Making Time for Well-Baby Care: The Effect of Maternal Employment and Paid and Unpaid Time Off*

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ABSTRACT

The American Academy of Pediatrics (AAP) recommends children receive six well-baby visits in the first year of life. By 12 months, the average baby has received less than two well-baby visits. Cost sharing under public and private insurance is very low. The fact that compliance rates are low despite the low cost of care suggests other factors, such as time costs, may be important. This paper examines the relationship between maternal employment and receipt of well-baby care among infants using the Medical Expenditure Panel Survey (MEPS). Findings suggest full time maternal employment does reduce the amount of care received but this relationship operates primarily at the extensive margin and is fully offset by access to paid vacation leave.

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Introduction

The American Academy of Pediatrics (AAP) recommends children receive six well-baby visits at regular intervals over the first year of life. By age 12 months, the average baby has received only 2 well-baby care visits.[3] Cost sharing for well-baby care under public and private insurance is very low. The fact that compliance rates are so low despite the low cost of care suggests other factors, such as time costs, may be especially important.

One-third of mothers return to work during the first three months of their baby's life (Klerman and Leibowitz 1990, 1994, 1999; Smith and Bachu 1999). For these mothers, well-baby care must either be scheduled around work hours, or time off work must be obtained. Among employed mothers, paid and unpaid leave and part-time work may help to enable employed mothers to take their babies to routine doctor visits.

This paper examines the following questions: First, does maternal employment compete with receipt of recommended well-baby care? Second, does access to employer provided paid leave or unpaid leave under the Family and Medical Leave Act (FMLA) help employed mothers find time to take their infants to routine visits? To do so, I specify and estimate the derived demand for preventive care using the Medical Expenditure Panel Survey. This paper contributes to the existing literature by providing reduced form estimates of the demand function underlying many of the empirical models estimated in previous studies. Although the signs of the demand function parameters support evidence of negative own and cross price effects and positive income effects presented in previous studies, the cross price elasticity estimates are not significant at conventional levels. However, other specifications provide suggestive evidence of a negative relationship between full time maternal employment and receipt of care. This relationship is robust to several attempts to account for endogeneity of maternal employment.

[3] Author's tabulation using 1996 through 2006 Medical Expenditure Panel Survey data.

Furthermore, access to paid vacation fully offsets the negative relationship between hours of work and receipt of care among employed mothers.

What is Well-Baby Care?

Well-baby care aims to prevent infant mortality and promote health. The anticipatory guidance provided during visits specifically targets avoidable risks common in early infancy and childhood including Sudden Infant Death Syndrome, accidents, and injuries. Although the risk of death is highest at the time of birth and during the first few hours and days of life, 10 percent of all infant deaths in 2003, and 34 percent of those which occurred after the perinatal period and were not associated with congenital abnormalities, were due to Sudden Infant Death Syndrome (SIDS), accidents or unintentional injury (Hoyert et al. 2003). Since proper sleep position guidance was first publicized in 1992, the percentage of infants placed on their backs to sleep increased from 13 percent to 72.8 percent and the rate of SIDS fell by over 50 percent (National Institute of Child Health and Human Development 2008). Although parents could have received sleep position guidance from a variety of sources, a portion of each well-baby care visit is specifically devoted to parent physician dialogue regarding proper sleep position and other age-appropriate preventive guidance.

Well-baby care visits also include key health screenings. Early diagnosis of existing conditions through these screenings can improve prognosis. From birth to ages 3 to 5 years, visual acuity develops from below 20/200 to near 20/20, however, early conditions such as strabismus (commonly known as “lazy eye”) can preclude development of visual acuity (Daw 1998). Research suggests the critical treatment period for strabismus and other sources of limited visual acuity (amblyomia) is between birth and age 2 years (Daw 1998). Children who receive early screening (before age 3) and treatment for amblyomia have better long run visual acuity than children who are screened and diagnosed at age 3 (Williams et al. 2002). Similarly infants, who are found to have congenital hearing loss in early infant hearing screening, have a higher likelihood of developing speech (Kaye 2006). Screenings can occur in other medical settings but well-baby care visits are specifically designed to include them and are scheduled at critical points in the child's development.

8.9 percent of 2003 deaths which occurred after the perinatal period and were not associated with congenital abnormalities were the result of infectious diseases and endocrine, nutritional or metabolic diseases (Hoyert et al. 2003). Vaccines are available for many infectious diseases. For some endocrine, nutritional and metabolic diseases, treatment can be as simple as administering vitamin supplements and maintaining routine follow-up care (Kaye 2006). The schedule of well-baby care visits includes screenings for many of these conditions. For those that cannot be detected in medical tests, routine physical examinations and developmental assessment included in all well-baby visits may lead to earlier diagnosis and treatment.

Preventive care is recommended to continue throughout childhood, adolescence and on into adulthood. However 6 of the 31 visits recommended between birth and age twenty-one are to occur before a child's first birthday. Given the higher mortality risk and the concentration of health screenings and vaccinations during those early years, the marginal benefit of preventative care is arguably higher for well-baby visits than for preventive care at older ages. Despite the importance of these visits, most studies have found babies receive significantly less than the recommended amount of care (Ronsaville and Hakim 2000; Byrd et al.1999; Maisels and Kring 1997).

