

The Long-Term Impacts of Medicaid Exposure in Early Childhood

Michel Boudreaux
University of Minnesota

January 21, 2014

Medicaid

- Provides health insurance coverage to low income mothers and children
- Joint effort of the states and federal government
 - Consumes about 16% of state budgets and 8% of federal spending
 - Finances 48% of all childbirths
 - Covers 35% of all children under 19
- Little information on the long term impacts of having Medicaid in childhood on adult health and economic status

Acknowledgments

- Funding
 - UofM Interdisciplinary Doctoral Fellowship
 - AHRQ Dissertation Grant
 - All errors and opinions are my own
- Co-authors
 - Ezra Golberstein
 - Donna McAlpine

Aim and Approach

- Research Question
 - Does exposure to Medicaid in early childhood improve health and economic outcomes in adulthood?
- Empirical Challenges
 - Unobserved selection into the program
 - Use the state-by-time variation in Medicaid using difference-in-differences to measure the effect of exposure to policy
 - Long follow-up period
 - Focus on Medicaid's original introduction in 1966 using data from the Panel Study of Income Dynamics

Medium-term impacts of Medicaid

- Medicaid exposure earlier in childhood improves outcomes later in childhood
 - Self Reported Health (Currie et al., 2008)
 - Mortality (Meyer & Wherry, 2012)
 - Academic Achievement (Levine et al., 2009)

Mechanisms

- Improvements in short-run health
 - Fetal origins hypothesis and emerging evidence on later childhood disease
 - Heart disease, type II diabetes, cancer, obesity, respiratory disease, rheumatism
 - Education, wages, employment status
- Improvements in family economic resources
 - Additional investments in childhood development
 - Reduced stress

Barker 2007; Gluckman and Hanson 2004; Montez and Hayward 2011; Kuh et al. 2003; Warren et al. 2013, Almond & Currie 2010; Black et al. 2007; Duncan et al. 2002

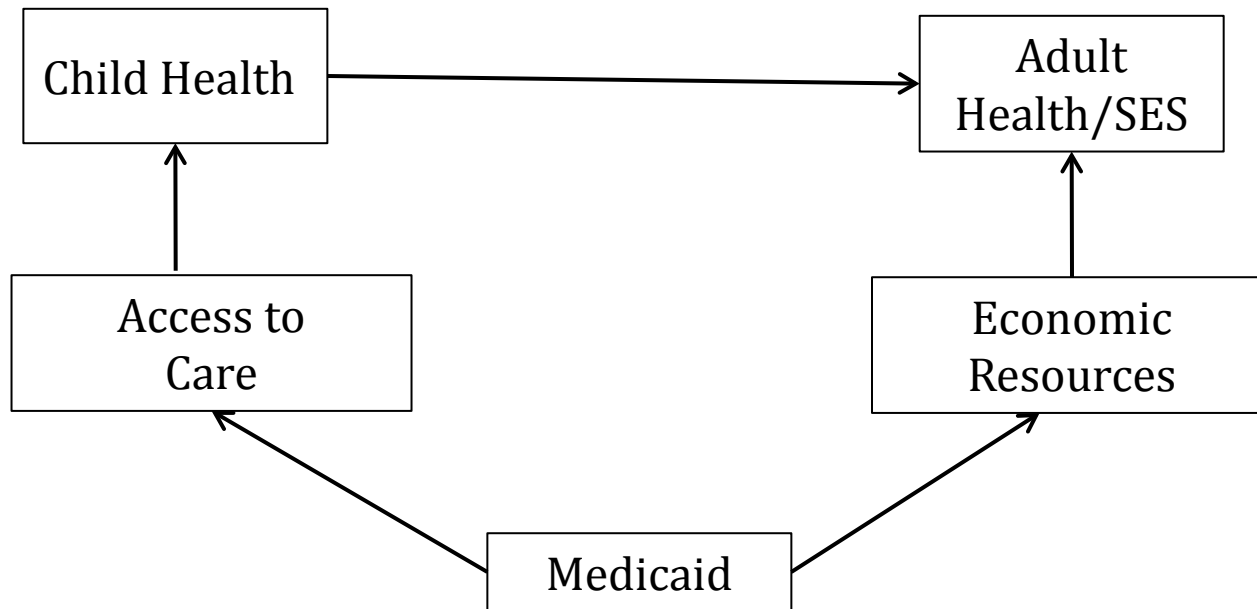
The long-run effects of early childhood health services

