Public Insurance and Mortality: Evidence from Medicaid Implementation

JPE, 2018

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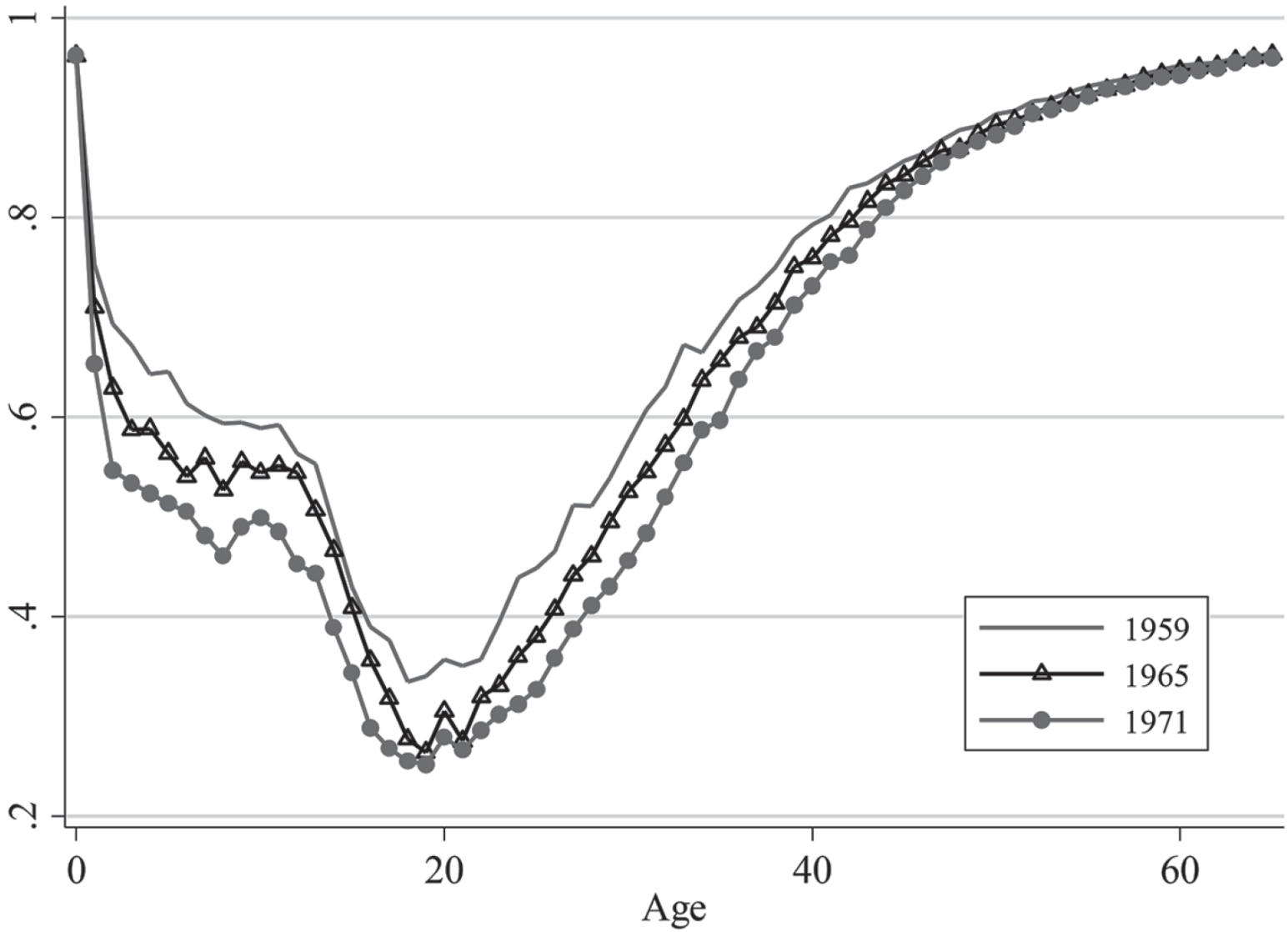
Motivation: Share of deaths due to internal causes by age



This work

Question: What is the Medicaid effect on the health of the poor, measured by mortality rates.

