Low-Income Children's Preventive Services Use: Implications of Parents' Medicaid Status

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This article examines the effect of parents' Medicaid status on the use of preventive health services by young children. Using data from the 1996 Medical Expenditure Panel Survey (MEPS), we analyzed a logit model for receipt of any well-child visits (WCVs) that compared three groups of low-income children. The three groups, defined by the joint insurance status of children and their parents, involved Medicaid pairs (both the child and the parent had Medicaid throughout the year), mixed pairs (the child had Medicaid and the parent was uninsured), and unsured pairs (both child and parent were unsured). Medicaid coverage for children was positively associated with receipt of any WCVs. However, the utilization effect of Medicaid coverage for children was significantly larger when the parent was also on Medicaid instead of being uninsured. Considering uninsured children with uninsured parents in 1996, enrolling only the children in Medicaid would have increased the percentage with WCVs from 29 to 43 percent according to simulations with the logit model. If the parents were enrolled in Medicaid as well, the percentage of children with any WCVs would have increased to 67 percent.

INTRODUCTION

Preventive care such as WCVs promotes children's health and well-being. The American Academy of Pediatrics (1997)

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recommends a schedule of nine WCVs over the first 2 years of life and an annual visit thereafter.

These visits provide opportunities for the physician to monitor the child's development and health for potential problems, address parental concerns, give nutritional guidance, and administer vaccines (Freed et al., 1999). In fact, children who do not receive an adequate number of WCVs are at increased risk for not completing the vaccination schedule (Freed et al., 1999).

Insurance improves use of preventive health services among children. However, approximately 11 percent of children (2.5 million) under age 6 are uninsured all year (Bhandari and Gifford, 2001). Uninsured children are more likely to lack a usual source of care, experience delays in seeking necessary care, and use less preventive care than other children (Davidoff et al., 2003; Himmelstein and Woolhandler, 1995; Short and Lefkowitz, 1992; Stevens-Simon et al.,1996). Failure to use preventive services may lead to more costly medical conditions later in life (Ekwueme et al., 2000). Yet, the medical costs of children tend to be relatively low (Cowan et al., 2004). Thus, policymakers have generally accepted the importance of providing health insurance to poor children who would otherwise be uninsured.

Having health insurance promotes a child's receipt of preventive treatment, but it is only one factor. A second factor is the parent's own use of health services. Children of parents who engage the health care system are more likely to have physician

visits and comply with the immunization schedule than children of parents who do not use health services (Bates et al., 1994; Freed et al., 1999; Hanson, 1998). Parents who lack health insurance may be discouraged from using the health care system. This suggests that children of uninsured parents may be at risk for not receiving care.

While access to public coverage for children in low-income families is improving, States can now decide whether to extend coverage to low-income parents (Broaddus, et al., 2002; Families USA, 2000). The current study examines how a parent's Medicaid status affects a child's use of preventive health services. In particular, this research is designed to compare the effect on use of preventive health services by children under the age of 6 from expanding Medicaid coverage only to low-income uninsured children relative to covering both children and their parents. The data source is the 1996 MEPS, which has a large, ethnically diverse national sample (Cohen, 1997).

Previous research supports the idea that both private insurance and Medicaid significantly increase children's access to preventive services (Davidoff et al., 2003; Short and Lefkowitz, 1992; Simpson et al., 1997). However, few studies have explored the effect of a child's insurance status on use of services after controlling for either parent's use of health services or parent's health insurance status (Hanson,1998; Davidoff et al., 2003). Of the studies that have, none have examined the effect of a parent's Medicaid status on a child's receipt of care. Accordingly, the current study asks: What is the effect of a parent's Medicaid insurance status on his or her child's use of preventive services?

