

Online Appendix of *Do all roads lead to the same destination? Proximity to abortion providers, abortions, and their conditions in Portugal*

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ONLINE APPENDIX

A Descriptive statistics: figures

Fig. A1 Number of municipalities with zero abortions

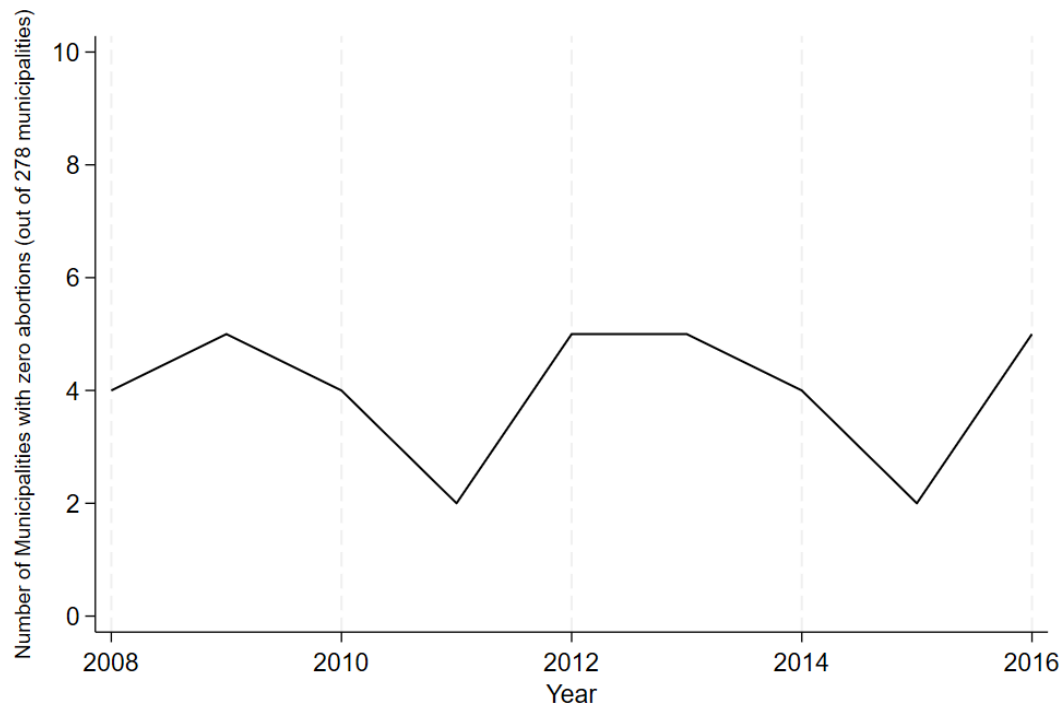


Fig. A2 Number of municipalities per travel time bin

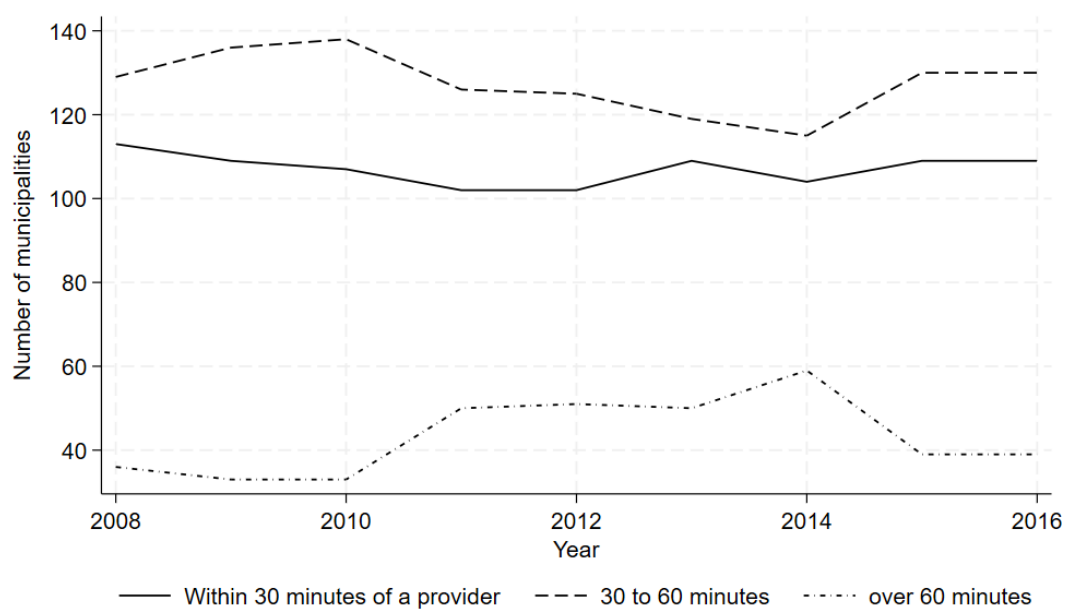


Fig. A3 Number of providers by type of abortion provider

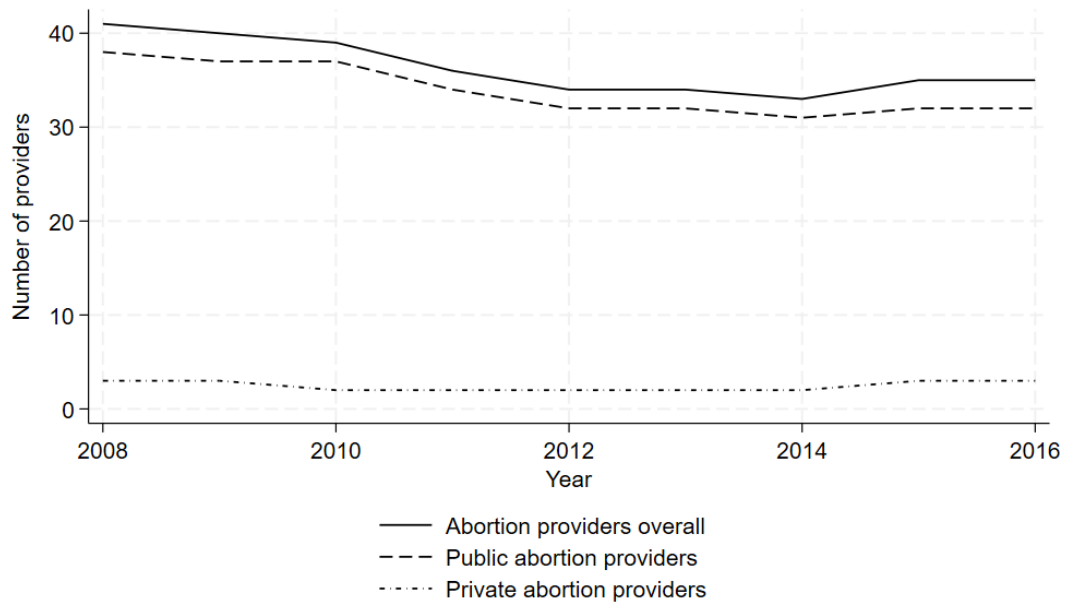


Fig. A4 Number of providers' openings and closures

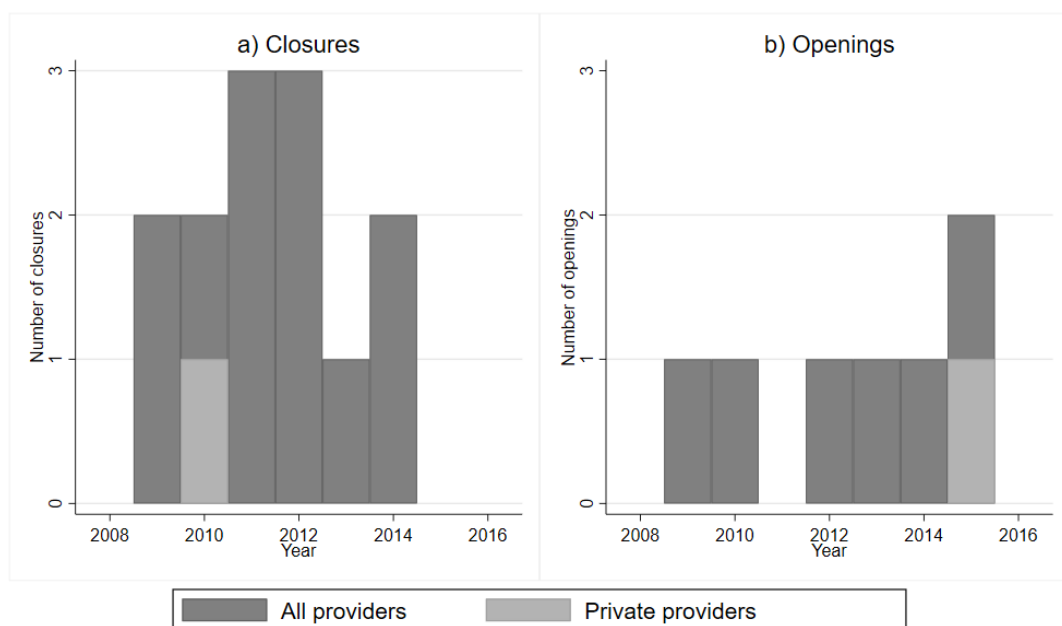
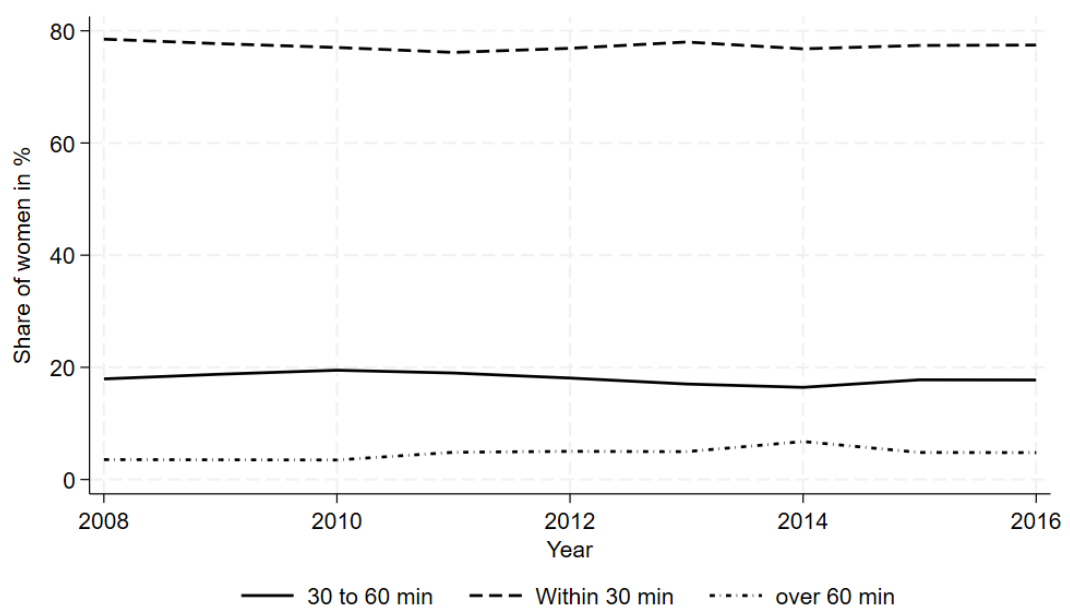


Fig. A5 Share of individuals of childbearing age per travel time bin



B Robustness checks

Table B1 Abortions and access to abortion: Criteria of open provider = at least 1 abortion in the past year

	Abortion rate among individuals of childbearing age		Abortion to pregnancy ratio		Teen pregnancy rate	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Travel time (10 min.)</i>						
Linear travel time	0.0431		0.0394		0.0077	
	(0.0567)		(0.0456)		(0.0259)	
Quadratic travel time	-0.0064		-0.0061		-0.0011	
	(0.0047)		(0.0038)		(0.0020)	
P-value of joint test	0.00		0.00		0.78	
<i>Bins of travel time (Ref: within 30min.)</i>						
30 to 60min.		0.0606		0.0170		0.0408
		(0.0618)		(0.0535)		(0.0779)
Over 60min.		-0.2397***		-0.2378***		-0.0150
		(0.0683)		(0.0671)		(0.0848)
Dep. Var.	Abortions		Abortions		Teen pregnancies	
Exposure Var.	Women 15 to 49 y.o		Pregnancies		Teenage women	
Observations	55,104	55,104	55,104	55,104	55,104	55,104
Municipalities	246	246	246	246	246	246
Stacks	74	74	74	74	74	74

Notes: All regressions were estimated by Poisson quasi-maximum likelihood. All regressions have year-by-stack and municipality-by-stack fixed effects and control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table B2 Abortions and access to abortion: Criteria of open provider = at least 10 abortion in the past year

	Abortion rate among individuals of childbearing age		Abortion to pregnancy ratio		Teen pregnancy rate	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Travel time (10 min.)</i>						
