel plots the RMSPE associated with each synthetic control procedure. When considering trimmed p-values, we trim the sample at RMSPE<0.4 to avoid cases where the synthetic control does not re-create pre-reform averages. Untrimmed p-values are based on the full set of permutations.

Figure A25: Complete Randomization Inference for Synthetic Control: Abortion Related Morbidity

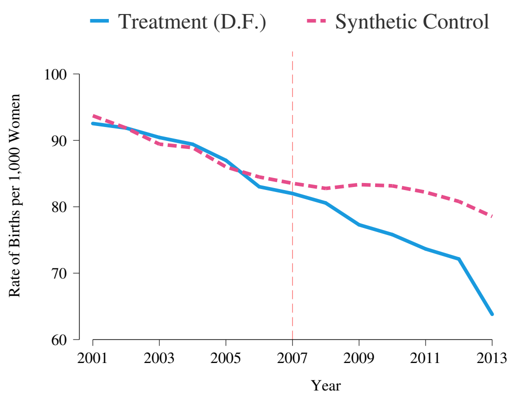


(a) Null Distribution based on Randomization Inference

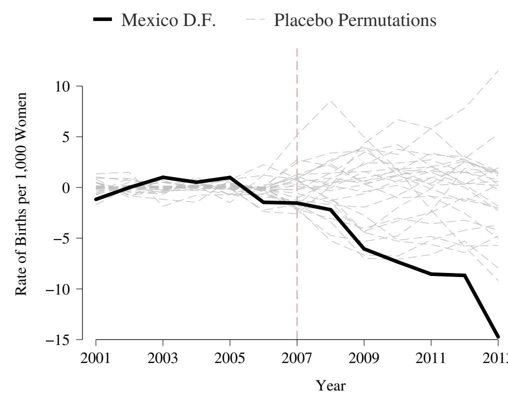
(b) RMSPE from Placebo Synthetic Controls

Notes: Refer to notes to Appendix Figure A24. An identical procedure is followed, however now using abortion related morbidity as the outcome instead of haemorrhage early in pregnancy. The actual estimate in this case is $\hat{\alpha} = -1.399$. The RMSPE trimming constant in this case is set at 2 when trimmed p-values are displayed.

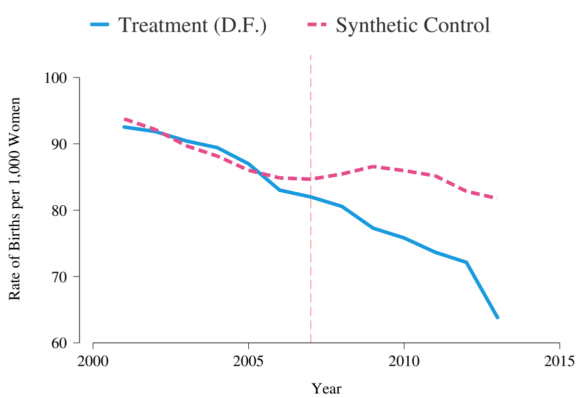
Figure A26: Fertility in Mexico DF and a Synthetic Control Group