What this paper does: Studies Medicaid's effects in a dif-in-dif framework, comparing infant and child mortality rates before and after Medicaid implementation between higher- and lower-eligibility states.

Key take away: Medicaid's introduction generated dramatic decreases in infant and child mortality rates, especially among non-white children.

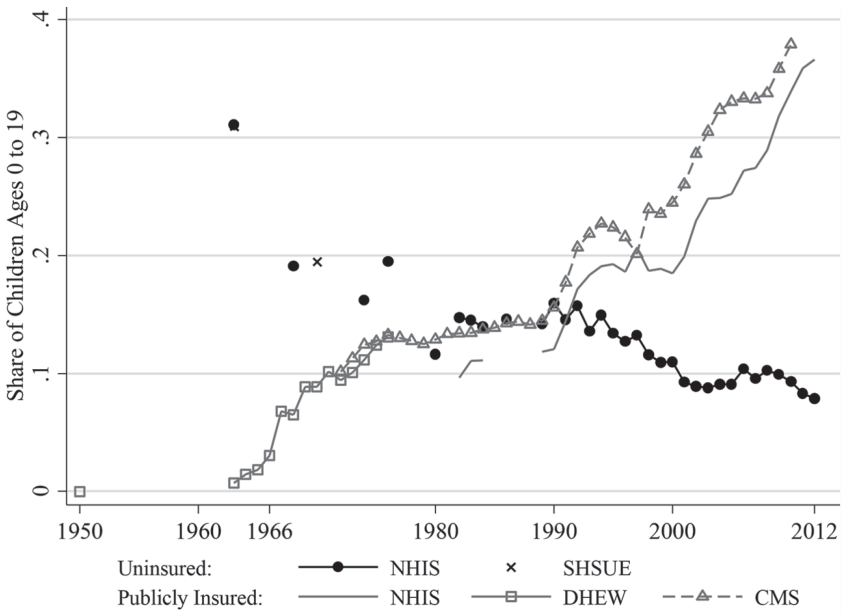
Medicaid: The program

A federal government program that finances a share of medical costs cares from private providers (1965).

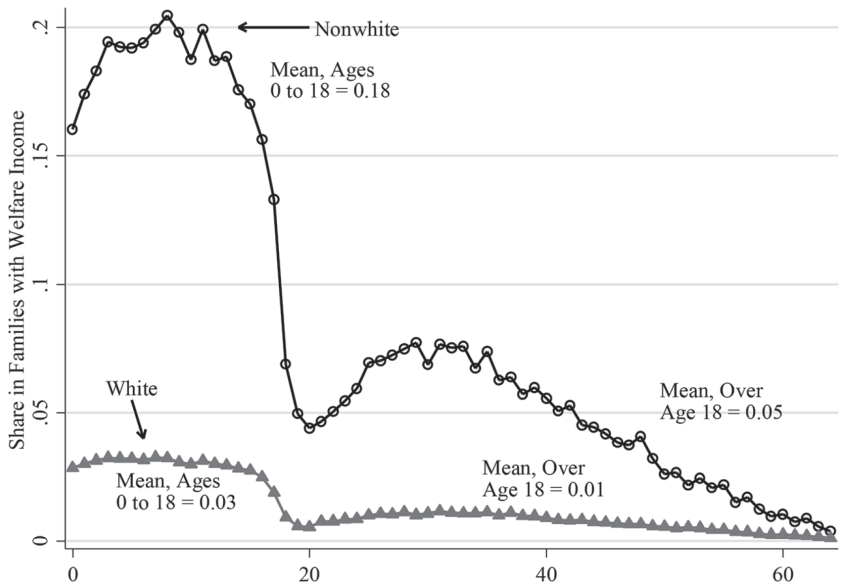
- 26 states adopted Medicaid in 1966, 11 in 1967, and the rest between 1968 and 1970.
- Eliminated caps on federal financing and increased the federal reimbursement rate.
- Required that states cover at least five types of care with no patient cost-sharing.
- Mandated coverage for recipients of federally funded cash welfare programs ("categorical eligibility").

