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Welfare Reform and Health of Immigrant Women and their Children

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Abstract We investigate the association between the 1996 welfare reform and health insurance, medical care use and health of low-educated, foreign-born, single mothers and their children. We find that welfare reform was associated with an eight to 11.5 percentage points increase in proportion uninsured among low-educated foreign-born, single mothers. We also find that the decline in welfare caseload since 1996 was associated with a 6.5 to 10 percentage points increase in the proportion of low-educated foreign-born, single mothers reporting delays in receiving medical care or receiving no care due to cost and a nine percentage points decline in visits to a health professional in the past 12 months. We do not find any consistent evidence that welfare reform affected the health insurance, medical care utilization and health of children living with single mothers.

Introduction

The 1996 Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) eliminated entitlement to cash assistance, imposed stringent work requirements on welfare recipients, and instituted time-limited benefits. While these changes in policy were striking, legal immigrants faced even more dramatic changes as they were the target of special provisions that eliminated all federal means-tested benefits to recent immigrants, and denied some benefits to all immigrants. As a result, immigrant use of cash assistance, Medicaid, Food Stamps and Supplemental Security Income has fallen sharply since 1996 [1, 2].

Research suggests that welfare reform has induced foreign-born, single mothers to move from welfare to work in large numbers (Kaestner and Kaushal, 2006) [2]. It also left many immigrant women and children without health insurance [3, 4]. These changes in employment, health insurance coverage and other life circumstances (family income, family structure) have the potential to significantly affect use of medical care and health of low-income immigrants. Increased employment and greater income may positively affect use of health care and health, but loss of health insurance and other changes in the lives of low-income families may adversely affect these outcomes.

To our knowledge, there is no study of the effect of welfare reform on use of medical care and health of low-income immigrant families. This is noteworthy because health is an important determinant of well being and change in health, as a result of welfare reform, would surely be viewed as a key measure of the success of this policy. Besides if welfare reform affected immigrant health adversely, it may have undermined the policy's intended objectives. Poor health would hinder immigrants' success in the labor market and impede progress toward economic independence. Further, the fiscal benefits of the immigrant provisions of PRWORA are also potentially eroded by the risk of increased health care costs resulting from more low-income immigrant families making use of emergency care that cannot be denied, but that is more expensive than routine preventive care.[1] Thus,

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[1] Denying immigrants access to means-tested programs resulted in 44 percent of the total savings in PRWORA [5].

knowledge about the effect of welfare reform on health care utilization and health of low-income immigrant families is critical to evaluating the efficacy of welfare policy and its immigrant provisions, and such research would almost certainly influence the ongoing debate on welfare policy reauthorization.

The objective of this paper is to examine the effect of federal and state welfare reform on immigrant use of medical care and health using data from the National Health Interview Surveys (NHIS). We begin by investigating the effect of welfare reform on health insurance because it is the primary causal mechanism that motivates an investigation of the effect of welfare reform on medical care utilization and health, and there is no previous research on this issue using NHIS. Next, we study several aspects of medical care utilization including reported delays or absence of medical care due to cost; whether an individual saw a health professional in the past two weeks (12 months); whether an individual saw a health professional more than 10 times in the past 12 months, and whether an individual stayed overnight in a hospital in the past 12 months. We also study a variety of self-reported health outcomes. For women, we examine the effect of welfare reform on self-reports of health status and number of bed days due to sickness in the previous 12 months. For children, we analyze parents' reports of child's health status and number of school loss days due to illness for school going children.

We conduct all analysis using a sample of low-educated foreign-born mothers and their children. These groups are further stratified into sub-groups in order to identify those most and least affected by welfare reform. Specifically, adults are stratified by marital status: single mothers and married mothers; and children are stratified by family type: those living with single mothers and those living in two parent families. We use multivariate regression methods with a comparison group research design. We focus on immigrants because of the demonstrated larger effects of PRWORA on immigrant use of means tested programs, employment and health insurance, and lack of any research on the effect of welfare policy on immigrant health and medical care use. Previous research has analyzed similar outcomes for natives [6–8].

Immigrant Provisions of PRWORA

Immigrant eligibility for means-tested programs has undergone several changes since the mid-1990s. Several aspects of PRWORA, namely time limited benefits, mandatory work requirements and sanctions for noncompliance of work requirements – were common for both the foreign-born and US-born populations. PRWORA also laid down an intricate set of rules for various groups of foreign-born legal residents on the basis of citizenship, year of arrival and years lived in the US. The initial law denied legal immigrants access to cash benefits, Medicaid, Food Stamps and Supplemental Security Income (SSI) in their first five years of residence in the US. State governments were given the option to use federal funds to provide benefits to the pre-1996 arrivals, and most states took this option.[2] PRWORA prohibited states from using federal funds for the post-1996 arrivals, to which many states responded by creating substitute programs, using state level funds.[3]

As a result, only newly arrived legal immigrants, who have been in the country for less than five years and live in states with no substitute program, are denied some or all mean-tested benefits. Despite this fact, use of means-tested programs by immigrants has declined sharply since 1996, and in some cases (Medicaid, food stamps) these declines have been greater than those experienced for natives. There is some evidence that among immigrants, the declines were stronger for recent arrivals, which is consistent with the larger policy changes for this group [2]. Researchers attribute these declines to three main factors: the economic expansion of the 1990s; federal and state level changes in immigrant access to means-tested programs; and the "chilling effect" of PRWORA that created an atmosphere of fear and confusion among immigrants, inducing them not to apply for benefits even when eligible [2, 9–11].[4] As we describe below, these changes in welfare policy may have affected low-income families' use of medical services and health.

[2] In all states except Alabama legal pre-1996 immigrants (or those in the US for at least five years) have access to cash welfare; in all states except Wyoming they have access to Medicaid, in 17 states they are eligible to use food stamps and in 10 states they have access to SSI.

[3] Nineteen states that have substitute TANF programs for newly arrived immigrants during the five year federal ban are: CA, MA, MD, WA, PA, OR, CT, GA, MN, HI, WI, MO, UT, RI, TN, NE, ME, VT, WY. Fifteen states where new immigrants are eligible for Medicaid are: CA, IL, MA, MD, VA, WA, PA, CT, MN, HI, RI, NE, NY, DE and ME. Subsequent changes in federal policy restored Food Stamps and SSI benefits to certain vulnerable groups and in 2002 Congress restored Food Stamps to all legal immigrants who have been in the country for at least five year.

