How Did Welfare Reform Affect the Health Insurance Coverage of Women and Children?

John Cawley, Mathis Schroeder, and Kosali I. Simon

Objective. To measure the change in U.S. women and children's health insurance coverage as a result of welfare reform (i.e. the creation of Temporary Assistance for Needy Families or TANF) in 1996.

Data Source. 1992–1999 longitudinal data from the Survey of Income and Program Participation (SIPP) merged with data on the timing of state implementation of welfare reform after 1996. Two key advantages of the SIPP data are that they permit matching type of insurance coverage to the welfare policy environment in each state in each month, and permit controlling for individual-level fixed effects.

Study Design. We measure how much insurance coverage changed after welfare reform using a difference in differences method that eliminates the influence of time-invariant unobserved individual heterogeneity and of statewide trends in insurance coverage. Models also control for individual, state, and year fixed effects, individual-level characteristics such as education, age, and number of children, plus state-level variables such as real per capita income, real minimum wage, and Medicaid eligibility.

Data Collection/Extraction Methods. We limit our analysis to the SIPP data specific to the month just completed prior to the interview; as a result, we have up to twelve observations for each individual in the SIPP. This paper uses pooled data from the 1992–1996 panels of the SIPP covering the period 1992–1999. Publicly available state identifiers permit the merger of state policies and macroeconomic variables with the SIPP.

Principal Findings. TANF implementation is associated with an 8.1 percent increase in the probability that a welfare-eligible woman was uninsured. Welfare reform had less of an impact on the health insurance coverage of children. For example, TANF implementation was associated with a 3.0 percent increase in the probability that a welfare-eligible child lacked health insurance.

Conclusions. An unintended consequence of welfare reform was to adversely impact the health insurance coverage of economically vulnerable women and children, and that this impact was several times larger than the previous literature implies.

Key Words. Health insurance, welfare reform, SCHIP, medicaid

Since passage of the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996, the number of welfare recipients in the U.S. has fallen by 60 percent (U.S. Department of Health and Human Services 2004). This paper tests for one possible consequence of welfare reform: the loss of health insurance for women and children.

The framers of PRWORA intended to leave Medicaid eligibility unaffected, but studies suggest that administrative problems may have undermined that intention (Greenstein and Guyer 2001). In fact, there are several pathways through which welfare reform (as the contents of PRWORA are popularly called) may have directly or indirectly affected individuals' health insurance coverage. When PRWORA decoupled eligibility for Medicaid from eligibility for welfare benefits for nonpregnant adult women, it raised administrative barriers for some families to apply for Medicaid (Greenstein and Guyer 2001; Hill and Lutzky 2003). For social programs in general, take-up is higher when enrollment is automatic (Currie 2004), so the time cost of completing a separate application process for Medicaid and State Children's Health Insurance Program (SCHIP) may have lowered take-up. Moreover, the method of the new application process may have contributed to lower take-up. Some states began to accept SCHIP application by mail (i.e., without an in-person interview with a caseworker), which led to higher rates of rejection because of errors or omissions in the written applications (Hill and Lutzky 2003). Several studies that interviewed welfare program administrators or low-income families, or observed interactions between the two, concluded that confusion about eligibility for Medicaid and/or SCHIP after welfare reform led to lower take-up among the Medicaid eligible. For example, confusion about different eligibility standards for cash welfare benefits and public health insurance, and the misperception that one had to be on welfare to receive Medicaid, were found to hinder enrollment of Medicaid eligibles (Ellwood 1999; Stuber et al. 2000; Kenney and Haley 2001). In addition, many beneficiaries leaving welfare were not told that they were entitled to continue on Medicaid (Quint and Widom 2001), and a majority of low-income parents mistakenly believed that the time limit for their cash benefits also applied to their children's SCHIP or Medicaid (Kaiser Commission 2000).

Address correspondence to Kosali I. Simon, Ph.D., Department of Policy Analysis and Management, Cornell University, 106 MVR Hall, Ithaca, NY 14853. John Cawley, Ph.D, is with the Department of Policy Analysis and Management, Cornell University, Ithaca NY. Mathis Schroeder, M.A., is with the Department of Economics, Cornell University, Ithaca, NY.

One might assume that there is no need to be concerned about Medicaid-eligible children who do not enroll in the program, as they can always enroll when they become ill. While failure to take up Medicaid could in theory be harmless, in practice it is associated with negative consequences. Children who are eligible for Medicaid but do not enroll and remain uninsured are less likely than those who did enroll in Medicaid to have a regular source of care, are more likely to have unmet medical needs, and their families are more likely to incur out-of-pocket health costs exceeding \$500 (Davidoff et al. 2000).

Welfare reform may have affected insurance status in other ways as well. Welfare recipients who entered the labor force because of welfare reform may have raised their incomes to an extent that they lost Medicaid eligibility; for those who were not offered employer-provided insurance or those who rejected an offer, this resulted in the loss of health insurance coverage. On a positive note, some individuals who entered the labor force because of welfare reform likely acquired health insurance coverage or shifted from public to private coverage.

In theory, PRWORA could have affected health insurance coverage by encouraging single mothers to marry. Marriage has the potential to either increase or decrease the probability of insurance coverage; on the one hand, it could increase access to privately provided insurance, but on the other hand, it could push family income above Medicaid eligibility thresholds. However, PRWORA probably had little effect on rates of uninsurance through marriage because it does not appear to have increased rates of marriage among the previously welfare eligible (Bitler et al. 2004) or to have reduced unmarried motherhood (Fitzgerald and Ribar 2004).

