Work, Health, and Mortality: The Case of WLEMMAs during the Shale Boom and Bust

Joseph Marchand (University of Alberta)
Kevin Milligan (University of British Columbia and NBER)

Work in Progress - please do not cite
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WLEMMAs and economic forces

White, lower-educated males of middle age (WLEMMA)

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- Mortality; deaths of despair (Case and Deaton 2015,2017; Milligan and Schirle 2020)
- SSDI caseload (Autor and Duggan 2006; Milligan and Schirle 2019)
- Employment and labor market (Autor Dorn Hansen 2013,2016; Binder and Bound 2019)
- Health, incarceration, education (Coile and Duggan 2019)
- Marriage, family, religion, and more (Autor Dorn Hansen 2019); Kearney and Wilson 2017; Edin et al. 2019)

Question, approach, and contribution

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  - Study impact on labor market, health, and mortality.
- Contribution: Evidence can reinforce findings from 'decline' literature.
  - If booms relieve pressures on WLEMMAs, this bolsters the case for economic drivers.

Three Major Findings in brief

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   - Decrease in mortality at ages 55-64.
   - Increases in mortality 25-44.

Data sources

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- Energy Information Administration.
  - Play geology: Thickness, depth.
  - Prices: oil; gas.
- American Community Survey, 2005-2018.
  - Labor, income, and disability outcomes.
- Centers for Disease Control and Prevention: Mortality data
  - National Center for Health Statistics
  - WONDER database.

Bartik

A Bartik-like instrumental variables strategy:

Bartik

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- A measure of local labor market demand
- A fixed, regionally-varying element
- A time series element

Bartik

Local labor market demand:

Bartik

Local labor market demand:

- Average male earnings, among those working.
- Do separately by CPUMA/county.

Bartik

For fixed element we use:

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- Avg. Depth of the play
- Initial share of employment in oil-gas extraction.