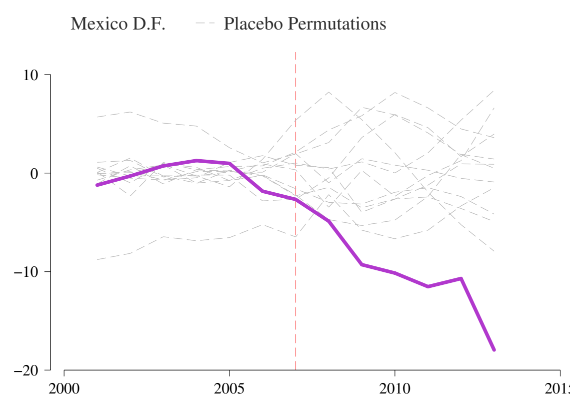
(a) Synthetic Control



(b) Inference



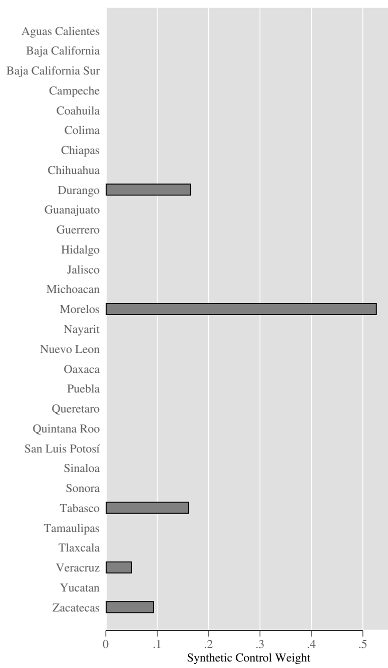
(c) Synthetic Control



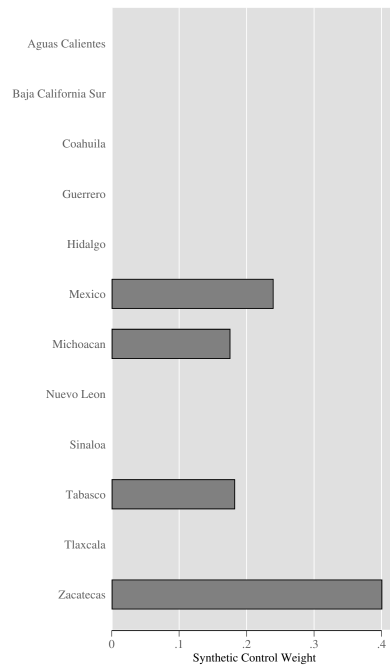
(d) Inference

Notes: Left-hand panel displays birth rates per 1,000 women aged 15-49 in Mexico DF (solid line), and a synthetic control formed from the remaining 30 states (excluding Mexico DF and Mexico State) in the top row (panels a) and formed only using states which did not implement a subsequent regressive reform in the bottom row (panel c). The synthetic control is chosen based on birth rates in all *pre*-reform years (2001-2006). The right hand panel displays the difference between Mexico DF and its synthetic control (thick solid line), and other placebo permutations, where the remaining states are considered as treated in 2006 (panel b) or where only non-regressive states are considered as treated (panel d), and their synthetic control is determined based on an identical procedure as in Mexico DF.

Figure A27: Synthetic Control Weights for Birth Rates



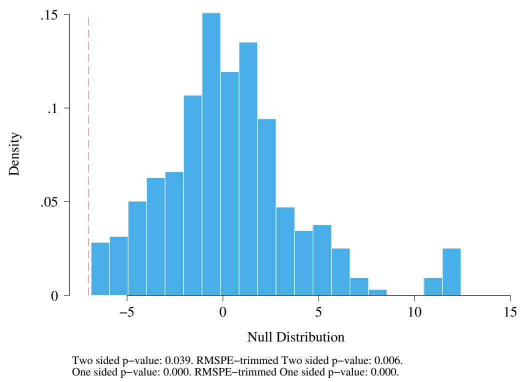
(a) 30 States as Donors



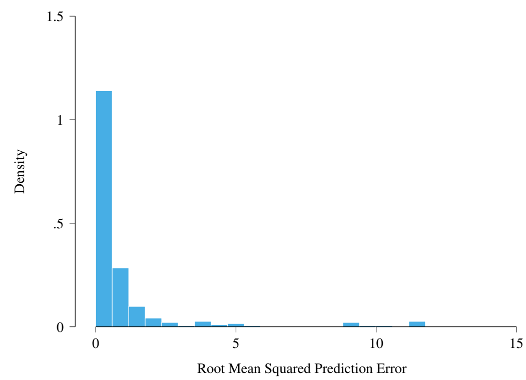
(b) Only Non-Regressive States as Donors

Notes: The composition of each synthetic control in Figure A26 is displayed, where bars refer to the weight given to each state. Weights are greater than or equal to 0 for each state, and sum to 1 over all states. The weights correspond to panels a and c in Figure A26.

Figure A28: Complete Randomization Inference for Synthetic Control: Fertility Rates



