Restrictive Immigration Law and Birth Outcomes of Immigrant Women

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Running head: Restrictive Immigration Law and Birth Outcomes

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Abstract

Unauthorized immigration is one of the most contentious policy issues in the United States. In an attempt to curb unauthorized migration, many states have considered restrictive laws intended to make life so difficult for unauthorized immigrants that they would choose to leave the country. Arizona's Senate Bill 1070, enacted in 2010, pioneered these efforts. Using population-level natality data and causal inference methods, we examine the effect of SB1070 on infants exposed before birth in Arizona. Prenatal exposure to the bill resulted in lower birthweight among Latina immigrant women, but not among US-born white, black, or Latina women. The decline in birthweight resulted from exposure to the bill being signed into law, rather than from its (limited) implementation. The findings indicate that the threat of a punitive law, even in the absence of implementation, can have a harmful effect on the birth outcomes of the next generation.

Keywords: Birthweight; Prenatal stress; Immigration policy; Immigrants; Infant health.

List of Abbreviations

DID Difference-in-difference

Immigration is one of the most contentious policy issues in the United States. There are currently about 11 million immigrants without authorization living in the country, most of whom come from Mexico and Central America (1, 2). Facing a deadlock at the federal level, states have taken an increasingly active role in setting immigration policy. Some states have chosen an inclusive approach, preventing law enforcement involvement in immigration enforcement ("sanctuary cities") and extending benefits such as driver's licenses to undocumented immigrants (3). Others have opted for a restrictive stance, expanding local involvement in the enforcement of federal immigration law, mandating employers to verify work eligibility, and blocking access to driver's licenses, in-state tuition, and other benefits (4, 5).

These "internal border control" measures have large implications for the target undocumented population. Research suggests they shape immigrants' residential choices (6–8), labor force participation (9, 10), health care utilization (11, 12) and health and psychosocial wellbeing (13, 14). Their effects can expand beyond intended targets, affecting authorized immigrants and even co-ethnic citizens. Spillover effects could emerge from proximity, given that many authorized immigrants and US-born co-ethnics live in the same mixed-status families, communities, and workplaces as their unauthorized peers (15–17). In contexts in which authorization status is conflated with ethnicity, those who speak the same language or share physical similarities with the unauthorized could be the target of profiling and harassment or feel directly threatened by immigration enforcement (18–22).

To date, the literature has focused on the consequences of immigration enforcement for adults and children (14). We shift attention to those exposed in utero, a less visible but relevant population. Because the prenatal period is highly sensitive to the environment and consequential for health and development, exposure during pregnancy can have enduring consequences over the life course (23, 24).

We examine the effect of Arizona's Senate Bill 1070 Support our Law Enforcement and Safe Neighborhoods Act on infant health among Latina immigrants. We focus on birthweight, a critical measure of early health and wellbeing. Signed into law in 2010, SB1070 is an omnibus bill intended to achieve "attrition through enforcement" (25) by targeting all undocumented immigrants and tying their legal status directly to law enforcement. The bill established that being an immigrant in Arizona without carrying registration documents was a state misdemeanor, prevented "sanctuary city" policies, and imposed penalties for hiring or transporting unauthorized immigrants. Its most prominent provision, the "show me your papers" component, required law enforcement agents to determine individuals' immigration status during lawful stops or arrests if there was reasonable suspicion that the individual was an unauthorized immigrant. According to critics, this provision induced profiling based on ethnicity, language, and skin tone (26).

SB1070 was not an isolated event. Rather, it provided a blueprint for about a dozen states, which have introduced comparable enforcement bills (27) (see Web Figure 1). More recently, federal immigration policy has adopted a more restrictive and aggressive immigration enforcement approach similar to Arizona's in communities across the country (28).

The timing of exposure to restrictive immigration law

Recent research using natural experiments provides evidence of an effect of prenatal exposure to environmental stressors on birthweight, rendering our question plausible. To date, however, these studies tend to focus on discrete events, such as a landmine explosion, a natural disaster, an immigration raid, or the death of a family member (22, 29–31). In all these cases, the event can be dated with accuracy. In contrast, the passage and implementation of immigration law is a process that unfolds over time, making the timing of its impact an empirical question.

SB1070 was never fully implemented. The bill was signed into law in April 2010, and its constitutionality was immediately challenged in court. On July 28 of that year, the day before the bill was scheduled to come into effect, most of its provisions –including the "show me your papers" component– were enjoined, and a very partial version came into effect the following day. The injunction was upheld until June 2012, when the U.S. Supreme Court struck down the entire bill with the exception of the "show me your papers" provision. Even after the Supreme Court ruling, the application of the law was very limited, with authorities usually following local ordinances rather than the new ones established by SB1070 (32, 33). In spite of its partial implementation, the passage of SB1070 is reported to have affected self-reported health (34), fear and distress (35–37) and health care utilization (38) among Latinos. Although the consequences appear to have been stronger among undocumented immigrants, evidence suggests the psychological distress may have extended to documented peers and even US-born Latinos (37).

We examined indicators of awareness and concern about the bill to ascertain

when it was experienced as a stressor. We relied on Google Trends, a web tool that uses Google search data to analyze how often a particular term is searched relative to the total search volume in a particular locality and language. We also analyzed mention counts of SB1070 from the two local newspapers with the highest circulation in Arizona. Figure 1 shows monthly trends in Google searches for "SB1070" in Arizona (1A), references to "SB1070" in the main local newspapers (1B) and Google searches for the Spanish words "*ilegal*" (illegal) and "*derechos*" (rights) in Arizona (1C). While the first two indicators capture awareness and concern about the law, the third reflects reactions by Arizona's Spanish-speaking community, conceivably intended to evaluate risk and develop protective strategies.

Though SB1070 was introduced to the Arizona legislature in January 2010, these indicators suggest that the bill did not become a major topic of public discussion until April 2010, when it was signed into law. There is a sharp spike in both Google searches and newspaper mentions immediately after the law's passage until its (partial) implementation in July 2010, followed by a marked drop. There is also a minor spike around June 2012 when the "show me your papers" provision was upheld by the Supreme Court, but it is slight compared with the initial reaction. The spike in alertness and concern about the bill contrasts with the stability in deportations of unauthorized immigrants. Figure 2, based on the Secure Communities deportation program, shows no increase in fingerprints submitted to federal authorities (2A) or in deportations (2B) after the passage of SB1070.

Combined, these trends suggest that the bill induced concern and anxiety but did not result in an increase in detentions or deportations of undocumented immigrants

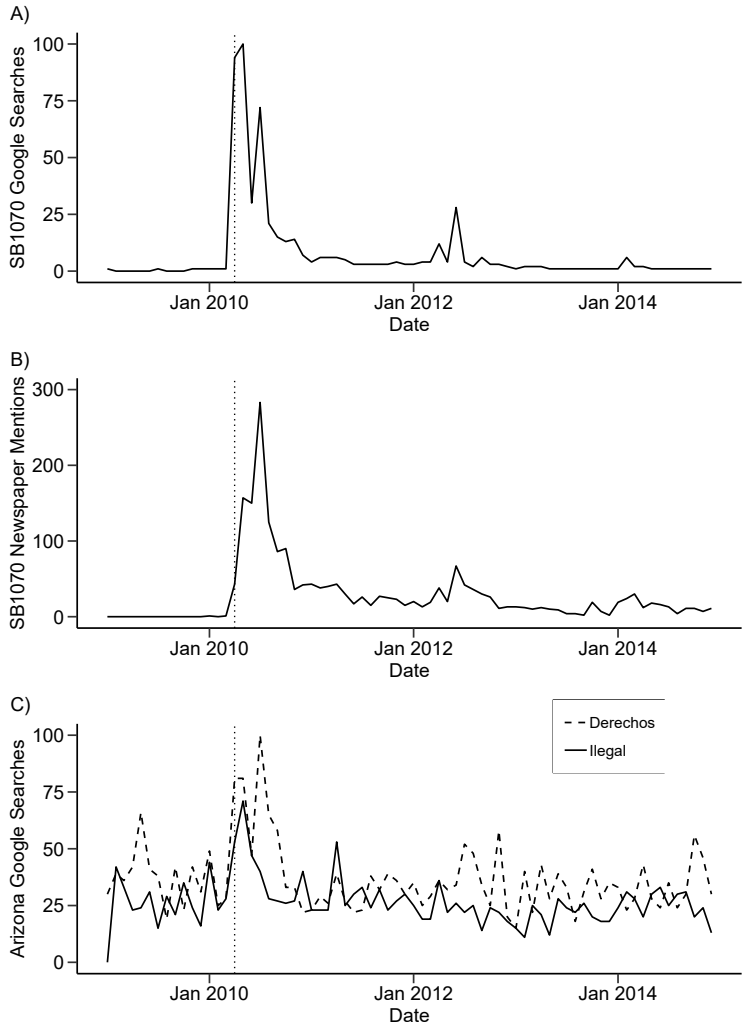

Figure 1: Monthly trends in awareness and concern about SB1070 in Arizona, January 2009-December 2014. Panel A) Monthly trends in Google searches for "SB1070" in Arizona. Panel B) References to "SB1070" in the main local newspapers. Panel C) Google searches for the Spanish words "*ilegal*" (illegal) and "*derechos*" (rights) in Arizona. Google search data obtained from Google Trends. Trends normalized by coding the highest frequency as 100. Newspaper mention counts from the two state newspapers with highest circulation, The Arizona Republic and Arizona Daily Star. The vertical line marks the signing into law of SB1070 in April 2010.