Conceptual Framework

Following Colle and Grossman (1978) I assume household utility is a function of the baby's health **B**, mother's and father's leisure l_m and l_f , and consumption of all other goods *X*.

$$\psi = \psi(\mathbf{B}, L, X) \tag{1}$$

Further, baby's health is produced using well-baby visits *V* and full-income less expenditure on well-baby care M^{-} and is affected by an exogenously determined, individual specific, health endowment b_i.

$$\mathbf{B} = \gamma(V, M^{-}, b_i) \tag{2}$$

Derived utility can then be written as a function of well-baby visits, leisure, other consumption, and infant health endowment:

$$U = U(V, L, X, b_i)$$

The household chooses the number of well baby visits, amount of leisure and consumption of other goods to maximize utility subject to the following budget and time constraints and corner restrictions:

$$P'X + W^{*\prime}L + W^{*\prime}V - W^{*\prime}S + p_V V = W^*T + Y = M \tag{3}$$

$$T = V + L + H - S \tag{4}$$

$$\begin{matrix} V \geq 0 & L \geq 0 \\ H \geq 0 & S \geq 0 \end{matrix} \tag{5}$$

P is a vector of prices corresponding to the consumption goods vector *X*, *W** is the vector of maternal and paternal shadow prices of time, which for employed parents should be equal to their wage, *S* is hours of paid time off available to each parent, *Y* is non-labor income, M is full income, *T* is the total time allocated to all activities, and *H* is hours spent in market work.

To simplify the optimization problem and subsequent analysis, I assume the mother is solely responsible for taking the baby to the doctor, and father's employment and income are exogenous. Mothers accompany children under age 16 to 91 percent of doctor visits (Vistnes and Hamilton 1995). This proportion is likely to be even higher for well-baby visits. Even in the case of a stay-at-home dad, the mother will likely need to be present for well-baby care because evaluations of breast feeding and mother-infant interaction are key objectives of care. With this simplification, the optimization problem can be written as follows:

$$\max_{v,l,X} U(v,l,X,b_i) \qquad s.t.\ P_x X + w^*(l+v-s) + P_v v = M$$
$$T = v + l + h - s \tag{6}$$
$$v \geq 0; l \geq 0; h \geq 0; s \geq 0$$

v is now the total number of visits received and w^*, *l,* and *s* are now mother's shadow price of time, her time spent in leisure and the days of paid leave she has available. Optimization yields the following conditions:

$$\frac{\partial V}{\partial P_v} < 0$$
$$\frac{\partial V}{\partial s} > 0 \qquad \frac{\partial V}{\partial M} > 0 \tag{7}$$

That is, the demand for visits should be decreasing in own price and increasing in paid time off and full income. For working women, w^* must equal the wage in equilibrium (assuming no hours constraints or fixed costs of work) and thus the effect of w^* on the demand for visits will depend on the size of income and substitution effects and the relative marginal values of time spent in leisure and well-baby care. Since the out-of-pocket cost of well-baby care is $0 for the majority of privately and publicly insured infants, the sign of the cross wage elasticity for working women is likely to be negative (Acton 1973).

For non-working women, w^* is the value of time spent in leisure, which must equal the reservation wage (Coffey 1983). Since there is no income effect for non-working women, the relationship between *w** and *V* will depend only on the relative marginal values of time spent in leisure and well-baby care.

In this simple model, paid time off should operate as an income compensated decrease in wage. Which means, all else equal, a mother with paid time off will have a lower time cost of well baby visits than other working *and* non-working mothers. If the relationship between *w** and visits is negative as hypothesized, this implies working mothers with paid time off should be more likely to take their children to visits than other mothers.

Unpaid time off, in the strictest interpretation of the model, should have no effect on well-baby care since individuals are assumed to freely choose their hours of work, leisure and well-baby care. If hours constraints exist, unpaid leave can be interpreted as relaxing those constraints, and the overall effect on well-baby care will again depend on the relative marginal values of time spent in leisure and well-baby care.

Previous Studies

There is a small body of literature that has attempted to determine why well-baby care is under-utilized. Although none of these studies provide estimates of demand function parameters, the results of their analyses suggest own-price and income elasticities have the predicted signs, and the cross-price elasticity may be negative. For example, among children ages 0 to 15, Vistnes and Hamilton (1995) find the number of preventive care visits a child receives is decreasing in mother's hours worked per week and weeks worked per year. Berger et al. (2005) find mothers who return to work early (within the first twelve weeks after giving birth) are 2.4 percentage points less likely to take their babies for any well-baby care in the first year of life and their babies receive 0.20 fewer visits on average. Berger et al. use propensity score matching to address the potential endogeneity of returning to work in the OLS model and find similar results. However, Vistnes and Hamilton (2005) do not include income among the regressors and Berger et al (2005) do not include a measure of out of pocket cost of care. Therefore, their results may be biased.

Previous studies have found mixed evidence regarding the availability of paid leave. Vistnes and Hamilton (1995) find mothers with sick leave to visit the doctor are no more likely to take their children to well-baby and well-child visits than those without. Berger et al. (2005) find positive relationships between leave duration and well-baby care use. However, they estimate the relationship between leave *behavior* and receipt of care, not the relationship between leave *availability* and receipt of care. Thus their estimates are likely larger than the relationship between leave availability and well-baby care use. I am unaware of any study that has considered the influence of FMLA leave eligibility.