Public Health Insurance for Low-Income Children

Throughout the late 1980s and 1990s, Federal initiatives focused on providing health insurance to children in low-income families. The Omnibus Reconciliation Acts of 1989 and 1990 greatly expanded Medicaid coverage to children from low-income families. More recently, the State Children's Health Insurance Program (SCHIP) enacted in the 1997 Balanced Budget Act, expanded coverage to more children in working families. Medicaid, SCHIP, and other State-based programs covered 28 percent of children under age 6 in 2001 according to data from the 2002 Annual Social and Economic Supplement of the Current Population Survey (Bhandari and Gifford, 2003).

States do have several opportunities for expanding health insurance coverage to parents. Under section 1931(b) of Medicaid, States may not only cover adults who would have qualified for the former Aid to Families with Dependent Children program, but may also use more lenient rules for determining an individual's income and assets. Through Medicaid 1115 waivers, States may offer parents a Medicaid package with a narrower set of benefits and use cost-sharing mechanisms such as premiums and copays. In addition, SCHIP 1115 waivers allow States to use unspent SCHIP funds to cover parents, provided all children under 200 percent of the Federal poverty level (FPL) are eligible for SCHIP, and the State has demonstrated that it has an effective outreach and enrollment process (Wheatley, 2000). Finally, States may operate their own health insurance program. In the absence of Federal funding, the State fully determines eligibility, benefits, and the types of cost-sharing mechanisms that will be employed.

Relationship in Use of Health Services

While public programs typically focus on reducing the number of low-income uninsured children, low-income parents receive less attention. An analysis of the 1997 National Survey of America's Families (NSAF) indicates that 7.3 million parents with incomes below 200 percent of the FPL are uninsured (Dubay, Kenney, and Zuckerman, 2000). Approximately one-half of these parents are in families below 100 percent of the FPL (3.5 million) and another 1.7 million parents are in families with incomes between 100 and 133 percent of the FPL. Despite their low income, these individuals generally do not qualify for Medicaid. For adults, Medicaid eligibility is generally limited to individuals with disabilities, pregnant women, or those with dependent children who meet stringent income eligibility rules under the former Aid to Families with Dependent Children program.

Conceptual Framework

This analysis examines determinants of children's use of preventive health services. A model commonly employed in studies of utilization is the Andersen/Aday Behavioral Model of Health Services Use (Andersen, 1995). This model suggests that people's use of health services is a function of their predisposition to use services, factors which enable or impede their use of health services, and their need for care (Andersen, 1968; Andersen, 1995). Predisposing factors found to affect preventive service use by low-income children include race/ethnicity, family structure, and level of maternal education (Guendelman and Schwalbe, 1986; Flores et al., 1999). Income, insurance status, and having a usual source of care constitute enabling

factors. Income and insurance status reduce the financial barriers to receiving care, while a usual source of care adds familiarity to the system (Simpson et al., 1997). Finally, individuals who are sick or otherwise need care are more likely to engage the health care system than individuals who do not perceive the need for care.

A consistently positive relationship between parent's use of health services and child's receipt of immunizations has been found in the literature (Bates et al., 1994; Freed et al., 1999; Stevens-Simon et al., 1996; Kogan et al., 1998). In a study of 484 urban infants born in a teaching hospital, mother's receipt of adequate prenatal care was associated with an increased likelihood that the child received the appropriate number of immunizations (Bates et al., 1994). Similarly, in a sample of 150 adolescent mothers and their newborn children, mother's delay in the timing of the first prenatal care visit was associated with an increased risk of delay in completion of child's primary immunization series (Stevens-Simon et al., 1996).

Like receipt of immunizations, receipt of WCVs appears to be associated with mothers' prenatal care initiation. An analysis of a large sample of children from North Carolina suggested that children of mothers who delayed prenatal care were 40 percent less likely to receive an adequate number of WCVs compared with children whose mothers had not delayed prenatal care, after controlling for a child's insurance status (whether private, Medicaid, or uninsured), maternal characteristics (age, marital status, race, and education), family income and whether the family resided in a metropolitan statistical area (MSA) (Freed et al., 1999). Finally, an analysis of the 1988 National Maternal and Infant Health Survey found an association between inadequate prenatal care and both decreased

number of WCVs and inadequate immunizations (Kogan et al., 1998). Taken together, this research indicates that parents' experiences with the health care system influence decisionmaking regarding children's use of services.