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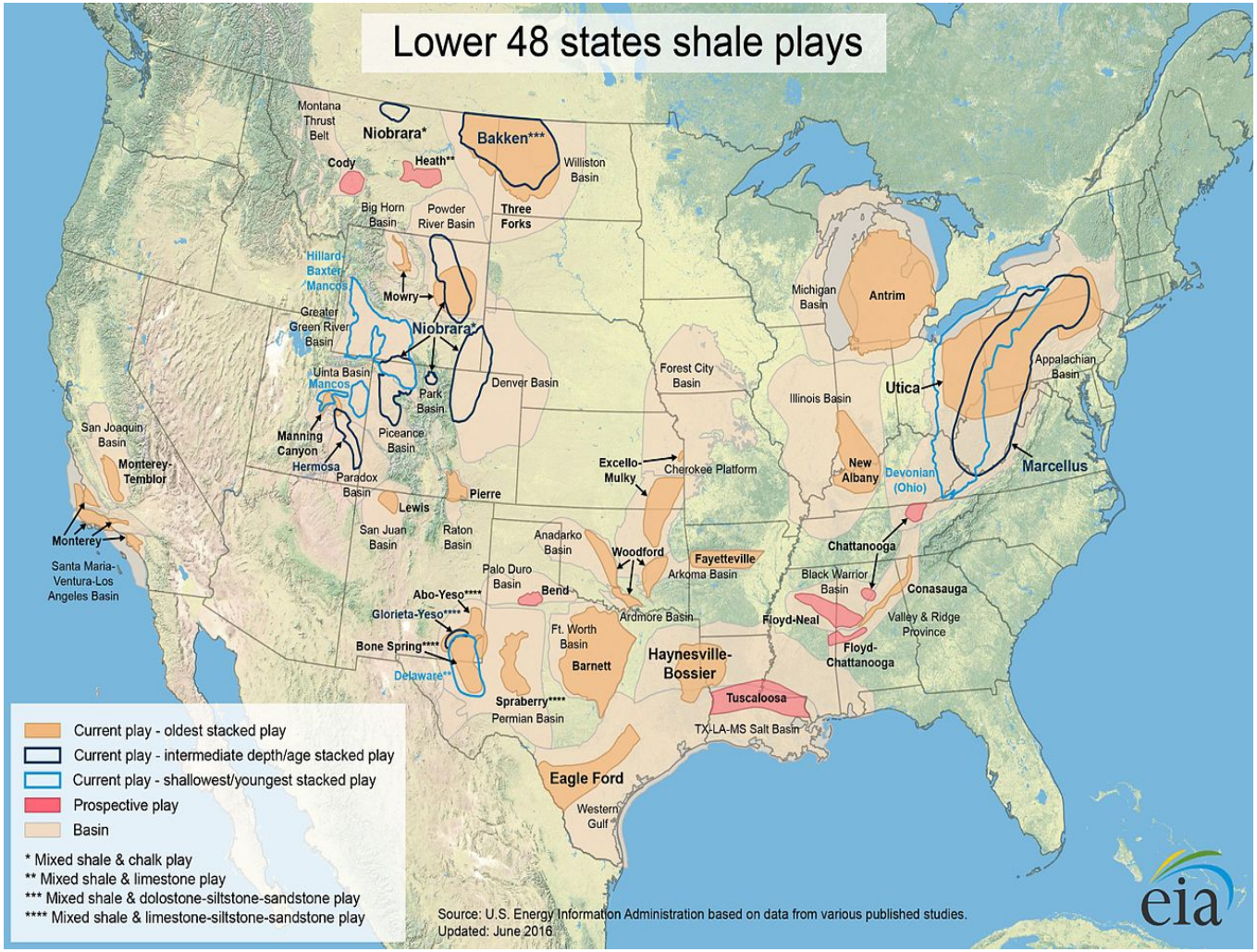
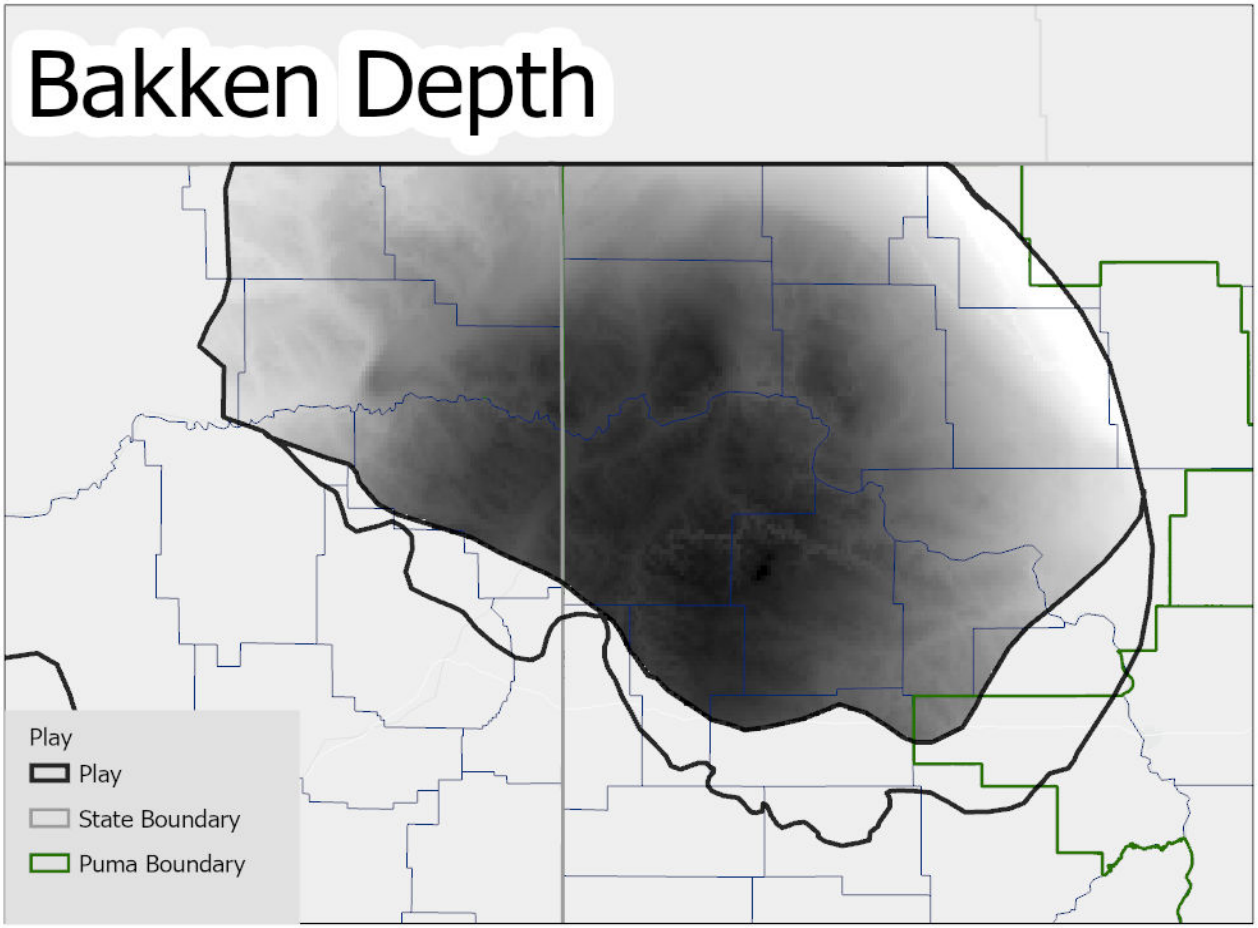
- Avg. Depth of the play
- Initial share of employment in oil-gas extraction.
- Can also use:
  - Surface area coverage
  - Thickness of play
  - Prospectivity index

North American Shale Plays



Depth: Bakken, ND/MT



Bartik

For time series element we use:

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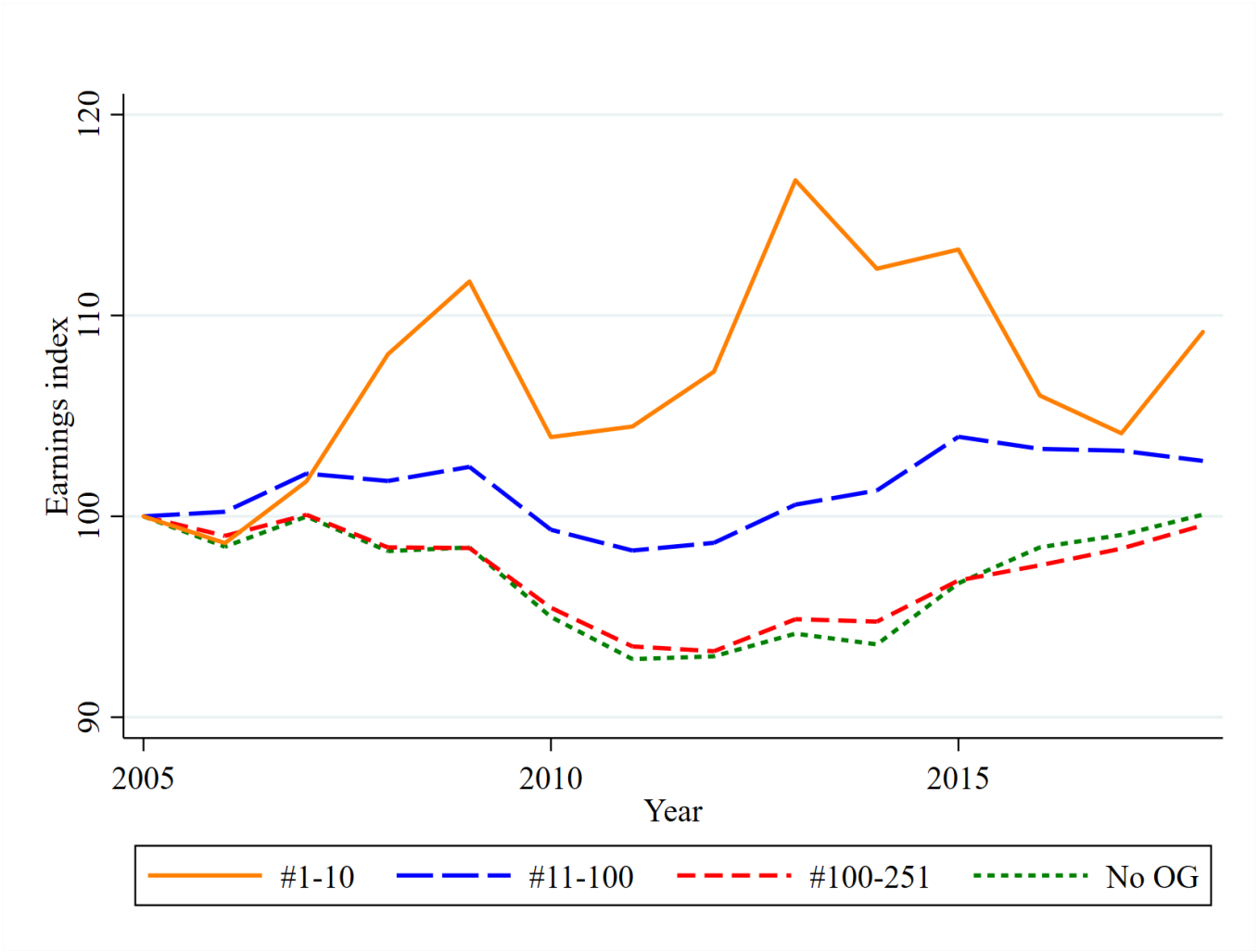
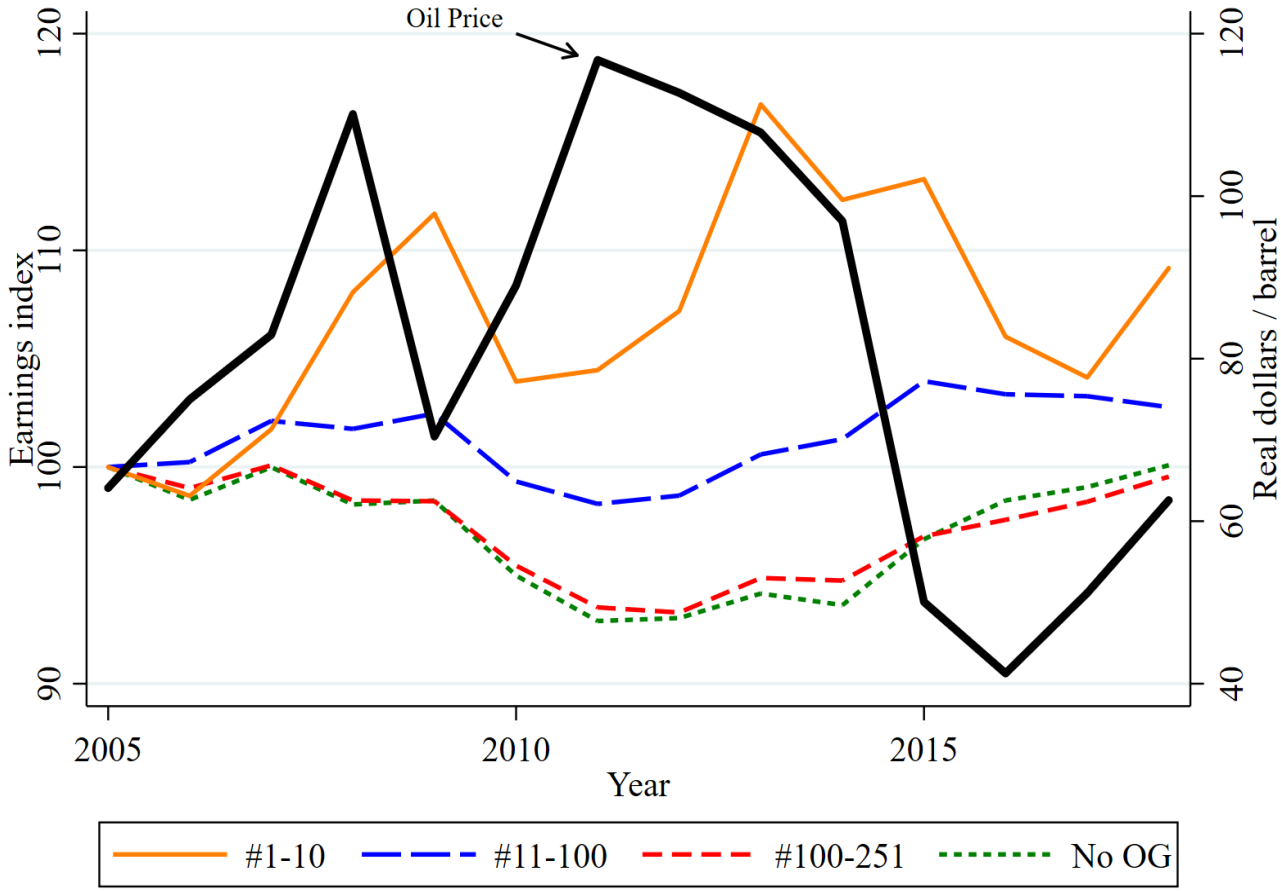
For time series element we use:

- Energy prices: WTI oil price.

