

Online appendix with additional results for “Utilization of Infertility Treatments: The Effects of Insurance Mandates,” by Marianne Bitler and Lucie Schmidt

1 Robustness tests

As noted in the text, we have estimated a number of robustness tests. Some of these results are available in this document; others are available on available on request.

1.1 Difference-in-difference models

First we present results from standard difference-in-difference models in Appendix Tables 1 and 2. These difference-in-difference models do not allow the effects of mandates to vary by subgroup. All variation in the mandate variable in this table is due to differences across states in whether they have mandates, and when the mandates were implemented. In both tables, the coefficients on “any mandate in effect” are small for the whole population, much smaller than the effects we detect for highly educated older women in Tables 4 and 5 of the paper.

1.2 Models estimated on various subsamples

We estimated specifications that restrict the sample to older women, younger women, women with high education, and women with low education, and then estimate models which allow the effect of mandates to vary by age (for the education samples) or by education (for the age samples). These are reported below in Appendix Tables 3 and 4. They suggest that even in these subsamples, the effects for highly educated women are large and sometimes significant, while effects for younger women or women with little education are much smaller in magnitude. Broadly speaking, the effects are consistent with our story and sometimes significant for ovulation inducing drugs.

1.3 Role of state-by-year controls

Next, we considered the role of the state-by-year level controls in our findings. These are reported in Appendix Tables 5 and 6. Specifications estimated with only the mandate variables, and the age and education

interactions with mandates are nearly identical in magnitude and significance to those reported in the paper in Tables 4 and 5.

We also considered whether the state-by-year level controls predict adoption of mandates. Whether we use individual level woman data (i.e., pooled CPS data from 1981-2000) or aggregate data, the only state-level controls which are consistently significant predictors of adoption are the share Hispanic in the state. These results are reported in Appendix Table 7.

1.4 Results with variation in mandate effects by time since the law was implemented

We looked at whether the effect of the mandates varied by how long they had been in effect. (Because our data is reported once every 5 years, we do not have all years of data since implementation for all states.) These are reported in Appendix Table 8 and 9. The 1–3 years since law implemented variable is 1 for 6 states in the 1988 NSFG and 2 for the 2002 NSFG. The 4–5 years since law implemented variable is 1 for 1 state in the 1982 NSFG, and 3 in the 1995 NSFG. The law in place for 6 or more years is identified by 1 state in 1988, 10 in 1995, and all but Louisiana and New Jersey in 2002. Focusing on the specific treatments, these tables suggest that for ovulation inducing drugs, the effect is the same for all of the 3-way law/age at least 30/high education coefficients, although only that for law in place 6 or more years is significant. The effects for artificial insemination seem to decline in time since the law was implemented and the largest effects for testing are also for the law in place 4–5 years. It is worth noting, however, that while these point estimates are sometimes different, we would not reject the null that they are equal.

1.5 Leads

We have considered the role of possible policy endogeneity by estimating specifications with leads of the policy variables. None of the leads are large in magnitude or significant, suggesting little concern about policy endogeneity.

1.6 Do mandates affect private health insurance coverage?

We have also considered the role of mandates in possibly causing firms to stop offering or women to stop taking up private insurance coverage. In addition to not being available consistently across all waves of

the NSFG, the NSFG for later (post most mandate adoption) years only reports current insurance coverage. Estimates using pooled March CPS data from 1981-2000 suggest no role of mandates in leading to less private health insurance coverage (in the woman's name or her spouse's name) for highly educated older women.

Appendix Table 1: Determinants of any infertility treatment, medical help to get pregnant, and medical help to avoid miscarriage, difference-in-differences estimates (main mandate variable only)

	Any infertility treatment	Medical help to get pregnant	Medical help to avoid miscarriage
Any mandate	0.0002 (0.009)	-0.007 (0.008)	0.004 (0.008)
Age 30 and older	0.073*** (0.006)	0.064*** (0.006)	0.023*** (0.005)
Some college	-0.020** (0.005)	-0.004*** (0.003)	-0.016*** (0.005)
30 and older * some college	0.083*** (0.009)	0.057*** (0.009)	0.046*** (0.007)

Notes: Shown are coefficients from least squares regressions of the determinants of ever having had various types of infertility treatments. Each column presents results from a single regression. Regressions are weighted, with standard errors clustered at the state level in parentheses. Specifications include state and year of interview fixed effects and individual demographic and state-by-year level demographic, policy, and economic controls. The only infertility mandate variable is a control for any mandated treatment. Data are from pooled 1982, 1988, 1995, and 2002 waves of the NSFG. Sample is all women who ever had sex after menarche. ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent levels.

