Using Discontinuous Eligibility Rules to Identify the Effects
of the Federal Medicaid Expansions

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This paper exploits the discrete nature of the eligibility criteria for two major federal expansions of Medicaid to discern the effects of the expansions on Medicaid coverage, overall health insurance coverage, and coverage by private and other non-Medicaid sources. Using data from the Survey of Income and Program Participation, we examine the "133 percent" program, which covered children under the age of six in families with incomes up to 133 percent of the poverty line, and the "100 percent" program, which covered children in poor families born after September 30, 1983. Graphical and conventional difference-in-differences methods suggest that the 100 percent program led to a 10-15 percentage point rise in Medicaid coverage among the targeted group, with a small decline in non-Medicaid coverage and a rise in the incidence of dual coverage. The newly covered group includes children in families further from the AFDC income cutoffs and closer to the poverty line than the traditional Medicaid caseload, and includes more children in dual-headed families. By comparison, we are unable to find much evidence that the 133 percent program had any effect on Medicaid coverage of children in families with incomes from 100 to 133 percent of the poverty line. This negative finding is confirmed in data from the March Current Population Survey.

Over the past 15 years the Medicaid program has expanded to provide health insurance coverage for children of low-income families that are outside the regular welfare system. Initial legislation in 1984 allowed states to cover children whose families satisfied the income requirements of the Aid to Families with Dependent Children program, irrespective of family structure. In 1990 coverage was extended to children under the age of six in families with incomes under 133 percent of the poverty line, and in 1991 to children born after September 30, 1983 in families with incomes below the poverty line.[1] Despite these expansions, health insurance coverage rates for children in families with incomes just above the welfare eligibility threshold are below those of children in richer or poorer families. Figure 1, for example, shows the fraction of children with health insurance in different family income groups in 1989, 1993, and 1999.[2] Coverage rates in all three years exhibit a U-shaped pattern, with the lowest rates for children in families with incomes from 75 to 125 percent of the poverty line – a range that is typically just above the income limit for welfare. While this group experienced a modest rise in insurance coverage between 1989 and 1993, the Medicaid expansions have not succeeded in bridging the coverage gap between the welfare system and private insurance.

Several previous studies have attempted to measure the impact of the Medicaid expansions and evaluate alternative explanations for the continuing coverage gap in Figure 1. An early paper by Cutler and Gruber (1996) argued that although the expansions increased the fraction of low-income children enrolled in Medicaid, they also led to reductions in the fraction covered by private health insurance. Their work suggested a substantial "crowd-out" effect, partially explaining the persistence of the U-shaped pattern of coverage after the expansions took effect. More importantly, Cutler and Gruber estimated that actual Medicaid enrollments lagged far behind the rise in the number of potentially

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[1]In addition, states were granted the option of offering even more extensive coverage. See Section II for a more comprehensive discussion of the expansions.

[2]These data are drawn from the March 1989, 1993, and 1999 Current Population Surveys (CPS). The samples include individuals age 0-18 who are neither a family head nor a spouse of a head. See the Data Appendix for more information.

eligible enrollees. Subsequent research (Dubay and Kenney (1996), Shore-Sheppard (1997), Yazici and Kaestner (2000), Blumberg et al (2000), Ham and Shore-Sheppard (2001)) has confirmed the modest impact of increasing eligibility on actual Medicaid coverage, while finding less evidence of crowd-out. A number of explanations – mainly focusing on the administrative burden of establishing and maintaining Medicaid coverage – have been offered for the apparently low take-up rate of coverage among groups made eligible by the recent expansions.

In this paper we use data from the 1990-1993 Surveys of Income and Program Participation (SIPP) to conduct study the effects of the two major federal Medicaid expansions – the "133 percent" program covering children under the age of six, and the "100 percent" program covering children born after September 30, 1983. A key feature of both programs is the sharp discontinuity in eligibility for children of different ages. Five year olds in families with incomes from 100 to 133 percent of the poverty line are eligible for Medicaid, whereas six year olds are not. Children in poor families born in the third quarter of 1983 are ineligible for coverage, whereas those born in the fourth quarter are eligible. Since age and birth month are accurately measured in the SIPP, these discontinuities allow us to construct simple comparisons between groups of eligible and ineligible children that are otherwise very similar, and discern the effects of the two federal programs.

Our results point to two major conclusions. First, the 100 percent program covering children born after September 30, 1983 led to a 10-15 percentage point increase in Medicaid coverage among children in families just under the poverty line who were made eligible by the law. This increase was associated with a small decline in other types of health insurance and a rise in dual coverage. Second, there is little evidence of an effect of the 133 percent program for children under the age of six on Medicaid enrollment or other health insurance coverage. This conclusion is confirmed with data from the March Current Population Survey. Interestingly, in the early 1990s the 133 percent program covered a larger potential eligibility pool than the 100 percent program. Thus, considered together, the marginal

impact of the two federal expansion programs was small. However, this conclusion masks a sharp difference between the programs that needs to considered in designing future policy initiatives.

II. The Medicaid Expansions

From its inception, Medicaid eligibility for non-disabled children was linked to the Aid to Families with Dependent Children (AFDC) program. The first loosening of the ties between the two programs occurred in 1984 with implementation of the "Ribicoff program." Ribicoff allowed states to offer Medicaid coverage to children whose families satisfied the income limits of the AFDC program, but not the family structure rules – e.g., children in two-parent families. Further decoupling occurred with passage of the Omnibus Budget Reconciliation Act (OBRA) of 1986 and OBRA 1997. As described in Appendix Table 1, these laws permitted states to raise the income limits for Medicaid eligibility of pregnant women, infants, and very young children above the AFDC level. OBRA 1987 also required the states to cover all children born after September 30, 1983 who lived in families with incomes below the AFDC income threshold, regardless of family structure.

The Medicare Catastrophic Coverage Act (MCCA, effective July 1989) and Family Support Act (FSA, effective October 1990), both passed in 1988, required states to extend Medicaid eligibility even further. The MCCA mandated eligibility for pregnant women and infants in families with incomes up to 75 percent of the poverty line, and permitted coverage of children up to age 8 in these families. The FSA required states to offer coverage to children in two-parent families in which the principal earner was unemployed.

The two most important expansions of the Medicaid program – and the focus of the analysis in this paper – were included in OBRA 1989 and OBRA 1990. Effective April 1990, OBRA 1989 required states to offer Medicaid coverage to pregnant women and children up to age 6 with family incomes below 133 percent of the federal poverty level (the "133 percent program"). Effective July 1991, OBRA 1990

required states to cover children born after September 30, 1983 with family incomes below 100 percent

of the federal poverty level (the "100 percent program"). These children continue to be covered as they

grow older, until they reach age 18.[3]

III. Measuring Medicaid Eligibility and Coverage

In this paper we use data from the 1990-1993 SIPP panels to study the effects of the two major

federal Medicaid expansions. SIPP data have some advantages over the March CPS data that have been

used in most previous studies of the Medicaid expansions. First, SIPP income and program participation

questions refer to a specific (and very recent) calendar month, rather than to the previous calendar year.

Since Medicaid eligibility is usually determined on a month-by-month basis, there is a close link between

the observed income data and the eligibility criteria. Moreover, SIPP household rosters are collected

every four months. Thus, the observed family structures in the SIPP correspond to the family units

relevant for determining current program eligibility. In contrast, living arrangements at the time of the

March CPS may differ from those of the previous calendar year, leading to slippage in eligibility

determination. A second key advantage of the SIPP is that information is available on month and year of

birth. These data allow us to form precise comparison groups of children on either side of the Medicaid

eligibility thresholds. Finally, because of the design of the questionnaires, health insurance coverage is

generally thought to be better measured in the SIPP than the CPS, especially in the period up to 1995 (see

Bennefield, 1996, Nelson and Mills, 2001, and Card, Hildreth, and Shore-Sheppard, 2001).

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[3]In addition to the programs described in the text, two other federal rule changes allowed the
states to expand Medicaid eligibility. The first, known as the Section 1902(r)(2) option, allowed states to
adopt more liberal standards for calculating income and resources for some categories of eligibility. The
second is the Section 1115 waiver option, which allowed states to apply to the Health Care Financing
Administration for a "research and demonstration" waiver. Under waivers, states could potentially raise
the eligibility limits for Medicaid.

Despite these advantages, the SIPP has some limitations that need to be kept in mind in interpreting our results. The SIPP samples are relatively small (14,000 children per panel versus over 40,000 children in each March CPS), forcing us to use broader aggregations than might be desirable[4]. Also, SIPP samples are not consistently available for every calendar year. Although new SIPP panels were started in 1990, 1991, 1992, and 1993, there were no new panels in 1994 and 1995. In view of the timing of the federal Medicaid expansions, however, and the evidence in Figure 1 of relative stability in health coverage patterns after 1993, we believe that the 1990-1993 panels provide a valuable window on the key period of the expansions.

Table 1 provides an overview of our SIPP samples. For each of the four panels we use one observation per person from the 4th interview month. Depending on the rotation group, this month corresponds to January through April of the beginning year of the panel (e.g., January to April 1990 for the 1990 panel). We include individuals up to the age of 18 who are not heading their own families. As explained in the Data Appendix, we have constructed families for the sample children using the available household and family relationship information in the SIPP merged longitudinal files. In most cases these families correspond to the members of the interviewed households. In cases where a child and his or her parent(s) live with other adults, however, we have restricted the family to include only the children and parent(s) of the appropriate subfamily. This definition corresponds to the family benefit unit that would be potentially eligible for AFDC or Medicaid.[5]

Our combined sample includes 49,309 children, with slightly fewer observations in the 1991 panel than in other years. The average age of the sample children is 8.7 years. About 17 percent are

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[4]It should be noted that the overlapping design of the CPS leads to substantial dependency in the samples in consecutive survey years. Each March CPS contains only about 24,000 "new" children.

[5]Appendix Table 2 shows a cross-tabulation of poverty status for children using our revised family incomes and the family incomes that are assigned in the SIPP file. Breaking up some of the households into subfamilies leads to higher family incomes (relative to the family poverty line) in some cases, and lower in others.

black, 11 percent are Hispanic, and 23 percent live with a single mother. Just over 20 percent live in

families with incomes under the (family-specific) poverty line, and another 20 percent live in families

with incomes from 100 to 200 percent of poverty. As shown in Appendix Table 2, these characteristics

are nearly identical to the characteristics of a similarly-defined set of children in the 1990-1993 March

Current Population Surveys. The similarity of the fractions living in poor and near poor families in the

SIPP and CPS is potentially surprising, since the SIPP measures monthly income whereas the CPS

measures annual income. Nevertheless, detailed comparisons of the family income distributions in the

CPS and SIPP (Appendix Figure 1) confirm that the fractions of children in different ranges of family

income-to-poverty are quite similar in the two data sets.

