EFFECTS OF CHILD HEALTH ON SOURCES OF PUBLIC SUPPORT

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ABSTRACT

We estimate the effects of having a child in poor health on the mother's receipt of both cash assistance and in-kind public support in the form of food, health care, and shelter. We control for a rich set of covariates, include state fixed effects, and test for the potential endogeneity of child health. Mothers with children in poor health are 5 percentage points (20%) more likely to rely on TANF and 16 percentage points more likely to rely on cash assistance (TANF and/or SSI) than those with healthy children. They are also more likely than those with healthy children to receive Medicaid and housing assistance, but not WIC or food stamps.

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Introduction

A growing body of research reveals that not only does low income lead to poor child health, but poor child health can have deleterious effects on family resources that may contribute to health and economic disadvantages over the life course. Corman & Kaestner (1992), Mauldon (1992), and Joesch & Smith (1997) found that married couples are more likely to divorce when their child has a serious health problem, and Reichman, Corman & Noonan (2004) found that one-year-old children with serious health problems are less likely than their healthy peers to live with their fathers. Having a child in poor health reduces mothers' labor force participation (see Powers 2003 and Corman, Noonan & Reichman—forthcoming), and it also appears to have increased reliance on cash assistance through the former Aid to Families with Dependent Children (AFDC) program (Wolfe and Hill 1995).

The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996 dramatically restricted eligibility for cash assistance in the United States by establishing term limits on the receipt of welfare, expanding work requirements for those receiving or seeking welfare, and allowing states to impose stricter sanctions for non-compliance with work requirements or other guidelines. Reflecting this new paradigm, it replaced the former Aid to Families with Dependent Children (AFDC) program with Temporary Assistance to Needy Families (TANF). Other features of the 1996 legislation were the imposition of a more stringent definition of child disability for Supplemental Security Income (SSI) benefits (after the criteria had been eased in 1990) and the de-linking of eligibility for Medicaid from that for cash assistance, so that needy families can be eligible for Medicaid even if they do not meet their state's new cash assistance requirements.

In this paper, we estimate the effects of having a young child in poor health on mothers' reliance on TANF and other sources of public support within this new regime. The effects on maternal labor supply found in other studies would suggest that having a child in poor health would increase reliance on welfare. However, this may not be the case under TANF, since mothers with children in poor health may: (1) have difficulty complying with TANF work requirements and therefore may choose not to participate (or have even had their benefits eliminated for this reason), (2) be more likely to delay participating in order to "bank" their lifetime benefit allotment, (3) have less of an incentive to participate in TANF since eligibility for Medicaid is no longer automatically tied to welfare participation, or (4) be more likely than before PRWORA to substitute SSI for TANF since the former has both higher financial benefits and fewer restrictions. Additionally, having a child in poor health may increase reliance on other sources of public support, such as food stamps, for which there are no restrictions such as work requirements or time limits.[1]

We estimate the effects of having a child in poor health on the mother's receipt of both cash assistance (TANF, SSI) and in-kind subsidies that provide food, health care, and shelter (WIC, food stamps, Medicaid, housing). We control for a rich set of covariates and test for the potential endogeneity of child health. The results have implications for our understanding of the processes underlying children's health and income trajectories in low-income families. They also contribute to the literature on determinants of welfare participation and further our understanding of how the limited safety net under PRWORA is affecting families who are particularly vulnerable because they have a child in poor health.

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[1] An exception is that PRWORA required states to reduce or eliminate food stamps benefits to recipients who have had a TANF sanction imposed. Under the former AFDC program, food stamp benefits were generally increased to offset, at least to some extent, sanctions that reduced a family's cash assistance grant (see Bloom and Winstead 2002).

Background

There is an extensive literature on the determinants of participation in both TANF and its predecessor, AFDC. There is another large literature evaluating the effects of policies, including the 1996 PRWORA legislation, on program participation.[2] Within both of these literatures, there are studies relevant to our research question. We discuss this research below, first focusing on pre-welfare-reform literature and then reviewing relevant post-welfare-reform studies.

Pre-welfare reform studies

A seminal study by Blank (1989) examined the relationship between medical need and AFDC participation. In the AFDC era, health insurance through the Medicaid program was strongly linked to AFDC participation. Blank posited that a mother who had medical problems herself (or had a family member with medical problems) would have an incentive to participate in AFDC for two reasons: a diminished capacity to work (directly, as a result of her own disability, or indirectly, due to caretaking burden for a disabled family member) and to obtain public health insurance through Medicaid. Using the National Medical Care Utilization and Expenditure Survey, Blank compared individuals' likelihood of AFDC participation in states with and without programs that had Medically Needy provisions for Medicaid; such provisions expanded coverage to certain financially or categorically ineligible individuals. She found that poor health of a mother or one of her family members increased the likelihood of AFDC participation among single mothers, but that participation was unrelated to whether or not the state had a Medically Needy provision. Thus, poor health increased AFDC participation because it limited the mother's ability to work, not because AFDC provided access to public health insurance.

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[2] See Blank (2002) and Moffitt (2002) for reviews of the major changes in US welfare policy over the 1990s and related research.

Using the 1984 panel of the Survey of Income and Program Participation (SIPP), Wolfe and Hill (1995) separately analyzed the effects of child disability (a serious activity limitation) and mother's poor or fair health on labor force participation. They simulated mothers' eligibility for a number of hypothetical public health insurance plans and found that those that would cover children for health insurance regardless of AFDC participation would have a large positive impact (up to 22 percentage points) on labor force participation of mothers of disabled children. They inferred that welfare participation of mothers of disabled children would decrease substantially with increased health insurance coverage for working mothers. The much stronger effects of health policy found in this study than in the Blank study may reflect the different measures of health/disability that they used. Blank used an average measure of health for the family, whereas Wolfe and Hill used specific and distinct measures of child disability and maternal health status.

