

# THE EFFECT OF MEDICAID ON HEALTH CARE CONSUMPTION OF YOUNG ADULTS

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## SUMMARY

All states provide Medicaid until the age of 19 years. After 19 years, young adults may become ineligible for Medicaid. Using the Medical Expenditure Panel Survey, we find that the resulting loss of Medicaid coverage causes substantial changes to the level and composition of health care use. The total number of visits to health care providers falls by over 60%, two-thirds of which is due to a decline in office visits. Expenditures, in particular inpatient expenditures, also appear to fall sharply. Copyright © 2014 John Wiley & Sons, Ltd.

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## 1. INTRODUCTION

Understanding how Medicaid affects enrollees' health care use is important for assessing the effect of changes to Medicaid's eligibility requirements. Simply comparing the health care consumption of Medicaid enrollees with the uninsured may be misleading, however, as these populations may differ in unobservable respects (Levy and Meltzer (2008); Finkelstein *et al.* (2012)). We focus on a quasi-experimental loss of insurance coverage among Medicaid enrollees, caused by their 'aging out' of the program. This allows us to isolate the causal effect of health insurance on health care use for this population.

A Medicaid applicant must typically satisfy two requirements to qualify for benefits. First, they must belong to one of the eligibility groups: Medicaid covers children and young adults, pregnant women, older adults, those with severe disabilities, and parents with eligible children. Second, their income must be sufficiently low.<sup>1</sup> The income thresholds for each eligibility group vary by state. Most states only cover young adults before they reach the age of 19 years. Some states offer full coverage up to the age of 21 years; others offer more limited programs for adults between the age of 19 and 21 years.<sup>2</sup> For those who do not also belong to another eligibility group, reaching their state's age cutoff causes them to lose their insurance.

Using the Medical Expenditure Panel Survey (MEPS), we find considerable changes in the level and composition of health care use in response to this quasi-experimental loss of coverage. Overall visits fall by over 60%, driven mostly by declines in office-based care. These results do not appear to merely reflect intertemporal shifting of expenditures in anticipation of losing coverage. Emergency department (ED) care is less responsive to coverage status. In particular, leaving Medicaid does not appear to cause substantially higher ED expenditure.

This paper is one of the few studies that seek to estimate the causal effect of insurance status on consumption of health services. Important contributions in this area are Anderson *et al.* (2012), Finkelstein *et al.* (2012),

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<sup>1</sup>The Patient Protection and Affordable Care Act of 2010 extended Medicaid eligibility to everyone with an income below 133% of the federal poverty line from 2014. Financial need alone will become sufficient to qualify for Medicaid, regardless of whether one belongs to an eligibility group. There are some 17 million currently uninsured adults meeting this income test (Kaiser Family Foundation, 2010a).

<sup>2</sup>Connecticut, Michigan, Minnesota, New Jersey, and Iowa are among the states that provide some coverage for some young adults until the age of 21 years, and a few states offer Medicaid to all childless adults. See Heberlein *et al.* (2011) for details.

and DeLeire *et al.* (2013).<sup>3</sup> Anderson *et al.* (2012) also exploits the change in insurance status resulting from young adults aging out of coverage. Unlike the current application that concerns Medicaid, the chief source of variation Anderson *et al.* (2012) use comes from children aging out of a mix of public and private plans.<sup>4</sup> Their main outcome variables are ED visits and inpatient admissions. We examine a wider range of categories, including office-based visits and dental services. These more detailed data come at the expense of sample size; Anderson *et al.* (2012) have almost all ED and inpatient visits for a selection of states.<sup>5</sup>

Finkelstein *et al.* (2012) study the Oregon Health Insurance Experiment, which randomly assigned the right to apply for a public insurance plan to a subset of adults under the age of 65 years who expressed interest in the plan. They estimate that health insurance increases health care utilization. The probability of a hospital admission increases by 30%, and a back-of-the-envelope calculation suggests that Medicaid increases spending by 25% over 6 months. The large regional differences in patterns of health care consumption within the United States suggest that the results from Oregon might not generalize to other states. In contrast to Finkelstein *et al.*, our sample comes from across the United States but is restricted to young adults rather than those under 65 years of age.

DeLeire *et al.* (2013) analyze that the effect of a public expansion insurance in Wisconsin automatically rolled out to low-income childless adults. They too find that insurance substantially increases outpatient and ED visits. Of particular interest is their finding that preventable hospitalizations fall by 48%, suggesting that public insurance may reduce the costs of care.