The third set of entries in Table 1 refer to eligibility and participation in the Aid to Families with

Dependent Children (AFDC) system. The rules of the AFDC program have an important impact on

actual and measured Medicaid participation, since families on AFDC automatically receive Medicaid

coverage, and children in families that report receiving AFDC are coded as covered by Medicaid in the

SIPP. We use data on state benefit rates together with information on family composition to assign each

family an AFDC income threshold (or "breakeven" level). We then express this maximum eligibility

cutoff as a fraction of the corresponding (family-specific) poverty line.[6]

In the early 1990s the average AFDC income threshold was in the range of 60-70 of the family

poverty line. Over the 1990-93 period the average cutoff declined somewhat, reflecting the failure of

many states to raise AFDC benefits as rapidly as inflation and actual benefit cuts in a few states. Despite

this decline, the fraction of children living in families with incomes under the AFDC cutoff rose slightly,

from 15.4 percent in 1990 to 17 percent in 1993. Actual AFDC participation rose more quickly, from 8.4

percent of children in 1990 to 12.0 percent in 1993. Compared to these rates, AFDC participation rates

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[6]Our cutoffs are based on a liberal interpretation of the maximum child care credits that a family can potentially receive (see the Data Appendix) and overstate the cutoffs for families that rely on informal child care.

of children in the 1990-93 CPS are 2-3 percentage points higher (see Appendix Table 3) but show very similar trends over the sample period.[7]

The bottom rows of Table 1 present data on Medicaid eligibility and participation. To measure eligibility we assign each child a maximum family income limit for Medicaid. In cases where a child meets the age restrictions of a state or federal expansion with an income limit above the state AFDC threshold, we assign the income limit of the expansion program, expressed as a fraction of the family-specific poverty line (e.g., 133 percent). In cases where a child is only eligible for Medicaid through AFDC, we assign the AFDC income limit. The effect of the Medicaid expansions is evident in the dramatic rise in the average eligibility limit from 77 percent of the poverty line in 1990 to 112 percent in 1993. Using reported family income data we can also calculate the fraction of children eligible for Medicaid but not AFDC. This rises from 1.7 percent in 1990 to 11.7 percent in 1993.[8]

Consistent with these trends, the Medicaid coverage rate of children in the SIPP rose from 12.1 percent in 1990 to 19.7 percent in 1993. Four percentage points (or 53 percent) of this increase was attributable to a rise in the fraction of children who received Medicaid coverage but not AFDC, while the remainder was attributable to the rise in AFDC participation. This trend in participation is fairly similar to the trend for children in the CPS (see Appendix Table 3), although measured Medicaid coverage rates in the SIPP are 2-4 percentage points lower than in the CPS, perhaps reflecting the nature of the coverage interval (a month in the SIPP versus a year in the CPS). Interestingly, CPS data imply that a slightly larger fraction (70 percent) of the rise in Medicaid coverage from 1990 to 1993 was due to a rise in coverage outside the AFDC system.

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[7]The CPS does not report AFDC participation for children. We code a child as an AFDC recipient in the CPS if his or her family reports receiving public assistance income in the past year.

[8]This calculation understates the fraction of children eligible for Medicaid but not AFDC, because we are ignoring the family structure rules of the AFDC program that do not apply to Medicaid.

Further detail on the sources of Medicaid eligibility for the children in our sample is presented in Table 2. Here, we assign the reasons for Medicaid eligibility according to a simple hierarchy: eligible through AFDC; eligible through the federal program for infants; eligible under the 133 percent program for children under age 6; eligible under the 100 percent program for children born after September 30, 1983; or eligible under a state program that provides coverage beyond the federal programs. For children in each eligibility group we also show the fraction who were actually covered by Medicaid. Of course any measurement errors in income or family composition will cause some Medicaid-eligible children to be assigned to the wrong eligibility class, or to the ineligible group, and will also cause some eligible children to be coded as ineligible. Moreover, children who are eligible for Medicaid because of a disability, or because their family has incurred large medical expenses, will be assigned to the ineligible category, or to a poverty-related eligibility class.

The first two rows of the table show data for children who are estimated to be ineligible. From 1990 to 1993 this group shrank from 83 to 71 percent of all children. At the same time the Medicaid coverage rate of the "ineligibles" rose by 45 percent. The next two rows refer to the subset of children who are categorically eligible for Medicaid because of their AFDC eligibility. As noted in Table 1, the size of this group increased slightly in the early 1990s. The Medicaid coverage rate of the AFDC-eligibles also rose, from 58 to 72 percent.

The infant program and the program for children under 6 both apply to families with incomes under 133 percent of the poverty line. Taken together, these two programs had a potential eligibility pool of about 5 percent of all children in 1992 and 1993. Among the eligibles, the fraction who were actually covered by Medicaid ranges from 20 to 40 percent, a rate that is much lower than the coverage rate for AFDC-eligible children. A similar observation has been made in previous studies of the Medicaid expansions (e.g., Cutler and Gruber, 1996 and Shore-Sheppard, 1997). The take-up rate of coverage

among newly eligible children is considerably lower than the average coverage rate of all children who are deemed to be eligible.

The 100 percent poverty program only began in mid-1991, and extended coverage to a relatively small fraction of children in our 1992 and 1993 samples (1-2 percent). Interestingly, however, the Medicaid coverage rate for the relatively older children eligible for this program (and not for AFDC or the 133 percent program) was close to 50 percent in 1993.

Finally, in the early 1990s many states adopted more generous Medicaid coverage limits than prescribed by the federal laws. Some of these programs only covered certain categories of medical expenses, or required co-payments. By 1993, we estimate that such state programs offered potential coverage to about 5 percent of children who were otherwise ineligible for Medicaid. The actual coverage rate for these children is fairly low (20-30 percent), perhaps reflecting the restrictive nature of some of the programs and a lack of knowledge about the state-specific programs.

Family Income, Medicaid Coverage, and the AFDC Program

Like the CPS data in Figure 1, data from the SIPP show a U-shaped pattern of health insurance coverage by family income. Indeed, as shown in Appendix Figure 2, the fractions of children with health insurance in different family income ranges are very similar in the CPS and SIPP. The driving force behind the fall-off in health insurance coverage between children with family incomes around 50 percent of the poverty line and those with incomes of 75 to 125 percent of the poverty line is AFDC eligibility. This is illustrated in Figure 2, where we show AFDC and Medicaid recipiency rates for children in the pooled 1990-93 SIPP sample as a function of the gap between measured family income and the (family-specific) AFDC income cutoff.

To understand this figure, consider a child in a family with income I that has an AFDC income cutoff of C and poverty line income of P. The gap between family income and the AFDC cutoff,

expressed as a fraction of the poverty line, is (I-C)/P. If families always participated in AFDC when I<C, and were off AFDC when I>C, and if family income and the AFDC cutoff were accurately measured, then the AFDC participation rate in Figure 2 would be 1.0 to the left of zero and 0.0 to the right. In reality, AFDC eligibility is restricted to female-headed families and dual-headed families with an unemployed parent, so many families with incomes less than C are ineligible for payments. Moreover, AFDC participation is typically under-reported, and not all those who are eligible for AFDC actually receive it. Finally, incomes are measured with error, and our estimate of the AFDC cutoff is arguably over-stated for most families because we have included relatively generous child care allowances available to a family ($200 per month per child under two and $175 per month per child under six), and families that use informal care are ineligible for these allowances. For all these reasons, the average rate of AFDC participation is only about 55-60 percent among children whose family incomes are 10 percent or more below the cutoff, and the rate of receipt falls off more slowly than would be expected if incomes and the AFDC cutoff were measured without errors.[9] Nevertheless, there is clear evidence of a "step-like" relationship between AFDC recipiency and income as family income approaches the AFDC cutoff, even though mean family income (shown by the increasing line in Figure 2) is smoothly rising with distance from the cutoff.

Medicaid participation rates are higher than AFDC rates, even for families with incomes far below the AFDC cutoff, but fall off sharply as family incomes pass through the AFDC cutoff. The fraction of children covered by Medicaid and not on AFDC is around 13 percent for those with incomes below the AFDC cutoff, and rises as family income approaches the cutoff, presumably reflecting the Medicaid expansions. While not shown in Figure 2, the fraction of children with any health insurance tracks the fraction with Medicaid very closely, falling from 85 percent for children whose family incomes

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[9]If we restrict attention to children with single mothers, the average AFDC recipiency rate is about 75 percent for those with incomes less than 10 percent below the cutoff, and the fall-off in receipt is sharper than in Figure 2.

are 10-60 percent below the AFDC cutoff to around 70 percent for those whose family incomes are just

above the AFDC cutoff. Thus, the U-shaped coverage pattern in Figure 1 is a reflection of the linkage

between AFDC and Medicaid, coupled with the limited incidence of private health insurance among

families that are just beyond the AFDC income threshold.

IV. The 100 Percent Program

Our analysis of the 100 percent Medicaid expansion program relies on simple comparisons

between children in poor families born on or after the earliest eligibility date for the program (October 1,

1983) versus those born before. Figure 3 shows the key features of this comparison. Here we have

plotted Medicaid coverage rates of children living in families with incomes from 60 to 99 percent of

poverty in the 1992 and 1993 SIPP samples by quarter of birth. To eliminate children who were

potentially eligible for AFDC, we include only those whose family-specific AFDC cutoff is less than 70

percent of the poverty line.[10] There is a discernable "jump" in Medicaid coverage between those born in

the third quarter of 1983 and those born in the fourth quarter. Moreover, coverage rates on either side of

the eligibility cutoff are fairly stable, suggesting that the jump is a real feature of the data rather than a

random blip.[11] A rough estimate of the magnitude of the jump is 10-15 percentage points.

There are several ways to check that the higher Medicaid participation rate of poor children born

after September 1983 is a reflection of the 100 percent Medicaid expansion program and not some other

confounding factor. The most obvious is to conduct a similar analysis for children living in families just

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[10]Based on the results in Figure 2, we infer that AFDC participation falls off quickly for children in families with income within 10 percent of the AFDC cutoff. In an effort to maintain as large a sample as possible we therefore include children with family incomes from 60 to 99 percent of poverty with AFDC cutoffs under 70 percent of the poverty line. The lines in Figure 3 are smoothed across cohorts using a 3-quarter moving average with weights (0.2, 0.6, 0.2).

[11]There are 25-30 children per birth quarter in the 60-99 percent poverty group in the combined 1992 and 1993 SIPPs. Thus, the standard error of the estimated Medicaid participation rate for a single birth-quarter is about 8 percentage points.

above the poverty line. As shown in Figure 3, there is no evidence of a jump in Medicaid coverage for

children whose family incomes are between 100 and 140 percent of poverty. A second way is to examine

Medicaid coverage rates of children with family incomes from 60 to 99 percent of poverty in the period

before the effective date of the 100 percent program (July 1991). A graph similar to Figure 3, but based

on the 1990 and 1991 SIPP samples, shows no indication of a jump in Medicaid coverage around the

September 1983 cutoff. Indeed, in the earlier data, coverage rates for children in families with incomes

from 60 to 99 percent of poverty are slightly lower for later birth groups, suggesting that if anything,

prior to the 100 percent program Medicaid coverage among the post-September 1983 cohort was lower

than among the older group.

Another potentially useful check is to examine the relationship between Medicaid coverage and

family income for children born before September 1983 versus those born after. The presence of the 100

percent program implies that Medicaid coverage should drop discretely as family income reaches the

poverty line for children born after September 1983, but **not** for those born earlier. This check is

performed in Figure 4.[12] A crucial difference between the comparisons by income in Figure 4 and those

by birth quarter in Figure 3 is the accuracy and "permanence" of birth date versus family income. Birth

date information is presumably quite accurate in the SIPP, whereas family income is measured with error.

At least as importantly, monthly incomes contain significant transitory components.[13] Since Medicaid

enrollment is costly, families will not necessarily enroll if their income is temporarily low. On the other

hand, birth cohort is a permanent characteristic, so differences in eligibility by cohort should lead to

differences in average enrollment. These considerations suggest that any discontinuity in Medicaid

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[12]As in Figure 3 , the samples used in Figure 4 exclude children whose AFDC cutoff is greater than 70 percent of the family-specific poverty line.

[13]See for example Pischke (1995), who fits a variety of models to monthly family income from the SIPP.

coverage generated by the eligibility rules will be easier to detect along the age or birth cohort dimension, and harder to detect along the income dimension.

Consistent with this reasoning, there is less evidence of a discrete shift in Medicaid coverage on either side of the income threshold in Figure 4 than on either side of the birth cohort threshold in Figure 3. Nevertheless, the patterns of Medicaid coverage for the older and younger cohorts in Figure 4 suggest that the 100 percent program has a significant effect. Above the poverty line, Medicaid coverage rates are fairly similar for the older and younger cohorts. Below the poverty line the coverage rate of the younger cohort is 10-15 percentage points higher.

Differences-in-Differences

The patterns in Figures 3 and 4 suggest that the 100 percent Medicaid expansion program generates discrete differences in Medicaid coverage by cohort and by family income. In view of this, we believe it is legitimate to estimate the effects of the program more formally using the "difference-in-differences" of various outcomes between children born and after September 30, 1983 in families above and below the poverty line. The components of these differences-in-differences are presented in Table 3, using data from 1992 and 1993 for children in families with incomes from 60 to 140 percent of the poverty line whose AFDC income cutoffs are less than 70 percent of the poverty line. We defer a discussion of the effects of changing these sample restrictions to the next section.