Linear travel time	0.0531		0.0488		0.0103	
	(0.0740)		(0.0592)		(0.0313)	
Quadratic travel time	-0.0072		-0.0069		-0.0011	
	(0.0059)		(0.0048)		(0.0023)	
P-value of joint test	0.00		0.00		0.85	
<i>Bins of travel time (Ref: within 30min.)</i>						
30 to 60min.		0.0981		0.0306		0.0137
		(0.0985)		(0.0853)		(0.0867)
Over 60min.		-0.2490***		-0.2644***		0.0451
		(0.0894)		(0.0905)		(0.0861)
Dep. Var.	Abortions		Abortions		Teen pregnancies	
Exposure Var.	Women 15 to 49 y.o		Pregnancies		Teenage women	
Observations	51,304	51,304	51,304	51,304	51,304	51,304
Municipalities	246	246	246	246	246	246
Stacks	68	68	68	68	68	68

Notes: All regressions were estimated by Poisson quasi-maximum likelihood. All regressions have year-by-stack and municipality-by-stack fixed effects and control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table B3 Conditions under which abortion occurs and abortion access: Criteria of open provider = at least 1 abortion in the past year

	Number of weeks pregnant				No. of waiting days		Having abortion over 9 weeks		NHS referral to private clinic		Having surgical abortion	
	First contact with services		Abortion intervention		(5)	(6)	Yes		Yes		Yes	
	(1)	(2)	(3)	(4)			(7)	(8)	(9)	(10)	(11)	(12)
<i>Travel time (10 min.)</i>												
Linear travel time	-0.0065 (0.0108)		-0.0027 (0.0089)		0.0159 (0.0243)		-0.0071 (0.0160)		0.0084 (0.0250)		0.0035 (0.0220)	
Quadratic travel time	0.0009 (0.0009)		0.0008 (0.0007)		0.0004 (0.0020)		0.0011 (0.0013)		0.0061** (0.0019)		0.0061** (0.0017)	
P-value of joint test	0.01		0.00		0.00		0.01		0.00		0.00	
<i>Bins of travel time (Ref: within 30min.)</i>												
30 to 60min.		0.0272*** (0.0093)		0.0326*** (0.0091)		0.0515 (0.0351)		0.0759*** (0.0192)		0.0539 (0.0717)		0.0472 (0.0661)
Over 60min.		0.0515*** (0.0104)		0.0583*** (0.0115)		0.1020 (0.0757)		0.0648*** (0.0156)		0.4644*** (0.1473)		0.4429*** (0.1411)
Observations	2889026	2889026	2889026	2889026	2889026	2889026	2889026	2889026	2746298	2746298	2889026	2889026
Municipalities	246	246	246	246	246	246	246	246	246	246	246	246
Stacks	74	74	74	74	74	74	74	74	74	74	74	74

