The War on Poverty's Experiment in Public Medicine: Community Health Centers and the Mortality of Older Americans

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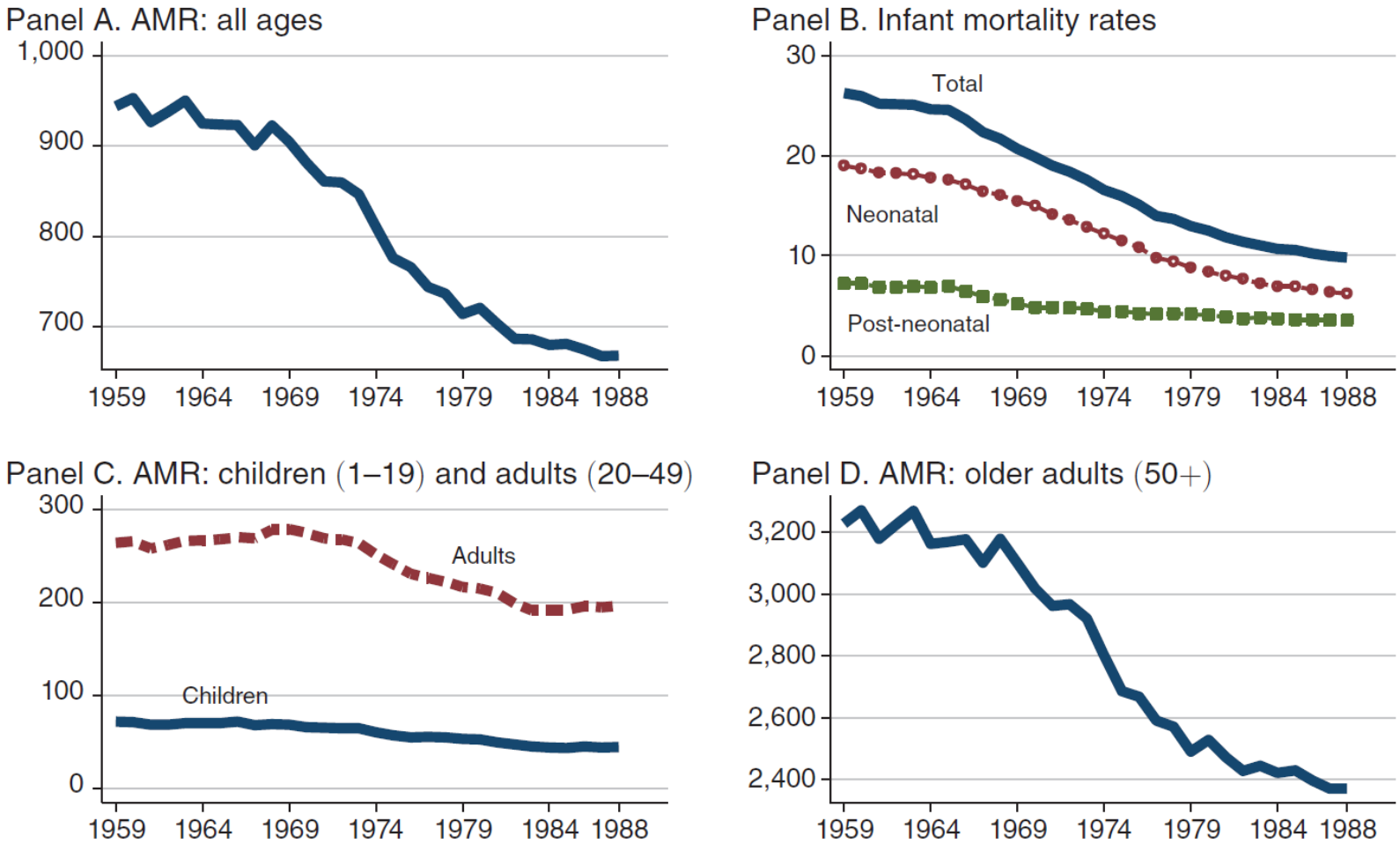
Motivation. Trend in Mortality rates by age group



Rates are per 100,000 residents. Age-adjusted deatch rates (AMR) control for the effects of differences in population age distributions

This work

Question: What are the Community Health Centers (CHCs) long-term health effects of increasing the availability of primary care to the poor.

What this paper does:
Takes advantage of a rare administrative disorder as a source of identifying variation to perform a dif-in-dif strategy to estimate the effects of CHCs rollouts on mortality rates.