Top Energy CPUMAs



Top Energy CPUMAs



Bartik

Putting it all together:

$$ln(Earnings)_{ct} = \beta_0 + \beta_k \cdot Resource_c \times Timing_t + \beta_2 \cdot X_{ct} + \alpha_c + \gamma_t + e_{ct}.$$

First stage

Table 3: First Stage

	Dependent variable: log local earnings					
	(1)	(2)	(3)	(4)	(5)	(6)
OilGasShare X lag oil price	1.286***	1.260***	1.065***	1.079***		1.009***
	[0.114]	[0.122]	[0.156]	[0.155]		[0.177]
Thickness X lag oil price		0.492		-0.558		
		[0.688]		[0.631]		
Depth X lag oil price			-0.367***	-0.394***		-0.297**
			[0.114]	[0.125]		[0.126]
OilGasShare X OilGasEarnings					0.022**	0.016**
					[0.010]	[0.007]
Depth X OilGasEarnings					-0.273***	-0.236***
					[0.064]	[0.063]
R-squared	0.9532	0.9532	0.9532	0.9532	0.9530	0.9534
F-test	127.0	60.5	46.3	32.2	22.9	41.0

Note: First stage regressions on individual data (2,820,954 observations) from the ACS, 2006-2018. Regressions include controls for race, Hispanic status, education, fixed effects for year, age, and CPUMA. Instruments organized at the CPUMA level. Reported coefficients are scaled; standard errors are clustered at the CPUMA level.

Labor market outcomes

$$Outcome_{cti} = \theta_0 + \theta_1 \cdot ln(Earnings)_{ct} + \theta_2 \cdot X_{cti} + \pi_c + \delta_t + \mu_{cti}$$

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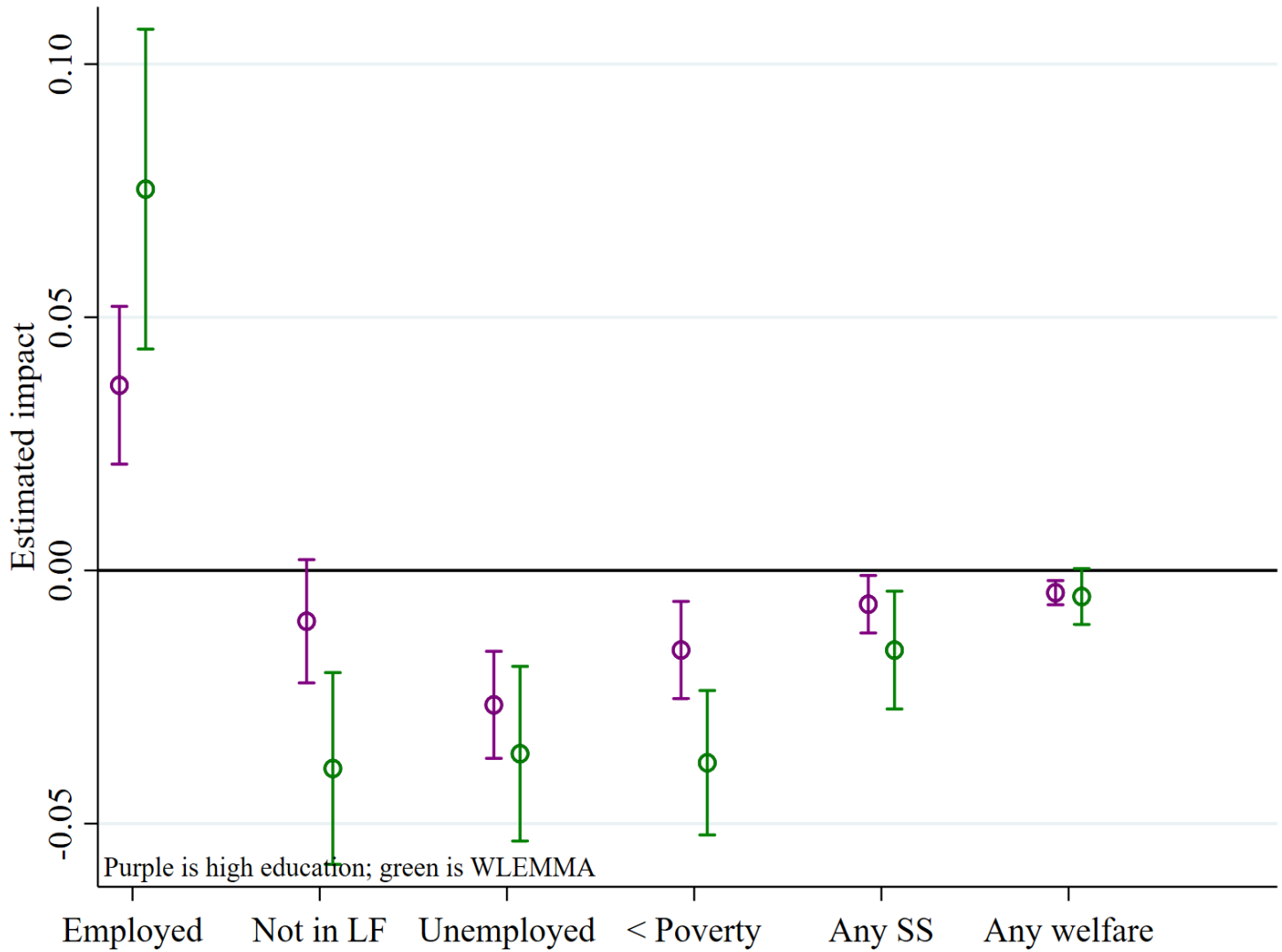
- Key coefficient is θ_1 on log of local earnings.
- To present results, we show impact of a 10% change in local earnings.
- Regressions use individual-level data.