- NICU Services for at-risk newborns
 - Academic test scores
- Antibiotics to treat child pneumonia
 - Income, employment, disability
- Hospital desegregation (Chay et al, 2009)
 - Improved cognitive ability

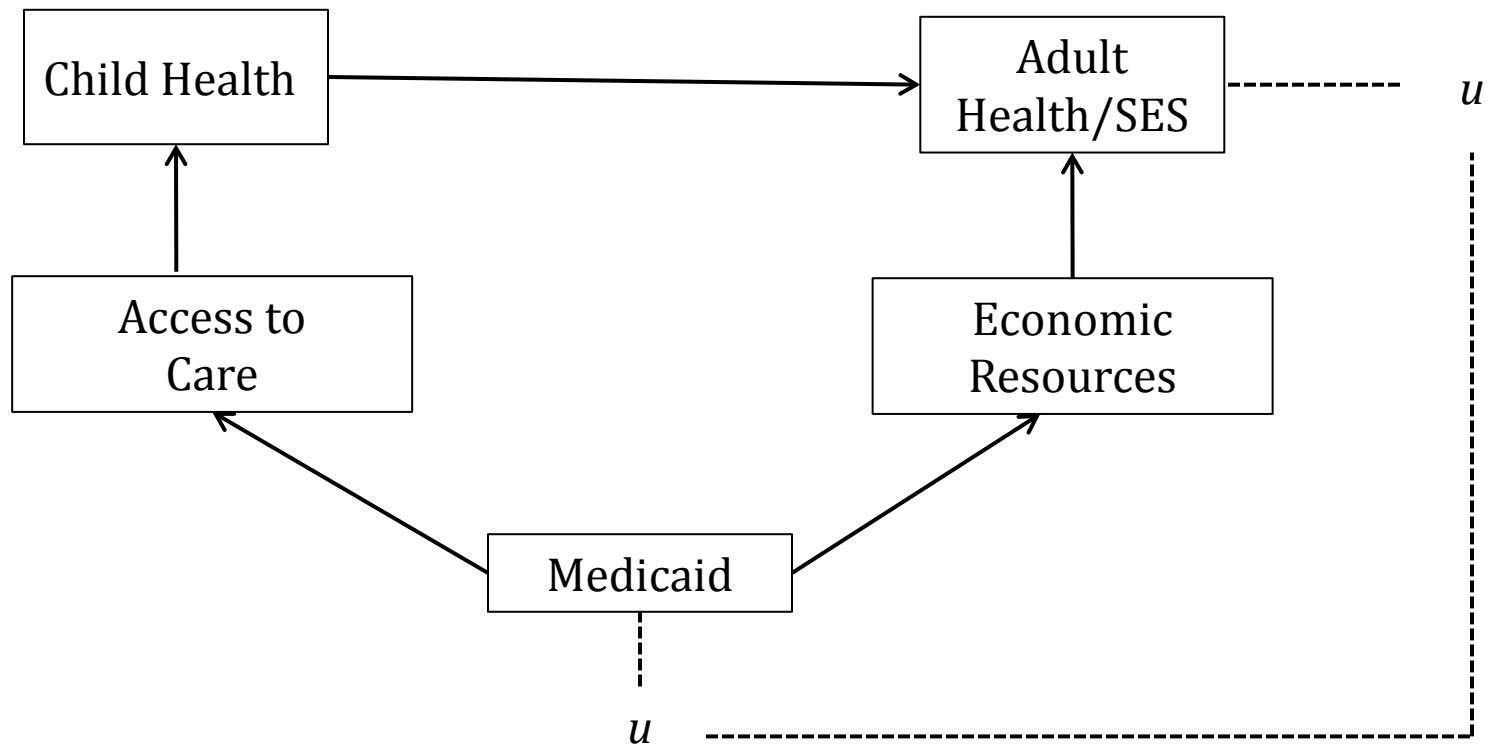
Hoynes, Shanzbach, & Almond (2012)

