The Response to a Loss in Medicaid Eligibility: Pregnant Immigrant Mothers in the Wake of Welfare Reform

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Abstract

As part of the 1996 welfare reform, recent immigrants lost eligibility for federal means-tested benefits. In response, several states used their own funds to provide Medicaid to federally-ineligible immigrants. I use this variation across states and population groups to examine the effects of this major change in Medicaid eligibility on health insurance coverage, health care utilization, and health outcomes among pregnant immigrant mothers. I find that Medicaid take-up among non-citizens declined due to the legislation. Meanwhile, prenatal care rates fell temporarily and likely would have continued to fall if public health clinics had not responded. With the exception of increased labor complications amongst "at-risk" mothers, birth outcomes were largely unaffected by these changes.

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I. Introduction

Despite having the highest per capita health care expenditures in the world, the United States has worse infant health outcomes than most other developed countries (World Health Organization, 2000). For example, in 1998, the infant mortality rate in the United States exceeded that of 27 other developed countries (Centers for Disease Control and Prevention, 2002). Recent efforts to improve infant health have aimed at increasing prenatal care through changes in the availability of means-tested public insurance. In the 1980's and early 1990's, for example, the federal government increased Medicaid income eligibility cutoffs for pregnant mothers.

Numerous studies (Currie and Gruber (1996); Piper, Ray, and Griffin (1990); Epstein and Newhouse (1998)) have examined such Medicaid expansions in an effort to estimate the effect of public insurance on birth outcomes. This link between the expansions and birth outcomes relies on four key factors: whether newly-eligible individuals enroll in these programs ("high take-up rates"); whether new enrollees had health insurance coverage prior to the reform ("crowdout"); whether the availability of insurance coverage causes people to seek additional medical services; and whether additional medical services improve health. In the case of Medicaid expansions, the existence of such factors is weak at best. Previous research (Currie and Gruber (1996); Card and Shore-Sheppard (2002); Cutler and Gruber (1996)) suggests that low take-up rates and substantial crowdout limited the effectiveness of these expansions. In particular, Cutler and Gruber (1996) and Card and Shore-Sheppard (2002) estimate that only 10 to 25 percent of the newly eligible enroll in Medicaid. Nevertheless, Currie and Gruber (1996) still find large effects of the Medicaid expansions on low birthweight and infant mortality. They estimate that infant mortality rates declined by 8.5 percent in response to a 30-percentage-point increase in eligibility.

This paper employs a new approach to examine the link between changes in public insurance eligibility and changes in health insurance coverage, health care utilization, and birth outcomes. Instead of focusing on Medicaid expansions, which arguably have a limited impact because of crowdout and low takeup rates, I look at the effects of a contraction in Medicaid eligibility. More specifically, under the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996, most recent immigrants who

arrived in the United States following the date of PRWORA's enactment (post-enactment non-citizens) were ineligible for federal means-tested benefits, including Medicaid. States could use their own funds to provide benefits to these ineligible immigrants; some states did (subsequently called "fill-in" states) and others did not ("no-fill-in" states).

While PRWORA provides a natural means of understanding the complex relationship between health insurance, health care use, and health, its direct impact on immigrant wellbeing, which a priori was expected to be substantial, is independently interesting and important to study. The Congressional Budget Office (1996) predicted that this law, which also imposed time limit restrictions and work requirements for welfare recipients, would save the government $54 billion, 40 percent of which would come from the ban of recent immigrants from the welfare rolls. Although section 403 does not apply to all immigrants, the affected group is large and continues to grow. Forty-two percent of immigrant mothers were post-enactment non-citizens in 2002, as compared to 6 percent in 1998 (March Current Population Survey estimates).

The structure of the PRWORA legislation allows for several natural comparisons to estimate the impact of the Medicaid restrictions. First, one can compare changes in outcomes based on immigrant or citizenship status within a given state. Second, one can contrast changes in outcomes across states based on the existence of a fill-in program. Third, one can exploit the differences in Medicaid eligibility among non-citizens based on time of arrival in the United States. This paper uses all three sources of identification. I start by using all three methods for a national study and follow by using the first comparison method for a more detailed study of Texas.

This is the first study to provide a comprehensive look at the effect of the reform; other studies have used a single data source and thus only have focused on part of the picture. To form a complete picture of the impact of the Medicaid eligibility reductions, I piece together evidence from four sources. These include Texas Medicaid enrollment data, the Texas Natality Files, the March Current Population Survey (March CPS), and the national Natality Detail Files. The Texas Medicaid enrollment data and the March CPS provide data on health insurance. The Texas Natality Files and the national Natality Detail Files, which are nearly a census

of all births, contain information on prenatal care use and birth outcomes. The March CPS also allows me to estimate the size of the population of post-enactment non-citizens.

I find that the changes in eligibility requirements reduced Medicaid coverage rates among pregnant non-citizens in no-fill-in states. But health insurance coverage fell less sharply than Medicaid coverage due to the slight increase in private insurance coverage. Among low-educated Hispanic immigrant women in no-fill-in states – individuals not likely to have access to private health insurance – prenatal care rates dipped temporarily and then recovered in the post-PRWORA period. Some plausible explanations for the smaller-than-predicted response include: crowd-in (i.e., substitution of private insurance for public insurance), the willingness of women to pay out-of-pocket for prenatal care, safety nets that provide uninsured women with prenatal care, and confusion within the Medicaid system concerning immigrant eligibility. Evidence from Texas suggests that this decline may have continued if public health clinics had not intervened and provided prenatal care to those in need. Meanwhile, for most women, there was no observed change in birth outcomes in response to this transitory sharp drop in prenatal care. However, labor complications increased following PRWORA for women with risk factors (e.g., hypertension and diabetes), a group for which prenatal care may be especially important.

This paper proceeds as follows. Section II provides an overview of the PRWORA legislation, its enforcement and the states' responses. Following the discussion of the prior literature in Section III, I study the impact nationally and in Texas in Sections IV and V, respectively. Section VI puts these estimates into perspective, comparing them to what might have been predicted. Section VII concludes.

II. The Immigrant-Related Provisions of The Personal Responsibility and Work Opportunity Act of 1996

In the 1990's, policymakers became increasingly concerned about immigrants' use of the welfare system. Immigrants arriving in the United States in the 1980's and 1990's were poorer and less educated than immigrants who had already settled in the United States (Borjas, 1994). As a result, these new arrivals were

more likely to be eligible and receive assistance from entitlement programs than were prior cohorts of immigrants (Borjas and Hilton, 1996).

Concerns about the reliance of immigrants on public assistance reached a tipping point in California in 1994 when voters passed Proposition 187. This law barred illegal immigrants from attending public schools and from receiving state-funded prenatal care, along with other public services. Battles about the constitutionality of Proposition 187 ensued and the law was never enforced.

At the national level, efforts among members of Congress to decrease spending on entitlement programs and to eliminate the perceived welfare dependency problem among immigrants soon followed. Congress debated the possibility of withdrawing welfare benefits for all immigrants. On August 22, 1996, Congress passed PRWORA, which effectively denied benefits to recent immigrants.

Under section 403 of PRWORA, a noncitizen's time of entry into the United States determined her welfare eligibility.[1] Most immigrants arriving after the date of enactment (hereafter called post-enactment non-citizens) could not receive most federal means-tested benefits.[2] However, immigrants who had arrived before August 22, 1996 (pre-enactment non-citizens) remained eligible for federal welfare programs on the same basis as citizens, although states could adopt laws prohibiting them from enrolling in federal means-tested programs.[3] In regards to Medicaid eligibility, only one state, Wyoming, disbarred pre-enactment non-citizens. Immigrant eligibility for federally-funded Medicaid preceding and following PRWORA is summarized in Table 1.[4]

Although post-enactment non-citizens could not receive federal welfare benefits, states could adopt replacement programs (so called "fill-in programs") to make up for the lack of federally-funded benefits. Financially, states did not have a direct incentive to create such programs because the federal government would not match the funds for these programs. The variation in Medicaid policies for post-enactment non-

[1] The programs affected by this eligibility change include Temporary Assistance for Needy Families (TANF), Supplemental Security Income (SSI), food stamps, Medicaid, and State Children's Health Insurance Program.
[2] A small number of immigrants—refugees, asylees, persons with 40 quarters of work in the United States, military personnel and their families, and deportees held by the Immigration and Naturalization Service (INS)—were exempt. This group constitutes about 7 percent of the total immigrant population (Fix and Passel, 2001).
[3] The federal government provided money to fund benefits for pre-enactment non-citizens for those states that decided to grant pre-enactment non-citizens the right to receive assistance from federal means-tested programs.
[4] As will be described later, some immigrants are eligible for state-funded Medicaid even though they are ineligible for federally-funded Medicaid.

citizens across states is evident in Figure 1.[5] The two states with the largest immigrant populations, California and New York, decided to permit post-enactment non-citizens to receive state-funded Medicaid, but Texas, Florida, and New Jersey, three other immigrant-populous states, did not.

While the decision to adopt replacement programs varies among the immigrant-intensive states, the existence of these programs is not random. My identification strategy is based on comparisons of different immigrant groups in fill-in and no-fill-in states and does not require that policy adoption be random across states. As it turns out, states with more immigrants were on average more likely to adopt fill-in legislation despite the higher cost of such a law in high immigrant states. However, a state's decision to fund a replacement programs is unrelated to a state's personal health care expenditures in levels or per capita terms, a state's welfare expenditures or per capita welfare expenditures, or a state's political following, as measured by the distribution of its electoral votes for the 1996 presidential election.

Given the intricacies of the PRWORA legislation, it is not clear that states adhered to the legislation. To enforce the law, government officials had to understand the law's complexities, including knowing who was eligible and had to request immigrant status documentation from applicants. States in violation of PRWORA could lose federal funding. As far as I am aware, although there are cases when states have been in violation of section 403 of PRWORA, the federal government has not denied money for programs as a result. For example, in 2001, Texas Attorney General John Cornyn announced that the Harris County Hospital District violated PRWORA when public hospitals and clinics in that area provided preventative health services to indigent undocumented immigrants (Weintraub, 2001). However, there is no mention that Texas lost some federal monies as punishment.

[5] Despite the importance of the fill-in laws, it is surprisingly difficult to find complete information on the status of every state's law. In Figure 1, I have used several sources, including reports from Zimmermann and Tumlin (1999), a handbook on immigrant eligibility for federal programs from the National Immigration Law Center (2002), the Kaiser Commission on the Medicaid and the Uninsured Report (2002), reports from Bureau of National Affairs, state legislation, and numerous news articles. In every case except Virginia, the sources agreed. Secondary sources, such as prior research studies (e.g., Borjas (2003) and Kandula et al. (2003)), differ on their assignment of fill-in status, and thus, I have decided to focus on primary sources. Adding to the complexities of documenting the fill-in laws is the fact that states can change their laws. However, I have found no mention of a change in policy for pregnant mothers. In June 2001, with the *Aliessa v. Novello* decision, New York Supreme Court ruled that denying post-enactment non-citizen Medicaid coverage was in violation in the New York State Constitution and the United States Constitution (Gormley, 2001). Prior to this verdict, pregnant post-enactment non-citizens were eligible for state-funded Medicaid, so this change in policy did not have an effect on eligibility for pregnant immigrant mothers.

Not only did government officials have problems understanding and complying with PRWORA, immigrants often did not comprehend whom the law affected. Anecdotal evidence suggests that many immigrants eligible for welfare benefits did not apply as a result of their misunderstanding. Moreover, immigrants feared deportation if they applied for benefits because under PRWORA, state agencies had to provide information to the INS. Many immigrants believed that recipiency of welfare benefits would then lead to their classification as a public charge – grounds for deportation or denial of the right to obtain citizenship. In 1999, to alleviate these anxieties, the federal government stated that recipiency of public services would not interfere with an immigrant's legal status (*Federal Register*, 1999). The size of these potential "chilling effects", however, may be small as Lofstrom and Bean (2002) find that local economic conditions are responsible for the declines in immigrant welfare use following PRWORA.[6]

The immigrant-related welfare reforms were only a small part of PRWORA. PRWORA also replaced the Aid to Families with Dependent Children (AFDC) with Temporary Assistance for Needy Families (TANF), which effectively ended the link between Medicaid and cash assistance. As a consequence of these general welfare reforms, the number of Medicaid enrollees dwindled by 10.6 percent between 1995 and 1997 (Bitler et al., 2005).