A key issue for interpreting the results in Table 3 is how the comparison between older and younger cohorts in families above and below the poverty line maps into differences in Medicaid eligibility. As shown in the third column of the table, children born before October 1, 1983 have very low rates of Medicaid eligibility, regardless of whether their family income is above or below the poverty line. (Nearly all of the eligible children in this cohort are eligible under state programs, although a few are eligible for AFDC). Children born after the cutoff date in poor families are all eligible for Medicaid

under the 100 percent program. However, close to one half of those in the same age group but in families

with incomes from 100 to 140 percent of the poverty line are also eligible – mainly through the 133

percent federal program. Thus, the difference of differences in estimated eligibility is only 47 percent.

In terms of Medicaid coverage, the results for children in families with incomes of 100 to 140

percent of poverty suggest that coverage rates are about 5 percentage points higher for the younger cohort

than the older cohort. Some of this may be attributable to the 133 percent program (or other state

programs), and some may be due to systematic differences in families with younger versus older

children. If one assumes that the same age differential would have existed among children from poorer

families in the absence of the 100 percent program, then one should subtract 5 percent from the observed

20.7 percent difference in coverage rates between the older and younger cohorts of these children,

leading to an implied program effect of 15.6 percent. The (conventional) standard error of this estimate

is 3.1 percent.[14]

The difference-in-differences can also be estimated while controlling for other observable factors

that affect the likelihood of Medicaid coverage, and for smooth differences in coverage rates by age and

income. In particular, consider the following linear probability model for the event of Medicaid coverage

for the ith individual:

$$(1) \qquad P(M = 1) \; = \; a \; + \; b_0 \, \text{Age} \; + b_1 \, (\text{Age} < 6 \text{ years}) + b_2 \, \text{Income} + b_3 \; \text{Income}^2$$

$$+ \, b_4 \, \text{Poor} \; + b_6 \, (\text{Born After } 9/30/81) + b_7 \, \text{Poor} \times (\text{Born After } 9/30/81)$$

$$+ \, b_8 \, X \, ,$$

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[14]It is possible to construct a variety of standard errors for the estimated difference in differences, depending on one's assumptions about the group structure of error components affecting Medicaid coverage. For example, if one assumes that coverage rates contain an i.i.d. quarter-of-birth component, the estimated standard error is 3.13 percent. We have not adjusted our sampling errors for possible correlations across children from the same family. There are about 1.95 children per household in our samples. If siblings are perfectly correlated our sampling errors are downward biased by 40 percent.

where M is an indicator for Medicaid coverage, "Age" represents an individual's age (in months),

"Income" represents family income divided by the family-specific poverty line, "Poor" is an indicator for

family income under the poverty line, and X is a set of other characteristics (family structure, region,

etc.) This specification allows Medicaid coverage to vary smoothly with age and family income, and to

exhibit possible discontinuities as family income reaches the poverty line, and as the child's birth date

approaches September 30, 1983. The potential effect of the 133 percent program is captured by the

indicator for age under 6.[15] The impact of the 100 percent program is identified by the presence of an

"interaction discontinuity" between poverty status and birth cohort.

The entry in the bottom row of Table 3 in the Medicaid coverage column presents the regression-

adjusted difference-in-differences. In addition to the controls specified in equation (1), we include

dummies for black race, Hispanic ethnicity, single mother family structure, and for 8 Census divisions.

While many of the covariates are statistically significant and add to the explanatory power of the model,

they have very little impact on the estimated effect of the 100 percent program, which is still around 15

percent. The fact that the estimated effect is nearly identical when a linear age term and quadratic

income controls are introduced in the model confirms that the data exhibit a discrete jump in coverage for

poor children born after September 1983, and that the estimate is not simply picking up differences by

age or family income.

The remaining columns of Table 3 analyze differences in AFDC participation, Medicaid

coverage outside of AFDC, overall health insurance coverage, and the presence of non-Medicaid

insurance. The results for AFDC can be interpreted as a specification check. In principle, the 100

percent program should have led to a rise in the fraction of children with Medicaid coverage, with little

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[15]This can be interacted with a dummy for whether family income is under 133 percent of poverty. The sample in Table 3 is restricted to families with incomes under 140 percent of poverty, however, so this interaction adds very little.

or no effect on AFDC participation.[16] This is confirmed in the table, by both the unadjusted and

regression-adjusted differences in differences.

The results for any health insurance, and for other (i.e., non-Medicaid) insurance, address the

issue of crowd out. As has been found in previous research on the Medicaid expansions, overall health

insurance coverage rates did not rise as much as the Medicaid coverage rate among the group newly

covered by the 100 percent program. This fact, and the differences-in-differences in the last column of

the table, suggest that the availability of Medicaid led some poor families to drop private coverage of

their children. In addition, the smaller rise in total coverage than in the difference between the change in

Medicaid coverage and the change in other insurance implies that there was a rise in the fraction of

children covered by **both** Medicaid and some other type of insurance.[17] Both the unadjusted and adjusted

differences-in-differences imply a 2.7 percentage point rise in the fraction with multiple coverage.

As mentioned earlier, one useful specification test of the methods underlying Figures 2 and 3 and

Table 3 is to perform the same analysis using data from 1990 and 1991, before the 100 percent program

took effect. This exercise is presented in Table 4. A first observation emerging from the eligibility

results in this table is that even before the 100 percent program took effect, there was a "treatment effect"

on potential Medicaid eligibility of children in poor families born after September 1983. This is because

by 1991 the 133 percent program was in effect for children in families under the age of 6, and all of these

were born after September 1983. In light of this "pre-program" difference, the actual increase in

eligibility attributable to the 100 percent program is more like 21 percent (=47.1–26.2).

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[16]The availability of Medicaid for families outside AFDC could lead to a fall in AFDC
participation, if prior to the expansions some families stayed on welfare to maintain health insurance
coverage. Keane and Moffitt (1998) argued that the implicit value of Medicaid insurance was a
significant source of welfare participation in the 1980s.

[17]The change in the fraction with both Medicaid and other coverage is equal to the sum of the
change in the fraction with Medicaid and the change in the fraction with other coverage, minus the
change in the fraction with any coverage.

Despite the fact that poor children in the younger cohort had higher eligibility rates in 1990-91 than those in the older (pre-September 1983) cohort, the results in Table 4 show that they had about 10 percent **lower** Medicaid coverage than would be expected from the patterns for the older cohort, and for children from families above the poverty line. This gap is due to an unexpectedly low rate of AFDC participation: the pre-program effect on the percent of children on Medicaid and not on AFDC is close to 0. The AFDC-related Medicaid coverage gap generatesd a similar gap in overall health insurance coverage, with little or no effect on the fraction with other health insurance. We are uncertain of the reasons for the relatively low AFDC participation rate of younger poor children in 1990 and 1991, compared to the situation in 1992 and 1993. It is worth noting, however, that about half of the shift in the difference-in-differences in AFDC participation between 1990-91 and 1992-93 is attributable to a reversal of the age patterns of AFDC participation among children in the *above-poverty* families. We doubt that this change was driven by the Medicaid expansions.

We have estimated a series of adjusted differences-in-differences using pooled data for both the pre- and post program periods. In one set of specifications we augmented equation (1) with year effects and included the interaction of living in a poor family and being born after September 1983 for observations in 1992 and 1993 (with no interaction in 1990 and 1991). This is equivalent to assuming that the pre-program differences-in-differences are all zero. The estimates from these models are very close to the estimates in Table 3, and slightly more precise. In another set of specifications we included an interaction term for living in a poor family and being born after September 1983, and a three-way interaction with the post-program period. The estimates of the 3-way interaction effect are nearly identical to the **differences** in the adjusted differences-in-differences between Table 3 and Table 4. (For example, the Medicaid effect is 0.25, the AFDC effect is 0.10, and the effect for being on Medicaid and not on AFDC is 0.16). Since it is unlikely that the 100 percent program led to a rise in AFDC participation for poor children born after September 1983, we believe that these estimates should be

viewed cautiously. We prefer those that ignore the pre-program gap in AFDC participation (i.e. the estimates in Table 3, or from pooled models that assume no effect in 1990-91).

Varying the Estimation Sample

One concern with the differences-in-differences in Table 3 is that they pool relatively large groups on each side of the September 30, 1983 birth date cutoff and on either side of the poverty line. Ideally we would like to focus more narrowly. Table 5 summarizes the results from a number of experiments with alternative sample definitions. For reference purposes, the first column of the Table reproduces the key results from our "baseline" sample in Table 3. In the second column we tighten the family income range from ±40 percent of the poverty line to ±30 percent. This has relatively little effect on the results, although the difference-in-differences of AFDC is somewhat larger, and the evidence of crowd-out effects is smaller. In the third column we drop the restriction that children in families whose AFDC cutoff is higher than 70 percent of the poverty line are excluded from the sample. About one-half of the affected observations are from California and New York, which have relatively generous AFDC benefits. This change substantially increases the sample size and lowers the estimated difference-in-difference in Medicaid eligibility(from 47 percent in the baseline specification to 21 percent) by including in the below-poverty group many children whose families are eligible for welfare. It also lowers the estimated effects on Medicaid coverage and on overall health insurance coverage.

The fourth, fifth, and sixth columns re-impose the income and AFDC cutoff limits of the baseline specification but narrow the age ranges of the children in the sample. Column 4 excludes children under the age of 6, and thereby eliminates any potential confounding effect of the 133 percent program. This sample change directly focuses on children made newly eligible by the 100 percent poverty program. Consistent with this, the difference-in-differences of eligibility is 94 percent. Interestingly, however, the effects on the fraction of children with Medicaid coverage or with Medicaid but not AFDC are smaller

when children under 6 are excluded than when they are included (particularly when the increases in

coverage are expressed per newly eligible child). This finding suggests that the 100 percent program led

to an increase in Medicaid coverage for children under 6 in poor families – a group who were presumably

already covered by the 133 percent program. As we show in the next section, this is not surprising in

light of the apparently small effects of the latter program.

Finally, in columns 5 and 6 of Table 5 we narrow the age range to children born within 5 years

(column 5) or 2 years (column 6) of the September 1983 cutoff date. The estimates from these

subsamples are similar to the baseline results, although with the narrowest age range the sample is very

small and none of the differences in differences are statistically significant. Taken as a whole, we

believe that the results in Table 5 are consistent with the conclusion that the 100 percent Medicaid

expansion program led to a rise in coverage of children in poor families born after September 1983, with

some reduction in other (non-Medicaid) coverage and some increase in the fraction of children with both

Medicaid and other insurance.

V. The 133 Percent Program

Like the 100 percent program, the 133 percent Medicaid expansion program generates sharp

discontinuities in Medicaid eligibility: after April 1990, children under the age of 6 in families with

incomes below 133 percent of the poverty line are eligible for coverage, whereas those ages 6 and older

are not necessarily eligible. To focus most directly on the group affected by the 133 program, we

compare children older and younger than 6 in families with incomes from 100 to 132 percent of the

poverty line in the 1991-93 SIPP. This income group was unaffected by the 100 percent Medicaid

expansion program. Figure 5 shows Medicaid coverage rates by age (in quarters) for this group, along

with similar data for a comparison group of children in families with incomes from 133 to 166 percent of

poverty.[18] Unlike the series in Figure 3, there is no evidence of a break in the Medicaid coverage rate

associated with the age limit of the 133 percent program[19]. If anything, there is a rise in coverage for

children in the lower income group as they reach their sixth birthday (between 24 and 25 quarters),

although this is arguably an artefact of the dip in coverage for those age 19-21 quarters.

A comparison of Medicaid coverage by family income also shows no evidence that the 133

percent program effects the coverage of younger children in eligible families. Figure 6 shows Medicaid

coverage rates of children ages 0-5 and 6-18 in families with incomes on either side of the 133 percent

cutoff. In contrast to Figure 4, there is no indication of a fall-off in the relative coverage of the younger

group as family income reaches the 133 percent cutoff.