- Long run impact of food stamp program on health and SES
- Exposure to FSP from ages 0-5
 - 0.3 SD improvement to health index
 - 0.3 SD improvement to SES index for women

The long-run impact of Medicaid



The long-run impact of Medicaid

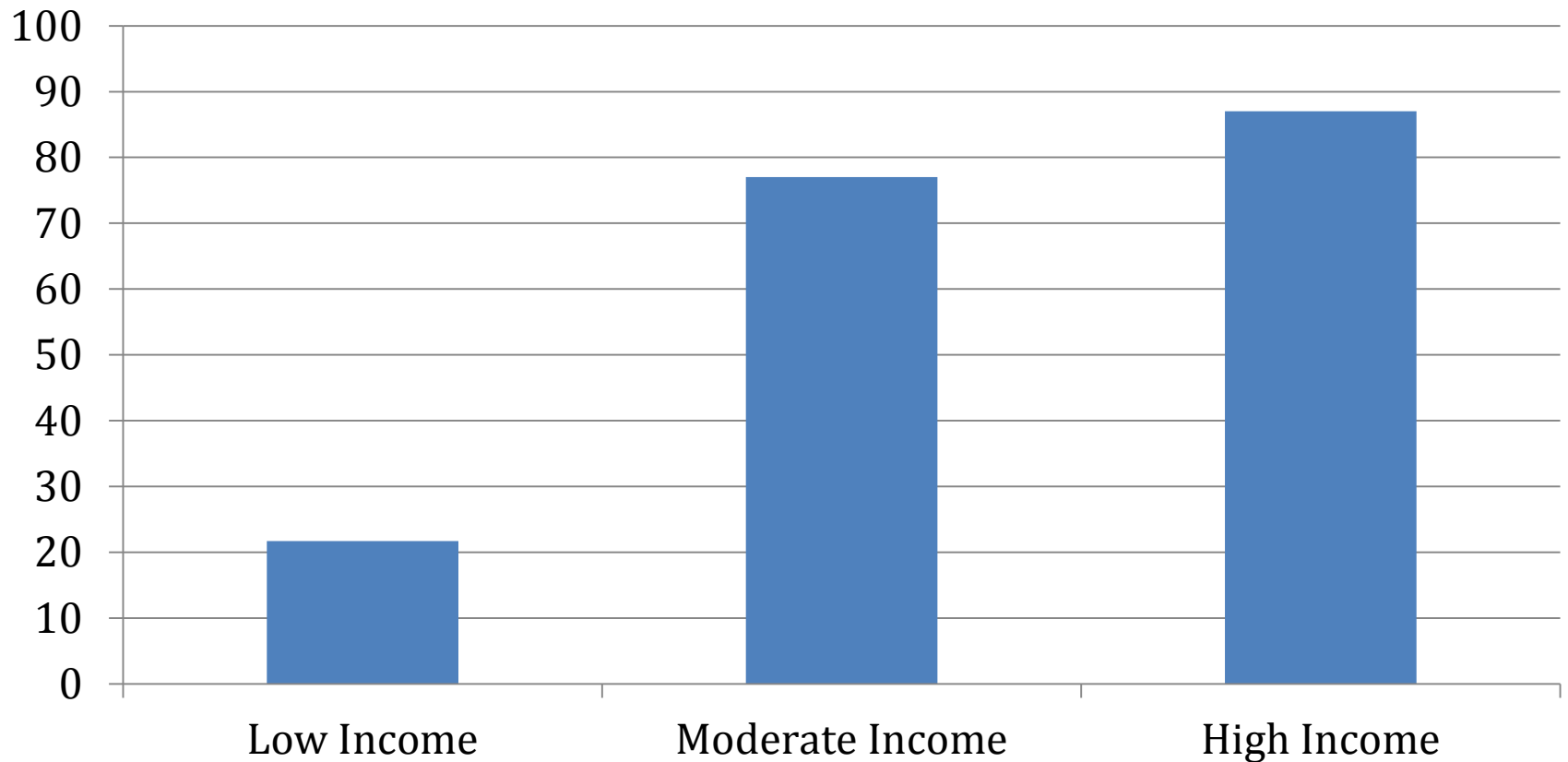


Study setting

- Staggered timing of Medicaid's introduction across the states
 - Created variation in the amount of early life exposure to Medicaid
- Enacted in 1965
 - Roll out mainly occurred between 1966-1970