[4] Surveys by the National Health Law Program and the National Immigration Law Center indicate that fear of deportation from the US has discouraged immigrants from obtaining publicly subsidized health care even when they were entitled to it [12]. The Kaiser Commission on Medicaid and the Uninsured, also found that since 1996 many immigrants did not seek public health insurance because they feared that it would affect their immigration status or jeopardize opportunity to become a citizen [18]. Similarly, Kaushal and Kaestner [4] find that PRWORA affected the insurance of immigrants who have been in the US for more than five years as adversely as of those in the US for less than five years, even though the later were subject to more stringent provisions in a number of states.

Theoretical issues

Welfare reform and utilization of medical care

Use of medical care is a function of a number of factors that include health, health insurance, income, and health behaviors. PRWORA may have affected one or more of these factors. Consider first the effect of changes in health insurance status. There is evidence that PRWORA lowered Medicaid use, among low-income, particularly immigrant, families [4, 8, 13]. While in the case of US-born mothers and their children the decline in Medicaid use was accompanied by an increase in private insurance, there was no such offsetting increase in private insurance for the foreign-born and their children, leaving a large proportion of the latter without any health insurance [4]. Loss of health insurance will reduce utilization of medical care [7, 14–17]. Loss of insurance may also change health behaviors (ex ante moral hazard), which in turn may decrease demand for medical care. For example, Kaestner and Tarlov [6] find that PRWORA was associated with a decrease in binge drinking and an increase in regular and sustained physical activity. Such behaviors will have a positive effect on health that will reduce demand for medical care. Finally, since private insurance has larger co-pays and deductibles than Medicaid, use of medical care may have declined even among those who moved from public to private insurance.

Other avenues through which welfare reform may affect use of medical care are changes in income and time constraints. Mothers who made a successful transition from welfare to work, and increased their incomes may increase their use of care. On the other hand, a reduction in income because of discontinuous work or because of expenses associated with work will decrease use of medical care (holding insurance status constant). Changes in time constraints, for example because of greater work effort, may also affect the ability to seek medical care.

Welfare reform and health

The most obvious causal pathway linking welfare reform to health is through declines in health insurance coverage and consequently declines in use of medical services that may adversely affect health. But, PRWORA may have also affected health of low-educated single mothers in a number of other ways. Welfare reform transformed the life circumstances and opportunities of low-income mothers. Here we discuss in detail how the transition from welfare-to-work may affect health, but similar causal pathways apply to other types of transitions (changes) that may have been caused by welfare reform. These transitions (changes) include staying employed instead of seeking public assistance, leaving employment, but not seeking public assistance, leaving public assistance but not obtaining employment. All of these changes as a result of welfare reform have the potential to affect health in the ways we now describe.

Women who moved from welfare-to-work because of the policy change may encounter job related physical and psychological stress. Activities and working conditions (e.g., autonomy) differ between household work, which includes a significant amount of childcare, and paid employment. Paid employment may entail more or less physical labor than household work, and there may also be differences in the amount of psychological distress between the two types of labor [19–24]. Research suggests that a woman's self esteem is higher when employed, and lower when on welfare, and that welfare recipients have greater levels of psychological distress than similar women not on welfare [25, 26].[5]

Those who move from welfare-to-work may also experience a change in what may be called organizational stress. A transition from welfare-to-work changes the daily routine of mothers and imposes time-constraints. Work entails a different schedule and different set of responsibilities for carrying out the daily tasks of life than household work, and may affect the amount of psychological distress women going through these transitions experience.

Changes in employment and organizational stress may also cause changes in coping strategies that adversely affect health. There is considerable research that greater psychological distress causes people to increase alcohol and tobacco use [27–31]. In addition, there is evidence that greater psychological distress causes changes in dietary habits (e.g., overeating) that may adversely affect health [32–36].

A transition from welfare-to-work may also affect family income, thereby affecting health through changes in material wellbeing [37]. Evidence suggests that there has been little change—if anything a slight improvement—in the material wellbeing of women who have left welfare, and poverty rates have not increased among low-income women in general [38, 39]. However, even if material wellbeing is unchanged, changes in psychological stress caused by new financial arrangements or financial uncertainty may affect health and health behaviors.

We have identified three broad pathways, which we refer to as employment stress, organizational stress, and financial stress, by which transitions from welfare-to-work may affect the health and health behaviors of low-educated, single mothers. These pathways are also relevant for other types of transitions of women who opted not to seek welfare in response to PRWORA. Each transition (change) represents a potential change in daily activities, working conditions, responsibilities, and financial circumstances that may affect health and health behaviors.

[5] These studies are purely descriptive and do not address the question as to whether the transition off welfare caused a change in health.

Transitions in mother's life in response to welfare reform may also affect child health. Parental time is an important input into children's health [40]. PRWORA imposed strict work requirements on welfare recipients, reducing mother's time for other activities, and induced low-educated single mothers to move from welfare to work. PRWORA induced decline in parental investment may have affected the health of children in low-income families. PRWORA induced changes in mother's life circumstances and health may also affect child's health.

In sum, there is evidence that welfare reform has affected the health insurance coverage of low-income immigrant, families. Changes in insurance coverage are likely to affect use of medical care and possibly health. In addition, there are plausible reasons to believe that welfare reform may have affected use of medical care and health through avenues other than insurance coverage, for example because of changes in income and what we refer to as organizational and emotional stress.

Research design and data

Our objective is to obtain estimates of the effect of welfare reform on health insurance, medical care utilization and health of low-educated, single immigrant mothers and their children. The statistical analysis is based on multivariate regression models that relate changes in federal welfare policy to health insurance, medical care utilization and health. We rely on a pre- and post-test with a comparison group research design.

The starting point of our research design is a regression model that links changes in health outcomes (or health insurance, medical care utilization) to changes in welfare caseload. Accordingly, we begin by estimating the following model:

$$\begin{aligned} H_{ijt} &= \alpha + \beta_j + (\beta_J * \delta_t) + \gamma\ \text{Caseload}_{jt} \\ &\quad + Z_{jt}\Phi + X_{ijt}\Gamma + u_{ijt} \\ i &= 1, \ldots, N\ \text{(persons)} \\ j &= 1, \ldots, 51\ \text{(states)} \\ t &= 1992, \ldots, 2002\ \text{(years)} \end{aligned} \tag{1}$$

In equation (1), the health of person i in state j and year t is a function of the welfare caseload in state j in year t; time-varying state characteristics (Z_{jt}) such as the Medicaid income eligibility thresholds, unemployment rate, per-capita income; individual characteristics (X_{ijt}) such as age, race, education, number of years lived in the US; state fixed effects (β_j); and state-specific time trends ($\beta_j * \delta_t$).