Medicaid: Coverage

Share of uninsured and publicly insured children, 1950-2012



Medicaid categorical eligibility by age and race, December 1967



60-70s is the only period in recent US history when changes in public coverage corresponded to similarly large reductions in the share of uninsured children (15%) $\Longrightarrow$ Large scope to improve the health of poor children.

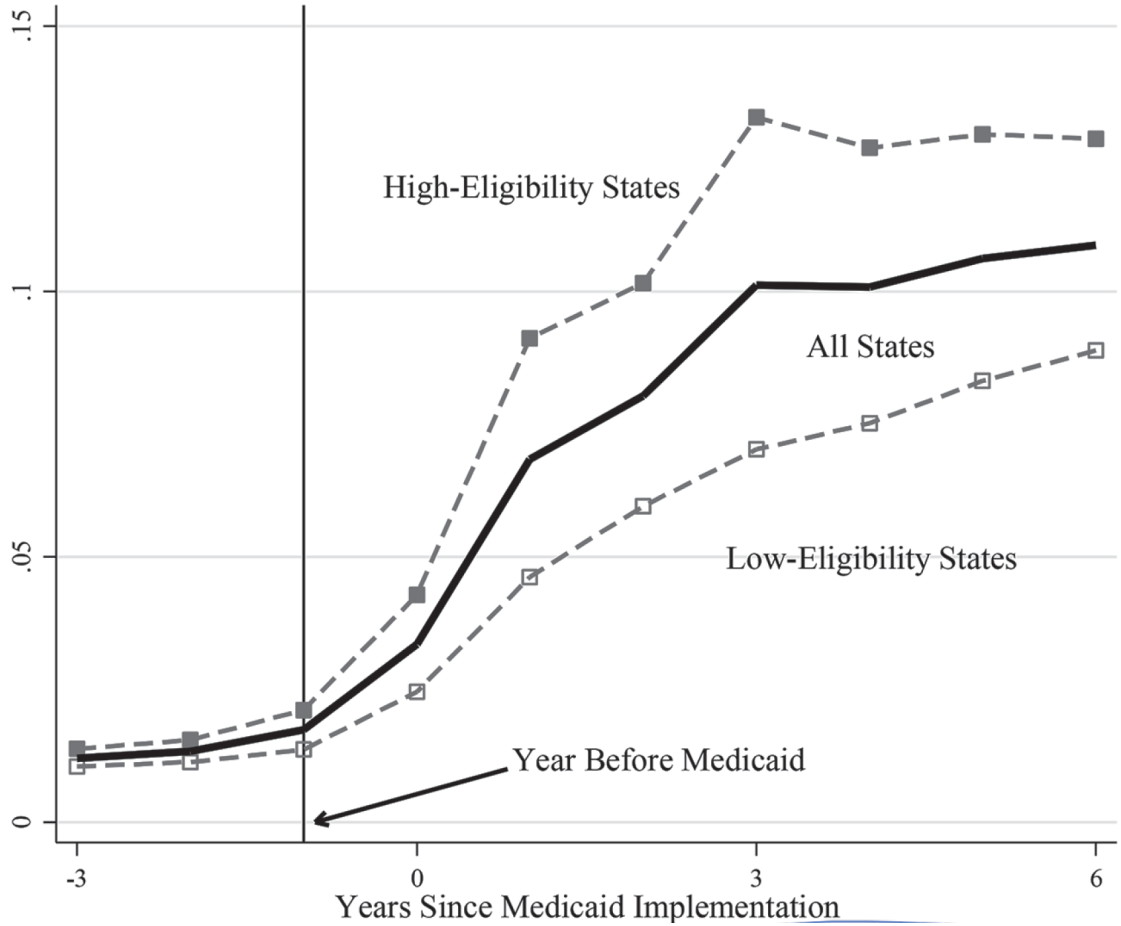
Data

Several data sources combined to gather public insurance eligibility and utilization, health outcomes, and potential confounders.