Labor market outcomes



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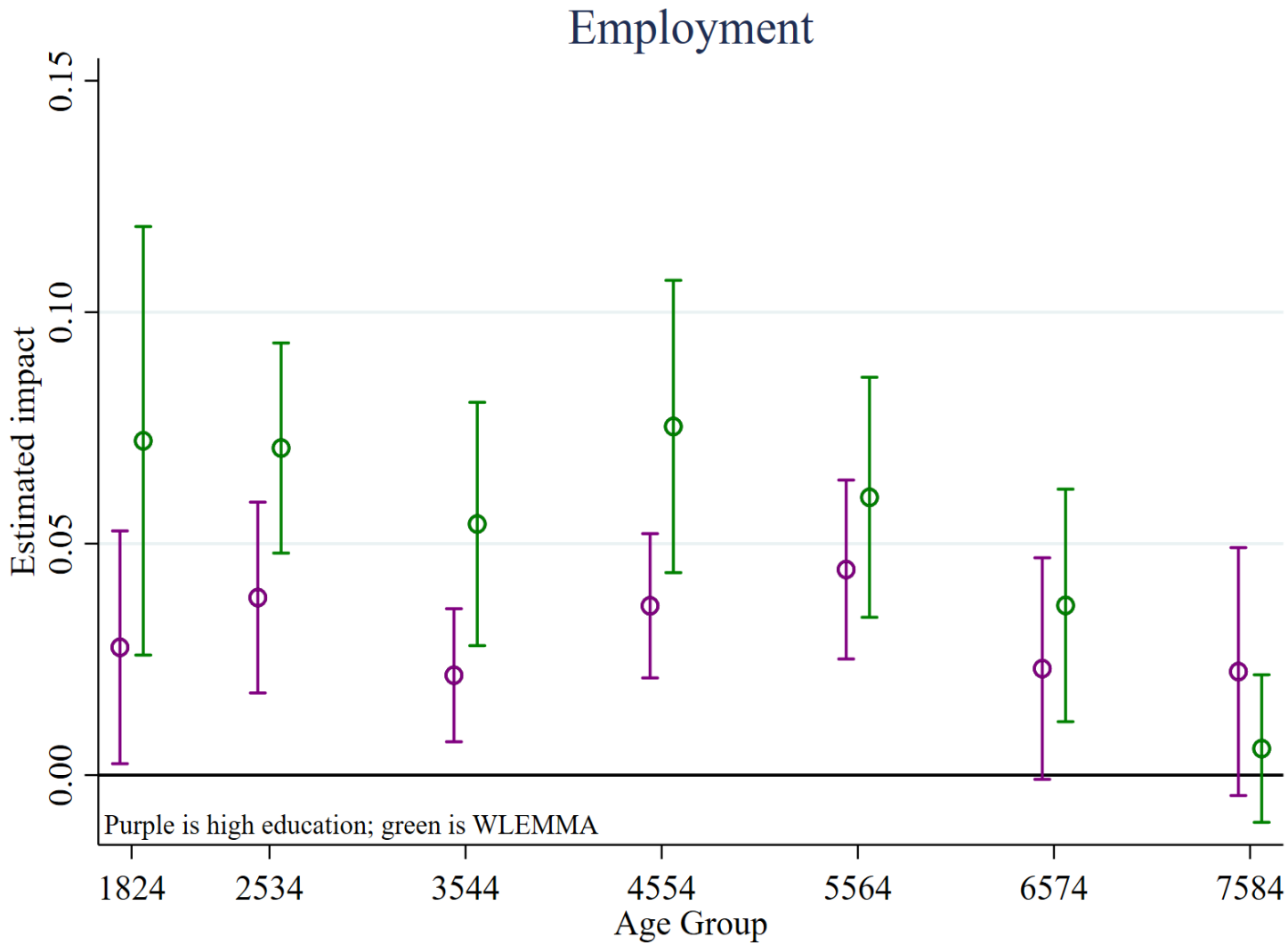
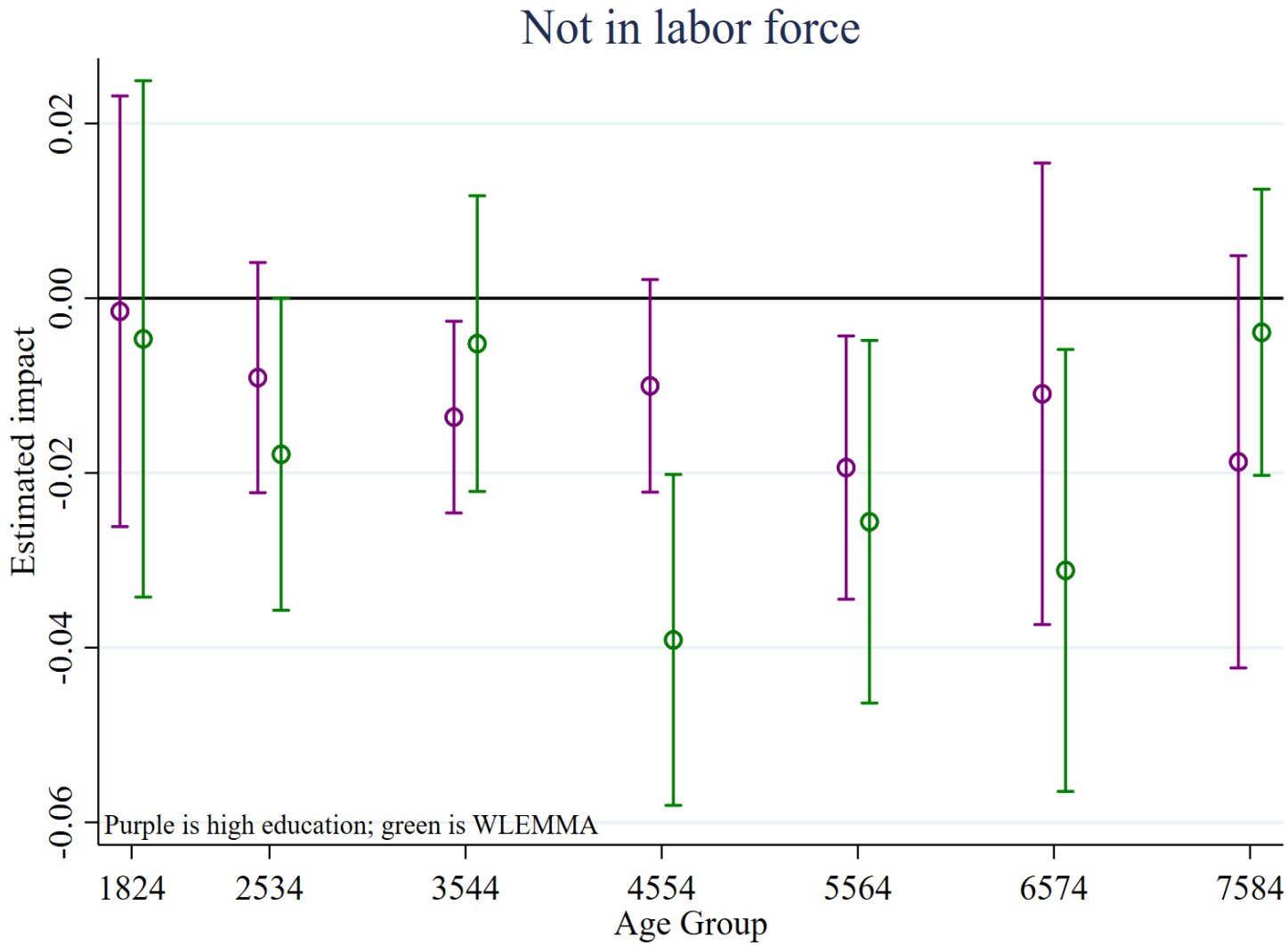