Appendix Table 2: Determinants of specific medical treatments to help get pregnant, main mandate variable only

	Ovulation inducing drugs	Artificial insemination	IVF	Testing of female	Testing of male	Tubal surgery	Other Treatment
Any mandate	0.002 (0.003)	0.0011 (0.0024)	0.0014 (0.0014)	-0.008 (0.006)	-0.005 (0.005)	-0.001 (0.003)	0.0002 (0.006)
Age 30 and older	0.019***	0.006***	0.0005	0.038***	0.021***	0.010***	0.023***
Some college	(0.002)	(0.001)	(0.0004)	(0.005)	(0.003)	(0.002)	(0.005)
	-0.004*	-0.0009	-0.0003	-0.006**	-0.007***	-0.002*	0.001
	(0.002)	(0.0010)	(0.0004)	(0.002)	(0.002)	(0.001)	(0.003)
30 and older * some college	0.032***	0.010***	0.0041***	0.038***	0.037***	0.010***	0.011
	(0.005)	(0.002)	(0.0009)	(0.005)	(0.005)	(0.003)	(0.007)

Notes: Shown are coefficients from least squares regressions of the determinants of ever having had various types of infertility treatments. Results in column 6 for outcome “other treatment” are for some other treatment besides the ones in columns 1–6. Each column presents results from a single regression. Regressions are weighted, with standard errors clustered at the state level in parentheses. Specifications include state and year of interview fixed effects and individual demographic and state-by-year level demographic, policy, and economic controls. The only infertility mandate variable is a control for any mandated treatment. Data are from pooled 1982, 1988, 1995, and 2002 waves of the NSFG. Sample is all women who ever had sex after menarche. ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent levels.

Appendix Table 3: Determinants of any infertility treatment, medical help to get pregnant, and medical help to avoid miscarriage, by subgroup

	Any infertility treatment	Medical help to get pregnant	Medical help to avoid miscarriage
<i>A. Sample is women with at least some college</i>			
Any mandate	-0.008 (0.018)	-0.023 (0.018)	0.001 (0.012)
Age 30 and older	0.150*** (0.009)	0.117*** (0.008)	0.066*** (0.006)
Mandate * 30 and older	0.019 (0.013)	0.014 (0.012)	0.011 (0.012)
<i>B. Sample is women with no college</i>			
Any mandate	0.007 (0.014)	0.011 (0.012)	-0.001 (0.008)
Age 30 and older	0.077*** (0.007)	0.071*** (0.007)	0.021*** (0.005)
Mandate * 30 and older	-0.019 (0.013)	-0.025** (0.009)	0.004 (0.009)
<i>C. Sample is women 30 and older</i>			
Any mandate	-0.003 (0.017)	-0.020* (0.011)	0.012 (0.014)
Some college	0.051*** (0.011)	0.042*** (0.010)	0.028*** (0.008)
Mandate * some college	0.025 (0.016)	0.023 (0.014)	0.002 (0.011)
<i>D. Sample is women under 30</i>			
Any mandate	-0.006 (0.014)	0.001 (0.011)	-0.006 (0.008)
Some college	-0.012* (0.007)	0.004 (0.005)	-0.015*** (0.005)
Mandate * some college	-0.010 (0.009)	-0.012* (0.007)	-0.001 (0.007)

Notes: Shown are coefficients from least squares regressions of the determinants of ever having had various types of infertility treatments. Each panel represents regressions for a different subsample. Each column within panel presents results from a single regression. Regressions are weighted, with standard errors clustered at the state level in parentheses. Specifications include state and year of interview fixed effects and individual demographic and state-by-year level demographic, policy, and economic controls. Data are from pooled 1982, 1988, 1995, and 2002 waves of the NSFG. ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent levels.

