



IMPACT OF INCOME SHOCK FROM THE 2008 GREAT RECESSION ON LIFE EXPECTANCY

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INTRODUCTION

- Examine the effect of the income shock from Great Recession on life expectancy
- Originally thought correlation would plateau (Reurell, 2016)
- Future wellbeing + inform/reshape healthcare infrastructure
- Bridge lack of understanding



ABOUT OUR PAPER

- Sampled panel data (2001 - 2018)
- Main + control variables + dependent
 - 2 Groups: Financial sector is of state GDP
 - C: healthcare expenditure per capita, ratio of white people, # available jobs
 - Main: average income per capita per state
 - Dependent: average life expectancy
- IV Diff-in-Diff Approach
 - Comparison between treated and control states
- State fixed effects + year fixed effects in place

BACKGROUND

2008 Great Recession

Housing Bubble

Rapid expansion + rise of prices in housing market

Borrowing

"Subprime" mortgages + high-risk ones offered

Bankruptcy + Other Factors

More pressure on financial market, GDP fell and unemployment rate (Weinberg, 2013)

AND THE AFTERMATH?

LIT REVIEW

Christopher Ruhm (2000)	Relationship btwn. economic conditions and health	<ul style="list-style-type: none">• Inverse relationship
Finkelstein and Notowidigdo (2024)	Built off of Ruhm's analysis to also explain above relationship	<ul style="list-style-type: none">• Incorporate existing estimates of "value of statistical life"• Health benefits are strongest for weakest group• Substantially reduced mortality
Chetty & Stepner (2016)	Four Key Results	<ul style="list-style-type: none">• Higher income = greater longevity through income distribution• Increases in life expectancy for top and bottom % of men + women• Varies across areas• Correlated w/ health behaviors

SO... WHY ARE WE DIFFERENT?

DATA

US Census Bureau

Racial
Composition &
Gender Ratio
(control variables)

US Mortality
Database

Average Life
Expectancy per
State (dependent
variable)

Bureau of
Economic Analysis

Average income (main
variable of interest),
healthcare expenditure
+ available jobs
(control)

DATA PT 2 - SUMMARY STATISTICS

Table 1

	Treated		Control	
	mean	sd	mean	sd
income_capita	42329.25	8696.82	37798.20	8094.80
ex	946.05	15.58	926.03	19.84
finance_pct	22.63	5.11	16.11	2.12
health_capita	7207.33	1867.19	6787.88	1608.76
white_ratio	80.28	13.70	81.62	9.68
jobs	4217068.49	4425009.93	2858020.12	2989927.05
N	468		432	

EMPIRICAL MODEL

$$\text{SI: } Income_{st} = \beta_0 + \beta_1 Treat_s + \beta_2 Post_t + \beta_3 (Treat_s * Post_t) + X'_{st} + \varepsilon_{st}$$

$$\text{SII: } ex_{st} = \beta_0 + \beta_1 \widehat{Income}_{st} + \beta_2 Treat_s + \beta_3 Post_t + X'_{st} + \eta_{st}$$

$$\text{DiD: } ex_{st} = \beta_0 + \beta_1 Treat_s + \beta_2 Post_t + \beta_3 (Treat_s * Post_t) + X'_{st} + \mu_{st}$$

OVERVIEW OF FIGURE RESULTS



FIGURE 1, 2, 3



Roughly parallel before and after 2008, but in some states, life expectancy increased



FIGURE 4



Roughly parallel, even after 2008



FIGURE 5



Treated states experienced a four-month greater increase

FIGURE 1

Mean Life Expectancy of Treated and Control States Across the Years (2000 - 2018)