While children's use of health services is associated with the parents' use of health services, there is also evidence that parents' own use of health services is affected by their insurance status. One study found that uninsured adults used ambulatory health services only 60 percent as often as otherwise similar adults who were insured (Long, 1994). Long and Marquis (1998) found similar results in an evaluation of Florida's Medicaid Program after income eligibility for pregnant women was expanded. In an analysis of the effect of Florida's program expansion on use of prenatal services, Long and Marquis (1998) found that mothers on Medicaid were less likely either to forgo prenatal services or initiate care late in pregnancy compared with uninsured mothers.

Relatively few studies have examined the effect of parents' insurance status on children's receipt of care. One study of the 1990 National Health Interview Survey examined the relationship between parents' and children's physician visits during the previous 12 months (Hanson, 1998). This study found a positive relationship between parents' and children's physician visits for both uninsured children (odds ratio=2.07, $p<0.05$) and privately insured children (odds ratio=2.94, p=0.05). The study did not find a statistically significant relationship between parents' insurance status and children's receipt of care. However, health insurance status was limited to coverage in the month prior to the survey.

Findings from the 1999 NSAF suggest that, for low-income children, having an uninsured parent reduces the probability of having any medical provider visit during the year by 6.5 percentage points and the probability of having a WCV by 6.7 percentage points (Davidoff et al., 2003). However, the effect of an uninsured parent varied by the child's insurance status. The effect was larger for uninsured children (12.5 percentage points for any medical provider visit and 11.8 percentage points for a WCV) relative to children with public coverage (3.2 percentage points for any medical provider visit and 3.5 percentage points for a WCV).

While these studies are important in describing the potential link between a parent's insurance status and use of health services and a child's use of health services, neither examines the link between a parent's Medicaid status and a child's receipt of care. The studies by both Hanson (1998) and Davidoff et al. (2003) considered only whether the parent was insured versus uninsured. Moreover, both studies examined receipt of care for children age 17 or under. However, the effect of a parent's insurance status may be larger for younger children. Unlike older children who may seek care in school or potentially access services in the community, younger children are more dependent on their parent or caretaker to seek care.

Accordingly, this study is designed to examine whether parents' Medicaid coverage affects young low-income children's receipt of preventive health care. Specifically, we hypothesize that, among children with a full year of Medicaid coverage, those with parents who have a full year of Medicaid will be more likely to use preventive services than children whose parents are uninsured all year, after controlling for predisposing characteristics, availability of services, and need.

METHODS

Data

We analyzed data from the household component of the 1996 MEPS (Cohen, 1997). This is a nationally representative sample of the non-institutionalized U.S. population. During these in-person interviews, a household reference person provided information regarding the demographic characteristics, health care use, income, and health insurance of each member of the household. The full-year 1996 person-level response rate was relatively high, 70.2 percent (Cohen, DiGaetano, Gokel et al., 1999. Surveys are considered a reasonably accurate and cost-effective means to assessing an individual's health insurance status and household health services utilization (Marquis, Marquis, and Newhouse, 1976.

Several important design features of MEPS improve the reliability and validity of the data. For example, data were collected during three rounds of computer assisted personal interviews spaced approximately 4 months apart. Having multiple interviews throughout the year rather than one interview at the end of the year lessens recall time, thus improving the respondents' ability to accurately recall events (Babbie, 1998). Moreover, interviews are conducted in-person. Therefore, the data do not exclude individuals who do not have a telephone.