Other studies have found non-black, non-poor and privately insured infants, infants with more educated parents (Yu et al. 2002; Mustin et al. 1994), infants from families with fewer children and infants from households without transportation problems (Moore and Hepworth 1994) received more care than other similar infants. Furthermore, McInerny et al. (2005) find state level insurance reimbursement rates are significantly and positively related to compliance with well-baby care recommendations. These variables are all related to household income and the time and monetary costs of care. Either prices, income, or both are missing in these studies so little can be said about the magnitude of own price, cross-price and income elasticities and the relationships between these factors and well-baby care may be biased due to the omission of price and income information. However, estimated relationships between these variables and receipt of care imply the own-price and income elasticities have the predicted signs.

In a related study, Colle and Grossman (1978) estimate a demand function for pediatric care, including whether or not a child received any well-child visits, among children ages 1 through 5. They intentionally omit children under age 1 because they argue the health problems encountered by infants are distinctly different from those encountered by older children (p. 121). If the marginal benefit of preventive care may differ dramatically for infants and older children and so would the parameters of the demand function. They find income increases the likelihood of receiving a preventive care visit, but the effect is smaller at higher income levels. Price effects are not separately estimated for preventive care visits, but they do find an own price elasticity of -0.106 for total number of office based visits received. Time costs reduce the likelihood of receiving preventive care and the estimated effect is largest for infants whose mothers work. To arrive at that result, they interact maternal employment status with visit price and estimate separate elasticities for working and non-working mothers. The potential endogeneity of maternal employment is not addressed.

In summary, previous studies provide suggestive evidence of a negative relationship between maternal employment and well-baby care. However, most of the existing evidence is based on estimations which directly incorporate maternal employment into the regression model and often omit other key predictors of demand such as price and income. Assuming no fixed costs of work or hours constraints, the effect of employment on demand for well-baby care is captured in the cross-price elasticity. Wages should appear on the right hand side of the empirical model, but employment should not.

If, however, there are fixed costs of work or hours constraints then employment and hours of work should appear on the right hand side of the empirical model. Given that most previous studies include employment measures among the regressors, it seems a more complex model is assumed. However, measures of employment are likely to be endogenous and only Berger et al. (2005) has tried to address that problem.

Data

The data are drawn from the 1996 through 2005 Household Component, Event Files, and Conditions Files of the Medical Expenditure Panel Surveys (MEPS). The Household Component contains socio-economic data including information about the Current Main Job (analogous to the Current Population Survey definition) and monthly insurance coverage. The Event Files consist of records for each unique household-reported medical event (e.g. office-based visit, emergency room visit, home health visit, outpatient treatment). The Event Files contain the date of the visit, the broad type of care received (e.g. well-baby care, diagnosis or treatment, emergency accident or injury), total cost of the visit by source of payment, and ICD9 condition and procedure codes.

Respondents identify visits as well-baby care when asked the main purpose of the visit. However, even sick visits may include some well-baby care components. The possibility of substituting sick or other preventive visits for well-baby visits is directly examined in the analysis. Most of the analysis uses a broad definition of well-baby care which includes any visits identified as a "general check-up", visits which included a vaccination, or visits that are assigned to the baby (not the mother) and defined as "post-natal care".

Throughout the analysis, receipt of care is measured by recommended care interval. A recommended care interval contains the age at which a visit is supposed to occur per the AAP guidelines. Figure 1 displays a histogram of all well-baby visits received by infants in the MEPS. The horizontal axis displays the ages at which the AAP recommends visits. The peaks in the distribution of visits across age indicate the timing of visits corresponds closely with the

AAP recommended schedule. When visits are more than one month apart, the bins to the right of each age at which the visit is to occur contain more visits the bins to the left. Thus, I define the recommended care interval for each visit to include the month in which the visit is recommended and subsequent months until the month of the next recommended visit. For example, in the 9 month recommended care interval the dependent variable would be equal to 1 for babies who received a visit at ages 9, 10 or 11 months. The only exception to this coding rule is the 1 month visit; the dependent variable is coded as 1 for infants who receive a visit before they reach 1 month of age even if they do not receive another visit at age 1 month.

The MEPS is a two year panel survey. To create the analysis sample, I include any children who were born or were age 14 months younger in the sample. A given infant only contributes observations for the recommended care intervals that started and ended during the survey. These inclusion rules result in an overlapping panel data set where only about 17 percent of infants in the sample contribute observations on all 6 recommended care intervals. In most specifications I used a dependent variable equal to the percentage of RCI's in which a visit was received, which reduces the panel to a cross section. To allow for heterogeneity across RCI's, I include dummy variables for the first and last RCI observed for each infant. In total, the sample consists of 3596 infants.

Among infants whose mothers do not work, wages are unobserved. To address this issue, we use past observed wages for mothers who worked at any time during the panel and predict wages for mothers who are not employed. For missing price data among visits that were not received, we use average cost of all office based visits and insurance coverage to predict well-baby care costs. For infants who were covered by Medicaid, cost sharing for well-baby care was eliminated in 1996 and thus any missing prices for Medicaid recipients are coded as 0.

Very few covariates vary across RCI's and those that do are measured as the average across RCI's. The lack of variation is primarily due to little variation in the underlying constructs. For employment status and insurance coverage changes, which generally occur within a survey round and in turn will occur within an RCI, the date of the change is included in the survey and used in the analysis to identify the percentage of RCIs in which the mother was employed or the baby was covered by a given plan.

Results of alternative specifications are, including one in which the sample is restricted to only those infants who are observed for all 6 recommended care intervals and the dependent variables is constructed as a count, are not reported in the tables but are discussed in relation to the results presented.

