

Older Adult Health Spending Before and After Mortgage Payoff

Christopher Herbert, Jennifer Molinsky, Samara Scheckler, Kacie Dragan

Presenter: Samara Scheckler

Disclaimer

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Housing Cost Burden

Defined as spending 30 percent or more of income on housing-related costs.

- Housing costs comprise the largest proportion of a household budget (Pew 2016)
 - Nearly 10 million older adult households experienced housing cost burdens in 2017 (JCHS 2019)
- Carrying a mortgage increases the likelihood of older adult housing cost burden
 - In 2017, 40 percent of homeowners 62 or older experienced housing cost burden as opposed to just 16 percent without a mortgage (JCHS 2018)

Trends in Late Life Housing Costs

Older American households are carrying more mortgage debt (JCHS 2018)

- The share of homeowners aged 62 and older with mortgage debt doubled over 25 years
- Their amount of debt relative to home value tripled over this period to 39 percent

Older households with a mortgage have higher housing cost (JCHS 2019)

- In 2017 households aged 65 and older with a mortgage paid \$1,310 in average monthly housing costs as compared with \$458 paid by homeowners without a mortgage

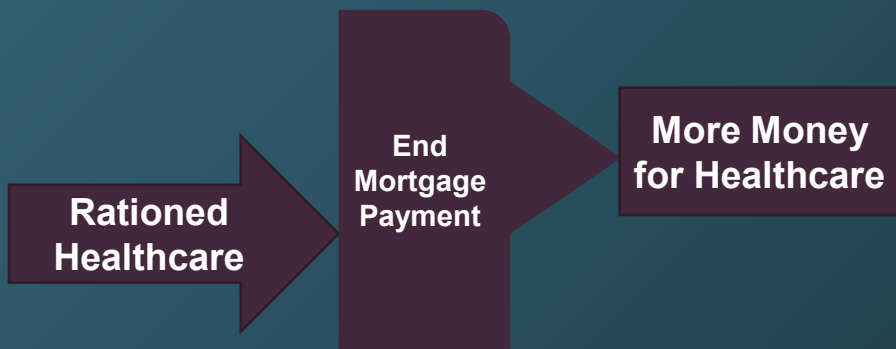
High mortgage debt is associated with financial insecurity for older adults (Hermann, Herbert & Molinsky, 2020)

Housing Cost Burden and Older Adult Health Care Rationing

- With limited income, households make tradeoffs between payments for housing and healthcare
 - Health shocks delay mortgage payoff (Zhang 2019)
- Rationing of all non-housing expenses is associated with housing cost burden
 - Moderately housing cost-burdened households spend almost 20 percent less on expenses such as food and healthcare than households with similar income but affordable housing (JCHS 2020)
 - About half of medication nonfulfillment or nonadherence is related to cost (McHorney & Spain 2011)
- Health care rationing reduces health
 - Cost-related medication nonadherence (CRN) increases health risks (Heisler et al. 2004)
 - CRN was associated with a 15 to 22% increase in all-cause mortality (Van Alsten & Harris 2020)
 - Health care rationing has also been associated with nursing home admission, especially among Medicaid recipients (Morales & Robert 2020; Crossley 2018; Rosenbaum 2016)

Research Question

Will out-of-pocket health spending change for some households when a mortgage ends, and housing costs go down?





Analysis: Model

Data

Health and Retirement Study

- Panel study with surveyed every 2 years
- Respondents 50 and older and their partners
- 20,000 respondents per wave
- New birth cohorts added every three years
- Survey years ranged from 1992 to 2016



Model: Difference in Differences

$$y_{it} = \alpha + \beta_1 Treated_i + \beta_2 Wave_t + \beta_3 (Treated_i * Wave_t) + \beta_4 X_{it} + \beta_5 CalYear_t + \epsilon_{it}$$

Treatment

Using the mortgage payment variable for the primary residence: *About how much are the payments on the mortgage or land contract?*

Operationalizing the End of Mortgage Payment Period

Wave 1	Wave 2	Wave 3	Wave 4
<i>Treatment</i>			
Mortgage	Mortgage	No Mortgage	No Mortgage
<i>Control</i>			
Mortgage	Mortgage	Mortgage	Mortgage
No Mortgage	No Mortgage	No Mortgage	No Mortgage