Black, Hispanic, and individuals with incomes below 200 percent of the FPL were oversampled in the MEPS sampling frame (Cohen, 1997; Moeller et al., 2003). Oversampling provides researchers with a larger sample of populations of particular interest such as low-income youth of various races and ethnic groups.

Analytic Sample

The sample used in our analysis consists of 380 children who met the following criteria: (1) were between age 1-5 (12 to 71 months) at the end of the year; (2) in families with incomes below 200 of the FPL; (3) both child and parent were covered by Medicaid all year, the child was covered by Medicaid, but the parent was uninsured all year, or both the child and the parent were uninsured all year; and (4) complete data for all rounds of the 1996 MEPS.

We focus on children under age 6 for two reasons. First, this age group is the most likely to be affected by policy changes involving parents, because younger children are most often covered by Medicaid (Bhandari and Gifford, 2001). Second, young children are less likely to complete the immunization series than school age children (Steven-Simons et al., 1996). Since childhood immunizations promote health throughout the life course, improving access for young children may be particularly important.

For simplicity, the sample for these analyses is limited to children and parents whose insurance status does not change during the year.

Each child was linked to a primary parent. In all but nine cases, the primary parent referred to the child's mother. For the remaining nine cases, we designated the child's father (two observations) or the household reference person if neither parent was present (seven cases).

Person-level weights provided by MEPS were incorporated in all analyses. The person-level weights project to the 1996 non-institutionalized population of United States (Cohen, 1997). The weights correct for non-response bias and are poststratified by sex, age, race/ethnicity, region, and MSA to the 1996 Census Bureau population estimates.

Variables

Use of preventive health services was operationalized as receipt of at least one WCV during 1996. WCVs were measured as any visit that the respondent identified as having occurred primarily for the purposes of well-child care, immunizations, or general/routine checkup. All ambulatory visits that met this criterion, regardless of site (the doctor's office, the emergency room, or another outpatient setting), were considered WCVs. A binary dummy variable indicated whether a WCV occurred.

The health insurance status of the child and the parent were central to this analysis. The first step in constructing the health insurance variable was identifying each child's and parent's insurance status individually. MEPS contains information on the monthly health insurance status of individuals. Each individual's insurance status for 1996 was categorized into one of the following groups: 12 months of Medicaid coverage or 12 months of being uninsured (those who did not fall into one of these categories were excluded from this analysis). The following set of dummy variables described the joint health insurance status of child and parent pairs:

(a) Medicaid pairs: Both the child and the parent had Medicaid all year (n=227);

(b) Mixed pairs: The child had Medicaid all year and the parent was uninsured all year (n=73);

(c) Uninsured pairs: Both the child and the parent were uninsured all year (n=80).

Family income, an enabling factor, was included in the model as a categorical variable describing whether family income was below 100 percent of the FPL, between 100 and up to 125 percent of the FPL, or between 125 and 200 percent of the FPL.

Race/ethnicity, child's age, parent's age, parent's education, and family structure were included as predisposing factors. In order to make mutually exclusive race/ethnic categories, we considered all individuals claiming Hispanic heritage as Hispanic regardless of race. Dummy variables indicated an individual's race/ethnicity as Black non-Hispanic, White non-Hispanic, Hispanic, or other. The age of the child at the end of the year was represented as a continuous variable.

Other predisposing characteristics that potentially affect a child's use of preventive health services included traits of the primary parent. These included the primary parent's age (less than 24, 24 to 30, 31 to 35, more than 35 years) and educational attainment (less than a high school graduate, high school degree including General Equivalency Diploma, and any college). Two variables were included to describe family structure. If the primary parent indicated that he or she lived with a spouse, then the family was considered to be a two-parent family. In addition, the number of children under age 19 in each family was included as a continuous variable.