Two recent studies assessed the effects of poor child health on exits from welfare. Acs and Loprest (1999), using data from the 1990 SIPP, found that child disability (defined as a limitation to usual activities) increased the probability that a mother of a child under 6 left welfare by about 14 percentage points within a short period (1 to 2 ½ years) but that it did not increase the probability that she left welfare in order to work. This result suggests that mothers may have left welfare to obtain more generous benefits from other sources such as SSI.[3] Meyers, Brady and Seto (2000) estimated the likelihood of transitioning off of welfare using panel data on participants in the California Work Pays Demonstration Project from 1992 to 1996 (just prior to implementation of PRWORA). They found, using a hazard model and holding constant the mother's age, ethnicity, number of children, presence of a partner in the household, county of residence, and own disability status, that having a severely disabled child reduced the probability

of getting off of cash assistance at all (AFDC or SSI) but increased the likelihood of leaving AFDC for SSI.

Two studies examined the effects of AFDC or SSI generosity on child SSI participation. Black, McKinnish and Sanders (1998) found that states with lower levels of AFDC generosity had higher rates of child SSI participation, holding constant other factors. Garrett and Glied (2000), who also used state-level data, obtained results similar to those of Black, McKinnish and Sanders and also found that the Zebley decision of 1990, which liberalized the definition of child disability before PRWORA made it more stringent in 1996, resulted in a significant increase in child SSI participation. In a related study using data from the National Health Interview Survey (from 1987 to 1994, covering pre- and post- Zebley decision years), Kubik (1999) found that greater numbers of children were diagnosed with chronic impairments after the Zebley decision. That study also found that children in states with high net SSI benefits[4] were more likely to be diagnosed with a disability than those in states with low benefits. These results indicate that policies that make welfare less generous or less accessible, or that make SSI more generous and more accessible, tend to shift participation from welfare to SSI. In a study that did not focus on children, Schmidt and Sevak (2004), using data from the March Current Population Survey from 1988-1997, found that female-headed households in states aggressively pursuing welfare reform were 21.6 percent more likely to receive SSI than those in less aggressive states. An implication of this set of studies is that welfare reform may have increased SSI participation and decreased TANF participation among mothers of young children with severe health problems.

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[3] Individuals are eligible for SSI disability benefits if they are both poor and disabled.
[4] Kubik computed the difference in benefits between having children on SSI versus AFDC. In all cases, child SSI was more generous than AFDC.

Post-welfare reform studies

Two recent studies addressed the effects of having a child with chronic illness on employment, TANF receipt, and medical coverage in the post welfare reform era. Smith et al. (2002), who studied 500 low-income parents of children with chronic illnesses (asthma, diabetes, sickle cell anemia, epilepsy, hemophilia, cerebral palsy, or cystic fibrosis) in Texas in 2001, found that mothers have extreme difficulties combining work and caring for their unhealthy children, and that they are more likely than mothers with healthy children to rely on TANF. Wise et al. (2002) investigated the impact of chronic illnesses in children (asthma, mental retardation, cerebral palsy, autism, attention deficit disorder, muscular dystrophy, cystic fibrosis, sickle-cell anemia, diabetes, arthritis, and congenital heart disease) on labor force participation and program receipt of poor families using the 1998 National Health Interview Survey. Like Smith et al., they found that mothers of children with chronic conditions are more likely to receive TANF and less likely to work than those with healthy children. They also found that although welfare reform was supposed to eliminate the link between cash assistance and medical assistance, TANF-enrolled children are more likely to have health insurance than poor children not on TANF.[5] In a study that did not consider the role of child health or disability, Pati, Romero, and Chavkin (2002) found that as TANF rolls decreased in poor Manhattan neighborhoods after PRWORA, Medicaid and food stamp enrollments also declined.

Brandon (2000) investigated the effects of child disability on exits from TANF using data from the SIPP. He used a proportional hazard model to estimate the probability of leaving welfare over a four-year period, beginning in 1996. He found that child disability, based on a

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[5] The Wise et al. (2002) study examined the relationship between TANF and health coverage, controlling only for the child's age.

measure that included limitations in communication, mobility, self-care, or cognition, had a significant negative effect on exiting from welfare.

No previous study has assessed the effects of poor child health on TANF participation as well as reliance on the other forms of public support that may either complement or substitute for welfare. We fill this gap by estimating the effects of having a young child with a severe health problem on whether mothers receive TANF, TANF and/or SSI, WIC, Medicaid, food stamps, and housing. We address the potential endogeneity of child health. We also (1) incorporate information about the baby's father and (2) assess the effects of poor child health among children who are the same age. In terms of the former, paternal health and human capital are likely to affect both the mother's reliance on public assistance and the child's health. Most studies do not include paternal characteristics at all, or do so only for fathers who are present in the household or married to the mother. In terms of the latter, although needs of children vary at different ages, most samples do not include enough children of the same age to allow for multivariate analyses on a single cohort. Rather, most studies include age variables in their models, assuming by default that age does not interact with the other covariates.[6]

Analytical Framework

We consider the following model to estimate the effect of poor child health on whether mothers rely on a specific type of public support:

(1) Program participation = f (Mother's and father's wages, quality and quantity of children, labor market opportunities, availability of public support, µ)

Program participation is a function of the each parent's earning capacity (wage), the quality and quantity of their children (together and with other partners), their labor market

opportunities, and the availability of public support. The program participation function may also contain another set of factors, μ, that are unobserved. To estimate this model, we need good measures or proxies for parents' wages, the quantity and quality of their children, their local labor markets, and the availability of public assistance. For wages, we use a set of characteristics including age, race/ethnicity, nativity, education, work history, and health status. We also include measures of the parents' relationship status, which may play a role in decisions about program participation. We focus on the participation effects of one measure of child quality—child health, but we also consider the child's gender. For quantity of children, we include whether the parents have other children together and whether each has children with other partners. For local labor markets, we include city unemployment rates, average full-time female wages, and the cost of living. Finally, we include state fixed effects to capture differences in availability of public support by state within the post-PRWORA regime.

Data

The Fragile Families and Child Wellbeing Study follows a cohort of new parents and their children in 20 large U.S. cities (in 15 states).[7] Baseline interviews were conducted from 1998 to 2000 with 4,898 sets of new, mostly unwed parents shortly after their children's births. Baseline response rates were 86 percent among eligible mothers and 78 percent among eligible fathers; 89 percent of the mothers who completed baseline interviews were re-interviewed when their children were between 12 and 18 months old. By design, about three-quarters of the births were to unmarried parents.