Key take away: Public investments in primary care providers may yield considerable returns for the underserved and underinsured population.

Community Health Centers (CHCs)

Federally funded primary health centers (different than subsidies to private providers, Medicare and Medicaid) for the poor and underserved.

- Charged on a "pay as you can" sliding scale.
- Located in disadvantaged neighborhoods.
- Offered home visits and transportation to appointments.
- In 2008, more than 8,000 CHC sites operated in every 50 states.
- In 2008, served over 20 million Americans, 40% of whom were uninsured, and 70% of whom were poor.

Identification: The great administrative confusion

- The first wave of CHC grants (1965-1974) was an arbitrary funding process, which depended more on the applicant's skills than on actual medical needs $\Longrightarrow$ get T and C, groups.
- Using a nationally representative data source (SHSUE) can recover data on primary sampling units (PSU).
- Dif-in-Dif estimator compares changes in outcomes in 17 of the PSUs with CHCs to changes in outcomes in the 56 PSUs that did not get them by 1970.

Empirical strategy

Expected Effects of CHCs on Mortality Rates: i) Prevention, ii) Relative effectiveness. Thus, mortality outcome effect at county j in year t to estimate dif-in-dif :

$$Y_{jt} = \overbrace{\theta_j + \gamma_{u(j)t} + \delta_{s(j)t}}^{\text{County, urban, state, year FEs}} + \mathbf{X}'_{jt}\boldsymbol{\beta} + \overbrace{\sum_{y=-7}^{-2} \pi_y D_j 1\left(t - T_j^* = y\right)}^{\text{Before CHSs effects}}$$
$$+ \underbrace{\sum_{y=0}^{15} \tau_y D_j 1\left(t - T_j^* = y\right)}_{\text{After CHSs effects}} + \varepsilon_{jt}.$$

Intention to treat (ITT) estimates; regardless of treatment (if any) received.