Inclusion Criteria

All HRS households 1996-2016

Included in Treatment

- Homeowners with a mortgage payment for two waves then no payment for two waves
 - Two types of households systematically cannot meet this 4-wave criteria because they did not remain intact through the treatment period
 - Households that split or combined due to divorce or new marriage
 - Households that dropped out of the data due to death

Excluded from Treatment

- Households that moved in payoff wave or wave prior

Included in Control

- Homeowners who were never included in the treatment group and had either
 - Four consecutive waves of mortgage payment, or
 - Four consecutive waves without a mortgage payment
- If more than four waves met criteria, four waves were included at random

Operationalizing Health Spending: Out-of-Pocket Pharmaceuticals

Prescription medication represents a large proportion of OOP spending

- OOP costs drives growth in pharmaceutical spending (Martin, et al. 2021)
- Prescription drugs drive costs for certain common chronic conditions (Fong 2019)

OOP prescription drug spending is less concentrated among outlier spenders than other OOP health costs

- While 53 percent of OOP pharmaceutical spending is attributed to the top 10 percent of spenders, 73 percent of outpatient surgery costs are concentrated in the top 10 percent of spenders (Fahle et al 2016)

Variable	Description
OOP Pharmaceutical	OOP prescription spending as household rate per person each wave

On average, about how much have you paid out-of-pocket per month for prescriptions?

Model: Variables

Variable	Description	Constant	By Wave
OOP Drug	OOP prescription spending as household rate per person each wave		X
Age	Continuous and squared term at each wave (randomly selected for married households)		X
Race/Ethnicity	Indicator for households with any resident who identifies as Black or Hispanic	X	
Marital Status	Indicator for married households	X	
Household Size	Count of number of total household members, including respondent and spouse		X
Income	1) Continuous total household income 2) Low-income flag for single households under \$24,000 or two-person under \$36,000		X
Assets	1) Sum of liquid assets 2) Sum of illiquid assets		X
Insurance	1) Medicaid or VA only, 2) Private only, 3) Medicare only, 4) Medicare plus private, 5) Medicare plus government, 6) Medicare plus government and private, 7) Private plus government, or 8) No insurance		X
Mortality	Indicator for households in which anyone is within 5 years of death in the third wave	X	
Health	Count of chronic conditions per person by household		X