 - By 1972, all but Arizona had a program

The situation before Medicaid: Health insurance in 1963

Children Age 0-5



1963 National Health Interview Survey

Components of Medicaid

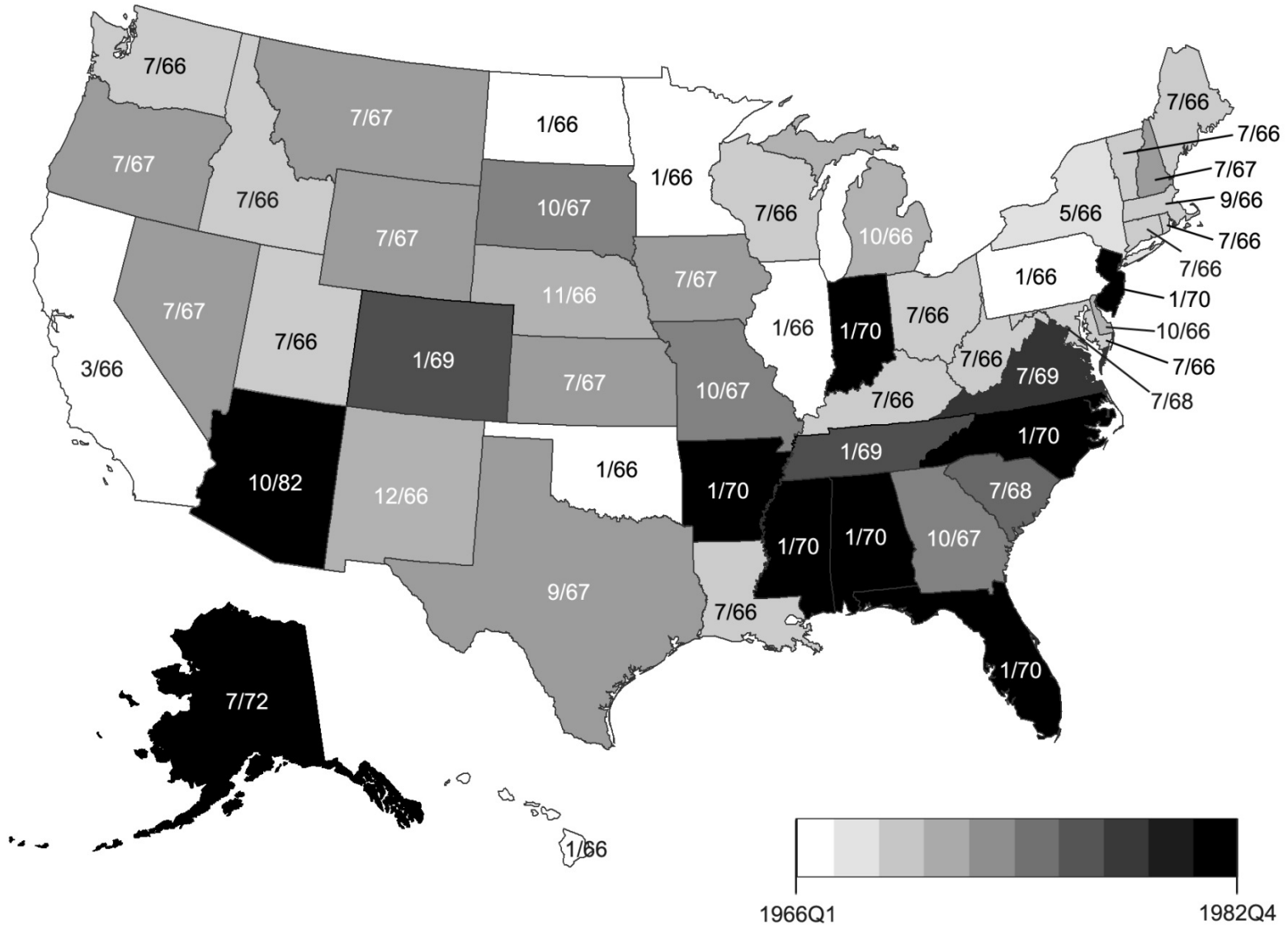
- Mandated that all people on Aid to Families with Dependent Children (cash welfare) be automatically enrolled
- Covered services with no copay
 - Physician services, hospital stays, lab and x-ray (Holahan, 1975)
- 8.5 million Medicaid participants by 1970