Results

Table 1 presents the percentage of RCIs in which a well-baby care or other types of office based visits was received during the first year of life. If these visits substitute for one another, it would seem infants receive close to the recommended amount of care. However, looking at the correlations between each type of care at both the extensive (received any) and intensive (amount received) margins, it seems there is some substitution between well-baby care and other preventive care but no substitution between well-baby care and sick visits. Furthermore among infant observed for all 6 RCIs, the percentage of RCIs in which any type of visit occurred is only 63 percent. Thus, the amount of care received is clearly less than the amount recommended by AAP guidelines. As can be seen in Figure 1, compliance is generally declining with age. Since there does appear to be a non-negligible amount of substitution between well-baby visits and preventive care visits, the rest of the analyses will treat well-baby visits and other preventive care visits interchangeably.

Table 2 presents descriptive statistics for key variables and cross-tabulations with the amount of care received. As would be expected when other factors are not controlled for, the relationships between wages and receipt of care and employment and receipt of care appear to be positive. However, infants whose mothers have access to paid and unpaid leave appear to be more likely to receive any visits and to receive more visits than those who do not.

Table 3 presents the estimation results for the base demand function specification. In this specification, any influence of maternal employment is captured through the cross-wage elasticity. Although the estimated cross-price elasticity has the hypothesized negative sign in the overall and extensive margin regressions, the estimates are not significantly different from zero. However, the coefficient on wages implies a 1 percent increase in wage would lead to a 1.1 percentage point reduction in the probability of receiving any care. Although not significantly different from zero, the confidence interval around the estimated marginal effect of wages excludes the marginal effect reported in Colle and Grossman's (1978) among children ages 1 through 15 in 1970. Our estimated marginal effect is -0.002 with a lower bound of -0.005 in a 95 percent confidence interval whereas their point estimate is -0.012. Assuming the estimates are comparable across time and empirical specifications, this suggests the demand for well-baby care is less responsive to changes in time cost (at the extensive margin at least) than the demand for preventive care for older children.

Price and income elasticities have the hypothesized signs across all specifications, but price appears to be a significant predictor only at the extensive margin. The estimate suggests a 1 percent increase in the out of pocket cost of care (which would be approximately 90 cents at the mean) would result in a 3 percent reduction in the likelihood of receiving any visits. Having a usual care provider was one of the strongest (in both statistical significance and magnitude) positive predictors of receipt of care at both the extensive and intensive margin. Children with usual care providers had a 7 percentage point higher probability of receiving any preventive care and an 8 percentage point higher percentage of recommended visits received. Uninsured children were 7, and those covered by Medicaid were 5 percentage points less likely to receive any care than privately insured children. Yet, intensive margin estimates indicate uninsured and Medicaid recipient children who do receive some care receive no less than privately insured children.

The insignificant cross-wage elasticities may be due to lack of statistical power, or there could be fixed costs of work or hours restrictions which would mean the time cost of visits is not equal to the wage. A thorough evaluation of the latter claim would require a more sophisticated theoretical model, which has yet to be done in this literature, and is beyond the scope of the present analysis. Instead, following previous work, we take a more ad hoc approach and directly incorporate maternal employment and hours variables into the model. However, we encounter two problems when doing so. First, maternal employment status and hours of work are likely to be endogenous. The techniques used to address this problem are described below. Second, as in many surveys, the distinction between being employed and on leave and being employed and at work is not captured in the data. Klerman and Leibowitz (1994) directly examine this problem using CPS data and find most women who will return to work do so within the first three months. Tabulations of the employment variables in our data suggest a similar pattern. To ensure the employment and hours variables are capturing time spent at work rather than the existence of a job to return to, we restrict the analysis to the six month through twelve month visit. Table 4 presents these results.

The dependent variable in Table 4 is the percentage of RCIs in which a visit occurred and infants who received no visits are included in the estimation. The first column simply adds maternal employment status and usual weekly hours of work to the base demand function specification. These variables are strongly jointly significant (F = 5.14) and they imply the relationship between maternal employment and receipt of preventive care is negative for mothers working more than 24.5 hours per week. The extensive margin results (not reported) imply mothers working 22 hours per week or more are less likely to take their children for any visits than those who work fewer hours or do not work. The intensive margin estimates (not reported) are negative for both employment and hours and imply children whose mothers who work 20 hours per week have a 2.4 percentage point lower percentage of recommended visits received than those who do not work at all and working full time (40 hours per week) is associated with an additional 0.8 percentage point reduction.

To account for the potential endogeneity of maternal employment and hours, we first employ a proxy variable strategy. In Column 2 of Table 4, whether or not the mother has ever worked for pay is used as a proxy for an unobserved preferences for employment vs. motherhood. There preferences may be correlated with current employment decisions and receipt of well-baby care. Adding this variable reduces the point estimate for maternal employment but the point estimate for hours remains unchanged. Therefore, in this specification the negative relationship between maternal employment and preventive care begins at lower hours levels.

Since most women in general, and 82 percent in the sample, work at some in their lives even if they stay at home full time when they have children, ever working may not adequately proxy for mother's preference to spend more time employed vs. caring for her children.