(a) Null Distribution based on Randomization Inference



(b) RMSPE from Placebo Synthetic Controls

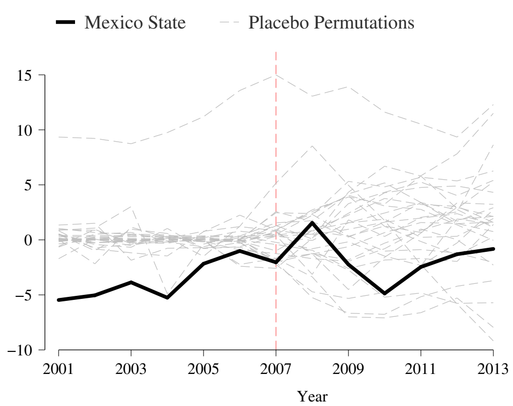
Notes: Left-hand panel plots the null distribution of average synthetic control placebo estimates $\hat{\alpha}^*$, and the actual estimate as the vertical dashed line. The actual estimate in this case is $\hat{\alpha} = -7.009$. Each placebo estimate is generated from a synthetic control permutation where the placebo-treatment state is one of the 30 non-ILE states, and the treatment year is one of the years from 2002-2012. Full permutations for each state and year combination are generated. The right-hand panel plots the RMSPE associated with each synthetic control procedure. When considering trimmed p-values, we trim the sample at RMSPE<5 to avoid cases where the synthetic control does not re-create pre-reform averages. Untrimmed p-values are based on the full set of permutations.

Table A23: Synthetic Control Estimates and Inference on Spillover Effects

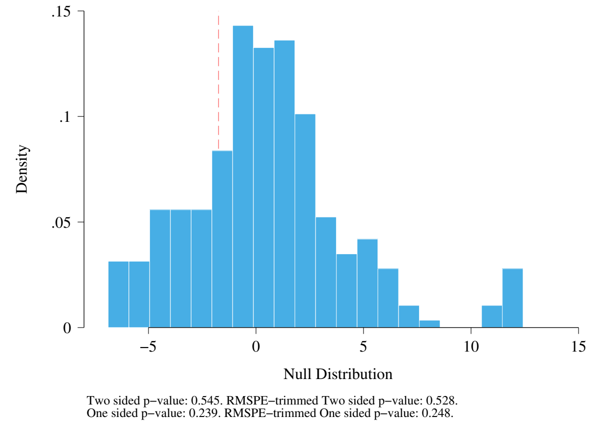
	Births		Abortion Morbidity		Haemorrhage Morbidity	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Main Synthetic Control Estimate						
Mexico DF	-7.009	[0.039]	-1.399	[0.190]	-0.906	[0.090]
Synthetic Control Estimate for Spillover States						
Mexico State	-1.741	[0.545]	0.333	[0.741]	0.559	[0.200]
Morelos	-1.764	[0.545]	0.749	[0.470]	0.118	[0.781]
Hidalgo	-0.182	[0.939]	-0.679	[0.500]	-0.264	[0.519]

Notes: Each point estimate refers to the average post-treatment difference between each state and its synthetic control, and p-values are calculated using permutation inference described in Section 4. A full display of each synthetic control estimate and permutation inference is provided in Appendix Figures A29 (Mexico States), A30 (Morelos) and A31 (Hidalgo).

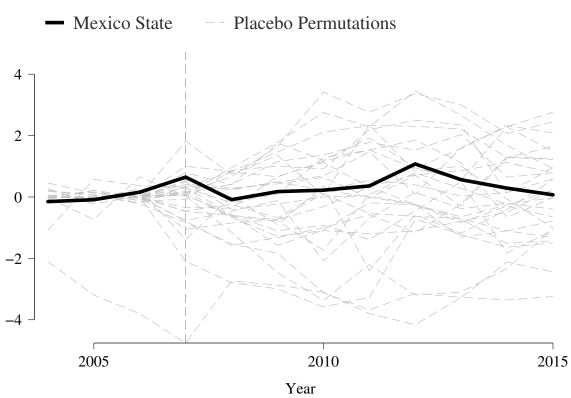
Figure A29: Synthetic Control Estimates for Spillovers: Mexico State