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[6] Some studies analyze children within specific age ranges, say 0 to 6, but even within such ranges there still may be differential effects of poor child health by age.

[7] Additional background on the research design of the Fragile Families and Child Wellbeing Study is available in Reichman et al. (2001).

The Fragile Families data are well suited for analyzing the effects of child health on reliance on public assistance because they were collected as part of a longitudinal birth cohort study and include: (1) data on the child's health from birth; (2) information about receipt of different types of public assistance; (3) measures of human capital (e.g., health status, education) of both fathers and mothers; (4) data on the fathers regardless of whether they ever lived with their children; and (5) detailed information on the parents' relationship status, living arrangements, and other children (together and with other partners) at the time of the birth. We also are able to include local labor market characteristics and state fixed effects in our models. Because the Fragile Families study sampled births exclusively in large cities and oversampled nonmarital births within those cities, the mothers in our sample are more likely than the population of new mothers in the United States to receive public assistance.

Descriptive Analysis

The purpose of this paper is to estimate the effects of poor child health on mothers' reliance on public assistance. Below we describe the measures we use in our analyses, present summary statistics, and point out many salient characteristics of the sample. Unless indicated otherwise, all covariates are measured at baseline. In general, we use mother reports for information about the mother and father reports for information about the father. However, in cases where the father's data are missing, we use mother reports about the father if these are available. We restrict our sample to the cases in which there were no missing data on any of the analysis variables. The characteristics of the sample are presented in Table 1.

Mothers were asked at the one year follow-up interview whether they had received any assistance from TANF in the past 12 months and whether they had received any food stamps

during the same time period. They were asked whether they had received any benefits from WIC since the child was born. Positive responses to these questions were used to code receipt of TANF, food stamps, and WIC, respectively. Mothers were asked to specify what other kinds of local state or federal agencies helped them since the child was born (excluding welfare or TANF) and whether they, a child who lived with them, or both they and a child who lived with them had received any cash assistance from SSI in the past 12 months. We coded the mother as having received SSI if she specified "disability" or "SSI" in response to the first question or if she responded affirmatively to the second. Mothers were asked whether they or their child(ren) who live with them currently received health insurance through Medicaid or another "public federal, or state assistance program which pays for medical care." If the mother responded affirmatively to that question, she was coded as having received Medicaid. Finally, mothers were asked whether the federal, state, or local government was currently helping them pay their rent and whether they live in a housing project. We coded them as receiving housing support if they responded affirmatively to either of these two questions or if they specified "housing assistance" in response to the question referred to above about other kinds of local state or federal agencies (other than welfare or TANF) helped them since the child was born.

Almost one quarter (24%) of mothers received some cash assistance through TANF. A slightly higher fraction (26%) received TANF and/or SSI. Over a third of mothers (36%) received food stamps and over half (56%) received Medicaid. A very large proportion (72%) of the mothers in the sample participated in the WIC program. Housing was the least commonly relied upon source of assistance in this sample; 20 percent of mothers reported at one year that they were receiving housing assistance or lived in a housing project.

Following Reichman, Corman and Noonan (2004), we consider a child to have poor health if at least one of the following criteria is met (all are from mothers' reports): the child weighed less than 4 pounds at birth (2.4%);[8] the mother reported at follow-up that the child had a physical disability (2.0%); or, if the child was at least 12 months old at follow-up, the child had neither walked nor crawled (0.8%) (figures not shown in table). We used a stringent definition of low birth weight rather than the typical 5.5-pound cutoff, in order to better identify cases of serious and chronic health problems (most heavier low birth weight children do not experience long-term health problems). Almost five percent of the children in our sample met at least one of these three criteria and are therefore characterized as having poor child health.[9]

We include several additional measures of child quality and quantity that may affect the mother's reliance on public assistance, and possibly child health: the gender of the focal child,[10] whether the parents had any other children together, and whether each parent had at least one child with another partner. Approximately one third of the parents had other children (together) at the time of the focal child's birth; about the same proportion of mothers had at least one child with another partner at that time. About one third of fathers had at least one child with another partner at the time of the mother's follow-up interview, according to mothers' reports.[11]

We go beyond whether the father was present in the mother's household to characterize the parents' relationship at the time of the birth; we consider whether the parents were married, cohabiting, romantically involved or friends, or rarely or never talked. About 74 percent of the

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[8] In a separate analysis, we compared mother respondents' reports of birth weight with the corresponding figures from the hospital records for a sub-sample of over 1800 cases. The correlation of babies' birth weight from the two sources was .94. To ensure adequate sample sizes for analysis, we used 4 pounds rather than the typical 3.5 pound cutoff used to designate very low birthweight.

[9] The percentages for the individual measures sum to more than 5 because some children fit more than one criterion.

[10] Recent studies (see, for example, Dahl and Moretti 2004) indicate that fathers have stronger commitments to their families when they have sons rather than daughters.

[11] Data limitations make it impossible to ascertain whether the father had any children with another partner at the time of the baseline.

new parents were unmarried at baseline; half (51%) of the unmarried parents lived together. Overall, 95 percent of the parents were in some type of relationship.

We take advantage of the longitudinal nature of our data by estimating models that control for mother's Medicaid status at the time of the baseline interview. Sixty one percent of the births were covered by Medicaid or another government assistance program. Since 41 percent of the births are first births, this measure is a more accurate proxy of financial eligibility for TANF at baseline than any other measure of program participation. It is important to note, however, that since financial eligibility for Medicaid is much more liberal for this sample (who gave birth) than that for TANF, this measure captures some mothers who are near-poor but would not meet the stricter eligibility criteria for TANF. Later, we explore possible interactions of child health with baseline Medicaid status and other proxies for poverty status.

We include several sociodemographic characteristics that have been associated with both reliance on public assistance and child health (race/ethnicity, nativity, and education), as well as two direct measures of the mother's human capital—her health status and whether she worked within the two-year period preceding the child's birth. We include many of the same characteristics for fathers. The sample consists predominantly of minority and disadvantaged parents. Indeed, only 22 percent of the mothers are white and non-Hispanic. One third of the mothers did not complete high school. Over half did not live with both parents when they were 15 years old.[12]

Finally, we include city-level unemployment rates, cost of living, and mean full-time wages of females to characterize local labor markets, as well as the mother's baseline state of residence to capture state policies and environments that may impact both child health and reliance on public support.