Analysis: Results

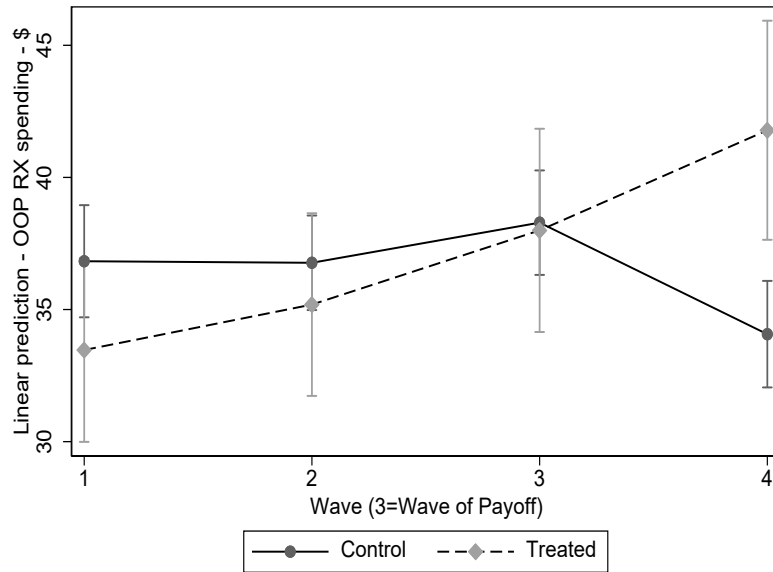


Description of Treatment and Control Groups

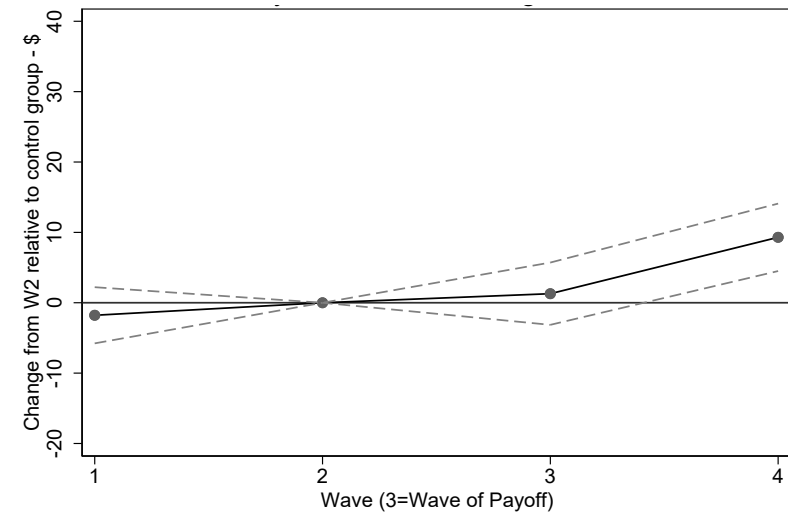
	Out of Pocket Pharmaceutical Expenditure Analysis							
	Excluded from Sample Due to Move		Included in Sample				Differences: Treatment & Control	Differences: Included & Excluded
			Treatment		Control			
	Number	%	Number	%	Number	%	p value	p value
Total	156		1,035		4,110			
Married	104	66.7	721	69.6	2,244	54.6	<0.0001	0.546
Age	63.2		62.4		65.0		<0.0001	0.235
Median Income	\$68,586		\$73,300		\$52,683		<0.0001	0.193
Low Income	27	17.4	189	18.3	1,135	27.6	<0.0001	0.818

Note: Weighted values. Adjusted to 2016 dollars.

Out-of-Pocket Pharmaceutical Spending After Mortgage Payoff



Difference in Differences

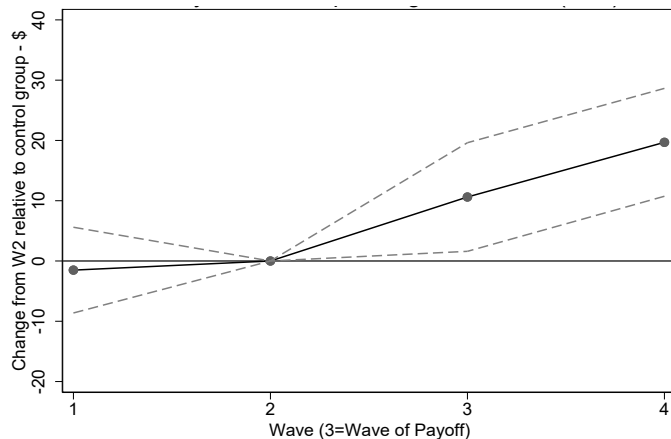


$$\begin{aligned} \text{First difference} &= (\text{Wave}_w - \text{Wave}_2) \\ \text{Second difference} &= (\text{FirstDiff}_{\text{T}_x} - \text{FirstDiff}_{\text{Control}}) \\ &= (T_w - T_2) - (C_w - C_2) \end{aligned}$$

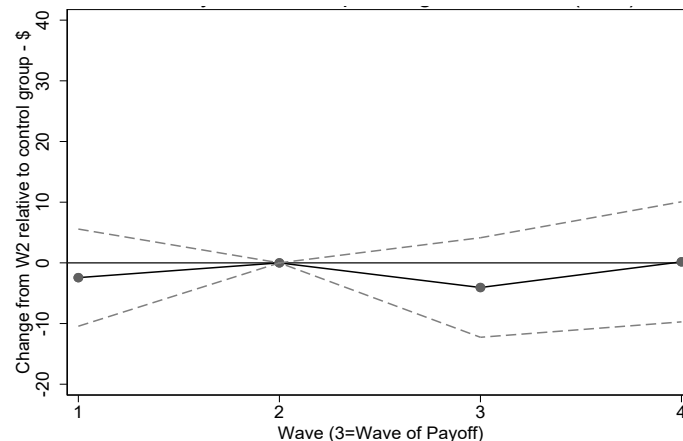
\$9 additional monthly pharmaceutical spending in Wave 4 compared with Wave 2

Triple Difference: Out-of-Pocket Pharmaceutical Spending After Mortgage Payoff by Age