Perceived health status, an indicator of child's need for health services, was included as a categorical variable (fair/poor/good, very good, or excellent). Finally, two sets of dummy variables controlled for geographic differences in service use associated with region (Northeast, Midwest, West, and South) and residence in a MSA. Because MEPS is a public access survey, State and county identifiers are suppressed to protect the confidentiality of the subjects. Therefore, we were unable to control for State or differences in State policies that affect eligibility for Medicaid and SCHIP. We were also unable to control for variation in the ratio of physicians to population, a measure that has been found to be predictive of use of services (Short and Lefkowitz, 1992).

Data Analysis

Logistic regression was used to model children's preventive health services use as a function of our theoretical model including the children's enabling characteristics, predisposing characteristics, need, region of residence, and whether the child lived in a MSA. We tested our main hypothesis (that children in Medicaid pairs would be more likely to have a WCV than children in mixed pairs, all else equal) using an F-test. This was a test of the linear restriction that the coefficient for Medicaid pairs was equal to the coefficient for mixed pairs (Long, 1997).

Coefficients from the logistic regression were subsequently used to simulate the effects of giving Medicaid coverage to child-parent pairs who were both uninsured. This simulation assumes that the effects of the other variables in the model (such as race/ethnicity and child's age) remain constant. Therefore, the only factor that changes is the parent's and/or child's insurance status. In this simulation, we calculated the predicted probability of receiving a WCV for each child in child-parent uninsured pairs. Then we recalculated each uninsured child's probability of receiving a WCV if the child were provided with Medicaid, but the parent was not. Finally, we calculated the predicted probability that each child in an uninsured pair would receive a WCV if both the child and the parent were enrolled in Medicaid (Long, 1997).

The MEPS has a complex survey design that includes stratification, clustering, multiple stages of selections, and disproportionate sampling. In order to correct the standard errors for these survey design effects we estimated our models in STATA® (StataCorp®, 2003).

RESULTS

Table 1 displays the means of both the dependent and independent variables in the multivariate model, with the means calculated separately by insurance category. The percentage of children receiving WCVs differed by insurance category. Sixty-two percent of children in Medicaid pairs had a WCV during the year. This was significantly higher than the percent of children receiving a WCV in mixed pairs (41 percent, $p<0.01$) or in uninsured pairs (29 percent, $p<0.01$).

Demographic characteristics of children and their parents also differed by insurance status. Children in uninsured pairs were older on average than children in Medicaid pairs ($p=0.08$). Children in Medicaid pairs were somewhat less healthy compared with children in uninsured pairs, with a higher percentage in the bottom category of poor, fair, or good health (32 versus 19 percent, $p=0.05$).

A higher percentage of Medicaid pairs were Black persons (36 percent) compared with uninsured pairs (12 percent, $p<0.01$) or mixed pairs (13 percent, $p=0.01$). By contrast, a lower percentage of Medicaid pairs were Hispanic persons (22 percent) compared with children in uninsured pairs (42 percent, $p=0.01$) and children in mixed pairs (41 percent, $p=0.08$).

Children in Medicaid pairs were less likely to live in a two-parent family (27 percent) than children in uninsured pairs (65 percent, $p<0.01$) and children in mixed pairs (53 percent, $p<0.02$). Children in Medicaid pairs were more likely to live in families whose income was below poverty (88 percent) than children in mixed pairs (51 percent, $p<0.01$) and children in uninsured pairs (38 percent, $p<0.01$).

A higher percentage of children in uninsured pairs (51 percent) lived in the South compared with children in Medicaid pairs