It seems clear that, for individuals at risk of being on welfare prior to PRWORA, welfare reform lowered the probability of publicly provided coverage. The net effect on the probability of coverage through any source is ambiguous, but we hypothesize that it is negative.

The prior literature on the health insurance consequences of welfare reform includes "welfare leaver" studies and econometric studies. Acs and Loprest (2001) review welfare leaver studies and document declines in Medicaid coverage of 10–49 percentage points, despite the fact that almost all leavers should have remained eligible for Medicaid. For example, Garrett and Holohan (2000) find that only 33 percent of women who left welfare between January 1995 and mid-1997 (the majority of whom were working) received employer health insurance, leaving 49 percent of women and 30 percent of children uninsured a year or more after they exited welfare.

This paper is most comparable to the econometric studies. The two that are most relevant to this paper are Kaestner and Kaushal's (2003) and Bitler, Gelbach, and Hoynes's (2005). While each pursues a somewhat different research question than ours, each yields important insights into our line of inquiry.

Kaestner and Kaushal (2003) ask a research question that is closely related: to what extent did the overall decline in welfare caseload between 1996 and 1999 affect the insurance status of the pre-1996 welfare population, and to what extent did the change in caseload due to welfare reform have a differential impact than the change in caseload due to other factors? Their focus on estimating this differential impact represents an important distinction between their paper and ours, as our interest lies in the absolute impact of welfare reform on insurance, not limited to its impact through the change in caseload.

Kaestner and Kaushal examine Current Population Survey (CPS) data for 1993–2000 and identify the impact of welfare reform on health insurance status by exploiting variation across states in the implementation of waivers from Aid to Families with Dependent Children (AFDC) prior to 1996 and the timing of implementation of Temporary Assistance for Needy Families (TANF) starting in 1996. They estimate difference-in-differences models, comparing the change in insurance status before and after welfare reform among the treatment group (women and children likely to be eligible for Medicaid) to the control group (women and children unlikely to be eligible for Medicaid), controlling for welfare caseload. They conclude that the overall decline in caseload of 42 percent from 1996 to 1999 was responsible for increases in uninsurance of 2–9 percent among women and 6–11 percent among children, who were eligible for welfare prior to PRWORA. Further, they infer that changes in caseload due to welfare reform had a less adverse impact on the probability of insurance than changes in caseload due to other factors.

Bitler, Gelbach, and Hoynes (2005) also study the extent to which welfare reform affected the probability of insurance, but do so as part of a broader research question: how did welfare reform affect health care utilization and self-reported health status among the welfare-eligible population? They study single women aged 20–45 in the Behavioral Risk Factor Surveillance System (BRFSS) for 1990–2000. Their identification strategy is similar to that of Kaestner and Kaushal: they exploit variation across states in the timing of AFDC waivers and TANF implementation. However, they differ from Kaestner and Kaushal, in that they do not limit their study of

the impact of welfare reform to the portion that operates through changes in caseloads.

Bitler et al. define three different treatment groups that are likely to be eligible for welfare: Hispanic working-age females, black working-age females, and working-age females of all races and ethnicities who are high school dropouts. The single women in each of their treatment groups may or may not have children—the BRFSS does not always record whether there are young children in the household—making their treatment groups imperfect, as they include some childless women who would not be eligible for welfare. Bitler et al. choose married women to serve as the control group of those unaffected by welfare reform. They cannot reject the hypothesis of no impact of AFDC waivers or TANF on health insurance coverage for their treatment group relative to the control group for their black sample or low-education sample. For their Hispanic sample, they cannot reject the hypothesis of no effect on health insurance for AFDC waivers, but find that TANF lowered the probability of coverage by 13.9 percentage points for the treatment group relative to the control group.

This paper builds on the previous literature in the following ways. First, it matches detailed health insurance coverage *in a specific month* to the welfare policies prevailing in the individual's state during that month. We can not only observe the incidence of health insurance coverage, but also whether that coverage was through an employer, a privately purchased insurance plan, or a public source. (Because we do not know the generosity or cost sharing involved in any employer-provided plan, we are unable to judge whether employer-provided coverage is "better" for the respondent than Medicaid or SCHIP coverage.) Previous studies either did not know insurance status by month, lacked information on the source of insurance, or lacked information on children's insurance coverage. The CPS, which was studied by Kaestner and Kaushal (2003), contains detailed information on the type of health insurance coverage, but it is not specific to a particular month; it records only whether that type of coverage was held at some point during the previous year. This vagueness is a decided shortcoming for our purpose, which requires matching insurance status at a particular time to the welfare regime in existence at that time.

The BRFSS, which was used by Bitler, Gelbach, and Hoynes (2004), contains data on insurance coverage of adults specific to a particular month, but the source of the coverage is not recorded (i.e., the BRFSS does not record whether insurance is publicly or privately provided) and the BRFSS does not contain information on the health insurance coverage of children.

The second contribution of this paper results from the use of longitudinal data, which allows us to control for person-specific fixed effects and thereby measure the impact of policies on individuals holding constant their unobserved time-invariant characteristics. The advantage of this is explained in the next section. As a result of these innovations, our estimate of the impact of welfare reform on health insurance coverage is considerably larger than that found in the previous econometric studies.

METHODS

There are several challenges to identifying the effect of welfare reform on insurance coverage. First, there may be unobserved heterogeneity correlated with both individual insurance coverage and state welfare policies. For example, more progressive states may do more in unobserved ways to promote insurance coverage, and may have declined to seek an AFDC waiver and may have been the last to implement welfare reform. A failure to remove the influence of such unobserved heterogeneity may bias estimates of how welfare reform affects insurance coverage.¹

A second challenge to identification is that there may have been changes over time in state insurance markets that happened to coincide with the implementation of welfare reform; failure to control for such trends would bias estimates of the effect of welfare reform on rates of uninsurance.