Table 6 presents differences-in-differences of Medicaid, AFDC, and health insurance outcomes

for children on each side of the age 6 cutoff and the 133 percent family poverty line. Looking first at the

eligibility data in the third column of the table, the 133 program has a large effect on the potential

eligibility of the targeted children. Children over 6 in families with incomes over the poverty line have

low Medicaid eligibility rates, as do children under 6 in families with incomes above 133 percent of

poverty. Relative to these groups, the 100 percent eligibility rate of children under 6 in the 100-132

percent group translates into an 84 percentage point difference-in-differences of eligibility. Nevertheless,

there is little evidence of an associated impact on Medicaid coverage, overall health insurance coverage,

or the fraction with other insurance. This same conclusion emerges from the adjusted differences-in-

differences, which are obtained from a specification similar to equation (1), modified to account for the

133 percent poverty limit. We experimented with many changes in the income and age limits for the

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[18]To avoid issues of AFDC eligibility, the underlying samples exclude children in families whose
AFDC income limit is above 100 percent of the poverty line. This affects a relatively small number of
children.

[19]As in Figure 3, the lines in Figure 5 are smoothed using a 3-quarter moving average with
weights (0.2, 0.6, 0.2). There are 40-50 observations per quarter for both income groups, slightly more
than in the samples in Figure 3.

samples used in Table 6. Narrowing the sample to children under 10 leads to very little change in the estimates. Further restricting the sample to children ages 4 to 7 (i.e., ±2 years of age from the cutoff limit) actually leads to negative estimated differences-in-differences for Medicaid coverage, as might be expected given the patterns in Figure 5. Finally, narrowing the family income range has no large or systematic effect on the results.

Although the results in Table 6 are surprising, they are consistent with several aspects of our findings for the 100 percent program. First, as noted, the 100 percent program was associated with a rise in Medicaid coverage of children under 6. Since children under 6 in families under the poverty line were already eligible under the 133 program, this result calls into question the impact of the 133 program. Moreover, the estimated coefficients of the indicator for children under 6 in equation (1) fit to 1992 and 1993 data are small in magnitude (in the range of 4-8 percent) and generally insignificant, suggesting that in families from 60 to 140 percent of poverty, there is little discernable rise in Medicaid coverage for children under 6.[20]

One important feature of the 133 percent program is that the age cutoff falls at exactly 6 years. Thus, it is possible to distinguish eligible and ineligible children in data sets that **only** specify age in years, such as the Current Population Survey. In view of the unexpected results in Table 6, we decided to replicate this analysis using data from the March 1991-93 CPS. The results are summarized in Table 7. Although the levels of Medicaid, AFDC, and health insurance coverage are higher in the CPS than the SIPP (reflecting the difference in the interval over which coverage is measured) the differences-in-differences are very similar. In particular, the March CPS data suggest that the 133 program had a very small effect on Medicaid coverage of children under 6 in families with incomes from 100-132 percent of poverty – on the order of 2 percent or less. Despite the much larger CPS sample sizes, none of the

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[20]The dummy for children under 6 is largest, and most often statistically significant, in models for the event of coverage by Medicaid and not AFDC. For example, in our baseline sample this dummy is 0.09 with a standard error of 0.03.

differences-in-differences are statistically significant, with the exception of the effect on other health insurance. Paradoxically, the CPS data suggest that the 133 program led to a decline in overall health coverage: the 3.9 percent decline in other health coverage more than offset the 1.6-1.7 percent rise in children obtaining Medicaid outside of AFDC[21]. We also conducted a year-by-year analysis using the CPS files for 1991, 1992, and 1993. The results (summarized in Appendix Table 4) show a slightly larger impact on Medicaid coverage in 1991. Indeed, any positive impact on the fraction of children covered by Medicaid and not on AFDC is confined to this year. There is no indication that the effect of the program was rising in the period after its initial effective date.

Based on the results in Figures 5 and 6 and Tables 6 and 7, we conclude that the 133 percent Medicaid expansion had little or no effect on the Medicaid coverage of children under 6 in families with incomes from 100 to 133 percent of poverty. Our most precise estimates, from the CPS, point to an effect on the order of 1-2 percentage points in the fraction of eligible children who are covered by Medicaid and not on AFDC. Results from the SIPP are fully consistent with this conclusion.

VI. Marginal Coverage Effects of the 100 Percent Program

A final issue we briefly address is the characterization of the types of children and families that benefitted from the Medicaid expansions of the early 1990s. In view of the results so far, we concentrate on children who were potentially affected by the 100 percent program – i.e., children born after September 30, 1983 living in families with incomes under the poverty line.

Our analysis is summarized in Table 8. The first two columns of the table show the characteristics of two groups of poor children, measured in the 1992 and 1993 SIPP: those born after

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[21]Note that while the CPS data indicate a significant decline in other health insurance coverage associated with the 133 program, the SIPP data show a small rise. This pattern is potentially consistent with a general pattern in the "crowd-out" literature: measured crowd-out is larger in the CPS than the SIPP. See Ham and Shore-Sheppard (2001) for further discussion.

September 30 1983 (the newly eligible group) and those born before (the comparison group). If there was no inter-cohort trend in any of the characteristics shown in the table, then the entries in the two columns would be equal, apart from sampling errors. This is roughly true, although there is a tendency for younger children (those born after the cutoff) to live in slightly poorer families. The next two columns of the table show the characteristics of the subset of children in each group who were covered by Medicaid. A comparison between columns 2 and 4 reveals that among the older children, those covered by Medicaid had lower family incomes and were more likely to be black, to live in a female headed family, and to live outside the South. Among the younger children the comparisons tend to be in the same direction, but there are some interesting differences in the relative magnitudes. For example, only 37.4 percent of covered children in the younger cohort are black, versus 51 percent of the covered children in the older cohort.

The group of covered children in the younger cohort can be divided into two subsets: those who would have been covered even in the absence of the 100 percent program, and the "newly covered" group. The relative size of the latter group can be inferred from the estimates in Table 3. Assuming that the 100 percent program led to a 15.6 percentage point increase in Medicaid coverage among children in poor families born after September 30, 1983, and that 44.8 percent were covered in 1992/93, 35 percent of the covered children are newly covered, and 65 percent would have been covered anyway. The characteristics of the covered children in the younger cohort are a weighted average of the characteristics of the newly covered group and those who would have had Medicaid in the absence of the 100 percent program, with weights 0.35 and 0.65, respectively. If one assumes that the characteristics of children who would have been covered without the expansion are the same as those of the **older** covered children in column 4, then one can infer the characteristics of the newly covered group.[22] These are reported in

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[22]Let E(X) represent the expected value of some characteristic X among the covered children in the younger cohort, let E(X|new) represent the mean value among the newly covered, and let E(X|always) represent the mean among those who would have been covered regardless of the expansion. Then

column 5 of Table 8 as "method 1". A potential problem with this calculation is that the older cohort is

not quite a perfect control group for the younger cohort. As an alternative to method 1, suppose that the

characteristics of the younger group who would have been covered even without the expansion are equal

to the characteristics of the older covered group, plus a differential equal to the mean difference in

characteristics between the overall populations in the two cohorts (i.e. column 4 + the difference between

column 1 and column 2). This gives rise to the estimated characteristics for the marginal coverage group

reported in the final column of the Table as "method 2."

Comparisons of the estimated characteristics of the newly covered group to those of the overall

population, and to the characteristics of the older cohort who were on Medicaid, suggest that the newly

covered group are from higher-income families (closer to the poverty line and further from the AFDC

cutoff), are substantially less likely to have a single mother, are much less likely to be black, and are

more likely to be in the South. The differences in family income and family structure reflect the intended

features of the 100 percent program. The program was designed to offer coverage to families that were

outside of the existing AFDC system – in particular, dual-headed families, and families with incomes just

above the AFDC cutoff. The larger effect of the program in the Southern region is also potentially

explainable by the fact that in Southern states, the gap between the poverty line and the income cutoff for

AFDC is typically larger than in other regions. The noticeable absence of black children in the newly

covered group is more surprising, and we are uncertain of the reasons for this. Interestingly, however,

Hispanic children are about as likely to be in the newly covered group as in the overall population.

A limitation of the analysis in Table 8 is the small sample sizes (under 1000 children in the

overall sample). As a result, the estimates in columns 5 and 6 are relatively imprecise, and any inferences

about the characteristics of the newly covered children under the 100 percent program have to drawn

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$E(X) = 0.35 \times E(X|\text{new}) + 0.65 \times E(X|\text{always})$.

If $E(X|\text{always})$ is known, then $E(X|\text{new}) = [E(X) - 0.65 \times E(X|\text{always})] \div 0.35$.

cautiously. Nevertheless, the evidence suggests that the program was successful in extending coverage to children in the targeted families, albeit with less success for black children than for whites or Hispanics.

VII. Conclusions

In this paper we have attempted to use the discrete nature of the eligibility criteria for the two major federal Medicaid expansions – the "133 percent" program covering children under the age of six in families with incomes up to 133 percent of the poverty line and the "100 percent" program covering children in poor families born after September 30, 1983 – to discern the effects of the expansions on Medicaid coverage, overall health insurance coverage, and coverage by private and other non-Medicaid sources. A key feature of both programs is the sharp discontinuity in program eligibility for children of different ages or birth dates. Since birth date is measured with relatively little error, and is a permanent characteristic of a child, we expect that differences in eligibility by birth date will translate into sharp differences in Medicaid participation for children on either side of the program cutoff. Both programs also have discrete income cutoffs. However, family incomes are hard to measure (both in surveys and in application forms) and contain substantial transitory components that may not have much effect on program participation decisions. Thus, it is less likely that observed income differences translate into sharp differences in coverage.

Graphical and conventional difference-in-differences methods suggest that the 100 percent Medicaid expansion program led to a 10-15 percentage point rise in Medicaid coverage among the targeted group, with a small decline in non-Medicaid coverage and a rise in the incidence of dual coverage. The newly covered group includes families further from the AFDC income cutoffs and closer to the poverty line than the traditional Medicaid caseload. It also includes more children in dual-headed families. By comparison, we are unable to find much evidence that the 133 percent program had any effect on Medicaid coverage of children in families with incomes from 100 to 133 percent of the poverty

line. This negative finding is confirmed using both Survey of Income and Program Participation data, and data from the larger Current Population Survey.

Our findings go some way toward explaining the rather limited impact of the Medicaid expansions identified in previous research. On paper, the 133 percent program covered a much larger fraction of the population than the 100 percent program, at least in the early 1990s. Based on our results, however, this program was apparently ineffective in raising Medicaid coverage – perhaps because the targeted group were in families too far from the boundary of traditional welfare participation. The smaller 100 percent program had much larger impacts, and even affected children under the age of 6 who were presumably already covered by the 133 percent program. Future research is obviously needed to better understand the relative differences in the two expansion programs, and the reasons for the relative success of one versus the relative failure of the other.

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Data Appendix

Survey of Income and Program Participation

The SIPP data used in this paper were extracted from the fourth interview months of the 1990, 1991, 1992, and 1993 full panel research files. The overall sample consists of individuals 18 and younger who are neither the head of a family nor the spouse of a family head. As state of residence is necessary to determine eligibility for AFDC and Medicaid state programs, individuals in the non-identified states are dropped. Members of a family are identified using information on their relationship to the household head, their family status (whether they are in the primary family, a related or unrelated subfamily, or are an unrelated individual), and their relationship to the family head. In most cases the families correspond to the members of the interviewed households. In cases where a child and his or her parent(s) live with other adults, however, we have restricted the family to include only the children and parent(s) of the appropriate subfamily. This definition corresponds to the family benefit unit that would be potentially eligible for AFDC or Medicaid. Variables such as family income and family structure are then calculated using just the individuals in that family.

To determine the income eligibility cutoff for AFDC (the level of income at which AFDC eligibility ends – the "breakeven" level), we use the family income and structure information as well as information on states' AFDC parameters. There are two income tests that a family must pass in order to qualify for AFDC – the "gross test", which requires that a family's gross income be less than 1.85 times the state's need standard, and the "net test", which requires that a family's income after disregards be less than the state's payment standard. In determining AFDC eligibility, families are permitted to disregard *actual* child care expenses up to a maximum of $175 per month ($200 per month for children under 2). As we do not have information on actual child care expenses, we assume that families receive the full disregard for all children under age 6 (and no disregard for older children). This assumption will overstate the amount of the disregard for many families, particularly those that use informal care. Income eligibility cutoffs for Medicaid-only programs are determined using the age of the child (for the infant, 133 percent, 100 percent, and state programs) and the parameters of state Medicaid programs (for the state program only).