The short-term effect of Medicaid's introduction

- Only two studies document the effect of Medicaid's introduction on child health
 - In groups targeted by Medicaid
 - 60% reduction in the incidence of low birth weight
 - 24% reduction in child mortality

(Decker and Gruber 1993; Goodman-Bacon 2013)

Medicaid adoption by quarter and year



Data

- 1968-2009 Panel Study of Income Dynamics
 - Follows respondents and their descendants
 - A large oversample of low income families
- Key measures
 - Health (chronic conditions)
 - Economic status (education, income, wealth)
 - Demographic information (place and time of birth and family structure)

Sample selection

- 1955-1980 birth cohorts
 - 6 cohorts with no Medicaid exposure prior to age 6
 - 10 cohorts w/exposure starting in early childhood
 - 10 cohorts exposed starting *in utero*
 - 1 drop AZ (< 1% of sample)
- A sample of adults (Age 18-54)
 - Attach childhood characteristics
 - Define childhood exposure and isolate subgroups targeted by the program
- Household heads and their spouses

Demographics of the sample

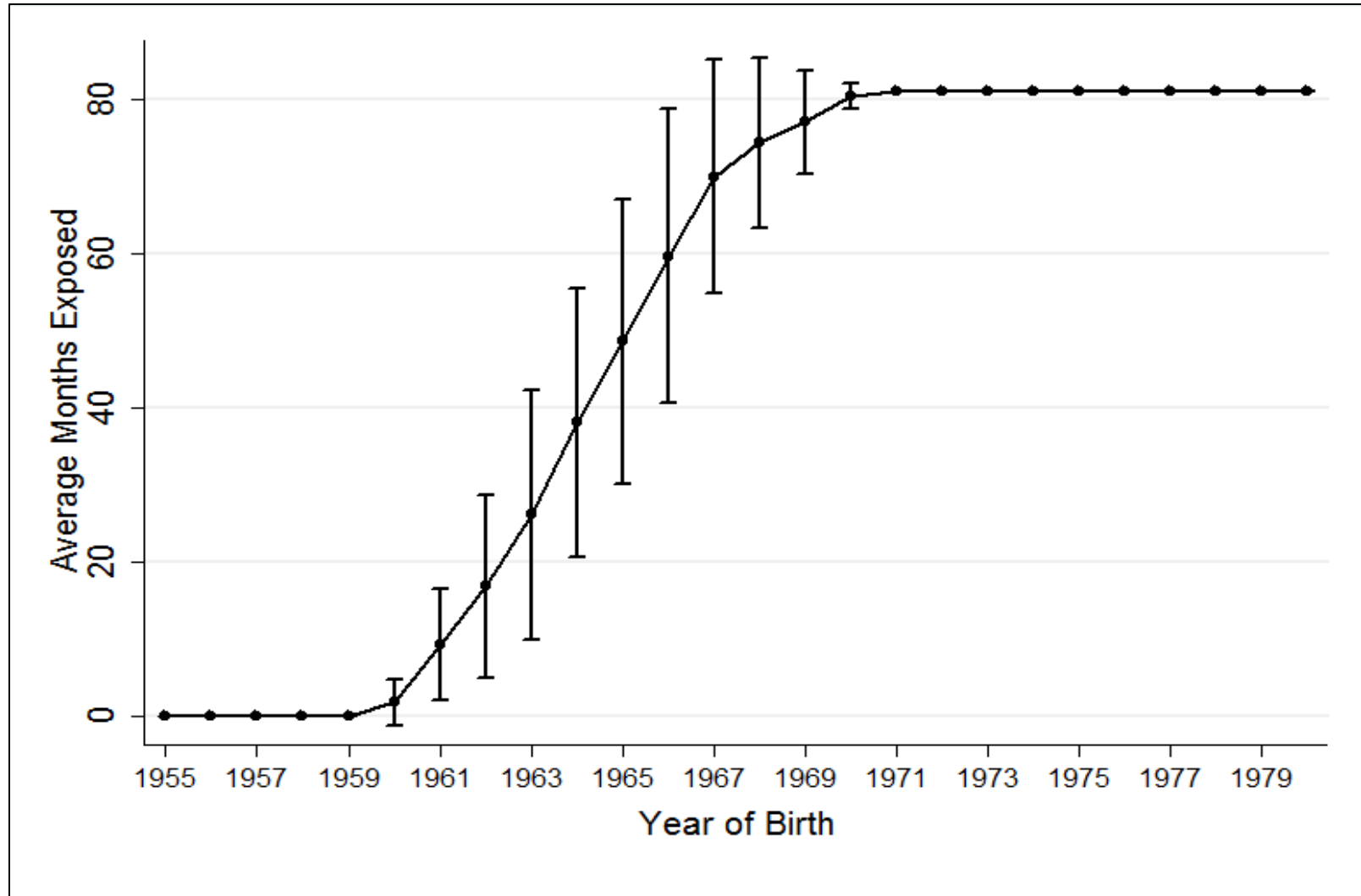
	n		
Person Years	18,243		
Unique Persons	3,863		

	Mean (SD)	Min	Max
Age	32.1 (7.8)	18	54
Male	.46	0	1
White	.82	0	1
Married	.65	0	1