We address these problems and identify the impact of welfare reform on insurance coverage, using a difference-in-differences approach. Intuitively, we measure how much insurance coverage changed after welfare reform for a “treatment” group (those eligible for welfare) relative to a “control” group (those not eligible for welfare). The first difference, which is the change over time within individuals, eliminates the influence of time-invariant unobserved individual heterogeneity. The second difference, between a treatment group and a control group, eliminates the influence of statewide trends in insurance coverage. The validity of the difference-in-difference method relies on two assumptions: first, that individual-level unobserved heterogeneity is constant over time and, second, that time effects such as changes in insurance markets are identical for the treatment and control groups (Blundell and Dias 2000).

Another challenge to identification is choosing the correct treatment group. Ideally it would consist of all individuals who were affected by welfare reform. This group is difficult to define, because welfare reform may have influenced individuals’ decisions about labor force participation, marriage, and fertility. However, recent studies suggest that welfare reform did not

significantly affect rates of marriage (Kaestner and Kaushal, 2001; Bitler et al. 2004) or fertility (Kearney 2002; Joyce et al. 2003).

A related problem is choosing the right control group. This should consist of individuals who were unaffected by welfare reform, but are otherwise similar to the treatment group. An added difficulty is that welfare reform may have indirectly affected the health insurance coverage even of individuals who have never been eligible for TANF or Medicaid. This could occur if members of the treatment and control groups are competitors for the same jobs. One goal of welfare reform was to encourage welfare recipients to seek work, which would shift the supply curve for labor, which *ceteris paribus* would result in lower total compensation, possibly taking the form of reduced benefits like health insurance. Thus, outcomes of the control group may be indirectly affected by the treatment, which would bias difference-in-difference estimates.

We define treatment and control groups for both women and children. Among women, we define the treatment group as *never married* mothers aged 16–44 with 12 or fewer years of schooling and we define the control group as *married* mothers aged 16–44 with 12 or fewer years of schooling. To clarify, the only difference between the treatment and control groups of women is that members of the control group are married and the members of the treatment group have never been married.²

We define the treatment group for children (aged 18 years and younger) as those whose mothers are in the women's treatment group, and define the control group as those whose mothers are in the women's control group. Thus, the only difference between the treatment and control groups of children is that the mothers of the control group are married and the mothers of the treatment group have never been married.

If our treatment group is appropriately defined, a large percentage of women in the treatment group should be receiving cash welfare benefits; likewise, if our control group is appropriately defined, only a small percentage of women in it should be receiving cash welfare benefits. In our sample, 39.9 percent of women in the treatment group received cash welfare benefits compared with only 2.5 percent of women in the control group, which suggests that the definitions of the treatment and control groups are appropriate.

It is also reassuring that Medicaid coverage is much higher among the treatment group than the control group for both women and children. Among women, 56.1 percent of the treatment group had Medicaid coverage, compared with 8.5 percent of the control group. Among children, 69.5 percent of the treatment group was covered by Medicaid, compared with 14.4 percent of the control group (see Table A1).

In order to compare changes in insurance in response to welfare reform across our treatment and control groups, we estimate difference-in-difference models of the following form:

$$Y_{ist} = \alpha + X_{it}\beta + Z_{st}\gamma + P_{st}\delta + TREAT_{it}\phi + P_{st} \times TREAT_{it}\lambda + \varepsilon_{ist}$$

where i indexes people, s states, and t time. (For simplicity, the equation does not list the year, state, and individual fixed effects included in all our models.) Y stands for one of four indicator variables that reflect insurance status, specifically, whether person i has any health insurance coverage at time t , whether person i is covered by public insurance (Medicaid for women, Medicaid or SCHIP for children) at time t , whether person i is covered by their own employer at time t (for women) or covered by any employer (for children), and whether person i is covered by any private source at time t . X represents a set of time-varying individual characteristics; e.g., family size and mother's age. Z represents a set of state-level characteristics that vary over time; specifically, an index of eligibility for Medicaid and SCHIP (which controls for expansions in parental eligibility for Medicaid and child eligibility for SCHIP that followed PRWORA), unemployment rate and its 1-year lag, effective real minimum wage, EITC rate, per capita income, and real maximum cash welfare benefit. P represents a set of indicator variables for welfare policy, specifically, an indicator for whether state s had an AFDC waiver at time t , and an indicator for whether state s had implemented TANF at time t . $TREAT$ is an indicator that equals one if the respondent is a member of the treatment group, and equals zero if the respondent is a member of the control group. The coefficient λ on the interaction term $P \times TREAT$ is our difference-in-differences measure of the effect of welfare reform on insurance status. The error term ε is assumed to be correlated within states, so we cluster the standard errors by state in the manner recommended by Bertrand, Duflo, and Mullainathan (2004).

Unlike Kaestner and Kaushal (2003), we do not control for AFDC/TANF caseload in our regression. This is because of the difference in our research questions. Our research question is: what is the total impact of welfare reform on the insurance status of women and children? In contrast, the research question in Kaestner and Kaushal (2003) is: how did changes in the welfare caseload during the 1990s affect insurance coverage among women and children?