Homeowners Under Age 65



Homeowners Age 65 or Older

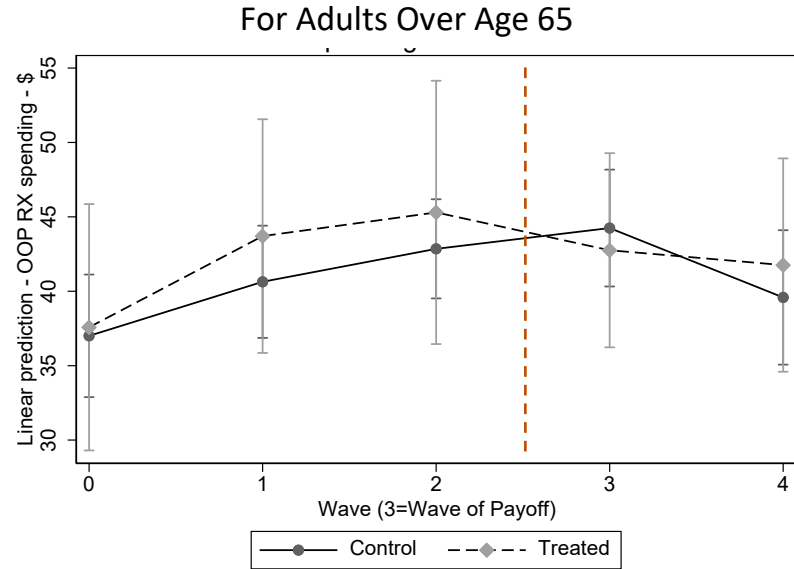
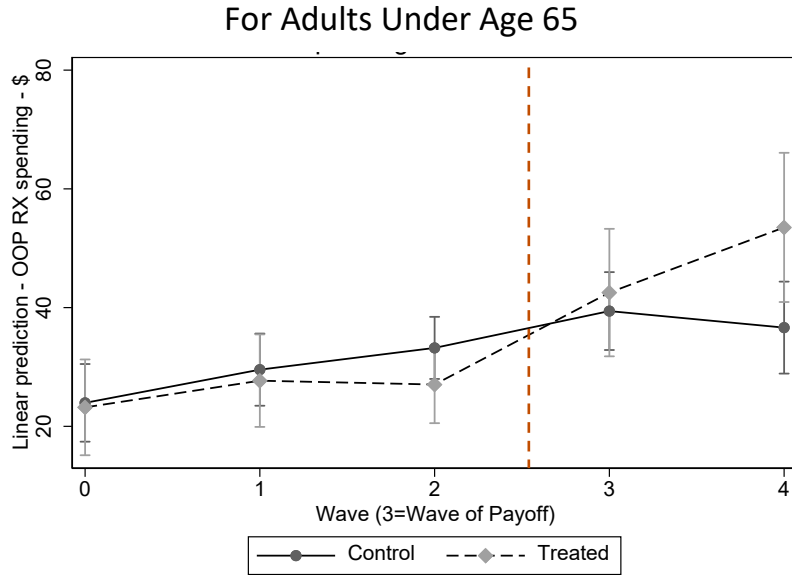


Note: This analysis compares the size of differences in pharmaceutical spending of under 65 and over 65 households between homeowners whose mortgage payments ended in Wave 2 and homeowners whose payment remained consistent. The size of differences were compared to Wave 2.

\$20 additional monthly pharmaceutical spending in Wave 4 compared with Wave 2

$$(T_w - T_2)_{U65} - (C_w - C_2)_{U65} = D_{U65}, \quad (T_w - T_2)_{O65} - (C_w - C_2)_{O65} = D_{O65}$$

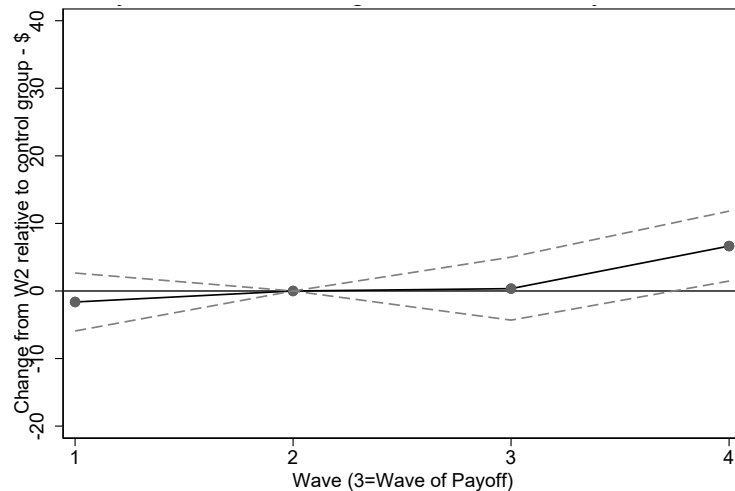
Robustness Check: Parallel Pre-Trends Assumption