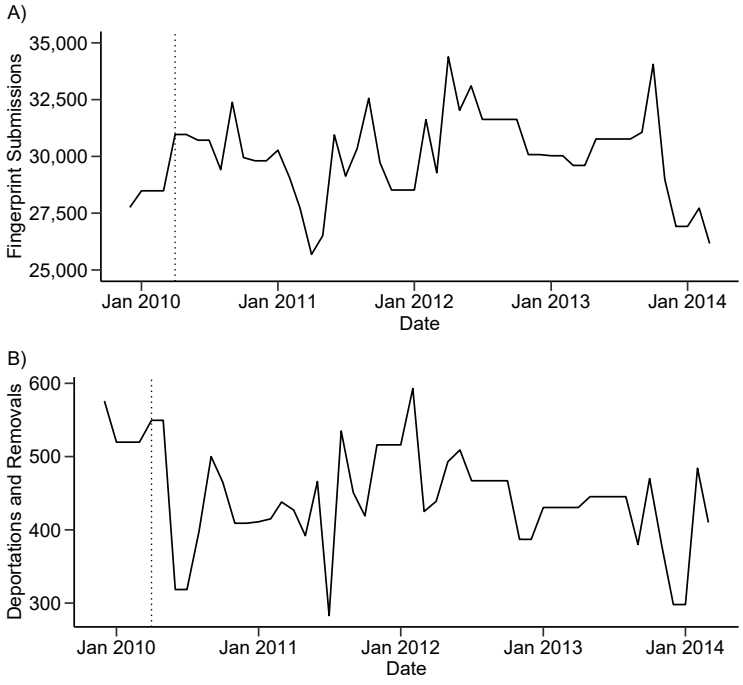

Figure 2: Monthly trends in fingerprint submissions (Panel A) and deportation (Panel B) via the Secure Communities program in Arizona, December 2009 - March 2014. Data obtained from the Department of Homeland Security (2014). The vertical line marks the signing into law of SB1070 in April 2010.

during or after the implementation of the law. Based on this evidence, we expect that Latina immigrants experienced the bill as a stressor immediately after it was passed and before it was enjoined by the courts, in the period between April and July of 2010. The effect of prenatal exposure on birthweight –if any– should then be most evident among births occurring in the second half of 2010. The effects of the bill may have extended to US-born Latinas, driven by proximity to the immigrant population and vulnerability to ethnic profiling.

Methods

We rely on natality microdata containing all U.S. births between January 2007 and December 2012, obtained from the Centers for Disease Control and Prevention. Since 2005, the public-use birth datasets excluded information on geography, so we obtained restricted-access datasets with location information. Since birth records compiled by the Centers for Disease Control and Prevention lack information on some variables for Arizona, we obtained natality data from the Arizona Department of Health Services and merged them with data for other states included in the analysis.

Difference-in-Difference Model

We used a difference-in-difference (DID) model, combining temporal and geographic variation in exposure to SB1070 to define a control population that would provide a counterfactual to Arizona. Due to privacy reasons, birth records do not include precise information about day or week of birth, so it is not possible to calculate

date of conception. Accordingly, the temporal dimension distinguishes the following periods based on date of birth: t_0=Births occurring between January 2007-June 2009, t_1=July-December 2009, t_2=January-June 2010, t_3=July-December 2010, t_4=January-June 2011, t_5=July-December 2011, and t_6=January-December 2012. The first three periods (t_0-t_2) capture pre-treatment prenatal exposure and the last four describe post-treatment exposure, assuming a standard gestational length of 39 weeks. The hypothesis that the law had its strongest effect during the interval between its passage in April 2010 and its injunction in July 2010 should result in an effect on infants born between July and December 2010 (t_3).

Rather than arbitrarily selecting control states, Arizona is compared with a synthetic cohort of states that resemble Arizona in terms of pre-treatment trends (39). The synthetic cohort was empirically obtained by assigning weights to a donor pool of states to minimize the difference between the treated and the control units. It is shaped as follows: California (.522), Louisiana (.168), New Mexico (.177), and Texas (.133). Web Appendix 1 and Web Table 1 provide details on the construction of the synthetic cohort.

The DID model captures the difference in mean birthweight between Latina immigrants in Arizona and Latina immigrants in the synthetic cohort of control states across periods of exposure. Since we considered seven time points between January 2007 and December 2012, we compare each period with the first period between January 2007-June 2009 (t_0). This model is expressed in regression form as follows:

$$Y_{ist} = \beta_0 + \beta_s x_s + \beta_t x_t + \beta_{st} x_{st}$$

where Y identifies the dependent variable, i indexes individual, s indexes state (1=Arizona, 0=synthetic cohort), t indexes time of birth (t_0= January 2007-December 2009,. . . , t_6=January-December 2012) and the population is restricted to Latina immigrants. β_s is a fixed state effect capturing time-invariant differences in the outcome between treatment and control states (e.g. differences in population composition), and β_t is a set of fixed period effects capturing temporal and seasonal trends shared across states (e.g., the economic cycle). The estimates identifying the effect of exposure to SB1070 on birth outcomes are β_{st}, which capture changes in birthweight between the 2007-2009 pre-treatment period and each subsequent period among Latina immigrant women in Arizona compared with Latina immigrants in control states. All models include county fixed effects and control for characteristics of the mother (age, education, marital status) and the birth (sex, parity, occurrence in state of residence). We estimate a similar model restricting the population to US-born Latinas to test the hypothesis of spillover effects onto this group.

Falsification Test

The main threat to unbiasedness of the DID estimator is the violation of the *parallel-trend assumption* that counterfactual trends in birthweight would be the same in Arizona and the control states in the absence of the law. If Arizona had experienced a change coinciding with the passage of the bill, such as an economic downturn or health care reform, the DID estimates would be biased. To address this possibility, we used a falsification approach and examined the effect of SB1070 on U.S.-born non-Hispanic white and black women, a group for whom no effect from the bill is

expected. The analysis considers birthweight (grams) and its two proximate determinants: gestational age (weeks) and intra-uterine fetal growth (sex- and gestational age-specific weight percentile).

Results

Model 1 in Table 1 reports changes in mean birthweight for Latina immigrants across periods of exposure. The main finding is a significant decline in birthweight of 15 grams ($P < 0.01$) for immigrants giving birth in the second half of 2010 (t_3), who were exposed to the passage of the law during gestation. No other significant effects for Latina immigrants were detected before or after the passage of the law. This finding suggests that the decline in birthweight resulted from exposure to SB1070 becoming law rather than from its (partial) implementation. Model 2 examines the effect of the bill for US-born Latinas. No adverse effects are detected for this group (and a significant increase in birthweight is found for infants born between July and December 2011). Nor are there negative effects of the bill for US-born black and white women, a placebo group for which no effects were expected, and a small positive effect is detected for infants born between January and June of 2010 (Model 3). Figure 3 compares the effect estimates obtained from Table 1 across different groups among infants born in the second half of 2010 (t_3), who were in-utero during the period between the bill's passage and partial implementation.

Table 1: Difference-in-Difference Estimates and 95% Confidence Intervals of the Impact of SB1070 on Birth Weight (grams) for Latina Immigrant Mothers, US-born Black and White Mothers, and US-Born Latina Mothers in Arizona, and on Gestational Age (weeks) and Intra-Uterine Fetal Growth (sex- and gestational-age specific weight percentile) for Latina Immigrant Mothers in Arizona, 2007-2012.[a]