Appendix Table 4: Determinants of specific medical treatments to help get pregnant, by subgroup

	Ovulation inducing drugs	Artificial insemination	IVF	Testing of female	Testing of male	Tubal surgery	Other Treatment
<i>A. Sample is women with at least some college</i>							
Any mandate	-0.011 (0.010)	-0.004 (0.004)	0.002 (0.003)	-0.022** (0.010)	-0.023** (0.009)	-0.009* (0.005)	0.004 (0.012)
Age 30 and older	0.046*** (0.005)	0.015*** (0.003)	0.004*** (0.001)	0.060*** (0.005)	0.054*** (0.004)	0.021*** (0.003)	0.034*** (0.006)
Mandate * 30 and older	0.016** (0.008)	0.006 (0.006)	0.0002 (0.0020)	0.010 (0.011)	0.013 (0.009)	-0.002 (0.005)	-0.002 (0.010)
<i>B. Sample is women with no college</i>							
Any mandate	0.006 (0.005)	0.002 (0.003)	0.0011 (0.0008)	0.002 (0.008)	0.003 (0.006)	0.007** (0.003)	0.005 (0.009)
Age 30 and older	0.020*** (0.003)	0.007*** (0.001)	0.0005 (0.0006)	0.027*** (0.004)	0.022*** (0.004)	0.010*** (0.002)	0.026*** (0.006)
Mandate * 30 and older	-0.003 (0.005)	-0.0003 (0.0027)	0.0002 (0.0006)	-0.007 (0.007)	-0.001 (0.006)	0.0001 (0.0030)	-0.012** (0.006)
<i>C. Sample is women 30 and older</i>							
Any mandate	-0.004 (0.008)	-0.002 (0.004)	0.001 (0.002)	-0.019** (0.009)	-0.009 (0.007)	-0.0005 (0.0050)	-0.003 (0.010)
Some college	0.021*** (0.004)	0.007** (0.003)	0.003*** (0.001)	0.025*** (0.005)	0.025*** (0.005)	0.007*** (0.003)	0.010 (0.007)
Mandate * some college	0.013 (0.009)	0.006 (0.006)	0.001 (0.002)	0.010 (0.010)	0.004 (0.010)	-0.002 (0.005)	0.008 (0.009)
<i>D. Sample is women under 30</i>							
Any mandate	0.002 (0.005)	0.001 (0.002)	-0.00005 (0.00045)	0.002 (0.006)	0.0006 (0.0052)	0.0005 (0.0025)	0.003 (0.008)
Some college	0.001 (0.003)	0.0007 (0.0011)	-0.0003 (0.0004)	-0.00005 (0.00287)	-0.0006 (0.0027)	-0.002 (0.002)	0.001 (0.003)
Mandate * some college	-0.007* (0.004)	-0.0006 (0.0019)	0.0013 (0.0011)	-0.004 (0.005)	-0.008** (0.004)	-0.001 (0.002)	-0.001 (0.005)

Notes: Shown are coefficients from least squares regressions of the determinants of ever having had various types of infertility treatments. Each panel represents regressions for a different subsample. Results in column 6 for outcome “other treatment” are for some other treatment besides the ones in columns 1–6. Each column within panel presents results from a single regression. Regressions are weighted, with standard errors clustered at the state level in parentheses. Specifications include state and year of interview fixed effects and individual demographic and state-by-year level demographic, policy, and economic controls. Data are from pooled 1982, 1988, 1995, and 2002 waves of the NSFG. ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent levels.

Appendix Table 5: Determinants of any infertility treatment, medical help to get pregnant, and medical help to avoid miscarriage, no controls but mandates, age, and education, and state/year fixed effects

	Any infertility treatment	Medical help to get pregnant	Medical help to avoid miscarriage
Any mandate	-0.0005 (0.010)	0.0005 (0.009)	0.0008 (0.007)
Age 30 and older	0.079*** (0.007)	0.072*** (0.007)	0.022*** (0.005)
Some college	-0.013** (0.006)	0.003 (0.005)	-0.014*** (0.005)
Mandate * 30 and older	-0.020 (0.013)	-0.026** (0.010)	0.004 (0.009)
Mandate * some college	-0.010 (0.009)	-0.012* (0.007)	-0.003 (0.008)
30 and older * some college	0.072*** (0.012)	0.046*** (0.010)	0.044*** (0.008)
Mandate * ≥ 30 * some college	0.040** (0.018)	0.040** (0.016)	0.006 (0.013)
Mean, no mandate in effect, women ≥ 30 & some college	0.228	0.170	0.100
3 way interaction as share of mean	0.18	0.24	0.06