Therefore, in Column 3 we take advantage of the panel structure of the MEPS to create variables which capture mother's employment choices when her previous child was born. Specifically, we control for whether the mother worked and how many hours she worked. Only babies who have an older sibling who was born in the panel are included in this specification. Since the MEPS is a two year panel and only a fraction of the births in the sample occur right at the end of the panel, few women have two separate births during the panel. Nonetheless, these estimates exhibit the same sign pattern and are statistically significant. Both point estimates are larger than in previous specifications and their magnitudes imply the negative relationship between maternal employment and care received exists among women working more than 38 hours per week. However, estimating the model from Column 1 (without employment status and hours when siblings were born) on the restricted sample of infants with siblings in the panel implies the relationship become negative after 36 hours of work. Therefore the change in the inflection point is primarily due to the sample restriction rather than the inclusion of new control variables.

The final column in Table 4 presents the results of two stage least squares estimation where father's years of potential experience, tenure in current job, and whether or not he is a salaried employee are used to instrument for mother's employment status and hours. These variables are all indicative of the father's job security and should be correlated with mother's employment status and hours but should not affect the baby's receipt of preventive care once we control for mother's employment. Results of the two-stage least squares estimation are very similar to the OLS results. They imply the relationship between maternal employment and receipt of care is negative after 29.6 hours of work.

Table 5 provides one final robustness check of the relationship between maternal employment and hours. Exploiting the panel structure of the data so that the unit of analysis is now the RCI and the dependent variable is equal to 1 in RCIs where a preventive care visit was received, we incorporate infant fixed effects. The relationship between maternal employment, hours of work, and care received is now identified by within infant variation in maternal employment and hours. Still, these estimates also imply a negative relationship between full-time work and receipt of care beginning after 27.5 hours of work.

Thus far, our analysis has yielded some fairly robust negative relationships between full-time work and receipt of care. Yet access to paid leave may reduce any negative effect of hours on receipt of care. Table 6 examines this possibility among employed mothers. Among working women, the estimates indicate each additional hour of work reduces the percentage of recommended visits received among all infants by 0.3 percentage points. However, when paid and unpaid leave variables are added to the regression, the reduction in the percentage of recommended visits received associated with an additional hour worked among women who have access to paid vacation time is only -0.1 percentage points. For women without paid vacation, the estimated effect is -0.5 percentage points.

The extensive and intensive margin results are also reported in Table 6 and some interesting patterns emerge. Most notably, the negative relationship between hours and receipt of care appears to operate primarily at the extensive margin. The point estimate for hours is negative in the intensive margin regression but smaller in magnitude and not statistically significant. Furthermore, the estimated coefficients on the hours variable and the interaction between hours and vacation leave become highly significant in the extensive margin regression and their magnitude suggests any negative effect of hours is fully mitigated by access to paid vacation leave.

Few other variables in these regressions explain the variation in receipt of care among children with employed mothers. Among the control variables not reported in Table 6, mother's job tenure is positively and significantly related to the receipt of any care and the amount received. This may be because women with more seniority are more likely to have access to informally granted leave. Although it is reasonable to suspect work schedules and flexibility differ for salaried vs. hourly workers and across occupations, there is not significant difference in receipt of care among infants whose mothers are hourly and those who are salaried workers and few notable differences across occupation. Military occupations and unclassifiable occupations were the only occupational groups that exhibited significant differences in receipt of care. Admittedly, the occupational classifications are broad; the categories are professional, managerial, sales, service, clerical, production, farming, construction, military, unclassifiable occupations, federal employees, and state employees. Still, to the extent that these capture work schedule, flexibility, and job characteristics other than hours of work per week and availability of paid and unpaid leave that may make some jobs more "family friendly" than others, they do not appear to matter as much as hours per week and access to paid leave.

Most of the foregoing analysis has examined receipt of well-baby care in the cross-section measured either as receipt of any visits (extensive margin) and percentage of RCIs in which a visit occurred among children who received at least one visit (intensive margin). We have examined the robustness of our findings to alternative specifications. First, if we restrict the sample to only those children who were in the sample from birth to 14 months and measure care received as a count of RCIs in which visits occurred, the results are very similar. The own-price and income elasticities have the same signs as those presented in Table 3 and the cross-price elasticity is positive, but none are statistically significant. When hours and employment variables are directly incorporated into the regression, the sign pattern is the same as the pattern shown in Table 4, the coefficient on hours is moderately significant ($p = 0.076$), and the implied inflection point in the relationship between hours of work and number of visits received is around 27 hours of work. Among employed mothers, an additional hour of work reduces the number of visits received by 0.013 visit, but as in Table 6 the negative effect is fully offset for women who have access to paid vacation. The sample sizes in these specifications are 633 infants observed from the 1 month visit through the 12 month visit and 1,811 observed from the 6 month visit through the 12 month visit, 1008 of whom have employed mothers.

The second alternative specification exploits the panel structure of the data as was done in Table 5 and defines the dependent variable as an indicator equal to 1 in RCIs when a visit was received. Excluding infant fixed effects, the signs and significance of the estimated elasticities are the same as in first column of results in Table 3. Adding hours and employment variables to the model suggests an inflection point in the relationship between hours and probability of receiving a visit during an RCI at 18.5 hours and the variables are highly jointly significant ($\chi^2 = 14.13$). However, the findings among employed women do not hold in this specification. The estimates suggest an additional hour of work decreases the likelihood of receiving a given visit by 0.36 percentage points, but this relationship is not mitigated by access to paid vacation or any other type of leave. The estimated coefficient on the interaction term is -0.001 ($p = 0.778$). Although the correlation between access to paid vacation and paid sick leave is reasonably high in this specification ($r = 0.67$) omitting other leave variables from the model does not change the sign or significance of the interaction term.