- **Categorical Eligibility**. State-by-year-by-race share of Aid to Families with Dependent Children (AFDC) payees.
- **Public Insurance Use**. Share of children who used public insurance. 90% of families on welfare who report Medicaid coverage also used it.
- **Health Outcomes**. Mortality rates by causes of death. Extreme but conceptually unambiguous health outcome of poor health.

Identification strategy (1)

Share of children using public health insurance before and after Medicaid



$\Longrightarrow$ ADFC (at the year of Medicaid implementation) share variation across states provides identification.

Identification strategy (2): Check

Primary identifying assumption: In the absence of Medicaid, mortality would have evolved similarly in higher- and lower-AFDC states.

Is AFDC* (ADFC at the year of Medicaid implementation) correlated with levels or trends in state characteristics?
(y: Range of state characteristics)

$$y_{st} = \alpha + \beta_0 \mathrm{AFDC}_s^* + \beta_1 \mathrm{AFDC}_s^* \times \left(y - y^{\mathrm{PRE}}\right) + u_{st}$$

- AFDC rates were relatively long-run, stable.
- Long-run institutional variation is uncorrelated with state policies and characteristics in the 1960s.

$\Longrightarrow$ Initial AFDCs will not capture heterogeneity in Medicaid's effect.

Empirical strategy

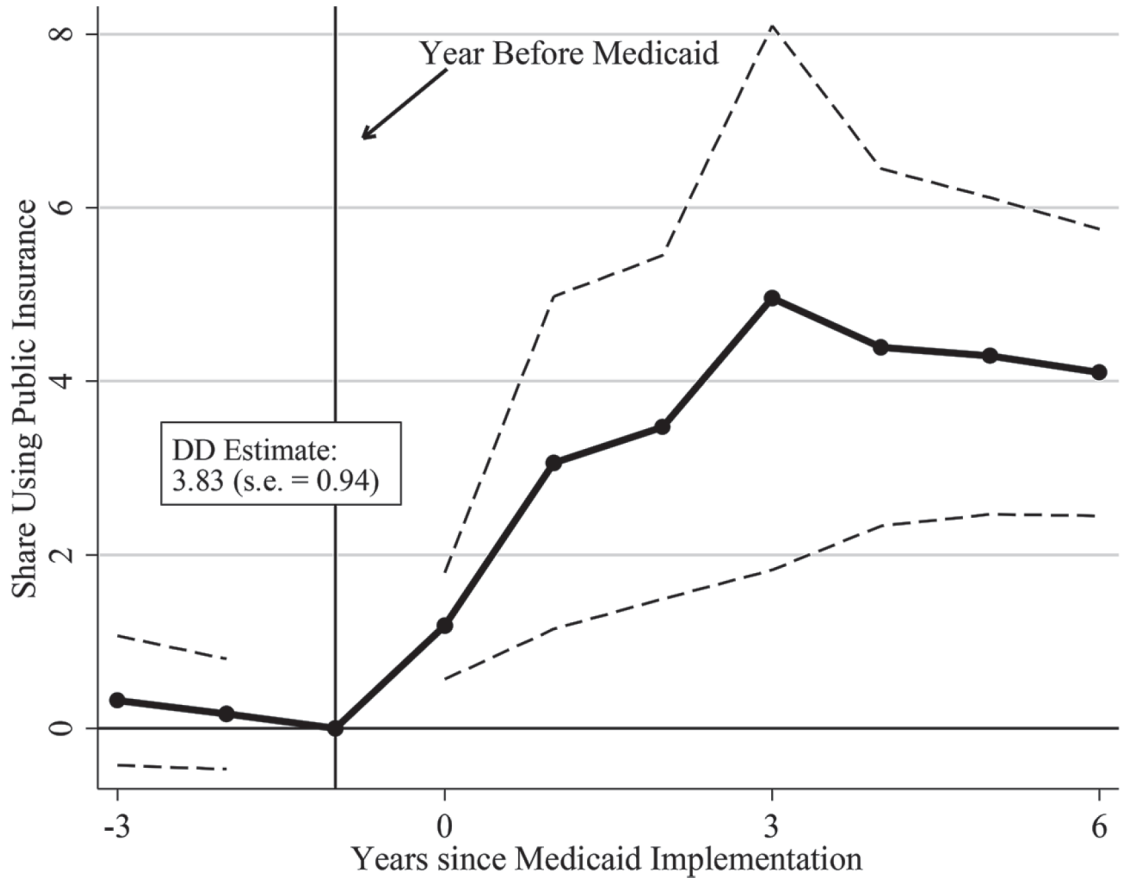
$$\ln(\text{ASMR}^k_{st}) = \overbrace{\mathbf{X}'_{st}\boldsymbol{\beta}_k}^{\substack{\text{Observables +region-by-year} \\ \text{and year-Medicaid timming FEs}}} + \overbrace{\text{AFDC}^*_s \sum_{y=-17}^{-2} \pi^k_y D_j \, \mathbb{1}\left(t - T^*_j = y\right)}^{\text{Before Medicaid effects}}$$