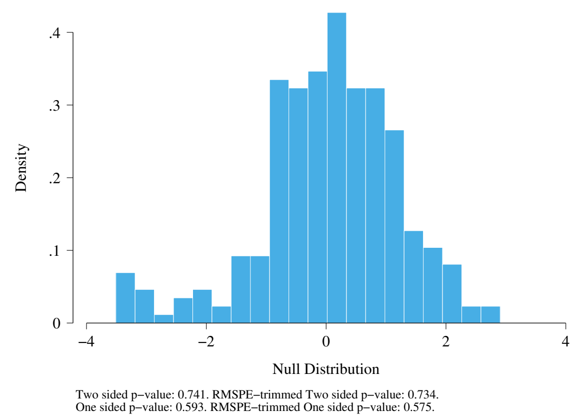
(a) Birth Rates: Inference by State



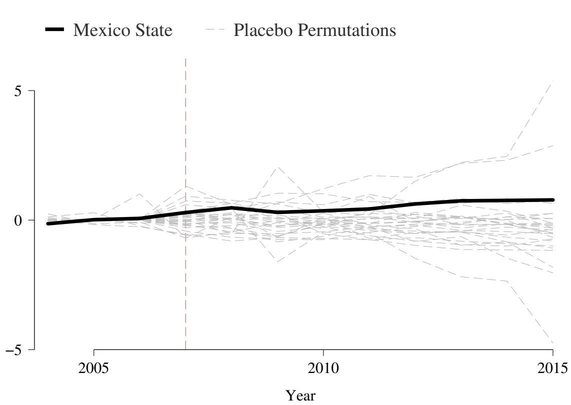
(b) Birth Rates: Inference by State and Time



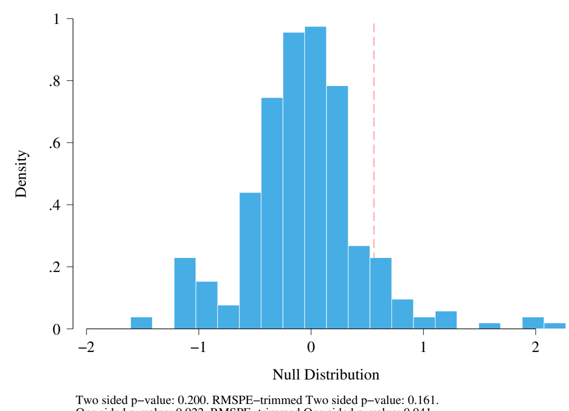
(c) Abortion Morbidity: Inference by State



(d) Abortion Morbidity: Inference by State and Time



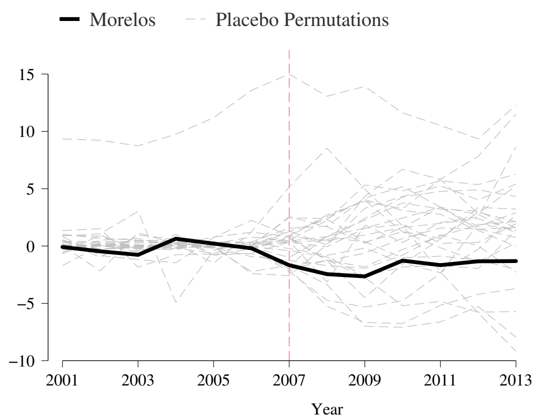
(e) Haemorrhage Morbidity: Inference by State



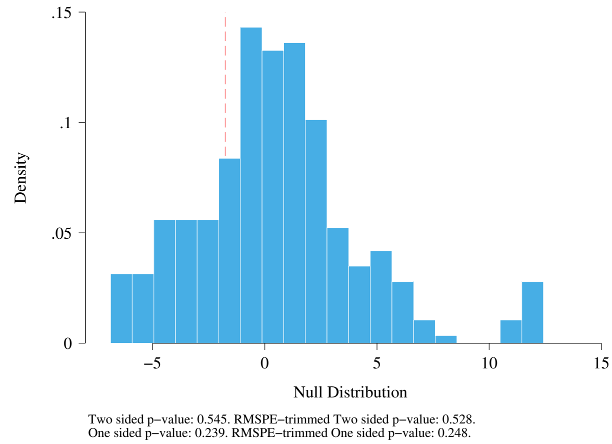
(f) Haemorrhage Morbidity: Inference by State, Time

Notes: Left-hand panels present plots of the difference between outcomes in Mexico State and similar differences between placebo states and their synthetic controls. Right hand plots compare average post-treatment differences between Mexico State and its synthetic control with a null distribution constructed permuting treatment over each donor state and time period. Panels (a) and (b) are for birth rates, (c) and (d) for abortion morbidity, and (e) and (f) for haemorrhage morbidity.