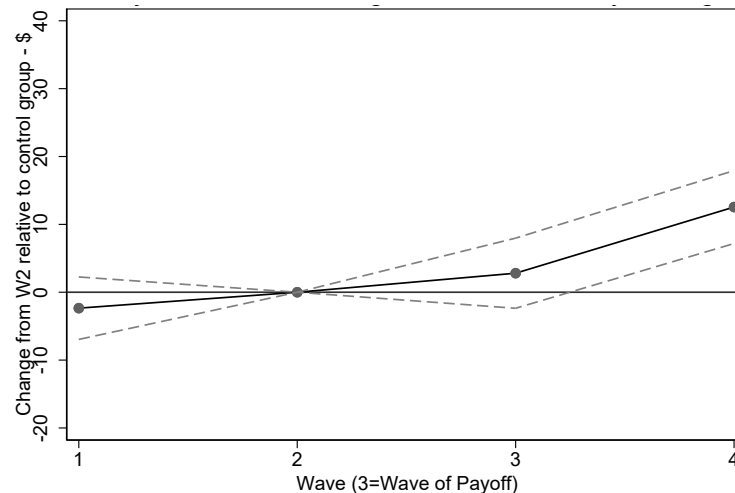
Note: This analysis compares the size of differences in pharmaceutical spending between homeowners whose mortgage payments ended in Wave 2 and homeowners whose payment remained consistent during that wave to the size of differences in spending between the two groups in Wave 4

Robustness Check: Separate Analyses for Always or Never Mortgage Payers

Four Waves without a Mortgage Payment



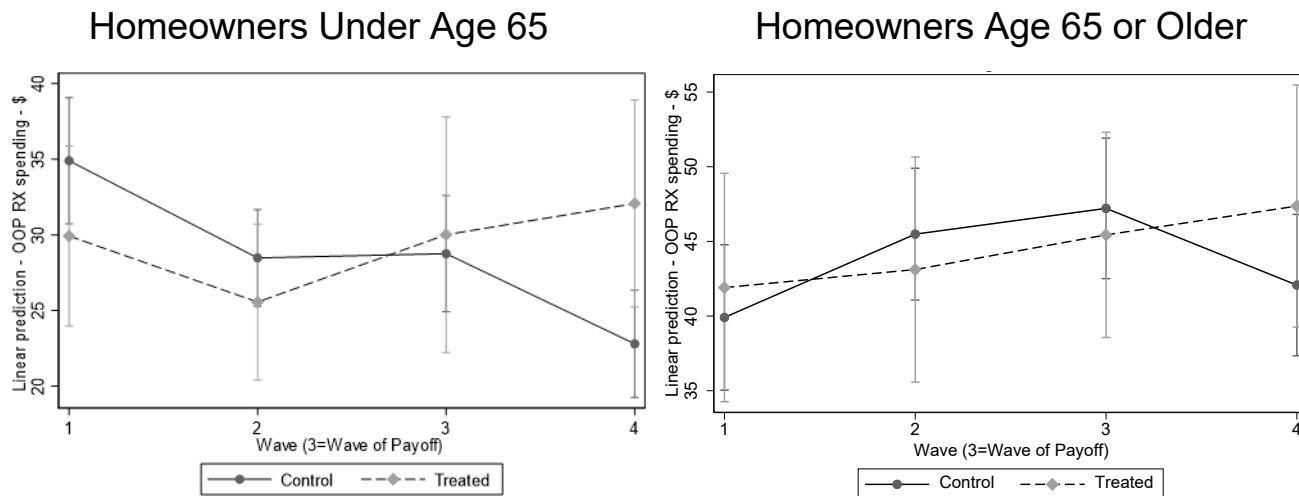
Four Waves with a Mortgage Payment



Note: This analysis compares the size of differences in pharmaceutical spending between homeowners whose mortgage payments ended in Wave 2 and homeowners whose payment remained consistent during that wave to the size of differences in spending between the two groups in Wave 4.

Robustness Check: Matching Analysis (CEM)

- 701 treated observations;
1,769 control observations
- Significant differences in
spending changes by age
group
- Homeowners under 65
spent \$12 more on OOP
pharmaceuticals in wave 4
after mortgage payoff



Note: This analysis compares the size of differences in pharmaceutical spending between homeowners whose mortgage payments ended in Wave 2 and homeowners whose payment remained consistent during that wave to the size of differences in spending between the two groups in Wave 4.