Whether the caseload variable belongs to the set of regressors depends on how one thinks welfare reform affected health insurance. If reform affected coverage solely through decreasing caseload, then one could instrument for caseload using welfare reform. If reform affected insurance through other

channels than caseload, one should regress coverage on the reform measures directly.³ There are several reasons that caseload may not fully reflect the impact of welfare reform on insurance. First, beneficiaries are allowed to work a certain number of hours, accept employer-provided health insurance if offered, and still remain in the caseload under TANF rules. Second, significant numbers of working poor families are ineligible for TANF, but the children are eligible for Medicaid/SCHIP, especially after eligibility expansions in the 1990s. We investigate how welfare reform affected insurance coverage overall rather than just through declines in caseload, so we omit caseload from the set of regressors and focus on the policy variables.

We estimate a linear probability model controlling for time, state, and person fixed effects, in order to eliminate the influence of unobserved time-invariant heterogeneity that may be correlated with both welfare reform policies and the probability that individuals enjoy health insurance coverage.⁴ For example, less progressive states may have sought AFDC waivers early and implemented TANF as soon as possible, and may also have unobserved policies (e.g., antiunion) that are associated with a lower probability that its residents have health insurance.

Our identification comes from individuals who experience a change in welfare policy in their state. That is, only sample members who experience both a 0 and a 1 value in either the waiver or TANF indicators contribute to identification. Using such respondents, our measure of the impact of the policy on insurance coverage is the difference between the treatment and control groups in the change in insurance status that is correlated with a change in welfare policy. Our estimated effects of an AFDC waiver and of TANF implementation should be interpreted as the average treatment effect over the period during which there is variation within respondents over time in the presence of an AFDC waiver or the implementation of TANF.

DATA

The Survey of Income and Program Participation (SIPP) is a nationally representative sample of Americans aged 15 years and older that consists of a series of 4-year panels starting in 1984 with sample sizes ranging from approximately 12,000 to 40,000 households. Interview records for children in the household are created using parent's reports. The SIPP interviews households at 4-month intervals for up to 4 years, collecting data on the month just completed and each of the 3 prior months after the last interview.

Evidence suggests that the data suffer from recall bias, so we limit our analysis to the data specific to the month just completed prior to the interview. As a result, we have up to 12 observations for each individual in the SIPP. This paper uses data from the 1992 to 1996 panels of the SIPP covering the period 1992–1999.⁵

Each interview contains information on the respondent's insurance coverage and the source of their coverage for a particular month.⁶ We study the following outcomes in the SIPP: an indicator variable for whether one has health insurance coverage through any source, an indicator for whether the individual is covered by Medicaid or SCHIP, an indicator for whether one receives health insurance coverage through one's own employer (for women) or any employer (for children), and an indicator for whether the individual is covered by any private source. The SIPP also contains information on job status and demographic characteristics that may influence insurance status (e.g., age, race, gender, education, marital status, and family size). The set of regressors used in each regression includes highest grade completed, age, number of children, marital status, and indicator variables such as individual, year, and state. Summary statistics of our SIPP sample are provided in Table A1.

Publicly available state identifiers permit the merger of state policies and macroeconomic variables with the SIPP. We focus on two policy variables: an indicator for the implementation of a waiver from federal AFDC regulations, and an indicator for implementation of TANF. We also control for other state-level characteristics, including current unemployment rate, its 12-month lag, real per capita income, the real effective state minimum wage, real state maximum welfare benefit for a family of three, the Earned Income Tax Credit, and state's Medicaid/SCHIP generosity.

ASPE (1999) is the source of data on the timing of AFDC waivers and TANF implementation. Table A2 lists the date of implementation of AFDC waivers and TANF. If a state either never applied for an AFDC waiver, or was never granted one, no date is listed. If a state received multiple waivers, the table lists the earliest date of implementation. AFDC waivers were implemented between 1992 and 1996. If a state had a waiver application approved, but the waiver was never implemented, we code the state as not having had a waiver. TANF implementation took place between late 1996 and January 1998. We use ASPE's "actual" TANF implementation date when it differs from the official implementation date.

Our measure of Medicaid/SCHIP generosity for children is a simulated measure of public health insurance eligibility as in Currie and Gruber (1996).

Specifically, we simulate the fraction of children younger than 18 years who would have been eligible for public health insurance had their families lived in a given state in a given year (after adjusting financial variables for inflation), using the 1996 March Current Population Survey. This produces an index that measures the generosity of public assistance health insurance in a given state in a given year. We create a similar index for pregnant women.

Unemployment rates are calculated at the state level by month from the Bureau of Labor Statistics, Local Area Unemployment Series. State per capita income data were calculated by the Bureau of Economic Analysis and are adjusted for inflation and reported in year 2000 dollars. The maximum cash welfare benefit for a family of three is taken from *The Green Book* (Committee on Ways and Means, various years). The minimum wage by state comes from Neumark and Washer (2000), which we cross-checked and updated for the most recent years, using the *Monthly Labor Review*. EITC rates come from various sources including Neumark and Washer (2000) for the years 1990–1994, the Center for Budget and Policy Priorities website for the years 1995–2000, and *The Green Book*. Summary statistics of the state-level variables appear in Table A3.

RESULTS

Before presenting the results of our difference-in-differences model, we first examine the unconditional trends in uninsurance among the treatment and control groups around the time of PRWORA. Figure 1 plots rates of uninsurance among women in the treatment and control groups from January 1996 to January 2000; recall that states implemented TANF between late 1996 and January 1998. The data points in each Figure in this paper were calculated using a 4-month moving average, which ensures that each SIPP respondent, interviewed every fourth month, is represented in each data point.