In this paper, I focus on the effect of the immigrant eligibility changes due to PRWORA rather than the effect of all PRWORA reforms. However, these more general welfare reforms are important to account for because Medicaid caseloads among immigrants may have fallen even in the absence of the year-of-entry requirements. To control for the effect of these concurrent reforms, I compare trends for the treated population in treatment states with trends for several control groups. However, since recent arrivals became ineligible for other public programs at the same time they became ineligible for Medicaid, estimates of the effects of PRWORA will capture the effects of the loss of several means-tested benefits, a likely bigger effect than the loss of Medicaid alone.

[6] Estimating the size of these "chilling effects" is difficult. At first pass, a decline in the receipt of means-tested benefits among immigrants unaffected by the PRWORA restrictions seems to be indicative of such effects. However, improving economic conditions could be responsible for such a drop. To estimate the extent of the "chilling effects", one would need welfare recipiency data at the monthly level as changes in economic conditions were gradual whereas the "chilling effects" were likely not.

III. Prior Literature

Most of the existing research on the impact of the PRWORA-instituted eligibility restrictions on immigrant welfare use comes from comparisons of time trends of welfare participation across groups using the March Supplement of the Current Population Survey (March CPS) (Lofstrom and Bean (2002), Fix and Passel (2002), Borjas (2002), Borjas (2003), Kandula et al. (2003)). The main conclusion from these studies, Lofstrom and Bean (2002) excluded, is that immigrant welfare participation fell relative to that of natives in the post-PRWORA period. For example, Borjas (2003) finds that non-citizens had over a 4-percentage-point decline in Medicaid coverage compared to natives over the same period.

However, using contrasts of non-citizens and natives to estimate the effect of immigrant restrictions fails to account for two facts: 1. the immigrant-related provisions of PRWORA should only affect post-enactment non-citizens in no-fill-in states and 2. the growth of the size of the post-enactment non-citizen population over time. Hence, drops in welfare use among non-citizens relative to natives may be due to a larger response to the non-immigrant-related PRWORA reforms and/or the "chilling effects" in addition to the eligibility restrictions. Moreover, the growth of the population affected by the reform makes a simple difference-in-difference in means sensitive to the time periods used.

This existing research also provides an incomplete picture of the effect of the immigrant-related provisions on health insurance, health care utilization, and health outcomes. Each of the aforementioned studies focuses on one part of the link between the change in Medicaid coverage and health outcomes, and in fact, with the exception of Joyce et al. (2001) and Gamper-Rabindran (2004), none of the existing research examines the effect of the immigrant eligibility restrictions on health care utilization.

Moreover, the findings of these two studies (Joyce et al (2001) and Gamper-Rabindran (2004)) lie in opposition. Joyce et al. (2001) compare prenatal care usage and infant health outcomes for foreign-born and native Hispanic pregnant women in Texas, California, and New York City between 1995 and 1998. Relative to natives, among foreign-born Hispanic women, they find no change in the incidence of low birthweight births but a perverse positive change in the initiation of prenatal care (i.e., earlier initiation). In contrast, using

Texas birth data, Gamper-Rabindran (2004) estimates that low-educated Hispanic mothers were less likely to receive early prenatal care following the reform. One of the potential reasons for the difference in results between these two studies is the changing number of post-enactment non-citizens over time.

This analysis extends and improves upon this existing literature along several dimensions. First, this is the only study to estimate the effect of the eligibility changes on health insurance, health utilization, and health outcomes together. Second, unlike Joyce et al (2001) and Gamper-Rabindran (2004), I focus on the impact of legislation across all states.[7] Third, I concentrate on an arguably more important measure of health care utilization – the fraction of mothers who receive prenatal care rather than the number of prenatal care visits or the start of care. An incremental change in the number of women receiving prenatal care is likely to have a much bigger effect on health than a similar change in the number of prenatal care visits. Fourth, I examine the response of an important safety net provider – public health clinics.

In the following two sections, I consider the effect of PRWORA nationally and test the robustness of these national results with a more detailed analysis of the impact in Texas, the largest no-fill-in state. The Texas analysis is particularly illuminating as additional data for Texas, not available nationally, suggests that safety net providers (i.e., public health clinics) played a critical role in diminishing the potential effects of PRWORA on prenatal care.

IV. What Happened Nationally?

i. Research Design and Data

The goal of this research is to identify the effect of the eligibility restrictions for immigrants on post-enactment non-citizens living in no-fill-in states for 3 outcomes: health insurance, health care utilization, and health outcomes. To control for systematic shocks occurring simultaneously but unrelated to the immigrant eligibility restrictions, I estimate the effect of PRWORA via difference-in-difference regressions. However, because I parse together information from several datasets but I cannot identify the exact treatment group –

[7] That is with the exception of Wyoming, the only state to make both pre- and post-enactment non-citizens ineligible for Medicaid.

post-enactment non-citizens living in no-fill-in states in each of these datasets, the exact regression specifications differ across the datasets. As such, I will describe both the data and the empirical approach together. Appendix Table 1 details the strengths and weaknesses of the data sources used.

a. March Supplement of the Current Population Survey

The March CPS serves two important purposes in this study. First, I can identify the exact treatment group (post-enactment non-citizens living in no-fill-in states) in the March CPS. Second, I can estimate the degree of crowd-in by looking at changes in health insurance coverage among the treated population, which I have argued is an important link to understanding the degree to which changes in Medicaid eligibility translate into changes in health outcomes. However, the CPS only provides evidence on some of the story as it lacks information on health care utilization or health outcomes.[8]

Beginning in 1994, the CPS includes questions on immigrant status. The survey asks respondents about their country of origin, their citizenship status, and when they came to the United States to stay. Arrival information is coded in intervals (e.g., 1996-1998). I characterize those who arrived in 1996 or later as post-PRWORA immigrants. This necessarily slightly overstates the post-PRWORA group slightly but is the best that can be done.[9]

[8] The information on health, besides health insurance, in the CPS is extremely limited. Recently the Census Bureau/Bureau of Labor Statistics added a question about self-reported health status, but there are no questions asking about health care utilization (e.g., doctor's visits) or health outcomes.

[9] The time of arrival variable in the CPS could also be problematic for another reason besides aggregation. Using Social Security records, Lubotsky (2000) found that 14 percent of immigrants reported earnings before their reported date of entry in the United States. He concludes that this anomaly arises from the fact that a significant subgroup of immigrants move back and forth between their home country and the United States. For purposes of PRWORA, the date of the most recent settlement in the United States determines whether an immigrant is a post-enactment non-citizen (Broder, 2003). In order to be classified as a pre-enactment non-citizen, an immigrant must have had continual residence in the United States before PRWORA became law. Exceptions for absences up to 90 days are allowed. Therefore, if the time of arrival variable coincides with the most recent year of entry, the CPS arrival variable should be accurate. On the other hand, if the time of entry variable does not measure the most recent arrival date but instead an earlier date, I will underestimate the number of post-enactment non-citizens.

The CPS collects data on health insurance and its type (e.g., private and Medicaid).[10] There is dispute about the reference period of these measures – whether they represent current insurance status or coverage over the past year. The questions literally ask about coverage at any time in the previous year. However, previous studies (e.g., Bennefield (1996) and Bitler et al. (2005)) suggest that these variables reflect current status, so I consider the measures as indicative of current coverage.

I restrict the sample in the following way. First, given the focus on pregnant immigrant mothers, I limit the sample to recent mothers (i.e., mothers with a child less than one year of age) as I cannot identify pregnant women in the CPS. Second, I remove mothers who are older than 50 as some women (N=34) seemed to be too old to have given birth recently. Third, I restrict the sample to mothers whose family income was less than 200 percent of the poverty line, a level slightly above the average state cutoff for Medicaid for pregnant mothers.[11]

Appendix Table 2 presents the means for several key variables in the March CPS sample by fill-in state status and citizenship status. Non-citizens and citizens are notably different: non-citizens are older, are more likely to be Hispanic, are less educated, and have lower rates of health insurance than citizens. This age difference is likely because births to immigrant mothers are censored. In particular, immigrants may have given birth before they came to the United States. On the other hand, the fill-in and no-fill-in states are remarkably similar.

[10] Over the past decade, the health insurance questions in the CPS have been extensively modified and expanded, making it difficult to calculate a consistent measure of health insurance coverage across time (Bitler et al., 2005). To calculate Medicaid, private insurance, and overall health insurance rates over time, I followed the methodology of Bitler et al. (2005), who carefully constructed consistent health insurance measures from the CPS to look at the impact of PRWORA on health insurance and health outcomes. I thank Hilary Hoynes who kindly provided me with her code and documentation.

[11] These income requirements for Medicaid vary across states. The federal government mandates that states have a minimum cutoff of 133 percent of the poverty threshold, but many states have higher cutoffs. At the time of welfare reform, the average state Medicaid cutoff for pregnant women was approximately 170 percent of the poverty line (National Governors Association, various issues). Therefore, mothers whose family income is below 200 percent of the poverty line are more likely to be affected by changes in Medicaid eligibility than an average mother.

Identifying the Effect of PRWORA using the March CPS (Estimator when Exact Treatment Group is Identified)

From the March CPS, I isolate the effect of PRWORA by comparing changes over time in health insurance coverage rates for post-enactment non-citizens in no-fill-states to the parallel changes for several control groups, including pre-enactment non-citizens in no-fill-in states and post-enactment non-citizens in fill-in states. Since treated individuals meet three criteria: arrived in the United States after August 22, 1996, are non-citizens, live in no-fill-in states, I estimate the effect of PRWORA using a difference-in-difference-in-difference-in-difference in mean estimator (DDDD estimator).[12] The regression equation has the following form:

$$\begin{aligned} Y_{its} = {} & \alpha_0 + \alpha_1 \text{Post-PRWORA}_t + \alpha_2 \text{No-fill-in}_s + \alpha_3 \text{Non-citizen}_i \\ & + \alpha_4 \text{Arrived in US after PRWORA enacted}_i + \alpha_5 (\text{Post-PRWORA}_t \text{ x No-fill-in}_s) \\ & + \alpha_6 (\text{Post-PRWORA}_t \text{ x Non-citizen}_i) + \alpha_7 (\text{No-fill-in}_s \text{ x Non-citizen}_i) \\ & + \alpha_8 (\text{No-fill-in}_s \text{ x Arrived in US after PRWORA enacted}_i) \\ & + \alpha_9 (\text{Post-PRWORA}_t \text{ x No-fill-in}_s \text{ x Non-citizen}_i) + \mathbf{X}_{its}\beta + \varepsilon_{its} \end{aligned} \quad (1)$$

where i indexes individuals, t indexes time, s indexes states, Y is an outcome of interest (e.g., Medicaid coverage), Post-PRWORA is an indicator variable for the post-PRWORA period, No-fill-in is a dummy variable equal to 1 if the mother lives in a no-fill-in state and 0 otherwise, Non-citizen is a dichotomous variable for whether the mother is a non-citizen, Arrived in US after PRWORA enacted is a dummy variable equal to 1 if arrived in the United States in the post-PRWORA period and 0 otherwise, and **X** is a vector of observable characteristics. The covariates in **X** include controls for age, race, ethnicity, education, marital status, state employment to population ratios, and state unemployment rates. α_8 represents the effect of the eligibility restrictions (i.e., the treatment effect).[13,14]

[12] Although I refer to the estimator as a quadruple difference-in-difference estimator, in some sense, it is not. This is because post-enactment non-citizens are only present in the US after PRWORA's enactment (i.e., they have no pre-PRWORA mean).

[13] Note that a complete set of interactions of the four dummy variables is not possible for two reasons. First, a non-citizen must reside in the United States for five years before becoming a citizen, but this residency requirement falls to three years if the non-citizen is married to a citizen. Among the sample of non-citizen mothers, 76 percent are married to non-citizens. Therefore, most of the mothers entering the United States in the post-PRWORA period cannot be citizens yet. Since nearly all of the post-enactment arrivals are non-citizens, the model is not identified when I separate the post-enactment citizens from the post-enactment non-citizens. Second, post-enactment non-citizens are only observed during the post-PRWORA period.

b. National Natality Detail Files

To identify whether the resulting changes in health insurance coverage from the loss of Medicaid eligibility translate into changes in health care utilization and health outcomes, I supplement the CPS analysis with analysis using the 1993-2001 National Natality Detail Files, which are a census of births in the United States.[15] The data come from a survey completed at birth that includes questions on mother's place of birth, education, marital status, the delivery method, medical risk conditions, pregnancy history, prenatal care utilization, and birth outcomes. While extensive, these data have one major drawback – no information on citizenship status or time of arrival in the United States. However, I can discern whether a mother is an immigrant.