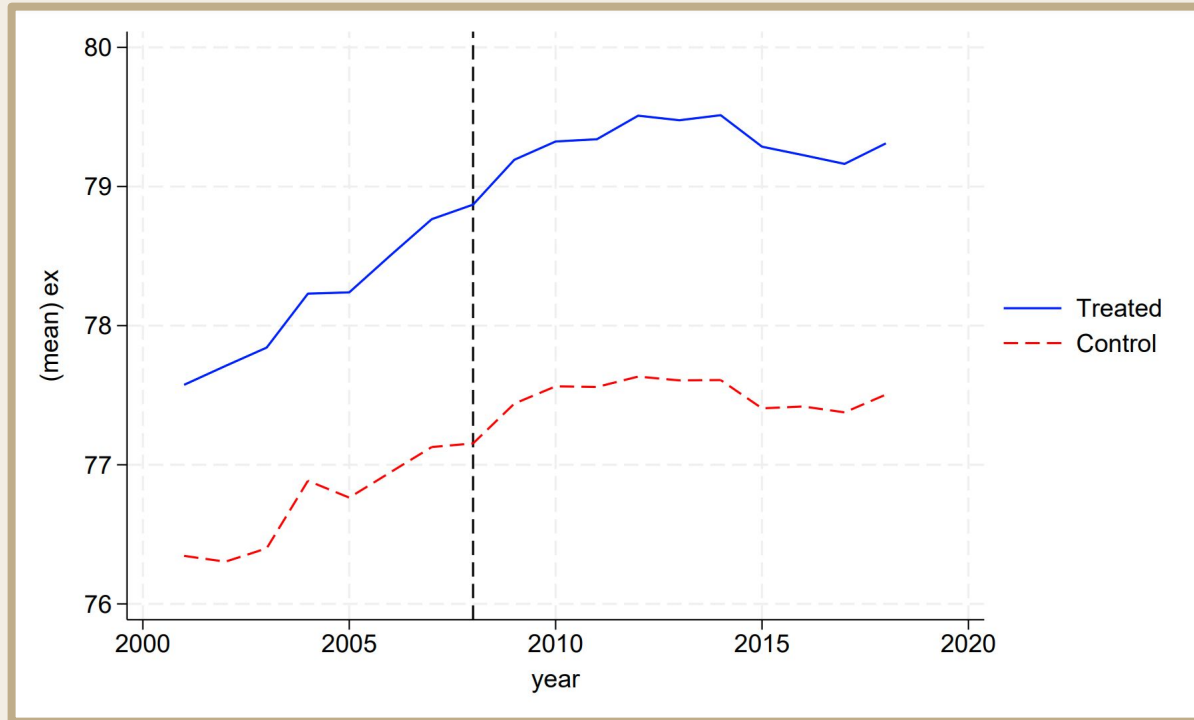
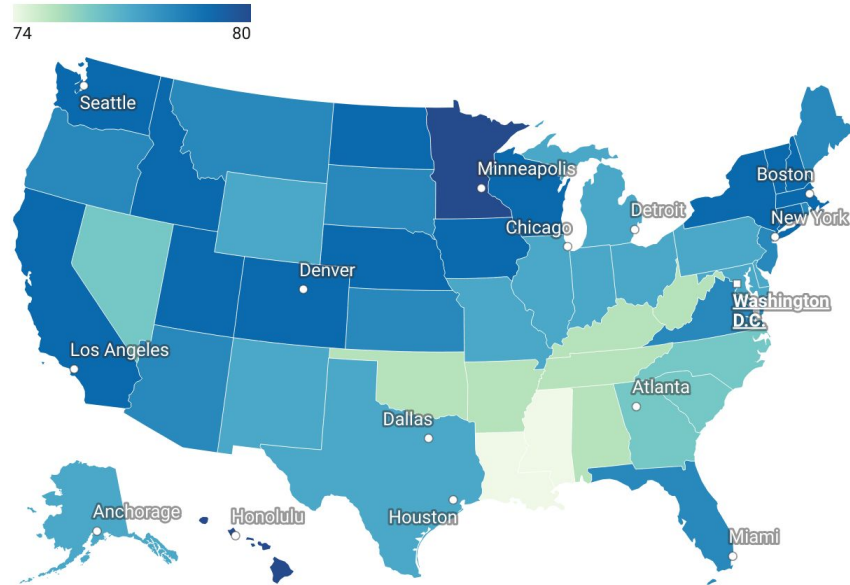