Finally, if we use a more restrictive measure of well-baby care that excludes other preventive care visits, the results are again qualitatively similar to those presented here. The implied inflection point in the relationship between hours of work and receipt of care is 25 hours in these specifications and the changes in magnitude of the coefficients on hours and employment follow the pattern in Table 4. As in Table 6, the negative relationship between hours of work and receipt of care among employed mothers in this specification appears to operate primarily at the extensive margin and is fully mitigated by access to paid vacation.

Discussion and Conclusion

The average child receives far less than the recommended amount of well-baby care in the first year of life. Among children born in the 1996 through 2006 MEPS, we find 46 percent of children did not receive any well-baby visits while in the survey. Among those observed for all six recommended care intervals in the first year of life, 29 percent received no well-baby visits. Although the data suggest other preventive care may substitute for well-baby care, there is not other preventive care occurring to make up for the low levels of well-baby care. The average infants received either type of visit during only 3.33 of the 6 RCIs.

The monetary cost of preventive care to the family is very low; the average is $8.71 across all infants in the sample and 44 percent of infants had no out of pocket cost (these were primarily Medicaid recipients). The low compliance rates with the AAP recommended care schedule despite the low cost of care suggests other factors may be important.

We examine the relationship between maternal employment and receipt of care and find robust negative relationships between hours worked and care received when we estimate visits received as a function of employment and hours. However, if we simply estimate the derived demand for well-baby care as a function of prices and income, the cross-wage elasticity does not consistently have the hypothesized negative sign and is insignificant across all specifications. Thus, together these results suggest wages may not capture the actual time cost of visits.

Across all specifications that include employment and hours variables, the estimates suggest the relationship between hours of work and receipt of care becomes negative somewhere between about 20 and 30 hours of work. This implies part-time maternal employment may not reduce the amount of care received but full time work may. This negative relationship operates primarily at the extensive margin. That is, women who work full-time are less likely to take their children to any visits but once they initiate care, their children receive no fewer visits than children whose mothers work part time or do not work. However, we find access to paid vacation leave fully offsets the estimated negative relationship between hours of work and receipt of care among infants whose mothers work. Access to FMLA leave or paid sick leave are not statistically significantly related to receipt of care.

The findings for maternal employment and hours are sensitive to the time period considered. If the 1 month, 2 month and 4 month visits are included in the analysis, the estimated relationships become insignificant. This is because the MEPS, as many other surveys, does not contain information that can be used to distinguish between women who are employed and at work and those who are employed and on leave. There is a leave status variable in the survey, but only 1.3 percent of mothers report being on leave during the first month after birth. Thus, this variable is not capturing all maternity leave. As Klerman and Leibowitz (1994) show, the majority of women who return to work at all in the first year do so within the first three months. Restricting the analysis to the 6 month through 12 month visit ensures the vast majority of women who say they are employed have returned to work and doing so substantially changes the results.

As in previous studies, the specifications which directly incorporate maternal employment status and hours of work are likely to be biased. To address this problem, we used two proxy variable strategies and an instrumental variables procedure. Results in each of these specifications are in keeping with the OLS regression without proxy variables. Nonetheless, if the assumptions behind these strategies are not met, the reported estimates will be biased.