Use of the welfare caseload as opposed to welfare policy is somewhat non-standard, but it is arguably better than the conventional approach that uses dummy variable indicators to describe the timing and efficacy of reform. The advantage of using the welfare caseload as a measure of the impact of welfare reform is that the caseload provides a comprehensive measure that is likely to more accurately reflect the timing and extent of reform in a state. As has been extensively documented state programs differed in significant ways with regard to programmatic details and administrative implementation, and that these changes were important explanations of differential effects of reform on the caseload [41]. Attempting to characterize such a diverse reform with a limited number of dummy variables is likely to lead to significant measurement error that is avoided by use of the caseload. We recognize that changes in the caseload reflect factors other than policy, and we include these in the regression model. Therefore, the coefficient on the caseload in equation (1) is a measure of the effect of policy.[6] However, to link our study to earlier studies, we also estimate a version of equation (1) that replaces the caseload variable with a set of dummy variables indicating whether a state implemented an AFDC waiver and TANF.[7] The waiver variable is set to zero when TANF is one.

To a large extent, equation (1) addresses the fundamental identification problem associated with this analysis, which is to isolate the effect of changes in the welfare caseload (policy) from other determinants of women's, or children's, health (or health insurance, medical care use) that vary over time, across states and over time within states. Nevertheless, estimates of equation (1) may be biased by time-varying, state-level variables that are omitted from the equation and that affect health of persons in low-income families and are correlated with the welfare caseload or government policy.

To address this problem, we rely on a comparison group approach. To implement this approach, we estimate equations (1) for two groups: those most likely to participate in the cash assistance program prior to welfare reform and therefore likely to be affected by welfare reform, and those less likely to participate in the cash assistance program and therefore less likely to be affected by welfare reform. We refer to the former as the target group and the latter as the comparison group. The counterpart of equation (1) for the

[6] Basically, the specification of equation (1) is derived from a model in which the caseload is determined in a linear way by policy changes, macroeconomic factors, state-specific effects, and state-specific time trends [6]. Since most determinants of the caseload, except the policy indicators, are included in equation (1), the coefficient on the caseload variable measures the effect of policy changes.

[7] Given the evidence and concerns about the "chilling effect" of PRWORA, we believe a dummy variable indicating TANF implementation is more likely to capture the effect of welfare reform and its "chilling effect," than the specific aspects of the law.

comparison group is the following:

$$H_{ijt} = \tilde{\alpha} + \tilde{\beta}_j + (\tilde{\beta}_j * \tilde{\delta}_t) + \tilde{\gamma}\ \text{Caseload}_{jt} + Z_{jt}\tilde{\Phi} + X_{ijt}\tilde{\Gamma} + e_{ijt} \quad (2)$$

In equation (2), the coefficient on the welfare caseload variable, $\tilde{\gamma}$, should be zero since this group is not at risk of welfare receipt and changes in the welfare caseload should not affect their health (insurance and medical care) outcomes. A non-zero estimate of this parameter indicates that there are omitted variables that affect health and are correlated with the welfare caseload. Therefore, we can subtract this effect from the corresponding estimate (γ) in equation (1) to obtain an estimate of the effect of the caseload on health (and other outcomes) that controls for these omitted variables.

This approach is commonly referred to as a difference-in-differences (DD) methodology and estimates can be obtained directly by combining equations (1) and (2):

$$H_{ijt} = \alpha' + \beta'_j + (\beta' * \delta')_t + \breve{\gamma}_0\ \text{Treat}_i + \breve{\gamma}_1\ \text{Caseload}_{jt} + \breve{\gamma}_2(\text{Caseload}_{jt} \times \text{Treat}_i) + Z_{jt}\Phi' + X_{ijt}\Gamma' + u_{ijt} \quad (3)$$

The only new variable in equation (3) is "Treat," which is a dichotomous variable equal to one if the person is in the target group and equal to zero if the person is in the comparison group. The DD estimate of the effect of the welfare caseload is $\breve{\gamma}_2$. Equation (3) is estimated on the combined sample of persons in the target and comparison groups, and it imposes several restrictions on equations (1) and (2). For example it assumes that state and time effects are the same for the target and comparison groups, and that the effects of time-varying state variables (Z) are the same for the two groups. These restrictions can be relaxed, and we do so in accordance with formal statistical tests. However, not rejecting some of the restrictions is an implicit test of the underlying identification assumption of the DD approach, which is that unmeasured state-year influences on health (health insurance, medical care utilization) would affect the target and comparison groups equally. This assumption gains credibility if measured state-year influences have the same effect on the target and comparison groups. In fact, statistical tests fail to reject the hypothesis that state-year influences, namely unemployment rate, per capita income and Medicaid eligibility thresholds, have the same effect on the outcomes for the target and comparison groups of women and children.

Data

We use the National Health Interview Surveys (NHIS) for 1992–1996 and 1998–2002 to conduct the analysis. We exclude 1997 because NHIS did not provide nativity for all respondents in this year.[8] Since most states implemented PRWORA in 1997, exclusion of 1997 is also prudent to avoid endogeneity of the state decision to implement welfare reform—i.e., we do not exploit differences in state timing of implementation of welfare reform to obtain estimates. The disadvantage of this constraint is that we are unable to control for separate year effects when we use dummy variables to measure changes in welfare policy. But as we report below, statistical tests suggest that state-specific trends are a more appropriate characterization of the effects of time than individual year dummy variables.[9]

The NHIS is a nationally representative survey designed to measure health habits, access to and utilization of medical care, and health status of the US population. During a year, the survey is conducted on a sample of 36,000 to 47,000 households, including 92,000 to 125,000 persons. The survey has over-samples of minority populations that enable us to obtain reasonably large size samples of the foreign-born population. The NHIS has a rich set of demographic variables that are used to create the target and comparison groups and to use as control variables in multivariate regressions. Samples are restricted to women aged 18–54 with 15 or fewer years of schooling, and their children. Children's samples are further restricted to those aged 0–14 years. Variables on family relationships are used to link mothers to their children. Unfortunately, the NHIS do not provide data on whether a foreign-born person is citizen for all the years used in this analysis. There is also no information on the legal status of immigrants, which may affect their health insurance and health [42, 43]. Therefore, it is not possible to control for a respondent's immigrant or citizenship status. This limitation is partly overcome by controlling for the number of years lived in the U.S. since citizenship is highly correlated with duration of residence in the US. The NHIS does not provide a foreign-born person's country of birth, but it provides detailed information on her ethnicity, which is used to define the following ethnic groups: non-Hispanic black, non-Hispanic white, Hispanic, Asian and others.