Figure 1 indicates that, among women, the rate of uninsurance is always higher in the treatment group than in the control group, but the gap between them increases during and after the implementation of TANF. While this trend is unconditional, it suggests that welfare reform increased uninsurance among welfare-eligible women.⁷

Figure 2 shows that in 1996, the treatment and control groups of children had at times identical rates of uninsurance. However, in early 1997, the rate of uninsurance among the treatment group rises above that of the control group,

Figure 1: Weighted Uninsurance Rates for Treatment and Control Groups of Women, 1996–1999.

Notes: (1) Our data come from the SIPP 1996 panel. (2) The treatment group is defined as never married mothers and the control group as married mothers, both with high school education or less and 16–44 years old. (3) Each data point is the moving average of four means of uninsurance incidence: the mean of the current month, the mean of the month before, and the means of the two following months.

and between 1998 and 2000 the gap between them grows. Again, while unconditional, this trend suggests that welfare reform increased rates of uninsurance among welfare-eligible children.⁸

Table 1 presents difference-in-differences results for women. Each column of Table 1 corresponds to a separate regression concerning the type of insurance coverage: coverage through any source, Medicaid, one's own employer, or any private source. Each cell of Table 1 contains a linear probability coefficient and standard error (which has been clustered to correct for correlations over time within states). The parameters of greatest interest are the coefficients on the interaction between treatment group and the policy changes; these are our difference-in-differences estimates. The coefficient on the interaction between treatment group and AFDC waiver indicates that such waivers lowered the probability of insurance coverage among welfare-

Figure 2: Weighted Uninsurance Rates for Treatment and Control Groups of Children, 1996–1999.

Notes: (1) Our data come from the SIPP 1996 panel. (2) The treatment group is defined as children of never married mothers and the Control group as children of married mothers, both less than 15 years old, where the mothers have high school education or less and are 16–44 years old. (3) Each data point is the moving average of four means of uninsurance incidence: the mean of the current month, the mean of the month before, and the means of the two following months.

eligible women by 4 percentage points; this is statistically significant at the 5 percent level.

TANF implementation lowered the probability of insurance coverage by 8.1 percentage points among welfare-eligible women; this is statistically significant at the 1 percent level. Looking at specific sources of coverage, TANF implementation is associated with a 6.7 percentage point decrease in the probability of Medicaid coverage, which may be due to increased administrative hurdles associated with Medicaid enrollment, and a 3.4 percentage point increase in the probability of coverage through one's own employer, which may be due to increased incentives to enter the labor force under PRWORA. There is no statistically significant change in the probability of coverage through any private source.

Table 1: Difference-in-Differences Estimates of the Effect of AFDC Waivers and TANF on the Health Insurance Status of Women

<i>Dependent Variable</i>	<i>Any Coverage</i>	<i>Medicaid Coverage</i>	<i>Employer Provided Insurance</i>	
			<i>in Own Name</i>	<i>Any Private</i>
AFDC waivers	0.005 (0.007)	− 0.006 (0.005)	− 0.001 (0.007)	0.011* (0.006)
AFDC waivers × treatment group	− 0.040** (0.016)	− 0.021 (0.016)	− 0.016 (0.009)	− 0.032** (0.014)
TANF	0.019*** (0.006)	0.003 (0.005)	− 0.005 (0.006)	0.016** (0.006)
TANF × treatment group	− 0.081*** (0.015)	− 0.067*** (0.011)	0.034** (0.013)	− 0.021 (0.017)
Treatment group	− 0.076 (0.087)	0.058 (0.064)	− 0.001 (0.042)	− 0.111 (0.072)
Number of observations	91,059	91,059	91,059	91,059

Notes: (1) The treatment group is defined as never married mothers and the control group as married mothers, both with high school education or less and 16–44 years old. (2) All estimations include unemployment and its 12-month lag, the state's real maximum benefit for a family of three, state real per capita income, real minimum wage, Earned Income Tax Credit, Medicaid eligibility for pregnant women, age, age squared, indicator for high school dropout, and number of own children in the household. All regressions also control for individual, state, and year fixed effects. (3) Standard errors are corrected for clustering within states.

*Significant at 10%;

**Significant at 5%;

***Significant at 1%.

AFDC, Aid to Families with Dependent Children; TANF, Temporary Assistance for Needy Families.

Interestingly, in Table 1, the main TANF effect is a 1.9 percentage point increase in the probability of coverage for both the treatment and control groups of women; as the control group is not eligible for TANF, this should be interpreted as the change in the probability of coverage between the pre-1996 and post-1996 period, that is, as a time effect rather than a policy effect. This change in overall coverage after TANF implementation is driven by an increase in the probability of private coverage of 1.6 percentage points. (These time effects are not entirely picked up by year fixed effects because the timing of TANF implementation varied across states.) Eliminating such changes over time that are common to the treatment and control groups is an important reason to estimate a difference-in-differences model.