The change in Medicaid eligibility requirements may not affect the average immigrant mother because either she has been in the United States long enough or her family income exceeds the income threshold for Medicaid. As such, I will focus on a group of mothers more likely to be impacted by the PRWORA-introduced eligibility requirements – Hispanic mothers with less than 12 years of education. Appendix Table 4 presents the means for key variables for immigrants and natives by no-fill-in status of state of residence before and after PRWORA. Immigrants differ from natives along several dimensions. They are less educated, more likely to be married and older than natives. As documented in the public health literature (Rumbaut and Weeks, 1996), although immigrants have lower rates of health care utilization, they experience better birth outcomes than natives. Both immigrants and natives are quite similar across the two types of states. Contrasting the pre- and post-PRWORA means, it does not appear that PRWORA impacted

[14] Note that in the presence of "chilling effects," the estimate of α_8 is downward biased. If immigrants who are not post-enactment non-citizens, one of the control groups in the DDDD estimator, do not apply for Medicaid because of fear or confusion, the relative drop in coverage for the treated group will be less dramatic.

[15] One may be worried about underreporting of births to immigrant mothers, especially illegal immigrant mothers. However, immigrant mothers have the incentive to fill out the birth certificate because by giving birth in the United States, their offspring are entitled to US citizenship.

immigrants in no-fill-in states adversely as neither prenatal care nor birth outcomes deteriorated. But, as will be shown later, these means mask the underlying trends.[16]

Identifying the Effect of PRWORA using the National Natality Detail Files (Estimator when Exact Treatment Group is not Identified)

Immediately at the time of PRWORA's enactment, the restrictions will not affect immigrant health care utilization or health outcomes because an immigrant had to arrive after August 22, 1996 for the eligibility restrictions to be applicable. Furthermore, the size of the affected population within this "treatment" group (i.e., immigrants in no-fill-in states in this case) should be increasing over time (see Table 2), so the effect of the loss in eligibility should be bigger as more time since PRWORA has passed. Given these two observations, the most appropriate estimator of the treatment effect is a difference-in-difference-in-difference in trend. The regression specification for this estimator is as follows:

$$\begin{aligned} Y_{its} = {} & \alpha_0 + \alpha_1(t\text{-}t^*) + \alpha_2 \text{No-fill-in}_s + \alpha_3 \text{Treated}_i \\ & + \alpha_4((t\text{-}t^*) \times \text{No-fill-in}_s) + \alpha_5((t\text{-}t^*) \times \text{Treated}_i) \\ & + \alpha_6(\text{No-fill-in}_s \times \text{Treated}_i) + \alpha_7((t\text{-}t^*) \times \text{Post-PRWORA}_t) \\ & + \alpha_8((t\text{-}t^*) \times \text{No-fill-in}_s \times \text{Post-PRWORA}_t) \\ & + \alpha_9((t\text{-}t^*) \times \text{Treated}_i \times \text{Post-PRWORA}_t) \\ & + \alpha_{10}((t\text{-}t^*) \times \text{No-fill-in}_s \times \text{Treated}_i) \\ & + \alpha_{11}((t\text{-}t^*) \times \text{No-fill-in}_s \times \text{Treated}_i \times \text{Post-PRWORA}_t) + \mathbf{X}_{its}\beta + \varepsilon_{its} \end{aligned} \quad (2)$$

where i indexes individuals, t indexes time, s indexes states, Y is an outcome of interest (e.g., health care utilization), t* is time period when PRWORA became law, Treated is a dummy variable for immigrants, and **X** is a vector of demographic characteristics, such as age, marital status, race, and ethnicity. All other variables in equation (2) are equivalent to those in equation (1). α_{11}, the triple-difference in trend, represents

[16] An interesting finding in Appendix Table 4 is the strong growth in births to immigrant mothers in no-fill-in states. It is unlikely that PRWORA is the driving factor for this. Why? First, since no-fill-in states are less generous, we would expect births to fall in these states. Second, it is not visually apparent that the growth rate of births changed as a result of PRWORA. North Carolina is responsible for most of the rise in births.

the treatment effect.[17] I have excluded an intercept shift from the regression specification because at the time of enactment, no one is treated.

ii. Results

Effects of PRWORA on Health Insurance

I begin by looking at the impact of PRWORA on health insurance. Figure 2 documents the time trends in health insurance for low-income recent mothers by citizenship status and fill-in state status. During the pre-reform years (1994 through 1996), the Medicaid take-up rates for non-citizens in no-fill-in states was virtually constant. Starting in 1997, consistent with the change in immigrant eligibility, the fraction of mothers who were enrolled in Medicaid declined. By 2002, rates of Medicaid coverage amongst this group were one-fourth of their pre-PRWORA level. The drop in Medicaid translated into a fall in overall health insurance (see bottom panel of Figure 2). Meanwhile, non-citizens in fill-in states, one of the control groups, experienced a temporary dip in Medicaid coverage at the onset of PRWORA, but Medicaid coverage rates returned to their pre-reform levels by 2000.[18]

Table 3 reports the estimated effects of PRWORA on health insurance coverage for post-enactment non-citizens in no fill-in states. Each regression coefficient in Table 3 is an estimate from a separate regression. Moving across the columns, the regression equation includes a richer set of covariates. As a means of comparing the results from the CPS and the Natality Detail Files, which do not have information on citizenship status or time of arrival in the United States, Appendix Table 3 presents estimates using the regression specification used for the Natality Detail Files (i.e., the triple difference in trend model).

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[17] Note α_{11} is not directly interpretable as the treatment effect on the treated. To derive an estimate of the true treatment effect, one can multiply the estimate of α_{11} by the number of post-PRWORA time periods and divide by the percentage of "treated" group who are post-enactment non-citizens. For example, suppose that the estimate of α_{11} is -0.005, t is measured in years, Y is prenatal care, and the "treated" group consists of immigrant mothers and a quarter of those mothers are post-enactment non-citizens 4 years after PRWORA was passed. This estimate implies that there was a 2-percentage-point decline in the proportion of immigrant mothers receiving prenatal care 4 years after PRWORA was passed, and moreover, prenatal care rates were 8 percentage points lower in the presence of the immigrant eligibility restrictions than they would have been otherwise.

[18] At first glance, this initial decline among this unaffected group is suggestive evidence of the "chilling effects." The "chilling effects" should be temporary, as the government made a concerted effort to clarify the law in 1999 (*Federal Register*, 1999).

The regression estimate in the first row of column (1) of Table 3 reveals that Medicaid coverage among post-enactment non-citizens in no-fill-in states was nearly 4 percentage points lower as a result of PRWORA. After including the complete set of covariates, the estimate is roughly half the size although due to the small sample size, is relatively imprecise. Note that these estimates will be downward biased in the presence of "chilling effects" affecting the behavior of the comparison groups.

Looking at a sample from the March CPS of persons 65 and younger, Borjas (2003) argues that although non-citizens in the less generous states experienced a drop in Medicaid coverage, they increased their labor supply and as a result, were more likely to receive employer-provided health insurance. Borjas concludes that on net, this increase in private insurance helped to counterbalance the loss of Medicaid coverage, which left health insurance rates virtually unchanged.

The second and third set of rows in Table 3 test whether this hypothesis holds true for this sample. It does not appear that it does. The effect of PRWORA on private health insurance is negative, not positive as would be expected in the presence of crowd-in, and the effect on overall health insurance is nearly comparable to that on Medicaid coverage. In sum, the evidence in Table 3 suggests that PRWORA negatively affected the health insurance coverage of post-enactment non-citizens in no-fill-in states but the confidence intervals of the estimated effects are somewhat large.[19]

These results differ from that of Borjas' likely because of differences in the estimation samples. Borjas' sample includes all persons under 65 years old regardless of income, so crowd-in is likely more prevalent in his sample because private health insurance is more available and affordable for this population. It is also important to note that Borjas estimates the effect of PRWORA on health insurance coverage for naturalized citizens and non-citizens relative to natives living in no-fill-in states rather than the effect on post-enactment non-citizens living in no-fill-in states. Even so, when I estimate Borjas' regression equations for the sample of poor recent mothers, the estimates reveal no crowd-in effect (results not shown).[20]

[19] The triple difference in trend results in Appendix Table 3 estimated using the sample of low-educated Hispanic mothers reveal a stronger crowd-in response but again are measured imprecisely.

[20] Consistent with Borjas' findings, there is weak evidence that non-citizen mothers in no-fill-in states did increase their labor force participation and did experience a rise in family income but these estimates are very imprecisely measured and are indistinguishable from zero.

Effects of PRWORA on Health Care Utilization and Health Outcomes

In light of the health insurance results, one might expect to observe an effect on health care utilization and infant health if a strong causal link between health insurance, health care utilization, and health exists. Investigating this further, I now turn to results from the national Natality Detail Files. Figure 3 displays trends in prenatal care rates for immigrants and natives in no-fill-in states and fill-in states for low-educated Hispanic mothers. Immediately following PRWORA, prenatal care rates for immigrants in no-fill-in states declined but only temporarily. This finding is unexpected as immigrant prenatal care rates should be declining monotonically following PRWORA as a larger share of the immigrant population is affected by the reform. None of the three controls groups had a comparable size dip in prenatal care.

To gauge the size of this drop, the first set of rows in Table 4 presents estimates of equation (2), the triple difference in trend specification, for several measures of health care utilization. In terms of the recipiency of prenatal care, the estimated PRWORA effect for immigrants in no-fill-in states implies that prenatal care use among immigrants in no-fill-in states fell 0.4 percentage points per year in the post-PRWORA period. This effect is the only estimate in Table 4 that is near the margin of conventional statistical significance. In other words, although there is a modest effect on prenatal care, we observe no change in infant health, suggesting a weak link between prenatal care and infant health.

In summary, these national results suggest that the loss in Medicaid eligibility for recent immigrants affected both Medicaid coverage and, to a lesser extent, overall health insurance coverage among post-enactment non-citizens in no-fill-in states. While enlightening, these CPS results should be considered suggestive as they are based on a small sample of recent mothers. As will be shown, however, estimates from administrative Texas Medicaid enrollment data, which should better measure Medicaid coverage, confirm the CPS findings. The decline in overall health insurance coincided with a fall in prenatal care, although unexpectedly temporary. In the following section, I will provide a potential explanation for this curious finding (i.e., the increased involvement of safety nets) using more detailed Texas data.

V. What Happened in Texas?

i. Research Design and Data

a. Texas Medicaid Enrollment Data

For data on Medicaid in Texas, I obtained a unique administrative dataset from the Texas Department of Human Services of the monthly stock of pregnant Medicaid enrollees by citizenship status from September 1994 to December 2003. Using these data, combined with counts of the population of pregnant women by citizenship status calculated from the Texas natality files and the Current Population Survey, I create monthly estimates of Medicaid coverage rates as detailed in Appendix A.

These data offer a distinct advantage over the March CPS. The administrative dataset only covers non-emergency coverage, whereas Medicaid coverage in the March CPS measures both emergency and non-emergency coverage. This difference is important because emergency Medicaid only funds delivery and not prenatal care visits. Moreover, all pregnant mothers, regardless of citizenship status, are eligible for emergency Medicaid. Therefore, estimates from March CPS may understate the true effect of the law on non-emergency Medicaid coverage, the parameter of interest.

I estimate the effect of PRWORA on Texas Medicaid enrollment using a similar difference-in-difference in trend estimator as outlined in equation (2) for the National Natality Detail Files. Due to the fact I am now only examining Texas, I cannot use the cross-state variation employed in equation (2). Therefore, the specification has the same general form as equation (2) except that the terms involving the no-fill-in dummy drop out and the treated dummy identifies non-citizens rather than immigrants.

b. Texas Natality Data

I once again use the natality data for data on health care utilization and health outcomes. However, the Texas Department of Health, collects additional data that is not present in the national files. One such important variable for this study is the location of prenatal care (e.g., a hospital and a public health clinic), which allows me to measure the importance of safety net providers. I continue to restrict the sample to less-

than-high-school-educated Hispanic women. Appendix Table 5 presents the means for key variables for immigrants and natives in Texas before and after PRWORA. As seen nationally, relative to natives, immigrant mothers are of lower socioeconomic status but have better birth outcomes. The estimating equation for identifying the effect of PRWORA has the same essential form as that of equation (2) except that all terms involving the no-fill-in dummy are excluded.

ii. Results

Effects of PRWORA on Medicaid Enrollment

Before turning to the regression results, I provide a visual summary of the time trends in the Texas enrollment data in Figure 4. Panel A of this figure presents monthly enrollment numbers for citizen and non-citizen pregnant Hispanic mothers. Before PRWORA, ignoring the systematic seasonal variability that patterns that which is exhibited for births, Medicaid enrollment for both groups was fairly stable. Immediately following PRWORA, both citizens and non-citizens experienced initial declines in caseloads. It is not surprising that citizen enrollment fell initially, as economic growth was strong and PRWORA effectively delinked Medicaid and cash assistance, effectively ending the common route to Medicaid through AFDC enrollment. By late 1998, the trends for non-citizens and citizens diverged as non-citizen enrollment continued to decline and citizen enrollment rose.