Clearly, the choice of target and comparison groups is crucial to the success of the difference-in-differences research design. Identifying a target group is relatively straightforward. Welfare reform was intended to decrease the welfare caseload, which consists primarily of low-educated, single

[8] In the NHIS public use data for 1997 the nativity variable is only provided in the Sample Adult file, which is a small set of the adult sample. The variable on nativity is missing in the Person and Sample Child files.

[9] When we use the welfare caseload to measure reform, we can include separate year effects. And it is in this case that we test the restrictions imposed by using year dummy variables, which are rejected in favor of models using state-specific trends to account for unmeasured time trends.

mothers. Accordingly, we define our target group to be single mothers with 15 or fewer years of education, and their children.[10] Our target group has a high risk of being on welfare; in 1994, for instance, nearly 40 percent of this group received welfare and 50 percent received Medicaid. The comparison group is more difficult to select. Ideally, we would like to find a group that is similar to the target group in terms of the determinants of health insurance (health care utilization, health), but unaffected by welfare reform. There is no perfect group. We choose two groups that may plausibly meet the criteria for valid comparison groups: low-educated (education $\leq$ 15 years), single women without children; and low-educated, married mothers. In the children's analysis, our comparison group is children of low-educated married mothers. We conduct tests, described in detail below, to check the validity of these comparison groups.

In 1997, the NHIS questionnaire was redesigned. As a result, several measures of health, health related conditions and medical care utilization were changed. We have identified variables that can be consistently constructed for the entire period and we take special care to study only those outcomes that are defined in the same manner in the pre-and post-welfare reform period. Prior to 1997, the basic NHIS data files were created and maintained by record type. We use the person, condition and hospital record files to obtain a rich set of outcomes relating to health and medical care utilization. Specifically, we study the following outcomes, for adults: whether an individual reported poor/fair health, bed days loss due to illness, whether a respondent saw a health professional in the past two weeks (12 months); whether a respondent saw a health professional more than 10 times in the past 12 months; and whether a respondent stayed overnight in a hospital in the past 12 months; for children: parents' reports of child's health status, number of school loss days due to illness for school going children, whether a respondent saw a health professional in the past two weeks (12 months); whether a respondent saw a health professional more than 10 times in the past 12 months; and whether a respondent stayed overnight in a hospital in the past 12 months. We use appropriate methods to obtain estimates of interest and these methods differ depending on the nature of the dependent variable. For dichotomous variables we use ordinary least squares and for variables that represent counts, for example bed days, we use Poisson regression. In each case we calculate robust standard errors (Huber-White sandwich estimates) and allow for non-independence of observations within state and year. The robust standard errors address the heteroscedasticity that arises when estimating dichotomous models using OLS and the over dispersion problem pertinent to Poisson regression.

NHIS provided supplement surveys on "access to care" in 1993–1994, and "insurance" in 1992–1994. We use these surveys to create variables on reported delays or absence of medical care due to cost and health insurance status. Thus, the period of investigation for insurance, school loss days due to sickness and bed days is 1992–1994 and 1998–2002, and for delays and lack of medical care, the sample comprises 1993–1994 and 1998–2002. For all other outcomes, as specified above, the period of investigation is 1992–1996 and 1998–2002.

Since 1997, in the redesigned format, Person data file has all of the basic indicators of health status, health insurance, and utilization of health care that we use in our analysis, except for the data on number of school loss days due to illness for school going children and number of bed days for adults. For these variables we use the Sample Adult and Sample Child files of the survey that are based on interviews of a randomly selected adult and child from each household.

State of residence indicators are used to merge the following information with the NHIS dataset: whether a state implemented TANF in year *t*; whether a state had an AFDC waiver in year *t*; Medicaid income eligibility threshold for pregnant women in year *t*, age specific Medicaid eligibility thresholds for children in year *t*; and unemployment rate and real per-capita income in year *t*. The welfare caseload data are merged to the NHIS data by state, year and quarter of interview. For outcomes relating to past 12 months, average monthly caseload of the current and the past three quarters is merged with the NHIS data. For all other outcomes, average monthly caseload of the current and previous quarter is merged with the NHIS data. Monthly caseload in each state in year *t* is computed from the monthly caseload data from the Administration for Children and Families (*http://www.acf.hhs.gov/programs/ofa/tanfindex.htm*). Medicaid eligibility data is taken from Yelowitz [45] who has compiled detailed data on Medicaid and SCHIP income eligibility thresholds by state, year and age of person. We use the higher of the Medicaid or SCHIP income eligibility thresholds. Medicaid eligibility variables, based on federal poverty line, for adults are: 0 to 150 percent, 150 to 185 percent and above 185 percent of the federal poverty line; and for children: 1–100 percent, 101–133 percent, 134–199 percent and above 199 percent of the federal poverty line. The data on welfare policies are drawn from Assistant Secretary for Planning and Evaluation of the Department of Health and Human Services, the Urban Institute (www.urban.org/content/Research/NewFederalism/Data/StateDatabase/StateDatabase.htm) and the State Documentation Project of the Center on Budget and Policy Priorities (www.cbpp.org). For outcomes that refer to the previous 12 month period, policy variables and time-varying controls

[10] It is possible that welfare reform affected fertility and marriage, so selecting the sample on these characteristics may result in changes in sample composition. Based on existing evidence, however, we believe the bias due to sample selection will be insignificant [44].

Table 1 Health Insurance Coverage, Health and Medical Care Utilization of Foreign-Born Low-educated Women and Children in the pre-PRWORA period

	Foreign-born women						Children of foreign-born women			
	Single, with kids		Married, with kids		Single, no kids		Living with single mothers		Living with married mothers	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Health Insurance										
Public health insurance	3994	0.19	12347	0.07	6407	0.06	6244	0.64	22082	0.25
Uninsured	3994	0.29	12347	0.33	6407	0.45	6244	0.19	22082	0.29
Medical Care Utilization										
Delay in care due to cost, past 12 months	3678	0.13	11172	0.12	5789	0.13	5715	0.05	20079	0.04
Received no care due to cost, past 12 months	3676	0.05	11162	0.04	5789	0.04	5715	0.02	20079	0.02
Saw health professional, past 2 weeks	5009	0.17	16085	0.12	8362	0.10	8021	0.11	28967	0.09
Saw health professional, past 12 months	3805	0.79	10278	0.73	8362	0.64	5326	0.83	19214	0.76
Saw health professional $>$ 10 times, past 12 months	3821	0.12	10249	0.10	5354	0.08	5345	0.05	19264	0.04
Stayed overnight in hospital, past 12 months	5012	0.14	16086	0.15	8362	0.06	8027	0.03	28967	0.02
Health										
Poor/fair health	5017	0.18	16095	0.12	8362	0.11	7982	0.07	28784	0.04
Bed days, past 12 months	3780	7.1	10219	4.4	5789	4.1		–	–	–
School loss days, past 12 months	–		–				2629	3.2	8775	2.2

Note: Number of observations, N, pertain to the entire period of analysis. Adult samples are restricted to women aged 18 to 54 years with 15 or fewer years of schooling; children's analysis consists of kids (aged 0–14 years) of mothers aged 18–54 years with 15 or fewer years of schooling. In the analysis on school days loss, the samples are restricted to children aged 5–14. The period of investigation for insurance, school loss days due to sickness and bed days is 1992–1994 and 1998–2002 and for delays and lack of medical care, the period of investigation is 1993–1994 and 1998–2002. For all other outcomes, the period of investigation is 1992–1996 and 1998–2002.

namely unemployment, Medicaid eligibility thresholds and per capita income are lagged by a year.