Modeling Strategy

We are interested in estimating the effect of a child's poor health on the mother's reliance on public assistance. We can express Equation (1) from our analytical framework as follows:

(2) Receipt of public assistance = f (child health, other measures of child quality and quantity, parent relationship status, mother and father characteristics, city labor market characteristics, state policy and economic environments, μ)

Estimation of equation (2) would be straightforward if the measured child health were truly random (exogenous). It is possible, however, that there are non-random components of child health that are correlated with unobserved determinants of the receipt of public assistance (μ). If so, child health would be endogenous and its estimated effect on receipt of public assistance would be biased.

We minimized the potential endogeneity problem by attempting to define poor child health as an exogenous or random shock, including a rich set of covariates (including baseline Medicaid status) that may be related to both child health and reliance on public assistance, and including state fixed effects. However, because we cannot be certain that we have *eliminated* the potential endogeneity problem, we modeled a system with two equations, one of which expresses child health as a function of parental characteristics and health care inputs, as follows:

(3) Child Health = g (mother & father characteristics, prenatal & perinatal health inputs, e)

Because the outcome measures in both equations (2) and (3) are dichotomous, we use a bivariate probit specification that allows us to test for the endogeneity of child health.[13] We allow

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[12] See Solon et al. (1988) for a discussion about the intergenerational aspects of welfare dependency.
[13] Models using an instrumental variables specification produced similar results (not shown).

for correlation between the error terms in the child health and public assistance equations, which we assume are normally distributed.[14]

In order to identify the bivariate probit model, we include certain variables (identifiers) in the health equation but not in the public assistance equation. For identifiers to be valid, they need to satisfy two conditions: They must be significant predictors of poor child health (*prediction*) and they must be uncorrelated with the mother's reliance on public assistance (*exclusion*). If these two conditions are met, and ρ (the correlation of the error terms in the two equations) is not significantly different from zero, it follows that child health can be considered exogenous and that a standard probit is the more appropriate model.[15] The following two identifiers satisfied both conditions: the number of obstetricians/gynecologists in 1996 in the city in which the child was born and the price of a carton of cigarettes in the city and year of the birth (expressed in 1998 dollars).[16] The former may be related to availability of health care for the mother during the pregnancy. The latter reflects the price of unhealthy prenatal behaviors. In addition, ρ was insignificant, indicating that a single-equation model is appropriate.

Results

We estimate multivariate models of reliance on both cash assistance and in-kind public support. For the former, we estimate whether the mother received any cash assistance from TANF and from TANF *and/or* SSI during the 12 months prior to her follow-up interview.[17] For reasons discussed above, we focus on the single-equation probit estimates.[18] For in-kind support,

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[14] For a more detailed description of this estimation strategy, see Reichman, Corman and Noonan (2003).
[15] Passing these two tests indicates that the equation has been overidentified.
[16] The tests were run for the models of TANF participation and TANF and/or SSI participation using the full sample of 3755 mothers (results available upon request).
[17] We do not have adequate sample sizes to examine the effects of poor child health on SSI alone.
[18] The bivariate probit estimates for the models of cash assistance are presented in the Appendix.

we estimate probit models for whether the mother relied on each of the following—WIC, Medicaid, food stamps, and housing. In all models, state fixed effects are included (estimates not shown) and the standard errors are corrected for city clustering of observations using the Huber-White method.

Cash Assistance

The probit results for the models of reliance on cash assistance are presented in Table 2. Estimates for whether the mother received any TANF (whether or not she received SSI) are in the second column. Because the coefficients in probit models are not easy to interpret, we also present marginal effects in the third column. We find that mothers of children in poor health were 5 percentage points (20%) more likely to receive TANF than those with healthy children. The next two columns present the probit estimates and marginal effects for whether the mother received TANF and/or SSI in the 12 months prior to her follow-up interview. We find that having a child in poor health increased the likelihood that the mother relied on one or both cash assistance programs by 16 percentage points—an increase of about 60 percent. This last result is not surprising since we have attempted to identify cases of severe child health problems and the SSI program is designed to provide cash assistance to disabled children and adults.

The coefficients for the other covariates generally have the expected signs. Having other children, having less than a high school education, being on Medicaid at the time of the birth, being U.S.-born, and living in a city with a high unemployment rate all are associated with an increased likelihood that a mother received cash assistance a year later. Interestingly, the weaker the tie between the mother and father at baseline, the more likely it is that the mother received cash assistance. Mothers who had no relationship with the baby's father at the time of the birth were about twice as likely to receive cash assistance one year later as those who cohabited with

the baby's father at the time of the birth. Baseline non-cohabiters who had no relationship with the father were over 10 percentage points more likely to receive cash assistance than those who had a friendly or romantic non-cohabiting relationship with the father at baseline. Father's education is associated with the mother's receipt of cash assistance—in general, the more educated the father, the less likely that the mother relied on TANF and on TANF and/or SSI.[19]

We next refine the analysis by assessing the effects of poor child health on the receipt of TANF (and TANF and/or SSI) among mothers likely to be eligible to receive cash assistance, such as those who were on Medicaid at baseline. Additionally, those with low levels of education and those who were U.S.-born were much more likely to be eligible than those with higher levels of education or immigrants. By eliminating non-Medicaid, highly educated, or immigrant mothers from the sample, we are better able to understand decision-making at the relevant margin.[20] We thus estimated probit models for mothers who were on Medicaid at baseline, mothers who were not college graduates, and mothers who were born in the United States. The estimated effects of poor child health for these subgroups, along with the sample means (the proportions of each sample that received the different types of support) are presented in Table 3. Each probit model includes the full set of covariates used in the previous analyses. For ease of comparison to the full sample, we report marginal effects and z-values from all models and show the corresponding figures for the full sample. As expected, we find that the effects of having a child in poor health on receipt of cash assistance were larger for U.S.-born mothers, those who had received Medicaid, and those with lower educational attainment than for the overall sample, which includes immigrants, non-poor, and highly educated mothers.