Notes: Regressions in columns 1 to 6 were estimated by Poisson quasi-maximum likelihood while regression in columns 7 to 12 were estimated by OLS. All regressions include year of age, occupation, education, number of children, nationality, cohabitation, year-by-stack and municipality-by-stack fixed effects. All regressions also control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table B4 Conditions under which abortion occurs and abortion access: Criteria of open provider = at least 10 abortions in the past year

	Number of weeks pregnant				No. of waiting days		Having abortion over 9 weeks		NHS referral to private clinic		Having surgical abortion	
	First contact with services		Abortion intervention				Yes		Yes		Yes	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>Travel time (10 min.)</i>												
Linear travel time	-0.0110 (0.0146)		-0.0060 (0.0117)		0.0174 (0.0318)		-0.0171 (0.0188)		0.0280 (0.0319)		0.0202 (0.0278)	
Quadratic travel time	0.0013 (0.0011)		0.0011 (0.0009)		0.0005 (0.0025)		0.0019 (0.0015)		0.0048** (0.0024)		0.0051** (0.0021)	
P-value of joint test	0.02		0.00		0.00		0.01		0.00		0.00	
<i>Bins of travel time (Ref: within 30min.)</i>												
30 to 60min.		0.0362*** (0.0119)		0.0378*** (0.0113)		0.0327 (0.0600)		0.0699** (0.0304)		0.0943 (0.1033)		0.0781 (0.0970)
Over 60min.		0.0616*** (0.0124)		0.0704*** (0.0137)		0.1267 (0.0946)		0.0784*** (0.0222)		0.5894*** (0.1695)		0.5557*** (0.1634)
Observations	2705496	2705496	2705496	2705496	2705496	2705496	2705496	2705496	2568593	2568593	2705496	2705496
Municipalities	246	246	246	246	246	246	246	246	246	246	246	246
Stacks	68	68	68	68	68	68	68	68	68	68	68	68

Notes: Regressions in columns 1 to 6 were estimated by Poisson quasi-maximum likelihood while regression in columns 7 to 12 were estimated by OLS. All regressions include year of age, occupation, education, number of children, nationality, cohabitation, year-by-stack and municipality-by-stack fixed effects. All regressions also control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table B5 Abortions and access to abortion – not controlling for the local level of conservatism

	Abortion rate among individuals of childbearing age		Abortion to pregnancy ratio		Teen pregnancy rate	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Travel time (10 min.)</i>						
Linear travel time	0.0531 (0.0742)		0.0487 (0.0598)		0.0103 (0.0307)	
Quadratic travel time	-0.0071 (0.0059)		-0.0068 (0.0048)		-0.0011 (0.0023)	
P-value of joint test	0.00		0.00		0.82	
<i>Bins of travel time (Ref: within 30min.)</i>						
30 to 60min.		0.0981 (0.0996)		0.0318 (0.0887)		0.0073 (0.0870)
Over 60min.		-0.2480*** (0.0886)		-0.2602*** (0.0893)		0.0390 (0.0859)
Dep. Var.	Abortions		Abortions		Teen pregnancies	
Exposure Var.	Women 15 to 49 y.o.		Pregnancies		Teenage women	
Observations	51,304	51,304	51,304	51,304	51,304	51,304
Municipalities	246	246	246	246	246	246
Stacks	68	68	68	68	68	68

Notes: All regressions were estimated by Poisson quasi-maximum likelihood. All regressions have year-by-stack and municipality-by-stack fixed effects and control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, and the growth rate of the NUTS III region's GDP. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table B6 Abortions and access to abortion: Inverse Hyperbolic Sine Transformation

	$\log\left(\frac{Var \times \sqrt{Var} + 1}{Denominator}\right)$					
	Abortion rate among individuals of childbearing age		Abortion to pregnancy ratio		Teen pregnancy rate	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Travel time (10 min.)</i>						
Linear travel time	0.0344		0.0341		-0.0047	
	(0.0594)		(0.0543)		(0.0348)	
Quadratic travel time	-0.0056		-0.0056		-0.0001	
	(0.0045)		(0.0042)		(0.0025)	
P-value of joint test	0.00		0.00		0.91	
<i>Bins of travel time (Ref: within 30min.)</i>						
30 to 60min.		0.0593		-0.0096		-0.0051
		(0.0880)		(0.0774)		(0.1059)
Over 60min.		-0.2463**		-0.2640***		0.0400
		(0.0957)		(0.1014)		(0.0998)
Var	Abortions		Abortions		Teen pregnancies	
Denominator	Women 15 to 49 y.o		Pregnancies		Teenage women	
Weighted by average number of:	Women 15 to 49 y.o		Pregnancies		Teenage women	
Observations	51,304	51,304	51,304	51,304	51,304	51,304
Municipalities	246	246	246	246	246	246
Stacks	68	68	68	68	68	68

Notes: All regressions were estimated by OLS. All regressions have year-by-stack and municipality-by-stack fixed effects and control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table B7 Abortion to pregnancy ratio and access to abortion: Fractional probit

	Poisson (benchmark from Table1)		Fractional Probit			
	(1)	(2)	(3)	(4)		
	Coefficient	Coefficient	Coefficient	Marginal effects		
<i>Travel time (10 min.)</i>						
Linear travel time	0.0488		0.0025			
	(0.0575)		(0.0314)			
Quadratic travel time	-0.0072		-0.0022			
	(0.0059)		(0.0025)			
P-value of joint test	0.00		0.00			
	<u>in % i.e., $(e^{\beta} - 1) \times 100$</u>		<u>In pp</u>	<u>In %</u>	<u>In pp</u>	<u>In %</u>
Effect of increase in travel time by 30 min at initial distance of:						
0 minutes	8.837		0.180	1.353		
	(14.724)		(2.237)			
30 minutes	-3.774		-0.772	-5.805		
	(4.992)		(1.180)			
60 minutes	-14.924***		-1.631***	-12.263		
	(3.544)		(0.304)			
90 minutes	-24.782***		-2.286**	-17.188		
	(9.346)		(0.922)			
<i>Bins of travel time</i>						
<i>(Ref: within 30min.)</i>						
30 to 60min.		-3.056			-1.087	-7.655
		(8.531)			(1.101)	
Over 60min.		-26.436 ***			-4.180***	-29.437
		(9.046)			(1.210)	
Observations	51,304	51,304	51,304	51,304		
Municipalities	246	246	246	246		
Stacks	68	68	68	68		

Notes: Regressions in columns 1 and 2 are the same as those presented in Table 1 (columns 3 and 4). Regressions in columns 3 and 4 of this table were estimated using a fractional probit estimated by pooled Bernoulli quasi-maximum likelihood estimation. All regressions include year-by-stack dummies and control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. I also control for the average of every time varying variable within stack-by-geocode cell, which is equivalent to introducing municipality-by-stack fixed effects, while avoiding the incidental parameters problem. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors are clustered at the municipality-level. Marginal effects in percentage are computed by dividing the estimate in percentage points by the average abortion ratio (13.3%) or by the abortion ratio in the reference bin (14.2%). . Standard errors are clustered at the municipality-level. * p <10% ** p <5% *** p <1%

Table B8 Conditions under which abortion occurs and abortion access: Inverse Hyperbolic Sine Transformation