Table 2 presents the difference-in-difference results for children. On the whole, the insurance coverage of children appears less sensitive to welfare reform than that of women. The probability of coverage for treatment group

Table 2: Difference-in-Differences Estimates of the Effect of AFDC Waivers and TANF on the Health Insurance Status of Children

<i>Dependent Variable</i>	<i>Any Coverage</i>	<i>Medicaid or SCHIP Coverage</i>	<i>Employer Provided Insurance</i>	<i>Any Private</i>
AFDC waivers	-0.002 (0.006)	-0.012 (0.010)	0.014 (0.009)	0.015* (0.008)
AFDC waivers × treatment group	-0.010 (0.018)	0.010 (0.026)	-0.009 (0.021)	-0.019 (0.021)
TANF	0.002 (0.009)	-0.015 (0.009)	0.015 (0.012)	0.017 (0.011)
TANF × treatment group	-0.030* (0.016)	-0.036* (0.019)	0.014 (0.023)	0.008 (0.023)
Treatment group	0.045 (0.06)	0.138** (0.068)	-0.116* (0.05)	-0.107* (0.064)
Number of observations	158,464	158,464	158,464	158,464

Notes: (1) The treatment group is defined as children of never married mothers and the control group as children of married mothers, where all mothers obtained high school education or less and are 16–44 years old. (2) All estimations include unemployment and its 12-month lag, the state's real maximum benefit for a family of three, state real per capita income, real minimum wage, Earned Income Tax Credit, Medicaid eligibility for a child of 14 years, age, and age squared. All regressions also control for individual, state, and year fixed effects. (3) Standard errors are corrected for clustering within states.

*Significant at 10%;

**Significant at 5%;

***Significant at 1%.

AFDC, Aid to Families with Dependent Children; TANF, Temporary Assistance for Needy Families.

children is unaffected by AFDC waivers. TANF implementation is associated with a 3 percentage point decrease in the probability that a welfare-eligible child is covered by any health insurance and a 3.6 percentage point decrease in the probability that such a child is covered by Medicaid. Recall that our model controls for state Medicaid eligibility, which was generally expanded in the late 1990s, so this coefficient reflects the change in coverage just due to TANF implementation, holding constant Medicaid eligibility.

DISCUSSION

Using a difference-in-differences approach to estimate the impact of welfare reform on insurance coverage, we find that AFDC waivers prior to 1996 and the implementation of TANF after 1996 lowered the probability that welfare-

eligible women had health insurance coverage. Specifically, AFDC waivers were associated with a 4 percentage point decrease, and TANF implementation was associated with an 8.1 percentage point decrease, in the probability that a previously welfare-eligible woman had health insurance coverage. Welfare reform had less of an impact on the health insurance coverage of children. We find no evidence that AFDC waivers increased the probability that welfare-eligible children were uninsured. However, TANF implementation was associated with a 3 percentage point decrease in the probability that a welfare-eligible child had health insurance.

We next compare our findings to those of Kaestner and Kaushal (2003), but first wish to emphasize that the two papers seek to measure different things, and thus the comparison is imperfect. Specifically, Kaestner and Kaushal estimate the impact of welfare reform on uninsurance solely through changes in welfare caseload; in contrast, we estimate the total impact of welfare reform on uninsurance. Their results imply that the decline in caseload after TANF implementation was associated with an increase in uninsurance of less than one percentage point (1–3 percent) among previously welfare-eligible women.⁹ Our estimate of the total impact is a rise in uninsurance of 8.1 percentage points (10 percent¹⁰) among treatment group women. Their estimates imply that TANF, through changes in caseload, was associated with a decline in women's Medicaid participation of roughly 1 percentage point (2–3 percent). Our estimate of the total impact is a decline in women's Medicaid participation of 6.7 percentage points (10.6 percent). Bitler, Gelbach, and Hoynes (2005) find, in general, even smaller impacts of welfare reform than Kaestner and Kaushal. They find no statistically significant effect of AFDC waivers on coverage for the treatment group relative to the control group for any of their three samples (black women, Hispanic women, and low-education women), and also find no statistically significant effect of TANF implementation for black women or low-education women (for Hispanic women, TANF implementation was associated with a 13.9 percentage point [21 percent] decrease in the probability of coverage for the treatment group relative to the control group).

Kaestner and Kaushal's estimates also imply that TANF implementation, through changes in caseload, was associated with a decrease in children's Medicaid participation of roughly 1 percentage point (1–2 percent). Our estimates suggest a total decrease in children's Medicaid participation of 3.6 percentage points (4.6 percent). Their estimates also imply that TANF implementation, through changes in caseload, was associated with an increase in uninsurance among welfare-eligible children of less than 1 percentage point

(2–3 percent); our estimate is that the total impact of TANF was to raise uninsurance among such children by 3 percentage points (3.4 percent).

The differences between our estimates and those of Kaestner and Kaushal (2003) appear to be due to our use of the SIPP as opposed to the CPS. When we convert our monthly SIPP data on actual insurance coverage into CPS-like annual data concerning health insurance coverage at any point in the past year and estimate models similar to those estimated by Kaestner and Kaushal, we still find significant changes in insurance status due to AFDC waivers and TANF implementation. For women, the probability of any health insurance coverage fell by 6.9 percentage points after an AFDC waiver and by 5.9 percentage points after TANF implementation; both are significant at the 1 percent level.

We have also explored whether two other differences between this paper and Kaestner and Kaushal's—the use of person fixed effects and controlling for welfare caseload—change our results, but our results are robust to each variation. This series of results demonstrate two things: (1) the results of this paper are robust to many variations; (2) that the previous Kaestner and Kaushal result—that there is no impact on insurance coverage of AFDC waiver or TANF implementation independent of caseload—does not hold in the SIPP.

Our results suggest that an unintended consequence of welfare reform was to adversely impact the health insurance coverage of economically vulnerable women and children. There are several reasons why uninsured children are a great policy concern (IOM 2002a, b). Uninsured children may receive less medical treatment than the insured (IOM 2002a, b). Uninsured children may also impose costs on the health care system by receiving care in relatively inefficient ways; for example, a parent may take an uninsured child to the emergency room for a condition that could have been effectively treated with an office visit (Weissman, Gastonis, and Epstein 1992). The health care disadvantage faced by uninsured children exists even when the children are eligible for public insurance and could be enrolled at the point of care (Davidoff et al. 2000).