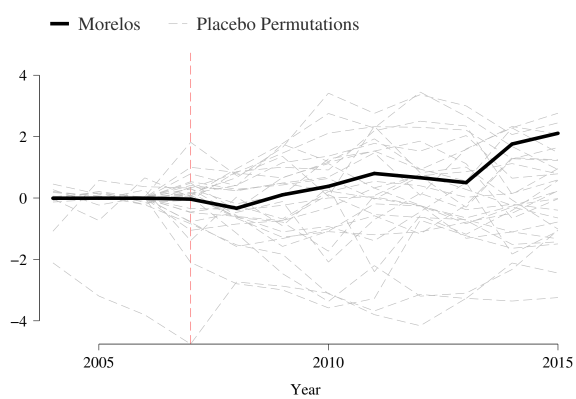
Figure A30: Synthetic Control Estimates for Spillovers: Morelos



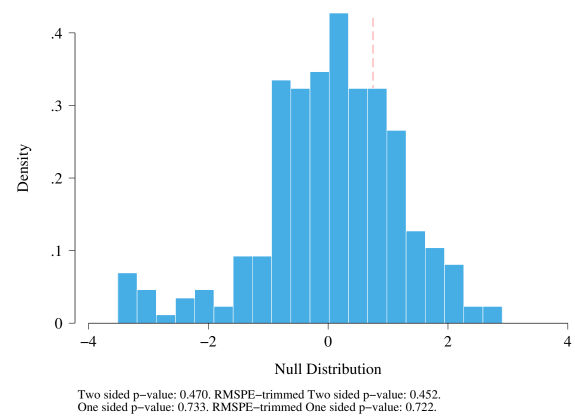
(a) Birth Rates: Inference by State



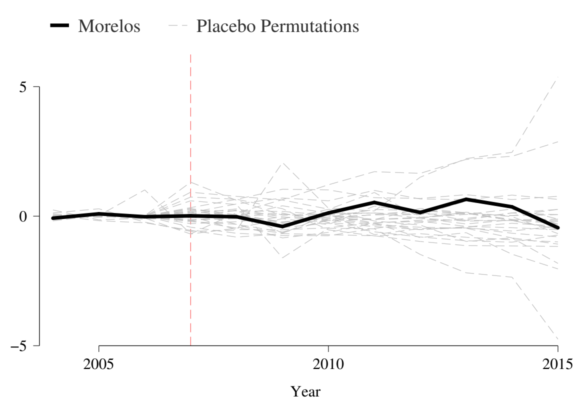
(b) Birth Rates: Inference by State and Time



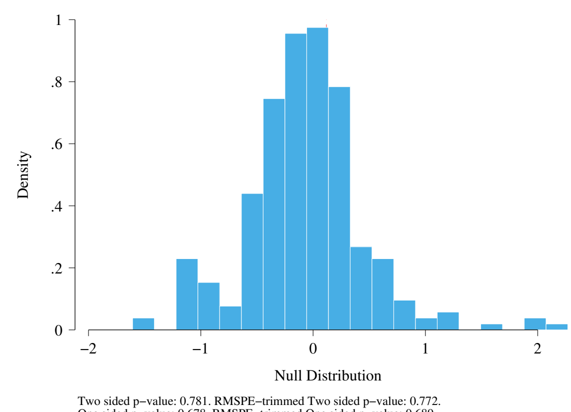
(c) Abortion Morbidity: Inference by State



(d) Abortion Morbidity: Inference by State and Time



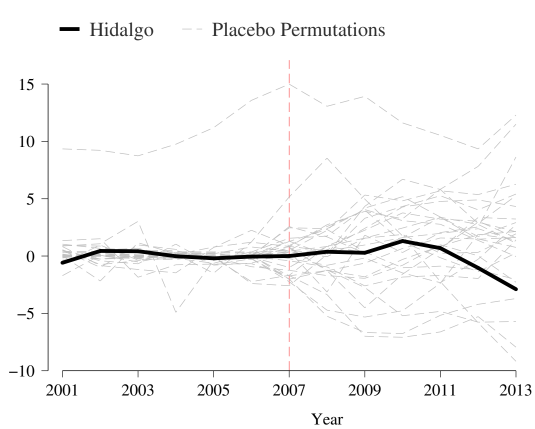
(e) Haemorrhage Morbidity: Inference by State



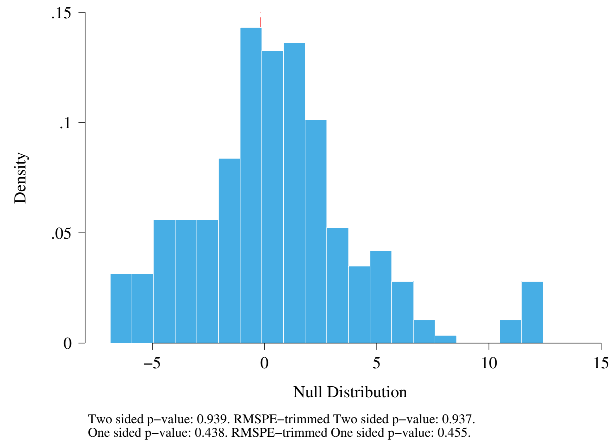
(f) Haemorrhage Morbidity: Inference by State, Time

Notes: Refer to notes to Appendix Figure A29. All details are identical, however now results are displayed for the state of Morelos.