Current Population Survey

We use data from individuals 18 and younger who are neither the head of a family nor the spouse of a head from the 1991, 1992, and 1993 March Current Population Surveys to examine the 133 percent program. In addition, we use similar individuals from the 1989, 1993, and 1999 March Surveys to construct Figure 1. As families are identified directly in the CPS, we use the family structure and income information already present in the data to determine which children would be eligible for AFDC and Medicaid. The determination of the income eligibility cutoffs for AFDC and Medicaid is done as described above.

Table 1: Characteristics of Children in First Wave of 1990-1993 SIPP Panels

	1990	1991	1992	1993
Mean Age	8.7	8.8	8.7	8.7
Percent Black	16.2	17.2	16.7	16.7
Percent Hispanic	11.4	13.1	13.5	14.0
Percent in South	36.5	33.8	36.4	34.9
Percent with Single Mother	22.2	23.2	24.0	24.8
Family Income-Poverty Ratio:				
Percent 0-99% Poverty	21.2	24.3	23.8	26.1
Percent 100-199% Poverty	22.1	22.6	23.7	22.2
AFDC Eligibility and Participation:				
Mean AFDC Income Cutoff (Percent of poverty threshold)	68.9	67.4	63.1	60.2
Percent Eligible for AFDC[a]	15.4	17.5	16.2	17.0
Percent on AFDC	8.4	9.9	10.0	12.0
Medicaid Eligibility and Participation:				
Mean Medicaid Income Cutoff (Percent of poverty threshold)	76.5	86.4	92.7	111.9
Percent Eligible for Medicaid but not AFDC	1.7	4.3	6.7	11.7
Percent on Medicaid	12.1	15.6	16.2	19.7
Percent on Medicaid and not on AFDC	3.7	5.7	6.2	7.7
Number Observations	16,196	10,268	14,063	14,494
Number with non-zero weight	14,075	9,252	12,878	13,104

Notes: Sample includes individuals age 0-18 in wave 1 of the SIPP panels who are not heads of families. Characteristics are measured as of the fourth interview month. See text for description of AFDC and Medicaid income cutoffs. Means are weighted by first year weights.

[a]Eligibility based on family income only, ignoring non-financial rules for AFDC-UP for children in families with father present.

Table 2: Medicaid Eligibility Rates by Source of Eligibility, and Medicaid Participation Rates of Eligibility Groups

	1990	1991	1992	1993
Ineligible for Medicaid:				
Percent of Children	82.9	78.2	77.1	71.3
Medicaid Rate of Ineligibles	3.5	4.7	4.6	5.1
Eligible Through AFDC[a]:				
Percent of Children Eligible	15.4	17.5	16.2	17.0
Medicaid Rate of Eligibles	57.8	62.6	65.7	72.3
Eligible Through Federal Program for Infants:				
Percent of Children Eligible	0.2	0.6	0.6	0.6
Medicaid Rate of Eligibles	20.2	19.7	47.4	38.7
Eligible Through Federal Program for Children Under 6:				
Percent of Children Eligible	0.6	3.2	3.8	4.1
Medicaid Rate of Eligibles	16.0	24.0	28.7	37.3
Eligible Through Federal Program for Children Born After 9/83:				
Percent of Children Eligible	0	0	1.1	1.8
Medicaid Rate of Eligibles	--	--	41.3	49.2
Eligible Through State Program:				
Percent of Children Eligible	0.9	0.5	1.2	5.2
Medicaid Rate of Eligibles	15.7	29.1	14.4	22.1

Notes: see notes to Table 1. Children who are eligible under several criteria are assigned to the first criterion they meet.

[a]Eligibility based on family income only, ignoring non-financial rules for AFDC-UP for children in families with father present.

Table 5: Effect of Changes in Sample Definition on Estimated Effect of Federal
Program Covering Children Born After October 1, 1983

SAMPLE PARAMETERS:						
Family Income Range	60-140	70-130	60-140	60-140	60-140	60-140
Max. AFDC Threshold	70	70	none	70	70	70
Age/Cohort Range	0-18	0-18	0-18	6-18	Born 10/78 – 9/88	Born 10/81 – 9/85
Number Observations	3,038	2,273	4,895	2,289	1,814	788
Medicaid Eligibility:						
Below Poverty Line						
Born Before 10/1/83	6.8	6.6	25.1	5.3	6.2	8.9
Born 10/1/83 or Later	100.0	100.0	100.0	100.0	100.0	100.0
Above Poverty Line						
Born Before 10/1/83	4.7	4.8	10.9	4.7	5.2	6.7
Born 10/1/83 or Later	50.8	59.3	65.0	5.8	33.1	5.2
Difference-in-Differences	47.1	38.9	20.8	93.6	65.9	92.6
Medicaid Coverage:						
Below Poverty Line						
Born Before 10/1/83	24.1	19.3	33.5	24.1	24.6	25.6
Born 10/1/83 or Later	44.8	31.8	53.6	40.4	40.2	39.6
Above Poverty Line						
Born Before 10/1/83	12.8	8.1	16.3	12.8	13.0	11.9
Born 10/1/83 or Later	17.8	15.8	22.8	16.8	15.9	17.5
Difference-in-Differences	15.6	13.8	13.7	12.3	12.7	8.4
	(3.1)	(3.0)	(2.6)	(3.9)	(3.9)	(5.9)
Adjusted D-in-D	15.4	13.8	10.3	10.6	13.5	7.9
	(2.9)	(3.0)	(2.4)	(3.8)	(3.7)	(5.7)
Other Outcomes – Adjusted Difference-in-Differences:						
Receive AFDC	-0.2	4.3	1.1	1.6	1.3	0.9
	(2.0)	(2.2)	(1.8)	(2.8)	(2.6)	(4.0)
Medicaid no AFDC	15.6	13.8	9.2	8.9	12.3	7.0
	(2.5)	(3.0)	(2.1)	(3.1)	(3.2)	(4.9)
Any Health Insurance	10.0	12.4	4.8	12.1	8.6	5.6
	(3.4)	(3.9)	(2.5)	(4.6)	(4.4)	(6.7)
Other Health Insurance	-2.7	-1.4	-3.5	2.1	-1.3	-2.1
	(3.5)	(4.2)	(2.7)	(4.7)	(4.5)	(6.9)

Notes: Standard errors in parentheses. Sample in a given column includes children
with family incomes in the stated range (relative to poverty line), with AFDC
income threshold below the stated maximum limit, and with age or birth cohort in
the stated range. Adjusted differences-in-differences obtained from regression
with covariates described in note to Table 3.

Table 3: Comparisons of Medicaid Eligibility and Participation Rates for Children Born Before and After October 1, 1983 in Families Above and Below Poverty Line

	Number Obs.	Percent Medicaid Eligible	Percent Covered by Medicaid	Percent on AFDC	Percent on Medicaid not AFDC	Percent with Any Insurance	Percent with Other Insurance
Family Income 60-99% of Poverty Line:							
Born Before 10/1/83	888	6.8	24.1	13.8	10.4	57.6	34.2
		(0.8)	(1.4)	(1.2)	(1.0)	(1.7)	(1.6)
Born 10/1/83 or Later	639	100.0	44.8	11.5	33.3	72.3	31.8
		(0.0)	(2.0)	(1.3)	(1.9)	(1.8)	(1.8)
Family Income 100-140% of Poverty Line:							
Born Before 10/1/83	841	4.7	12.8	5.3	7.5	66.1	55.6
		(0.7)	(1.2)	(0.8)	(0.9)	(1.6)	(1.7)
Born 10/1/83 or Later	670	50.8	17.8	2.7	15.2	70.5	55.7
		(1.9)	(1.5)	(0.6)	(1.4)	(1.8)	(1.9)
Difference-in-Differences	--	47.1	15.6	0.4	15.3	10.3	-2.6
		(2.2)	(3.1)	(2.0)	(2.7)	(3.4)	(3.5)
Regression-Adjusted D-in-D	--	--	15.4	-0.2	15.6	10.0	-2.7
			(2.9)	(2.0)	(2.5)	(3.4)	(3.5)

Notes: Standard errors in parentheses. Sample includes children in month 4 of 1992 and 1993 SIPP in families with incomes from 60-140% of poverty line and with family-specific AFDC eligibility thresholds under 70% of poverty line. Regression-adjusted difference-in-differences includes age in months and dummy for age under 6, dummies for black, Hispanic, single mother, and 8 Census divisions, ratio of family income to poverty line and its square, dummy if family income below poverty line, dummy if born after 10/1/83, and interaction of dummies for income below poverty line and born after 10/1/83 (reported in table).

Table 4: Comparisons of Medicaid Eligibility and Participation Rates for Children Born Before and After October 1, 1983 in Families Above and Below Poverty Line **in 1990 and 1991**

	Number Obs.	Percent Medicaid Eligible	Percent Covered by Medicaid	Percent on AFDC	Percent on Medicaid not AFDC	Percent with Any Insurance	Percent with Other Insurance
Family Income 60-99% of Poverty Line:							
Born Before 10/1/83	778	4.8	23.2	13.2	10.0	61.0	40.0
		(0.8)	(1.4)	(1.2)	(1.0)	(1.7)	(1.8)
Born 10/1/83 or Later	281	65.2	19.2	5.3	13.9	55.2	37.9
		(2.8)	(2.3)	(1.3)	(2.1)	(3.0)	(2.9)
Family Income 100-140% of Poverty Line:							
Born Before 10/1/83	844	0.0	7.6	3.2	4.4	66.1	60.4
		(0.0)	(0.9)	(0.6)	(0.7)	(1.6)	(1.7)
Born 10/1/83 or Later	299	34.2	13.2	5.3	8.0	73.1	63.3
		(2.7)	(2.0)	(1.3)	(1.6)	(2.6)	(2.8)
Difference-in-Differences	--	26.2	-9.7	-9.9	0.3	-12.8	-5.0
		(4.0)	(3.4)	(2.5)	(2.6)	(4.7)	(4.7)
Regression-Adjusted D-in-D	--	--	-11.0	-10.4	-0.6	-10.4	-1.4
			(3.4)	(2.5)	(2.6)	(4.6)	(4.6)

Notes: Standard errors in parentheses. Sample includes children in month 4 of 1990 and 1991 SIPP in families with incomes from 60-140% of poverty line and with family-specific AFDC eligibility thresholds under 70% of poverty line. Regression-adjusted difference-in-differences includes age in months and dummy for age under 6, dummies for black, Hispanic, single mother, and 8 Census divisions, ratio of family income to poverty line and its square, dummy if family income below poverty line, dummy if born after 10/1/83, and interaction of dummies for income below poverty line and born after 10/1/83 (reported in table).

Table 6: Comparisons of Medicaid Eligibility and Participation Rates for Children Older and Younger than Age 6 in Families Above and Below 133% of the Poverty Line

	Number Obs.	Percent Medicaid Eligible	Percent Covered by Medicaid	Percent on AFDC	Percent on Medicaid not AFDC	Percent with Any Insurance	Percent with Other Insurance
Family Income 100-132% of Poverty Line:							
Age 6 and Older	1552	9.1 (0.7)	17.9 (1.0)	8.2 (0.7)	9.7 (0.8)	67.6 (1.2)	52.7 (1.3)
Under Age 6	795	100.0 (0.0)	22.5 (1.5)	4.5 (0.7)	18.0 (1.4)	77.1 (1.5)	58.2 (1.7)
Family Income 134-166% of Poverty Line:							
Age 6 and Older	1710	8.4 (0.7)	7.9 (0.7)	2.0 (0.3)	5.9 (0.6)	74.7 (1.1)	69.2 (1.1)
Under Age 6	912	15.3 (1.2)	13.4 (1.1)	1.9 (0.5)	11.5 (1.1)	84.6 (1.2)	74.1 (1.5)
Difference-in-Differences	--	84.0 (1.6)	-0.8 (2.2)	-3.5 (1.2)	2.7 (2.0)	-0.5 (2.5)	0.6 (2.8)
Regression-Adjusted D-in-D	--	--	0.1 (2.1)	-3.1 (1.2)	3.2 (1.8)	-0.2 (2.6)	0.2 (2.8)

Notes: Standard errors in parentheses. Sample includes children in month 4 of 1991-1993 SIPP in families with incomes from 100-166% of poverty line and with family-specific AFDC eligibility thresholds under 100% of poverty line. Regression-adjusted difference-in-differences includes age in months and dummy for age under 6, dummies for black, Hispanic, single mother, and 8 Census divisions, ratio of family income to poverty line and its square, dummy if family income below 133% of poverty line, dummy if under age 6, and interaction of dummies for income below 133% of poverty line and under age 6 (reported in table).