In the presence of the aforementioned co-existing factors that impacted Medicaid caseloads, it is more informative to examine relative trends. Panel B of Figure 4 displays the ratio of non-citizen to citizen enrollment over time. Before welfare reform, the enrollment ratio is relatively flat with roughly 5 times as many citizens enrolled as non-citizens. Shortly after PRWORA, this ratio falls rapidly and by the end of 2002, the number of pregnant citizen Medicaid enrollees exceeds the number of pregnant non-citizen Medicaid enrollees by a factor of 7.5, a rise of nearly 45 percent over the post-reform period.

To control for potential changes in population size that may be driving the time trends in Panels A and B, Panel C displays Medicaid coverage rates along the ratio of citizen to non-citizen coverage rates.[21] I use both the monthly CPS and the Texas Natality Files to estimate the number of pregnant women (see Appendix A for further discussion) used as the coverage rate denominator.[22] Medicaid coverage for non-citizens dropped nearly 50 percent over the post-legislation period in the predicted monotonic pattern.[23] In summary, the time series patterns in Medicaid coverage rates and Medicaid enrollment, as displayed in Figure 4, suggest that the immigrant eligibility restrictions affected Medicaid enrollment among non-citizens in Texas, consistent with the earlier CPS results.

To quantify the effect of PRWORA and control for other sources of variation in Medicaid coverage rates, such as unemployment rates, I present estimates of equation (2) with Medicaid coverage (first 2 columns of estimates) or the natural logarithm of Medicaid enrollment counts (last 2 columns of estimates) as the dependent variable in Table 5.[24] The coefficients in this table are regression-adjusted difference-in-difference in trend estimates. They capture the difference in the Medicaid coverage time trend for non-citizens pre- and post-PRWORA after differencing out the time trend for citizens over the same time frame. As the units of the linear time trend are quarters, the results suggest that, as a result of the law, the proportion

[21] An obvious concern about the trends in Panels A and B is that PRWORA may have influenced the migration decisions of non-citizens. In particular, in response to the eligibility changes, non-citizens originally living in Texas or intending to reside in Texas could have moved to more generous states, resulting in lower Medicaid non-citizen enrollment in Texas. However, if this did occur, it was not big enough to impact the number of births to immigrant mothers in Texas, mitigating the concern about potential bias due to selective migration.

[22] The computed Medicaid coverage rates are considerably lower than those calculated from the March CPS. Reporting error in the March CPS, the inclusion of emergency Medicaid as a part of Medicaid coverage in the CPS but not in the administrative enrollment counts, and the difficulty in constructing a denominator for Texas enrollment counts may explain these differences. While these low estimated levels of coverage may cause worry, they should only be troubling to the extent that the degree of measurement error varies over time, which seems unlikely.

[23] To sense whether the observed fall in coverage for non-citizens is due primarily to the fact that recent immigrants are ineligible for Medicaid, I constructed simulated Medicaid coverage rates under the assumption that the law was binding and post-enactment non-citizens were unable to receive Medicaid. This predicted series closely patterns the actual series.

[24] The standard errors in Table 5 do not take into account the strong positive serial correlation in Medicaid coverage rates. To measure how biased these standard errors are, I have estimated the regression models correcting for first-order serial correlation using the Prais-Winston procedure. The point estimates remain statistically significant at the 5 percent level. However, the standard errors are roughly 4 times larger. In an earlier version of this paper, I used randomization inference, which Bertrand et al (2004) argue is the best way to deal with the biasedness of the traditional standard errors, to test whether the program effect differed from zero. This approach involves estimating the effect of placebo laws, but it is unclear what assumptions one should make when creating the placebo laws. For further discussion, see Bertrand et al (2004).

of non-citizen mothers with Medicaid coverage fell a substantial 1.7 percentage points per year, an effect comparable to that found nationally.[25]

Effects of PRWORA on Health Care Utilization and Health Outcomes

To test whether the drop in Medicaid affected prenatal care, I present the trends in the rate of prenatal care use for natives and immigrants in Figure 5. Prior to the welfare reform, there was a strong upward trend in prenatal care utilization for immigrant mothers as observed in the national results for those living in no-fill-in states. Precisely at the time PRWORA became law, the proportion of immigrant mothers who received prenatal care started to descend rapidly – dropping 2 percentage points over the course of one year but later rising after this sudden dip although never returning to its pre-PRWORA level. Meanwhile, prenatal care rates for natives exhibited less variation over the period. Fewer native Hispanic mothers did attend prenatal care after PRWORA but this drop was minor.

Why did prenatal care rates start to increase in early 1998 when we would expect the drop to be continual? Figure 6 provides a likely explanation. This figure displays the fraction of women receiving prenatal care from public health clinics by quarter of conception. When prenatal care rates for low-educated Hispanic immigrant mothers rose in 1998, there was a concurrent upturn in the proportion of these women who received prenatal care at public health clinics, a safety net provider of prenatal care. This rise in care at public health clinics may explain why I do not observe the predicted monotonic decline in prenatal care. Adding further credence to this finding, the fraction of native mothers seeking prenatal care at public health clinics is quite stable from 1998 onward.

The first set of rows in Table 6 present estimates of the effect of the Medicaid restrictions on immigrant's use of health services as measured by whether the mother received prenatal care, the number of prenatal care visits, and whether the mother received care in the first 3 months of pregnancy. The first estimated coefficient indicates that prenatal care rates for immigrants in Texas fell 1.1 percentage points per year in the post-PRWORA period. The size of this effect is over 3 times as large as that observed earlier for

[25] These CPS results using the non-citizen versus citizen comparison were not shown.

immigrants living in no-fill-in states. Adding additional controls to the health care utilization regressions does not alter the point estimates substantially, providing some evidence that the estimated coefficients are picking up the effect of PRWORA rather than some other factor affecting prenatal care usage. The effects of PRWORA on early prenatal care and the number of prenatal care visits among immigrants are also statistically significant – revealing that immigrants delayed care and had fewer prenatal checkups.

In this research design, the estimate of the effect of PRWORA is credible to the extent that low-educated Hispanic natives in Texas are a good counterfactual for low-educated Hispanic immigrants in Texas. However, these sub-populations appear to be different along many dimensions (see Appendix Table 5). To measure the extent of this potential bias, I use a propensity score approach to control for the observed differences between the native and immigrant groups.[26] Since the point estimates using the propensity score techniques, with the exception of that for smoking, are nearly identical to those reported in Table 6. This reduces the concern about the appropriateness of natives as a control group. Both propensity score methods indicate that the estimated effect on smoking in Table 6 may be downward biased by a factor of 9.

The estimated effect on prenatal care in Table 6 is one-half the size of the analogous effect for Medicaid coverage displayed in Table 5. It is substantially smaller for two reasons. First, in response to the eligibility changes, mothers could purchase private insurance (the crowd-in effect), pay for prenatal care out-of-pocket, or seek care at clinics where care is free or provided at a reduced cost (as evidenced in Figure 6). Second, the fraction of immigrants who are post-enactment non-citizens, the "treated" group in the Natality regressions, is smaller than the fraction of non-citizens who are post-enactment non-citizens, the "treated" group in the Medicaid enrollment regressions. To adjust for the differences in the "treated" group between the two regressions, I can divide the estimated coefficient in Table 6 by the fraction of immigrants who are non-citizens, which is 0.78. Doing so, the magnitude of the coefficient changes slightly to -0.0033. This implies a responsiveness of prenatal care use to changes in Medicaid coverage of -0.0033/-0.0045=0.7346.

[26] To do this, I use a logistic regression to estimate the probability that the individual is an immigrant. I use the propensity scores (i.e., the resulting predicted values) in two ways. The first method involves constructing a weight for each observation where the weight is equal to the propensity score divided by 1-propensity score. I then estimate the OLS regressions in Table 6 using these weights. For the second method, I include the propensity score and the (propensity score – mean propensity score) interacted with the immigrant dummy and the post-PRWORA linear time trend as controls to control for selection and potential heterogeneous treatment effects.

Thus, for every 1-percentage-point decrease in Medicaid coverage, prenatal care decreases by a 0.7 percentage point. Because the estimated effects are nearly equal, the degree of crowd-in may be small in this population.

To see whether these declines in prenatal care use impacted birth outcomes, the second set of rows in Table 6 displays the analogous results with several different infant health measures as the outcome measures.[27] As a visual display of the underlying data, Figure 7 presents the time trends for low birthweight for natives and immigrant mothers. Both the regression results and the time series patterns strongly imply that the change in Medicaid eligibility did not adversely impact infant health. Since rates of smoking among pregnant immigrants did not change, one of the stronger mechanisms through which prenatal care could affect infant health, this result may be not be so surprising.

While it could be argued that for the average mother, the scope for prenatal care to affect infant health is quite limited (Fiscella, 1995), prenatal care may be important for mothers with risk factors (e.g., diabetes and hypertension). Looking at this sample of less healthy mothers, I find comparable, if not larger, effects on the three measures of prenatal care (results not shown). These observed declines in health care utilization appear to have a meaningful impact on labor complications as such complications increased a statistically significant 2.6 percentage points per year for immigrants in the post-PRWORA period.

VI. Interpreting the Magnitude of the Effect on Prenatal Care

While both the national and Texas results indicate that prenatal care rates fell because of the Medicaid restrictions imposed on recent immigrants, one is unable to discern how these estimated effects compare to reasonable predicted rates of care. To meet this aim, Figure 8 displays two predictions of time trends in prenatal care rates for low-educated Hispanic immigrant mothers in no-fill-states following the welfare reform, alongside the actual rates of prenatal care use. For the predicted (all poor post-enactment

[27] Ideally, one would like to compare the implied Wald IV estimates from Table 6 to IV estimates from other studies. I hesitate in doing so for two reasons. First, the first-stage estimates are weak but statistically significant. Second, the margin most affected by the policy change is the percent of women receiving any care and as far as I am aware, this is the only quasi-experimental study that looks or finds effects along this margin.

non-citizens receive no prenatal care) line, I can write the predicted rate of care as a weighted average as follows:

$$P_t = \frac{N_{non-treated,t}}{N_t} P_{non-treated,t} + \frac{N_{treated,t}}{N_t} P_{treated,t}$$

where P_t is the predicted rate at time t, N_t is the number of immigrant mothers conceiving at time t, $N_{treated,t}$ is the number of immigrant mothers who are poor post-enactment non-citizens, $N_{non-treated,t}$ is the number of remaining immigrant mothers (i.e., $N_{non-treated,t} + N_{treated,t} = N_t$). Under the assumption that all poor post-enactment non-citizens receive no prenatal care, $P_{treated,t}$ is 0, so the predicted prenatal care rate at time t is

$$P_t = \frac{N_{non-treated,t}}{N_t} P_{non-treated,t}$$

To estimate number of immigrant mothers who are poor post-enactment non-citizens, I use the March CPS. The assumption underlying this equation is strict, especially considering that some poor post-enactment non-citizens may have health insurance in spite of being ineligible for Medicaid. To account for this, I calculate a second prediction by imposing weaker restrictions and assuming that all poor post-enactment non-citizens without health insurance do not receive prenatal care.

The differences between the simulated rates and the actual rates are stunning but consistent with the earlier regression results. Prenatal care usage for immigrants in no-fill-in states did not fall nearly as much as expected in light of the size of the treated population. In the first quarter of 2000, under the premise that uninsured post-enactment non-citizen pregnant mothers do not seek care, the predicted rate is 0.80, while the actual rate is 0.96. Even without health insurance, immigrants are not deterred from receiving care.

One can also run the reverse experiment – that is, inferring what the rate of prenatal care among the treated group must have been given the actual trends presented in Figure 3. The predicted rate of prenatal care use is 0.95, much bigger than 0 but slightly smaller than the pre-PRWORA immigrant mean (0.97).

VII. Conclusion

The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 changed the federal welfare state drastically. This study focuses on one of the legislation's most substantial changes – the loss of Medicaid eligibility for recent immigrants to understand the dynamics between health insurance, health care utilization, and health and to provide a broad picture of how poor immigrants fared in the post-PRWORA era. In the wake of the reform, pregnant immigrants in no-fill-in states experienced a decline in health insurance coverage and a modest temporary decrease in prenatal care use. This response, however, was more pronounced in Texas, the largest no-fill-in state. The drop in prenatal care rates was nearly 3 times as large. Unexpectedly, this decline in prenatal care did not persist likely because more immigrants received prenatal care at public health clinics. These findings from Texas suggest that the response to the PRWORA was quite heterogeneous, an observation likely missed by national analyses.