$$+ \underbrace{\text{AFDC}^*_s \sum_{y=0}^{15} \tau_y D_j \, \mathbb{1}\left(t - T^*_j = y\right)}_{\text{After Medicaid effects}} + \varepsilon_{jt}.$$

- ASMR: Infant and child mortality rates.
- Intention to treat (ITT) estimates; regardless of treatment (if any) received.
- $\tau_y = 0$ if Medicaid affected mortality equally across states.

Estimation results: Public insurance ussage

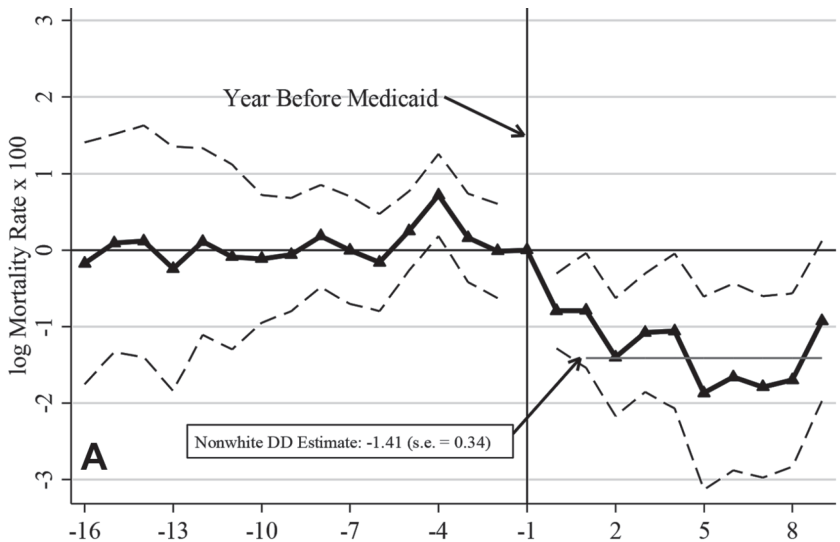
Share of children using public health insurance before and after Medicaid



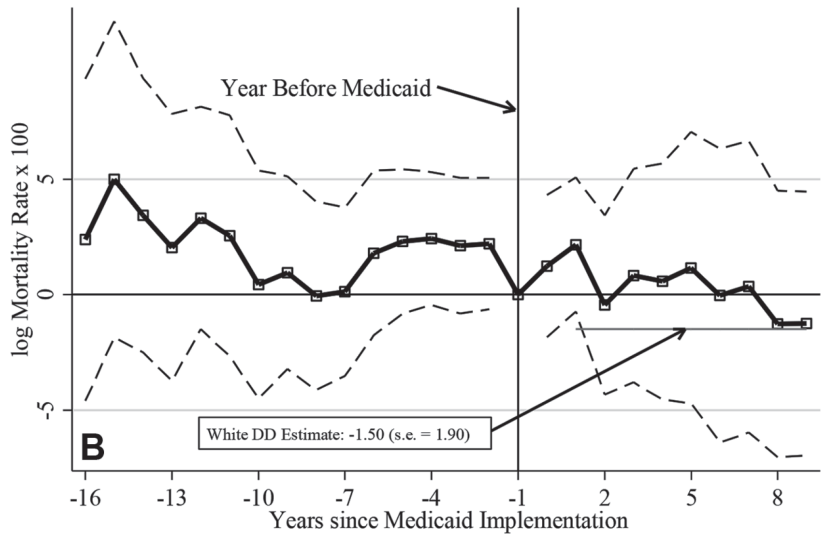
$\Longrightarrow$ Sharply increase after Medicaid is in place.