## 2. BACKGROUND AND DATA

Medicaid covers nearly 60 million people, 29 million of whom are children. The Children's Health Insurance Program (CHIP) covers a further 7 million children from families with incomes slightly above the eligibility threshold for Medicaid (Kaiser Family Foundation (2010b)). The median state by CHIP generosity is Kansas; in 2010, it covered children from families below 241% of the federal poverty line (Georgetown University Health Policy Institute (2010)). We do not distinguish between Medicaid and CHIP in this analysis, and the data we use include enrollees in both programs.

### 2.1. Data description

The MEPS provides the data for this study. The MEPS contains month level information on insurance coverage and health care use in various categories. Data are available from 1996 to 2008. Where possible, the MEPS obtains expenditure data directly from medical providers to minimize household misreporting. Participants are surveyed for 2 years, and most utilization and insurance variables are available at the month level. In particular, the MEPS records for each month whether or not the respondent is covered by Medicaid.

Figure 1 shows the proportion of observations in Medicaid and uninsured by age (in keeping with the structure of the MEPS, an observation here is a person-month). There is a gradual decline in the fraction Medicaid covers from ages 1 to 18 years. This decline is due both to children becoming ineligible for coverage and to eligible children disenrolling. Children may become ineligible even if family income is unchanged,

<sup>3</sup>The Rand Health Experiment provided early evidence of modest price elasticities of medical care demand (Manning *et al.*, 1987). Other work (Currie and Gruber (1996a, 1996b, 2001) and Dafny and Gruber (2005)) studies the effect of Medicaid eligibility expansions on health care use. This paper complements that literature by directly estimating the effect of coverage status itself, instead of eligibility for coverage.

<sup>4</sup>A further difference is that their estimated treatment effects apply to those who visit the ED at least once before aging out of insurance.

<sup>5</sup>Card *et al.* (2008) and Card *et al.* (2009) also study the effect of age-related discontinuities in program eligibility on health care use, but for Medicare rather than Medicaid. The transition they analyze is from majority private insurance to almost universal Medicare coverage, whereas we focus on the comparison between Medicaid and no insurance coverage. Polsky *et al.* (2009) find that Medicare generates health improvements for those who were previously uninsured before turning the age of 65 years, whereas Finkelstein and McKnight (2008) study the effect of the passage of Medicare in 1965.

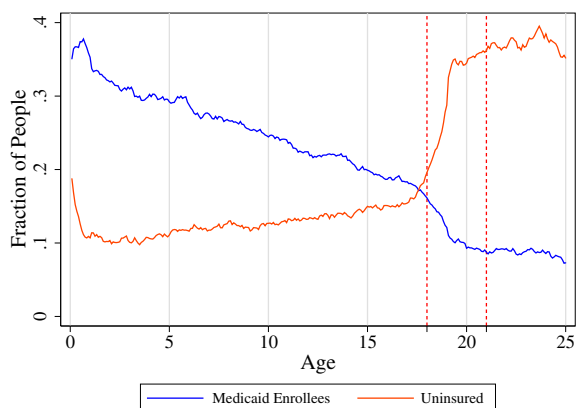


Figure 1. Medicaid enrollees and uninsured by age, with 18–21 interval indicated

Figure shows the fraction of the US population in Medicaid and uninsured by age, as calculated from the Medical Expenditure Panel Survey using survey weights.

because in most states, the maximum qualifying family income decreases with the age of the child. Eligible children will lose coverage if they fail to renew. Renewal is usually required once or twice a year and may require verification of income and assets, depending on the state. Sommers (2007, 2010) documents some of the difficulties Medicaid faces in retaining eligible children.

One striking feature of Figure 1 is the sharp drop in the proportion covered around the ages of 18, 19, and 20 years, due to age-related transitions out of Medicaid. This explains around half of the increase in the percentage uninsured over this age range. There is however no jump in the fraction covered by Medicaid at exactly the age cutoff of 19 (or 21, in some states). A likely explanation for this is that those who will shortly become ineligible are less inclined to renew their coverage. The time and effort costs of renewal may outweigh the benefit of receiving only a few more months of medical insurance. As a result, people may allow their coverage to expire even before they become ineligible.<sup>6</sup>

The health care consumption data we use fall into one of six categories: *Dental*; *Inpatient*; *Emergency*; *Outpatient*; *Office* (for office-based medical provider visits); and *Home* (for home health care, including home health agency visits and nursing home stays).<sup>7</sup>

## 2.2. Sample

Informed by Figure 1, we select those young adults who are recorded in the MEPS as being in Medicaid in 1 month, when aged 18, 19, or 20 years at the start of that month, and being uninsured in the subsequent month. For each person, we keep only those months in which they are continuously in Medicaid before the transition

<sup>6</sup>Those who qualify for Medicaid on grounds other than age can stay enrolled after the age cutoff. They may be pregnant mothers, parents, or disabled. More rarely, they may live in states that provide Medicaid or Medicaid-like benefits to childless adults (this requires a waiver from the federal government, unless financed by state-only funds (Kaiser Family Foundation (2010b))). Figure 1 also shows a small jump in coverage at age 65 years, as some seniors become eligible for benefits.