Despite these declines in health care utilization, there were no concurrent changes in traditionally-measured birth outcomes (i.e., prematurity, low birthweight, and infant mortality). Immigrant women with risk factors in Texas though had higher rates of labor complications. These estimates suggest that if the United States aims to improve infant health by increasing prenatal care utilization, policies that increase public health coverage are likely to be ineffective for most mothers. However, if the share of at-risk mothers rises in the future, the provision of prenatal care may become of greater importance.

Even though nearly one half of immigrants are post-enactment non-citizens by 2002, the effects of PRWORA on prenatal care were not as large as they could have been. There are three potential explanations for this subdued response. First, uninsured women may be willing and able to pay for prenatal care; this may be plausible since one visit can cost about $100 to $200 (New York Academy of Medicine, 2001). Second, there are also safety nets such as public health clinics and funding from the Title V of the Social Security Act that enable women to receive prenatal care at reduced cost.[28] Finally, confusion among administrators of the law who were unable to discern eligibility may have contributed to the gap. It is unlikely that crowd-in

[28] Title V provides prenatal care to mothers who meet the income criteria for Medicaid but are otherwise ineligible. The federal government provides block grant money for this program but does not consider it a means-tested program. Thus, Title V does not fall under the jurisdiction of the immigrant restrictions implemented as part of PRWORA.

explains much of the muted response since the study population consists of low-educated Hispanic mothers whose access to private insurance is minimal.

Although the results reveal that the immigrant eligibility restrictions had a negligible influence on health outcomes for most pregnant immigrant mothers and babies, one should be cautious before generalizing these conclusions to other populations or health conditions. In particular, despite lower rates of prenatal care use, immigrant mothers experience better birth outcomes than natives, possibly indicating a limited role of prenatal care interventions. Moreover, pregnant mothers often have access to resources that are less available to other individuals in need of health care. One such example is Title V, which served over half of all pregnant mothers in 2001 (Maternal and Child Health Bureau, 2002). In comparison, cancer patients whose health care costs well exceed that of pregnant mothers may not be so fortunate. The impact of this legislation on other immigrant populations with substantial health care needs is an important area for future research.

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Appendix A – Data Appendix

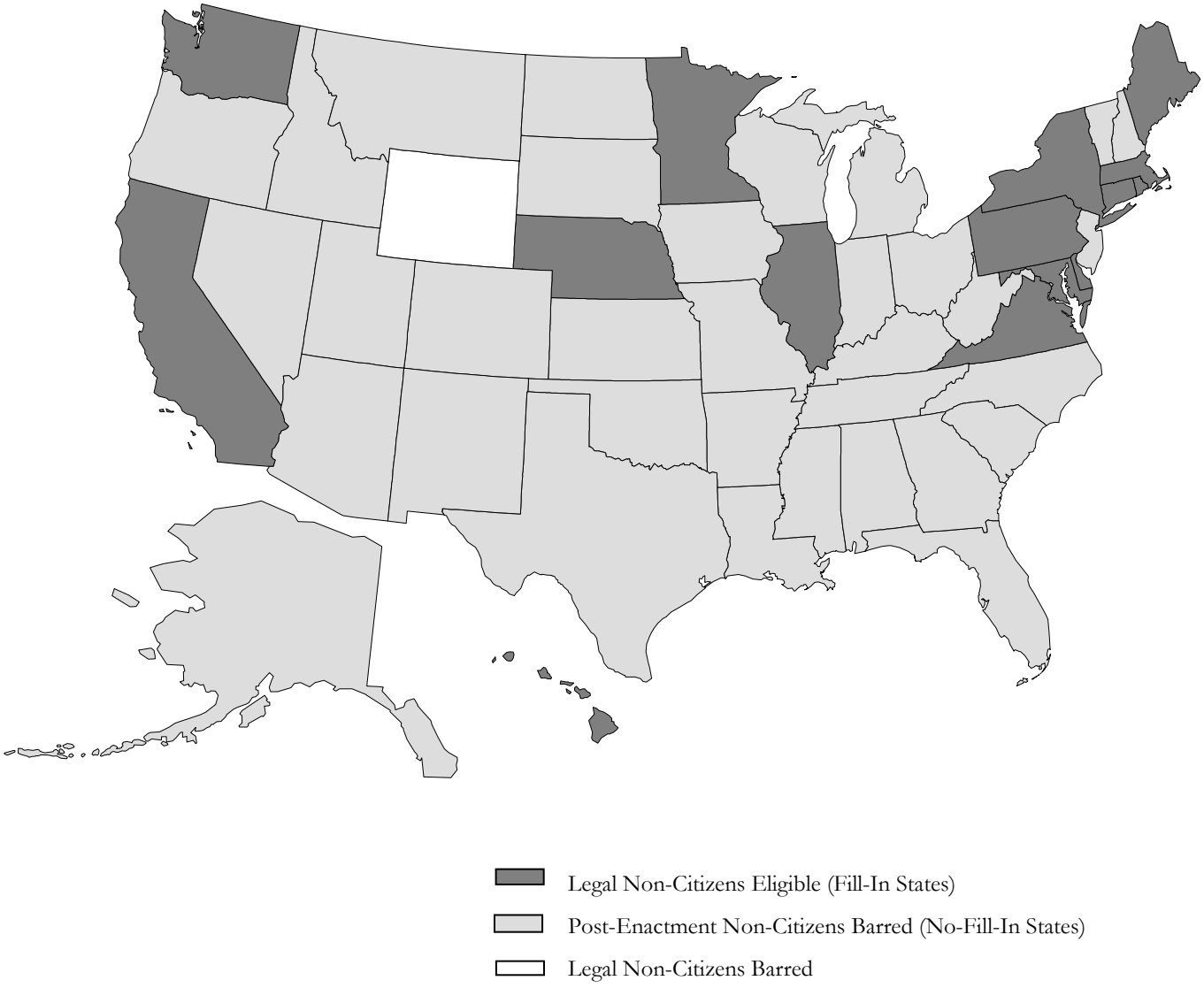
A. Texas Medicaid Enrollment Data

Construction of Medicaid Coverage Rates

To construct coverage rates, I divide the enrollment counts by the potential number of pregnant mothers receiving prenatal care. I chose this group as the denominator population for two reasons. First, a woman must be pregnant in order to enroll in Medicaid. Second, she may not decide to enroll in Medicaid until she has attended prenatal care. I could have chosen the population of pregnant mothers as the denominator instead. However, some of these mothers will not be enrolled in Medicaid either because they are unaware that they are pregnant or because they have no need for insurance since they have not received care yet.

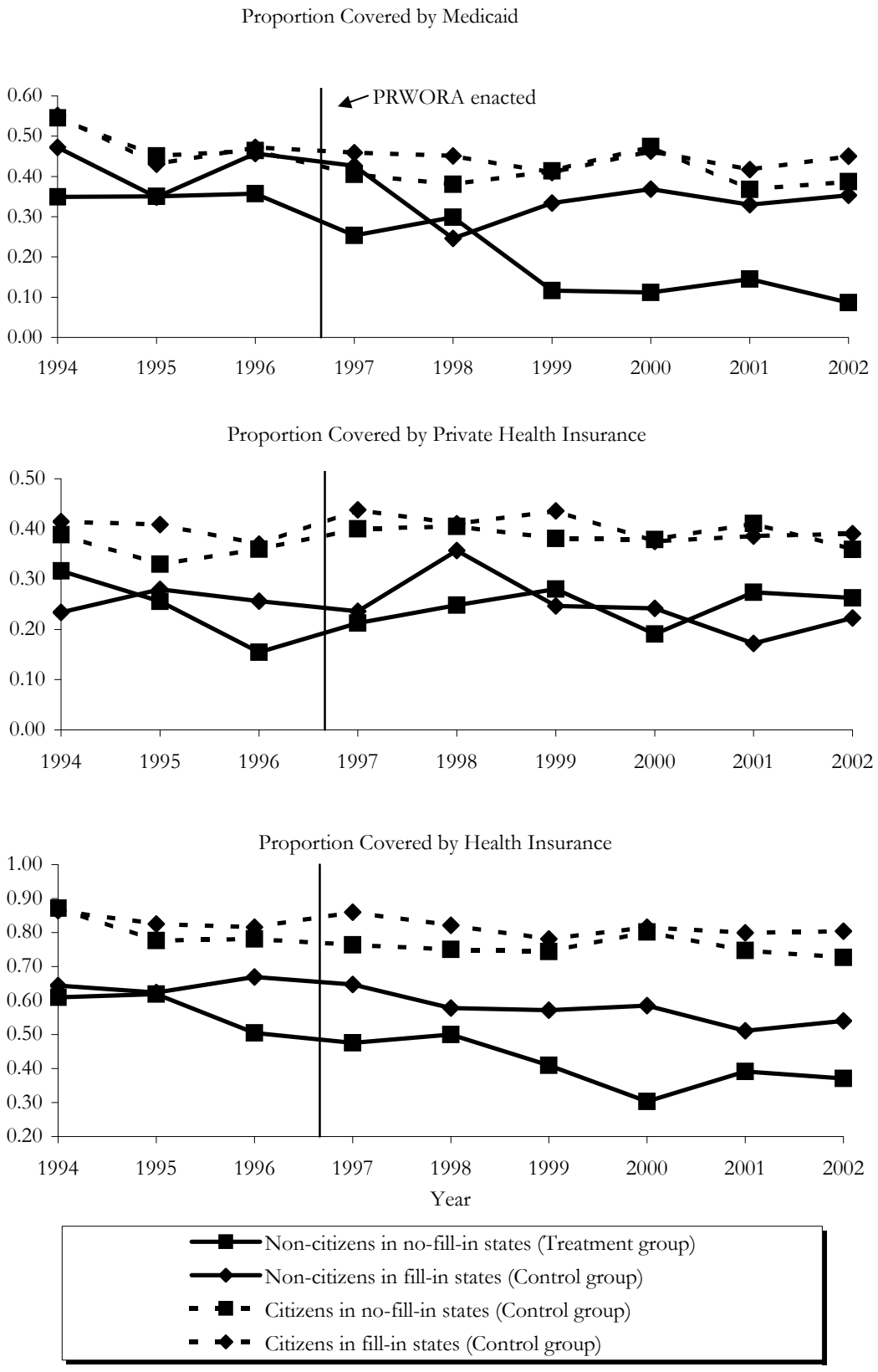
I estimate the potential monthly number of non-citizen and citizen women seeking care in the following way. To begin, I assume that all pregnant women in Texas start to receive care 2.5 months after conception. Two and half months is the average delay between conception and the initiation of prenatal care in Texas (calculation from Texas Natality Files). Under this assumption, I calculate the number of immigrant and native women potentially receiving care in Texas using the Texas Natality Files. Ideally, I would be able to calculate the number of non-citizen and citizen women seeking care. However, from these data, I cannot determine whether a mother is a citizen. As the next best alternative, I estimate the fraction of immigrants and natives who are non-citizens. To estimate these fractions, I create 3-month moving average estimates of the fraction of Texas immigrant women aged 15 to 45 who are citizens using the monthly Current Population Survey files. I multiply these fractions by the numbers of immigrant and native women to obtain estimates of the monthly number of non-citizen and citizen women seeking care.