Estimation results: White vs Nonwhite mortality rates results

Nonwhite



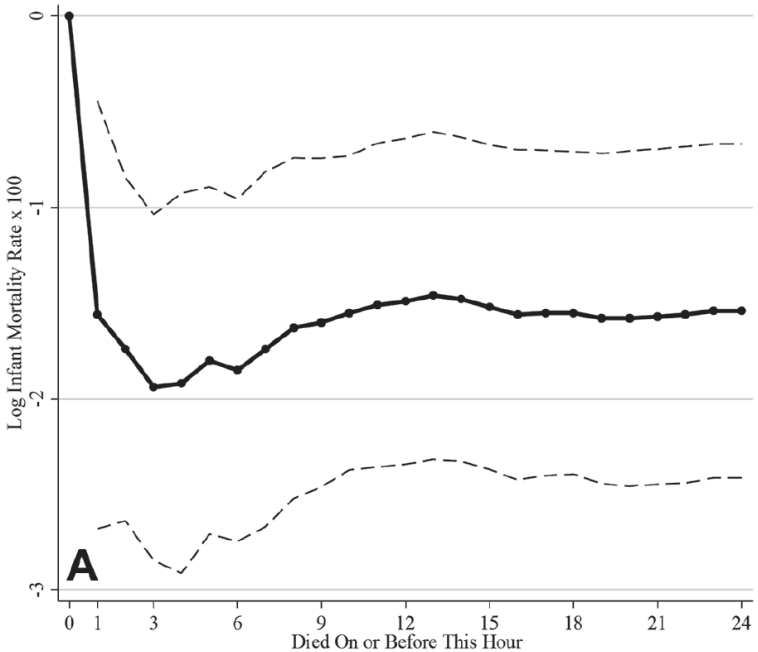
White



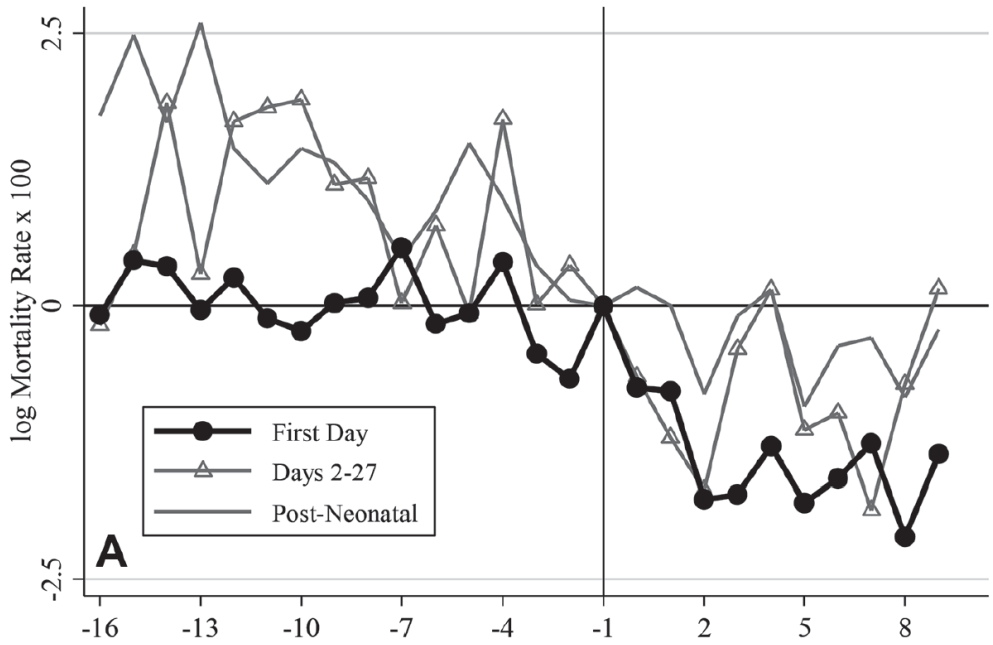
$\Longrightarrow$ Medicaid affected mortality similarly for white (less precise estimate) and nonwhite children. But will focus on nonwhite child outcomes.

