Medicaid Exposure in Youth and Young Adult Health

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3.1 Data

My analytical strategy largely follows that of Hoynes, Schanzenbach and Almond (2016), who exploited county-level heterogeneity in the introduction of the Food Stamps program between 1962 and 1975 to study the effects of access to Food Stamps in youth on several economic and health outcomes in adulthood. I use publicly available data from the Panel Survey on Income Dynamics (PSID), a longitudinal study that began surveying members of a representative sample of approximately 5,000 American households in 1968 and has tracked those respondents and their descendents up until 2017.

Using the PSID, I track individuals who were born up to 10 years before or after their states expanded eligibility to Medicaid, including their demographics, state of residence at birth, family circumstances at birth (or early childhood) and their health in young adulthood,

from birth to 2017. Specifically, for each individual, I extract from the survey wave closest to that individual's birth (henceforth "at birth"): whether the individual is male, whether he is non-white, his birth order to his mother, whether his mother is single, the education level of the head of his household, the size of his family, his family's total income, and his state of residence. Following Hoynes, Schanzenbach and Almond (2016), I compute a ratio of the individual's family income at birth to the federal poverty guidelines set forth by US Bureau of Labor Statistics (2015), accounting for the individual's family size at birth.

I create an index of exposure to Medicaid expansion (henceforth "Medicaid Exposure Index") by multiplying the proportion of the individual's young life (from conception to age 1) that occurred after Medicaid expansion with the percentage change of eligibility requirements in the individual's state. An individual born 1 or more years before their state expanded Medicaid would have a Medicaid Exposure Index score of 0 (equation 1), and an individual conceived after Medicaid expansion in a state that doubled its eligibility (e.g., from 50% to 100%) would have a a Medicaid Exposure Index score of 1 (equation 2). These scores are calculated based upon an individual's birth date and state of residence at birth along with data on Medicaid expansions provided by Torres and Kenney (1989) (Table 1).

$$\frac{0}{12+9} \times \frac{100\% - 30\%}{30\%} = 0.00 \tag{1}$$

$$\frac{12+9}{12+9} \times \frac{100\% - 50\%}{50\%} = 1.00 \tag{2}$$

As an illustrative example, an individual that was born 2 months (i.e., conceived 11 months) before Medicaid was expanded in a state where Medicaid eligibility was expanded from 30% to 100% would have an index score of 1.56 (equation 3):

$$\frac{(12+9)-(2+9)}{12+9} \times \frac{100\% - 30\%}{30\%} = 1.56 \tag{3}$$

The PSID began asking the head of household and their spouse about their overall health

in 1984, their weight in 1986, their height in 1999, and whether they had been diagnosed with certain health conditions (heart disease, heart attack, hypertension, and diabetes) in 1999. Following Hoynes, Schanzenbach and Almond (2016), I create two main outcome measures: whether the individual rates their health as excellent or very good (relative to good, fair, or poor) each survey wave from 1984 and an index of metabolic syndrome every survey wave from 1999. I compute the index of metabolic syndrome by computing the Z-Score[1] for each individual for each of 5 conditions (heart disease, heart attack, hypertension, and obesity [i.e., body mass index over 30]). For each year that the individual responds to the survey, I take the mean of these Z-scores as their metabolic syndrome index score.

I restrict my analysis to individuals born up to 10 years before or after their state's Medicaid expansion. Following Hoynes, Schanzenbach and Almond (2016), I restrict my analysis to health outcomes collected after the individual turned 18 and focus my analysis on a "high impact sample" of disadvantaged families, i.e., those who, at birth, belonged to households headed by someone with less than a high school education. The data is summarized in Table 2.

3.2 Analytical Strategy

I assess the effect of exposure to Medicaid expansion in youth on health outcomes in young adulthood through a difference-in-difference design. I estimate:

$$y_{isbt} = \alpha + \delta \text{MedicaidIndex}_{sb} + X_{isbt}\beta + \eta_s + \lambda_b + \gamma_t + \theta t + \epsilon_{isbt} \tag{4}$$

where i indexes the individual, s indexes the state of birth, b indexes the birth year (cohort), and t indexes the survey year. y_{isbt} is the individual's health outcome (either whether the individual is in "excellent" or "very good" health or the individual's metabolic syndrome index score) in a given survey year. δ is the parameter of interest, corresponding to

[1] I compute the Z-Score by taking the difference between the individual's score and the sample mean and divide by the sample standard deviation, deriving the sample mean and standard deviation from those born more than 8 years before their state expanded Medicaid.

an individual's Medicaid Exposure Index score. η_s refers to a state fixed effect, λ_b to a birth year fixed effect, and γ_t to a survey year fixed effect. θt refers to a state specific linear survey year trend. X_{isbt} is a matrix of potential confounders. Some confounders, including whether the individual received education beyond high school, the individual's age, the individual's age squared, and whether the individual is married, vary by survey year. Other confounders, such as whether the individual is male, whether the individual is white, the size of the family that they were born into, the individual's birth order (to his mother), whether the individual was born to a single mother, and the individual's income-to-federal-poverty-line ratio at birth, do not vary by survey year. All models are estimated using PSID sample (longitudinal) weights, and errors are clustered by state of residence at birth.

