MOTHERS' LABOR SUPPLY IN FRAGILE FAMILIES:

THE ROLE OF CHILD HEALTH

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INTRODUCTION

A growing body of research indicates that low socioeconomic status in early childhood sets the stage for increasing disadvantages in both health and educational capital over the child's life course and can cause low socioeconomic status to persist for generations. Case, Lubotsky & Paxson [2002] examined why children from families with low socioeconomic status have poor health and why the health differential between poor and non-poor children gets larger at older ages. They presented a model in which a child's health deteriorates because of a health shock, the negative effects of which can be offset, at least in part, by parental investments in his or her health. Because wealthier parents can invest more in their children's health and because older children have been subjected to more shocks, the difference in child health between poor and non-poor children increases with age. Currie & Stabile [2003] extended the analysis by investigating whether poor children are less able to recover from each health shock or whether they tend to experience a greater number of shocks. They found that the latter explains the widening socioeconomic gap in child health with age.

These recent studies have focused primarily on causality in one direction, from income to health, but have suggested that feedback from child health to parents' income may play a role in shaping children's health trajectories. Other research, including a recent study of the effects of child health on parents' relationship stability [Reichman, Corman & Noonan 2004], suggests that child health does affect family

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Eastern Economic Journal, Vol. 31, No. 4, Fall, 2005

resources and supports the notion that child health and family income interactively and jointly determine children's health and economic trajectories.

We estimate the effects of poor child health on one potential source of financial resources available to the child—the mother's labor supply. The time commitment involved in caring for a child in poor health may inhibit the mother's ability to participate in the labor market, resulting in both lower family income and reduced ability to invest in the child's health. Thus, children born in poor health may be at risk for adverse long-term health and economic outcomes both directly (because they have the health condition) and indirectly (through family income). We use a national sample of mostly unwed parents and their children—a group at high risk of living in poverty—to investigate the second issue in the post welfare reform era.

BACKGROUND

Having a child in poor health imposes additional time and financial constraints for mothers that can impact their labor supply, and ultimately, the financial resources available to the child.[1] The added time constraints would imply reduced labor force participation, whereas additional financial constraints might lead to increased labor force participation. Children's health problems also may increase the cost of child care and reduce its availability, which would likely reduce mothers' labor force participation. The net effects of these child health-related push and pull factors on the labor supply of mothers have been estimated in a number of studies, but few have analyzed data collected after the implementation of the Personal Responsibility and Work Opportunity Reconciliation Act [PRWORA] legislation of 1996, which may have dramatically altered the equation by imposing new pressure on mothers of young children to work. Below we review the previous literature of the effects of poor child health on maternal labor supply and identify our contributions to this literature.

Powers [2003] provides an excellent review of the early literature on the effects of poor child health on labor supply of the mother, including results from Powers [2001] that investigated this issue using the School Enrollment Supplement to the October 1992 Current Population Survey. Most of the twelve studies she reviewed found reduced labor force participation among mothers of disabled children; a few found no effects. Although the studies varied considerably in the way they defined child disability, they used similar sets of control variables, which included maternal sociodemographic characteristics, family structure, and regional economic conditions. Many also included policy variables, such as the generosity of state welfare benefits. The studies tended to focus on unmarried mothers, although a few also analyzed the labor supply of married mothers. All used data that predated welfare reform.

Several additional recent studies have contributed to the growing literature on this topic. Norberg [1998] used the 1994 wave of the National Longitudinal Survey of Youth [NLSY] to examine mothers' labor force participation one, two, three, four, and five years after the birth of their children. She incorporated medical information about the child at the time of the birth: whether the child had been growth retarded in utero, whether the child had been born preterm, whether the child had an extended length of hospitalization after birth, and whether the child had any birth defects. She

found that certain high-risk health problems at birth reduce the mother's labor force participation, and that the effects are stronger in years 3, 4, and 5 than in years 1 and 2, controlling for whether the mother had a male partner at baseline, her work history, her cognitive ability, and many other maternal characteristics.