Robustness Check: Changes in Health

	Economic Events in Wave 1: Baseline		Economic Events in Wave 2: Last Full Wave With a Mortgage		Economic Events in Wave 3: First Wave With a Mortgage- Free Period		Economic Events in Wave 4: No Mortgage Payment	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
New health diagnosis	260	25.1	297	28.6	267	25.8	259	25.0
1+ ADL support need in household	134	12.9	158	15.3	165	15.9	169	16.4



Discussion

Key Takaways

- There are spillover effects between housing costs and healthcare utilization
- Homeowners increase out-of-pocket pharmaceutical spending after their last mortgage payment
- Effects are concentrated in homeowners between the ages of 50 and 64
- Income and healthcare subsidies provided through OASI and Medicare may smooth health care utilization beginning around age 65



Implications and Future Research

Do certain demographics particularly struggle to afford both housing and health?

- By income
- By race/ethnicity
- By geography

Are certain policies more effective in smoothing these tradeoffs and reducing impacts?

- OASI and income subsidies
- Medicare or OASI healthcare subsidies
- Housing and other cost-of-living subsidies

An aerial photograph of a city grid, likely New York City, showing a dense pattern of streets and buildings. The image is partially obscured by a dark, semi-transparent overlay that covers the central portion. The overlay is a dark reddish-brown color. The text "Discussion" is centered within this overlay in a white, sans-serif font. Below the title, the email address "samara_scheckler@harvard.edu" is also centered in a smaller white font. The city grid extends to the edges of the frame, with some snow visible on the rooftops and ground in the lower-left and upper-right corners.

Discussion

samara_scheckler@harvard.edu



Appendix

Descriptive: Sample Economic Trends

	Economic Events in Wave 1: Baseline		Economic Events in Wave 2: Last Full Wave With a Mortgage		Economic Events in Wave 3: First Wave With a Mortgage- Free Period		Economic Events in Wave 4: No Mortgage Payment	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
New retirement (respondent or partner)	147	14.2	159	15.3	144	13.9	207	20.0
Sale of primary residence	54	5.2	31	3.0	33	3.2	43	4.2
IRA withdrawal	108	10.4	126	12.1	174	16.8	212	20.5
Gift/Lump sum received	126	12.2	82	7.9	115	11.1	83	8.0
Social Security retirement income reciency	345	33.3	430	41.6	537	51.9	640	61.8

Descriptive: Sample Health Trends

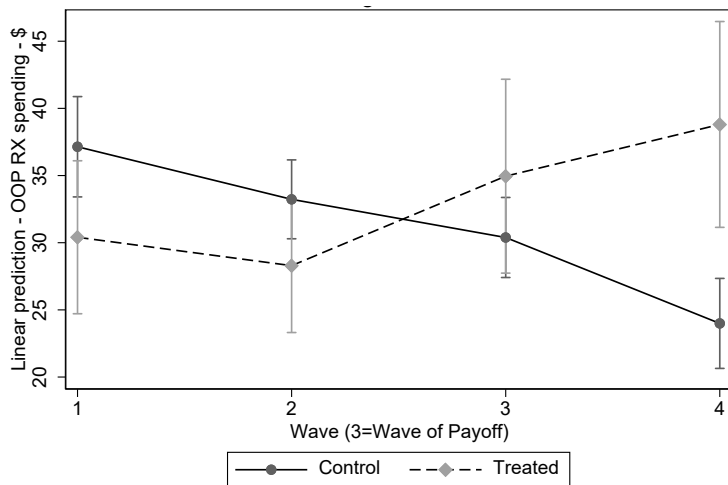
	Economic Events in Wave 1: Baseline		Economic Events in Wave 2: Last Full Wave With a Mortgage		Economic Events in Wave 3: First Wave With a Mortgage-Free Period		Economic Events in Wave 4: No Mortgage Payment	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Spouse/partner death	13	1.2	26	2.5	25	2.4	35	3.4
New health diagnosis	260	25.1	297	28.6	267	25.8	259	25.0
1+ ADL support need in household	134	12.9	158	15.3	165	15.9	169	16.4
New ADL support need in household	119	11.5	171	17.2	182	17.6	174	16.9
Household size increase	63	6.2	81	7.8	73	7.1	77	7.4
Medicaid coverage	35	3.4	38	3.7	38	3.7	47	4.6
VA coverage	58	5.6	60	5.8	60	5.8	75	7.3
Medicare coverage	342	33.0	455	43.9	532	51.4	641	61.9
Per person premium cost under age 65	\$135	-	\$165	-	\$202	-	\$206	-
Per person premium cost 65 or older	\$98	-	\$99	-	\$114	-	\$97	-