Labor market outcomes



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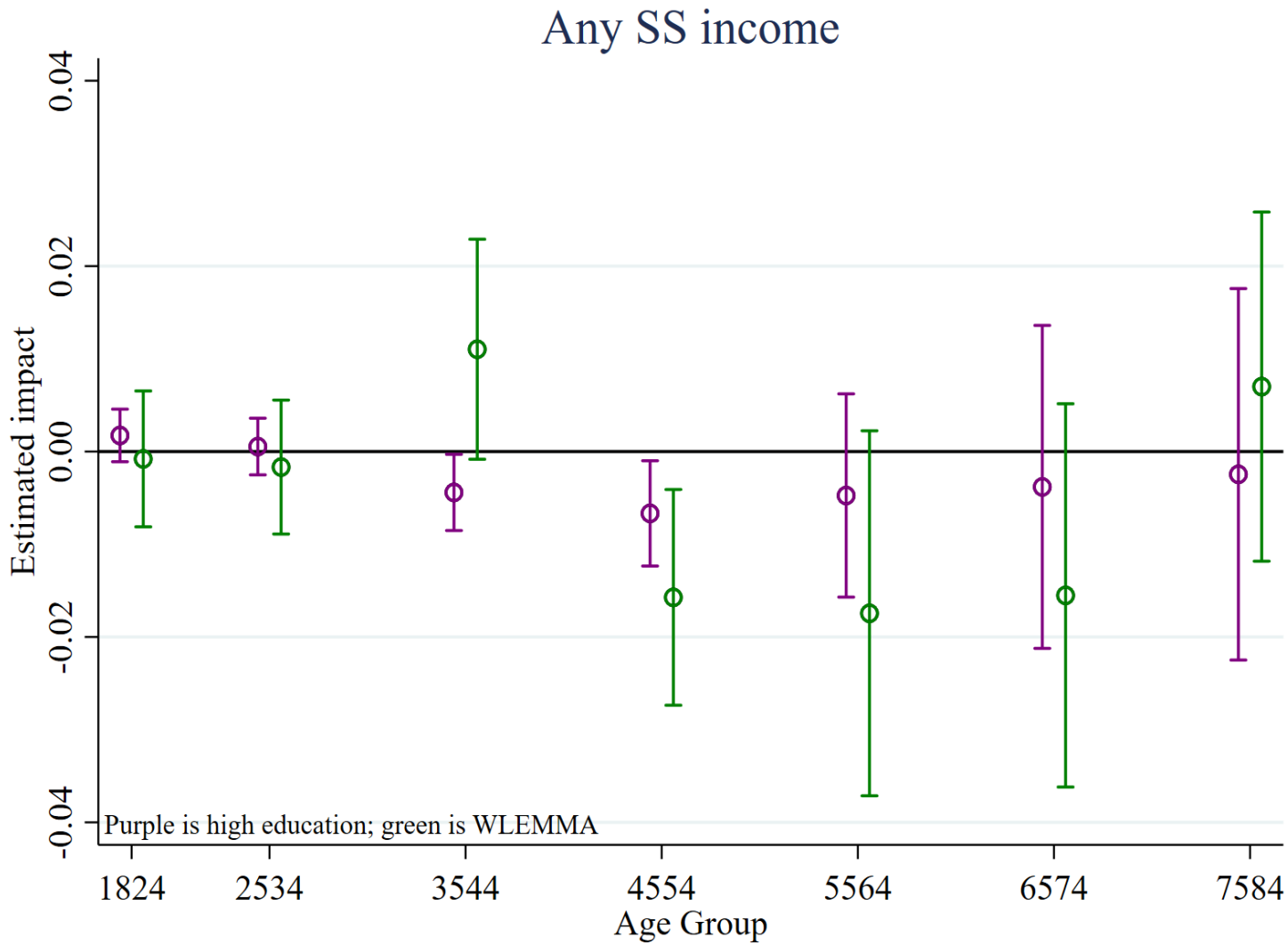