Case, Lubotsky & Paxson [2002] used data from the 1997 Panel Survey of Income Dynamics [PSID] to examine health trajectories of children by family socioeconomic status. They found that differences in child health between poor and non-poor children increase with age, largely because parental investments in their children's health are inversely related to income. Although their primary focus was on the effects of income on child health, they did suggest that child health could affect income. In testing for causality in this (reverse) direction, they found that a child being low birth weight or having been in a neonatal intensive care unit had no association with parents' labor force participation or hours of work in each of the first three years of the child's life.

Kuhlthau and Perrin [2001], in a cross-sectional analysis using the 1994 National Health Interview Survey [NHIS], found that having a child with poor health status (measured by general reported health, hospitalizations, activity limitations, and chronic condition or disability status of the child with the poorest health status in the family) is negatively associated with the probability that the mother is employed. Earle and Heymann [2002] used a sample of former welfare recipients from the NLSY to investigate the effect of poor child health on job loss. They found that former welfare recipients are 33 percent more likely to experience a job loss if they have a child with an activity or school-related limitation. Porterfield [2002] used 1992 Survey of Income and Program Participation (SIPP) data to examine the effect of having a child age 0-19 with a disability (defined as having a developmental disorder for children under age six, and having any limitation on activities of daily living for children aged 6-19) on the mother's decision to work part-time, full-time, or not at all. She found that having a young disabled child is a strong disincentive to working full-time for both married and unmarried mothers, and that it is also a disincentive to working part-time [versus not working] among married mothers.

Powers [2003], using the 1991-1992 SIPP, considered the effects of poor child health among children aged 0-21 on their mothers' hours worked, using a number of alternative measures of poor child health based on respondents' reports of physical activity limitations, schooling activity limitations, participation in therapy or diagnostic services, receipt of Supplemental Security Income, physical limitations in daily living, and specific diagnoses such as autism, mental retardation, or use of walking aids. She found that child disability is associated with decreased employment and hours of work among both unmarried and married mothers. In models of changes in labor force participation and hours worked, she found significant effects for married mothers.

Fewer studies have investigated the effects of child health on mothers' labor supply post welfare reform. 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. Wise et al. [2002], who investigated the association 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) with mothers' labor force participation using the 1998 NHIS, found that mothers with unhealthy children are less likely to work than those with healthy children. Loprest and Davidoff [2004], using the 2000 NHIS, found that low-income single mothers of children with activity limitations are less likely to be employed and worked fewer hours than those whose children do not have activity limitations, but that the same is not true for mothers of children with specific chronic conditions or enrolled in special services. All four of these studies used cross sectional data on children in wide age ranges.

Bednarek and Hudson [2003] used data from the Medical Expenditure Panel Survey from 1996-1999 to estimate the effects on maternal labor supply (participation, full time/part time/not at all, and hours) of having a child age 0-17 with physical or cognitive limitations, enrollment in special education or related services, or behavioral and emotional problems (determined from the Columbia Impairment Scale). They found that child disability is negatively associated with most measures of maternal labor supply. Gould [2004], using the 1997 PSID Child Development Supplement (collected shortly after the PRWORA legislation), found that after controlling for the financial burden of the illness, single mothers work fewer hours if their child has a time-intensive illness. They also found that married mothers are less likely to work and work fewer hours if their child has a severe condition with an unpredictable time component. It is possible that the differences found in this study vis-à-vis severity apply more to older children than to infants.

In the present study, we estimate the effects of poor child health on the labor supply of mostly poor and unwed mothers with one-year-old children. Our key contributions are that we: [1] incorporate detailed father variables, including age, education, and health status, even when the parents are not living together; [2] consider a range of parental relationships rather than a marital/nonmarital dichotomy; [3] consider whether the mother and father each have children with other partners, which can complicate the allocation of parents' time and financial resources within families; [4] test for potential endogeneity of child health; [5] use a longitudinal data set on a birth cohort of children so that the temporal ordering of events is clear and the analysis is not complicated by differential timing of births or ages of children; [6] analyze data 4-5 years after the 1996 welfare reform legislation, as low income mothers have faced increasing pressures to work; and [7] include the mother's employment and both parents' health status at the time of the birth, as well as local labor market conditions.