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[19] The associations of the control variables other than child health with receipt of cash assistance should not be interpreted as causal because we did not address potential selection bias in those estimates.

In-Kind Sources of Support

Table 4 shows probit estimates of the effects of poor child health on receipt of food stamps, Medicaid, WIC, and housing support. Each model includes the full set of covariates. The first row of figures indicates the effects of poor child health on receipt of food stamps, WIC, Medicaid, and housing for the full sample. The subsequent rows indicate the corresponding effects for the subgroups of mothers who were on Medicaid at the time of the birth, were not college graduates, and were U.S.-born. As in the previous table, marginal effects and z-values are presented, with the relevant sample mean following each multivariate estimate. In the full sample, poor child health is not statistically significant in predicting Medicaid, although the magnitude of the marginal effect is substantial (8 percentage points). Additionally, the effects on Medicaid are large and statistically significant among mothers who were not college graduates and among those who were U.S.-born. Poor child health also has large effects on the likelihood of receiving housing assistance—although the effect was not statistically significant for the full sample, the marginal effect was almost 10 percentage points among mothers who were on Medicaid at the time of the birth and highly significant, 5 percentage points among mothers who had not graduated from college at the time of the birth, and 5 percentage points among mothers who were U.S.-born. We do not find evidence that poor child health is related to receipt of food assistance, either through food stamps or the WIC program.

Overall, these results indicate that having a young child in poor health not only increases the likelihood a mother will receive TANF and cash assistance defined more broadly as TANF and/or SSI, it also increases the likelihood that she will rely on Medicaid and housing assistance.

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[20] Limiting the sample on the basis of multiple characteristics (for example, excluding both college graduates and immigrants) yielded sample sizes inadequate for analysis. In general, because cell sizes become quite small in some of the subgroup analyses, the results are not always conclusive and should be interpreted with caution.

In contrast, poor child health does not appear to increase the likelihood of receiving food assistance in the form of food stamps or through WIC.

Conclusion

We have investigated the effects of having a child in poor health on the likelihood that the mother relies on a number of different sources of public support in the post-PRWORA program environment. We found that mothers with children in poor health are 5 percentage points (20%) more likely to rely on TANF and 16 percentage points more likely to rely on cash assistance (TANF and/or SSI) than those with healthy children. They are also more likely than those with healthy children to receive Medicaid and housing assistance. These effects pertain to a very short period of time (12 – 18 months after the child's birth). Since some serious health problems can be diagnosed or occur at older ages, we may be underestimating the effects of poor child health on whether their mothers rely on public support.

Our results have both positive and negative implications for families with children in poor health. The positive implication is that families who are particularly needy because they have unhealthy children are getting extra financial help in the form of cash assistance, health insurance, and housing. The negative implication is that they are more likely than those with healthy children to rely on TANF, which is a much more precarious source of support than its predecessor, AFDC. TANF recipients are subject to work requirements and other restrictions with which mothers who have children in poor health may have difficulty complying. In addition, this form of assistance is now time limited. Housing assistance, too, is increasingly being provided with strings (such as community service requirements) attached. Ultimately, families with unhealthy children may have fewer resources with which to invest in their

children's health, which may have negative effects on the children's health and economic

trajectories.

References

Acs, G. and P. Loprest. (1999). "The Effect of Disabilities on Exits from AFDC." *Journal of Policy Analysis and Management* 18(1): 28-49.

American Hospital Association. (1998). "AHA Annual Survey Database FY 1998." The American Hospital Association.

Black, D. A., T. G. McKinnish and M. Sanders. (1998). "Are AFDC and SSI Substitutes?" Working Paper, University of Kentucky. Retrieved at http://gatton.uky.edu/Academic/Economics/WorkingPapers/BlackssiAFDC.pdf.

Blank, R. M. (1989). "The Effect of Medical Need and Medicaid on AFDC Participation." *The Journal of Human Resources* 24(1): 54-87.

-------. (2002). "Evaluating Welfare Reform in the United States." *Journal of Economic Literature* XL: 1105-1166.

Bloom, D. and D. Winstead. (2002). "Sanctions and Welfare Reform." Welfare Reform and Beyond Policy Brief No. 12. Brookings Institution, Washington, DC. Retrieved at http://www.brookings.edu/wrb/publications/pb/pb12.pdf.

Brandon, P. D. (2000). "Child Care Utilization Among Working Mothers Raising Children with Disabilities." *Journal of Family and Economic Issues* 21(4): 343-364.

Corman, H. and R. Kaestner. (1992). "The Effects of Child Health on Marital Status and Family Structure." *Demography* 29(3): 389-408.

Corman, H., K. Noonan and N. E. Reichman. (Forthcoming). "Mothers' Labor Supply in Fragile Families: The Role of Child Health." *Eastern Economic Journal*.

Dahl, G. and E. Moretti. (2004). "The Demand for Sons: Evidence from Divorce, Fertility, and Shotgun Marriage." National Bureau of Economic Research Working Paper #10281.

Garrett, B. and S. Glied. (2000). "Does State AFDC Generosity Affect Child SSI Participation?" *Journal of Policy Analysis and Management* 19(2): 275-295.

Joesch, J. M. and K. R. Smith. (1997). "Children's Health and Their Mothers' Risk of Divorce or Separation." *Social Biology* 44(3-4): 159-169.

Kubik, J. D. (1999). "Incentives for the Identification and Treatment of Children with Disabilities: The Supplemental Security Income Program." *Journal of Public Economics* 73: 187-215.

Mauldon, J. (1992). "Children's Risks of Experiencing Divorce and Remarriage: Do Disabled Children Destabilize Marriages?" *Population Studies* 46(2): 349-62.

Meyers, M. K., H. E. Brady and E. Y. Seto. (2000). "Expensive Children in Poor Families: The Intersection of Childhood Disabilities and Welfare." Public Policy Institute of California. San Francisco, CA.

Moffitt, R. (2002). "The Temporary Assistance for Needy Families Program." National Bureau of Economic Research Working Paper # 8749.

Pati, S., D. Romero and W. Chavkin. (2002). "Changes in Use of Health Insurance and Food Assistance Programs in Medically Underserved Communities in the Era of Welfare Reform: An Urban Study." *American Journal of Public Health* 92(9): 1441-1445.