Table 7: Comparisons of Medicaid Eligibility and Participation Rates for Children Older and Younger than Age 6 in Families Above and Below 133% of the Poverty Line, Current Population Survey

	Number Obs.	Percent Medicaid Eligible	Percent Covered by Medicaid	Percent on AFDC	Percent on Medicaid not AFDC	Percent with Any Insurance	Percent with Other Insurance
Family Income 100-132% of Poverty Line:							
Age 6 and Older	6383	7.7 (0.3)	23.9 (0.5)	13.9 (0.4)	11.1 (0.4)	71.8 (0.6)	54.3 (0.6)
Under Age 6	2730	100.0 (0.0)	33.2 (0.9)	14.8 (0.7)	18.5 (0.7)	77.8 (0.8)	54.3 (1.0)
Family Income 134-166% of Poverty Line:							
Age 6 and Older	6334	7.3 (0.3)	12.7 (0.4)	6.0 (0.3)	7.5 (0.3)	74.6 (0.5)	66.3 (0.6)
Under Age 6	2788	13.9 (0.7)	20.2 (0.8)	7.1 (0.5)	13.3 (0.6)	82.1 (0.7)	70.2 (0.9)
Difference-in-Differences	--	85.7 (0.8)	1.8 (1.4)	-0.2 (1.0)	1.6 (1.0)	-1.5 (1.3)	-3.9 (1.6)
Regression-Adjusted D-in-D	--	--	2.3 (1.3)	0.3 (1.0)	1.7 (1.0)	-1.1 (1.4)	-3.9 (1.5)

Notes: Standard errors in parentheses. Sample includes children in 1991-1993 March CPS in families with incomes from 100-166% of poverty line and with family-specific AFDC eligibility thresholds under 100% of poverty line. Regression-adjusted difference-in-differences includes age in years, dummies for black, Hispanic, single mother, and 8 Census divisions, ratio of family income to poverty line and its square, dummy if family income below 133% of poverty line, dummy if under age 6, and interaction of dummies for income below 133% of poverty line and under age 6 (reported in table).

Table 8: Characteristics of Children in Low Income Families Born Before and After October 1, 1983

	All Children with Family Incomes 60-99% of Poverty:		Subset Covered By Medicaid:		Newly Covered Group:	
	Born After (1)	Born Before (2)	Born After (3)	Born Before (4)	Method 1 (5)	Method 2 (6)
PERCENT OF GROUP IDENTIFIED IN COLUMN WITH CHARACTERISTIC IN ROW:						
Family Income 60-79% of Poverty Line	58.3	52.2	62.0	69.0	49.0	37.7
Family Income 80-99% of Poverty Line	41.7	47.8	38.0	31.0	51.0	62.3
Female Headed Family	39.5	39.9	53.6	65.4	31.7	32.4
Black	28.9	31.0	37.4	51.3	11.6	15.5
Hispanic	18.9	20.0	18.2	17.7	19.1	21.2
Southern Region	56.3	52.4	49.4	41.3	64.4	57.2
Number of Observations	311	644	121	162	--	–

Note: Sample includes children in month 4 of 1992 and 1993 SIPP age 6 and older, born after January 1 1978, and living in families with incomes from 60 to 99 percent of poverty line with family-specific AFDC eligibility thresholds under 70% of poverty line. "Born After" refers to children born on or after October 1, 1983. "Born Before" refers to children born before October 1, 1983. The entries in the fifth and sixth columns are estimated characteristics of the children who were covered as a result of the OBRA-89 Medicaid expansion. See text for discussion of alternative methods.

Appendix Table 1: Summary of Federal Legislation Related to Medicaid Coverage for Pregnant Women, Infants, and Children, 1986-1990.

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1. Omnibus Budget Reconciliation Act (OBRA) 1986.   Effective: April 1987.

Optional: States may raise the income eligibility threshold above AFDC levels to as high as the Federal poverty level for pregnant women, infants, and children up to 5 years of age, even if the principal earner is employed. (Children may be phased in gradually.)

2. Omnibus Budget Reconciliation Act (OBRA) 1987.   Effective: July 1988.

Required: States must cover all children under age 7 born after 9/30/83 who meet income and resource standards for AFDC, regardless of family structure.

Optional: States may raise income thresholds for pregnant women and infants to 185% of the Federal poverty level. States may cover children under age 2, 3, 4, or 5 who were born after 9/30/83 with incomes below the Federal poverty level.

3. Medicare Catastrophic Coverage Act (MCCA).   Effective: July 1989.

Required: States must cover pregnant women and infants with incomes less than or equal to 75% of the poverty level (it was to move to 100% by the following year, but was superseded by OBRA 1989)

Optional: States may cover children up to 8 years of age with incomes less than or equal to 75% of the poverty level.

4. Family Support Act (FSA) 1988.   Effective: October 1990.

Required: States must extend Medicaid coverage to eligible 2-parent families where the principal earner is unemployed.

5. Omnibus Budget Reconciliation Act (OBRA) 1989.   Effective: April 1990.

Required: States must cover pregnant women and children under age 6 with family incomes up to 133% of the Federal poverty level.

6. Omnibus Budget Reconciliation Act (OBRA) 1990.   Effective: July 1991

Required: States must cover children under age 19 who were born after 9/30/83 whose family income level is below 100% of the poverty level. States must continue benefits for pregnant women until 2 months after the end of pregnancy, and for infants through the first year of life.

Sources: United States House of Representatives Committee on Ways and Means (1986-1991).

Appendix Table 2: Comparison of Income-to-Poverty Ratios, SIPP Families vs.
Modified Families

	SIPP Family Income-to-Poverty Ratio		
	<100%	100-200%	>200%
Income-to-Poverty Ratio of Modified Family Income:			
<100%	22.2	2.0	0.8
100-200%	0.4	20.3	2.2
>200%	0.0	0.8	51.4

Notes: Sample includes children in month 4 of 1991-1993 SIPP. SIPP family
income refers to family income assigned to individuals in the SIPP
longitudinal file. Modified family income re-assembles families to include
parents and siblings of each child only.

Appendix Table 3: Characteristics of Children in the March 1990-1993 CPS

	1990	1991	1992	1993
Mean Age	8.6	8.6	8.6	8.6
Percent Black	15.5	15.6	15.6	16.0
Percent Hispanic	11.0	11.3	11.6	13.5
Percent in South	34.1	34.2	33.8	34.2
Percent with Single Mother	22.8	23.6	24.3	25.0
Family Income-Poverty Ratio:				
Percent 0-99% Poverty	20.4	21.6	22.5	23.7
Percent 100-199% Poverty	20.8	21.3	21.9	21.7
AFDC and Medicaid Participation:				
Percent on AFDC	10.9	12.3	13.3	13.4
Percent on Medicaid	15.2	17.9	19.8	23.2
Percent on Medicaid and not on AFDC	4.7	6.0	6.8	10.3
Number Observations	44,906	45,190	44,036	43,422

Notes: Sample includes individuals age 0-18 who are not heads of families. Individuals in related sub-families are assigned poverty status based on subfamily income and composition. AFDC participation is assigned from information on whether family received public assistance income last year. Sample characteristics are formed using March supplement weights.

Appendix Table 4: Comparisons of Medicaid Eligibility and Participation Rates for Children Older and Younger than Age 6 in Families Above and Below 133% of the Poverty Line, Current Population Survey

	1991		1992		1993	
	MC	MC not AFDC	MC	MC not AFDC	MC	MC not AFDC
Below 133% of Poverty:						
Age 6 and Older	21.4	7.8	25.3	11.2	25.1	14.5
	(0.9)	(0.6)	(0.9)	(0.7)	(0.9)	(0.8)
Under Age 6	26.7	14.4	33.4	18.2	38.2	22.3
	(1.6)	(1.2)	(1.0)	(0.8)	(1.6)	(1.6)
Above 133% of Poverty:						
Age 6 and Older	11.2	6.5	12.9	8.1	14.1	8.0
	(0.7)	(0.5)	(0.7)	(0.6)	(0.8)	(0.6)
Under Age 6	15.1	8.5	21.4	14.6	24.3	17.1
	(0.8)	(0.6)	(1.4)	(1.2)	(1.4)	(1.2)
Difference-in Differences	1.4	4.6	-0.4	0.5	2.9	-1.3
	(2.1)	(1.6)	(1.7)	(1.7)	(2.4)	(2.0)