ANALYTICAL FRAMEWORK

We consider the following model to analyze the effect of poor child health on a mother's labor supply:

(1) Mother's labor supply = f(Own wage rate, wage rate of child's father, quality and quantity of children, labor market opportunities, availability of public support, μ)

A mother's labor supply is a function of her earnings capacity (wage), the child's father's wage, the quality and quantity of their children (together and with other partners), labor market opportunities, and the availability of public support. The labor supply 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, and their local labor market opportunities and policy environments. 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 is likely to play a role in decisions about maternal labor supply. We focus on the labor supply effects of one measure of child quality—child health, but we also consider the child's gender.[2] For quantity of children, we include whether the parents have other children together and whether each has children with another partner. For local labor markets, we include city unemployment rates and average wages. Finally, we include state fixed effects.

DATA

The Fragile Families and Child Wellbeing Study follows a cohort of new parents and their children in 20 U.S. cities (in 15 states). The study was designed to take a longitudinal look at the conditions and capabilities of new (mostly unwed) parents, the nature and trajectories of their relationships, and the long-term consequences for parents and children of welfare and child support reform. The data, when weighted, are representative of births in U.S. cities with populations over 200,000. Both mothers and fathers were interviewed in the hospital at the time of the birth (fathers were interviewed by telephone or in-person outside of the hospital when the interview was not completed in the hospital), and again when the child was one year old.[3] Baseline interviews were conducted with 4,898 mothers from 1998 to 2000; 89 percent of the mothers who completed baseline interviews were re-interviewed when their children were between 12 and 18 months old.

The Fragile Families data are well suited for analyzing the effects of child health on maternal labor supply because they were collected as part of a longitudinal birth cohort study and include: [1] considerable detail about labor force activity, [2] characteristics [e.g., health and human capital] of fathers as well as mothers, and [3] detailed information on the parents' relationship status, living arrangements, and other children (together and with other partners).

DESCRIPTIVE ANALYSIS

The purpose of this paper is to estimate the effects of poor child health on mothers' labor supply. Below we describe the measures we use in our analyses, present summary statistics (in Table 1), and point out many salient characteristics of the sample. Unless indicated otherwise, all individual level characteristics 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 father's data

TABLE 1
Sample Characteristics (Proportions, unless indicated otherwise)

	Full Sample (Currently Working) **n=3933**	**Sub-Sample** (Hours Worked) **n=3885**
Mother is Currently Working	.54	
Number of Hours Mother Works Per Week		19.7
Child Quality and Quantity		
Child is in Poor Health	.05	.05
Child is Male	.53	.53
Parents Have Other Child(ren) Together	.32	.32
Mother Has Child(ren) with Other Father(s)	.33	.33
Father Has Child(ren) with Other Mother(s)	.34	.34
Parents' Relationship at Baseline		
# Months Mother Knew Father (mean)	59.0	58.8
Married*	.26	.26
Cohabiting	.37	.37
Romantic or Friends	.32	.32
Rarely/Never Talk	.05	.05
Mother Characteristics		
Age (mean in years)	25.1	25.1
Less than High School*	.34	.33
High School Graduate	.30	.30
Some College	.25	.25
College Graduate	.11	.12
Medicaid	.62	.61
White/Non-Hispanic*	.22	.22
Hispanic	.27	.27
Non-White/Non-Hispanic	.51	.51
Immigrant	.16	.16
Lived with Both Parents at Age 15	.43	.43
Worked Within 2 years Before Birth	.81	.81
Attends Religious Services Several Times/Month	.39	.39
Health is Very Good or Excellent	.67	.67
Father Characteristics		
Age (mean in years)	27.7	27.7
Less than High School*	.33	.31
High School Graduate	.34	.35
Some College	.22	.23
College Graduate	.11	.11
White/Non-Hispanic	.20	.20
Hispanic	.27	.27
Non-White/Non-Hispanic	.53	.53
Health is Very Good or Excellent	.60	.61
Health Status Missing	.16	.16
# Months Between Baseline and Follow-up Interviews (mean)	14.5	14.5