Powers, E. T. (2003). "Children's Health and Maternal Work Activity: Static and Dynamic Estimates under Alternative Disability Definitions." *Journal of Human Resources* 38(3): 522-556.

Reichman, N. E., H. Corman and K. Noonan. (2003). "Effects of Child Health on Parents' Relationship Status." National Bureau of Economic Research Working Paper #9610.

-------. (2004). "Effects of Child Health on Parents' Relationship Status." *Demography* 41(3): 569-584.

Reichman, N. E., J. O. Teitler, I. Garfinkel and S. S. McLanahan. (2001). "Fragile Families: Sample and Design." *Children and Youth Services Review* 23(4/5): 303-326.

Schmidt, L. and P. Sevak. (2004). "AFDC, SSI, and Welfare Reform Aggressiveness: Caseload Reductions versus Caseload Shifting." *Journal of Human Resources* 39(3): 792-812.

Smith, L. A., D. Romero, P. R. Wood, N. A. Wampler, W. Chavkin and P. H. Wise. (2002). "Employment Barriers Among Welfare Recipients and Applicants With Chronically Ill Children." *American Journal of Public Health* 92(9): 1453-1457.

Solon, G., M. Corcoran, R. Gordon and D. Laren. (1988). "Sibling and Intergenerational Correlations in Welfare Program Participation." *The Journal of Human Resources* 23(3): 388-396.

Wise, P. H., N. A. Wampler, W. Chavkin and D. Romero. (2002). "Chronic Illness Among Poor Children Enrolled in the Temporary Assistance for Needy Families Program." *American Journal of Public Health* 92(9): 1458-1461.

Wolfe, B. L. and S. C. Hill. (1995). "The Effect of Health on the Work Effort of Single Mothers." *The Journal of Human Resources* 30(1): 42-62.

Table 1: Sample Characteristics (means)

Sources of Public Support (from follow-up interview)		Mother Characteristics	
TANF	.24	Age	25.1 (6.0)
TANF and/or SSI	.26	Less than High School*	.33
Food Stamps	.36	High School Grad	.30
WIC	.72	Some College	.25
Medicaid	.56	College	.12
Housing	.20	Medicaid Birth	.61
		White*	.22
		African-American	.47
Child Quality and Quantity		Hispanic	.27
Child is in Poor Health	.05	Non-White/Non-African-American/ Non-Hispanic	.04
Child is Male	.53	Immigrant	.16
Parents Have Other Child(ren) Together	.32	Lived with Both Parents at Age 15	.43
Mother Has Child(ren) with Other Father(s)	.09	Worked Within 2 Years Before Birth	.81
Father Has Child(ren) with Other Mother(s)	.34	Health is Very Good or Excellent	.67
		Attends Religious Services Several Times/Month	.39
Parents' Relationship at Baseline		# Months Since Baseline Interview (Child's Age)	14.8 (3.46)
# Months Mother Knew Father	59.0	**Father Characteristics**	
Married*	.26		
Cohabiting	.38	Age	27.7 (7.2)
Romantic or Friends	.31	Less than High School*	.32
Rarely/Never Talk	.05	High School Grad	.34
		Some College	.23
City Characteristics		College	.11
Unemployment Rate	5.39 (1.93)	White*	.20
Average Full-Time Female Earnings (dollars)	28,358 (3,962)	African-American	.49
Cost of Living Index	115.62 (24.03)	Hispanic	.27
Price of Cigarettes Index	31.13 (8.18)	Non-White/Non African-American/ Non-Hispanic	.04
# Ob/Gyns Per 10,000 Women	20.91 (11.71)	Health is Very Good or Excellent	.64
		Health Status Missing	.12
		Number of Observations	3,755

Notes: Standard deviations in parentheses; * excluded category in regression models
† Data on unemployment rates, earnings and population were obtained from the 2000 U.S. Census at the following link: http://factfinder.census.gov/servlet/DTGeoSearchByListServlet?ds_name=DEC_2000_ SF1_U&_lang=en&_ts=73400311652; data on ob/gyns were obtained from the American Medical Association and data on the price of cigarettes was obtained from the ACCRA Cost of Living Index (www.coli.org).

Table 2: Probit Estimates of Cash Assistance Participation

	TANF		TANF and/or SSI	
	Coefficient (Standard Error)	Marginal Effect	Coefficient (Standard Error)	Marginal Effect
Child Quality and Quantity				
Child is in Poor Health	0.193* (0.109)	0.049	0.525*** (0.127)	0.163
Child is Male	0.032 (0.061)	0.007	0.074 (0.054)	0.019
Parents Have Other Child(ren) Together	0.182** (0.071)	0.044	0.146** (0.066)	0.038
Mother Has Child(ren) with Other Father(s)	0.315*** (0.078)	0.077	0.260*** (0.069)	0.070
Father Has Child(ren) with Other Mother(s)	0.133* (0.078)	0.031	0.139* (0.074)	0.037
Parents' Relationship at Baseline				
# Months Mother Knew Father	-0.001 (0.001)	-0.000	-0.000 (0.001)	-0.000
Cohabiting	0.550*** (0.079)	0.136	0.523*** (0.089)	0.142
Romantic or Friends	0.811*** (0.119)	0.217	0.745*** (0.105)	0.215
Rarely/Never Talk	1.009*** (0.137)	0.330	0.993*** (0.142)	0.341
Mother Characteristics				
Age	-0.045 (0.036)	-0.010	-0.013 (0.042)	-0.003
Age Squared	0.001 (0.001)	0.000	0.000 (0.001)	0.000
High School Grad	-0.197** (0.089)	-0.044	-0.219** (0.088)	-0.054
Some College	-0.374*** (0.107)	-0.079	-0.400*** (0.097)	-0.094
College Grad	-0.761*** (0.157)	-0.127	-0.777*** (0.158)	-0.146
Medicaid Birth	0.407*** (0.068)	0.089	0.372*** (0.046)	0.091

* Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level
Notes: (City) clustered robust standard errors in parentheses; all models include state fixed effects (results not presented).