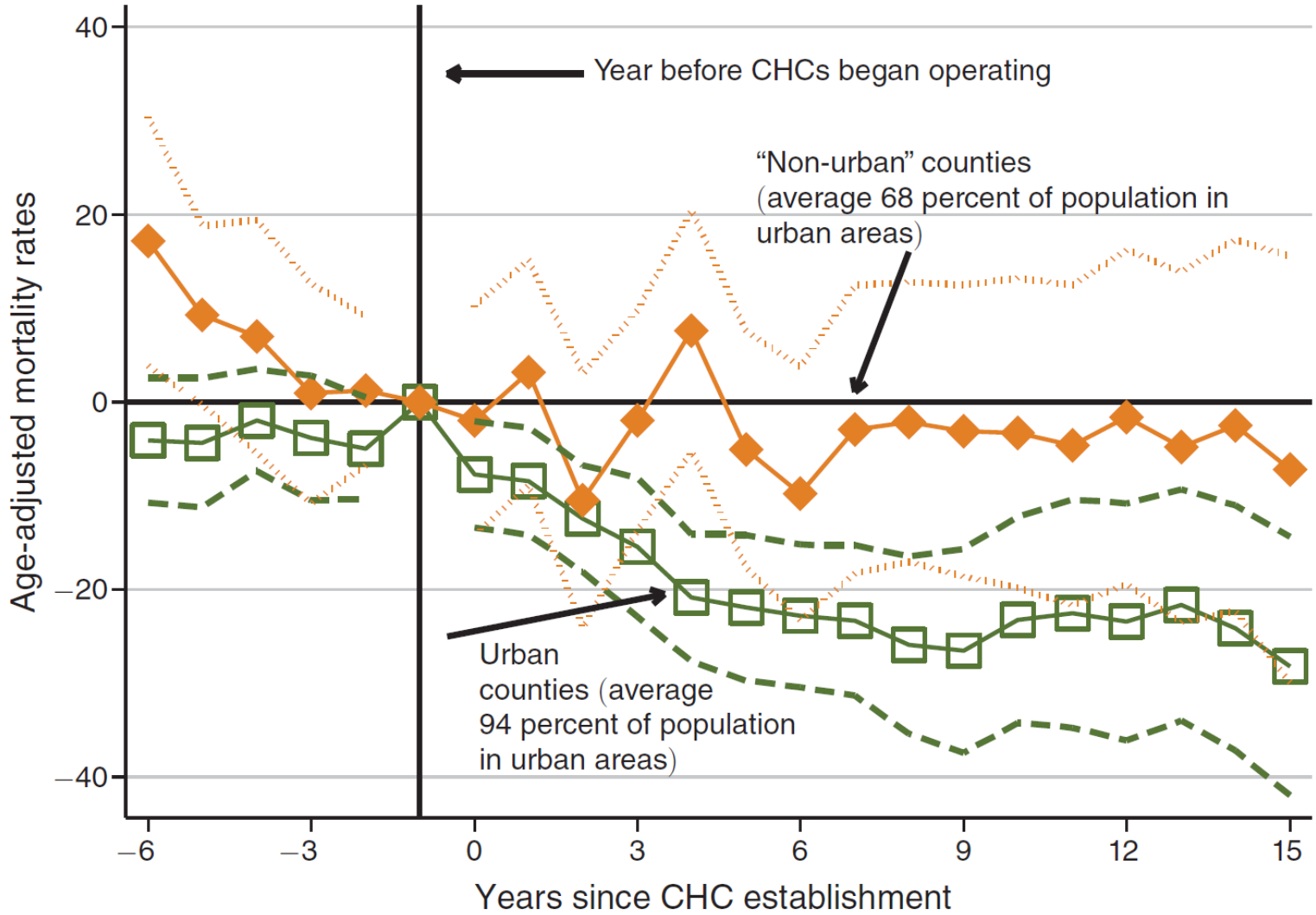
Estimation results

	(1)	(2)	(3)	(4)
Panel A. Age-adjusted mortality, all ages				
Mean at $t^* = -1$			929.3	
Years −6 to −2	0.03	−2.0	−2.7	1.5
	[2.8]	[2.1]	[2.0]	[3.2]
Years 0 to 4	−5.6	−10.1	−9.0	−8.6
	[3.5]	[2.3]	[2.4]	[2.6]
Years 5 to 9	−12.1	−18.9	−15.7	−13.9
	[4.6]	[3.5]	[3.5]	[3.7]
Years 10 to 14	−9.4	−17.5	−11.8	−18.4
	[5.6]	[4.8]	[4.6]	[4.7]
R^2	0.82	0.85	0.87	0.96
Panel B. Age-adjusted mortality, 50 years and older				
Mean at $t^* = -1$			3,213	
Years −6 to −2	10.6	−2.0	−3.3	5.3
	[10.2]	[8.0]	[8.1]	[11.1]
Years 0 to 4	−29.5	−41.1	−38.2	−30.5
	[13.7]	[9.6]	[8.9]	[11.3]
Years 5 to 9	−58.4	−72.0	−62.3	−49.1
	[17.3]	[14.8]	[11.7]	[15.7]
Years 10 to 14	−48.7	−64.1	−46.9	−61.0
	[21.1]	[19.3]	[15.3]	[18.6]
R^2	0.78	0.80	0.84	0.96
Covariates	C, U–Y	C, U–Y, S–Y, R, D·Year	C, U–Y, S–Y, R, C·Year	C, U–Y, S–Y, R, P-weights

$\Longrightarrow$ Within 10 years, CHCs reduced age-adjusted mortality rates by 2% percent in treated counties. (-18/929 and -61/3213)