	$\log(Var \times \sqrt{Var + 1})$					
	Number of weeks pregnant				No. of waiting days	
	First contact with services		Abortion intervention			
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Travel time (10 min.)</i>						
Linear travel time	-0.0089		-0.0043		-0.0061	
	(0.0146)		(0.0113)		(0.0284)	
Quadratic travel time	0.0011		0.0009		0.0033	
	(0.0011)		(0.0009)		(0.0021)	
P-value of joint test	0.03		0.00		0.00	
<i>Bins of travel time</i>						
<i>(Ref: within 30min.)</i>						
30 to 60min.		0.0421***		0.0396***		0.0171
		(0.0141)		(0.0119)		(0.0742)
Over 60min.		0.0663***		0.0714***		0.1889
		(0.0121)		(0.0160)		(0.1292)
Observations	2706035	2706035	2706035	2706035	2706035	2706035
Municipalities	246	246	246	246	246	246
Stacks	68	68	68	68	68	68

Notes: Regressions in columns were estimated by OLS with an inverse hyperbolic sine transformation of the dependent variable. All regressions include year of age, occupation, education, number of children, nationality, cohabitation, year-by-stack and municipality-by-stack fixed effects. All regressions also control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table B9 Conditions under which abortion occurs and abortion access: Linear Probability Model and Probit – no municipality-by-stack FE

	Having abortion over 9 weeks				NHS referral to private clinic				Having surgical abortion			
	LPM		Probit		LPM		Probit		LPM		Probit	
	(1) Coef.	(2) Coef.	(3) Coef.	(4) Marg.eff.	(5) Coef.	(6) Coef.	(7) Coef.	(8) Marg.eff.	(9) Coef.	(10) Coef.	(11) Coef.	(12) Marg.eff.
<i>Travel time (10 min.)</i>												
Linear travel time	-0.0111 (0.0180)		-0.0391 (0.0616)		0.0059 (0.0298)		0.1476 (0.1208)		0.0137 (0.0299)		0.0989 (0.1557)	
Quadratic travel time	0.0015 (0.0015)		0.0054 (0.0050)		0.0060*** (0.0023)		0.0151 (0.0105)		0.0054** (0.0022)		0.0178 (0.126)	
P-value of joint test	0.00		0.00		0.00		0.00		0.00		0.00	
Average Marginal Effect	-0.0059 (0.0128)		-0.00053 (0.0117)		0.0271 (0.0223)		0.0192*** (0.0068)		0.0329 (0.0226)		0.0216 (0.0149)	
<i>Bins of travel time (Ref: within 30min.)</i>												
30 to 60min.		0.0476* (0.0273)		0.0426* (0.0243)		0.0456 (0.0673)		-0.0125 (0.0089)		0.0974 (0.08890)		0.0614 (0.0510)
Over 60min.		0.0712*** (0.0239)		0.0807*** (0.0264)		0.4480** (0.1796)		0.4282*** (0.0814)		0.4645** (0.1843)		0.4199*** (0.1425)
Observations	2706035	2706035	2706035	2706035	2569113	2569113	2569113	2569113	2706035	2706035	2706035	2706035

Notes: Regressions in columns 1, 2, 5, 6, 9, and 10 were estimated by OLS while regression in columns 3, 4, 7, 8, 11, and 12 were estimated by Probit. All regressions include year of age, occupation, education, number of children, nationality, cohabitation, year-by-stack and municipality fixed effects. All regressions also control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table B10 Correlation between abortions and controls

Outcome:	Residuals of regression: $\text{Number of abortions}_{mt} = \text{Municipality FE} + u_{mt}$	
	Coefficients	SD
Demographic controls		
<i>Share of age group in population of individuals of childbearing age</i>		
15 to 19 y.o.	-96.826*	(51.408)
20 to 24 y.o.	(omitted)	(omitted)
25 to 29 y.o.	10.536	(49.620)
30 to 34 y.o.	2.156	(39.737)
35 to 39 y.o.	27.617	(38.158)
40 to 54 y.o.	-153.583***	(41.304)
45 to 49 y.o.	2.186	(40.593)
Economic controls		
Unemployment rate	29.636**	(14.649)
GDP per capita growth (NUTS III)	-24.851*	(9.997)
Controls for social norms		
Marriages (<i>per</i> 1000 inhabitants)	-0.601	(0.668)
Catholic marriages (<i>per</i> 1000 inhabitants)	0.858	(0.877)
Observations	2502	
Municipalities	278	
R^2	0.024	

Notes: The first regression was estimated by Poisson quasi-maximum likelihood, with the number of individuals of childbearing age in the municipality as the exposure variable. The regression of the residuals on the controls was estimated by OLS. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table B11 Abortions and access to abortion: Excluding municipalities closer to a Spanish provider

	Abortion rate among individuals of childbearing age		Abortion to pregnancy ratio		Teen pregnancy rate	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Travel time (10 min.)</i>						
Linear travel time	0.0546		0.0499		0.0093	
	(0.0741)		(0.0593)		(0.0320)	
Quadratic travel time	-0.0072		-0.0068		-0.0012	
	(0.0059)		(0.0047)		(0.0023)	
P-value of joint test	0.00		0.00		0.78	
<i>Bins of travel time (Ref: within 30min.)</i>						
30 to 60min.		0.1036		0.0354		0.0025
		(0.1000)		(0.0868)		(0.0870)
Over 60min.		-0.2357***		-0.2526***		0.0199
		(0.0895)		(0.0920)		(0.0949)
Dep. Var.	Abortions		Abortions		Teen pregnancies	
Exposure Var.	Women 15 to 49 y.o		Pregnancies		Teenage women	
Observations	47,668	47,668	47,668	47,668	47,668	47,668
Municipalities	245	245	245	245	245	245
Stacks	63	63	63	63	63	63

Notes: All regressions were estimated by Poisson quasi-maximum likelihood. All regressions have year-by-stack and municipality-by-stack fixed effects and control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table B12 Conditions under which abortion occurs and abortion access – municipality-level analysis

		Number of abortions below 7 weeks		Number of abortions between 7 and 9 weeks		Number of abortions over 9 weeks		Number of NHS referrals to private clinic		Number of surgical abortions		Number of medical abortions	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>Travel time (10 min.)</i>													
Linear travel time		0.0864		0.0619		-0.0318		0.1436		0.0227		-0.0239	
		(0.0969)		(0.0949)		(0.1342)		(0.1705)		(0.1566)		(0.1759)	
Quadratic travel time		-0.0126		-0.0046		0.0047		0.0070		0.0145		-0.0210	
		(0.0080)		(0.0078)		(0.0101)		(0.0133)		(0.0128)		(0.0144)	
P-value of joint test		0.00		0.77		0.29		0.00		0.00		0.00	
<i>Bins of travel time (Ref: within 30min.)</i>													
30 to 60min.			0.0653		0.0410		0.2793***		-0.0109		0.0380		0.0278
			(0.1403)		(0.2021)		(0.0552)		(0.1822)		(0.1246)		(0.3446)
Over 60min.			-0.5126***		0.0693		0.3692***		1.9132***		1.6488***		-1.2874**
			(0.1415)		(0.1487)		(0.0912)		(0.2511)		(0.2382)		(0.6416)
Municipalities		246	246	246	246	246	246	246	246	246	246	246	246
Stacks		68	68	68	68	68	68	68	68	68	68	68	68
Observations		51304	51304	51304	51304	51304	51304	51304	51304	51304	51304	51304	51304

Notes: All regressions were estimated by Poisson quasi-maximum likelihood with the number of individuals of childbearing age as the exposure variable. All regressions have year-by-stack and municipality-by-stack fixed effects and control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

C Descriptive statistics: Tables

Table C1 Descriptive statistics of municipalities

Variable	Panel	Mean	SD	Min	P1	P25	P50	P75	P99	Max
<i>Abortion access</i>										
Travel time (minutes)	Overall	39.25	23.61	1.38	1.75	24.12	36.07	51.17	110.90	159.68
	Between Municipalities		21.51							
	Within Municipalities		9.81							
<i>Demographics</i>										
Number of abortions	Overall	63.08	183.39	0	0	6	14	45	661	2,700
	Between Municipalities		182.16							
	Within Municipalities		23.58							
Number of individuals of childbearing age	Overall	8,353.50	13,548.56	317	528	1433	3239	9145	73559	117,277
	Between Municipalities		13,552.08							
	Within Municipalities		701.57							
Number of teenager (15 to 19 y.o.)	Overall	929.21	1,435.71	31	58	169	383	1020	8061	11,641
	Between Municipalities		1,436.03							
	Within Municipalities		75.40							
Number of pregnancies	Overall	372.83	759.57	6	13	49	122	361	2986	8,859
	Between Municipalities		758.33							
	Within Municipalities		68.62							

Notes: There are 2,502 observations in total, corresponding to a balanced panel of 278 municipalities over a nine year period.