	Latina immigrant Birth weight (n = 1,444,541 observations).		US-born Latina Birth weight (n = 1,504,561 observations).		US-born black and white Birth weight (n = 2,403,044 observations).		Latina immigrant Gestational age (n = 1,444,541 observations).		Latina Immigrant Intra-uterine growth (n = 1,444,541 observations).	
Variable[f]	Estimate	95% C.I.	Estimate	95% C.I.	Estimate	95% C.I.	Estimate	95% C.I.	Estimate	95% C.I.
t_0 Jan 2007 - Jun 2009 (omitted)										
t_1 Jul 2009 - Dec 2009	-14.2[e]	-21.1, -7.3	-4.7	-11.4, 2.1	-2.6	-9.1, 3.8	0.008	-0.016, 0.032	-1.24[e]	0.86, 1.61
t_2 Jan 2010 - Jun 2010	-5.4[b]	-11.2, 0.4	-1.9	-10.86, 7.07	-6.4	-16.3, 3.5	0.01	-0.012, 0.032	-0.57[e]	-0.89, -0.25
t_3 Jul 2010 - Dec 2010	-6.9[c]	-12.8, -1.0	-7.6[c]	-14.7, -0.5	-2.5	-4.6, 1.9	0.026[c]	0.004, 0.05	-1.08[e]	-1.46, -0.70
t_4 Jan 2011 - Jun 2011	-8.3[c]	-15.3, -1.4	-3.7	-9.4, 2.0	0.7	-4.3, 5.7	-0.006	-0.033, 0.021	-0.60[d]	-1.00, -0.19
t_5 Jul 2011 - Dec 2011	-8.0[b]	-17.1, 1.1	-12.6[e]	-19.7, -5.5	3.2	7.0, 2.2	0.032[b]	-0.01, 0.065	-1.08[e]	-1.54, -0.62
t_6 Jan - Dec 2012	-8.7[c]	-14.0, -3.4	-5.3[b]	-11.1, 0.5	7.3[c]	2.4, 12.3	0.028[c]	0.001, 0.055	-0.95[e]	-1.32, -0.59
Arizona*t_0 (omitted)										
Arizona*t_1	-3.0	-11.8, 5.8	1.3	-15.4, 18.0	-1.7	-10.11, 6.8	-0.007	-0.037, 0.037	-0.08	-0.48, 0.32
Arizona*t_2	-8.1[b]	17.3, 1.2	-3.4	-16.5, 9.8	11.6[c]	0.8, 22.4	-0.022	-0.061, 0.021	-0.29	-0.80, 0.22
Arizona*t_3	-14.9[d]	-25.6, -4.1	11.3[b]	-0.6, 23.2	-0.7	-6.2, 4.7	-0.019	-0.051, 0.031	-0.68[c]	-1.28, 0.09
Arizona*t_4	10.6	-11.2, 12.4	5.2	-4.7, 15.1	0.6	-9.0, 10.2	0.011	-0.02, 0.042	0.28	-0.34, 0.90
Arizona*t_5	-1.3	-14.8, 12.3	29.8[e]	21.3, 38.3	3.7	-5.5, 13.1	-0.045[b]	-0.096, 0.006	0.51	-0.25, 1.27
Arizona*t_6	6.1	-5.9, 18.0	10.8c	1.8, 19.7	9.7[b]	-0.9, 20.4	-0.021	-0.065, 0.025	0.54[b]	-0.07, 1.15
Female	-95.4[e]	-97.8, -93.0	-95.9[e]	-101.2, -90.4	-117.6[e]	-119.6, -114.4	0.145[e]	0.133, 0.157	0.40[e]	0.28, 0.51
Education less than HS (omitted)										
Education some HS	10.7[e]	6.8, 14.6	1.4	-16.1, 18.9	15.1[c]	0.9, 29.3	-0.005	-0.016, 0.016	0.64[e]	0.35, 0.92
Education HS graduate	4.6	-2.8, 12.0	24.5[c]	3.1, 45.9	80.5[e]	65.7, 95.3	-0.015	-0.030, 0.010	0.39[b]	-0.06, 0.84
Education some college	11.8[d]	4.0, 19.6	35.4[d]	12.3, 58.6	115.5[e]	99.0, 131.9	-0.007	-0.033, 0.039	0.78[e]	0.34, 1.21
Education college graduate	12.9[c]	1.0, 24.8	64.0[e]	32.7, 95.2	161.3[e]	142.2, 180.2	0.074[e]	0.039, 0.109	-0.21	-0.99, 0.57
Birth order 1 (omitted)										
Birth order 2-3	75.8[e]	69.8, 81.9	55.0[e]	50.4, 59.5	46.3[e]	41.2, 51.4	-0.162[e]	-0.178, -0.142	5.63[e]	5.30, 5.96
Birth order 4-5	98.4[e]	90.5, 106.3	52.2[e]	45.6, 58.8	27.6[e]	17.7, 37.5	-0.229[e]	-0.256, -0.202	7.59[e]	7.15, 8.03
Birth order 6+	100.3[e]	89.4, 111.2	27.0[e]	16.4, 37.7	-3.3	-10.8, 13.1	-0.314[e]	-0.349, -0.279	8.50[e]	8.00, 9.00
Mother's age	30.6[e]	27.7, 33.5	22.8[e]	19.6, 26.0	12.6[e]	10.3, 14.9	0.106[e]	0.090, 0.122	1.16[e]	1.00, 1.32
Mother's age^2	-0.5[e]	-0.5, -0.6	-0.4[e]	-0.4, -0.3	-0.2[e]	-0.3, -0.2	-0.002[e]	-0.002, -0.002	-0.02[e]	-0.02, -0.01
Mother is married	12.7[e]	9.0, 16.5	36.8[e]	28.7, 44.9	104.8[e]	96.8, 112.6	0.038[e]	0.014, 0.062	0.50[e]	0.31, 0.70
Birth in state of residence	233.8[e]	201.6, 266.0	201.4[e]	142.3, 260.5	137.7[c]	32.1, 243.3	1.111[e]	0.944, 1.278	5.80[e]	3.74, 7.86
Constant	2,627.0[e]	2,570.0, 2684.0	2,726.1[e]	2644.9, 2807.1	2,846.6[e]	2738.3, 2953.7	36.523[e]	36.251, 36.789	21.34[e]	19.08, 23.60

Abbreviations: Jan = January, Jun = June, July = July, Dec = December, HS = high school.

[a] Difference-in-difference models compare trends in Arizona with trends in a synthetic cohort of control states (see text for details). Robust standard errors used for 95% CIs.

[b] $P < 0.10$, [c] $P < 0.05$, [d] $P < 0.01$, [e] $P < 0.001$ (two-tailed tests).

[f] Indicator for the treatment group (Arizona) dropped because of perfect collinearity with the county fixed effects.

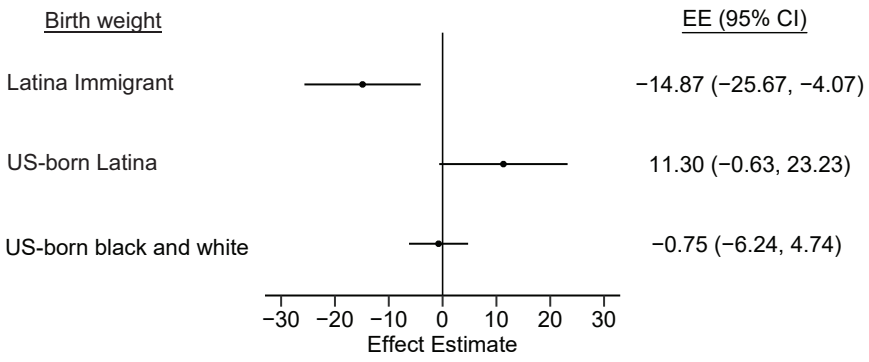

Figure 3: Comparison of effect estimates associated with exposure to the signing of SB1070 into law in the first half of the pregnancy for different groups of women defined by ethnicity and nativity, and 95% CIs. CIs based on tests for the null hypothesis that the parameter estimate is different from zero at the .05 confidence level.

Proximate determinants of birth weight

Models 4 and 5 in Table 1 examine the effects of the bill on the two proximate determinants of birthweight, gestational age and fetal growth, among Latina immigrants. Evidence indicates a decline in both measures among infants born in the second half of 2010 (t_3) but the decline is only significant for fetal growth, and it reaches .7 percentage points.

The population-level impact of exposure to SB1070 is similar to the effect of exposure to other environmental stressors discussed in the literature. For example, a study found a decline in birthweight of approximately 8 grams resulting from prenatal exposure to a landmine explosion in the municipality of mother's residence (29). Early-pregnancy exposure to an earthquake resulted in a decline in birthweight

of 50 grams (30) and the effect of the death of one of the mother's parents during pregnancy was found to reach approximately 20 grams (31). While these studies vary methodologically, the negative effect of exposure to SB1070 on birthweight is within the range defined by the studies capturing the effect of major environmental stressors.

Behavioral responses and population composition

Among Latina immigrants, behavioral responses to the threat posed by the law, such as out-migration or fertility postponement, could have altered the population of births exposed to the bill. For example, if highly-educated immigrants had left Arizona to avoid exposure, the negative effect attributed to the bill could be an artifact of population sorting inducing negative selectivity.

To assess compositional change of the exposed population, Panel A in Figure 4 tests for changes in the birth rate of Latina immigrants in Arizona in the second half of 2010 (t_3) using DID models (Web Table 2 reports the full models). It shows a significant decline of 2.72 births per thousand population. This decline is much larger than the one experienced by U.S.-born black and white women, suggesting that Latina immigrants may have reduced their fertility, voluntarily or involuntarily, as the bill was being signed into law. Panels B-D in Figure 4 (Web Table 3) examine changes in sociodemographic characteristics of women known to be correlated with birth outcomes, including age, marital status, and education (40–43). Latina immigrants exposed to SB1070 during pregnancy were less likely to be teens ($P < .001$) and less likely to be single ($P < .001$). The decline in the proportion of immigrants with low

education is not significantly different from zero ($P = .80$). However, for all three sociodemographic markers, these declines are much larger than those experienced by U.S.-born black and white women.