Notes: Shown are coefficients from least squares regressions of the determinants of ever having had various types of infertility treatments. Each column presents results from a single regression. Regressions are weighted, with standard errors clustered at the state level in parentheses. Specifications include state and year of interview fixed effects and age and education controls. The only state-by-year level controls are the infertility mandates and their interactions with the various groups. Data are from pooled 1982, 1988, 1995, and 2002 waves of the NSFG. Sample is all women who ever had sex after menarche. ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent levels. Bottom two rows present pre-mandate mean of dependent variable for women ≥ 30 and the 3 way interaction effect (coefficient on mandate * ≥ 30 * some college) as a share of the baseline mean.

Appendix Table 6: Determinants of specific medical treatments to help get pregnant, no controls but mandates, age, and education, and state/year fixed effects

	Ovulation inducing drugs	Artificial insemination	IVF	Testing of female	Testing of male	Tubal surgery	Other Treatment
Any mandate	-0.003 (0.004)	-0.0005 (0.0025)	0.0002 (0.0008)	-0.009 (0.006)	-0.005 (0.004)	-0.001 (0.003)	0.006 (0.006)
Age 30 and older	0.021*** (0.003)	0.007*** (0.001)	0.0005 (0.0006)	0.028*** (0.004)	0.022*** (0.004)	0.010*** (0.002)	0.027*** (0.006)
Some college	-0.0008 (0.003)	-0.0004 (0.0019)	-0.0004 (0.0003)	-0.002 (0.003)	-0.003 (0.003)	-0.002 (0.002)	0.002 (0.003)
Mandate * 30 and older	-0.003 (0.006)	-0.0005 (0.0027)	0.0002 (0.0006)	-0.007 (0.007)	-0.001 (0.007)	0.0004 (0.0029)	-0.013** (0.006)
Mandate * some college	-0.005 (0.004)	-0.0004 (0.0019)	0.0012 (0.0010)	-0.004 (0.006)	-0.007** (0.004)	-0.001 (0.002)	-0.002 (0.005)
30 and older * some college	0.026*** (0.005)	0.009*** (0.003)	0.0041*** (0.0011)	0.033*** (0.006)	0.033*** (0.005)	0.010*** (0.003)	0.008 (0.007)
Mandate * >= 30 * some college	0.019** (0.009)	0.006 (0.005)	-0.0001 (0.0022)	0.016 (0.013)	0.014 (0.010)	-0.002 (0.006)	0.011 (0.009)
Mean, no mandate in effect, women >= 30 & some college	0.062	0.017	0.005	0.075	0.068	0.024	0.057
3 way interaction as share of mean	0.31	0.35	-0.02	0.21	0.21	-0.08	0.19

Notes: Shown are coefficients from least squares regressions of the determinants of ever having had various types of infertility treatments. Results in column 6 for outcome “other treatment” are for some other treatment besides the ones in columns 1–6. Each column presents results from a single regression. Regressions are weighted, with standard errors clustered at the state level in parentheses. Specifications include state and year of interview fixed effects and age and education controls. The only state-by-year level controls are the infertility mandates and their interactions with the various groups. Data are from pooled 1982, 1988, 1995, and 2002 waves of the NSFG. Sample is all women who ever had sex after menarche. ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent levels. Bottom two rows present pre-mandate mean of dependent variable for women ≥ 30 and the 3 way interaction effect (coefficient on mandate * ≥ 30 * some college) as a share of the baseline mean.

Appendix Table 7: Do state level characteristics predict adoption of laws?