<sup>7</sup>The MEPS also contains data on prescription drug expenditure and other expenditure, but these categories are recorded yearly rather than monthly. This makes it impossible to directly compare consumption in the months before and after disenrollment, and we omit them from this analysis.

Table I. Sample characteristics

	Mean
Age	19.05 (0.91)
Total yearly income, dollars	4849 (6832)
Northeast	0.16
Midwest	0.15
South	0.38
West	0.31
Male	0.52
White	0.66
Black	0.26
Asian	0.04
MSA	0.77
Married	0.07
Full time student	0.42
Employed	0.28
Some physical limitation	0.10
Reported physically healthy	0.61
Reported mentally healthy	0.66
<i>N</i>	805

Table summarizes characteristics of all people in the sample. Standard deviations for the two continuous variables, 'Age' and 'Total Yearly Income, Dollars', are presented in parentheses. 'Northeast', 'Midwest', 'South', and 'West' are indicators for the respondent's place of residence. 'MSA' is an indicator for living in a metropolitan statistical area. 'Some Physical Limitation' is indicator for some reported activity, functional, or sensory limitation. 'Reported Physically Healthy' and 'Reported Mentally Healthy' are indicators for the respondent reporting very good or excellent physical or mental health.

and continuously without any medical insurance afterwards. We also omit those who transition into and out of Medicaid multiple times when aged 18, 19, or 20 years, as these transitions are less likely to be age related.<sup>8,9</sup>

In total, the sample includes 805 people and 15,638 person-months. Table I describes some characteristics of the sample. Only 28% of the sample is employed, and all must be sufficiently poor to qualify for Medicaid, so average income is low. The sample appears to be more unhealthy than the average young adult; 61% and 66% report being in less than very good physical or mental health, compared with 74% and 77% in a representative sample of this age group.

Table II summarizes monthly visits to health care providers and monthly health expenditures.<sup>10</sup> Overall, the observations uncovered by Medicaid have around 57% fewer visits and 69% lower expenditure. The change in the mean number of visits is driven mostly by office-based care, whereas expenditure is more affected by inpatient care.

<sup>8</sup>Women may gain eligibility for Medicaid upon becoming pregnant. The income threshold for a pregnant woman to qualify for coverage is more generous than the threshold for the under-19s in most states (Georgetown University Health Policy Institute (2010)). Pregnancy could cause some women to take up Medicaid coverage, presenting a problem of reverse causality. We therefore also exclude those with pregnancy-related inpatient admissions.

<sup>9</sup>The regression results of Section 3 are not sensitive to the exact choice of selection criteria; keeping all Medicaid or uninsured months for those who transition from Medicaid to no insurance does not greatly change the estimates.

<sup>10</sup>The MEPS is household-level data and excludes some expenditures included in the National Health Expenditure Accounts. Outlays for research, public health, administration, and government payments not linked to patient events are not recorded in the MEPS. Per-capita health expenditures based on MEPS data are considerably smaller than those based on the more comprehensive National Health Expenditure Accounts data. See Seldon and Sing (2008) and Sing *et al.* (2006) for more.

Table II. Monthly health care consumption

	Visits in Medicaid	Visits out of Medicaid	Expenditure in Medicaid	Expenditure out of Medicaid
<i>Total</i>	0.299 (0.868)	0.129 (0.414)	107.43 (1651.29)	33.38 (445.68)
<i>Dental</i>	0.056 (0.071)	0.016 (0.021)	7.79 (89.85)	2.52 (46.44)
<i>Inpatient</i>	0.006 (0.007)	0.002 (0.003)	55.99 (1586.57)	10.25 (379.11)
<i>Emergency</i>	0.027 (0.031)	0.022 (0.031)	12.08 (147.24)	11.53 (191.06)
<i>Outpatient</i>	0.016 (0.031)	0.004 (0.005)	8.08 (144.71)	2.06 (62.07)
<i>Office</i>	0.189 (0.615)	0.084 (0.291)	20.89 (169.78)	6.67 (55.00)
<i>Home</i>	0.005 (0.007)	0.001 (0.001)	2.61 (46.22)	0.35 (13.68)
<i>N</i>	8392	7246	8392	7246

Table shows the mean and standard deviation of monthly visits to health care providers and health care expenditures, in total and by category, for observations covered and uncovered by Medicaid. An observation is a person-month. Expenditures are inflation-adjusted using the Gross Domestic Product (GDP) deflator to 2008 prices.