Attributing trends in population composition solely to the passage of SB1070 would be incorrect. The changes preceded and persisted after the law's passage (Web Tables 2-3), likely driven by the impact of the Great Recession and by prior immigration enforcement regulation in Arizona (44, 45). Regardless of their causes, this analysis indicates a reduction in fertility and a positively selected group of Latina immigrants exposed to SB1070 during pregnancy.

Discussion

Existing literature suggests that the passage of a restrictive immigration bill in Arizona had a negative effect on health care utilization, psychological wellbeing, and self-rated health among Latino immigrants (34–38). Here we examined a less visible but relevant outcome: the effect of restrictive immigration law on infants exposed before birth. We find that exposure to the bill's passage had a negative effect on birthweight among Latina immigrant women, which was largely driven by a decline in intra-uterine fetal growth. Web Appendix 1 offers a battery of robustness checks and shows that the findings are robust to alternative specifications and significance calculations (Web Tables 4-7). This effect was not observed among US-born Latinas or US-born black and white women, and its magnitude is comparable to the effect of major environmental stressors documented by the literature. This finding should be

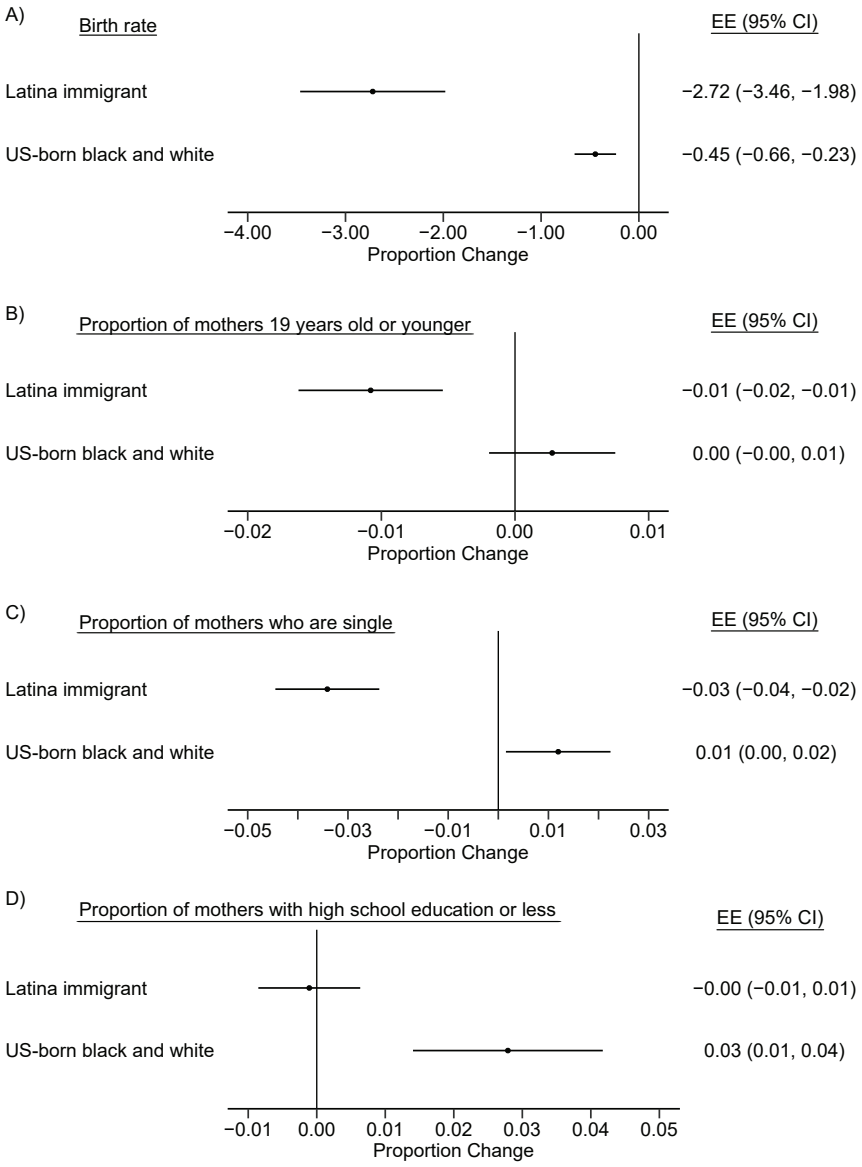

Figure 4: Indicators of change in the composition of births occurring in the second half of 2010 in Arizona for different groups of women defined by ethnicity and nativity, and 95% CIs. Birth rate measured as birth per thousand population (Panel A), proportion of mothers 19 or younger (Panel B), proportion of mothers who are single (Panel C), and proportion of mothers with a high school diploma or less (Panel D).

interpreted in the context of the birth outcomes of Latina immigrants, which compare favorably to those of US-born white women despite immigrants' lower levels of education, income, and health insurance (46–48). Even if the decline in birthweight resulting from exposure to SB1070 has limited clinical impact at the individual level, its consequences at the aggregate level erode part of the health advantages of an already vulnerable population.

We also detected a decline in fertility and a reduction in the proportion of teen, low-education, and single mothers among Latina immigrants exposed to the immigration bill. These changes suggest that more disadvantaged Latina immigrants may have reduced their fertility in the face of the bill. Even if these sociodemographic factors are controlled for in our models, if they are correlated with unobserved sources of maternal selectivity, they could result in an underestimate of the true effect of the law's passage on birthweight that would have been observed had the composition of Latina immigrants not changed.

An important question that we cannot address with the available data is the mechanisms accounting for the negative effect of restrictive immigration law on birthweight. The literature suggests several pathways through which prenatal exposure to environmental stressors can affect birth outcomes. These include the mother's physiological, neuroendocrine, and immune stress response that could impact the developing fetus, and the mother's behavioral responses to anxiety such as reducing prenatal care use, or consuming alcohol or cigarettes (49–51). The fact that the effect of exposure to the bill's passage was discrete and short-term is consistent with an acute stress response among immigrant mothers. A plausible mechanism for the

observed effect on intra-uterine growth is a stress-induced increase in levels of placental corticotropin releasing hormone resulting in decreased uteroplacental flow and hypoxemia restriction, which are well-known risk factors for fetal growth restriction (52). Our ancillary analysis of prenatal care utilization and smoking as potential behavioral mechanisms (Web Tables 8-9) suggests that these behavioral pathways did not play a significant role in this setting. There are, however, several other plausible pathways such as economic hardship, change in diet, and decline in the quality of healthcare that call for further investigation (14).

We found no evidence that the effect of the bill on birthweight extended to US-born Latinas, departing from other research reporting a negative impact of restrictive immigration policy on this population (22). We can only speculate about the sources of divergence. It is possible that the absence of a spillover effect in this case results from contextual factors. In the context of a large and established Latino population in Arizona, the differences between immigrant and US-born Latinos in terms of economic standing, language, and demeanor might be more pronounced and visible than in contexts with a smaller and more homogeneous Latino population. Alternatively, it has been established that Latino immigrants lose their health advantage in birth outcomes across generations, plausibly because subsequent generations are more exposed to and more aware of racialized exclusion than recent immigrants (53). As a result, a novel shock such as a restrictive immigration law may be less consequential for a population already accustomed to racialized exclusion.

It is important to note that the effect captured in this analysis is an "intent to treat" outcome measured among all Latina immigrant women exposed to the bill,

regardless of immigration status and socioeconomic advantage. It is likely, however, that the effect varied within the population. For those interested in overall population wellbeing, the intent-to-treat effect is a central result. If the focus is on mitigation and compensation policies, identifying the women most affected is critical. Ancillary analysis offered in Web Table 10 examines heterogeneity in SB1070's effect among Latina immigrants based on mother's educational attainment, distinguishing immigrants with a high school diploma or less and those with some college or more education. Prenatal exposure to the bill's passage results in a decline in birthweight of 12 grams ($P = .04$) among immigrants with low education, and 29 grams ($P = .05$) among immigrants with higher levels of education (while these estimates differ in magnitude, they are statistically indistinguishable [$P = .29$]). The negative effect among highly-educated immigrants, most of whom are authorized, suggests that the detrimental effect of restrictive immigration law may have extended to documented immigrants.

We find that the effect on infant health resulted only from exposure to the signing of the bill into law rather than from its (partial) implementation. This suggests that it is not necessary for a proposed institutional change to become the law of the land to have harmful consequences. This finding is noteworthy given the recent proliferation of restrictive immigration enforcement initiatives at the state and, more recently, federal level. Even though most of these proposals have been blocked by the legislative or judicial systems and have not been implemented, our findings indicate that the threat might be sufficient to alter birth outcomes among vulnerable populations. While the Arizona bill did not increase deportations, nor does it appear

to have achieved a meaningful reduction in the unauthorized population (54, 55), it affected the birth outcomes of infants born to Latina immigrants who were exposed during pregnancy. The infants affected are US citizens and will most likely become the next generation of students, workers, and taxpayers. To the extent that birthweight predicts later health, development, and achievement, these infants could be scarred by an institutional shock experienced before birth.