Table 2: Probit Estimates of Cash Assistance Participation

	TANF		TANF and/or SSI	
	Coefficient (Standard Error)	Marginal Effect	Coefficient (Standard Error)	Marginal Effect
Mother Characteristics (continued)				
Hispanic	0.082 (0.111)	0.019	0.060 (0.093)	0.016
African-American	0.269** (0.134)	0.063	0.274** (0.108)	0.071
Non-White/Non-African-American/Non-Hispanic	0.104 (0.182)	0.025	0.080 (0.171)	0.021
Immigrant	-0.575*** (0.109)	-0.107	-0.639*** (0.110)	-0.131
Lived with Both Parents at Age 15	-0.121*** (0.042)	-0.028	-0.103** (0.041)	-0.026
Worked Within 2 Years Before Birth	-0.242*** (0.055)	-0.060	-0.349*** (0.053)	-0.098
Health Is Very Good or Excellent	-0.114** (0.054)	-0.027	-0.127** (0.055)	-0.033
Attends Religious Services Several Times/Month	-0.079 (0.056)	-0.018	-0.068 (0.060)	-0.017
# Months Since Baseline Interview (Child's Age)	-0.026*** (0.010)	-0.006	-0.027** (0.011)	-0.007
Father Characteristics				
Age	0.037 (0.023)	0.009	0.014 (0.028)	0.003
Age Squared	-0.001** (0.000)	-0.000	-0.000 (0.000)	-0.000
High School Grad	-0.175*** (0.047)	-0.039	-0.145*** (0.045)	-0.036
Some College	-0.220*** (0.079)	-0.048	-0.139** (0.068)	-0.035
College Grad	-0.327 (0.199)	-0.066	-0.174 (0.148)	-0.042
Hispanic	0.019 (0.084)	0.004	0.014 (0.099)	0.004
African-American	0.215** (0.099)	0.050	0.232** (0.095)	0.060

* Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level
Notes: (City) clustered robust standard errors in parentheses; all models include state fixed effects (results not presented).

Table 2: Probit Estimates of Cash Assistance Participation

	TANF		TANF and/or SSI	
	Coefficient (Standard Error)	Marginal Effect	Coefficient (Standard Error)	Marginal Effect
Father Characteristics (continued)				
Non-White/Non-African-American/Non-Hispanic	0.246 (0.165)	0.064	0.238 (0.188)	0.067
Health is Very Good or Excellent	-0.007 (0.047)	-0.002	-0.024 (0.042)	-0.006
Health Status Missing	0.214 (0.098)**	0.054	0.188** (0.092)	0.052
Local Labor Market				
Unemployment Rate in City	0.163*** (0.017)	0.038	0.136*** (0.018)	0.035
Average Full-Time Female Earnings in City	0.000*** (0.000)	0.000	0.000*** (0.000)	0.000
Cost of Living	-0.011** (0.005)	-0.003	-0.002 (0.006)	-0.001
Constant	-1.859** (0.796)		-2.021** (0.931)	
Number of Observations	3755	3755	3755	3755
Log Likelihood	-1560.27	-1560.27	-1617.79	-1617.79

* Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level
Notes: (City) clustered robust standard errors in parentheses; all models include state fixed effects (results not presented).

Table 3: Effects of Poor Child Health on Cash Assistance Participation, by Subgroup

	TANF		TANF and/or SSI	
	Marginal Effect (z)	Sample Mean	Marginal Effect (z)	Sample Mean
Full Sample n=3755	.049 (1.64)	.238	.163 (3.61)	.256
Medicaid Births Only n=2353	.071 (1.50)	.325	.175 (3.49)	.345
Non-College Graduates Only n=3322	.062 (1.77)	.266	.184 (3.61)	.286
U.S.-Born Only n=3169	.054 (1.46)	.264	.181 (3.62)	.285

Table 4: Effects of Poor Child Health on Reliance on Different Types of In-Kind Public Support, by Subgroup

	Food Stamps		WIC		Medicaid		Housing	
	Marginal Effect (z)	Sample Mean	Marginal Effect (z)	Sample Mean	Marginal Effect (z)	Sample Mean	Marginal Effect (z)	Sample Mean
Full Sample n=3755	.006 (.12)	.361	.005 (.17)	.720	.081 (1.39)	.556	.041 (1.73)	.196
Medicaid Births Only n=2353	-.003 (-.04)	.489	-.017 (-.65)	.866	.041 (.99)	.734	.098 (3.43)	.263
Non-College Graduates Only n=3322	-.007 (-.12)	.403	-.000 (-.00)	.788	.089 (1.77)	.611	.052 (1.83)	.218
U.S.-Born Only n=3169	.027 (.46)	.393	.018 (.60)	.720	.121 (2.00)	.562	.050 (1.78)	.205

Appendix Table 1(a): Bivariate Probit Estimates for TANF

	TANF	Child is in Poor Health
	Coefficient (Standard Error)	Coefficient (Standard Error)
Child Quality and Quantity		
Child is in Poor Health	0.546 (0.610	
Child is Male	0.028 (0.061)	0.109* (0.062)
Parents Have Other Child(ren) Together	0.185*** (0.071)	-0.095 (0.098)
Mother Has Child(ren) with Other Father(s)	0.314*** (0.078)	-0.008 (0.066)
Father Has Child(ren) with Other Mother(s)	0.135* (0.077)	-0.091 (0.084)
Parents' Relationship at Baseline		
# Months Mother Knew Father	-0.001 (0.001)	0.000 (0.001)
Cohabiting	0.544 (0.079)	0.146 (0.124)
Romantic or Friends	0.798*** (0.118	0.311** (0.147)
Rarely/Never Talk	1.001*** (0.140)	0.157 (0.225)
Mother Characteristics		
Age	-0.044 (0.035)	-0.026 (0.054)
Age Squared	0.001 (0.001)	0.001 (0.001)
High School Grad	-0.197** (0.089)	0.013 (0.082)
Some College	-0.374*** (0.108)	-0.003 (0.072)
College Grad	-0.764*** (0.156)	0.138 (0.120)
Medicaid Birth	0.399*** (0.064)	0.183* (0.101)