Health difficulties

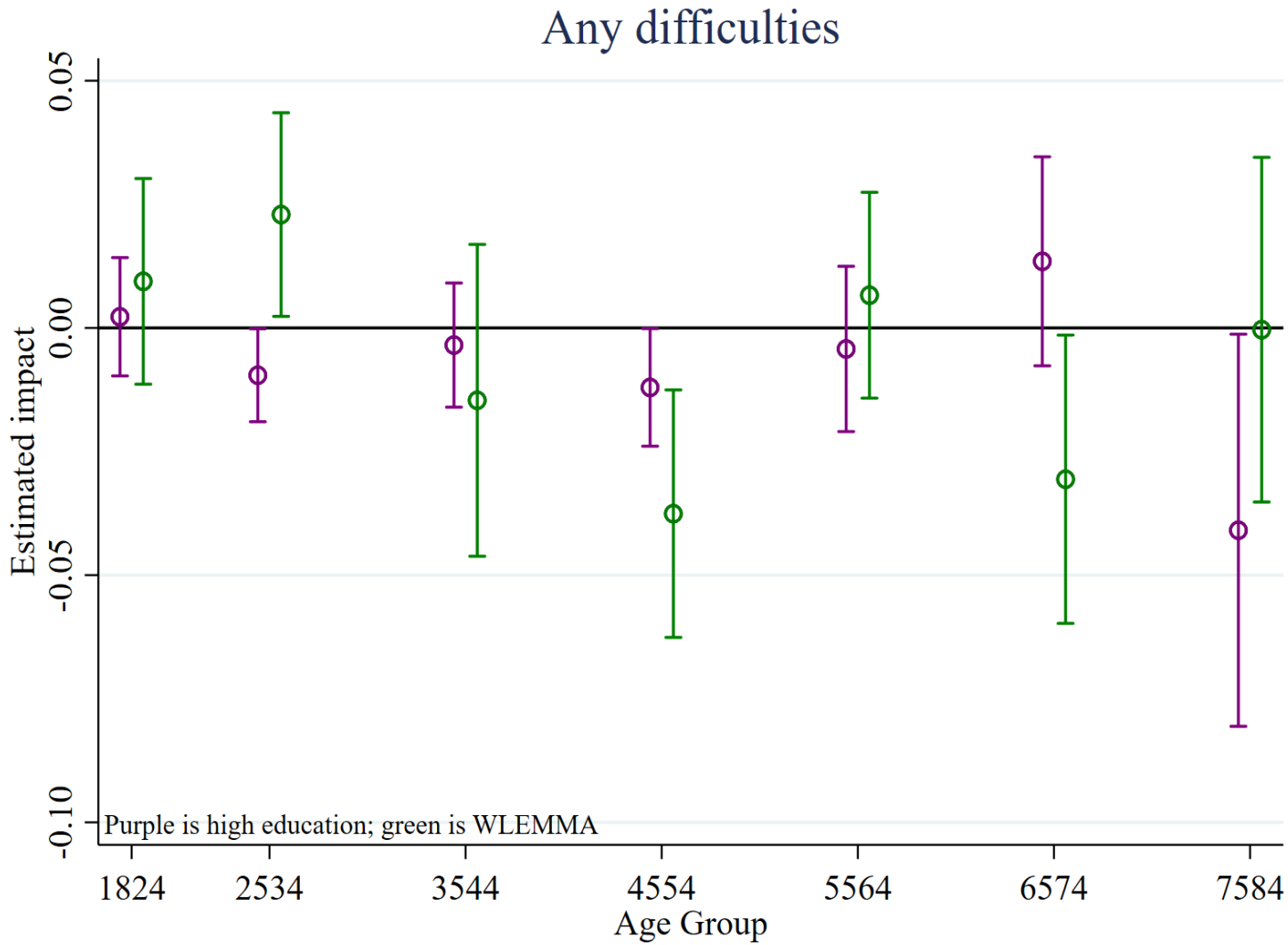
ACS reports whether respondent had "difficulties" with various aspects of life:

Health difficulties

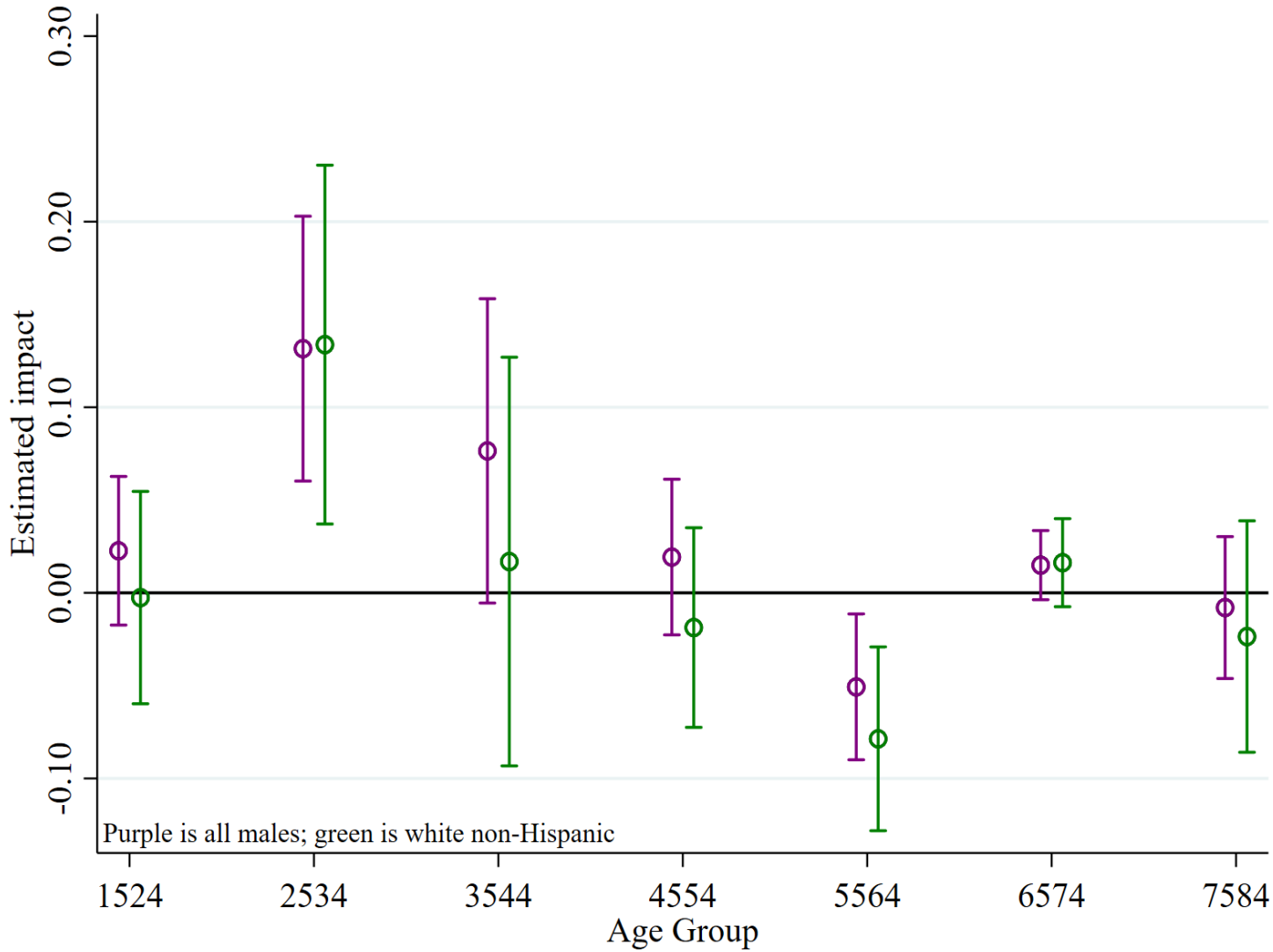
ACS reports whether respondent had "difficulties" with various aspects of life:

- Cognitive
- Ambulatory
- Independent living
- Self care
- Hearing or vision

Health difficulties



Mortality


Estimated impact
0.30
0.20
0.10
0.00
-0.10
Purple is all males; green is white non-Hispanic
1524
2534
3544
4554
5564
6574
7584
Age Group

Deaths of Despair and Accidents

The WONDER data allows us to see precise cause of death.

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Deaths of Despair:

- Poisoning: accidental and intent undetermined drug overdose and alcohol poisoning.
- Suicide
- Alcoholic Liver Disease and Cirrhosis

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Deaths of Despair:

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- Suicide
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Accidents:

- All accidents.
- less the 'accidental' alcohol and drugs included as 'despair'

Mortality

Table 8: Impact on mortality

Dependent variable: log mortality							
Age groups	15-24	25-34	35-44	45-54	55-64	65-74	75-84
	3yr groups: White Non-Hispanic						
Observations	3,822	5,006	6,559	9,636	11,148	11,667	10,661
Pop coverage	86.4%	91.7%	94.5%	98.5%	99.5%	99.7%	99.8%
10% local	0.030	0.137***	0.082	-0.005	-0.064***	0.016	-0.019
earnings change	[0.030]	[0.049]	[0.063]	[0.023]	[0.022]	[0.022]	[0.019]
	3yr groups: White Non-Hispanic despair deaths						
Observations	1,614	2,669	3,055	4,291	4,177	2,636	1,513
Pop coverage	69.7%	82.1%	83.2%	87.9%	86.9%	77.1%	65.6%
10% local	0.089	0.189*	-0.018	0.013	-0.121***	0.015	-0.208
earnings change	[0.074]	[0.099]	[0.114]	[0.051]	[0.046]	[0.034]	[0.372]
	3yr groups: White Non-Hispanic accident deaths						
Observations	1,324	1,246	1,209	2,011	2,224	2,299	3,198
Pop coverage	64.1%	65.7%	64.2%	73.6%	74.7%	73.4%	80.3%
10% local	0.010	-0.087	-0.102	-0.111	-0.031	-0.001	0.069
earnings change	[0.073]	[0.076]	[0.174]	[0.130]	[0.045]	[0.053]	[0.066]

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