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Restrictive Immigration Law and Birth Outcomes of Immigrant Women

Florencia Torche and Catherine Sirois

Table of contents:

Web Appendix 1……2
Web Figure 1……7
Web Table 1……8
Web Table 2……9
Web Table 3……10
Web Table 4……11
Web Table 5……12
Web Table 6……13
Web Table 7……14
Web Table 8……15
Web Table 9……16
Web Table 10……17

Web Appendix 1.

METHODS

Synthetic cohort construction: A synthetic cohort approach allows for estimation of an effect when a unit is exposed to an event or intervention ("treatment"). It provides a systematic method to obtain a weighted sum of donor control units (states, in this setting) chosen from a pool of potential candidate units. The weighted combination of control units is chosen to approximate the unit affected by the treatment in terms of the outcome's predictors.

We first established a donor state pool by excluding states that had passed similarly restrictive immigration legislation during the period of observation, providing a poor counterfactual (see Web Figure 1). These states include Alabama, Georgia, Indiana, Kansas, Mississippi, Missouri, Rhode Island, South Carolina, Utah, West Virginia. We then used Abadie et al.'s (1) algorithm to select a synthetic cohort of states that resembles the treated state in terms of demographic and socioeconomic pre-treatment trends and attributes from the donor pool. This ancillary analysis is based on the Current Population Survey (CPS), a monthly survey of about 54,000 households conducted by the US Census Bureau and the Bureau of Labor Statistics. Using the CPS monthly surveys from January 2007 to December 2012, we constructed a state-by-semester panel including the following trends and attributes:

- Lagged value of the outcome variable (birth weight). Lagged values of the outcome are considered critical predictors in synthetic cohort models because they include the effects of any factor shaping the outcome whether or not they are observed (2). Rather than including values of the outcome for all pre-treatment periods, it is recommended to use an average of lagged values prior to the period of treatment implementation or a single pre-treatment value (3) and to assess the sensitivity of the results to the choice of lagged outcome (4). We compared several lag structures and obtained similar results, so we report results with lagged birthweight value during the second semester of 2009, 12 months prior to the treatment.
- Proportion of non-citizen Latinos residing in the state.
- State-level unemployment rate.
- Proximity to the border, an ordinal variable coded 2 for border states, 1 for states adjacent to a border state, and 0 for other states (this attribute is constant over time).
- Proportion of non-citizen residents born in Mexico, El Salvador, Guatemala, Honduras, and Nicaragua.
- Proportion of the adult population with a high school diploma or more.

We assigned weights to the donor pool's states to minimize the difference between the treated unit and the control units based on these pre-treatment trends and characteristics. **Web Table 1** reports the weights for the states included in the synthetic cohort and the predictor balance comparing Arizona with the synthetic cohort after weighting.

RESULTS

Web Tables 2 and 3 are the source of Figure 4.
Web Table 2 reports estimates of the impact of SB1070 on the birth rate among Latina immigrant mothers (Model 1) and US-born black and white women (Model 2) across the period of exposure. The birth rate is expressed as the number of births per 1,000 population for each period of

exposure, separately for each group of women. Population figures were obtained from monthly Current Population Surveys (CPS).
Web Table 3 reports estimates of the impact of SB1070 on socioeconomic characteristics of women giving birth, obtained from the birth certificates. These characteristics include mother is teenager (19 years old or younger at time of birth), mother is unmarried at time of birth, and mother has a low level of educational attainment at time of birth (a high school diploma or less).

ALTERNATIVE SPECIFICATIONS AND ROBUSTNESS TESTS

Restricting analysis to "stayers". In our models, exposure to SB1070 has been defined by mother's state of residence rather than the state of birth occurrence, as reported in the birth certificate. If women temporarily left their state of habitual residence and gave birth in their temporary location but did not change their permanent residence, they were coded as exposed in their state of residence. This decision averts confounding emerging from migratory flows induced by SB1070. However, it is plausible that a portion of the discrepancy between state of mother's residence and state of birth occurrence is due to reporting error, or that residents of Arizona who gave birth in a different state have sufficient ties in the state of birth occurrence that the Arizona bill had a weaker effect on them. To account for this possibility, **Web Table 4** estimates alternative models restricted to mothers who gave birth in their state of residence. These models for "stayers" produce substantively identical results to the main findings presented in Table 1.

Using an alternative control group. We relied on a synthetic cohort approach to obtain control states based on similarity to Arizona in terms of pre-treatment trends. Some of the synthetic cohort member states neighbor Arizona (see Web Figure 1). If the hostile environment created by SB1070 led to substantial emigration from Arizona to these neighboring states, or if the bill had spillover effects on the Latino populations residing in the control states, they would provide a poor counterfactual. To address these potential sources of bias, we used Florida and New Jersey as alternative control states. While they differ from Arizona in pre-treatment attributes, Florida and New Jersey are important immigrant destinations. Given their distance from Arizona and different country-of-origin composition of the immigrant population, both would have been unlikely destinations of choice for Latina immigrants leaving Arizona as a result of SB1070 and would have been unlikely to experience spillover effects. **Web Table 5** offers results from models estimating the effect of SB1070 using these alternative control states and shows a negative effect of SB1070 among births occurring in the second half of 2010.

Models with clustered standard errors: All models estimated use robust standard errors to account for heteroskedasticity. To account for potential common error structure, we estimated models with robust standard errors clustered at the state level. State-clustered standard errors allow for an unrestricted covariance structure within states, the units determining treatment allocation (6). **Web Table 6** shows that clustered standard errors are substantially smaller than the robust standard errors, so we opted for the more conservative robust version. An additional potential issue leading to underestimation of standard errors in DID models is serial correlation, likely emerging from serial time dependency of the treatment itself (7). This is not a concern in this setting because the analysis relies on a short panel with time intervals of different lengths, and because the treatment is not an absorbing state.

Evaluating an increase in home births: In response to SB1070, some Latina immigrants in Arizona may have chosen not to deliver in health care facilities to avoid interacting with state authorities or healthcare providers. To test the plausibility of this response, we examined the effect

of SB1070 on the prevalence of home births in Arizona using difference-in-differences models. **Web Table 7** offers results from the analysis and shows no significant change in the likelihood of a home birth among Latina immigrant women. A null effect is also found for US-born black and white women. Furthermore, even if the proportion of home births did not increase, it is possible that mothers who delivered at home had opted not to obtain a birth certificate for these births after the passage of SB1070. This possibility is extremely unlikely given the advantages of obtaining a birth certificate to prove citizenship, enroll in school, and apply for some government benefits[1].

Potential Mechanisms

Several mechanisms have been offered to account for a detrimental effect of prenatal stress exposure on birth weight, including the physioneuroendocrine stress maternal response that could harm the developing fetus, as well as behavioral responses by mothers such as reduction in prenatal care, cigarette and alcohol consumption, and change in diet or exercise (8,9). While we cannot perform an exhaustive evaluation of mechanisms with the data available in the birth certificates, we can test two behavioral pathways: A decline in prenatal care use and an increase in cigarette consumption as a response to SB1070.

Prenatal care use: The birth certificates contain information on the number of prenatal care visits during pregnancy. To adjust for length of gestation, we created a gestational-age specific measure of whether the number of prenatal care visits is adequate according to the recommendations of the American College of Obstetricians and Gynecologists (ACOG), whether it is lower than recommended, or higher than recommended (10,11)[2]. A lower than recommended number of prenatal care visits would suggest insufficient medical care, while a higher than recommended number is likely associated with pregnancy or maternal complications.

Smoking: Available information in the birth certificates about smoking during pregnancy and number of cigarettes smoked available in the birth certificates varies over time and across states. The only variable consistently available over the entire period of observations and for all states is a dichotomous indicator coded 1 if the mother smoked cigarettes during pregnancy, 0 otherwise.

Web Table 8 offers estimates of the effect of SB1070 on birth weight controlling for prenatal care visits and **Web Table 9** offers models with controls for mother's cigarette consumption during pregnancy. (We should note that the analysis cannot be given a causal interpretation because the putative mediators are not randomly allocated, violating the sequential ignorability assumption (12)). The results show virtually no change in parameter estimates capturing the effect of SB1070 after accounting for these putative mediators, even if both have a strong association with the outcome. These results suggest these behavioral pathways do not account for the detrimental effect of exposure to SB1070 on birth weight among Latina immigrant women.

Stratifying by mother's level of education

In order to examine heterogeneity in the effect of exposure to SB1070, we stratified the sample of Latina immigrants based on the mother's educational level. We distinguished two groups: Mothers with a high school diploma or less (low education) and mothers with some college education or

[1] In fact, unauthorized immigrants have organized to demand the right to a birth certificate for their US-born children when this right has been threatened at the state level. See for example Presto (13).