FIGURE 2 & 3

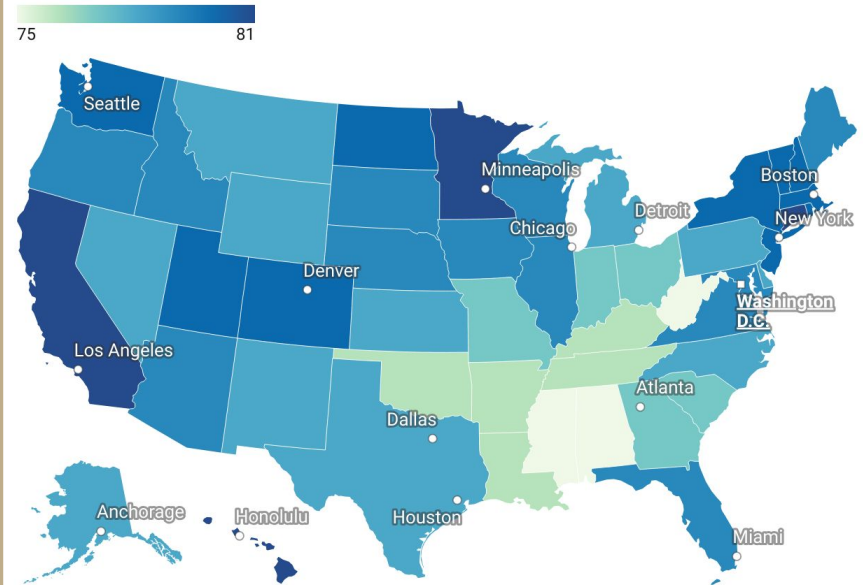
Visual Map of Mean Life Expectancy per State Before & After 2008

[Mean Life Expectancy per State before 2008]



Created with Datawrapper

Mean Life Expectancy per State after 2008



Created with Datawrapper

OVERVIEW OF FIGURE RESULTS



FIGURE 1, 2, 3



Roughly parallel before and after 2008, but in some states, life expectancy increased