TABLE 1 (cont.)
Sample Characteristics (Proportions, unless indicated otherwise)

	Full Sample (Currently Working) **n=3933**	**Sub-Sample** (Hours Worked) **n=3885**
Area and Hospital Characteristics†		
City Unemployment Rate (mean)	5.4	5.4
Average Full-Time Female Earnings in City (mean, in thousands of dollars)	28.3	28.3
# Adoption Agencies per 10,000 Women Aged 15-44 in City (mean)	.53	.53
Level III NICU in birth hospital	.87	.87

* 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/DTGeoSearchByList Servlet?ds_name=DEC_2000_SF1_U&_lang=en&_ts=73400311652; data on Level III NICUs were collected by the authors and verified against data from the American Hospital Association (1998); data on adoption providers were obtained from the National Adoption Information Clearinghouse at the following link http://www.calib.com/naic/database/nadd/naddsearch.cfm

are missing, we use mother reports about the father if these are available. We exclude multiple births from all analyses.

We estimate the following outcomes: [1] whether the mother was employed at the time of the follow-up interview [N = 3933], and [2] the number of hours that she worked the week prior to her follow-up interview [N = 3885]. The difference in sample size is due to missing data on hours worked for 48 mothers. Table 1 shows that over half (54 percent) of the mothers were employed. The average number of hours of work per week for all mothers (both working and non-working) was 19.7; the corresponding figure for mothers who were working was 36 hours per week (not shown in table).

Table 1 also presents the characteristics of the children, mothers, and fathers, as well as other measures that we include in our models. As discussed earlier, we consider several measures of both child quality and quantity. 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 (2.5 percent),[4] the mother reported at follow-up that the child had a physical disability (2.4 percent), or the child was at least 12 months old at follow-up and had neither walked nor crawled (0.9 percent) (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 health problems). Our goal is to identify children with a serious health shock from birth. Five percent of the children in our sample meet the criterion for having poor child health.[5]

We also include the gender of the focal child, 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.[6]

We go beyond whether the father was present in the mother's household to characterize the parents' relationship; we consider whether the parents were married, cohabiting, romantically involved or friends, or rarely or never talked. About three quarters of the new parents were not married at baseline; about half of those lived together. Additionally, we include a variable indicating how long the parents had known each other (in months) at the time of the child's birth.

Both educational attainment and Medicaid (whether the birth was covered by Medicaid) are included as proxies for poverty status. With over half of the births covered by Medicaid, it is clear that a large proportion of the sample is poor or near-poor.

We take advantage of the longitudinal nature of our data by estimating models that control for mother's labor supply at baseline, which we characterize by whether or not she had worked at all in the two years prior to the birth of the child (over 80 percent of mothers had done so). We use this measure rather than her actual employment status at the time of a life event (childbirth) that could have had temporary effects on employment. We also include: [1] the number of months between the mother's baseline and follow-up interviews, in order to control for the length of time during which the mother could have participated in the labor market; and [2] whether the mother rated her own health as very good or excellent (vs. good, fair, or poor) at baseline, in order to disentangle the effects of the child's health from that of the mother.

We have excellent information on the father even when he was not present in the household. In addition to his education and race, we have information on his health status; well over half of interviewed fathers reported at baseline that they were in very good or excellent health (the proportion for mothers is somewhat higher, at about two thirds). Since we do not have mothers' reports on fathers' health status, we include a dummy variable for cases with missing paternal health status.

Finally, we include city unemployment rates and wages to characterize local labor markets; adoption and neonatal intensive care availability as identifiers for poor child health (these will be discussed later in the modeling strategy section); and the mother's baseline state of residence to capture state policies and environments that may impact parents' family formation behaviors, reliance on public assistance, and labor market participation.