Results

Descriptive analysis

Table 1 presents mean levels of various health related outcomes for the treatment and comparison groups in the pre-welfare reform (pre-PRWORA) period, and provides useful insights into the health insurance status, medical care utilizations and health of persons in our samples. Low-educated single mothers had relatively similar outcomes as compared to low-educated married mothers than low-educated single women with no children, suggesting that parenthood is a better indicator of health related outcomes than marital status. This also suggests that married mothers may be a better comparison than single women with no children, a point we return to shortly.

In the pre-PRWORA period, low-educated single, immigrant mothers and their children were more likely to receive public health insurance and less likely to be without any insurance than those in the comparison groups. For instance, during 1992–1994, 19 percent of the low-educated single, immigrant mothers received public health insurance and 29 percent had no insurance. In contrast, only seven percent of married mothers and six percent of single women with no children had public insurance and 33 percent of married mothers and 45 percent of single women without kids had no insurance. Similarly, 64 percent of the children of single immigrant mothers had public insurance and 19 percent lacked insurance, while 25 percent of the children of married immigrant mothers had public insurance and 29 percent had no insurance (data from the Current Population Survey show similar figures, see Kaushal and Kaestner [4]).

Most indicators of self-reported health, however, suggest relatively poorer outcomes for the target group of mothers and children. Single, low-educated immigrant mothers were six to seven percentage points more likely to report poor/fair health as compared to married mothers or single women without kids with similar education or nativity. Single low-educated mothers reported three more (68 to 73 percent) bed days due to illness as compared to the comparison groups of women. Similarly, children of single mothers were three percentage points (75 percent) more likely to report poor or fair health and one more school loss day (50 percent) due to sickness as compared to children in two parent families.

In the pre-PRWORA period, the proportion of low-educated single mothers and their children who reported delays in medical care or lack of medical care due to cost was almost the same as that reported by the comparison groups. Around 13 percent of women and four to five percent of children reported delays in receiving medical care and four to five percent of women and two percent of

children reported not to have received medical care when needed due to cost.

In accord with their relatively poorer self-reported health status and greater health insurance coverage, low-educated single mothers and their children were more likely to have seen a health professional in the past two weeks (as well as 12 months) as compared to the comparison groups. Low-educated single mothers were five to seven percentage points (41 to 70 percent) more likely to have seen a health professional in the past two weeks, and six to 15 percentage points (eight to 19 percent) more likely to have seen a health professional in the past 12 months as compared to women in the two comparison groups. Children of single mothers were two percentage points (22 percent) more likely to have seen a health professional in the past two weeks and seven percentage points (nine percent) more likely to have seen a health professional in the past 12 months as compared to children in two parent families.

Single immigrant mothers were more likely to have spent a night in hospital as compared to single immigrant women without kids, but slightly less likely as compared to married immigrant mothers. Children living in single mother families were more likely to have experienced hospitalization in the past 12 months as compared to children living in two parent families.

To sum up, in the pre-PRWORA period, single mothers and their children reported higher rates of health insurance coverage, poorer health and greater use of medical care as compared to women and children in the comparison groups. What was the effect of welfare reform on their health and medical care utilization? Did welfare reform widen or reduce these disparities? We explore these issues, next, using multivariate regressions methods.

Multivariate analysis—women

Before discussing the regression results, we test the validity of the comparison groups we have selected. Specifically, we use the NHIS data for the pre-PRWORA period and compute the difference-in-difference estimates of the association between welfare caseload and health (health insurance, and medical care use) for the target groups. We use models similar to those in equation (3). Besides controls for demographic factors, the regressions include controls for Medicaid eligibility thresholds, state unemployment rate, per capita income and whether a state had a waiver in year t and state fixed effects. If the assumption of our difference-in-difference methodology is correct, the estimated difference-in-difference coefficients in the pre-PRWORA period should be close to zero. Results of this analysis are presented in Appendix 1.

For most outcomes, the difference-in-difference estimates, with married low-educated immigrant mothers as the comparison, are small (relative to the mean). All estimates are statistically insignificant. Estimates obtained when using single women with no children as the comparison are sometimes large (relative to the mean) and sometimes statistically significant. This suggests that married mothers are a better comparison group than single women, with no children. Accordingly, we only present results using the former comparison group. In the children's analysis, the estimated difference-in-difference coefficients are small and statistically insignificant for all outcomes.

Overall, these results suggest that the comparison group approach we have selected is reasonable. And note that we provided additional evidence earlier that the comparison group approach is valid. Specifically, we failed to reject the equality (between target and comparison group) of effects of time-varying state variables (e.g., unemployment, per capita income and Medicaid eligibility thresholds). Nevertheless, to provide as much information as possible, we present both the first-difference (pre- and post-welfare reform change) and difference-in-difference estimates. We recognize the difficulty of identifying "ideal" comparison groups. At the very least, the comparison group approach we employ identifies whether any observed effects of welfare reform on health status are group-specific, and whether the effects are primarily found for the group of interest—the target group. If the identifying assumption of the difference-in-differences procedure is valid (i.e. time-varying factors correlated with welfare caseload affected the target and comparison groups in the same manner), then our estimates may be given a "causal" interpretation.