Our finding that the probability of public health insurance coverage fell after welfare reform supports the general point in Currie (2004), that take up of public programs is lower when a separate application process is required than when enrollment is automatic. PRWORA decoupled enrollment in Medicaid from enrollment in cash welfare benefits because policy makers did not want Medicaid beneficiaries removed from that program's rolls when their cash welfare benefits expired. However, this decoupling created an application process for Medicaid and SCHIP that is costly in time, and has resulted in

increased rejection of applications and lower take-up. This unintended consequence is apparent in the results of this paper. Future research that could exploit variation across states and over time in the administrative hurdles involved in applying for Medicaid/SCHIP would help improve our understanding of how changes in the time cost of application affect program enrollment.

ACKNOWLEDGMENTS

For helpful comments, we thank Marianne Bitler, Alan Garber, Arden Handler, Robert Kaestner, and participants in the NBER Frontiers in Health Policy Research conference.

NOTES

1. To investigate the impact of controlling for individual fixed effects, we test for the equality of coefficients in models that do and do not control for fixed effects. We reject at the 10 percent level the hypothesis of equality of coefficients on the interaction of treatment group and TANF implementation in the Medicaid coverage and all private coverage regressions. We also reject the hypothesis of equality of coefficients on the interaction between treatment group and AFDC waiver in the Medicaid coverage regression. We fail to reject the hypothesis of equality of coefficients on both difference-in-difference estimators in the regressions for any type of coverage and for own employer coverage. In summary, we reject the exogeneity of the welfare policies, in several (but not all) cases. For the sake of comparability we include individual fixed effects in each model.
2. Out of concern that the control group is not an appropriate counterfactual for Medicaid, we pursued the following robustness check. We limited the analysis to the treatment group and included state-specific time trends to serve as a statistical control group. We find that the impact of TANF on the treatment group is not statistically significant; the point estimate suggests a decrease in the probability of Medicaid coverage of 1.5 percentage points. When we used the control group, we estimated that TANF was responsible for a 6.6 percentage point decrease in the probability of Medicaid coverage for women. In summary, if we use no control group for the Medicaid population, we get a different result. On the one hand, one might be concerned that the results are driven by the use of a control group, but, on the other hand, the control group is used to eliminate any common trend, so it is predictable that omitting a control group generates different results.
3. Whether changes in caseload measure the full impact of welfare reform on health insurance coverage is ultimately an empirical question, so we investigate it by adding to our models controls for caseload and its interaction with the treatment

indicator. We find that even after controlling for caseload and its interaction with treatment group, the coverage of welfare-eligible women fell by 4.3 percentage points after an AFDC waiver and by 7.5 percentage points after TANF implementation; both are statistically significant at the 1 percent level. The natural logarithm of caseload and its interaction with a treatment indicator were not statistically significant. This is clear evidence that welfare policies have an impact on insurance coverage that is independent of caseload.

4. We test whether collinearity between indicators between policy treatments and year is a problem for our estimates. Specifically, we estimated models in which we replaced indicator variables for state and year with state-specific quadratic time trends. We find no evidence that the collinearity between year effects and policy affects estimates (they vary by only one- to three-tenths of a percentage point).
5. Certain low-population states are not individually identified in the SIPP, but are instead grouped. The low-population states grouped in the 1992 panel are somewhat different than those grouped in the 1996 panel. Because our identification strategy relies upon fixed effects models, we drop SIPP residents whose states we cannot identify for this reason. For the sake of consistency between the 1992 and 1996 panels, we drop the roughly 3.5 percent of respondents who reside in a state that is grouped in either panel. These states are ME, VT, ND, SD, IA, AK, ID, MT, and WY. We have re-estimated the models in this paper including residents if their state can be identified in one panel but not the other, and found no meaningful change in our results.
6. If there is random measurement error in reports of health insurance coverage, then the fixed effects estimates will be biased toward zero. Alternatively, if mistakes in reporting are correlated over time, then the fixed effects framework will help to attenuate the effects of measurement error.
7. We refer to the treatment group as "welfare-eligible," but acknowledge that we, like previous studies of the impacts of welfare reform, are unable to identify with certainty those who would have been welfare eligible in the absence of welfare reform.
8. Marquis and Moore (1990) and Kalton and Miller (1991) document "seam bias" in the SIPP; that is, within each panel of the SIPP, when one wave ends and another begins, there is often a jump in the mean values of variables. In addition, there is evidence of a similar phenomenon *between* panels of the SIPP. Figures 1 and 2 avoid recall bias and panel seam bias because they use only data from the most recent interview month and from only the 1996 panel.
9. On pp. 976–77 of Kaestner and Kaushal (2003), the authors list the change in insurance coverage associated with the 42 percent decline in welfare caseload since 1999. They attribute a third of that decline to welfare policy, so we multiply their total estimated changes in insurance by a third to derive the implied impact on insurance of welfare reform operating through changes in caseload.
10. Percentage changes are calculated by dividing the percentage point change by the percent of the treatment group in our sample with that type of coverage in 1995.