MODELING STRATEGY

As discussed earlier, having a child in poor health increases a mother's financial and time constraints and, as a result, her labor supply may either increase or decrease. To estimate the effect of poor child health, we operationalize Equation (1) as follows:

(2) Mother's labor supply = f (child health, other measures of child quality, child quantity, mother and father characteristics, city labor market characteristics, state policy and economic environments, μ)

When the labor supply variable is dichotomous, we estimate Equation (2) using a probit specification. When estimating hours of work, we use Tobit models.

Estimation of Equation (2) would be straightforward if child health were truly random [exogenous]. It is possible, however, that despite our best efforts at measuring true health shocks, we may capture non-random components of child health that are correlated with unobserved determinants of the mother's labor supply [μ] that even the state fixed effects do not eliminate. If so, our measure of child health would be endogenous and its estimated effect on mother's labor supply would be biased.

To account for the possibility that child health is endogenous, we used a full-information maximum likelihood estimator based on both the labor force participation equation and a second equation that estimated poor child health. We assumed that the error terms in both equations were normally distributed and allowed for the possibility that they were correlated. This joint estimation allowed us to test whether child health is endogenous [if it is, the correlation between the error terms, ρ, would be significant].[7]

For the labor force participation equations, we used a bivariate probit specification because the outcome measures are dichotomous. For the identifiers to be valid, they needed to satisfy two conditions: They had to be significant predictors of poor child health (prediction) and they had to be uncorrelated with the mother's labor supply after controlling for poor child health and the other covariates (exclusion). When these two conditions are met, if ρ 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.[8]

The number of hours worked is a censored variable, and under the assumption of normality it can be estimated using a Tobit model. To account for the potential endogeneity of child health for this outcome, we used Limited Information Maximum Likelihood to estimate a two-step probit model. In the first step, we estimated poor child health and calculated predicted values. We then used the predicted values of poor child health in the second step to estimate hours of work using a Tobit model, and adjusted the standard errors per Murphy & Topel [1985].

The two conditions mentioned above were satisfied with the following two identifiers: the number of adoption agencies (public or private) per 10,000 women in the city in which the child was born and the presence (or lack thereof) of a Level III neonatal intensive care unit (NICU) in the hospital where the baby was delivered. The former may be related to the wantedness of the birth, given that the mother did not place the child for adoption (and therefore was eligible to participate in the study). The latter reflects availability of neonatal care technology.

RESULTS

As discussed above, we first estimated two-step models to allow us to test for the endogeneity of child health. Our two identifiers (adoption availability and whether the hospital had a Level III NICU) satisfied both the prediction and exclusion conditions discussed above, and the error terms in the labor supply and child health equations

TABLE 2
Effect of Child, Mother, Father, Relationship, and Labor Market Characteristics on Mother's Labor Supply