[2] An additional measure of prenatal care adequacy is time of care initiation. This variable is not available for all states included in the analysis.

more (high education). The models, presented in **Web Table 10** show a decline in birthweight among infants born in the second half of 2010 (t_3) for both groups. Prenatal exposure to the bill's passage results in a decline in birthweight of 12 grams (P=.04) among immigrants with low education, and 29 grams (P=.05) among immigrants with higher levels of education (while these estimates differ in magnitude, they are statistically indistinguishable [P=.29]).

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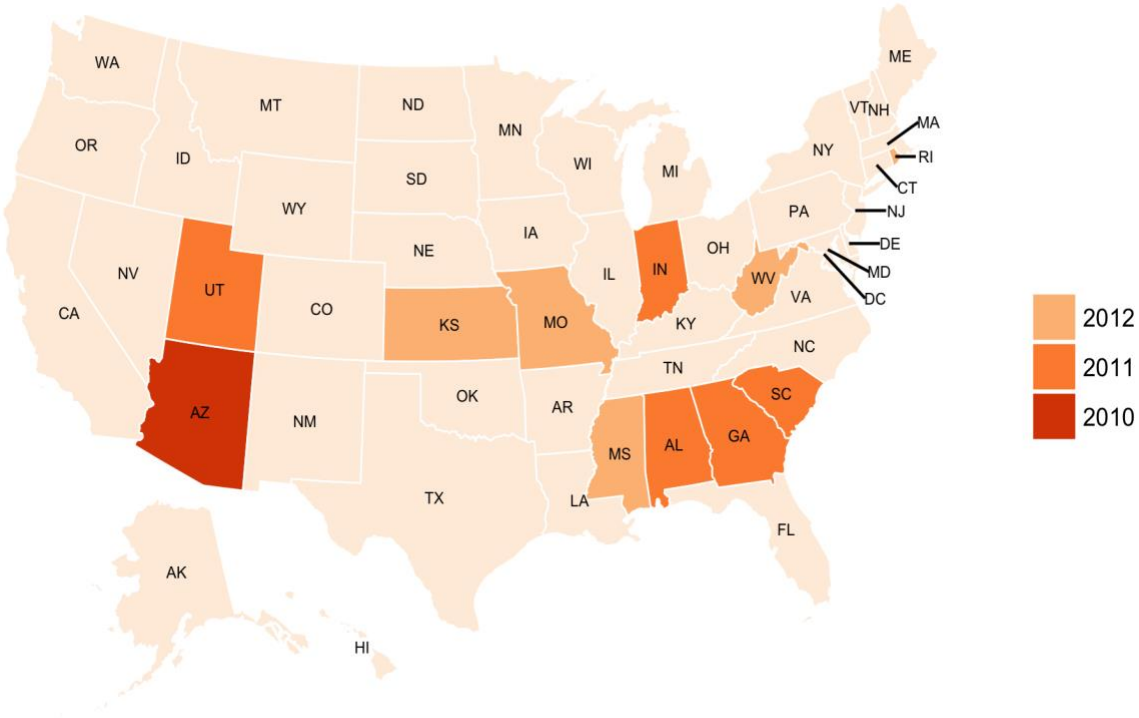
Web Figure 1. States considering restrictive omnibus immigration laws after Arizona passed SB1070.



Web Table 1. Weights assigned to potential donor pool states to create counterfactual population using synthetic cohort approach.

State	Weight	Predictor variable:	Predictor balance	
			Arizona	Synthetic cohort
		Lagged birth weight	3327.7	3329.6
California	0.522	Latino non-citizens	0.077	0.078
Louisiana	0.168	Unemployment rate	0.046	0.047
New Mexico	0.177	Border proximity	2.000	1.832
Texas	0.133	Non-citizens from Mexico & Central America	0.076	0.075
Total weight	**1.000**	Residents with a high school diploma	0.791	0.790

Web Table 2. Difference in difference estimates of the impact of SB1070 on the birth rate (births per 1,000 population) for Latina immigrant mothers and US born Black and White mothers in Arizona and control states.

	Latina immigrants	US-born black and white
t_0 Jan 2007-Jun2009 (omitted)		
t_1 Jul 2009 – Dec 2009	-2.6***	0.2***
	(0.1)	(0.0)
t_2 Jan 2010 – Jun 2010	-8.0***	-1.6***
	(0.1)	(0.0)
t_3 Jul 2010 – Dec 2010	-5.3***	-0.5***
	(0.1)	(0.0)
t_4 Jan 2011 – Jun 2011	-7.4***	-1.9***
	(0.1)	(0.0)
t_5 Jul 2011 – Dec 2011	-5.6***	-1.0***
	(0.1)	(0.0)
t_6 Jan – Dec 2012	-9.4***	-1.3***
	(0.1)	(0.0)
Arizona *t_0 (omitted)		
Arizona *t_1	-1.7***	-0.5***
	(0.4)	(0.1)
Arizona *t_2	-4.5***	1.1***
	(0.4)	(0.1)
Arizona *t_3	-2.7***	-0.4***
	(0.4)	(0.1)
Arizona *t_4	-7.7***	0.9***
	(0.4)	(0.1)
Arizona *t_5	-8.8***	0.2
	(0.4)	(0.1)
Arizona *t_6	-7.1***	1.7***
	(0.4)	(0.1)
Constant	36.7***	12.8***
	(0.1)	(0.0)

+p<.10 *p<.05, **p<.01, ***p<.001. Two-tailed tests. Robust standard errors in parentheses. Indicator for the treatment group (Arizona) dropped because of perfect collinearity with the county fixed effects

Web Table 3. Difference in difference estimates of the impact of SB1070 on socioeconomic attributes (teen mother, unmarried mother, mother with low educational attainment) of Latina immigrant mothers and US-born Black and White mothers in Arizona and control states.

	Mother is teenager		Mother is single		Mother has low education	
	Latina immigrant	US-born black and white	Latina immigrant	US-born black and white	Latina immigrant	US-born black and white
t_0 Jan 2007-Jun2009 (omitted)						
t_1 Jul 2009 – Dec 2009	-0.011***	-0.004**	0.011***	0.011***	-0.009**	-0.025***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.003)	(0.006)
t_2 Jan 2010 – Jun 2010	-0.015***	-0.011***	0.008**	-0.002	-0.024***	-0.048***
	(0.002)	(0.001)	(0.003)	(0.003)	(0.004)	(0.007)
t_3 Jul 2010 – Dec 2010	-0.018***	-0.013***	0.011***	0.008*	-0.028***	-0.047***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.006)
t_4 Jan 2011 – Jun 2011	-0.022***	-0.018***	0.002	-0.003	-0.036***	-0.066***
	(0.002)	(0.001)	(0.008)	(0.002)	(0.004)	(0.005)
t_5 Jul 2011 – Dec 2011	-0.028***	-0.021***	-0.001	0.011***	-0.040***	-0.059***
	(0.002)	(0.002)	(0.008)	(0.003)	(0.005)	(0.004)
t_6 Jan – Dec 2012	-0.032***	-0.027***	0.004	0.006+	-0.052***	-0.067***
	(0.002)	(0.002)	(0.005)	(0.003)	(0.005)	(0.005)
Arizona *t_0 (omitted)						
Arizona *t_1	-0.005+	-0.002	-0.014***	0.001	-0.004	0.020**
	(0.003)	(0.002)	(0.004)	(0.006)	(0.004)	(0.006)
Arizona *t_2	-0.010***	0.001	-0.032***	0.017**	-0.006	0.030***
	(0.002)	(0.002)	(0.005)	(0.005)	(0.007)	(0.007)
Arizona *t_3	-0.011***	0.003	-0.034***	0.012*	-0.001	0.028***
	(0.003)	(0.002)	(0.005)	(0.005)	(0.004)	(0.007)
Arizona *t_4	-0.016***	0.004*	-0.019*	0.010*	-0.008	0.040***
	(0.003)	(0.002)	(0.009)	(0.004)	(0.006)	(0.006)
Arizona *t_5	-0.010**	0.002	-0.039***	0.010*	-0.010+	0.030***
	(0.003)	(0.003)	(0.009)	(0.005)	(0.005)	(0.006)
Arizona *t_6	-0.008**	0.007**	-0.036***	0.020**	-0.002	0.036***
	(0.003)	(0.002)	(0.006)	(0.007)	(0.008)	(0.006)
Constant	0.096***	0.097***	0.491***	0.393***	0.853***	0.424***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)

+p<.10 *p<.05, **p<.01, ***p<.001. Two-tailed tests. Robust standard errors in parentheses. Indicator for the treatment group (Arizona) dropped because of perfect collinearity with the county fixed effects Teen mothers are women 19 years old or younger at the time of birth, single mothers are women who are unmarried at the time of birth, low education mothers are mothers with a high school diploma or less at the time of birth.

Web Table 4. Difference in difference estimates of the impact of SB1070 on birth weight for Latina immigrant mothers and US-born Black and White mothers in Arizona and control states, excluding women who gave birth outside of their state of residence.