Table 1
1996 Sample Means, by Insurance Categories

Characteristic	All	Both Uninsured	Child Medicaid, Parent Uninsured	Both Medicaid
		Percent		
Any Well-Child Visit During the Year	50	29	41	62
Child's Health				
Excellent	38	39	42	36
Very Good	34	41	30	32
Good, Fair, or Poor	28	19	28	32
Child's Race/Ethnicity				
White Non-Hispanic	37	35	46	35
Black Non-Hispanic	26	12	13	36
Hispanic	31	42	41	22
Other	6	11	0	6
Parent's Education				
Some College	5	7	5	4
Completed High School or Has GED	51	53	60	48
Less Than High School	44	40	35	48
Parent's Age				
Under 24 Years	28	21	33	30
24-30 Years	43	47	39	43
31-35 Years	13	11	13	14
35 Years or Over	16	21	16	14
Family Characteristic				
Two-Parent Family	41	65	53	27
Family Income				
< 100 percent of FPL	69	38	51	88
100-125 Percent of FPL	8	14	13	3
125-200 Percent of FPL	23	49	36	9
Region				
South	36	51	40	29
Midwest	18	7	36	16
Northeast	19	13	4	26
West	27	29	20	29
Metropolitan Statistical Area	76	74	55	85
		Mean		
Number of Children Under 19 in Household	2.87	2.61	2.94	2.95
Child's Age	2.94	3.18	2.99	2.82
Unweighted Sample (N)	380	80	73	227

NOTE: FPL is Federal poverty level.

SOURCE: Gifford, E.J., Weech-Maldonado, R., and Short, P.F.: Tabulations of the 1996 Medical Expenditure Panel Survey.

(29 percent, $p<0.03$). In contrast, a higher percentage of children in Medicaid pairs (26 percent) lived in the Northeast compared with children in mixed pairs (4 percent, $p<0.01$) or uninsured pairs (13 percent, $p<0.06$). There was a higher percentage of mixed pairs (36 percent) in the Midwest compared with uninsured pairs (7 percent, $p<0.02$). A higher percent of children in Medicaid pairs lived in a MSA (85 percent) than children in mixed pairs (55 percent, $p=0.01$).

Table 2

Multivariate Logit Results: Receipt of a Well-Child Visit in 1996

Demographic	Characteristic	Coefficient	Standard Error
Insurance	Both Parent and Child Medicaid	***1.93	0.42
	Child Medicaid, Parent Uninsured	*0.73	0.41
Child's Age	—	***-0.27	0.09
Child's Health	Excellent	0.06	0.32
	Very Good	-0.11	0.33
Child's Race	Black Non-Hispanic	-0.33	0.39
	Hispanic	**0.97	0.41
	Other	0.56	0.64
Parent's Education	Some College	0.61	0.65
	Completed High School or Received GED	***0.98	0.32
Parent's Age	24-30 Years	-0.24	0.34
	31-35 Years	0.18	0.41
	35 Years or Over	-0.15	0.50
Family Characteristics	Two-Parent Family	0.09	0.28
	Number of Children Under 19 Years in Household	***-0.33	0.11
Family Income	100-<125 Percent FPL	-0.37	0.66
	125-< 200 Percent FPL	-0.07	0.39
Region	Midwest	0.08	0.41
	Northeast	0.23	0.38
	West	0.03	0.34
Metropolitan Statistical Area	—	0.28	0.35
Constant	—	-0.42	0.69

*Significant at 10 percent.

**Significant at 5 percent.

***Significant at 1 percent.

NOTES: Omitted group: Child and parent are both uninsured all year; child's health is good, fair, or poor; child's race is White; parent's education is less than high school; parent's age is less than 23 years; single-parent family structure; family income is less than 100 percent FPL; and South. FPL is Federal poverty level.

SOURCE: Gifford, E.J., Weech-Maldonado, R., and Short, P.F.: Tabulations of the 1996 Medical Expenditure Panel Survey.

Medicaid and Children's Preventive Service Use

Table 2 presents the results from the multivariate logit model. Our results suggest that Medicaid coverage for children is associated with a higher probability of receiving a WCV. After controlling for child's age, child's health status, child's race, parent's education, parent's age, family structure, family income, region, and MSA, we found that children in mixed pairs (p=0.05) and Medicaid pairs (p<0.01) were more likely to have a WCV than uninsured children.