Table 2 presents estimates of the effect of the welfare caseload and an indicator of TANF. Separate (first difference) estimates are shown for single and married mothers (equation 1) and as well as the difference-in-differences estimates (equation 3). Each row shows estimates for a different dependent variable. Each regression controls for race, age, education, years lived in the US, state of residence, state per capita income, unemployment rate, Medicaid eligibility thresholds and state-specific quadratic trends. All regressions are based on ordinary least squares except those that measure outcomes in number of counts, for which the mode of estimation is Poisson regression. More specifically, for two outcomes, namely, days in bed due to sickness for adults, and number of school loss days due to sickness for school going children, we use Poisson models (with robust standard errors to correct for over-dispersion). For all other outcomes, we employ ordinary least squares models. In models with TANF as the policy variable, we also include controls for whether a state had an AFDC waiver in period *t*. Robust standard errors (Huber-White sandwich estimates) that allow for non-independence of

Table 2 Estimates of the Association between Welfare Caseload and TANF and Health Insurance, Health and Medical Care Utilization of Low-educated Foreign-born Women

	Log (caseload)			TANF		
	Single mothers	Married mothers	DinD	Single mothers	Married mothers	DinD
Uninsured	−0.158*	−0.089**	−0.074	0.14	0.02	0.115***
	(0.081)	(0.039)	(0.055)	(0.09)	(0.04)	(0.049)
Delay in care due to cost, past 12 months	−0.041	0.041	−0.090**	0.028	0.002	0.018
	(0.067)	(0.034)	(0.041)	(0.029)	(0.021)	(0.014)
Received no care due to cost, past 12 months	−0.115	0.037	−0.060**	0.039	0.006	0.011
	(0.066)	(0.029)	(0.030)	(0.027)	(0.013)	(0.010)
Saw health professional, past 2 weeks	−0.040	0.022	−0.024	0.007	−0.016	0.004
	(0.050)	(0.022)	(0.032)	(0.026)	(0.017)	(0.022)
Saw health professional, past 12 months	−0.008	−0.101***	0.082**	0.035	0.059**	−0.053
	(0.056)	(0.037)	(0.032)	(0.048)	(0.026)	(0.036)
Saw health professional > 10 times, past 12 months	−0.067	0.054**	−0.030	0.018	−0.011	0.024
	(0.062)	(0.024)	(0.036)	(0.031)	(0.014)	(0.024)
Stayed overnight in hospital, past 12 months	0.024	0.024	0.041	−0.03	−0.02	0.009
	(0.042)	(0.027)	(0.032)	(0.03)	(0.01)	(0.020)
Poor/fair health	0.108**	0.018	0.060	−0.102***	−0.047***	−0.041
	(0.053)	(0.027)	(0.038)	(0.039)	(0.017)	(0.042)
Bed days, past 12 months[1]	0.534	0.720	−0.186	−0.975***	−0.287	−0.688
	(0.696)	(0.479)	(0.845)	(0.373)	(0.279)	(0.466)

Note: Each figure is from a separate regression, with heteroscedasticity adjusted standard errors clustered at year-state in parenthesis. Each regression controls for race, age, education and number of years lived in the US, state of residence, unemployment rate, Medicaid eligibility thresholds, per capita income and state-specific quadratic trends. Estimates with superscript[1] are based on Poisson models; all others apply the ordinary least squares method.

*$0.05 < P = < 0.1$.

**$0.01 < P = < 0.05$.

***$P = < 0.01$.

observations within state and year are shown in parentheses.[11]

We begin the discussion with estimates related to the proportion uninsured. Estimates in Table 2 indicate that the welfare caseload is negatively related to the proportion of single and married mothers who are uninsured with the estimate being larger for single mothers. The difference-in-differences (DinD) estimate is -0.074 and it is not statistically significant. To put this estimate in perspective, we computed the change in welfare caseload of low-educated, foreign-born single mothers, using the March Current Population Survey (CPS) between 1996 and 2002. We found that during 1996–2002, the welfare caseload of this group declined by 67 percent or 1.08 log points. So the DinD estimate indicates a decline in the caseload of this magnitude was associated with an eight percentage points ($-0.074 * 1.08$), or a 28 percent, increase in proportion uninsured among single mothers. Similar results are found when we use an indicator of TANF instead of the caseload. TANF implementation is associated with an increase in the proportion of single and married mothers who are uninsured. Again the effect is larger for single mothers, substantially larger in this case, and the DinD estimate indicates that TANF is associated with a statistically significant 11.5 percentage point (40%) increase in the proportion of uninsured single mothers. The increase in the proportion of single mothers without insurance found here using the NHIS is very similar to the increase found in a similar analysis that used the Current Population Survey (CPS) [4].

The increases in the proportion uninsured that were associated with the decrease in the welfare caseload and implementation of TANF are likely to decrease utilization of health care. Consistent with this expectation, estimates indicate that decline in the caseload and implementation of TANF are associated with increases in the probability of delaying receipt of care and of not obtaining care due to costs among single mothers, and either a decrease or virtually no change in the probability of delaying receipt of care and of not obtaining care due to costs among married mothers. DinD estimates of the association between the caseload and these outcomes are quite large and statistically significant; a 1.08 log point

[11] We repeat the analysis by restricting the sample to the top 14 states where 87 percent of the immigrants in NHIS lived during the period of analysis. The results were similar to those obtained using the national sample.

decrease is associated with 9.7 percentage point (74%) increase in the probability of delaying care due to cost and a 6.5 percentage point (130%) increase in the probability of not obtaining care due to cost. DinD estimates of the association between TANF and these outcomes are about one-fifth as large as the caseload estimates and not statistically significant. For other measures of health care utilization, however, estimates of the associations between outcomes and the decline in the welfare caseload and TANF implementation do not indicate a decrease in utilization among single mothers. In fact, most estimates indicate an increase. Similarly, welfare reform is associated with increases in utilization among married mothers. DinD estimates indicate that the decline in the caseload between 1996 and 2002 and the implementation of TANF are associated with a 5.3 (using TANF) to 9.2 percentage points (using caseload, computed as $1.08 * 0.082$) decrease in the probability of seeing a health professional in the last 12 months. But as noted, this is due to a relatively larger increase in utilization among married mothers, and this estimate is not consistent with the loss of insurance observed for single and married mothers. All other estimates of the association between welfare caseload (and TANF) and medical case use are modest and statistically insignificant.

We now examine the associations between the welfare caseload, TANF, and measures of health. The decline in the caseload and implementation of TANF are associated with a decrease in the proportion of single and married mothers who report that they are in fair or poor health with the decrease being larger for single mothers. DinD estimates indicate that the decline in the caseload between 1996 and 2002 is associated with a six percentage point (33%) decrease in the probability of reporting poor or fair health, and that TANF is associated with a 4.1 percentage point (23%) decrease in the same probability. However, both estimates are statistically insignificant. Welfare caseload is also associated with a decrease in the number of bed days in the past 12 months for both single and married mothers with the decline being larger for married mothers. DinD estimates indicate that the decline in the caseload between 1996 and 2002 is associated with a 20 percent increase in bed days, and TANF is associated with a 69 percent decrease in bed days. Surprisingly, the large estimate associated with TANF is not statistically significant.[12] To assess whether the bed days result was due to greater employment, we re-estimated the model including an indicator of whether the woman was currently employed. Estimates (not reported) from this specification revealed that greater employment (or inclusion of the employment variable) could explain only 23 percent of the decrease in bed-days when TANF is the explanatory variable. Adjusting for current employment status, in models with welfare caseload, lowered the coefficient on bed days for married mothers by 27 percent and the coefficient on bed days for single mothers by one percent.