Notes: Standard errors in parentheses. See notes to Table 7 for sample definition. Columns labeled "MC" report percent of children covered by Medicaid. Columns labeled "MC not AFDC" report percent of children covered by Medicaid and not in families that received AFDC.
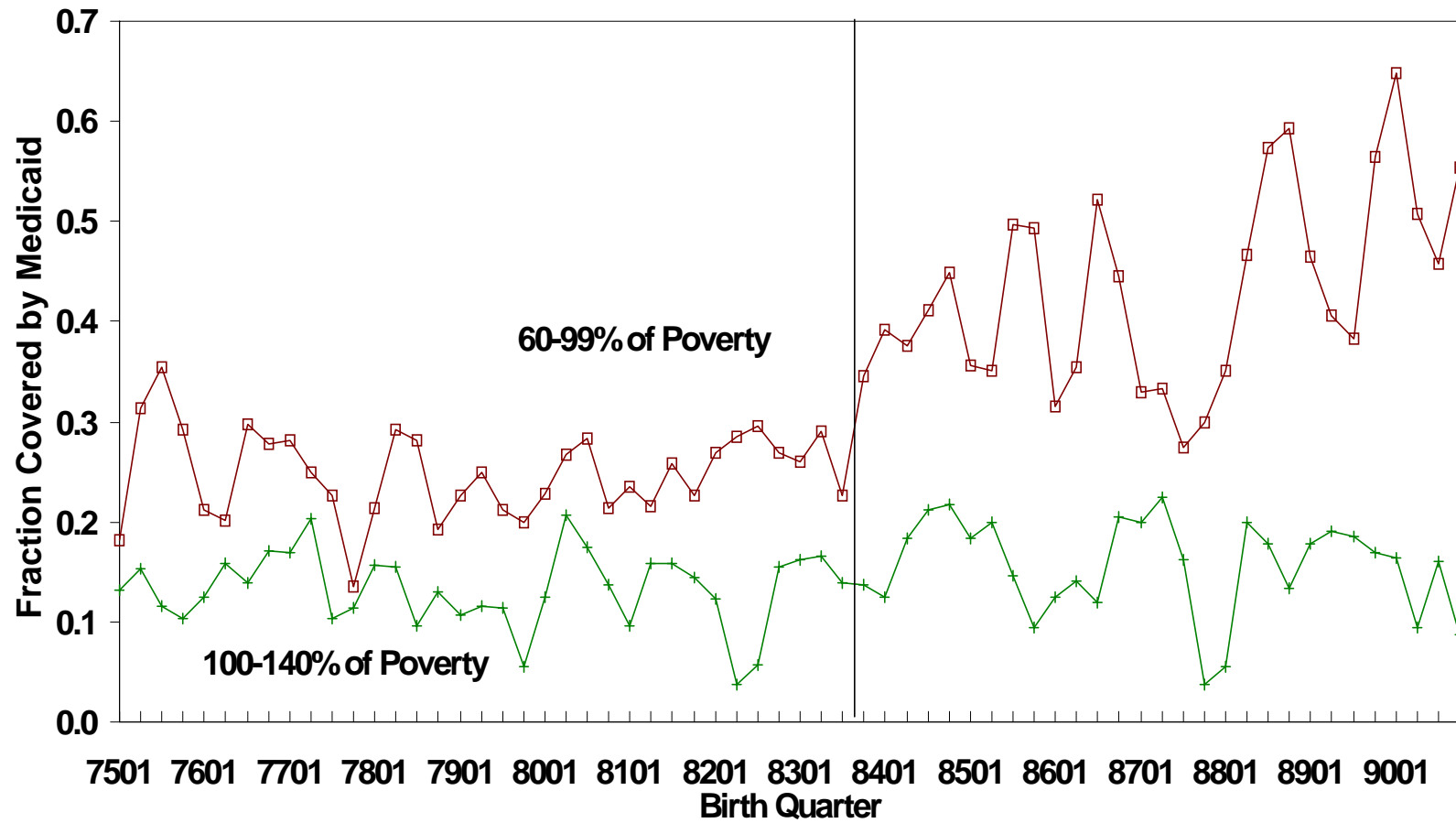
Figure 1: Fraction of Children with Health Insurance by Family Income in 1989, 1993, and 1999 CPS
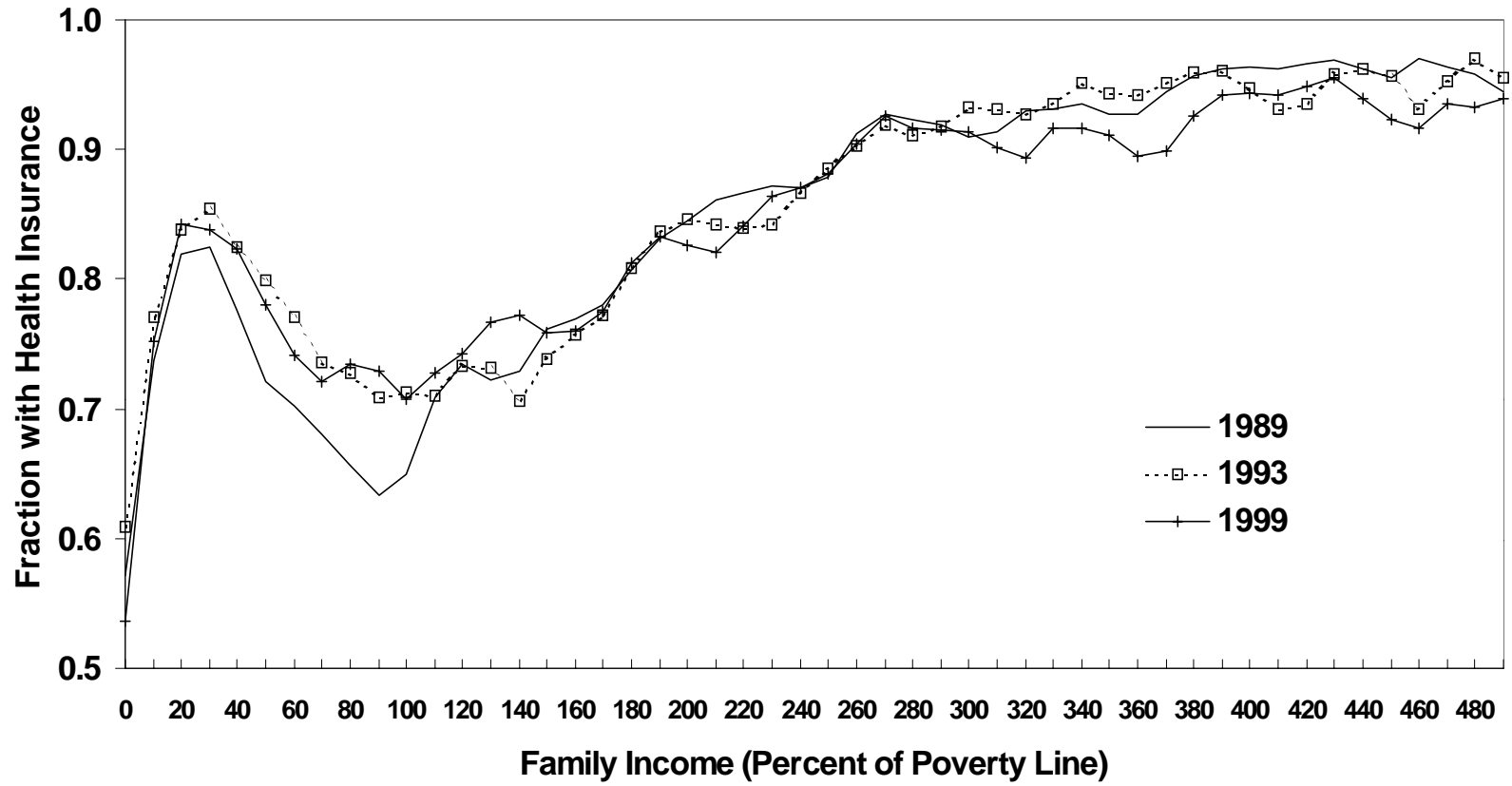
Figure 2: Medicaid and AFDC Recipiency and Family Income by Distance from AFDC Threshold
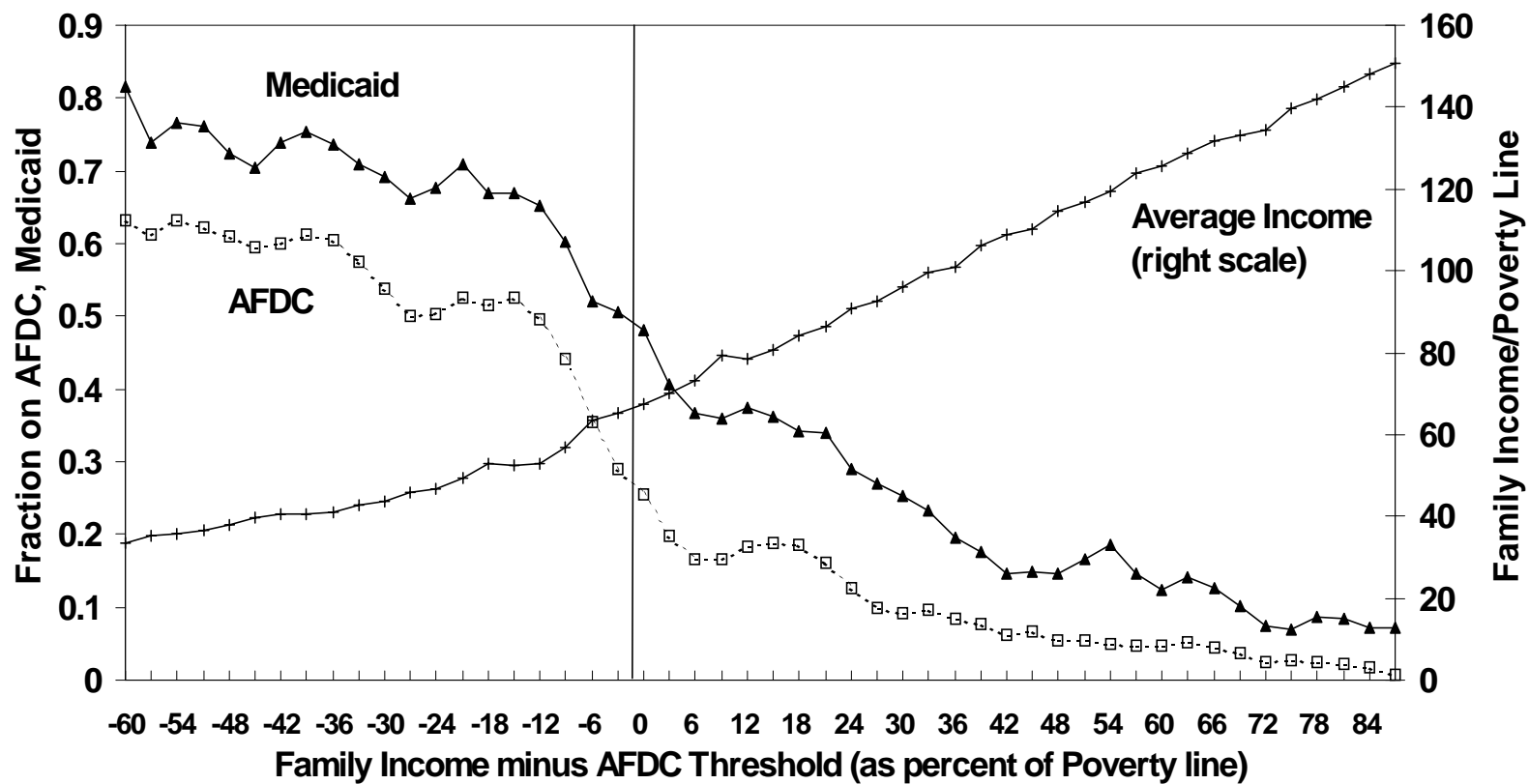
Figure 3: Medicaid Coverage Rates by Birth Quarter