Figure 1 – Medicaid Eligibility for Legal Non-Citizens Following PRWORA



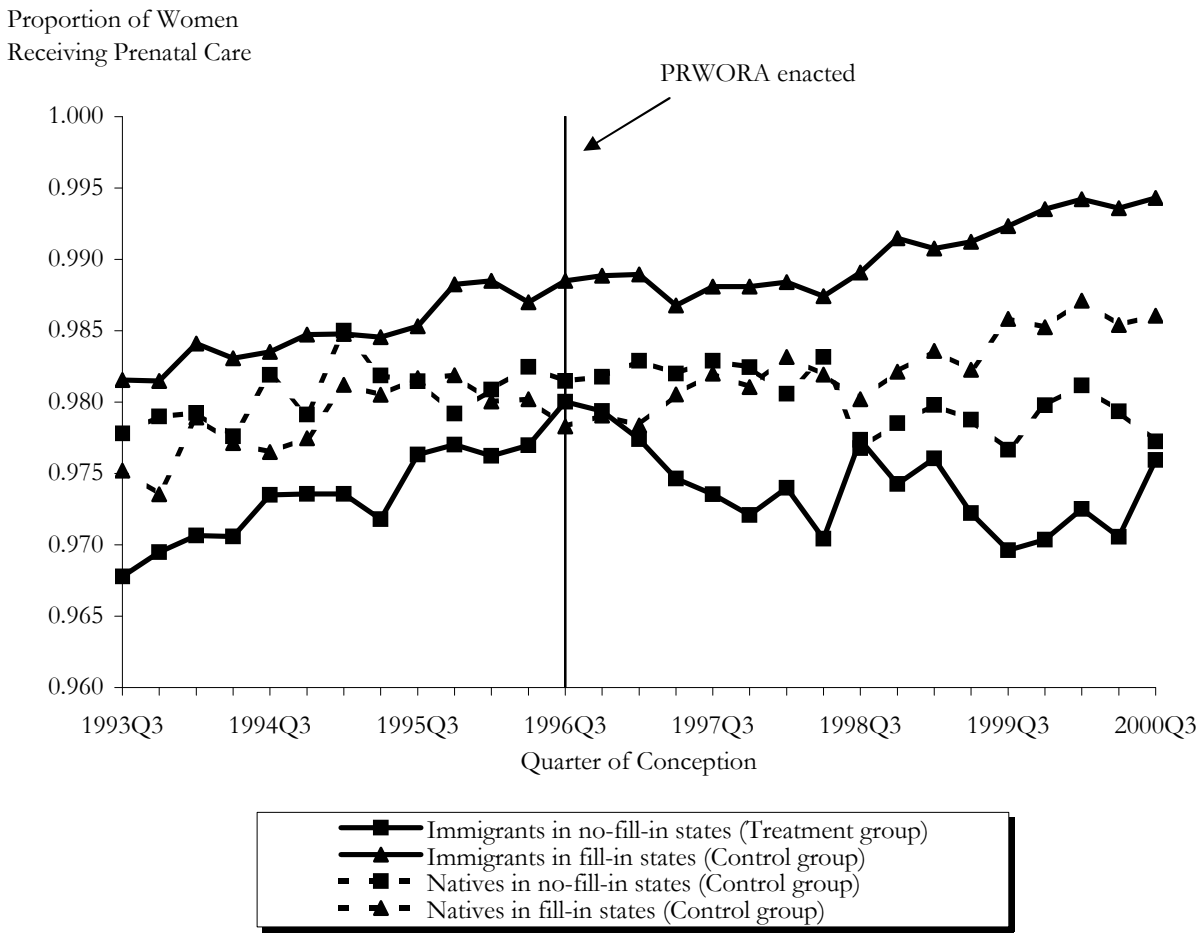
Source: See text.

Figure 2 - Time Trends in Health Insurance Coverage for Recent Mothers with Family Income Below 2 Times the Poverty Line (CPS Data)



Notes: Means are weighted by the CPS March Supplement weights. Observations for Wyoming have been deleted.

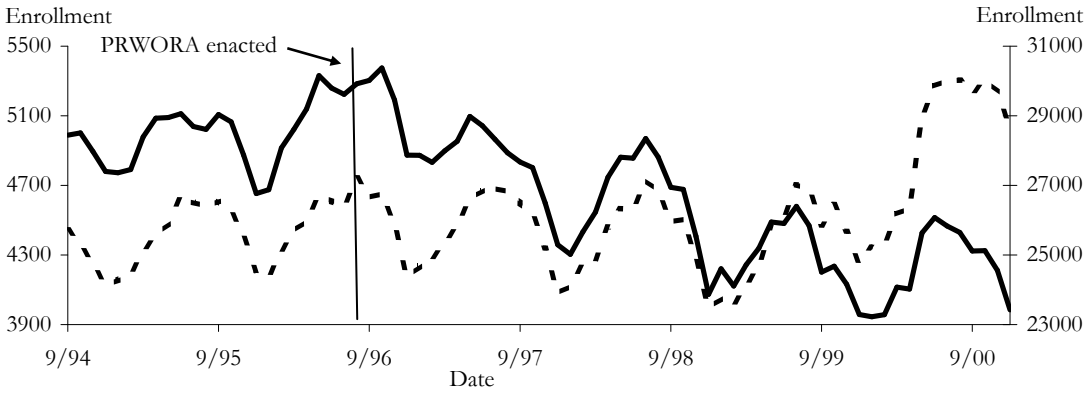
Figure 3 - Time Trends in Prenatal Care for Less-Than-High-School-Educated, Hispanic Mothers (National Natality Files)



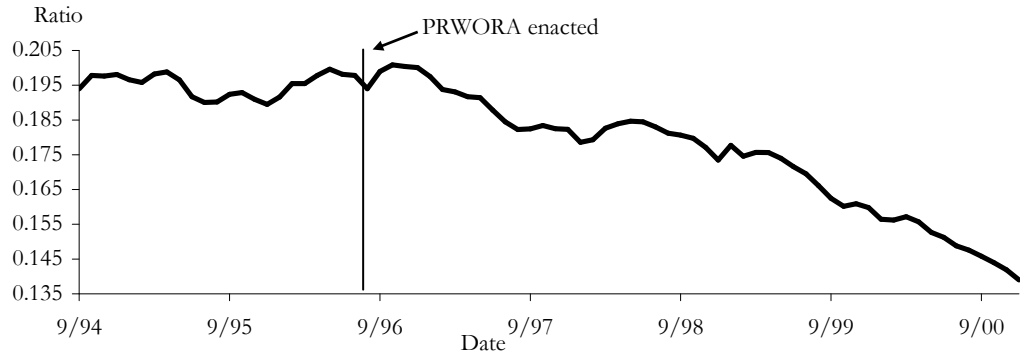
Notes: Observations for Wyoming have been deleted. All plural births are excluded.

Figure 4

Panel A: Texas Medicaid Enrollment for Hispanic Pregnant Women
Non-Citizen Enrollment (Left Axis) and Citizen Enrollment (Right Axis)
(Texas Enrollment Data)



Panel B: Ratio of Non-Citizen to Citizen Enrollment
(Texas Enrollment Data)



Panel C: Proportion of Pregnant Mothers Receiving Medicaid in Texas
(Texas Enrollment Data, Texas Natality Files, CPS)

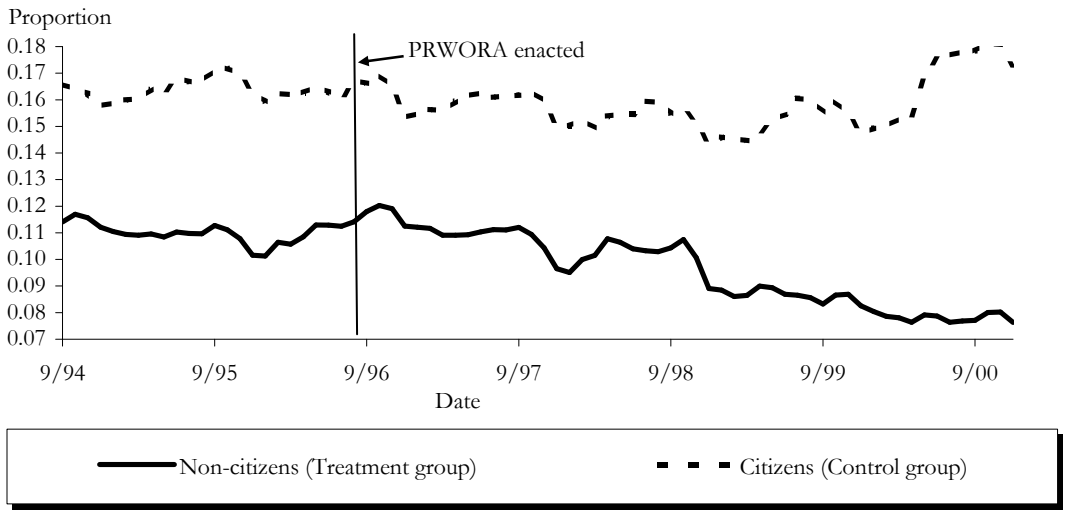
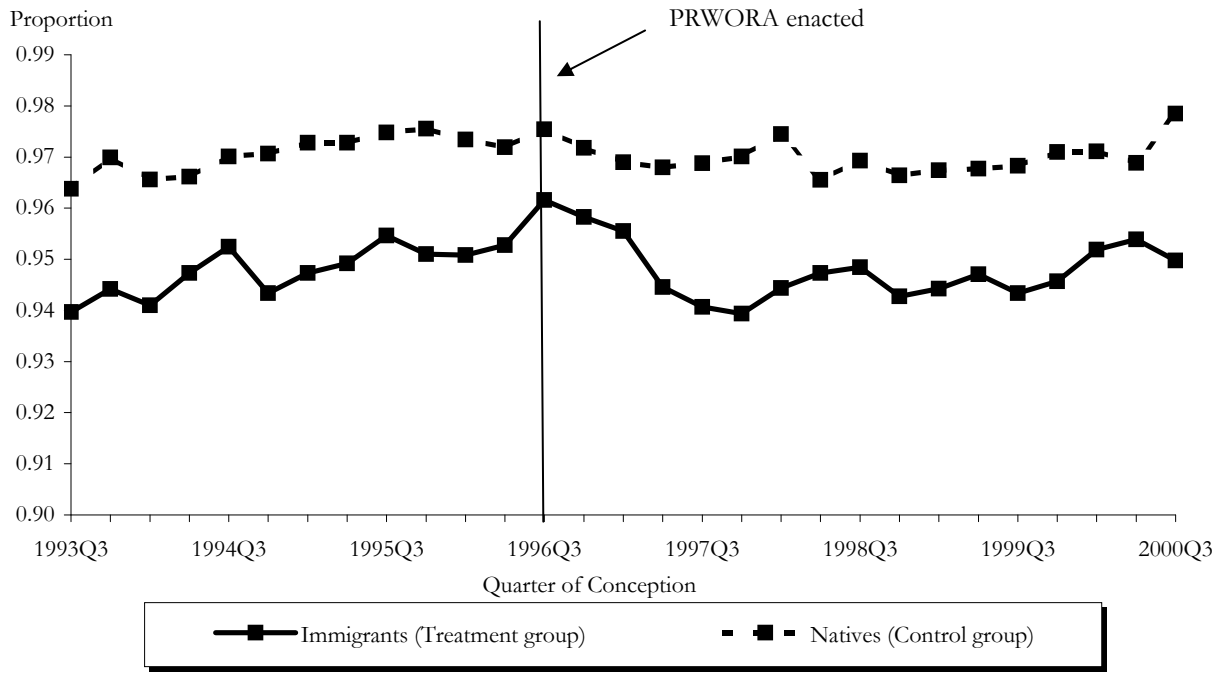
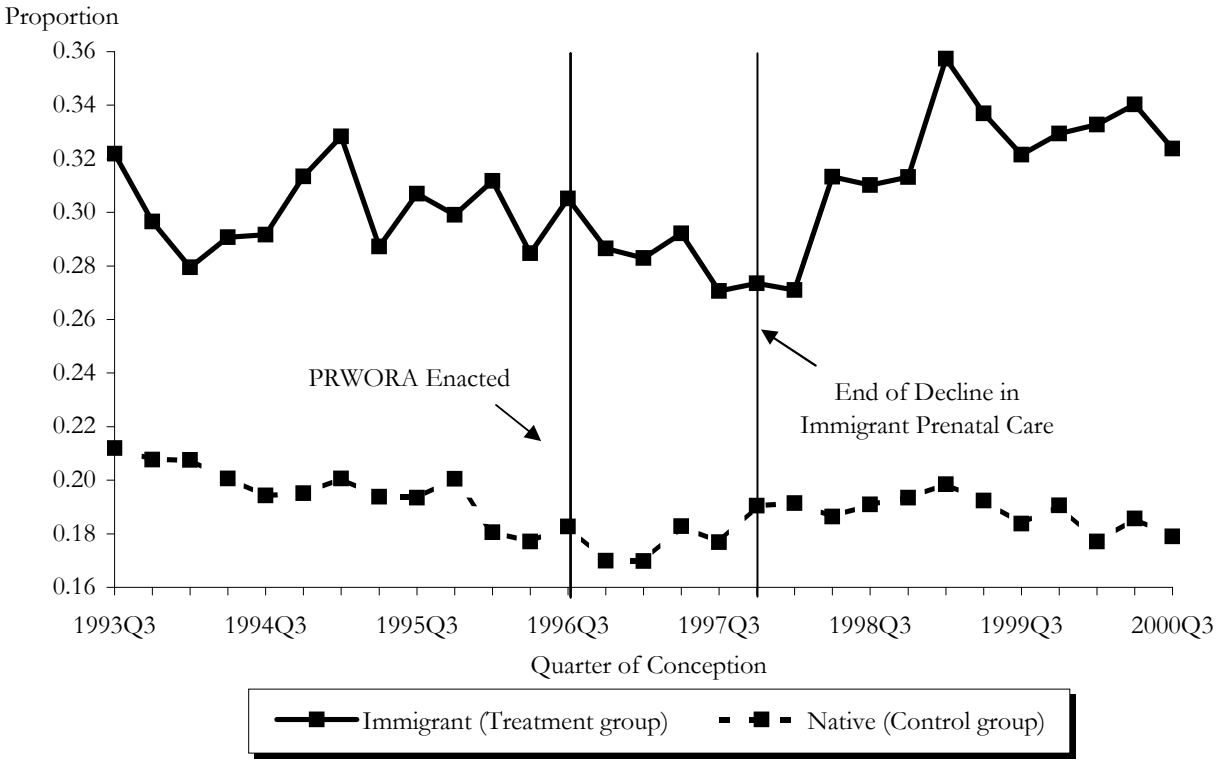