To sum up, our analysis confirms the findings of previous research that welfare reform was associated with an increase in the proportion of uninsured among single, low-educated, immigrant mothers. Consistent with this, we also find that welfare reform was associated with an increase in the proportion of single mothers reporting delays or failure to obtain care due to cost. However, we do not find a worsening of health. In fact, welfare reform was associated with single, low-educated immigrant mothers reporting better health, as measured by self-reports of health status.

Multivariate analysis: children

Table 3 presents estimates of the association between welfare caseload and TANF, and health insurance, health outcomes and medical care utilization of children. The format of the table is the same as that used for Table 2. Each figure in this table is an estimate from a different regression that controls for race, age, child's gender, whether the child was born abroad, mother's education, the number of years mother lived in the US, state of residence, state per capita income, Medicaid eligibility thresholds, unemployment rate and state-specific quadratic trends. Columns list estimates for children of single mothers, married mothers and difference-in-differences estimates.

Estimates in Table 3 indicate that the welfare caseload is negatively related to the proportion of children of single and married mothers who are uninsured with the estimate being larger for children of married mothers. The DinD estimate is 0.069, indicating that decreases in the caseload lowered the proportion of children uninsured by 7.5 percentage points (39%), but it is not statistically significant. TANF implementation is also associated with an increase in the proportion of children uninsured, but in this case the estimate is larger among children of single mothers. The DinD estimates are statistically insignificant and indicate that TANF is associated with a 2.9 percentage point increase in uninsured children. Overall, there is not strong evidence that welfare reform adversely affected the health insurance of children of single, immigrant mothers, although estimates do indicate an increase in uninsured among this group that is larger than that for the comparison group. This result is somewhat inconsistent with the findings of Kaushal and Kaestner [4] who used CPS data and conducted a similar analysis. They found that welfare reform significantly increased the proportion of children of foreign-born mothers without insurance. One potential explanation of this difference is due

[12] The difference-in-difference estimate for bed days is the difference between the estimate for single mothers and married mothers. We did not estimate a pooled regression because of the non-linear form of the Poisson regression model. The standard error of the difference-in-difference estimate assumes that the covariance of the two estimates is zero.

Table 3 Estimates of the Association between Welfare Caseload and TANF, and Health Insurance, Health and Medical Care Utilization of Children of Low-educated, Foreign-born Mothers

Mother's marital status	Log(caseload)			TANF		
	Single	Married	DinD	Single	Married	DinD
Uninsured	−0.070	−0.138**	0.069	0.139	0.074	0.029
	(0.103)	(0.064)	(0.083)	(0.091)	(0.058)	(0.108)
Delay in care due to cost, past 12 months	0.028	0.021	0.019	0.005	−0.008	0.032
	(0.047)	(0.026)	(0.046)	(0.020)	(0.014)	(0.024)
Received no care due to cost, past 12 months	0.071	−0.007	0.095**	−0.006	0.006	0.007
	(0.049)	(0.026)	(0.040)	(0.020)	(0.010)	(0.016)
Saw health professional, past 2 weeks	−0.043	0.031	−0.046	0.055**	0.005	0.049
	(0.040)	(0.020)	(0.034)	(0.025)	(0.014)	(0.030)
Saw health professional, past 12 months	−0.047	−0.022	−0.024	0.036	0.026	0.010
	(0.052)	(0.034)	(0.031)	(0.023)	(0.027)	(0.034)
Saw health professional > 10 times, past 12 months	−0.057	−0.006	−0.045	0.011	0.013	0.000
	(0.039)	(0.018)	(0.031)	(0.019)	(0.012)	(0.019)
Stayed overnight in hospital, past 12 months	−0.036	−0.038**	−0.001	0.021	0.014	−0.009
	(0.025)	(0.016)	(0.022)	(0.018)	(0.017)	(0.012)
Poor/fair health	−0.009	0.012	−0.038	−0.044**	−0.015	−0.033
	(0.034)	(0.012)	(0.027)	(0.020)	(0.009)	(0.024)
School loss days due to sickness[1]	−1.553**	0.435	−1.988**	−0.168	−0.645***	0.477
	(0.778)	(0.384)	(0.868)	(0.300)	(0.264)	(0.400)

Note: Each figure is from a separate regression, with heteroscedasticity adjusted standard errors clustered at year-state in parenthesis. Each regression controls for race, age, child's gender and nativity, mother's education and number of years she has lived in the US, state of residence, unemployment rate, per capita income, Medicaid eligibility thresholds and state-specific quadratic trends. Estimates with superscript[1] are based on Poisson models; all others use the ordinary least squares method.

*$0.05 < P = < 0.1$.

**$0.01 < P = < 0.05$.

***$P = < 0.01$.

to differences in sample composition. NHIS over-samples the Hispanic population and therefore is likely to contain a larger proportion of undocumented persons, whereas the undocumented population is under-reported in the CPS [46]. As Kaushal and Kaestner [4] show, welfare reform had differential effects on children of foreign-born mothers depending on mother's citizenship status, and nativity of child.

Figures in Table 3 show that welfare caseload was associated with a decline in proportion of children of single mothers reporting delays in receipt of care, but the association between TANF implementation and reports of delays is positive, indicating increases in delays in receipt of care. All estimates are statistically insignificant. Welfare caseload is associated with a decline in the proportion of children of single mothers reporting to have received no health care due to cost. In this case, the DinD estimate is statistically significant and implies that the decline in welfare caseload during 1996 and 2002 was associated with a 10 percentage points decline in the proportion that received no care when needed due to cost. Similar estimates with TANF, however, suggest a slight increase in the proportion who received no care due to cost, but the estimates are not statistically significant.