Appendix Table 1(a): Bivariate Probit Estimates for TANF

	TANF	Child is in Poor Health
	Coefficient (Standard Error)	Coefficient (Standard Error)
Mother Characteristics (continued)		
Hispanic	0.090 (0.110)	-0.321*** (0.109)
African-American	0.268* (0.137)	-0.031 (0.105)
Non-White/Non-African-American/Non-Hispanic	0.101 (0.183)	0.029 (0.239)
Immigrant	-0.571*** (0.108)	-0.001 (0.149)
Lived with Both Parents At Age 15	-0.120*** (0.042)	-0.015 (0.090)
Worked Within 2 Years Before Birth	-0.235*** (0.059)	-0.159 (0.106)
Health Is Very Good or Excellent	-0.105* (0.059)	-0.202*** (0.077)
Attends Religious Services Several Times/Month	-0.085 (0.057)	0.155** (0.068)
# Months Since Baseline Interview (Child's Age)	-0.026*** (0.010)	
Father Characteristics		
Age	0.035 (0.024)	0.062 (0.037)
Age Squared	-0.001* (0.000)	-0.001 (0.001)
High School Grad	-0.173*** (0.050)	-0.033 (0.084)
Some College	-0.212*** (0.080)	-0.245*** (0.082)
College Grad	-0.313 (0.197)	-0.395* (0.208)
Hispanic	0.013 (0.084)	0.216** (0.108)
African-American	0.216** (0.100)	-0.018 (0.126)

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	TANF	Child is in Poor Health
	Coefficient (Standard Error)	Coefficient (Standard Error)
Father Characteristics (continued)		
Non-White/Non-African-American/Non-Hispanic	0.248 (0.163)	-0.102 (0.247)
Health is Very Good or Excellent	-0.009 (0.049)	0.069 (0.070)
Health Status Missing	0.219** (0.100)	-0.160 (0.114)
City Characteristics		
Unemployment Rate	0.164*** (0.018)	
Average Full-Time Female Earnings	0.000*** (0.000)	
Price of Cigarettes		0.012** (0.005)
Cost of Living	-.012** (.006)	
# Ob/gyns per 10,000 Women		0.007 (0.007)
Constant	-1.855** (0.781)	-2.962*** (0.734)
Number of Observations	3755	3755
Rho	-.169 (.275)	-.169 (.275)
Log Likelihood	-2261.35	-2261.35

* significant at 10%; ** significant at 5%; *** significant at 1%

	TANF and/or SSI	Child is in Poor Health
	Coefficient (Standard Error)	Coefficient (Standard Error)
Child Quality and Quantity		
Child is in Poor Health	0.473 (0.341)	
Child is Male	0.075 (0.054)	0.105* (0.060)
Parents Have Other Child(ren) Together	0.145** (0.067)	-0.100 (0.097)
Mother Has Child(ren) with Other Father(s)	0.260*** (0.069)	-0.009 (0.070)
Father Has Child(ren) with Other Mother(s)	0.138* (0.073)	-0.086 (0.086)
Parents' Relationship at Baseline		
# Months Mother Knew Father	-0.000 (0.001)	0.000 (0.001)
Cohabiting	0.524*** (0.090)	0.146 (0.126)
Romantic or Friends	0.746*** (0.107)	0.311** (0.147)
Rarely/Never Talk	0.993*** (0.143)	0.142 (0.233)
Mother Characteristics		
Age	-0.013 (0.041)	-0.029 (0.054)
Age Squared	0.000 (0.001)	0.001 (0.001)
High School Grad	-0.219** (0.088)	0.002 (0.072)
Some College	-0.400*** (0.097)	-0.016 (0.065)
College Grad	-0.776*** (0.157)	0.125 (0.116)

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Appendix Table 1(b): Bivariate Probit Results for TANF and/or SSI

	TANF and/or SSI	Child is in Poor Health
	Coefficient (Standard Error)	Coefficient (Standard Error)
Mother's Characteristics (continued)		
Medicaid Birth	0.373*** (0.043)	0.182* (0.100)
Hispanic	0.058 (0.091)	-0.323*** (0.110)
African-American	0.274** (0.107)	-0.030 (0.106)
Non-White/Non-African-American/Non-Hispanic	0.080 (0.171)	0.029 (0.237)
Immigrant	-0.640*** (0.110)	-0.002 (0.145)
Lived with Both Parents at Age 15	-0.103** (0.041)	-0.016 (0.090)
Worked Within 2 Years Before Birth	-0.350*** (0.054)	-0.149 (0.101)
Health Is Very Good or Excellent	-0.128** (0.055)	-0.200*** (0.077)
Attends Religious Services Several Times/Month	-0.067 (0.059)	0.153** (0.068)
# Months Since Baseline Interview (Child's Age)	-0.027** (0.011)	
Father Characteristics		
Age	0.014 (0.029)	0.062 (0.039)
Age Squared	-0.000 (0.000)	-0.001 (0.001)
High School Grad	-0.145*** (0.045)	-0.030 (0.083)
Some College	-0.140** (0.069)	-0.245*** (0.080)
College Grad	-0.176 (0.150)	-0.386* (0.205)

Appendix Table 1(b): Bivariate Probit Results for TANF and/or SSI

	Received TANF	Child is in Poor Health
	Coefficient (Standard Error)	Coefficient (Standard Error)
Father Characteristics (continued)		
Hispanic	0.015 (0.100)	0.217** (0.108)
African-American	0.232** (0.095)	-0.014 (0.124)
Non-White/Non-African-American/Non-Hispanic	0.238 (0.187)	-0.092 (0.243)
Health is Very Good or Excellent	-0.024 (0.042)	0.070 (0.069)
Health Status Missing	0.187** (0.092)	-0.155 (0.118)
City Characteristics		
Unemployment Rate	0.136*** (0.018)	
Average Full-Time Female Earnings	0.000*** (0.000)	
Price of Cigarettes		0.012** (0.005)
Cost of Living	-0.002 (0.006)	
# Ob/gyns per 10,000 Women		0.008 (0.007)
Constant	-2.022** (0.934)	-2.922*** (0.757)
Number of Observations	3755	3755
Rho	.025 (.161)	.025 (.161)
Log Likelihood	-2319.00	-2319.00

* significant at 10%; ** significant at 5%; *** significant at 1%