FIGURE 4



Roughly parallel, even after 2008



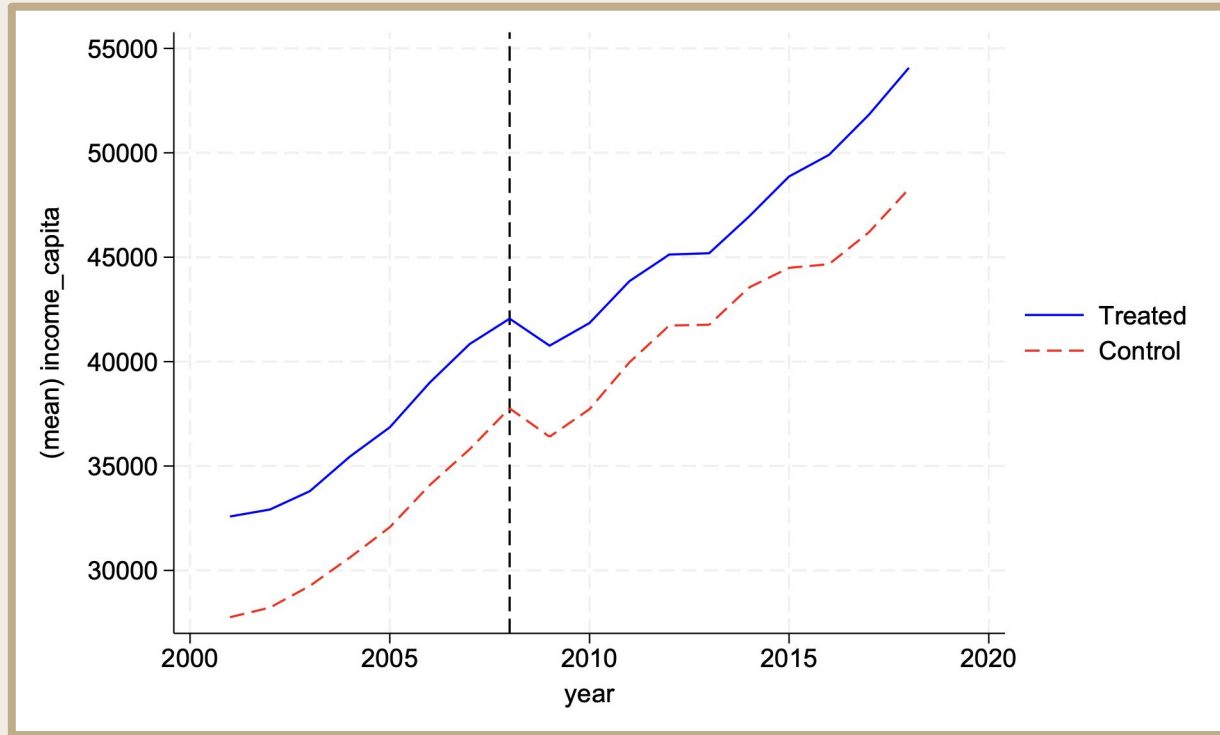
FIGURE 5



Treated states experienced a four-month greater increase

FIGURE 4

Mean Income Per Capita for Treated and Control States Across the Years (2000 - 2018)



OVERVIEW OF FIGURE RESULTS



FIGURE 1, 2, 3



Roughly parallel before and after 2008, but in some states, life expectancy increased



FIGURE 4



Roughly parallel, even after 2008



FIGURE 5



Positive trends between income and life expectancy

FIGURE 5

Mean Life Expectancy and Mean Income Per Capita for Treated and Control States

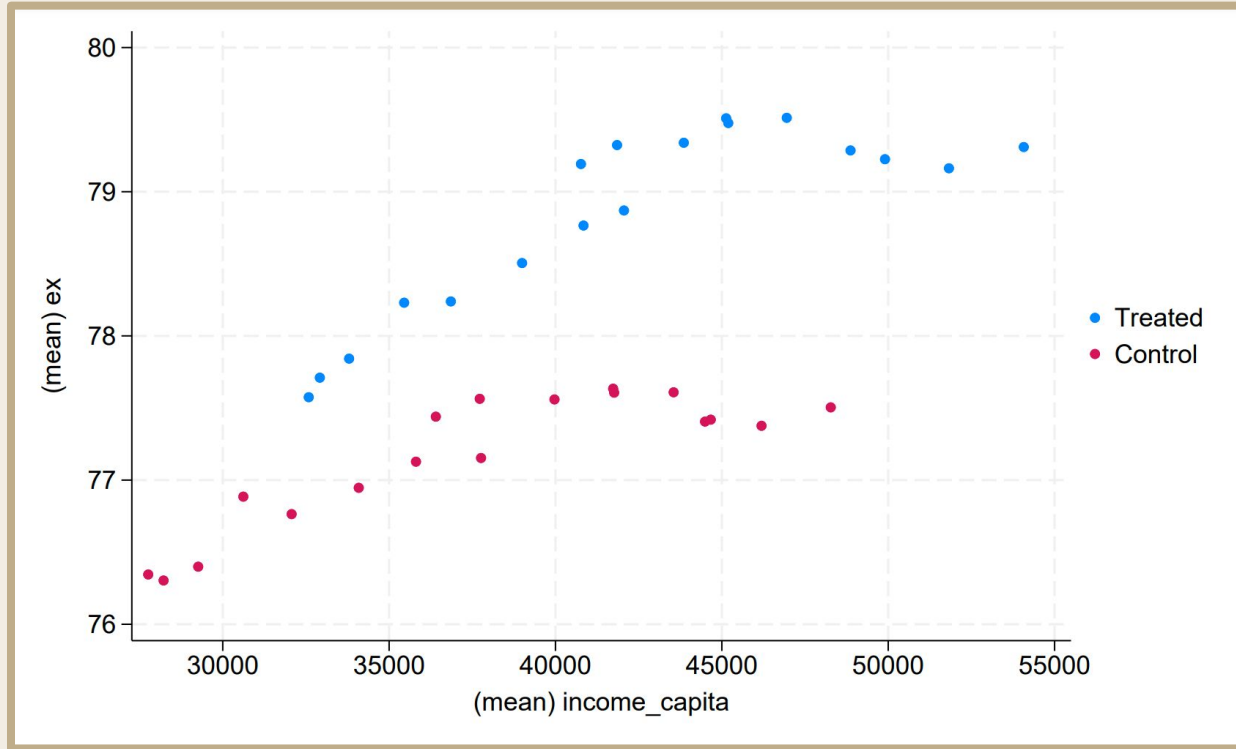


TABLE 1

First-Stage Regression

	Income	p	t	ci95
treat	6543.729	0.000	13.810	5613.637,7473 .821
post	21251.989	0.000	45.579	20336.789,221 67.189
Treat x Post	-444.556	0.069	-1.820	-923.868,34.7 56
Constant	23333.163	0.000	43.462	22279.403,243 86.924
Observations	900			