Parent's Insurance and Children's Preventive Service Use

We hypothesized that the coefficient for Medicaid pairs would be larger than the coefficient for mixed pairs, indicating that

Medicaid children with Medicaid parents would be more likely to use preventive health services than Medicaid children with uninsured parents. An F statistic of 11.01 (p<0.01) indicated that we should reject the null hypothesis that the two coefficients were equal. Therefore, the data support our hypothesis and imply that parents' Medicaid status is a determinant of preventive service use among young Medicaid children.

Table 3 shows the results of the microsimulation, suggesting how the probability of a WCV for young, low-income, uninsured children with uninsured parents might change if their other characteristics remained the same, but the family pattern of insurance changed. As mentioned, 29 percent of children in uninsured pairs received a WCV. If all of the children, but none of the parents were given Medicaid,

Table 3

Uninsured Children Receiving Well-Child Visits in 1996 Under Two Alternatives

| | Well-Child Visit | | |
Insurance Coverage	Observed	Predicted	Increase
		Percent	
Baseline			
Both child and parent are uninsured all year	29	—	—
Expansion Alternative 1			
Child is given Medicaid all year and parent remains uninsured	—	43	+14
Expansion Alternative 2			
Both child and parent are given Medicaid all year	—	67	+24

SOURCE: Gifford, E.J., Weech-Maldonado, R., and Short, P.F.: Tabulations of the 1996 Medical Expenditure Panel Survey.

the predicted percentage with a WCV would increase by 14 percentage points. Alternatively, if both the children and the parents were given Medicaid, the percentage with a WCV would increase by 24 percentage points.

DISCUSSION AND CONCLUSIONS

Our results imply that extending Medicaid or SCHIP coverage to low-income parents would have spillover benefits for children. By suggesting that covering parents encourages increased utilization of preventive services for children, our study complements other research showing that coverage for parents indirectly benefits children by encouraging greater participation of eligible children in public insurance programs. Specifically, Dubay and Kenney (2001) found that about 80 percent of eligible poor children were enrolled in Medicaid in States with family coverage expansions, compared with 57 percent of eligible children in States with less generous eligibility rules for adults.

Our findings regarding children's use of preventive services, based on data from the 1996 MEPS, are also consistent with findings reported by Davidoff et al. (2003) using data from the NSAF. Our microsimulation suggests that for uninsured pairs, providing Medicaid to the child only would increase WCVs by 14 percentage points while extending Medicaid to both child

and parent would increase WCVs by 24 percentage points. The findings of Davidoff and colleagues (2003) suggest that having an uninsured parent decreases the probability of a WCV by 3.5 percentage points for children with public coverage and 11.8 percentage points for uninsured children. The observed larger effect in our study of parents' insurance status for the mixed pair may be a result of differences in study populations. While we limited our sample to younger children (less than 6 years), Davidoff et al. (2003) examined children through age 17. As we have stated before, we expect the effect of parents' insurance to be larger among younger children. Younger children are more dependent on their parents to seek care, while older children may have greater access to care through school and community-based services.

It is possible that our analysis overstates the spillover effects of parents' coverage because of unobserved differences between uninsured and Medicaid parents that are also associated with differences in the use of preventive services by their children. However, we are relying on the wide differences in State Medicaid rules governing parents' eligibility in 1996 as the primary, exogenous source of variation in parents' insurance that allows estimation of its effect on children's utilization from non-experimental data. In other words, we believe that the uninsured parents in our

analyses were mostly ineligible for Medicaid; they were not a self-selected group who failed to enroll in Medicaid because of unobserved attitudes or expectations related to their children's use of health care.