REFERENCES

- Acs, G., and P. Loprest. 2001. "Final Synthesis Report of Findings from ASPE's 'Leaver' Grants." Washington, DC: Urban Institute.
- Assistant Secretary for Planning and Evaluation (ASPE). 1999. "State Implementation of Major Changes to Welfare Policies 1992–1998" [accessed 2004]. Report Written by Gil Crouse. Available at http://aspe.hhs.gov/hsp/Waiver-Policies99/policy_CEA.htm
- Bertrand, M., E. Duflo, and S. Mullainathan. 2004. "How Much Should We Trust Differences-in-Differences Estimates?" *Quarterly Journal of Economics* 119 (1): 249–76.
- Bitler, M. P., J. B. Gelbach, and H. Hoynes. 2005. "The Impact of Welfare Reform on Health Insurance and Health Outcomes." *Journal of Human Resources* 40 (2): 309–34.
- Bitler, M. P., J. B. Gelbach, H. W. Hoynes, and M. Zavodny. 2004. "The Impact of Welfare Reform on Marriage and Divorce." *Demography* 41 (2): 213–36.
- Blundell, R., and M. C. Dias. 2000. "Evaluation Methods for Non-Experimental Data." *Fiscal Studies* 21 (4): 427–68.
- Committee on Ways and Means, U.S. House of Representatives. Various years. *The Green Book*. Washington, DC: U.S. Government Printing Office.
- Currie, J. 2004. "The Take-Up of Social Benefits." NBER Working Paper #10488.
- Currie, J., and J. Gruber. 1996. "Health Insurance Eligibility, Utilization of Medical Care, and Child Health." *Quarterly Journal of Economics* 111: 431–66.
- Davidoff, A. J., B. Garrett, D. M. Makuc, and M. Schirmer. 2000. "Children Eligible for Medicaid But Not Enrolled: How Great a Policy Concern?" *New Federalism: Issues and Options for States*, # A-41. Washington, DC: Urban Institute.
- Ellwood, M. 1999. "The Medicaid Eligibility Maze: Coverage Expands, But Enrollment Problems Persist: Findings from a Five-State Study." *Assessing the New Federalism*, Occasional Paper #30. Washington, DC: Urban Institute.
- Fitzgerald, J. M., and D. C. Ribar. 2004. "Welfare Reform and Female Headship." *Demography* 41 (2): 189–212.
- Garrett, B., and J. Holohan. 2000. "Health Insurance Coverage after Welfare." *Health Affairs* 19 (1): 175–84.
- Greenstein, R., and J. Guyer. 2001. "Supporting Work through Medicaid and Food Stamps." In *The New World of Welfare*, edited by R. Blank and R. Haskins. Washington, DC: Brookings Institution Press.
- Hill, I., and A. W. Lutzky. 2003. "Getting In, Not Getting In, and Why: Understanding SCHIP Enrollment." *Assessing the New Federalism*, Occasional Paper #66. Washington, DC: Urban Institute.
- Institute of Medicine, Board on Health Care Services, Division of Health Care Services. 2002a. *Health Insurance is a Family Matter*. Washington, DC: National Academy Press.
- . 2002b. *Care without Coverage: Too Little, Too Late*. Washington, DC: National Academy Press.
- Joyce, T., R. Kaestner, and S. Korenman. 2003. "Welfare Reform and Non-Marital Fertility in the 1990s: Evidence from Birth Records." *Advances in Economic Analysis & Policy* 3 (1): 1–34.

- Kaestner, R., and N. Kaushal. 2001. "Immigrant and Native Responses to Welfare Reform" NBER Working Paper #8541.
- . 2003. "Welfare Reform and Health Insurance Coverage of Low-Income Families." *Journal of Health Economics* 22: 959–81.
- Kaiser Commission on Medicaid and the Uninsured. 2000. *Medicaid and Children: Overcoming Barriers to Enrollment: Findings From a National Study*. New York: Henry J. Kaiser Family Foundation.
- Kalton, G., and M. E. Miller. 1991. "The Seam Effect with Social Security Income in the Survey of Income and Program Participation." *Journal of Official Statistics* 7 (2): 235–45.
- Kearney, M. S. 2002. "Is There an Effect of Incremental Welfare Benefits on Fertility Behavior?" NBER Working Paper 9093.
- Kenney, G., and J. Haley. 2001. "Why Aren't More Uninsured Children Enrolled in Medicaid or SCHIP?" *New Federalism: National Survey of America's Families*, # B-35. Washington, DC: Urban Institute.
- Marquis, K. H., and J. Moore. 1990. "Measurement Errors in the SIPP Program Reports." *Proceedings of the Bureau of Census Annual Research Conference*, pp. 721–745, Washington, DC.
- Neumark, D., and W. Washer. 2000. "Using the EITC to Help Poor Families: New Evidence and a Comparison with the Minimum Wage." NBER Working Paper.
- Quint, J., and R. Widom. 2001. *Post-TANF Food Stamp and Medicaid Benefits: Factors that Aid or Impede Their Receipt*. New York: Manpower Demonstration Research Corporation.
- Stuber, J. P., K. A. Maloy, S. Rosenbaum, and K. C. Jones. 2000. "Beyond Stigma: What Barriers Actually Affect the Decisions of Low-Income Families to Enroll in Medicaid?" Issue Brief, Center for Health Services Research and Policy, George Washington University.
- U.S. Department of Health and Human Services. 2004. "U.S. Welfare Caseloads Information." Available at <http://www.acf.dhhs.gov/news/stats/newstat2.shtml>
- Weissman, J. S., C. Gastonis, and A. M. Epstein. 1992. "Rates of Avoidable Hospitalization by Insurance Status in Massachusetts and Maryland." *Journal of the American Medical Association* 268 (17): 2388–94.

SUPPLEMENTARY MATERIAL

The following supplementary material is available for this article online:

TABLE A1. Descriptive Statistics of the SIPP Sample.

TABLE A2. Implementation Dates of AFDC Waivers and TANF, by State.

TABLE A3. Descriptive Statistics of State Policies by Treatment and Control Groups.