Figure 5 - Time Trends in Prenatal Care for Hispanic Texas Mothers with Less than 12 Years of Education
Proportion of Mothers Receiving Prenatal Care
(Texas Natality Files)



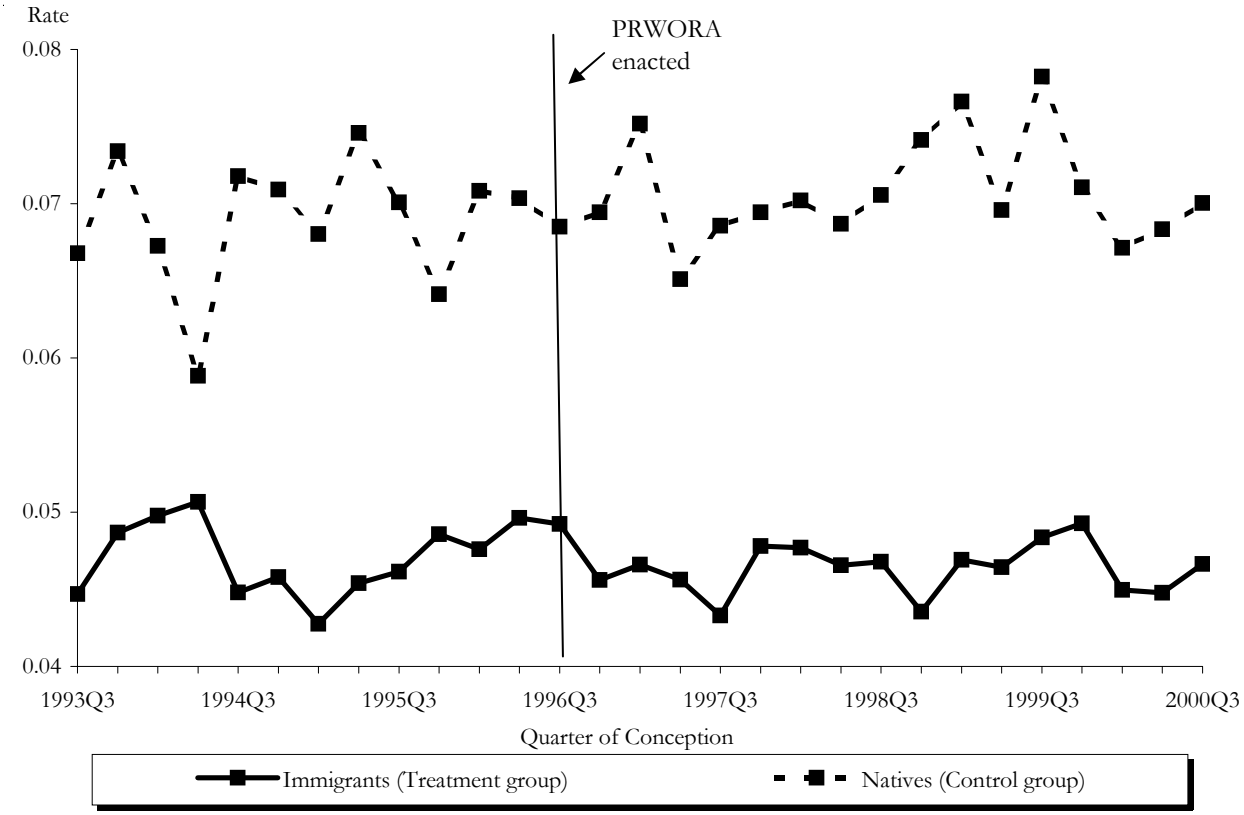
Notes: All plural births are excluded.

Figure 6 - Time Trends in Source of Prenatal Care for Texas Mothers (Texas Natality Files)
Proportion Receiving Prenatal Care from a Public Health Clinic



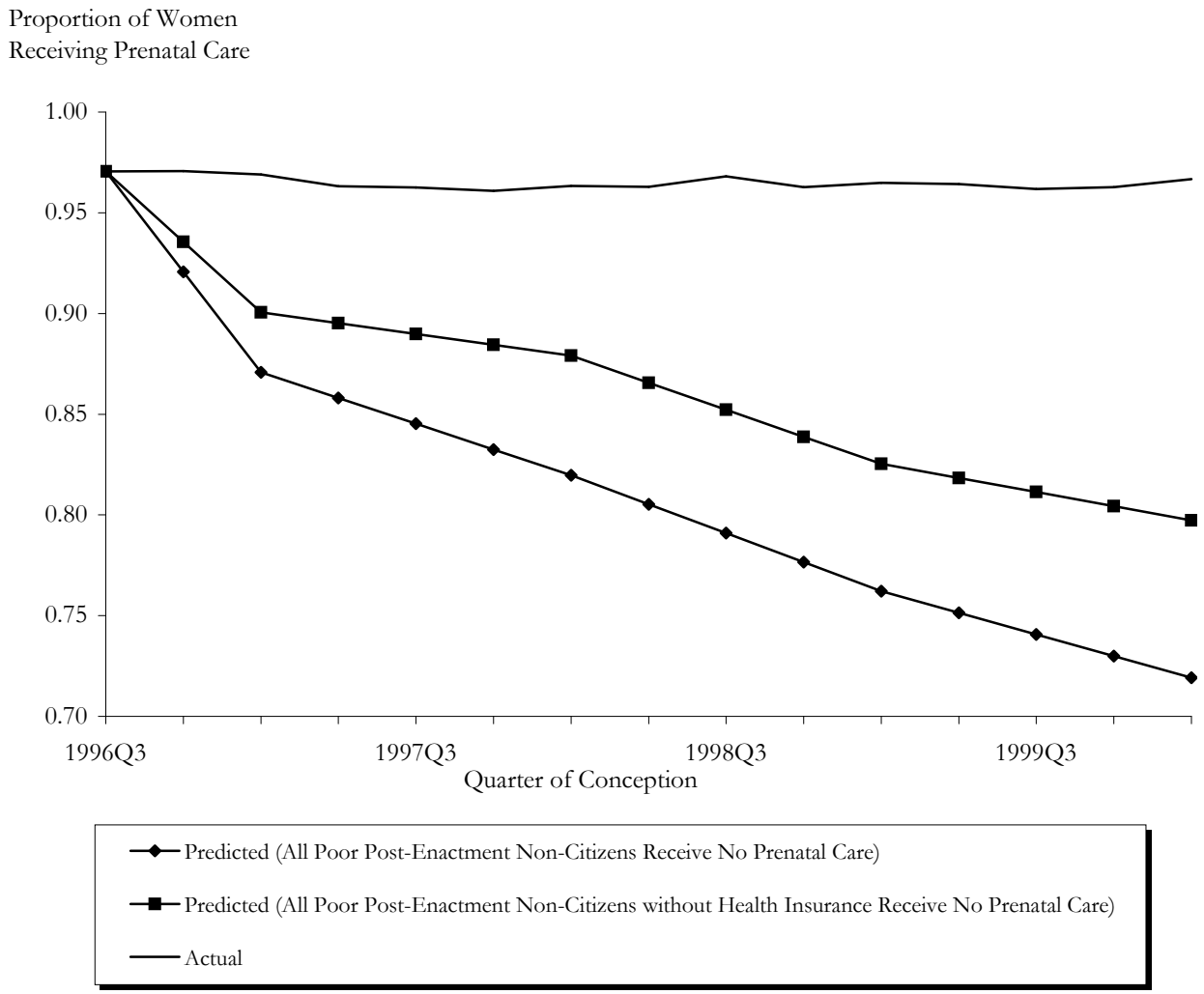
Notes: All plural births are excluded.

Figure 7 - Time Trends in Rates of Low Birth Weight for Texas Hispanic Mothers with Less than 12 Years of Education (Texas Natality Files)



Notes: All plural births are excluded.

Figure 8 - Predicted Time Trends in Prenatal Care among Less-Than-High-School-Educated Hispanic Immigrants in No-Fill-In States (National Natality Detail Files and March CPS)



Notes: Given that the number of low-educated Hispanic mothers in the March CPS is small, the estimated fraction of low-educated Hispanic immigrants in no-fill-in states that are post-enactment non-citizens is the fraction of immigrants in no-fill-in states that are post-enactment non-citizens. I classify families with incomes less than two times the poverty line as poor.

Table 1 - Immigrant Eligibility for Federally-Funded Medicaid

	Before PRWORA	After PRWORA
Citizens	Eligible	Eligible
Non-citizens legally in the United States		
Arrived on or before August 22, 1996	Eligible	State option**
Arrived after August 22, 1996		
Legal permanent residents	NA	Ineligible* for 5 years; state option after 5 years
Refugees	NA	Eligible for 7 years; state option after 7 years
Asylees	NA	Eligible for 7 years; state option after 7 years
Persons with 40 quarters of work in the US	NA	Eligible for 7 years; state option after 7 years
Members of the United States military	NA	Eligible for 7 years; state option after 7 years
Deportees held by the INS	NA	Eligible for 7 years; state option after 7 years
Undocumented immigrants	Ineligible*	Ineligible*

Notes: * Although ineligible for federally-funded non-emergency Medicaid, these immigrants are eligible for emergency Medicaid, which includes delivery.

** Only Wyoming decided to make these non-citizens ineligible.

Source: Fix, Michael E. and Karen Tumlin (1997). "Welfare Reform and the Devolution of Immigrant Policy." The Urban Institute.

Table 2 - Percent of Immigrant Mothers who are Post-Enactment Non-Citizens (Treated)
(March CPS data)

CPS Year	Percent	Observations
1998	6.6	290
1999	16.8	288
2000	23.3	271
2001	34.3	288
2002	42.2	434

Notes: All percentages computed using the CPS March Supplement weights. Observations for Wyoming are excluded.

Table 3 - Difference-in-Difference-in-Difference in Means OLS Estiamtes of the Effect of PRWORA on Health Insurance (CPS Data)

		Post-PRWORA*Non-Citizen*No-Fill-In*Post-PRWORA Arrival Treatment Dummy Coefficient Estimate		
Dependent Variable	Mean of Dependent Variable for Non-Citizens in No-Fill-in States in the Pre-PRWORA Period	No Covariates	With Demographic Covariates	With Complete Covariates
		(1)	(2)	(3)
Covered by Medicaid	0.355	-0.038	-0.013	-0.017
		(0.029)	(0.031)	(0.034)
Covered by Private Health Insurance	0.245	-0.005	-0.026	-0.032
		(0.053)	(0.055)	(0.056)
Covered by Health Insurance	0.579	-0.017	-0.018	-0.025
		(0.050)	(0.049)	(0.051)
Controls				
Age		NO	YES	YES
Ethnicity/Race		NO	YES	YES
Marital Status		NO	YES	YES
Education		NO	YES	YES
State Employment/Population Ratio		NO	NO	YES
State Unemployment Rate		NO	NO	YES
Observations		7638	7638	7638

Notes: The estimation sample consists of recent mothers whose family income is below 2 times the poverty line. All regressions are estimated using OLS weighted by the March CPS Supplement weights. Robust standard errors adjusted for clustering at the non-citizen and state level are in parentheses. Data for Wyoming are excluded. See text for details on the regression specification.