Inconsistency also characterizes the estimates of the association between welfare reform and other measures of health care utilization of children of foreign-born mothers. Part of the inconsistency is due to a lack of statistical power, as standard errors are quite large. This makes it difficult to assess the effect of welfare reform on most measures of utilization. For example, estimates of the association between the welfare caseload and TANF, and whether a child of a single mother saw a health professional in past two weeks are large; TANF is associated with a 5.5 percentage point, or 50 percent, increase in the probability of seeing a health professional, and the decrease in the caseload between 1996 and 2002 is associated with a 4.6 percentage point, or 42 percent, increase in this probability. Only the TANF estimate is statistically significant. DinD estimates suggest that decreases in the caseload and TANF implementation were associated with an increase in the probability of seeing a health care professional in the past two weeks. These estimates are not statistically significant. In general, estimates of the associations between the welfare caseload and TANF, and measures of utilization are imprecise and more importantly, they do not reveal a consistent pattern that would suggest that welfare reform had a significant effect on the health care utilization of children of foreign-born, single mothers.

Table 3 shows that welfare caseload had no statistically significant relationship with the proportion of children reported to be in poor/fair health; all the estimates were relatively small and statistically insignificant. Models with TANF suggest that the policy change led to a statistically significant 4.4 percentage point decrease in the proportion of children of single immigrant mothers reporting poor/fair heath, and a 1.5 percentage point decrease in the proportion of children of married immigrant mothers reporting poor/fair heath. The DinD estimate is −0.033, which represents a statistically insignificant 47 percent decrease in the proportion of children of single immigrant mothers reporting poor/fair heath. DinD estimates also suggest that welfare caseload had no statistically significant association with the proportion of children in the target group reporting poor/fair health.

The association between school loss days due to sickness and welfare caseload among children aged 5–14, estimated using Poisson models, is found to be negative for the children of single mothers and positive for children of married mothers.[13] Estimates are quite large, between 43 and −155 percent, and statistically significant in the case of the children of single mothers. Models using TANF suggest that the policy is associated with a 17 percent (half a day) decrease in school days lost due to sickness for children of single mothers, and a 65 percent (approximately one and a half day) decrease in school days lost due to sickness for children of married mothers. DinD estimates indicate that decreases in the caseload and implementation of TANF are associated with very large increases in school days lost to sickness. A 1.08 log point decrease in the caseload is associated with a 215 percent increase in school days lost and TANF is associated with a 48 percent increase in school days lost. Only welfare caseload estimate is statistically significant.

To sum up, we do not find any statistically significant association between welfare policy (caseload) and health insurance or medical care utilization by children of single mothers, although estimates do indicate an increase in the proportion of uninsured children. These findings are somewhat inconsistent with earlier studies that found a significant increase in the proportion of children of foreign-born, single mothers who are uninsured [4]. We find some evidence of a decline in the proportion of children of single mothers reporting having received no care due to cost. At the same time, we also find an increase the number of school loss days due to sickness among the school going children of single mothers. The analysis of children's outcomes was hampered by a lack of statistical power.

[13] We note that the sample of school going children of single mothers is small consisting of only 2629 observations, which results in imprecise estimates.

Conclusion

In this paper, we investigated the association between the 1996 welfare reform and health insurance, medical care use and health of low-educated, foreign-born, single mothers and their children. Using the National Health Interview Surveys for 1992–2002, we find that welfare reform was associated with an eight to 11.5 percentage points (28 to 40 percent) increase in proportion uninsured among low-educated, foreign-born single mothers. This result is similar to the findings of the previous research that used the March CPS data [4]. Our research suggests that the decline in welfare caseload since 1996 was associated with a 6.5 to 10 percentage points (77 to 130 percent) increase in the proportion of low-educated, foreign-born single mothers reporting delays in receipt or no receipt of care due to cost and a nine percentage points (11 percent) decline in visits to a health professional in the past 12 months. However, we do not find a worsening of health. In fact, welfare reform was associated with single, low-educated immigrant mothers reporting better health, as measured by self-reports of health status.

In the children's analysis, we do not find any consistent evidence that welfare reform affected the health insurance, medical care utilization and health of children living with single mothers. Welfare reform was associated with a relatively large increase (15 to 40 %) in the proportion uninsured, but estimates of this association were not statistically significant. This is somewhat inconsistent with previous research that found an increase in the proportion of uninsured children in families headed by low-educated, foreign-born single mothers [4]. The difference in our finding may be due to differences in sample composition.

Our findings in the women's analysis, however, provide evidence of the unintended adverse effects of welfare reform on the health insurance and medical care utilization of low-income immigrant families. In the long run, these adverse effects of the 1996 policy may hurt the economic progress of low-income immigrant families, thus undermining the policy's intended objectives, i.e. increasing the economic independence of immigrants and eliminating their dependence on the state. Poor health would hinder success in the labor market and impede progress toward economic independence. The fiscal benefits of the immigrant provisions of PRWORA would be potentially undermined by the risk of increased health care costs resulting from more low-income immigrant families making use of emergency care that cannot be denied, but that is more expensive than routine preventive care.

Our findings illustrate a potentially serious flaw in social policy in the US. Linking health insurance coverage of low-income families to their participation in a cash welfare program, either directly or indirectly because of administrative barriers, may result in unintended consequences when changes in either program are made. In the long run, these chan-

Appendix 1 Test of Difference-in-difference Methodology: DinD Estimates of the Association between Log Caseload and Health Insurance, Health and Medical Care Utilization of Low-educated Foreign-born Single Mothers and their Children in the pre-PRWORA period

Target group/	Low-educated single mothers		Children of low-educated single mothers
Comparison group/	Low-educated married mothers	Low-educate women, no children	Children of low-educated married mothers
Uninsured[1]	0.02	−0.03	−0.01
	(0.02)	(0.02)	(0.02)
Saw a health professional in past 2 weeks	−0.01	−0.02	0.00
	(0.01)	(0.01)	(0.01)
Saw a health professional in past 12 months	0.01	0.04**	0.02
	(0.01)	(0.02)	(0.01)
Saw a health professional > 10 times in past 12 months	0.00	0.00	−0.00
	(0.01)	(0.01)	(0.01)
Stayed overnight in hospital in the past 12 months	0.02	0.01	0.00
	(0.01)	(0.01)	(0.00)
Poor/fair health	0.00	0.00	−0.01
	(0.01)	(0.01)	(0.01)
Bed days in the past 12 months[1]	0.04	0.17	–
	(0.11)	(0.12)	

Note: NHIS 1992–1995. Each regression controls for race, age, education, years lived in the US (in children's analysis, number of years mother had lived in the US), state Medicaid eligibility threshold, unemployment rate, per capita income, whether a state had an AFDC waiver in year t and state fixed effects. The regression for children also control for mother's education and the gender of the child.

[1]Analysis pertains to NHIS 1992–1994.

*$0.05 < P = < 0.1$.

**$0.01 < P = < 0.05$.

***$P = < 0.01$.

ges may adversely affect health of individuals in low-income families.

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