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Figures and Tables

Figure 1 Distribution of Visits Across AAP Visit Schedule

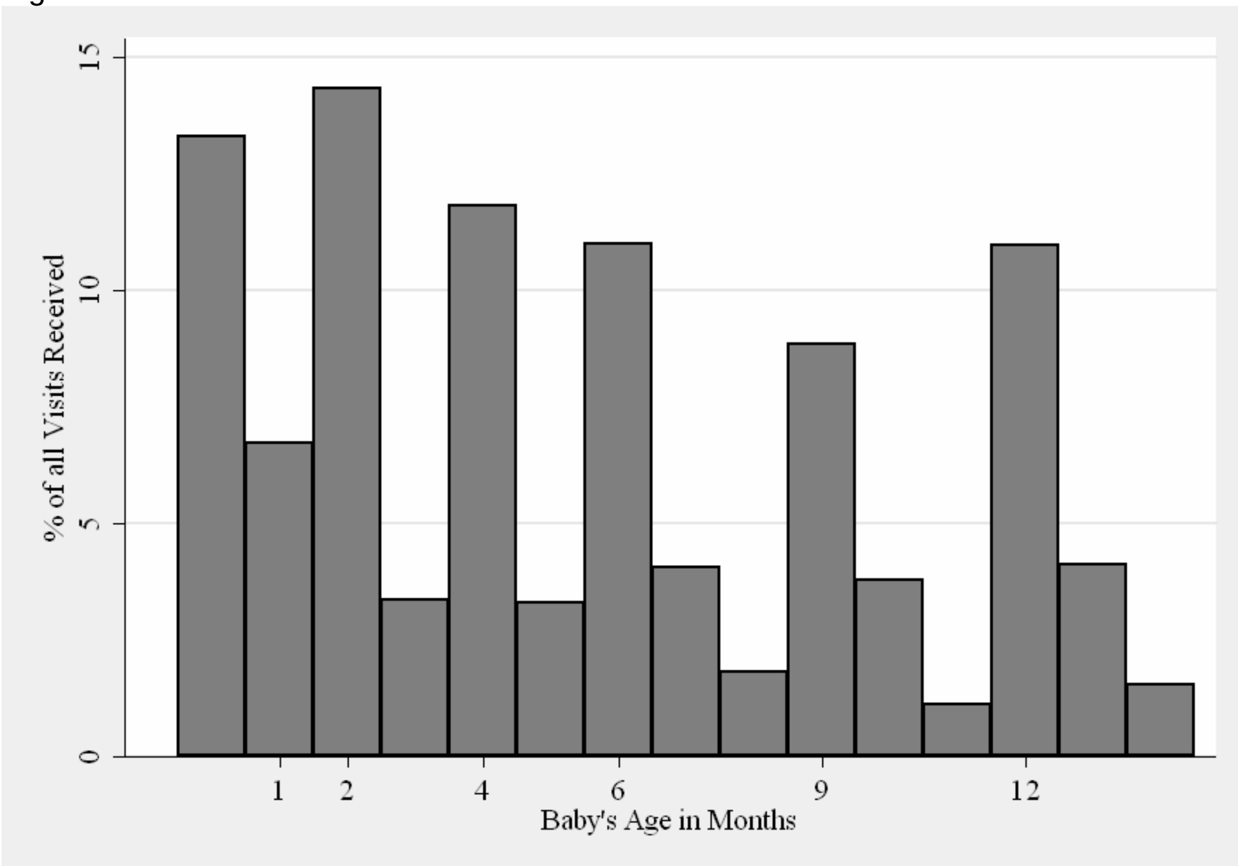

Table 1 Distribution of Visits Across Children and Correlation between Visit Types

	All Infants				Only those Observed for all 6 RCIs			
	Well Baby Visits	Other Preventive Care[1]	Sick Visits	Any Type	Well Baby Visits	Other Preventive Care[1]	Sick Visits	Any Type
% of RCI's at Least 1 Visit was Received	31% (0.74)	28% (0.67)	35% (0.76)	59% (0.71)	33% (1.50)	28% (1.31)	31% (1.22)	61% (1.28)
Extensive Margin								
% of Children Received no Visits	46% (1.03)	44% (1.03)	36% (0.98)	14% (0.69)	29% (2.17)	32% (2.30)	22% (1.92)	4% (0.85)
Correlation with % Received No Well-Baby Visits	1.00	-0.22	0.08		1.00	-0.22	0.10	
Intensive Margin[2]								
% RCIs in which Visits Received (Conditional on Receiving Any Visit of Type)	56% (0.80)	51% (0.74)	55% (0.81)	69% (0.59)	47% (1.47)	41% (1.36)	39% (1.22)	63% (1.20)
Correlation with % of Well-Baby Visits Rec'd (Excluding Those who Received no Visit of Type)	1.00	-0.31	0.09		1.00	-0.41	0.04	

Note: Survey weights used to estimate population parameters. Standard errors are in parentheses.
[1]Any visits which were not identified as well-baby care but were identified as "general check-up" or "post-natal care" for the baby and not the mother and any visits which included a vaccination.
[2] The intensive margin referred to is the quantity of recommended care intervals observed that contained a visit. One could also think of the total number of visits received (allowing for more than 1 visit during an interval). Babies received two or more well-baby visits in 2.5% of all recommended care intervals in the sample and two or more well-baby or preventive care visits in fewer than 10% of all recommended care intervals in the sample.

Table 2 Descriptive Statistics and Cross Tabulations for Key Variables

	Sample Mean (Standard Deviation)	Sample Mean Conditional on Any Preventive or WB Care Received	Sample Mean Conditional on WB or Preventive Care Received in all RCIs
Out of Pocket Cost	$8.71 (17.99)	$9.39 (18.88)	$11.84 (20.03)
Wage	$11.19 (7.41	$11.56 (7.67)	$13.86 (8.71)
Income (thousands)	$37.14 (33.15	$37.99 (33.56)	$42.87 (35.97)
Uninsured	10.63% (26.93	10.46% (26.58)	8.13% (25.23)
Employed	57.57% (47.46)	58.79% (47.08)	62.08% (47.73)
Usual Weekly Hours Worked (Conditional on Working)	32.31 (12.28)	32.08 (12.47)	33.56 (12.18)
Access to Paid Sick Leave (Conditional on Working)	50.86% (49.07)	52.51% (48.93)	63.40% (47.76)
Access to Paid Vacation (Conditional on Working)	59.34% (48.18)	60.57% (47.83)	68.11% (46.28)
Access to FMLA Leave (Conditional on Working)	33.37% (45.77)	33.57% (45.84)	39.60% (48.37)
N All N Employed	3596 2218	2991 1891	826 526

Table 3 Base Model Results

	Overall	Extensive Margin[1]	Intensive Margin
Out of Pocket Cost	-0.000	-0.002**	-0.000
	(0.001)	(0.001)	(0.001)
Out of Pocket Cost^2	0.000	0.000*	0.000
	(0.000)	(0.000)	(0.000)
Full Income (in 10 thousands)	0.011+	0.006	0.006
	(0.006)	(0.004)	(0.004)
Full Income^2 (in 10 thousands)	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Ln(wage)	-0.006	-0.011	0.009
	(0.012)	(0.012)	(0.010)
Constant	0.235		1.133*
	(0.153)		(0.118)
Observations	3596	3596	2991
R^2	0.151		0.266
Pseudo R^2		0.208	
Own Price Elasticity	-0.004	-0.030+	-0.005
	(0.013)	(0.017)	(0.008)
Income Elasticity	0.071*	0.046	0.032
	(0.035)	(0.034)	(0.023)
Cross-Price Elasticity	-0.010	-0.023	0.013
	(0.023)	(0.026)	(0.015)

Note: Robust Standard Errors in Parentheses.
[1] Reported estimates are the marginal effects based on probit estimation.