Treatment variable

- Medicaid exposure
 - Share of months from conception to 6th birthday (“early childhood”)
 - Range is [0,1]
 - A function of time and place of birth
 - Measures exposure to policy, not participation

Average months exposed



Adult health outcomes

- Health conditions (Measured in 1999-2009):
 - High blood pressure (14%)
 - Heart disease or heart attack (3%)
 - Adult onset diabetes (2%)
 - Obesity (24%)
- Condition Index ($\bar{x}=-0.03$; $sd=0.6$)
 - Equally weighted mean of z-scores
 - Improves power and reduces problems of multiple comparisons
 - Anderson, 2008; Hoynes et al. 2012

Adult Economic Outcomes (Age 25+)

- Economic Indicators (Measured in 1999-2009)
 - Years of education ($\bar{x}=13.4$; $sd=2.1$)
 - Income-to-poverty ($\bar{x}=4.6$; $sd=6.2$)
 - Family wealth ($\bar{x}=6.1$; $sd=2.9$)
 - Measured in deciles
- Economic index ($\bar{x}=0.3$; $sd=0.9$)

Contextual Controls

- Many things were changing around Medicaid's introduction
- 3 strategies
 - Time trends
 - Control for as much as I can
 - Triple differencing

State-of-Birth Controls

- Per Capita AFDC Caseloads and benefit standards
 - Average in early childhood
- Unemployment rates
 - Average in early childhood
- Legalized abortion
 - Indicator at conception