### 3. ECONOMETRIC MODEL AND RESULTS

#### 3.1. Econometric model

The basic regression specification is

$$Quantity_{i,m} = \alpha + \beta \cdot OutOfMcd_{i,m} + \gamma \cdot X_{i,m} + \varepsilon_{i,m} \quad (1)$$

for person  $i$  at month  $m$ . *Quantity* refers to either visits or expenditures, depending on the regression. *OutOfMcd* is an indicator for no longer being covered by Medicaid.  $X$  is the vector of characteristics summarized in Table I, excluding age (which varies little in this sample) and including year indicator variables.  $\beta$  is the fall in monthly health care use resulting from losing Medicaid coverage.

We instrument for *OutOfMcd* <sub>$i,m$</sub>  with dummy variables for the age of person  $i$  in month  $m$ . The identifying assumption is that for these young adults, age affects their health care use only to the extent that it causes them to lose Medicaid eligibility. This rules out changes in the average health status of young adults between the ages of around 18 and 21 years. There seems to be little reason to expect considerable shifts in demand for health care during this relatively narrow time window, and thus the effect of age on health care consumption seems likely to be predominantly through its effect on Medicaid eligibility.<sup>11</sup>

#### 3.2. Results

Table III shows the first stage regression coefficients on the excluded instruments. Corresponding to Figure 1, we see that age is a strong predictor of Medicaid disenrollment.<sup>12</sup> The  $F$ -statistic associated with the dummy variables for age is 1368, which allows the null hypothesis that age is insignificant in the first stage regression to be easily rejected.

Table IV shows estimates of the change in monthly health care visits and expenditures, with standard errors are clustered at the person level. Losing coverage results in an estimated 64% fall in the total number of visits

<sup>11</sup>If there are a large portion of young adults who both tend to consume more health care when at home and who leave home during this age window, this might bias our estimates. We suspect that the fall in the fraction of visits we find is too large to be explained mostly by such a subpopulation.

<sup>12</sup>Although all individuals in the sample transition from Medicaid to being uninsured at the ages of 18, 19, or 20 years, they may be included in the MEPS survey for some months before or after this transition, explaining the presence of person-months under 18 or above 21 years.

Table III. First stage regression of medicaid enrollment on age

$N = 15638$	Under 18	18–19	19–20	20–21	Over 21
<i>OutOfMcd</i>	-0.063 (0.125)	0.263 (0.014)	0.669 (0.017)	0.717 (0.025)	0.992 (0.014)

Table presents the coefficients on the excluded instrumental variables from the first stage regression. The instruments are indicator variables for the indicated age ranges.

Table IV. Effect of leaving Medicaid on monthly health care utilization

$N = 15638$	100 × Change in visits	100 × Average visits, before	Change in Expenditure	Average Expenditure, before
Total	-19.23 (4.55)	29.90	-111.25 (47.28)	107.43
Dental	-4.09 (0.95)	5.62	-4.40 (2.33)	7.79
Inpatient	-0.17 (0.23)	0.57	-89.12 (44.83)	55.99
Emergency	0.29 (0.56)	2.73	5.19 (4.81)	12.08
Outpatient	-1.63 (0.70)	1.57	-5.56 (4.02)	8.08
Office	-13.18 (4.00)	18.88	-14.72 (4.01)	20.89
Home	-0.45 (0.41)	0.52	-2.64 (1.95)	2.61

The rows in the “100 × Change in Visits” column contain the coefficients on *OutOfMcd* in Equation 1, with the dependent variable varying by row. The “Change in Expenditure” column is defined analogously. The other covariates included in the regressions are those summarized in Table I, excluding age and including year indicator variables. Standard errors are clustered at the person level and displayed in parentheses. The table also shows average monthly number of visits and expenditure while still in Medicaid.

to health care providers. About two-thirds of this is due to the decline in *Office* visits, whereas *Dental* and *Outpatient* account for most of the remainder. As might be expected given the high variance in health expenditures, the changes in expenditures are less precisely estimated than the changes in visits. Total expenditure appears to fall significantly however, as do *Dental*, *Inpatient*, and *Office* expenditures.