Table C1 (continued)

Variable	Panel	Mean	SD	Min	P1	P25	P50	P75	P99	Max
Number of teenage pregnancies	Overall	16.96	40.60	0	0	2	5	15	188	552
	Between Municipalities		39.62							
	Within Municipalities		9.13							
<i>Economy</i>										
Insured unemployment rate	Overall	7.93	2.57	2.01	3.27	6.03	7.68	9.50	15.38	18.81
	Between Municipalities		2.09							
	Within Municipalities		1.49							
NUTSIII GDP per capita (thousand euros)	Overall	18.24	3.97	11.75	12.11	15.46	17.67	19.73	30.02	32.89
	Between Municipalities		3.83							
	Within Municipalities		1.06							
<i>Proxies for social norms</i>										
Marriages (<i>per</i> 1000 inhabitants)	Overall	2.70	0.91	0	0.58	2.9	2.70	3.28	4.90	7.12
	Between Municipalities		0.64							
	Within Municipalities		0.65							
Catholic marriages (<i>per</i> 1000 inhabitants)	Overall	1.19	0.66	0	0	0.70	1.11	1.60	3.12	3.93
	Between Municipalities		0.50							
	Within Municipalities		0.43							

Notes: There are 2,502 observations in total, corresponding to a balanced panel of 278 municipalities over a nine year period

Table C2 Abortion rates per travel time bin

	Travel time to nearest provider							
	<i>Within 30 minutes</i>		<i>30 to 60 minutes</i>		<i>Over 60 minutes</i>		<i>Total</i>	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<i>Abortion rates (per 10000 individuals of childbearing age)</i>								
Overall	6.228	3.992	4.659	2.642	4.785	2.611	5.283	3.310
Below 7 weeks of gestation	3.735	2.446	2.922	1.880	2.953	1.811	3.240	2.142
Between 7 and 9 weeks	2.256	1.919	1.584	1.308	1.667	1.392	1.856	1.614
Between 9 and 10 weeks	0.237	0.389	0.153	0.318	0.166	0.382	0.187	0.359
Referred from NHS to Private	0.611	2.500	0.913	1.917	1.368	2.603	0.861	2.152
Surgical abortions	0.968	2.504	1.159	2.097	1.600	2.702	1.154	2.368
Medical abortions	5.241	3.347	3.472	2.716	3.158	2.515	4.105	3.082
<i>Abortions to pregnancies ratio</i>								
Overall	0.142	0.061	0.126	0.057	0.129	0.061	0.133	0.060
<i>Teenage Pregnancy rate</i>								
Overall	0.016	0.011	0.014	0.010	0.017	0.014	0.015	0.011

Table C3 Descriptive statistics of women who aborted – outcome variables

	Travel time to nearest provider											
	Within 30 minutes			30 to 60 minutes			Over 60 minutes			Total		
	No.	Col (%)	Row (%)	No.	Col (%)	Row (%)	No.	Col (%)	Row (%)	No.	Col (%)	Row (%)
<i>Abortions</i>	127,783	100	84	19,088	100	13	5,253	100	3	152,124	100	100
<i>Weeks pregnant</i>												
Less than seven	71,014	56	84	10,915	57	13	3,078	59	4	85,007	56	100
From seven to nine	50,319	39	84	7,317	38	12	1,930	37	3	59,566	39	100
From nine to ten	6,450	5	85	856	4	11	245	5	3	7,551	5	100
Total	127,783	100	84	19,088	100	13	5,253	100	3	152,124	100	100
<i>Type of provider</i>												
Private clinic - own initiative	10,334	8	87	1,252	7	11	331	6	3	11,917	8	100
Private clinic - NHS referral	27,318	21	77	6,172	32	17	1,950	37	6	35,440	23	100
NHS Hospital	90,131	71	86	11,664	61	11	2,972	57	3	104,767	69	100
Total	127,783	100	84	19,088	100	13	5,253	100	3	152,124	100	100
<i>Method</i>												
Medical abortion	88,346	69	86	11,612	61	11	2,965	56	3	102,923	68	100
Surgical abortion	39,437	31	80	7,476	39	15	2,288	44	5	49,201	32	100
Total	127,783	100	84	19,088	100	13	5,253	100	3	152,124	100	100
<i>Method (Among women accessing to services through the NHS)</i>												
Medical abortion	87,749	74	86	11,560	65	11	2,956	60	3	102,265	73	100
Surgical abortion	30,294	26	78	6,332	35	16	1,977	40	5	38,603	27	100
Total	118,043	100	84	17,892	100	13	4,933	100	4	140,868	100	100
<i>Method (Abortions performed in the NHS)</i>												
Medical abortion	87,163	97	86	11,496	99	11	2,934	99	3	101,593	97	100
Surgical abortion	2,968	3	94	168	1	5	38	1	1	3,174	3	100
Total	90,131	100	86	11,664	100	11	2,972	100	3	104,767	100	100
<i>Method (Abortions performed in private clinics)</i>												
Medical abortion	1,183	3	89	116	2	9	31	1	2	1,330	3	100
Surgical abortion	36,469	97	79	7,308	98	16	2,250	99	5	46,027	97	100
Total	37,652	100	80	7,424	100	16	2,281	100	5	47,357	100	100
		Mean	SD		Mean	SD		Mean	SD		Mean	SD
Weeks pregnant at:												
Time of access		6.57	1.53		6.59	1.50		6.67	1.46		6.58	1.52
Time of abortion		7.32	1.37		7.30	1.32		7.29	1.29		7.32	1.36
Waiting days		8.31	4.69		8.07	4.62		7.53	4.32		8.25	4.67
Travel time (minutes)		13.57	8.77		40.5	7.72		75.35	16.25		20.31	17.53

Table C4 Descriptive statistics of women who aborted – control variables

	Mean	SD	No.	Travel time to nearest provider								
				Within 30 minutes			30 to 60 minutes			Over 60 minutes		
				No.	Col (%)	Row (%)	No.	Col (%)	Row (%)	No.	Col (%)	Row (%)
<i>Age</i>	28.5	7.3										
Less than 15			640	536	0	84	79	0	12	25	0	4
15 to 19			16,499	13,957	11	85	1,998	10	12	544	10	3
20 to 24			34,559	29,502	23	85	3,926	21	11	1,131	22	3
25 to 29			32,908	27,930	22	85	3,881	20	12	1,097	21	3
30 to 34			30,956	25,851	20	84	4,042	21	13	1,063	20	3
35 to 39			25,134	20,767	16	83	3,415	18	14	952	18	3
Over 40			11,422	9,234	7	81	1,747	9	15	441	8	4
Total			152,124	127,783	100	84	19,088	100	13	5,253	100	3
<i>Education</i>												
Illiterate			418	344	0	82	52	0	12	22	0	5
Reads/writes			307	248	0	81	44	0	14	15	0	5
Primary school			6,147	5,123	4	83	807	4	13	217	4	4
Lower middle school			18,751	15,404	12	82	2,645	14	14	702	13	4
Higher middle school			41,032	34,205	27	83	5,372	28	13	1,455	28	4
High school			54,342	45,691	36	84	6,750	35	12	1,901	36	3
College			31,127	26,768	21	86	3,418	18	11	941	18	3
Total			152,124	127,783	100	84	19,088	100	13	5,253	100	3
<i>Occupation</i>												
Agriculture (ISCO08:6-8)			23,926	19,679	15	82	3,454	18	14	793	17	3
Armed Forces (ISCO08:0)			827	705	1	85	110	1	13	12	0	2
Services (ISCO-08:4-5)			16,621	14,154	11	85	2,013	10	12	454	10	3
Unskilled (ISCO-08:9)			27,892	23,558	18	84	3,605	19	13	729	16	3
Managers (ISCO-08:1)			1,520	1,357	1	89	134	1	9	29	1	2
Professionals (ISCO-08:2)			10,628	9,183	7	86	1,152	6	11	293	6	3
Technicians (ISCO-08:3)			11,664	10,036	8	86	1,312	7	11	316	7	3
Domestic worker			3,445	2,662	2	77	634	3	18	149	3	4
Student			25,554	21,768	17	85	2,996	15	12	790	17	3
Unemployed			30,047	24,921	20	83	4,039	21	13	1,087	23	4
Total			152,124	127,783	100	84	19,088	100	13	5,253	100	3