	Mother Currently Working		Mother's Hours of Work	
	Probit		Tobit	
	Coefficient (standard error)	Marginal Effect	Coefficient (standard error)	Marginal Effect
Child Quality and Quantity				
Child is in Poor Health	-.21**	-.08	-5.23**	-3.23
	(.10)		(2.54)	
Child is Male	.03	.01	.48	.30
	(.05)		(1.21)	
Parents Have Other Child(ren) Together	-.00	-.00	.18	.11
	(.04)		(.70)	
Mother Has Child(ren) with Other Father(s)	.01	.01	.74	.46
	(.06)		(1.40)	
Father Has Child(ren) with Other Mother(s)	.09*	.04	2.87**	1.77
	(.05)		(1.27)	
Parents' Relationship at Baseline				
# Months Mother Knew Father	.00	.00	.00	.00
	(.00)		(.01)	
Cohabiting	.18***	.07	4.54***	2.81
	(.06)		(1.11)	
Romantic or Friends	.18**	.07	3.22*	1.99
	(.09)		(1.85)	
Rarely/Never Talk	.21	.08	4.79	2.96
	(.14)		(3.22)	
Mother Characteristics				
Age	.10***	.04	2.37***	1.46
	(.02)		(.61)	
Age Squared	-.00***	-.00	-.04***	-.02
	(.00)		(.01)	
High School Graduate	.32***	.13	9.93***	6.14
	(.05)		(1.54)	
Some College	.62***	.24	16.21***	10.01
	(.08)		(2.23)	
College Graduate	.74***	.27	19.72***	12.18
	(.13)		(3.14)	
Medicaid	-.35***	-.14	-7.47***	-4.61
	(.05)		(1.24)	
Hispanic	.17*	.07	4.23*	2.61
	(.09)		(2.23)	
Non-White/Non-Hispanic	-.03	-.01	-.17	-.10
	(.11)		(2.60)	
Immigrant	-.09	-.04	-2.38	-1.47
	(.08)		(2.21)	
Lived with Both Parents at Age 15	-.02	-.01	-.36	-.22
	(.05)		(1.08)	
Worked Within 2 Years Before Birth	1.05***	.39	29.69***	18.34
	(.04)		(2.60)	
Attends Religious Services Several Times/Month	-.02	-.01	-1.33	-.82
	(.04)		(.93)	
Health is Very Good or Excellent	.00	.00	-.36***	-.22
	(.05)		(1.19)	

TABLE 2 (cont.)
Effect of Child, Mother, Father, Relationship, and Labor Market Characteristics on Mother's Labor Supply

	Mother Currently Working		Mother's Hours of Work	
	Probit		Tobit	
	Coefficient (standard error)	Marginal Effect	Coefficient (standard error)	Marginal Effect
Father Characteristics				
Age	-.04**	-.02	-1.05**	-.65
	(.02)		(.40)	
Age Squared	.00*	.00	.01**	.01
	(.00)		(.55)	
High School Graduate	-.02	-.01	-.59	-.36
	(.03)		(.82)	
Some College	.05	.02	1.26	.78
	(.05)		(1.07)	
College Graduate	-.10	-.04	-3.47	-2.15
	(.11)		(2.40)	
Hispanic	-.02	-.01	1.23	.76
	(.09)		(2.29)	
Non-White/Non-Hispanic	.18**	.07	7.17***	4.43
	(.09)		(2.38)	
Health is Very Good or Excellent	-.02	-.01	-.60	-.37
	(.08)		(1.74)	
Health Status Missing	.08	.03	1.81	1.12
	(.08)		(1.86)	
Local Labor Market				
City Unemployment Rate	.08**	.03	1.69*	1.04
	(.04)		(.90)	
Average Full-Time Female Earnings in City	.07***	.03	1.61***	1.00
	(.02)		(.54)	
# Months Between Baseline and Follow-up Interviews	.01*	.00	.52***	.32
	(.01)		(.15)	
Number of Observations	3933		3885	
Log Likelihood	-2,318.37		-11,428.08	

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

were uncorrelated. Thus, we are confident that child health is not endogenous to mother's labor supply in our models and do not need to rely on the two-step estimations.[9] In Table 2, we present single-equation results for mother's labor force participation and hours of work. Standard errors are corrected for city clustering of observations using the Huber-White method. All models include state fixed effects (coefficients of state dummies not shown).

In the first column of results, we present probit estimates for whether the mother was employed at the time of the follow-up interview.[10] Because the coefficients in

probit models are not easy to interpret, we also present marginal effects. We find that having a child in poor health decreases the likelihood that a mother will work by an average of eight percentage points, with a range of about 1 to 16 percentage points.[11] This estimate is in the range of that found by others [Powers 2003 and several studies reviewed in that article; Porterfield 2002; Norberg 1998].

Several other measures of child quality and/or quantity also significantly affect whether mothers participate in the labor force. As explained earlier, we distinguish between the existence of full biological siblings, mother's children with other partners, and father's children with other partners.[12] We find that having other children with either the father or another partner does not affect the mother's likelihood of being employed, net of the other covariates, but that the father having children with another partner increases the likelihood that the mother will participate in the labor market by four percentage points. It appears that many mothers are working to compensate for resources being diverted to their partners' other children.