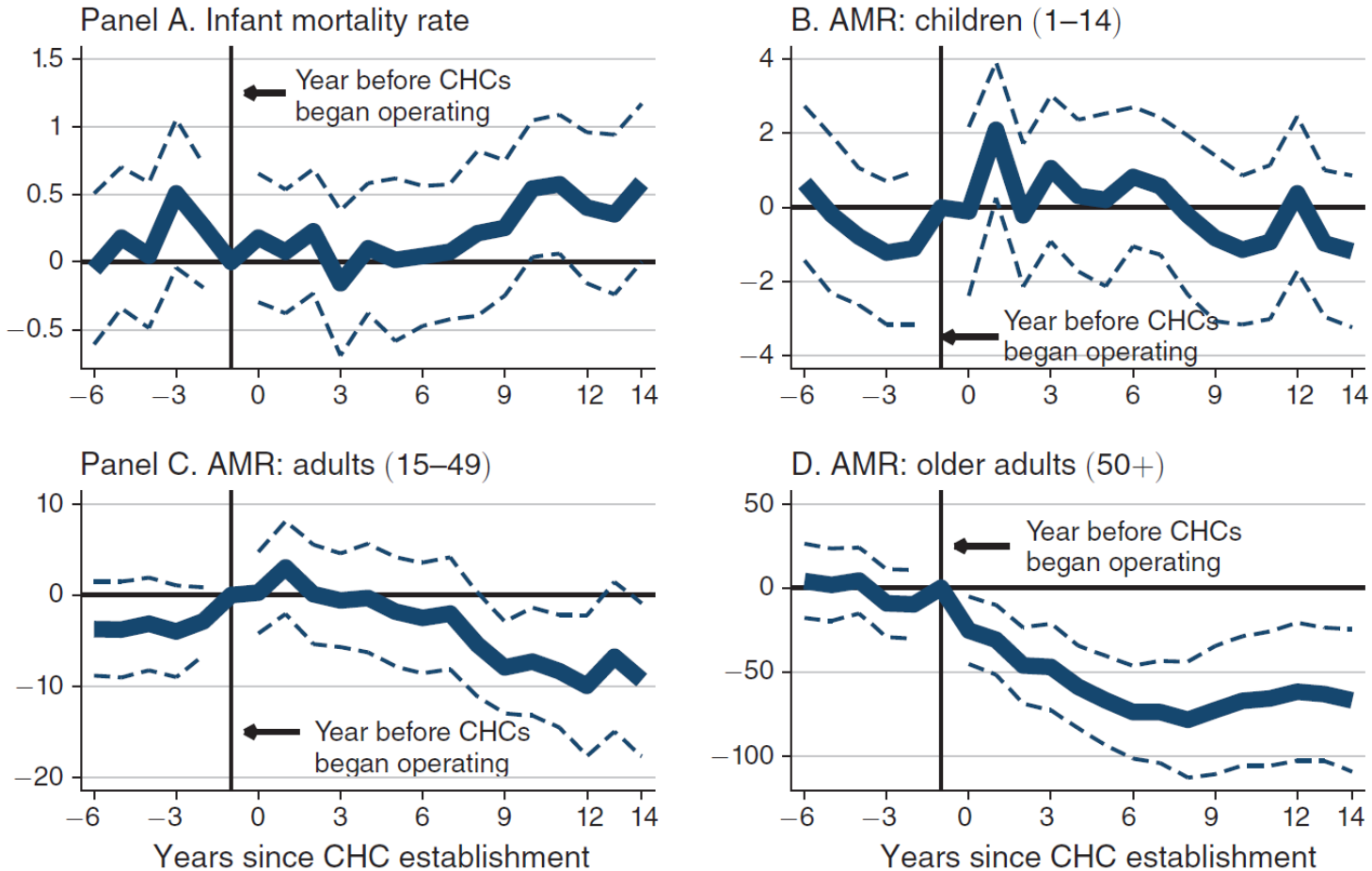
$\Longrightarrow$ Translated into ATET: 7-13% mortality rates reduction (poor 50+); 20-40% on the 1966 poor-non poor mortality gap for 50+.

Heterogeneity 1: Urban vs Non Urban



$\Longrightarrow$ Urban driven effect.

Heterogeneity 2: Age Group



$\Longrightarrow$ 50+ years old driven effect.

Heterogeneity 3: Cause of dead

DV cause:	All-cause	Heart disease (1)	Cerebrovascular disease (2)	Cancer (3)	Infectious disease (4)	Diabetes (5)	Accident (6)
Panel A. Age-adjusted mortality, older adults (50+)							
Mean at $t^* = -1$	3,227	1,461.1	424.4	607.4	127.2	72.3	92.6
Years −6 to −2	−2.0	3.6	2.6	−6.1	3.3	−0.9	−1.7
	[8.0]	[6.3]	[3.0]	[2.9]	[2.2]	[1.0]	[1.6]
Years 0 to 4	−41.1	−16.1	−10.1	−7.7	−1.9	−1.2	−0.8
	[9.6]	[5.8]	[3.2]	[3.3]	[1.7]	[1.0]	[1.3]
Years 5 to 9	−72.0	−26.5	−16.8	−11.2	−0.5	−1.7	−0.6
	[14.8]	[9.1]	[4.5]	[4.7]	[2.4]	[1.1]	[1.7]
Years 10 to 14	−64.1	−19.9	−12.1	−11.4	1.6	−3.2	−0.3
	[19.3]	[11.8]	[4.7]	[5.4]	[3.2]	[1.5]	[2.0]
R^2	0.80	0.80	0.77	0.25	0.31	0.20	0.33
Panel B. Age-adjusted mortality, ages 50–64							
Mean at $t^* = -1$	1,465	564.5	120.8	370.0	50.1	31.5	60.4
Years −6 to −2	−2.8	−1.4	1.5	−0.4	0.5	−0.9	−1.1
	[6.4]	[5.1]	[1.6]	[2.8]	[1.1]	[0.8]	[1.4]
Years 0 to 4	−1.4	−7.5	−3.3	−1.4	−1.8	−1.3	0.3
	[0.6]	[3.8]	[1.6]	[3.0]	[1.0]	[0.8]	[1.4]
Years 5 to 9	−3.2	−8.1	−6.3	−6.2	−2.2	−2.2	0.4
	[1.0]	[5.4]	[2.1]	[3.7]	[1.1]	[0.9]	[1.4]
Years 10 to 14	−3.5	−2.3	−5.7	−8.5	−1.7	−2.5	−0.2
	[1.3]	[6.2]	[2.3]	[4.4]	[1.7]	[1.0]	[1.4]
R^2	0.58	0.58	0.49	0.09	0.22	0.08	0.14