Table C4 (continued)

	Mean	SD	No.	Travel time to nearest provider								
				Within 30 minutes			30 to 60 minutes			Over 60 minutes		
				No.	Col (%)	Row (%)	No.	Col (%)	Row (%)	No.	Col (%)	Row (%)
<i>Nationality</i>												
Portuguese			125,483	104,010	81	83	16,802	88	13	4,671	89	4
Other			26,641	23,773	19	89	2,286	12	9	582	11	2
Total			152,124	127,783	100	84	19,088	100	13	5,253	100	3
<i>Civil Status</i>												
Married			37,375	30,118	24	81	5,727	30	15	1,530	29	4
Divorced			11,317	9,168	7	81	1,743	9	15	406	8	4
Separated			2,263	1,890	1	84	295	2	13	78	1	3
Single			100,518	86,098	67	86	11,208	59	11	3,212	61	3
Widow			651	509	0	78	115	1	18	27	1	4
Total			152,124	127,783	100	84	19,088	100	13	5,253	100	3
<i>Cohabitation</i>												
Lives with partner			74,954	61,528	48	82	10,513	55	14	2,913	55	4
Lives without partner			77,170	66,255	52	86	8,575	45	11	2,340	45	3
Total			152,124	127,783	100	84	19,088	100	13	5,253	100	3
<i>Previous children</i>	1.0	1.0										
0			61,676	52,725	41	85	7,006	37	11	1,945	37	3
1			44,694	37,767	30	85	5,386	28	12	1,541	29	3
2			33,630	27,365	21	81	4,962	26	15	1,303	25	4
3			8,959	7,271	6	81	1,330	7	15	358	7	4
4			2,247	1,892	1	84	281	1	13	74	1	3
More than 4			918	763	0	83	123	0	13	32	0	4
Total			152,124	127,783	100	84	19,088	100	13	5,253	100	3

D Extension: provider re-opening in the south of Portugal

As mentioned in the Empirical Strategy section, one limitation of the main analyses is that, by only focusing on the first changes in a municipality's travel time to an abortion provider, I am not able to investigate the effect of re-openings or re-closures of abortion providers. However, during the time period I analyze, one hospital, in the municipality of Beja – in the region of Alentejo, south of Portugal –, closed in 2011 and then re-opened in 2015.¹ To better understand the implications of this re-opening, I narrow the analyses to the municipalities in the Alentejo region that were affected by it. As I am focusing on the second change in treatment dose for these municipalities, I need to assume that – unlike the previous analyses – past changes in treatment dose do not contaminate the effects of current dose changes. Also, I need to establish another selection criteria for the choice of non-first stacks. Specifically, I exclude those for which treatment changes at $T-2$ and at T since this will likely differentially affect outcomes of treatment and control municipalities in the pre-treatment period. Thus, I only include stacks for which first treatments occurred before $T-2$.² Overall, this re-opening affected 19 municipalities in Alentejo. I append the 19 corresponding stacks and run the analyses on abortion rates and conditions described in equations 2 and 3, respectively. As online appendix Table D1 shows, I find no statistically significant effects of travel time on abortion rates, ratios and teen pregnancy rates. Also, I find that the coefficients in the results of abortion conditions are generally less precise and lower in magnitude – see online appendix Table D2.

The fact that I only use 19 changes in travel time to the nearest provider, raises the concern that I lack statistical power in these analyses. Thus these results should be interpreted with caution.

¹ There are two abortion providers in my data that changed opening status twice: the hospital of Guarda and the hospital of Beja. For reasons I detail below, I am only able to analyze the latter.

² Because of this condition, wI am not able to analyze the re-closure of the hospital of Guarda since it took place only two years after the hospital opened an abortion service – in 2009.

Nevertheless, despite the lower magnitude and statistical significance of these coefficients, the signs of the estimates in both the municipality and individual-level analysis are coherent with those in the main analyses.

Table D1 Abortions and access to abortion: Provider re-opening in the south of Portugal

	Abortion rate among individuals of childbearing age		Abortion to pregnancy ratio		Teen pregnancy rate	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Travel time (10 min.)</i>						
Linear travel time	0.00550		0.0348		0.0019	
	(0.0027)		(0.0238)		(0.0273)	
Quadratic travel time	-0.0003		-0.0024		-0.0008	
	(0.0025)		(0.0022)		(0.0018)	
P-value of joint test	.854		.053		.467	
<i>Bins of travel time (Ref: within 30min.)</i>						
30 to 60min.		-0.13002		-0.03050		0.05304
		(0.11273)		(0.11982)		(0.17205)
Over 60min.		-0.00738		0.06296		-0.05703
		(0.04704)		(0.04269)		(0.10215)
Dep. Var.	Abortions		Abortions		Teen pregnancies	
Exposure Var.	Women 15 to 49 y.o.		Pregnancies		Teenage women	
Observations	12,932	12,932	12,932	12,932	12,932	12,932
Municipalities	189	189	189	189	188	188
Stacks	19	19	19	19	19	19

Notes: All regressions were estimated by Poisson quasi-maximum likelihood. All regressions have year-by-stack and municipality-by-stack fixed effects and control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

Table D2 Conditions under which abortion occurs and abortion access: Provider re-opening in the south of Portugal

	Number of weeks pregnant				No. of waiting days		Having abortion over 9 weeks		NHS referral to private clinic		Having surgical abortion	
	First contact with services		Abortion intervention				Yes		Yes		Yes	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>Travel time (10 min.)</i>												
Linear travel time	0.0072		-0.0006		-0.0307***		0.0002		0.0596***		0.0520***	
	(0.0108)		(0.0094)		(0.0071)		(0.0238)		(0.0165)		(0.0164)	
Quadratic travel time	-0.0004		0.0002		0.0024***		-0.0002		0.0008		0.0010	
	(0.0010)		(0.0008)		(0.0007)		(0.0020)		(0.0012)		(0.0013)	
P-value of joint test	0.26		0.39		0.00		0.89		0.00		0.00	
<i>Bins of travel time (Ref: within 30min.)</i>												
30 to 60min.		0.0209		0.0177		0.0056		0.0826*		0.0496		0.0276
		(0.0347)		(0.0260)		(0.0823)		(0.0475)		(0.0828)		(0.0723)
Over 60min.		0.0265		0.0220*		-0.0199		0.0006		0.5990***		0.5459***
		(0.0182)		(0.0127)		(0.0316)		(0.0342)		(0.0163)		(0.0194)
Observations	620419	620419	620419	620419	620419	620419	620419	620419	595622	595622	620419	620419
Municipalities	189	189	189	189	189	189	189	189	189	189	189	189
Stacks	19	19	19	19	19	19	19	19	19	19	19	19