The relationship status of the parents at the time of the child's birth is significantly associated with the mother's labor force participation one year later. Unmarried mothers are about 7 percentage points more likely to work than women who were married at baseline, with similar effects (compared to married) for each of the three relationship status categories.[13] Thus, it appears that marital status may be a more relevant distinction than co-residence (i.e., being married *or* cohabiting) in determining maternal labor force participation.

Generally, mother's characteristics affect her labor force participation in the expected directions; for example, mothers who worked in the two years prior to the birth of the focal child were significantly more likely to work at the time of the follow-up interview (it increases the likelihood by almost 40 percentage points) and the likelihood of employment increases with education.

We included father characteristics even when the mother was neither married to nor cohabiting with the father because [1] ninety-five percent of the unmarried parents in the sample of 3,933 births were in some type of relationship with one another at the time of the birth; [2] almost 80 percent of unmarried mothers receive financial support from the father during the child's first year [Nepomnyaschy 2003]; and [3] relationships among unmarried parents tend to be quite fluid [Graefe & Lichter 1999], with some new parents entering cohabiting unions or forming more serious relationships after the birth of their child [Carlson, McLanahan & England 2004]. After controlling for the mother's own characteristics, child characteristics, the parents' relationship status, and the other covariates, we find that father's demographic characteristics, as a group, significantly impact mother's labor force participation at the 1 percent level [result not shown].

Mother's labor force participation is positively related to both the average wage rate for females of childbearing age and the unemployment rate in her city. High wages are an incentive to participate in the labor market and also tend to be correlated with cost of living, which may increase labor market participation. The positive association we find between labor force participation and city unemployment rate may reflect an "added worker effect," in that mothers may be working to compensate for earnings of family members who are unemployed or in jeopardy of losing their jobs.

In the next two columns, we present Tobit results for the number of hours the mother works per week, as well as marginal effects that represent the average change in hours for the 54 percent of mothers who are working. Having a young child in poor health significantly reduces the number of hours that employed women work—by over three per week; this result is consistent with that found by Bednarek & Hudson [2003]. Having other children with the father or with another partner has no effect on the mother's hours of work, but again, the father having children with another partner has a significant effect—it increases her work effort, on average, by almost two hours per week. Thus, not only are mothers more likely to work, but those who are employed are also more likely to work a greater number of hours when their partners have children with other mothers.

Mothers who were not married to their children's fathers at baseline work two to three more hours per week than mothers who were married, all else equal. Again, the effects of mother and father characteristics are generally as expected (and consistent with those for labor force participation) and father's characteristics, as a group, are significant predictors of mother's hours of work (latter result not shown). Employed mothers with a high school education work an average of six more hours per week, and those with a college education work 10-12 more hours, than their counterparts with less than a high school education. Employed mothers who had worked during the two years prior to the birth worked 18 more hours per week than those who had not.

TABLE 3
Marginal Effects of Poor Child Health on Mother's Current Employment Status, for Selected Subgroups of Mothers

	Number of Observations	Child is in Poor Health
Married	1017	.02
Not Married	2916	-.11*
Less than High School Education	1295	.01
High School Education	1189	-.19**
More than High School Education	1449	-.05
Younger than 21	1380	-.05
21 and Older	2551	-.11*

* Significant at 5 percent level;
** Significant at 1 percent level

Finally, we investigated whether the effect of having a child in poor health on labor force participation interacts with some of the other covariates. We estimated probit models for a number of subgroups according to marital status, maternal age, and maternal education. The marginal effects are presented in Table 3. Because cell sizes become quite small in many of the subgroup analyses, the results are not always conclusive and should be interpreted with caution. That said, poor child health decreases the likelihood of employment by over 11 percentage points among unmarried mothers, but appears to have no effect on employment among married mothers. Similarly, poor child health decreases the likelihood of employment by over 11 percentage points among mothers age 21 or older, but has no significant effect among younger mothers.[14] Finally, poor child health has a large effect on employment among moth-

ers with a high school education (a 19 percentage point reduction), but insignificant effects among both mothers who have not completed high school and those who have attended at least some college. These results suggest that the effects of poor child health are greatest among mothers with adequate job skills and a high propensity to work to begin with, but relatively modest earnings capacity—older, unmarried, high school educated mothers who have not attended college.