$\Longrightarrow$ Effects concentrated in heart-disease-related mortality.

$\Longrightarrow$ The effects of CHCs on the Medicare ineligible (50 to 64 year olds) are not completely explained by an interaction with Medicare-funded services.

Heterogeneities 4, 5 and 6

Older Adult Mortality Rates. Results are not race or regions specific.

- Larger effects at highest pre-program mortality rates and in high(!) physicians per capita areas.

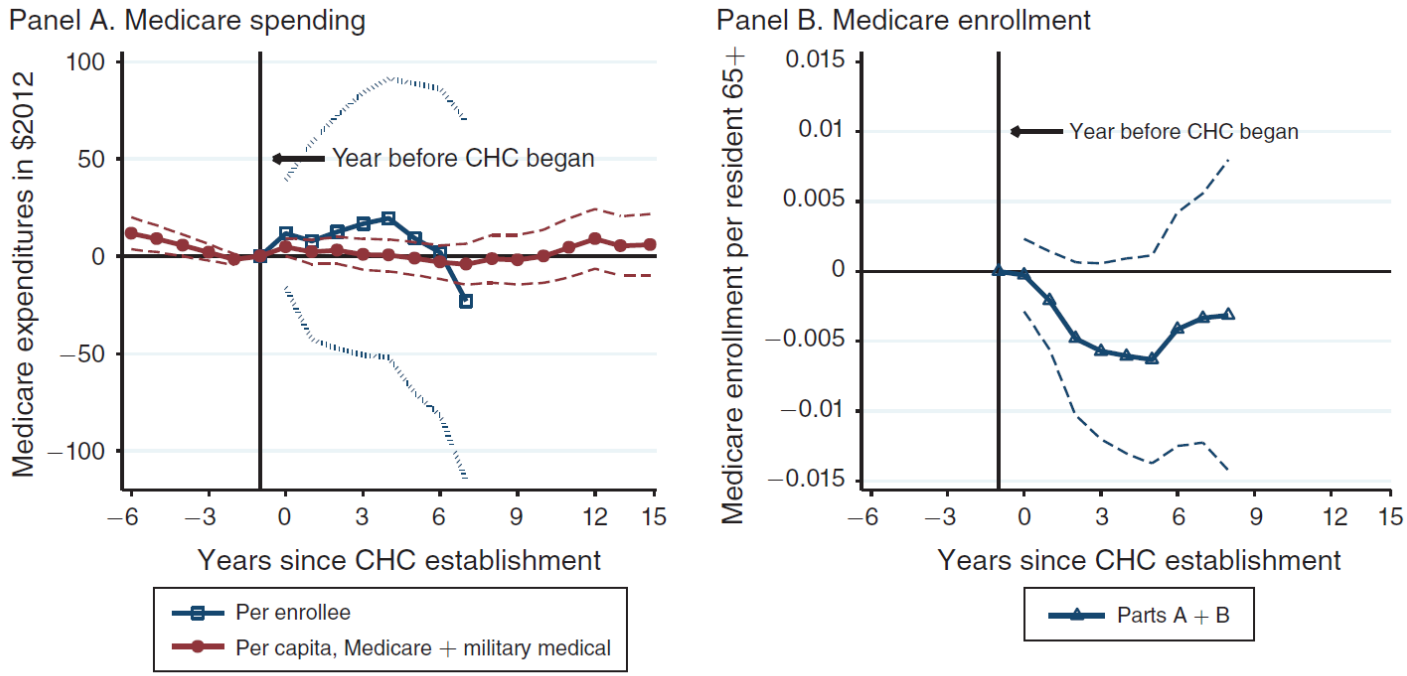
Use of Primary Care and Prescription Drugs

- Increased the likelihood of older adults in poverty reporting a regular source of care by 23%.
- Reduction of 1/3 in the likelihood of paying for prescription drugs out of pocket among older adults in poverty.