Notes: Regressions in columns 1 to 6 were estimated by Poisson quasi-maximum likelihood while regression in columns 7 to 12 were estimated by OLS. All regressions include year of age, occupation, education, number of children, nationality, cohabitation, year-by-stack and municipality-by-stack fixed effects. All regressions also control for the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP, the number of marriages and Catholic marriages per thousand inhabitants in the municipality. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * p <10% ** p <5% *** p <1%

E Event studies

To better understand if openings and closures of abortion providers are driven by abortion demand or broader social forces, I conduct event studies which are displayed in Figures D1 to D4 below. In this analysis, I use the abortion rate and the number of marriages and Catholic marriages of the catchment area of a provider – which is defined as the set of municipalities to which that provider was, at some point in time, the closest abortion provider – as an outcome and estimate the model described below:

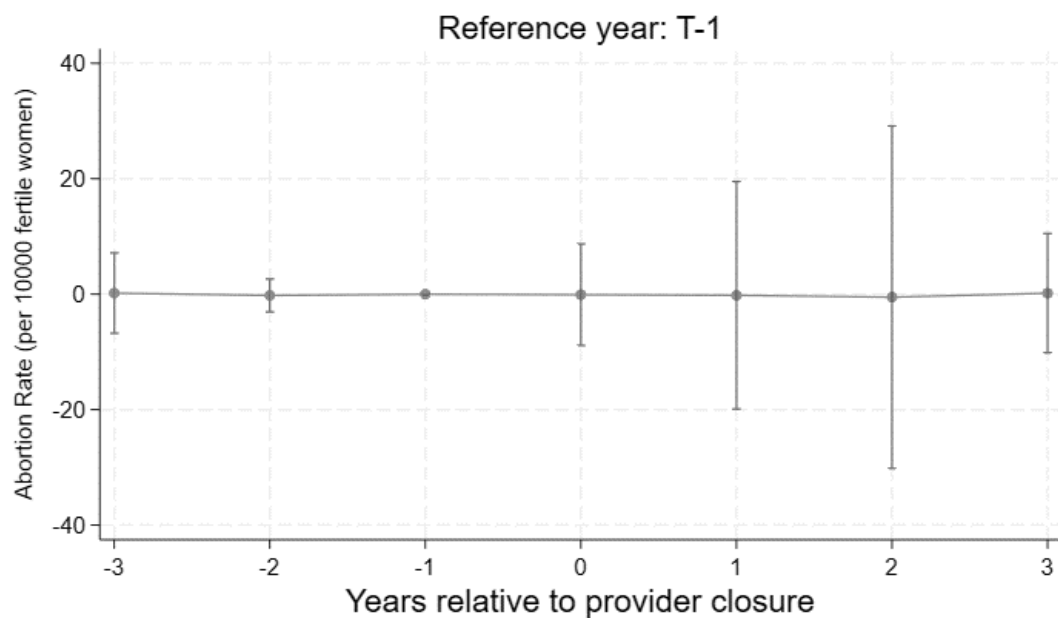
$$\text{Log}(Y_{rt}) = \sum_{i=-Pre}^{-2} \alpha_i T_{rti} + \sum_{i=0}^{Post} \alpha_i T_{rti} + X_{rt}\beta + \varphi_r + \zeta_t + u_{rt}$$

Where Y_{rt} is either the abortion rate or one of my two proxies for social norms (number of marriages and Catholic marriages per thousand inhabitants) and T_{rti} is a dummy equal to one for the catchment area of provider r , in year t , which is i years away from the event (opening or closure of provider). X_{rt} is a vector of time-varying characteristics of the provider's catchment area, namely: the share of all age groups in the population of individuals of childbearing age, the insured unemployment rate, the growth rate of the NUTS III region's GDP. If the outcome variable is the abortion rate, I also include as controls the number of marriages and Catholic marriages per thousand inhabitants. φ_r and ζ_t are provider's catchment area and year fixed effects, respectively. u_{rt} is the error term.

However, estimating this model by a standard TWFE regression is problematic, as regions where an abortion provider closed in year $T-1$ will be used as controls for regions experiencing a shutdown in year T (Sun and Abraham 2021). To correctly estimate the value of the coefficient of both leads and lags, I implement the DIDM estimator (de Chaisemartin and D'Haultfoeuille 2020), where only never treated or not-yet-treated observations are used in the control group. The advantage of this procedure is that unlike other solutions – e.g. Callaway

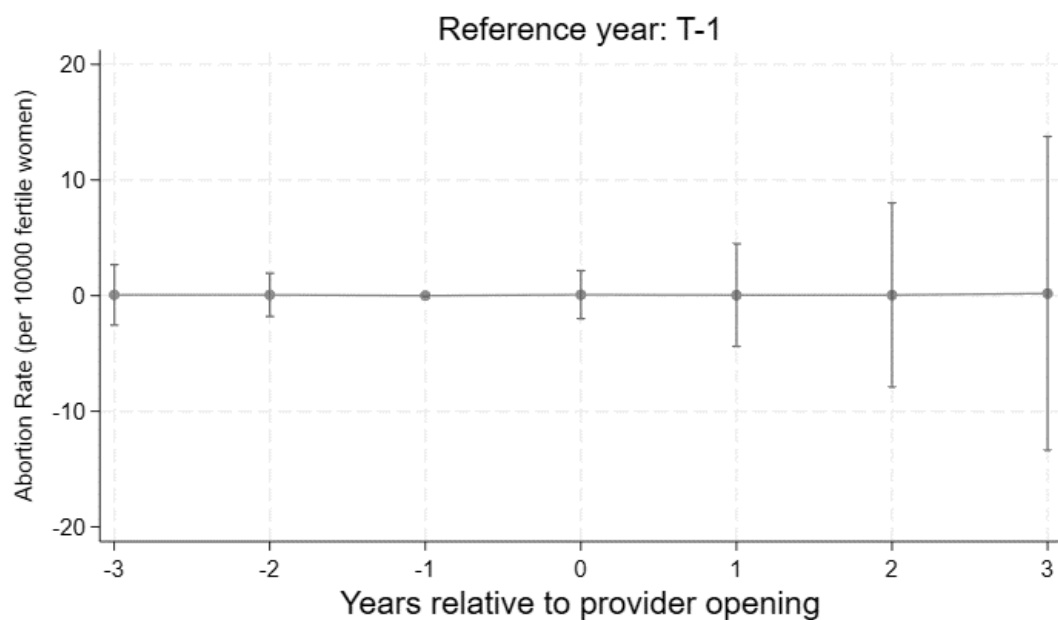
and Sant’Anna (2021) – it allows to control for time varying variables. This was done using the Stata `did_multiplegt` command (de Chaisemartin et al. 2019). As shown in Figures E1 to E4, I find no evidence that there were systematic differences in abortion rates or changes in social norms prior to the closures or openings of abortion providers.

Fig. E1 Abortion rate before and after clinic closure



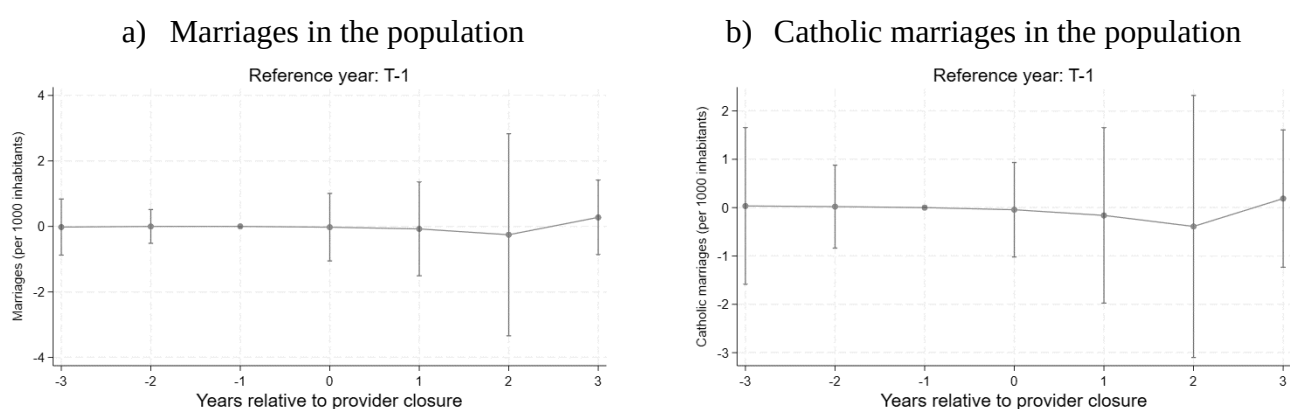
Notes: Each dot presents the coefficient of lags/leads and is represented along with the respective 95% confidence interval.