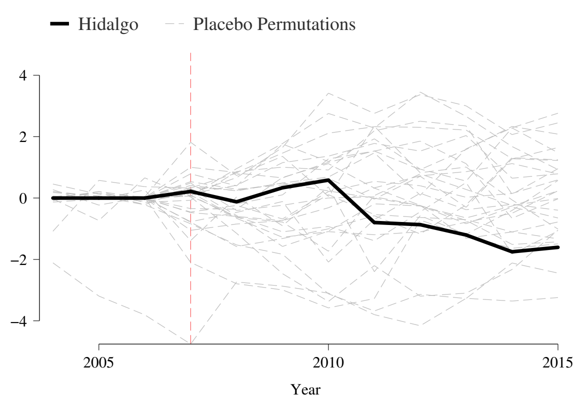
Figure A31: Synthetic Control Estimates for Spillovers: Hidalgo



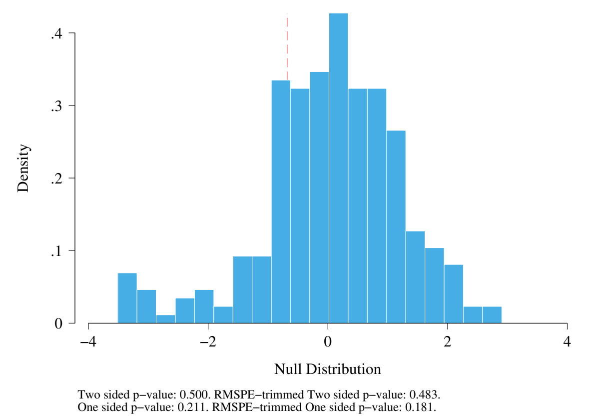
(a) Birth Rates: Inference by State



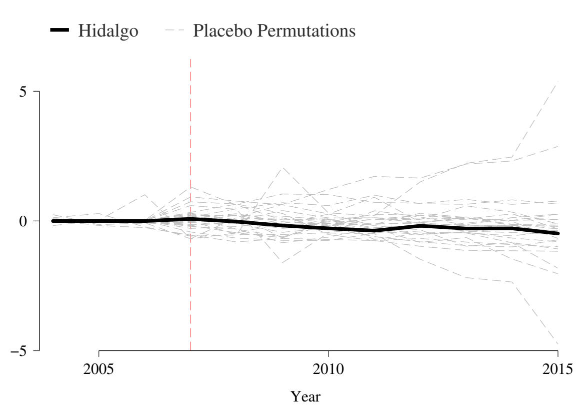
(b) Birth Rates: Inference by State and Time



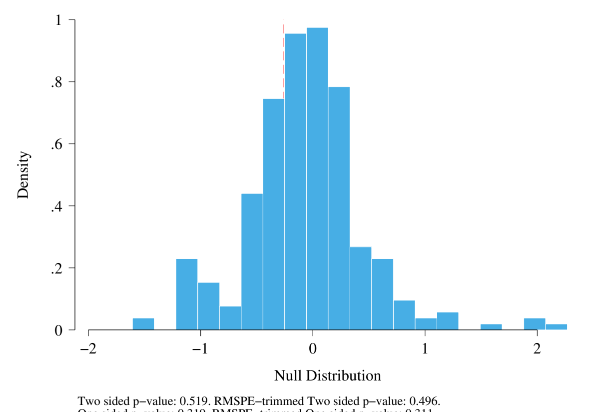
(c) Abortion Morbidity: Inference by State



(d) Abortion Morbidity: Inference by State and Time



(e) Haemorrhage Morbidity: Inference by State



(f) Haemorrhage Morbidity: Inference by State, Time

Notes: Refer to notes to Appendix Figure A29. All details are identical, however now results are displayed for the state of Hidalgo.