Heterogeneity 1: Results for Nonwhite Infant Mortality by Age

Hours of life



Days of life



$\Longrightarrow$ Nearly all of Medicaid's effect manifests immediately after birth: it is biggest after 3 hours.

Heterogeneity 2: Conditional mortality

Reductions in immediate infant deaths could be due to improvements in health at birth or reductions in mortality rates conditional on fitness at birth, but:

- Very low weight rates didn change much after Medicaid.
- Neither low birth weight ratios.
- Nor male/female sex ratios.

The mortality effects change very little $\Longrightarrow$ Medicaid increased survival conditional on health at birth.

Heterogeneity 3: Nonwhite Labor and Delivery Care

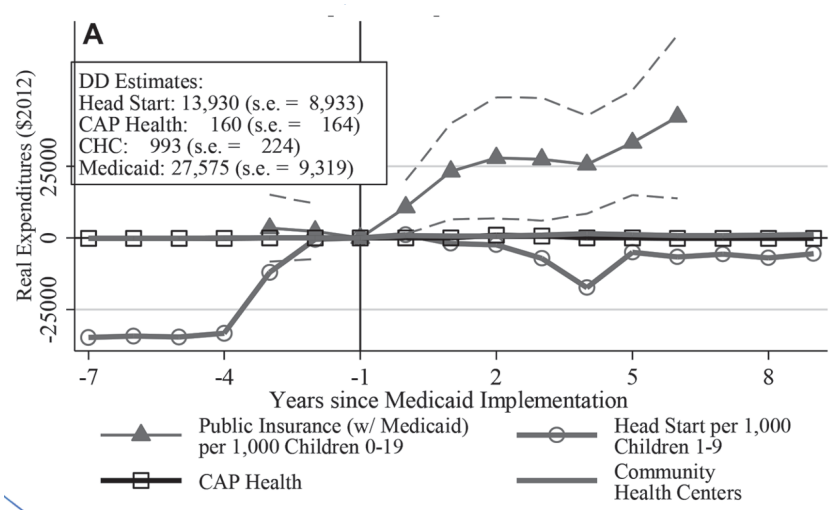
Medicaid could have reduced such short-run infant mortality rates without improving fetal health mainly through improvements in acute care at birth, fact:

- Medicaid reduced an outcome highly correlated with hospital care: maternal mortality.
- Hospital switching in California. The share of black births in public county hospitals fell 33%, perinatal mortality rates fell by 16%, and the birth weight rate distribution remained constant.

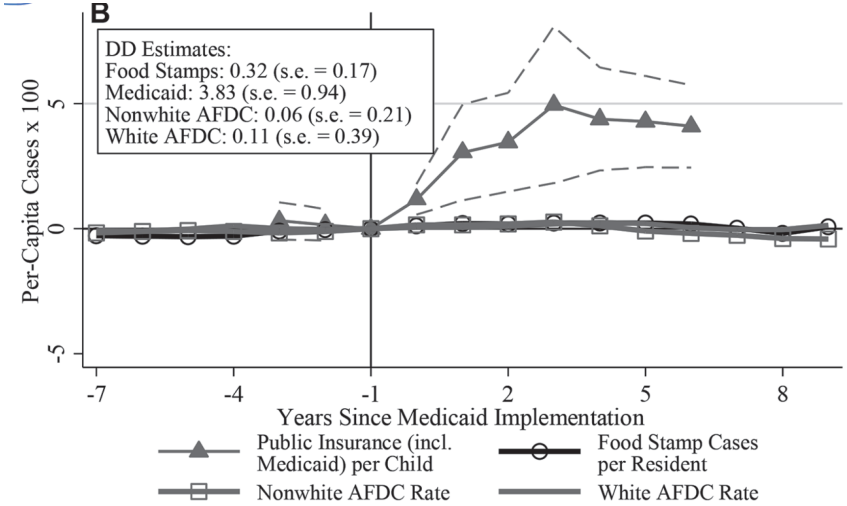
$\Longrightarrow$ Medicaid can explain race-specific neonatal mortality and survival conditional on health at birth.