Table 4 - OLS Estimates of the Effect of PRWORA on Health Care Utilization, Health-Related Behaviors, and Health Outcomes Hispanic Mothers with Less than 12 Years of Education (National Natality Detail Files)

	Prenatal Care						Risky Behaviors	
	Any Care		Care in First Trimester		Number of Visits		Smoking	
Triple Difference in Trend Estimate	-0.00082	-0.00098	0.00095	-0.00001	0.01672	0.00857	0.00141	0.00122
	(0.00059)	(0.00058)	(0.00172)	(0.00181)	(0.01369)	(0.01423)	(0.00141)	(0.00136)
Pre-PRWORA Mean for Immigrants	0.9705		0.5613		9.4465		0.0192	
Non-PRWORA-related Controls	N	Y	N	Y	N	Y	N	Y

	Birth Outcomes			
	Low Birthweight		Premature Birth	
Triple Difference in Trend Estimate	0.00011	0.00022	-0.00029	-0.00007
	(0.00036)	(0.00036)	(0.00069)	(0.00071)
Pre-PRWORA Mean for Immigrants	0.0485		0.1005	
Non-PRWORA-related Controls	N	Y	N	Y

Notes: The estimated regressions with no non-PRWORA-related controls include an immigrant dummy, a no-fill-in dummy, a linear time trend, and all possible interactions of these three variables. In addition, all interactions of these three variables with a post-PRWORA dummy are included. However, an uninteracted post-PRWORA dummy is not included for reasons mentioned in the text. The reported coefficient is the coefficient on the post-PRWORA, time trend, immigrant, no-fill-in interaction. The regressions that include non-PRWORA-related controls also include controls for maternal risk factors, maternal marital status, birth order, maternal age, maternal education, and paternal presence. Standard errors, presented in parentheses, are clustered standard errors at the level of immigrant status and quarter of conception. Except for the smoking regressions, the number of observations underlying each regression is 2,046,756. The smoking regressions include 853,708 observations. The unit of measurement for the time trends is quarter.

Table 5 - OLS Estimates of the Effect of PRWORA on Medicaid Coverage among Hispanic Texas Mothers
(Texas Enrollment Data, Texas Natality Files, CPS)

	Medicaid Coverage		Log of Enrollment Counts	
Double Difference in Trend Estimate	-0.00452	-0.00452	-0.02272	-0.02272
	(0.00064)	(0.00064)	(0.00351)	(0.00350)
Pre-PRWORA Mean for Immigrants	0.1178			
Non-PRWORA-related Controls	N	Y	N	Y

Notes: The regressions omitting the non-PRWORA-related controls include the following covariates: month dummies, a non-citizen dummy, a linear quarterly trend, a quarterly trend interacted with a non-citizen dummy, a linear trend interacted with a post-PRWORA dummy, and a linear trend interacted with a post-PRWORA dummy and a non-citizen dummy (the treatment variable). The regressions with non-PRWORA-related controls include the Texas monthly employment to population ratio and unemployment rates in addition to the controls included in the regressions that omit the non-PRWORA-related controls. The number of observations underlying each regression is 152. For details on the construction on the Medicaid coverage rates, see text.

Table 6 - OLS Estimates of the Effect of PRWORA on Health Care Utilization, Health-Related Behaviors, and Health Outcomes
Hispanic Texas Mothers with Less than 12 Years of Education (Texas Natality Files)

	Prenatal Care						**Risky Behaviors**	
	Any Care		Care in First Trimester		Number of Visits		Smoking	
Triple Difference in Trend Estimate	-0.00271	-0.00259	-0.00409	-0.00364	-0.05718	-0.05284	0.00009	0.00012
	(0.00118)	(0.00117)	(0.00183)	(0.00187)	(0.01652)	(0.01669)	(0.00019)	(0.00018)
Pre-PRWORA Mean for Immigrants	0.9348		0.5939		8.8208		0.0111	
Non-PRWORA-related Controls	N	Y	N	Y	N	Y	N	Y

	Birth Outcomes							
	Low Birthweight		Premature Birth		Infant Death		Labor Complications	
Triple Difference in Trend Estimate	0.00003	0.00005	-0.00013	-0.00018	-0.00001	-0.00001	0.00153	0.00152
	(0.00028)	(0.00028)	(0.00045)	(0.00045)	(0.00007)	(0.00007)	(0.00113)	(0.00102)
Pre-PRWORA Mean for Immigrants	0.0467		0.0843		0.0043		0.2093	
Non-PRWORA-related Controls	N	Y	N	Y	N	Y	N	Y

Notes: The estimated regressions with no non-PRWORA-related controls include an immigrant dummy, a linear time trend, a linear time trend interacted with an immigrant dummy, a linear time trend interacted with a post-PRWORA dummy, and a linear time trend interacted with a post-PRWORA dummy and an immigrant dummy (the coefficient reported as the triple difference in trend estimate). For interpretation of the estimated coefficient, see text. The regressions that include non-PRWORA-related controls also include controls for maternal risk factors, maternal marital status, birth order, maternal age, maternal education, and paternal presence along with the controls included in the regressions with no non-PRWORA-related controls. Standard errors, presented in parentheses, are clustered standard errors at the level of immigrant status and quarter of conception. Except for the smoking regressions, the number of observations underlying each regression is 557,033. The smoking regressions include 554,798 observations. The unit of measurement for the time trends is quarter.

Appendix Table 1 - Data Sources

	Texas Data Sources		*National Data Sources*	
Information on	Texas Medicaid Enrollment Data	Texas Natality Files	March CPS	Natality Detail Files
Medicaid	YES	NO	YES	NO
Health Insurance	NO	NO	YES	NO
Prenatal Care Use	NO	YES	NO	YES
Location Received Prenatal Care	NO	YES	NO	NO
Health Outcomes	NO	YES	NO	YES
Whether an Immigrant	NO	YES	YES	YES
Whether a Non-Citizen	YES	NO	YES	NO
Time of Immigrant's Arrival in United States	NO	NO	YES	NO

Appendix Table 2 - Means for Key Variables for Recent Mothers with Family-Size-Adjusted Income Below 200% of the Poverty Line (CPS data)

	Non-citizens in no-fill-states (Treatment group)		Non-citizens in fill-in states (Control group)		Citizens in no-fill-in states (Control group)		Citizens in fill-in states (Control group)	
	Before PRWORA	After PRWORA	Before PRWORA	After PRWORA	Before PRWORA	After PRWORA	Before PRWORA	After PRWORA
Age	26.52	27.12	27.72	27.77	24.75	24.87	25.41	25.64
	[5.26]	[5.86]	[5.74]	[5.87]	[5.84]	[6.03]	[5.97]	[6.15]
White	0.79	0.86	0.77	0.82	0.70	0.69	0.74	0.75
Hispanic	0.74	0.80	0.73	0.77	0.10	0.14	0.20	0.20
No high school	0.30	0.33	0.36	0.29	0.05	0.04	0.06	0.04
Some high school	0.27	0.24	0.23	0.27	0.28	0.25	0.27	0.25
High school	0.25	0.23	0.24	0.25	0.38	0.41	0.36	0.39
More than high school	0.18	0.20	0.17	0.18	0.29	0.31	0.31	0.32
Married	0.81	0.80	0.75	0.77	0.52	0.47	0.51	0.50
Employed	0.24	0.21	0.20	0.23	0.36	0.42	0.31	0.39
Family income in 2001$ adjusted for family size	7173.28	8367.95	7751.68	8294.52	7631.34	7893.63	7721.58	8120.46
	[5196.11]	[5162.21]	[4971.35]	[4901.95]	[5547.20]	[5584.03]	[5577.19]	[5595.84]
Covered by Medicaid	0.35	0.17	0.43	0.34	0.49	0.40	0.49	0.44
Covered by private health insurance	0.24	0.24	0.26	0.25	0.36	0.39	0.40	0.41
Covered by health insurance	0.58	0.41	0.64	0.58	0.81	0.76	0.84	0.81
Proportion post-enactment non-citizens	0.00	0.31	0.00	0.22	0.00	0.00	0.00	0.00
Observations	219	498	388	529	1505	2601	721	1173

Notes: Standard deviations for continuous variables are in brackets. All means are computed using the 1994-2002 March CPS and using only observations that have nonmissing data for all variables in the table. Means are weighted by the CPS March Supplement weights. Observations for Wyoming have been deleted. Means for before PRWORA are computed using the 1994-1996 CPS and means for after PRWORA are computed using the 1997-2002 CPS.

Appendix Table 3 - OLS Difference-in-Difference-in-Difference in Trend Estimates of the Effect of PRWORA on Health Insurance (CPS Data)

Dependent Variable	Mean of Dependent Variable for Immigrants in No-Fill-in States in the Pre-PRWORA Period	Coefficient on Yearly Time Trend*Immigrant*No-Fill-In*Post-PRWORA Treatment Variable		
		No Covariates	With Demographic Covariates	With Complete Covariates
		(1)	(2)	(3)
Covered by Medicaid	0.338	-0.0613	-0.0603	-0.0550
		(0.0380)	(0.0368)	(0.0403)
Covered by Private Health Insurance	0.251	0.0778	0.0651	0.0450
		(0.0576)	(0.0571)	(0.0580)
Covered by Health Insurance	0.576	0.0115	0.0006	-0.0116
		(0.0401)	(0.0391)	(0.0406)
Controls				
Age		NO	YES	YES
Ethnicity/Race		NO	YES	YES
Marital Status		NO	YES	YES
Education		NO	YES	YES
State Employment/Population Ratio		NO	NO	YES
State Unemployment Rate		NO	NO	YES
Observations		7676	7676	7676

Notes: The estimation sample consists of recent Hispanic mothers who have fewer than 12 years of education. All regressions are weighted by the March CPS Supplement weights. Robust standard errors adjusted for clustering at the immigrant and state level are in parentheses. Data for Wyoming are excluded. See text for details on the regression specification.

Appendix Table 4 - Means for Key Variables for Low-Educated Hispanic Mothers (National Natality Detail Files)

	Immigrants in no-fill-states (Treatment group)		Immigrants in fill-in states (Control group)		Natives in no-fill-in states (Control group)		Natives in fill-in states (Control group)	
	Before PRWORA	After PRWORA	Before PRWORA	After PRWORA	Before PRWORA	After PRWORA	Before PRWORA	After PRWORA
Age	24.83	25.00	25.89	26.42	20.90	20.91	21.14	21.23
	[5.82]	[5.78]	[6.02]	[6.08]	[5.23]	[5.03]	[5.50]	[5.38]
No high school	0.60	0.57	0.60	0.56	0.16	0.15	0.13	0.11
Some high school	0.40	0.43	0.40	0.44	0.84	0.85	0.87	0.89
Married	0.58	0.55	0.57	0.57	0.29	0.30	0.26	0.25
Father present	0.76	0.80	0.88	0.89	0.60	0.66	0.80	0.79
Received prenatal care	0.97	0.97	0.98	0.99	0.98	0.98	0.98	0.98
Number of prenatal care visits	9.45	9.66	10.06	10.90	9.93	9.98	10.17	10.64
Month prenatal care began	3.59	3.45	3.16	2.86	3.33	3.23	3.17	2.96
	[1.93]	[1.88]	[1.74]	[1.67]	[1.79]	[1.79]	[1.75]	[1.71]
Smoked during pregnancy	0.019	0.011	0.010	0.007	0.151	0.137	0.156	0.151
Premature birth	0.100	0.105	0.098	0.098	0.126	0.128	0.123	0.120
Very low birth weight birth	0.007	0.007	0.007	0.007	0.011	0.011	0.012	0.011
Low birth weight birth	0.048	0.048	0.044	0.044	0.075	0.075	0.072	0.069
Observations	149,046	250,826	570,826	548,099	84,601	103,203	168,252	174,322

Notes: The sample includes only Hispanic mothers with less than 12 years of education. Standard deviations for the continuous variables are in brackets. All means and standard deviations are computed using births conceived in the 3rd quarter of 1992 through the 3rd quarter of 2000. All plural births are excluded.

Appendix Table 5 - Means for Key Variables
for Low-Educated Hispanic Texas Mothers (Texas Natality Data)

	Immigrants (Treatment Group)		Natives (Control Group)	
	Before PRWORA	After PRWORA	Before PRWORA	After PRWORA
Age	25.42	25.66	21.21	21.25
	[5.92]	[5.94]	[5.40]	[5.25]
No high school	0.57	0.52	0.21	0.18
Some high school	0.43	0.48	0.79	0.82
Married	0.73	0.69	0.52	0.46
Father present	0.83	0.84	0.73	0.75
Received prenatal care	0.93	0.95	0.97	0.97
Number of prenatal care visits	8.82	9.24	10.04	10.24
	[4.51]	[4.54]	[4.49]	[4.46]
Month prenatal care began	3.36	3.21	3.23	3.08
	[1.90]	[1.86]	[1.77]	[1.76]
Smoked during pregnancy	0.011	0.009	0.058	0.055
Premature birth	0.084	0.089	0.113	0.118
Very low birth weight birth	0.007	0.007	0.011	0.011
Low birth weight birth	0.047	0.046	0.069	0.071
Infant mortality rate (deaths/1000 births)	4.309	3.570	6.445	5.620
Labor complications	0.209	0.232	0.239	0.223
Observations	143,817	174,812	97,908	113,956

Notes: The sample includes only Hispanic mothers with less than 12 years of education. Standard deviations for the continuous variables are in brackets. All means and standard deviations are computed using births conceived in the 3rd quarter of 1992 through the 3rd quarter of 2000. All plural births are excluded.