Under the Emergency Medical Treatment and Active Labor Act, hospitals are obliged to provide stabilizing emergency health care to all who require it, regardless of the ability to pay or insurance status. This suggests that coverage status should have less impact on emergency spending than on other categories, and this is supported by these data. One view is that the uninsured use the ED for non-urgent care (New York Times (2008a, 2008b)), so that loss of insurance might increase emergency spending. Our results suggest that the increase in emergency spending is likely to be limited. Even small increases of \$15 can be ruled out at conventional significance levels, so increases in emergency health care are likely to do little to offset the overall decline in expenditure.<sup>13</sup> As a fraction of total health care use, however, emergency care is much more important for the uninsured. Only around 9% of total visits are emergent for the Medicaid enrollees, whereas for the uninsured, the figure is about three times larger.

These results complement those in Anderson *et al.* (2012), who estimate treatment effects on a somewhat different population: those people who visit the ED at least once before aging out of insurance. They find losing coverage reduces ED visits by 40% and inpatient visits by 61%. Our data reveal the effects of insurance status on other categories of visits too, most notably office-based care (which accounts for over 60% of visits to health care providers).

<sup>13</sup>In a survey of the literature, Newton *et al.* (2008) come to a related conclusion: on average, uninsured patients do not present to the ED with less acute conditions than insured patients. Anderson *et al.* (2012) find that not having insurance results in a 40% reduction in ED visits.

Table V. Medicaid and health care utilization, including first and last months indicators

$N = 15638$	100×Change in visits	Change in Expenditure
Total	-18.23 (5.51)	-116.37 (53.68)
Dental	-3.86 (1.13)	-3.95 (2.75)
Inpatient	-0.04 (0.32)	-99.19 (51.58)
Emergency	0.81 (0.68)	4.00 (4.72)
Outpatient	-1.55 (0.79)	-3.49 (4.86)
Office	-13.10 (4.84)	-11.15 (4.50)
Home	-0.48 (0.52)	2.59 (2.32)

The rows in the '100 × Change in Visits' column contain the coefficients on *OutOfMcd* in Equation 1, with the dependent variable varying by row. The 'Change in Expenditure' column is defined analogously. The other covariates included in the regressions are those summarized in Table I, excluding age and including year indicator variables. Standard errors are clustered at the person level and displayed in parentheses.

#### 4. ENROLLMENT EFFECTS AND ANTICIPATORY CONSUMPTION

If enrollment is driven by acute negative health shocks to the Medicaid eligible population, this could cloud the interpretation of the estimates earlier. Consider for example a young adult eligible for Medicaid who breaks their arm and chooses to enroll. Health case use would be initially high as enrollee seeks care and then decline as their health reverts to normal. Use would tend to be higher when insured not because of the causal effect of insurance but rather because average health is not be constant when insured and uninsured.

Consumption shifting over time may also make interpreting the estimates difficult. A forward-looking Medicaid enrollee might increase his health care consumption in the run up to losing coverage. The estimated change in consumption could be driven partly by this intertemporal substitution.

We allow for these two effects by including dummy variables for each person's first or last few months of Medicaid coverage. We run the regression

$$Quantity_{i,m} = \alpha + \beta \cdot OutOfMcd_{i,m} + \delta FirstLastMonths_{i,m} + \gamma \cdot X_{i,m} + \varepsilon_{i,m} \quad (2)$$

where *FirstLastMonths*<sub>*i,m*</sub> includes four indicator variables, for the first two and last two months person *i* is observed to be in Medicaid.<sup>14</sup> Table V shows estimated changes in visits and expenditure with these additional controls. Overall, they are close to the original estimates presented in Table IV. The estimated change in total visits, for example, is only about 5% smaller than the original estimate. This suggests that neither enrollment effects nor anticipatory consumption is likely to be a major cause of the estimated fall in health care use on leaving Medicaid.

#### 5. CONCLUSION

We estimate that a quasi-experimental loss of Medicaid coverage results in a substantial fall in the health care consumption of young adults, with a decrease in the number of visits to providers of over 60%. Some caveats are in order. This analysis focuses on the change in individual consumers' health care use resulting from changes

<sup>14</sup>Using the first and last month, or the first and last three months gives very similar results.

in their coverage status, rather than the aggregate, market-wide effects of policy reform. As Finkelstein (2007) notes, the partial and general equilibrium effects of expanding coverage may be quite different. Also, these results can be extrapolated out of sample only with caution. The response to insurance of these young adults may not be a good indicator of the responses of the rest of the population. How this sudden change in health care consumption affects health outcomes is however an interesting question for future research.

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