	State-year data		Individual CPS data
<i>State level characteristics:</i>			
Median family income for a family of 3 real \$1000s	0.004 (0.006)	0.004 (0.007)	0.007 (0.007)
Unemployment rate/100	2.139 (1.681)	2.590 (3.262)	2.191 (3.031)
Employment growth rate	0.259 (0.763)	-0.310 (1.269)	-0.636 (1.110)
Medicaid eligibility threshold, pregnant woman	0.0001 (0.0004)	-0.0008 (0.0006)	-0.0008 (0.0006)
Real maximum AFDC/TANF benefits, \$1000s	0.038 (0.029)	0.032 (0.035)	0.035 (0.034)
% of births to unmarried women	-0.667 (0.642)	-0.631 (0.902)	-0.877 (0.828)
<i>% of population that is</i>			
In poverty/100	0.441 (0.501)	1.760 (1.031)	2.071** (0.982)
Hispanic	0.029* (0.016)	0.046** (0.020)	0.049** (0.018)
Black	0.003 (0.008)	0.007 (0.010)	0.011 (0.011)
<i>Woman level characteristics:</i>			
Age \geq 30			-0.001 (0.001)
Some college			-0.002 (0.001)
Age \geq 30·some college			0.003** (0.001)
White, non Hispanic			-0.0002 (0.0013)
Weighted	N	Y	Y
\bar{R}^2	0.729	0.729	0.741
F-statistic (p-value) state characteristics jointly significant	1.17 (0.334)	2.85 (0.001)	4.72 (0.0001)
N	1071	1071	929,192

Notes: Shown are coefficients from least squares regressions of whether a state has implemented a infertility insurance mandate policy this year as a function of the previous year's state level characteristics, state and year fixed effects, and in the third column, individual characteristics. Sample for columns 1 and 2 is states and years between 1982 and 2002. Sample for column 3 is pooled March CPS data for women 18–55 for states and years between 1982 and 2002. Regressions in column 2 are weighted by women 15–44 in the state, and those in column 3 are weighted with the CPS March person weight. All standard errors are clustered at the state level. ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent levels.

Appendix Table 8: Determinants of any infertility treatment, medical help to get pregnant, and medical help to avoid miscarriage, sample of all women, policies vary by time since implemented, 3 way interaction terms only

	Any infertility treatment	Medical help to get pregnant	Medical help to avoid miscarriage
<i>Number of years mandate in effect:</i>			
Policy for 1–3 years* >= 30 * some college	0.023 (0.036)	0.042 (0.037)	-0.006 (0.035)
Policy for 4–5 years* >= 30 * some college	0.045 (0.039)	0.030 (0.028)	0.016 (0.011)
Policy for ≥ 6 years* >= 30 * some college	0.045*** (0.018)	0.043*** (0.014)	0.010 (0.017)

Notes: Shown are coefficients from least squares regressions of the determinants of ever having had various types of infertility treatments. Each column presents results from a single regression. Regressions are weighted, with standard errors clustered at the state level in parentheses. Specifications include state and year of interview fixed effects and individual demographic and state-by-year level demographic, policy, and economic controls, as well as the main mandate variables by years since policy in place and two-way interactions of those variables with age of women at least 30 and some college. Data are from pooled 1982, 1988, and 1995 waves of the NSFG. Sample is all women who ever had sex after menarche. ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent levels.

Appendix Table 9: Determinants of specific medical treatments to help get pregnant, sample of all women, policies vary by time since implemented, 3 way interaction terms only

	Ovulation inducing drugs	Artificial insemination	IVF	Testing of female	Testing of male	Tubal surgery	Other Treatment
<i>Number of years mandate in effect:</i>							
Policy for 1–3 years* >= 30 * some college	0.021 (0.018)	0.018* (0.006)	-0.001 (0.009)	0.014 (0.027)	0.020 (0.024)	0.003 (0.011)	0.010 (0.019)
Policy for 4–5 years* >= 30 * some college	0.020 (0.014)	0.014*** (0.005)	0.0004 (0.0020)	0.046*** (0.015)	0.042*** (0.010)	-0.002 (0.008)	-0.007 (0.017)
Policy for ≥ 6 years* >= 30 * some college	0.020* (0.012)	0.001 (0.006)	0.0004 (0.0014)	0.012 (0.014)	0.009 (0.011)	-0.003 (0.006)	-0.015* (0.009)

Notes: Shown are coefficients from least squares regressions of the determinants of ever having had various types of infertility treatments. Results in column 6 for outcome “other treatment” are for some other treatment besides the ones in columns 1–6. Each column presents results from a single regression. Regressions are weighted, with standard errors clustered at the state level in parentheses. Specifications include state and year of interview fixed effects and individual demographic and state-by-year level demographic, policy, and economic controls, as well as the main mandate variables by years since policy in place and two-way interactions of those variables with age of women at least 30 and some college. Data are from pooled 1982, 1988, and 1995 waves of the NSFG. Sample is all women who ever had sex after menarche. ***, **, and * denote significance of the coefficient at the 1, 5, and 10 percent levels.