Use of Anti-Hypertensive Medications

- People aged 50 to 70 who were prescribed anti-hypertensive drugs experienced a reduction in five-year, all-cause mortality rates of 2,160 deaths per 100K (26%).

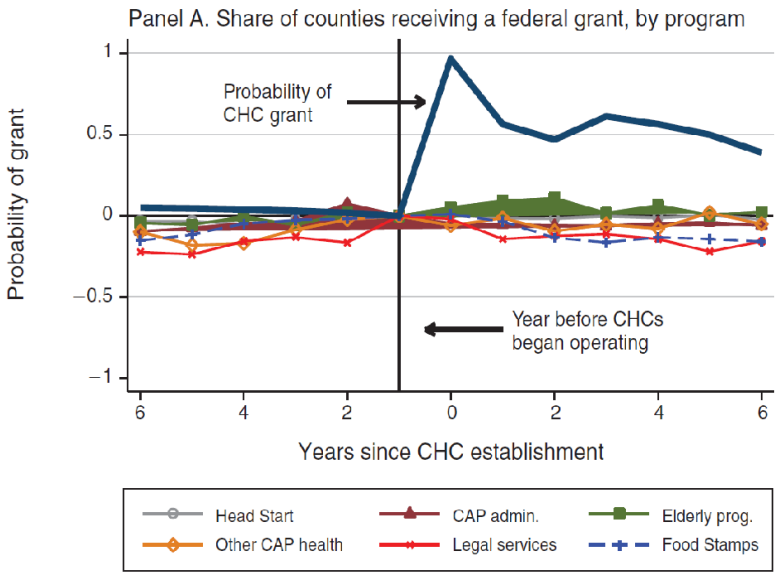
Robustness 1: Use of Medicare

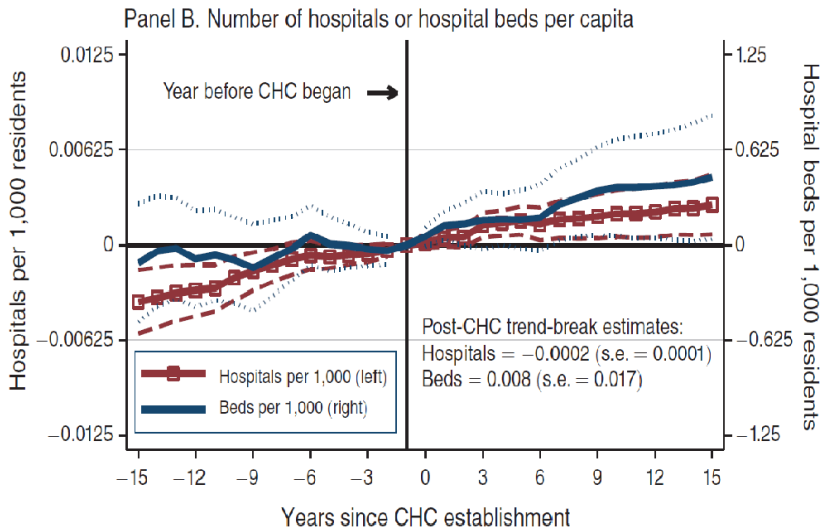


If CHCs effects operate through Medicare, this program enrolment and spending should increase.

It doesn't $\Longrightarrow$ longer-term benefits and lower-cost medication provided by CHCs should be the main mechanisms for mortality effects

Robustness 2: Other resources





$\Longrightarrow$ No evidence of local shocks in federal spending, medical resources, or state Medicaid programs compromising the research design's internal validity.

Longer-Term Returns to Primary Care

- Total cost of the CHC program over its first ten years can be recovered with the average annual federal cost of CHCs and multiplying by the 114 CHCs in the sample; $4.4 billion in 2012 dollars and a cost per year of life ratio of approximately $54,000.
- Multiplyin baseline estimates by the older adult population in treated counties during CHCs' first ten years implies 81,644 years of life gained after CHCs began.
- Medicare: Cost-per-year-of-life ratio range: $2.5 to $7.1 million in 2012 dollars. Scaling the estimates by remaining life expectancy, the cost per one extra year of life is between $161,373 and$459,000 in 2012 dollars. 3 to 8 times higher than CHCs.
- Also, Death ratios understate the broader effects of CHCs.