	Latina immigrant	US-born black and white
t_0 Jan 2007-Jun2009 (omitted)		
t_1 Jul 2009 – Dec 2009	-13.8***	-2.7
	(3.6)	(3.2)
t_2 Jan 2010 – Jun 2010	-4.8	-6.6
	(3.0)	(5.1)
t_3 Jul 2010 – Dec 2010	-6.5*	-2.7
	(2.9)	(2.5)
t_4 Jan 2011 – Jun 2011	-7.5*	0.8
	(3.5)	(2.7)
t_5 Jul 2011 – Dec 2011	-7.6+	3.1
	(4.6)	(2.7)
t_6 Jan – Dec 2012	-8.3**	6.9**
	(2.8)	(2.5)
Arizona *t_0 (omitted)		
Arizona *t_1	-3.4	-2.0
	(4.6)	(4.2)
Arizona *t_2	-8.1+	11.3*
	(4.8)	(5.5)
Arizona *t_3	-15.6**	-0.7
	(5.3)	(3.0)
Arizona *t_4	9.6	-0.5
	(6.0)	(4.7)
Arizona *t_5	-1.7	4.0
	(6.8)	(4.6)
Arizona *t_6	5.9	10.1+
	(6.0)	(5.2)
Female	-95.0***	-117.4***
	(1.1)	(1.3)
Education LT 8 years (omitted)		
Education some HS	10.4***	17.2*
	(2.1)	(7.3)
Education HS graduate	4.3	82.8***
	(3.9)	(7.7)
Education some college	12.3**	118.1***
	(3.8)	(8.6)
Education college graduate	11.3+	163.7***
	(6.4)	(9.8)
Birth order:1 (omitted)		
Birth order 2-3	75.8***	46.4***
	(3.1)	(2.7)
Birth order 4-5	98.6***	28.2***
	(4.3)	(5.0)
Birth order 6+	100.5***	-4.1
	(5.8)	(8.8)
Mother's age	30.8***	12.6***
	(1.4)	(1.2)
Mother's age^2	-0.5***	-0.2***
	(0.0)	(0.0)
Mother is married	12.5***	104.4***
	(2.0)	(4.0)
Constant	2,857.3***	2,983.3***
	(19.5)	(16.6)

+p<.10 *p<.05, **p<.01, ***p<.001. Two-tailed tests. Robust standard errors in parentheses. Indicator for the treatment group (Arizona) dropped because of perfect collinearity with the county fixed effects

Web Table 5. Difference in difference estimates of the impact of SB1070 on birth weight for Latina immigrant mothers and US-born Black and White mothers in Arizona using Florida and New Jersey as control states.

	Latina immigrant	US-born black and white
t_0 Jan 2007-Jun2009 (omitted)		
t_1 Jul 2009 – Dec 2009	-9.1+	0.7
	(4.7)	(1.9)
t_2 Jan 2010 – Jun 2010	-0.0	4.0*
	(5.3)	(2.0)
t_3 Jul 2010 – Dec 2010	-5.6	2.5
	(5.8)	(2.4)
t_4 Jan 2011 – Jun 2011	-2.9	4.5+
	(7.0)	(2.4)
t_5 Jul 2011 – Dec 2011	-4.2	6.5**
	(4.3)	(2.1)
t_6 Jan – Dec 2012	9.6	12.0***
	(6.1)	(2.0)
Arizona *t_0 (omitted)		
Arizona *t_1	-8.2	-4.1
	(5.6)	(3.3)
Arizona *t_2	-11.2+	3.5
	(6.0)	(2.9)
Arizona *t_3	-15.6*	-2.6
	(7.3)	(2.7)
Arizona *t_4	6.4	-1.1
	(8.5)	(4.6)
Arizona *t_5	-3.0	3.1
	(6.5)	(4.6)
Arizona *t_6	-10.7	9.2+
	(7.9)	(5.3)
Female	-96.3***	-119.2***
	(1.6)	(1.3)
Birth order:1 (omitted)		
Birth order 2-3	83.7***	34.9***
	(3.3)	(2.1)
Birth order 4-5	109.1***	4.0
	(4.9)	(4.6)
Birth order 6+	104.7***	-45.7***
	(6.6)	(10.5)
Mother's age	2.1***	2.7***
	(0.4)	(0.2)
Mother is married	13.1***	149.3***
	(2.6)	(4.4)
Birth in state of residence	103.5***	38.0*
	(25.9)	(15.1)
Constant	3,131.0***	3,125.4***
	(32.4)	(15.6)

+p<.10 *p<.05, **p<.01, ***p<.001. Two-tailed tests. Robust standard errors in parentheses. Indicator for the treatment group (Arizona) dropped because of perfect collinearity with the county fixed effects. Controls for mother's education not included because the variable is not available for the entire period of observation in the control states.

Web Table 6. Difference in difference estimates of the impact of SB1070 on birth weight for Latina immigrant and US-born Black and White mothers in Arizona and control states using clustered standard errors.

	Latina immigrant	US-born black and white
t_0 Jan 2007-Jun2009 (omitted)		
t_1 Jul 2009 – Dec 2009	-14.2*	-2.6
	(3.8)	(3.5)
t_2 Jan 2010 – Jun 2010	-5.4***	-6.4
	(0.4)	(9.2)
t_3 Jul 2010 – Dec 2010	-6.9*	-2.5
	(2.2)	(5.3)
t_4 Jan 2011 – Jun 2011	-8.3*	0.7
	(2.6)	(2.5)
t_5 Jul 2011 – Dec 2011	-8.0	3.2
	(7.7)	(5.4)
t_6 Jan – Dec 2012	-8.7**	7.3
	(1.3)	(6.2)
Arizona *t_0 (omitted)		
Arizona *t_1	-3.0	-1.7
	(3.5)	(3.4)
Arizona *t_2	-8.1***	11.6
	(0.6)	(9.0)
Arizona *t_3	-14.9**	-0.7
	(1.8)	(5.3)
Arizona *t_4	10.6*	0.6
	(3.0)	(2.6)
Arizona *t_5	-1.3	3.7
	(7.2)	(5.5)
Arizona *t_6	6.1**	9.7
	(1.1)	(5.9)
female	-95.4***	-117.6***
	(0.8)	(1.6)
Education LT 8 years (omitted)		
Education some HS	10.7+	15.1
	(4.4)	(8.2)
Education HS graduate	4.6	80.5**
	(7.5)	(10.6)
Education some college	11.8+	115.5**
	(4.4)	(15.6)
Education college graduate	12.9+	161.3**
	(5.7)	(21.3)
Birth order:1 (omitted)		
Birth order 2-3	75.8***	46.3**
	(5.0)	(9.0)
Birth order 4-5	98.4***	27.6+
	(7.5)	(12.9)
Birth order 6+	100.3**	-3.3
	(12.4)	(19.4)
Mother's age	30.6***	12.6*
	(0.7)	(2.9)
Mother's age^2	-0.5***	-0.2**
	(0.0)	(0.0)
Mother is married	12.7***	104.8***
	(0.6)	(12.1)
Birth in state of residence	233.8***	137.7**
	(4.7)	(20.1)
Constant	2,627.0***	2,846.6***
	(9.5)	(41.7)

+p<.10 *p<.05, **p<.01, ***p<.001. Two-tailed tests. Robust standard errors in parentheses. Indicator for the treatment group (Arizona) dropped because of perfect collinearity with the county fixed effects

Web Table 7. Difference in differences estimates of the impact of SB1070 on the percent of home births for Latina immigrant mothers and US-born Black and White mothers in Arizona and control states.

	Latina immigrant	US-born black and white
t_0 Jan 2007-Jun2009 (omitted)		
t_1 Jul 2009 – Dec 2009	0.010	0.014
	(0.023)	(0.082)
t_2 Jan 2010 – Jun 2010	-0.029	0.241**
	(0.020)	(0.078)
t_3 Jul 2010 – Dec 2010	0.028	0.442***
	(0.034)	(0.095)
t_4 Jan 2011 – Jun 2011	0.011	0.347***
	(0.017)	(0.089)
t_5 Jul 2011 – Dec 2011	0.023	0.373**
	(0.028)	(0.133)
t_6 Jan – Dec 2012	0.047*	0.419***
	(0.021)	(0.069)
Arizona *t_0 (omitted)		
Arizona *t_1	0.000	0.182
	(0.036)	(0.123)
Arizona *t_2	0.003	0.010
	(0.024)	(0.104)
Arizona *t_3	-0.014	-0.136
	(0.037)	(0.155)
Arizona *t_4	0.048	-0.160
	(0.031)	(0.117)
Arizona *t_5	-0.017	-0.015
	(0.033)	(0.154)
Arizona *t_6	-0.037	-0.061
	(0.026)	(0.135)
Female	0.028*	0.019
	(0.014)	(0.021)
Education LT 8 years (omitted)		
Education some HS	-0.015	-0.634***
	(0.013)	(0.190)
Education HS graduate	-0.001	-0.685**
	(0.012)	(0.227)
Education some college	0.095*	-0.371
	(0.042)	(0.263)
Education college graduate	0.186***	0.317
	(0.046)	(0.315)
Birth order:1 (omitted)		
Birth order 2-3	0.073***	0.355***
	(0.017)	(0.074)
Birth order 4-5	0.116***	0.813***
	(0.022)	(0.145)
Birth order 6+	0.224***	2.106***
	(0.050)	(0.304)
Mother's age	0.007	0.045
	(0.007)	(0.031)
Mother's age^2	-0.000	-0.001
	(0.000)	(0.000)
Mother is married	0.008	0.449***
	(0.012)	(0.098)
Birth in state of residence	0.054	1.304**
	(0.058)	(0.458)
Constant	-0.083	-1.389+
	(0.142)	(0.771)

+p<.10 *p<.05, **p<.01, ***p<.001. Two-tailed tests. Robust standard errors in parentheses. Indicator for the treatment group (Arizona) dropped because of perfect collinearity with the county fixed effects Home births include any residential birth, even if it is not in the mother's residence.