CONCLUSION

We estimated the effects of poor child health on the labor supply of mothers with one-year-old children using a national longitudinal data set that oversampled unmarried parents in the post welfare reform era. We found that having a child in poor health reduces the mother's probability of working by eight percentage points and her hours of work by three per week when she is employed. Although this may perhaps mean that the children in poor health are getting increased resources in terms of time, it may also mean that their parents' capacity to invest financially in their health is diminished, placing them at increased risk for adverse health and economic outcomes in the future.

The negative effects of poor child health on maternal labor supply are strongest for unmarried mothers, those over age 21, and those who are high school graduates—a profile of many mothers who face increasing pressure to rely on earnings from work rather than from public assistance. Another important finding is that the father having children with another partner increases the mothers' labor supply, even after controlling for the focal child's health status and numerous other covariates. These results highlight the complexities underlying the economic and health trajectories of children in fragile families.

NOTES

This paper was prepared for presentation at the Eastern Economic Association meeting in February 2004. Funding was provided by the National Poverty Center at the University of Michigan and National Institute of Child Health and Human Development [R01-HD-35301 and R01-HD-45630]. We are grateful for helpful input from William Greene, Michael Grossman, Sara Markowitz, and Jennifer Marogi.

1. Reduced maternal labor supply decreases income, which may create hardships for children and their families. However, it is possible that there are offsetting positive benefits to the child in terms of increased maternal care. Past research has found that longer maternity leave improves maternal health [Chatterji and Markowitz 2005] and infant health [Ruhm 2004, Winegarden and Bracy 1995], and that infant cognitive development is enhanced when mothers do not work full time [Brooks-Gunn, Han and Waldfogel 2002] or at all [Baum 2003].
2. Recent studies indicate that fathers tend to have higher levels of commitment to their families when they have sons rather than daughters [see, for example, Dahl and Moretti 2004].
3. Additional background on the research design of the Fragile Families and Child Wellbeing Study is available in Reichman et al. [2001].
4. In a separate analysis, we compared mother respondents' reports of birth weight with the corresponding figures from hospital records for a sub-sample of over 1800 cases. We found exact matches (to the ounce) between the maternal reports in the survey and the entries in the hospital

charts in 76 percent of the cases, and matches within 8 ounces in 94 percent of the cases. The correlation of babies birth weight from the two sources was .98. To assure adequate sample sizes for analysis, we used 4 pounds rather than the typical 3.5 pound cutoff used to designate very low birth weight.

5. The percentages for the individual measures sum to more than 5 because some children fit more than one criterion.
6. Data limitations make it impossible to ascertain whether the father had any children with another partner at the time of the baseline.
7. For a more detailed description of this estimation strategy, see Reichman, Corman and Noonan [2003].
8. Passing these two tests indicates that the equation has been overidentified.
9. Results are available from the authors upon request.
10. We ran additional probit models for whether the mother had worked at all since the birth of the child. Results from this alternative definition of maternal labor market participation were very similar to those shown here for "current" labor market participation. Results from these auxiliary models are available from the authors upon request.
11. The range indicates the 95 percent confidence interval of the estimate.
12. It is important to note that the existence of other children may be endogenous, as may some of the other covariates. For example, women with a greater taste for working may have fewer children (see, for example, Nakamura & Nakamura 1994). The results should be interpreted with this in mind.
13. For the last group (those who had no relationship with the father), the effect is not statistically significant.
14. Sample sizes precluded assessing effects for teenage mothers.

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