Fig. E2 Abortion rate before and after clinic opening



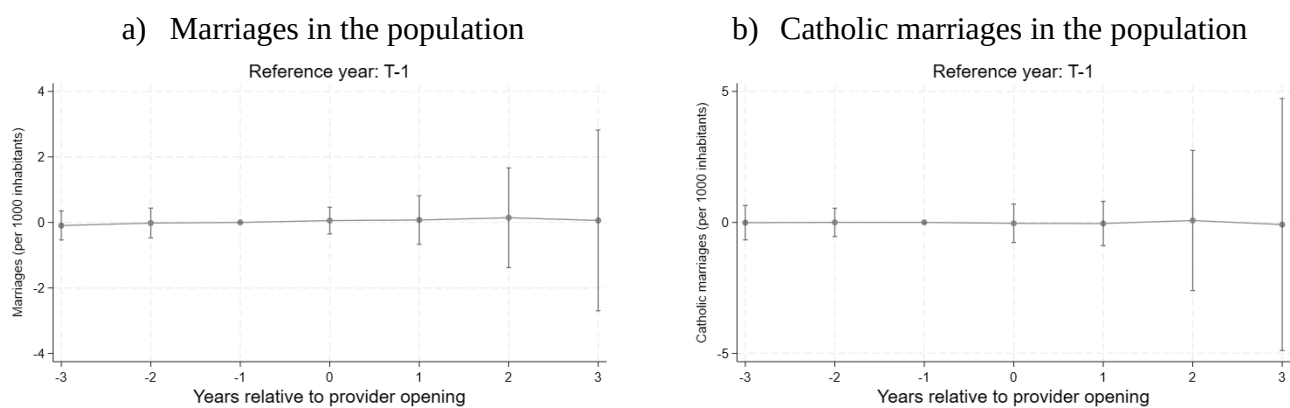
Notes: Each dot presents the coefficient of lags/leads and is represented along with the respective 95% confidence interval.

Fig. E3 Marriages before and after clinic closure



Notes: Each dot presents the coefficient of lags/leads and is represented along with the respective 95% confidence interval.

Fig. E4 Marriages before and after clinic opening



Notes: Each dot presents the coefficient of lags/leads and is represented along with the respective 95% confidence interval.

F Placebo test for pre-trends (de Chaisemartin et al. 2024)

For differences-in-differences with a continuous treatment with more than two periods, which is the case of the analyses in this paper, de Chaisemartin et al. (2024) suggest to test for pre-trends by the means of a placebo test. Specifically, they propose to: *i*) replace “ ΔY_t by ΔY_{t-1} ”, and *ii*) “restricting the sample, for each pair of consecutive time periods ($t-1, t$), to units whose treatment did not change between $t-2$ and $t-1$ ” (de Chaisemartin et al. 2024:22). Using the stacked dataset that I use in the main analysis – Table 1 –, I follow de Chaisemartin et al. (2024) and test for pre-trends in abortion rates by: *i*) lagging the abortion rates of municipalities by one year and *ii*) keeping the years before and after treatment switches, i.e. $t-1$ and t .

As I construct the stacked dataset so that all the observations at $t < 0$ are not-yet or never treated – as detailed in section 4.1 –, I ensure that the placebo is comparing “the average ΔY_{t-1} of the $t-1$ -to- t switchers and stayers, restricting attention to $t-2$ -to- $t-1$ stayers” (de Chaisemartin et al. 2024:22). Thus I estimate the following model:¹

$$\text{Number of abortions}_{m,t-1,s} = \rho \text{Time}_{m,t,s} + \varphi_{m,s} + \zeta_{t,s} \text{ with } 0 \geq \rho \geq -1$$

$\text{Number of abortions}_{m,t-1,s}$ is the number of abortions among women living in municipality m , in year $t-1$ in stack s . $\text{Time}_{m,t,s}$ is the travel time between the nearest abortion provider and the town hall of municipality m in year t in stack s . As in equation 1, I include municipality-by-stack ($\varphi_{m,s}$) fixed effects and year-by-stack fixed effects ($\zeta_{t,s}$), clustering standard errors at the municipality-level. The coefficient of interest is ρ . It should not be statistically significant as the change in travel time in year t should have no effect on the abortion rate at $t-1$. This is what I find in columns 1 and 2 of Table F1. Thus, it reassures that the pre-trends in abortion rates of treatment and control municipalities are not detectably different. I also estimate the model

¹ More precisely, I estimate: $E(\text{Number of abortions}_{m,t-1,s} | \text{Time}_{m,t,s}, \varphi_{m,s}, \zeta_{t,s}) = e^{(\rho \text{Time}_{m,t,s} + \varphi_{m,s} + \zeta_{t,s})}$ with the number of individuals of childbearing age of $T-1$ as the exposure variable.

without lagging the abortion rate by one year but still restricting the sample to observation at $t-1$ and t , to understand if abortion rates fall immediately after changes in treatment dose. I confirm this in columns 3 and 4 of Table F1.

Table F1 Abortion rates and access to abortion: placebo test

	Placebo: Abortion rate among individuals of childbearing age (T-1)		Abortion rate among individuals of childbearing age (T)		Poisson (be
	(1)	(2)	(3)	(4)	
<i>Travel time (10 min.)</i>					
Linear travel time	-0.0217 (0.0337)		0.0725 (0.0760)		
Quadratic travel time	0.0024 (0.0028)		-0.0084 (0.0060)		
P-value of joint test	0.56		0.00		
	in % i.e., $(e^{\beta} - 1) \times 100$		in % i.e., $(e^{\beta} - 1) \times 100$		
Effect of increase in travel time by 30 min at initial distance of:					
0 minutes	-4.238 (7.406)		15.275 (20.138)		
30 minutes	0.009 (3.577)		-0.849 (6.986)		
60 minutes	4.445 (4.253)		-14.717*** (4.338)		
90 minutes	-9.077 (9.202)		-26.646** (11.218)		
<i>Bins of travel time</i> (Ref: within 30min.)					
30 to 60min.		-0.06835 (0.09668)		0.04836 (0.05563)	
Over 60min.		-0.03194 (0.06426)		-0.24090*** (0.08020)	
Dep. Var.	Abortions (T-1)		Abortions		
Exposure Var.	Women 15 to 49 y.o (T-1)		Women 15 to 49 y.o		
Observations	25,652	25,652	25,652	25,652	
Municipalities	246	246	246	246	
Stacks	68	68	68	68	

Notes: All regressions were estimated by Poisson quasi-maximum likelihood using a sample restricted to the years prior to treatment dose change ($t-1$) and to the year of change in treatment dose (t). All regressions have year-by-stack and municipality-by-stack fixed effects. Odd columns present travel time as a second order polynomial, while even columns present it categorically. Standard errors clustered at the municipality-level in parenthesis. * $p < 10\%$ ** $p < 5\%$ *** $p < 1\%$

APPENDIX REFERENCES

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