County-of-Birth Controls

- Per Capita Doctors and Hospitals
 - Average in early childhood
- Per Capita Spending on public assistance
 - Average in early childhood
- Food stamps, head start, community health centers, family planning grants, MCH grants, job training grants
 - Fraction of months in early childhood

*Data generously provided Amy Finkelstein, Douglas Almond, Hillary Hoynes, and Martha Bailey

Models

$$\begin{aligned} y_{insct} &= \lambda MCAIDSHARE_{st} + \beta X_{insct} \\ &+ \phi STATECON_{st} + \varphi CNTYCON_{ct} \\ &+ \rho_n + \delta_t + \gamma_s + (\gamma_s * t) + e_{insct} \end{aligned}$$

- OLS
- Sample weights adjust for initial selection and attrition
- Standard errors clustered on state of birth (Bertrand et al. 2004)

Subgroups targeted by Medicaid

- PSID collects AFDC information but I avoid using it to reduce the risk of compositional shifts that could bias the results
- Low income (< 150% FPL)
 - Average level in the early childhood period
 - Any AFDC in childhood: 40%
- Low education (< H.S.)
 - Status of family head at birth
 - Any AFDC in childhood: 22%

The effect of Medicaid in childhood on adult health and economic status

	Low Income		Low Education	
	Effect of Medicaid Exposure	SE	Effect of Medicaid Exposure	SE
Condition Index	-0.36**	0.13	-0.18	0.15
Sample Size	5,926		6,960	
Mean of Y	-0.01		-0.01	
R ²	0.21		0.18	
Economic Index	-0.11	.21	-0.18	0.28
Sample Size	5,973		7,181	
Mean of Y	-0.24		-0.10	
R ²	0.33		0.30	

*p<0.1; **p<0.05; ***p<0.01

Models control for demographics, contextual controls, fixed effects

Interpretation

- Condition Index
 - Coefficient in low-income sample suggests that exposure to Medicaid reduces the probability of having one of the conditions measured by the index by 0.4
- Economic Index
 - Confidence intervals can not exclude a large range of potentially meaningful effect sizes

The effect of Medicaid in placebo groups

	Moderate Income		High Education	
	Effect of Medicaid Exposure	SE	Effect of Medicaid Exposure	SE
Condition Index	0.05	0.12	0.01	0.09
Sample Size	5,695		10,802	
Mean of Y	-0.14		-0.18	
R ²	.15		.09	
Economic Index	-0.03	0.14	0.12	0.09
Sample Size	11,210		19,557	
Mean of Y	-0.2		-0.32	
R ²	.12		.07	

*p<0.1; **p<0.05; ***p<0.01

Models control for demographics, contextual controls, fixed effects

Interaction models (triple diff.)

- Formalize the comparison between impact groups using a triple difference approach
 - Interact the exposure variable with predicted probability of participation
- Provide sharper focus on targeted groups
 - Using a different set of eligibility proxies that are less controllable than income

See Hoynes et al. 2012; Hoyt 2007

Measuring the Predicted Probability of Participation

- Participation rates obtained from 1977-1978 PSID (Medicaid or AFDC)
- Defined for 24 demographic groups
 - Age by Race by Education by Marriage
- Probabilities are merged back to the analytical sample according to the record's childhood characteristics
 - Mean: 0.05
 - Min: 0.01
 - Max: 0.44

Model and Interpretation

- Same demographic controls, contextual controls, and fixed effects
- Main effect of Medicaid exposure
 - Should be small (part. rate = 0)
- Interaction
 - The effect of exposure as predicted participation approaches 1

The effects of Medicaid

	Condition Index		Economic Index	
	Coef.	SE	Coef.	SE
Medicaid Exposure	-0.03	0.08	-0.16	0.14
Exposure*Participation	-0.88*	0.45	-0.07	1.10
Sample Size	18,094		38,442	
Mean of Y	-0.04		0.19	
R ²	0.12		0.25	