Furthermore, basing our estimates of the effects of parents' coverage entirely on the contrast between mixed and Medicaid pairs—where all of the children were on Medicaid—makes our estimates less susceptible to self-selection based on the children's expected use of services. All of the primary parents considered in this part of the analysis were concerned enough about their children's health care to enroll the children, even if the parents remained uninsured. Admittedly, differences between parents eligible and ineligible for Medicaid that were not controlled in the logit model could still have skewed our results. For example, pregnant mothers were more likely to qualify for Medicaid under the program's eligibility rules, and their regular visits for prenatal care might have increased the likelihood of well-child care for preschool children who accompanied them to a physician's office.

One potential problem with cross-sectional observational studies is endogeneity or self-selection bias. For example, parents who anticipate their children will use services may be more likely to enroll their children in Medicaid than parents who anticipate their children will not use services. If this is the case, then the observed association that children with Medicaid are more likely to receive services than uninsured children might suggest a difference in parental preferences rather than a causal link between Medicaid and receipt of services. However, we are primarily interested in the effect of parent's insurance status on child's use of services. We regard our estimates of the effects of the parent's insurance status to be less suscep-

tible to self-selection bias than our estimates of the child's own insurance on use of preventive services. It seems unlikely that a parent would enroll him or herself in an insurance program to ensure that their child receives services.

In order to minimize problems associated with self-selection bias, this study took several measures. First, we used a theoretically grounded model that controlled for widely known predictors of preventive service use. Second, we limited our sample to children in families with incomes below 200 percent of the FPL and controlled for income within that range. The income restriction excluded children who most likely qualified for Medicaid because of disability or extraordinary health care needs. We also included a measure of health status in the logit model and experimented with several different measures of child health, with no significant effect on the results.

A second limitation of this study is that almost all of the parents were mothers. It is difficult to know whether these findings would generalize to a child whose primary caregiver is someone other than his or her mother. Further research could examine whether the effect of the parent's insurance status is limited to the mother's insurance status or whether it is the insurance status of the primary caregiver that is important. However, despite growth in the variation of children's living arrangements, the primary caregiver for most children is the mother so this distinction may be of limited importance (Fields, 2004).

Despite the potential benefits for children as well as parents, States have been relatively slow to increase coverage for low-income parents. As of 2002, according to Broaddus and colleagues (2002), a single working parent with two children who earned more that 69 percent of the FPL would not have been eligible for Medicaid

or other public insurance in one-half the States. Indeed, while about 20 percent of low-income children were uninsured in 2001, about 35 percent of low-income parents were without health insurance, according to data from the March 2002 Current Population Survey (Ross and Cox, 2003).

Another issue for policymakers and practitioners is the large percentage of low-income children who did not have a WCV during the year as recommended by the American Academy of Pediatrics. Even in the highest utilization group, where both parents and children were on Medicaid, the utilization rate was only 62 percent. Financing is evidently not the only barrier to appropriate use of preventive health services for young children in low-income families.

According to an evaluation of strategies for improving children's vaccination rates by the Task Force on Community Prevention (Briss et al., 2000), these rates can be raised cost effectively for children with a regular source of care by monitoring compliance with the immunization schedule and reminding parents about immunizations. For children without a usual source of care, it may be beneficial to monitor vaccinations and issue reminders through programs, such as the Special Supplemental Nutrition Program for Women, Infants, and Children, that serve low-income families. Requiring immunizations as a prerequisite for school attendance is an alternative strategy for improving vaccination rates that has been effective in achieving over a 95-percent vaccination coverage rate among school-age children. By contrast, the vaccination rate for pre-school children (from 19 to 35 months of age) is only 76 percent. Laws that required a medical examination prior to attendance at child care centers or preschools might increase both vaccination rates and the likelihood of an annual WCV (Federal Interagency Forum on Child and Family Statistics, 2002).

In order to substantially improve rates of preventive service use among young low-income children, policymakers and analysts should consider a variety of approaches. Results from this study suggest that providing parents with health insurance has spillover benefits for children. When policymakers and analysts are contemplating changes to health insurance eligibility rules aimed at low-income populations, these spillover benefits should be considered in the calculations.

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