Web Table 8. Difference in differences estimates of the impact of SB1070 on birth weight controlling for adequacy of prenatal care visits. Latina immigrants and US-born Black and White mothers in Arizona and control states.

	Latina immigrant	US-born black and white
t_0 Jan 2007-Jun2009		
t_1 Jul 2009 – Dec 2009	-15.1***	-2.7
	(3.4)	(3.4)
t_2 Jan 2010 – Jun 2010	-6.7*	-7.5
	(2.9)	(5.6)
t_3 Jul 2010 – Dec 2010	-8.1**	-3.1
	(2.9)	(2.5)
t_4 Jan 2011 – Jun 2011	-10.2**	-0.9
	(3.6)	(2.6)
t_5 Jul 2011 – Dec 2011	-10.0*	1.3
	(4.8)	(2.5)
t_6 Jan – Dec 2012	-10.1**	6.8*
	(3.1)	(2.6)
Arizona *t_0 (omitted)		
Arizona *t_1	-2.2	0.9
	(4.5)	(4.5)
Arizona *t_2	-6.4+	15.0*
	(3.6)	(6.2)
Arizona *t_3	-13.6*	2.8
	(5.6)	(2.7)
Arizona *t_4	13.2*	5.1
	(5.9)	(4.6)
Arizona *t_5	1.5	9.1+
	(7.0)	(5.0)
Arizona *t_6	9.1	15.0*
	(6.7)	(6.0)
female	-95.5***	-117.6***
	(1.2)	(1.3)
Education LT 8 years		
Education some HS	10.7***	14.8*
	(2.0)	(7.1)
Education HS graduate	4.7	77.8***
	(3.9)	(7.4)
Education some college	12.1**	112.1***
	(4.2)	(8.2)
Education college graduate	12.6*	157.2***
	(6.3)	(9.5)
Birth order:1 (omitted)		
Birth order 2-3	75.5***	46.3***
	(3.1)	(2.6)
Birth order 4-5	98.4***	29.1***
	(4.0)	(5.0)
Birth order 6+	100.9***	0.1
	(5.5)	(8.2)
Mother's age	30.1***	12.3***
	(1.5)	(1.1)
Mother's age^2	-0.5***	-0.2***
	(0.0)	(0.0)
Mother is married	12.1***	103.1***
	(2.0)	(4.0)
Birth in state of residence	236.9***	140.6**
	(16.4)	(53.6)
Recommended prenatal care		
Less than recommended visits	-37.1***	-70.3***
	(6.3)	(4.7)
More than recommended visits	-73.4***	-83.2***
	(11.4)	(7.3)
Constant	2,640.3***	2,864.0***
	(29.2)	(54.4)

+p<.10 *p<.05, **p<.01, ***p<.001. Two-tailed tests. Robust standard errors in parentheses. Indicator for the treatment group (Arizona) dropped because of perfect collinearity with the county fixed effects

Web Table 9. Difference in differences estimates of the impact of SB1070 on birth weight controlling for mother's smoking during pregnancy. Latina immigrants and US-born Black and White mothers in Arizona and control states.

	Latina immigrant	US-born black and white
t_0 Jan 2007-Jun2009		
t_1 Jul 2009 – Dec 2009	-15.1***	-3.1
	(3.7)	(3.4)
t_2 Jan 2010 – Jun 2010	-5.7+	-6.8
	(3.0)	(4.4)
t_3 Jul 2010 – Dec 2010	-7.0*	-3.6
	(3.0)	(2.6)
t_4 Jan 2011 – Jun 2011	-9.3*	-1.8
	(3.6)	(2.3)
t_5 Jul 2011 – Dec 2011	-9.1+	0.1
	(4.7)	(2.9)
t_6 Jan – Dec 2012	-8.6*	5.5*
	(3.5)	(2.6)
Arizona *t_0 (omitted)		
Arizona *t_1	-2.3	-4.1
	(4.7)	(4.3)
Arizona *t_2	-7.4+	8.6+
	(3.8)	(5.0)
Arizona *t_3	-14.5**	-4.7
	(5.4)	(2.9)
Arizona *t_4	11.4+	-0.6
	(6.0)	(4.8)
Arizona *t_5	0.2	1.0
	(7.0)	(5.0)
Arizona *t_6	6.4	4.7
	(6.3)	(5.9)
female	-95.2***	-118.1***
	(1.2)	(1.3)
Education LT 8 years		
Education some HS	10.8***	7.4
	(1.9)	(7.6)
Education HS graduate	4.7	62.1***
	(3.8)	(7.8)
Education some college	11.8**	95.4***
	(4.2)	(7.9)
Education college graduate	13.2*	143.7***
	(6.3)	(8.6)
Birth order:1 (omitted)		
Birth order 2-3	73.9***	49.9***
	(3.6)	(2.8)
Birth order 4-5	96.4***	33.9***
	(5.4)	(5.6)
Birth order 6+	98.2***	6.6
	(7.1)	(8.9)
Mother's age	31.4***	19.9***
	(1.6)	(2.7)
Mother's age^2	-0.5***	-0.3***
	(0.0)	(0.0)
Mother is married	-10.4***	-72.5***
	(3.1)	(14.5)
Birth in state of residence	234.0***	136.2*
	(17.4)	(53.8)
Smoked during pregnancy	-101.4***	-146.6***
	(20.7)	(6.5)
Constant	2,637.0***	2,921.7***
	(34.4)	(80.4)

+p<.10 *p<.05, **p<.01, ***p<.001. Two-tailed tests. Robust standard errors in parentheses. Indicator for the treatment group (Arizona) dropped because of perfect collinearity with the county fixed effects

Web Table 10. Difference-in-Difference Estimates of the Impact of SB1070 on Birth Weight (grams) for Latina Immigrant Mothers with low educational attainment (a high school diploma or less) and high educational attainment (some college or more), 2007-2012.

	Low-education Latina immigrants	High-education Latina Immigrants
t_0 Jan 2007-Jun2009 (omitted)		
t_1 Jul 2009 – Dec 2009	-14.587***	-12.341*
	(4.379)	(5.530)
t_2 Jan 2010 – Jun 2010	-5.884	-3.902
	(4.240)	(9.056)
t_3 Jul 2010 – Dec 2010	-8.063*	-2.612
	(3.386)	(6.128)
t_4 Jan 2011 – Jun 2011	-6.708+	-15.980*
	(3.433)	(7.747)
t_5 Jul 2011 – Dec 2011	-8.115	-7.876
	(5.654)	(6.813)
t_6 Jan – Dec 2012	-8.808**	-8.952
	(3.347)	(5.892)
Arizona *t_0 (omitted)		
Arizona *t_1	-2.608	-6.642
	(5.410)	(9.774)
Arizona *t_2	-6.058	-16.994
	(5.280)	(18.511)
Arizona *t_3	-11.884*	-29.005+
	(5.666)	(14.982)
Arizona *t_4	9.222	15.769+
	(7.704)	(9.524)
Arizona *t_5	-1.720	-0.981
	(6.880)	(12.972)
Arizona *t_6	8.167	-2.217
	(5.726)	(9.201)
Female	-92.849***	-108.354***
	(1.301)	(4.518)
Education some HS	11.175***	
	(1.939)	
Education HS graduate	4.926	
	(3.738)	
Education some college		-2.991
		(4.733)
Education college graduate		
Birth order:1 (omitted)		
Birth order 2-3	77.557***	70.713***
	(3.416)	(5.093)
Birth order 4-5	100.014***	92.175***
	(4.341)	(4.661)
Birth order 6+	100.930***	100.333***
	(5.580)	(17.963)
Mother's age	30.607***	25.505***
	(1.455)	(3.015)
Mother's age^2	-0.495***	-0.427***
	(0.025)	(0.048)
Mother is married	11.750***	17.931***
	(2.317)	(3.292)
Birth in state of residence	231.506***	245.869***
	(16.207)	(36.384)
Constant	2,624.666***	2,725.641***
	(26.092)	(52.583)
Observations	1,213,836	230,705

+ <.10, * $P<.05$, ** $P<.01$, *** $P<.001$ (two-tailed tests). Robust standard errors in parentheses. Indicator for the treatment group (Arizona) dropped because of perfect collinearity with the county fixed effects.