Table 1: Medicaid Expansions

State	Expansion Effective Date	Eligibility Before	Eligibility After
Alabama	1988-07-01	14.6	100
Alaska	1989-01-01	77.2	100
Arizona	1988-01-01	36.3	100
Arkansas	1987-04-01	34.1	100
Connecticut	1988-04-01	87.9	185
Delaware	1988-01-01	39.5	100
District of Columbia	1987-04-01	60.1	100
Florida	1987-10-01	45.4	100
Georgia	1989-01-01	46.6	100
Hawaii	1989-01-01	59.9	100
Idaho	1989-01-01	37.6	67
Illinois	1988-07-01	56.7	100
Indiana	1988-07-01	35.7	50
Iowa	1989-01-01	65	150
Kansas	1988-07-01	59.4	100
Kentucky	1987-10-01	36.2	125
Louisiana	1989-01-01	32	100
Maine	1988-10-01	71	185
Maryland	1987-07-01	54.7	100
Massachusetts	1987-07-01	90.8	185
Michigan	1988-01-01	70.8	185
Minnesota	1988-07-01	87.8	185
Mississippi	1987-10-01	45.6	185
Missouri	1988-01-01	34.9	100
Nebraska	1988-07-01	60.9	100
New Jersey	1987-07-01	70.1	100
New Mexico	1988-01-01	32.7	100
North Carolina	1987-10-01	44.3	100
Ohio	1989-01-01	38.3	100
Oklahoma	1988-01-01	58.3	100
Oregon	1987-11-01	69.2	100
Pennsylvania	1988-04-01	55.7	100
Rhode Island	1988-10-01	85.7	185
South Carolina	1987-10-01	49.9	100
South Dakota	1988-07-01	45.3	100
Tennessee	1987-07-01	45.2	100
Texas	1988-09-01	33.1	100
Utah	1989-01-01	85.8	100
Vermont	1987-10-01	104.1	185
Virginia	1988-07-01	44.3	100
Washington	1987-07-01	74.2	90
West Virginia	1987-07-01	35.9	150
Wyoming	1988-10-01	44.6	100

Table 2: Summary Statistics of PSID Sample

	In High Impact Sample			Not in High Impact Sample		
Variable	N	Share (%)	SD	N	Share (%)	SD
Age (Mean, SD)	8926	25.86	5.73	18993	25.70	5.66
Born						
After Expansion	1809	20.28		4460	23.48	
Before Expansion	7111	79.72		14533	76.52	
Survey Year						
1994 to 1998	268	3.00		338	1.78	
1999 to 2010	3898	43.67		7925	41.73	
2011 to 2017	4760	53.33		10729	56.49	
Education						
Greater than High School	2669	33.23		9432	55.49	
High School Diploma	3473	43.24		5799	34.11	
Less than High School	1889	23.52		1768	10.40	
Marital Status						
Married	4216	47.24		11638	61.29	
Unmarried	4709	52.76		7349	38.71	
Birth Year						
1977 to 1984	6890	77.19		14192	74.72	
1985 to 1987	207	2.32		321	1.69	
1988 to 1992	888	9.95		2095	11.03	
1993 to 1999	941	10.54		2385	12.56	
Family Size at Birth						
1 to 4	4891	54.79		15189	79.97	
5 to 9	3681	41.24		3729	19.63	
Over 10	354	3.97		75	0.39	
Circumstance at Birth						
Single Mother at Birth	8137	2.74		18266	2.17	
Family Income to FPL Ratio (Mean, SD)	8926	1.47	1.00	18985	2.92	1.97
Birth Order to Mother						
1	2906	43.91		5720	40.02	
2	1784	26.96		5163	36.12	
3	1131	17.09		2271	15.89	
4+	797	12.04		1140	7.98	
Sex						
Female	4795	53.72		9656	50.84	
Male	4131	46.28		9337	49.16	
Race						
Not White	6271	71.44		7186	38.23	
White	2507	28.56		11613	61.77	
Other Health Outcomes						
Smokes Cigarettes	5235	33.20		11075	23.04	
Ever Smoked	5226	47.67		11068	42.66	
More than 3 Drinks in Session	8926	12.31		18993	15.41	
Main Outcomes						
Excellent/Very Good Health	5254	54.00		11103	66.71	
Metabolic Syndrome Index (Mean, SD)	5236	-0.18	0.36	11082	-0.26	0.30
Metabolic Syndrome Components						
High Blood Pressure	5233	14.10		11072	9.70	
Heart Disease	5231	1.57		11075	0.75	
Heart Attack	5232	0.69		11078	0.42	
Obesity	5144	34.23		10922	25.92	
Diabetes	5233	3.42		11076	2.27	
Medicaid Exposure Index (Mean, SD)	8684	0.31	0.73	17963	0.35	0.77

Note:
The High Impact Sample is those who were born to families headed by someone without a high school education. Estimates in this table are unweighted. Each observation is a individual X survey year response.