Robustness 1: Other grants

Real expenditures



Per capita cases

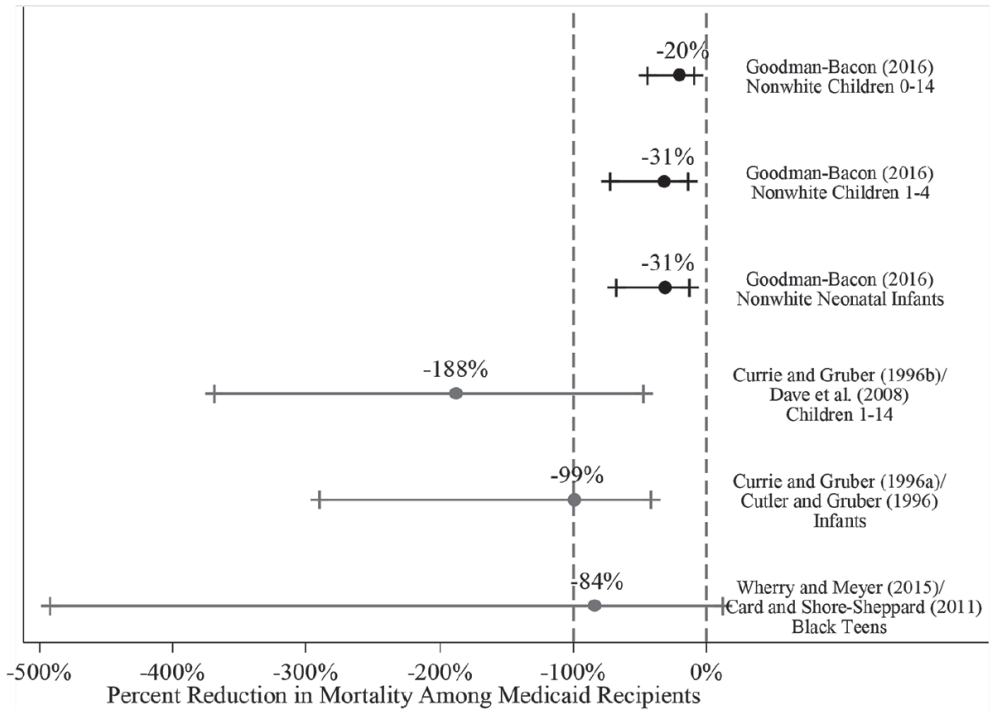


$\Longrightarrow$ AFDC is uncorrelated with post-Medicaid changes in per capita expenditures on other health-related programs.

$\Longrightarrow$ AFDC participation itself does not change differentially after Medicaid in higher-AFDC states.

Interpreting the Mortality Effects, comparing ATETs

From ITT to ATET: Divide the DD mortality estimate for nonwhite children by the appropriate first-stage estimate for insurance coverage.



$\Longrightarrow$ The ATET estimates reaffirm that Medicaid significantly reduced nonwhite infant and child mortality rates, and the magnitudes are consistent (>-100).

Aggregate Costs and Benefits

- Between 1966 and 1979, 35,087 nonwhite deaths were averted due to Medicaid (2,506 deaths per year).
- Would have occurred among neonates and young children, for whom the remaining life expectancy in 1966 was about 65.5, $\Longrightarrow$ 2.3 million life-years saved.
- Through 1976, Medicaid spent about \$5.8 billion (in 2012 dollars) per year on all children aged 0-19; cost per death averted of about \$1.83 million and a discounted cost per life-year saved of about \$64,000.
- The cost per death averted is \$160,000 for nonwhite neonates and \$2.1 million for young, nonwhite children.
- The latter does not consider: i) later life health benefits, ii) educational attainment, or iii) Productivity.