*p<0.1; **p<0.05; ***p<0.01

Models control for demographics, contextual controls, fixed effects

Robustness

- School and Hospital desegregation
 - Results robust to removing southern born non-whites
- Selective migration
 - Robust to removing cases that moved states in the early childhood period
- Contextual controls
 - Robust to removing contextual controls

Summary

- Exposure to Medicaid in early childhood appears to decrease the prevalence of adult chronic conditions
 - A reduction of one chronic condition
- No evidence of improved economic status
 - Wide confidence intervals cannot exclude a large range of potential effects

Limitations

- I can not identify exact mechanisms
 - Economic resources
 - Health
 - But what services specifically?
- Can not determine if there is a critical period embedded in the early childhood years
 - There has been a lot of attention to the prenatal period, but I cannot isolate it with these data

Contributions

- First examination of long run outcomes of Medicaid
 - Consequences of childhood health
 - Policy interventions
 - Medicaid evaluation literature
 - Benefits persist over time

Policy Implications

- This study suggests that providing health insurance at early ages produces long term benefits for low income children
 - Improves individual health
 - Could produce down-stream savings
- 5.5 million children uninsured in 2011
 - The benefit of covering these children through the ACA could extend beyond contemporaneous measures

Thank You

Michel Boudreaux
boudr019@umn.edu

Backup 1

Table 2. Coefficients on MCAIDSHARE in Health Models, by Impact Group

	High Impact				Low Impact (Placebo)			
	Low Income		Low Education		Moderate Income		High Education	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Chronic Condition Index	-0.36**	0.17	-0.18	0.18	0.05	0.14	0.01	0.12
Sample Size	5,926		6,960		5,695		10,802	
Mean of Y	0.09		0.1		-0.05		-0.09	
R ²	0.2		0.18		0.15		0.08	
Fair Health or Worse	0.03	0.07	0.01	0.05	0.02	0.04	0.04	0.04
High Blood Pressure	-0.23**	0.10	-0.24**	0.11	-0.07	0.09	0.02	0.07
Heart Disease/Heart Attack	-0.01	0.05	-0.03	0.04	-0.04	0.05	-0.02	0.03
Adult Onset Diabetes	-0.05	0.06	0.03	0.04	0.07	0.05	0.03	0.05
Obesity (BMI \geq 30)	-0.20	0.14	-0.13	0.16	0.01	0.15	-0.01	0.07

Source: PSID 1968-2009.

Backup 2

Table 3. Coefficients on MCAIDSHARE in Economic Models, by Impact Group

	High Impact				Low Impact (Placebo)			
	Low Income		Low Education		Moderate Income		High Education	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Economic Index	-0.11	0.21	-0.18	0.19	0.14	0.29	-0.29*	0.16
Sample Size	5,973		7,181		5,739		10,579	
Mean of Y	-0.24		-0.10		0.23		0.44	
R ²	0.33		0.30		0.14		0.16	
Years of Education	-0.04	0.52	-0.28	0.6	0.37	0.7	0.12	0.50
Continuous Income to Poverty Ratio	-1.06*	0.59	-0.91	0.81	-0.9	1.54	-0.62	0.94
Decile of Family Wealth	-0.11	0.74	-0.33	0.59	1.55*	0.86	-0.86	0.52

Source: PSID 1968-2009.

Backup 3

Table 4. Triple Difference Models

	Chronic Condition Index		Economic Index	
	Coef.	SE	Coef.	SE
With Contextual Controls				
MCAIDSHARE	-0.03	0.08	-0.16	0.14
MCAIDSHARE*PRATE	-0.88*	0.45	-0.07	1.10
Sample Size	18,094		17,970	
Mean of Y	-0.04		0.19	
R ²	0.12		0.25	
Without Contextual Controls				
MCAIDSHARE	-0.04	0.11	0.12	1.04
MCAIDSHARE*PRATE	-0.99**	0.44	-0.01	0.96
Sample Size	18,241		18,112	
Mean of Y	-0.04		0.19	
R ²	0.11		0.24	

Source: PSID 1968-2009.