First-stage regression summary statistics

Variable	R-sq.	Adjusted R-sq.	Partial R-sq.	Robust F(1,832)	Prob > F
income_cap~a	0.9639	0.9610	0.0043	3.31419	0.0690

TABLE 2

Second Stage Regression

	Ex	p	t	ci95
Income_Capita	-0.010	0.066	-1.840	-0.021,0.001
Constant	1121.898	0.000	8.762	870.948,1372.847
Observations	900			

TABLE 3

Difference-in-Difference Model

	ex	p	t	ci95
did	4.061	0.002	3.246	1.547,6.576
health_capita	-0.000	0.697	-0.391	-0.002,0.002
white_ratio	-0.369	0.465	-0.736	-1.377,0.639
jobs	0.000	0.000	4.292	0.000,0.000
Constant	944.524	0.000	21.850	857.656,1031.393
Observations	900			

SUBGROUP TEST DIFFERENCE-IN-DIFFERENCES

But for each region

- Midwest: DiD estimate: 1.71, p-value, 0.295 = positive but statistically insig. Effect
 - High degree of uncertainty around estimate
- Northeast: DiD: 4.44, $p < 0.001$, tight confidence interval = substantial improvements in life expectancy to control states
- South & West similar patterns to NE

	West Life expectancy	South Life expectancy	Northeast Life expectancy	Midwest Life expectancy
did	6.648* (2.50)	5.407** (3.16)	4.443*** (6.47)	1.707 (1.10)
health capita	-0.00299 (-1.23)	0.00158 (1.02)	-0.00161 (-1.63)	-0.000644 (-0.58)
white_ratio	-0.796 (-0.48)	-0.217 (-0.75)	-3.177* (-3.33)	0.592 (0.41)
jobs	0.00000188* (2.38)	0.00000229*** (4.70)	0.00000819*** (8.69)	0.00000298 (0.43)
Constant	972.1*** (7.28)	937.5*** (37.83)	1194.8*** (14.70)	871.2*** (6.06)
Observations	288	234	162	216

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

HETEROGENEITY MODEL

For High Income and Low Income States

- Split into high and low income states
 - High: DiD = 4.12, p-value = 0.014 → statistically and economically significant increase in life expectancy
 - Low: weaker and statistically insig.
 - Concentrated in wealthier states → why?

	High Income Life Expectancy	Low Income Life Expectancy
did	4.124* (2.66)	1.554 (0.96)
health capita	-0.000931 (-0.78)	-0.00353 (-1.85)
white_ratio	-0.157 (-0.52)	-0.824 (-0.86)
jobs	0.00000274** (2.97)	0.00000455*** (4.34)
Constant	939.8*** (33.38)	985.3*** (12.47)
Observations	450	450
t statistics in parentheses * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

PLACEBO TEST FOR 2005

	ex	p	t	ci95
did_placebo	1.558	0.010	2.678	0.389,2.726
health_capita	0.002	0.114	1.609	-0.001,0.005
white_ratio	-1.298	0.117	-1.596	-2.933,0.336
jobs	0.000	0.043	2.073	0.000,0.000
Constant	1014.961	0.000	14.014	869.416,1160.506
Observations	350			

- False treatment year
 - DiD = 1.56, p-value of 0.010, indicates that pretreatment differences may exist

CONCLUSION

- Equal amount of impact on treated + control
 - Broad and systemic
- Increase may be because:
 - Air pollution
 - Federal stimulus + social safety nets (Weinberg, 2013)
- Policy response:
 - Public health infrastructure and environmental regulation prioritized
 - Expanding social safety nets
 - Targeted support for low-income

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