Table 4 Direct Estimates of Cross-Sectional Relationship between Maternal Employment and Visits Received

	(1)	(2)	(3)	2SLS
Out of Pocket Cost	-0.001	-0.001	-0.003	-0.003+
	(0.001)	(0.001)	(0.006)	(0.002)
Out of Pocket Cost^2	0.000**	0.000**	0.000	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
Full Income (in thousands)	0.016**	0.016**	0.076*	-0.003
	(0.007)	(0.007)	(0.020)	(0.019)
Full Income (in thousands^2)	-0.001**	-0.001**	-0.002*	0.000
	(0.000)	(0.000)	(0.001)	(0.001)
Ln(wage)	-0.007	-0.006	-0.095**	0.049
	(0.018)	(0.018)	(0.041)	(0.052)
Employed	0.049	0.028	0.345*	0.888
	(0.034)	(0.035)	(0.111)	(0.602)
Hours	-0.002*	-0.002*	-0.009*	-0.030+
	(0.001)	(0.001)	(0.003)	(0.017)
Ever Worked for Pay in Life		0.079*		
		(0.027)		
Employed When Older Sib Born			-0.248**	
			(0.117)	
Hours When Older Sib Born			0.006+	0.222
			(0.003)	(0.347)
Constant	0.178	0.317+	0.582	
	(0.183)	(0.186)	(0.464)	
Observations	3194	3189	250	2021
R^2	0.140	0.143	0.433	0.171

Note: Dependent variable is fraction of RCIs in which a well-baby or preventive care visit occurred (as in Overall column in Table 3). Robust standard errors in parentheses.

(1) Adds Employed and Hours variables to the base model.
(2) Uses whether or not the mother has ever worked for pay as a proxy for unobserved heterogeneity which may be correlated with current employment and hours.
(3) Uses whether of not the mother worked and how many hours she worked when her previous child was born as proxies for unobserved heterogeneity.
(4) Instruments for employment and hours are father's wage, father's hours of work, and whether or not father is a salaried employee. Regression is restricted to mothers who are married to or cohabitating with the biological father and the father is employed.

Table 5 Direct Estimates of Within Infant Relationship between Maternal Employment and Visits Received

	Dependent Variable = 1 in RCIs when Visit was Received
Out of Pocket Cost	-0.001
	(0.001)
Out of Pocket Cost^2	0.000
	(0.000)
Full Income	-0.101
	(0.109)
Full Income^2	0.001
	(0.005)
Employed	0.165+
	(0.098)
Hours	-0.006*
	(0.003)
ln(wage)	0.101
	(0.081)
Observations	6865 RCIs 3185 Infants

Note: Results are estimated coefficients from OLS fixed effects estimation. Logit estimates are similar in sign and significance. Robust standard errors in parentheses.

Table 6 Estimated Relationship between Access to Paid Time off, Work Schedule and Visits among Continuously Employed Mothers Only

	Overall		Extensive Margin[1]		Intensive Margin	
Out of Pocket Cost	0.000	0.000	-0.000	-0.000	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Out of Pocket Cost^2	0.000	0.000	0.000+	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Full Income (in thousands)	0.013	0.013	0.013	0.012	0.006	0.006
	(0.008)	(0.008)	(0.009)	(0.009)	(0.006)	(0.006)
Full Income^2 (in thousands)	-0.001	-0.001	-0.000	-0.000	-0.000+	-0.000+
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ln(wage)	-0.007	-0.008	-0.018	-0.020	0.013	0.013
	(0.018)	(0.018)	(0.016)	(0.016)	(0.013)	(0.013)
Salaried	0.018	0.015	0.006	0.002	0.018	0.017
	(0.029)	(0.030)	(0.029)	(0.030)	(0.021)	(0.021)
Hours	-0.003*	-0.005*	-0.003*	-0.004*	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Employer Offers Paid Sick Leave		0.061		0.141		-0.071
		(0.098)		(0.097)		(0.058)
Employer Offers Paid Vacation		-0.131		-0.154		-0.011
		(0.096)		(0.097)		(0.057)
FMLA (Covered and Eligible)		-0.011		-0.142		0.100
		(0.133)		(0.127)		(0.092)
Hours*Sick Leave		-0.001		-0.003		0.002
		(0.003)		(0.003)		(0.002)
Hours*Vacation Leave		0.004+		0.005**		0.000
		(0.003)		(0.003)		(0.002)
Hours*FMLA		0.000		0.003		-0.002
		(0.003)		(0.003)		(0.002)
Constant	0.261	0.330	0.338	0.402	1.150*	0.941*
	(0.264)	(0.268)	(0.298)	(0.301)	(0.209)	(0.212)
Observations	1758	1758	1758	1758	1346	1346
R-squared	0.145	0.148	0.147	0.153	0.299	0.303

Note: Robust standard errors in parentheses.

[1] Reported estimates are the marginal effects based on probit estimation.