4 Results

I find that Medicaid Exposure is associated with improved overall health and decreased metabolic syndrome symptoms in young adulthood. Among those in the high impact sample, a 1-unit (1.17 standard deviation) increase in the Medicaid Exposure Index is associated with a 13.2% higher probability (0.264 standard deviations) of reporting excellent or very good health (p¡0.05) and a 0.122-unit (0.34 standard deviation) decrease in the Metabolic Syndrom Index (p¡0.01) (Table 3). In contrast, the Medicaid Exposure Index is not associated with a significant change in either overall health or the Metabolic Syndrome Index for individuals not in the high impact sample (Table 6).

Table 3: Effect Among High Impact Sample

	Overall Health	Metabolic Syndrome Index
Medicaid Exposure Index	0.132**	-0.122***
	(0.0596)	(0.0333)
Constant	31.27	-86.89
	(69.62)	(56.59)
Dep Var Mean	0.484	-0.178
Dep Var SD	0.500	0.364
N	3238	3227
R^2	0.169	0.204

Clustered standard errors are in parentheses. Significance levels: * 10%, ** 5%, *** 1%

Table 4: Effect on Metabolic Syndrome Among High Impact Sample

	Overall	Components				
	Metabolic Syndrome Index	Diabetes	Hypertension	Obesity	Heart Disease	Heart Attack
Medicaid Exposure Index	-0.122***	-0.0284	-0.0319	-0.145***	-0.0119*	-0.0171
	(0.0333)	(0.0232)	(0.0324)	(0.0399)	(0.00589)	(0.0102)
Constant	-86.89	-35.02	-39.18	29.42	-45.82**	-16.97*
	(56.59)	(35.37)	(71.12)	(49.23)	(19.82)	(8.392)
Dep Var Mean	-0.178	0.0530	0.153	0.315	0.0195	0.00497
Dep Var SD	0.364	0.224	0.360	0.465	0.138	0.0703
N	3227	3226	3226	3187	3225	3226
R^2	0.204	0.242	0.173	0.257	0.171	0.0843

Clustered standard errors are in parentheses. Significance levels: * 10%, ** 5%, *** 1%

Table 5: Effect on High Impact Sample by Sex

	Female		Male	
	Overall Health	Metabolic Syndrome Index	Overall Health	Metabolic Syndrome Index
Medicaid Exposure Index	0.0848	-0.0949	0.162**	-0.135
	(0.0519)	(0.0626)	(0.0715)	(0.0983)
Constant	-14.70	-31.80	34.82	-78.70
	(72.95)	(83.89)	(78.72)	(74.41)
Dep Var Mean	0.437	-0.170	0.544	-0.188
Dep Var SD	0.496	0.390	0.498	0.326
N	1961	1956	1277	1271
R^2	0.242	0.289	0.273	0.326

Clustered standard errors are in parentheses. Significance levels: * 10%, ** 5%, *** 1%

Table 6: Effect Among Those Not in the High Impact Sample

	Overall Health	Metabolic Syndrome Index
Medicaid Exposure Index	0.0359	0.00424
	(0.0309)	(0.0211)
Constant	-4.761	-17.61
	(48.76)	(32.48)
Dep Var Mean	0.667	-0.256
Dep Var SD	0.471	0.293
N	6538	6522
R^2	0.0918	0.137

Clustered standard errors are in parentheses. Significance levels: * 10%, ** 5%, *** 1%

Table 7: Effect on Metabolic Syndrome Among Those Not in High Impact Sample

	Overall	Components				
	Metabolic Syndrome Index	Diabetes	Hypertension	Obesity	Heart Disease	Heart Attack
Medicaid Exposure Index	0.00424	-0.0122	-0.0371*	0.0646*	-0.000402	0.00109
	(0.0211)	(0.0193)	(0.0193)	(0.0373)	(0.00398)	(0.00339)
Constant	-17.61	28.22	-18.50	-10.18	-23.30**	-3.097
	(32.48)	(19.49)	(28.20)	(52.09)	(11.00)	(5.573)
Dep Var Mean	-0.256	0.0227	0.0959	0.255	0.00962	0.00431
Dep Var SD	0.293	0.149	0.294	0.436	0.0976	0.0655
N	6522	6522	6520	6471	6521	6522
R^2	0.137	0.0936	0.0949	0.128	0.0722	0.0380

Clustered standard errors are in parentheses. Significance levels: * 10%, ** 5%, *** 1%

5 Discussion

6 Conclusion

References

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Tables

Figures

Appendix A. Placeholder