Figure 4: Medicaid Coverage Rates by Family Income

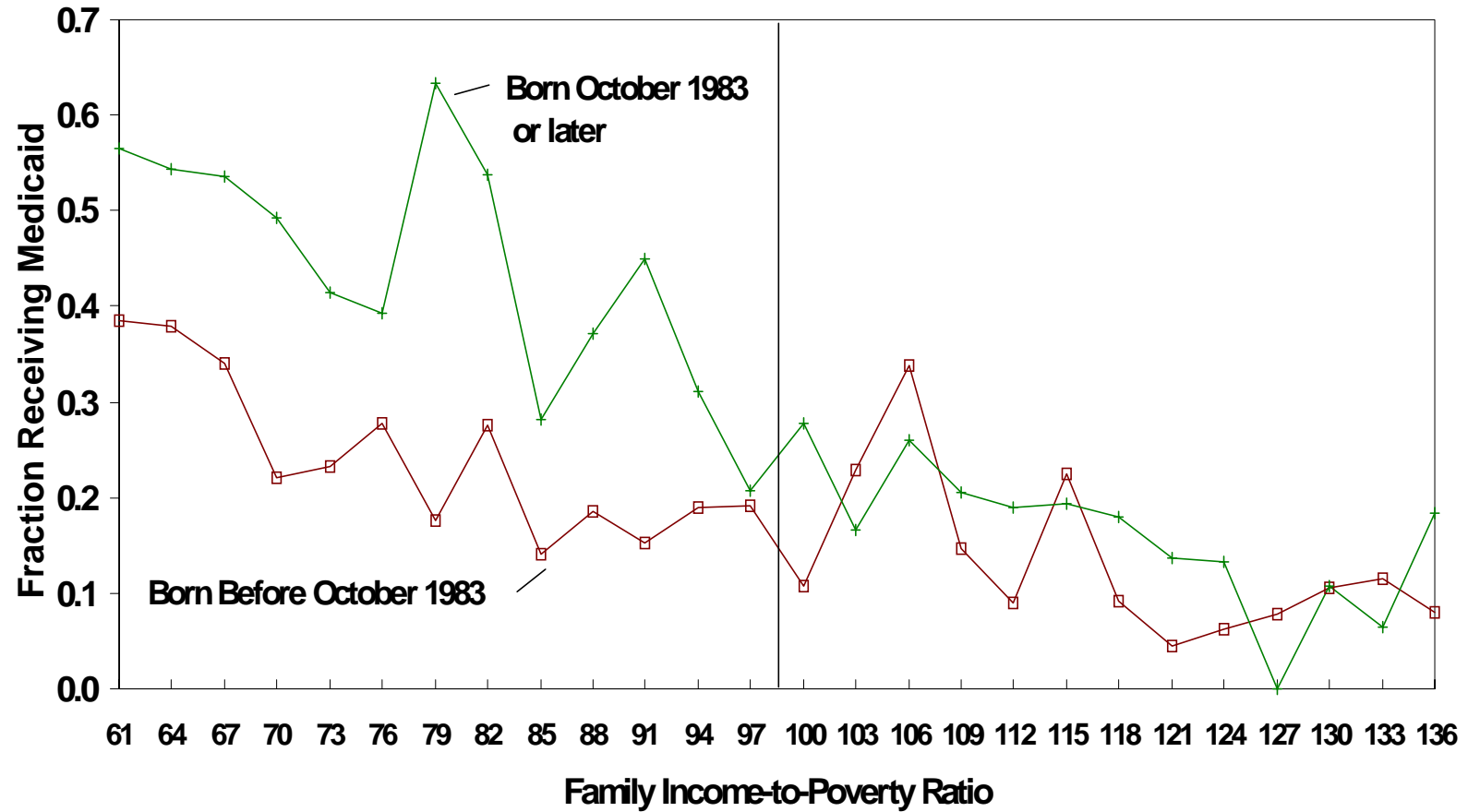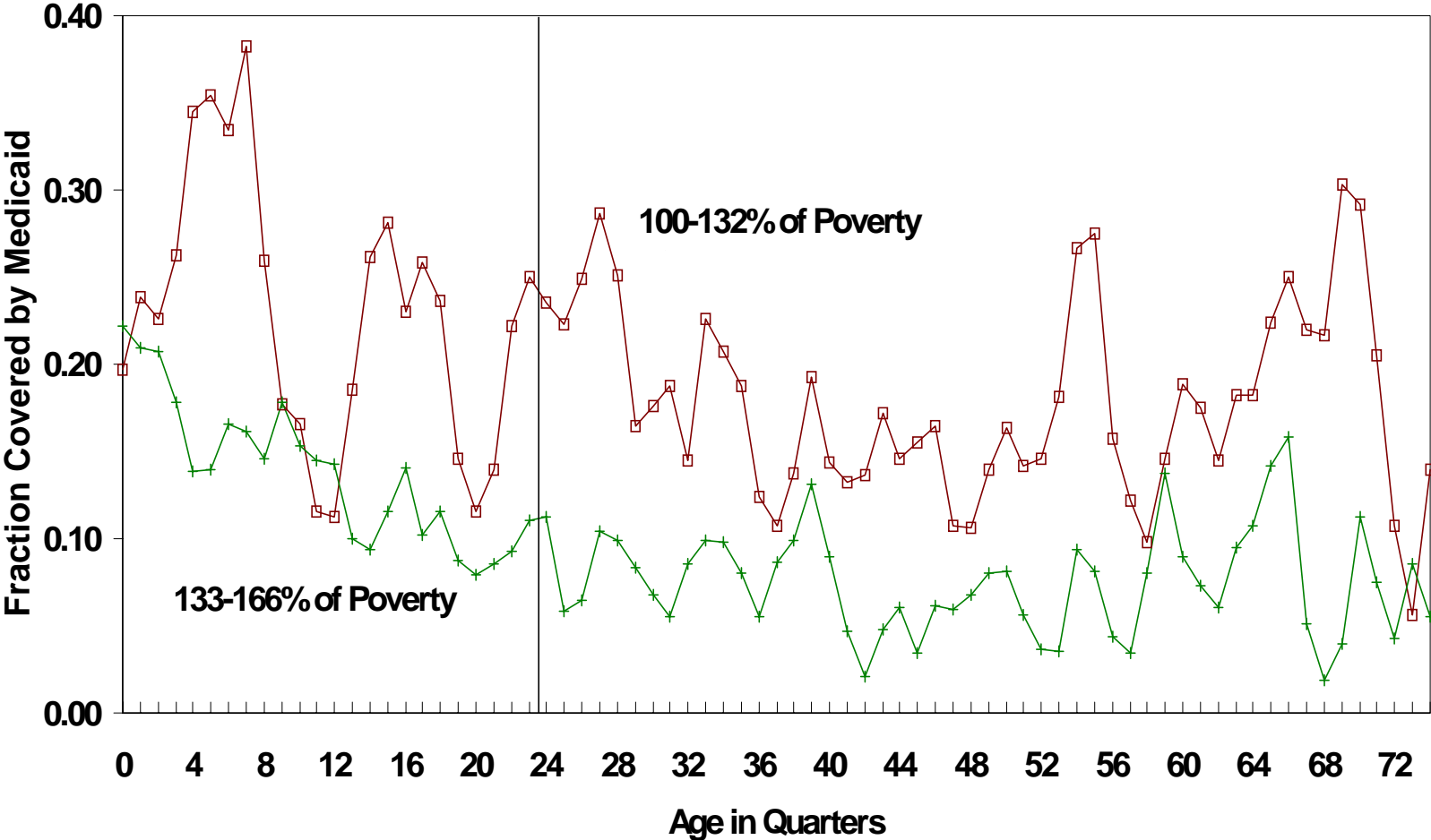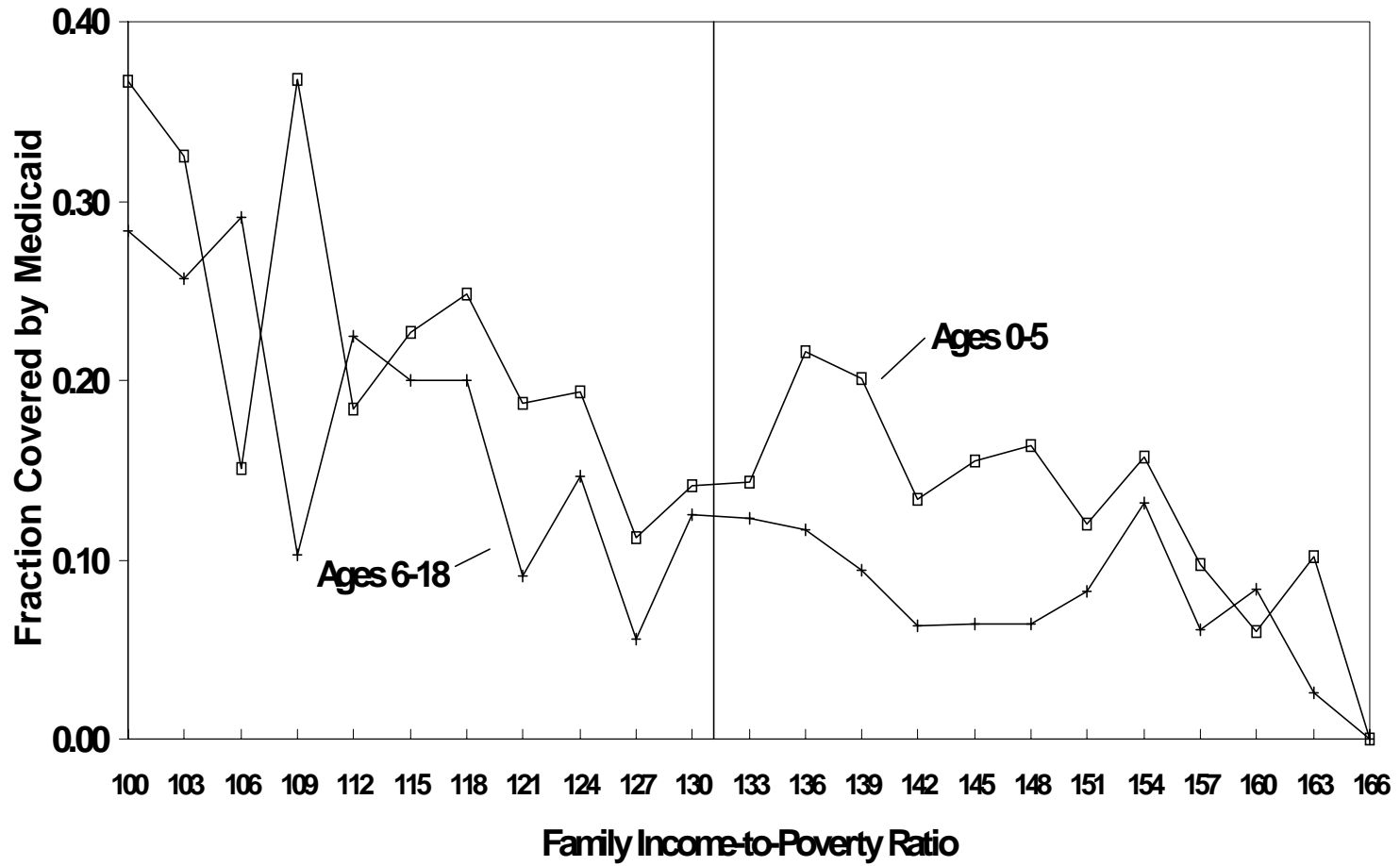Figure 4: Medicaid Coverage Rates by Family Income. Y-axis: Fraction Receiving Medicaid (0.0 to 0.7). X-axis: Family Income-to-Poverty Ratio (61 to 136). Two series: "Born October 1983 or later" and "Born Before October 1983".
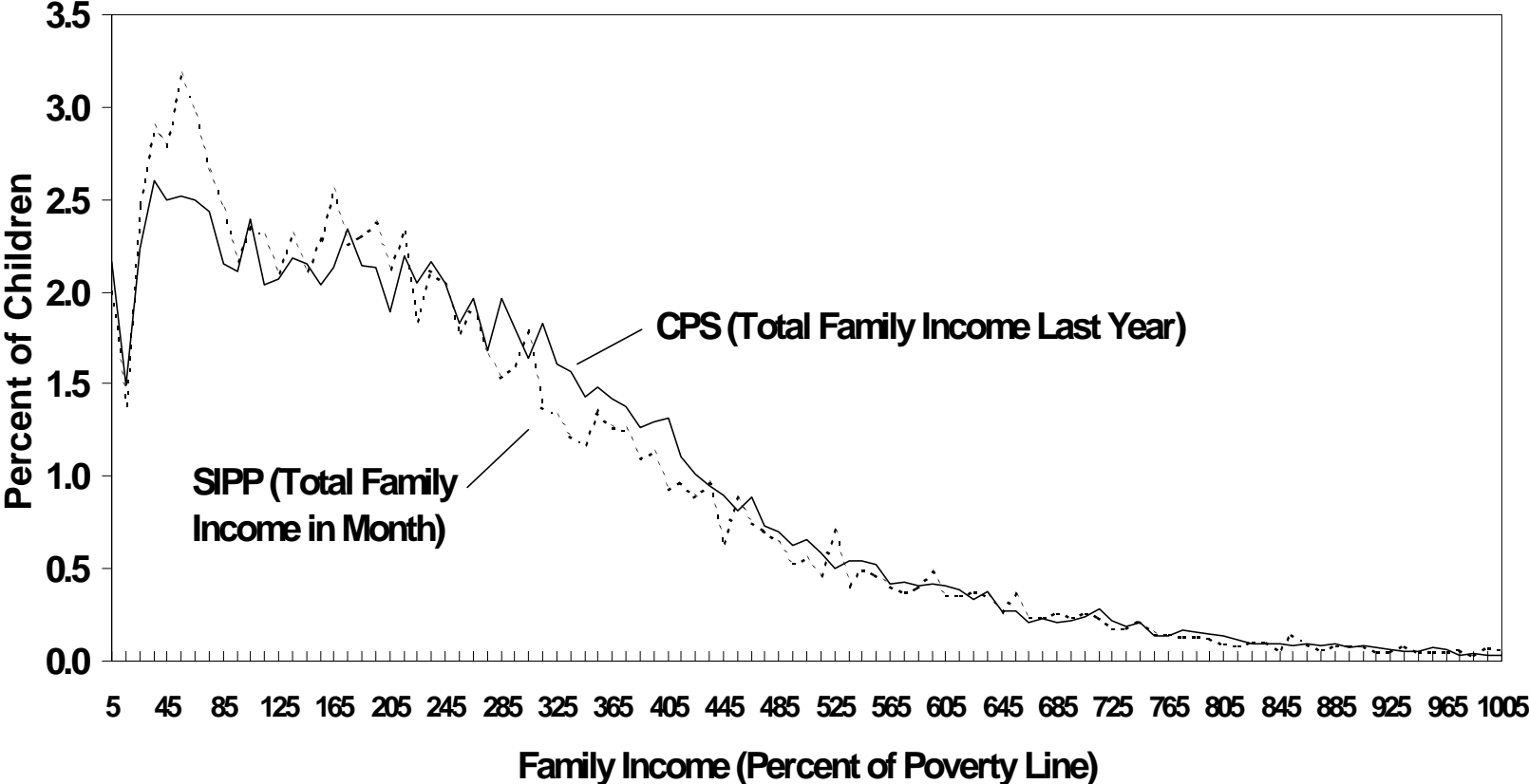
Figure 5: Medicaid Coverage Rates by Age

Figure 6: Medicaid Coverage Rates by Family Income

Appendix Figure 1: Distribution of Family Income (in Poverty Equivalents) for Children in 1992 and 1993 CPS and SIPP

Appendix Figure 2: Fraction of Children with Health Insurance by Family Income, 1992 and 1993 CPS and SIPP