Closer Look at Counterfactual

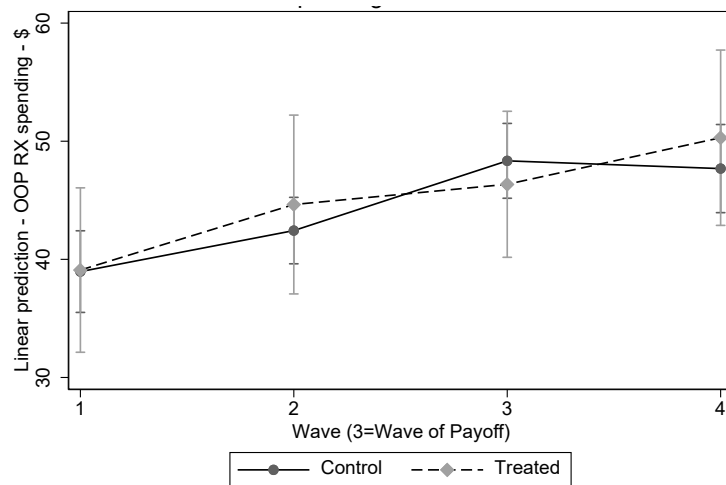
					Significant Differences Treatment and Control			Significant Differences Treatment and Control			Significant Differences Treatment and Control
	Treatment		All Control			4 Waves Mortgage			4 Waves No Mortgage		
	Number	Percent	Number	Percent	<i>p</i> value	Number	Percent	<i>p</i> value	Number	Percent	<i>p</i> value
Median Income	\$53,948	-	\$46,520	-	-	\$88,016	-	$p < 0.001$	\$32,516	-	$p < 0.001$
Low Income: under \$20,000 single \$30,000 couple	203	18.4%	1,203	26.5%	$p < 0.001$	120	7.2%	$p < 0.001$	1083	37.7%	$p < 0.001$
White	936	85.0%	3,954	87.0	-	1430	85.8%	-	2524	87.7%	$p = 0.037$
Black	86	7.8%	276	6.1	$p = 0.04$	123	7.4%	-	153	5.3%	$p = 0.004$
Hispanic	52	4.8%	198	4.4	-	52	3.2%	-	146	5.1%	-
Mean Age	63.1	-	65.1	-	$p < 0.001$	57.5	-	$p < 0.001$	69.5	-	$p < 0.001$

Age Specific Analysis

Homeowners Under Age 65



Homeowners Age 65 or Older



Note: This analysis compares the size of differences in pharmaceutical spending between homeowners whose mortgage payments ended in Wave 2 and homeowners whose payment remained consistent during that wave to the size of differences in spending between the two groups in Wave 4.

Demographics of Each Mortgage Type

As Expected

	Number	%
	293	9.4
Mean Age	63.7	
Median Income	\$70,000	
Low Income	45	15.5
White	249	85.1
Black	23	7.7
Hispanic	14	4.9
Single Family	256	87.2
Multifamily	27	9.2
Mobile Home	9	3.2

As Expected, Cliff

	Number	%
	749	24.0
Mean Age	64.3	
Median Income	\$67,000	
Low Income	136	18.1
White	650	86.8
Black	48	6.4
Hispanic	31	4.1
Single Family	543	72.5
Multifamily	153	20.4
Mobile Home	40	5.3

Unexpected, Cliff

	Number	%
	829	26.5
Mean Age	64.0	
Median Income	\$44,012	
Low Income	235	28.4
White	621	74.9
Black	96	11.6
Hispanic	75	9.1
Single Family	625	75.4
Multifamily	143	17.3
Mobile Home	47	5.7

Churn

	Number	%
	1,257	40.2
Mean Age	65.8	
Median Income	\$45,000	
Low Income	352	28.0
White	955	76.0
Black	159	12.6
Hispanic	103	8.2
Single Family	998	79.4
Multifamily	145	11.5
Mobile Home	82	6.5

Events Associated with Each Mortgage Type

As Expected

	#	%
	293	9.4
Cliff Wave		
Retirement	24	8.1
Property sale	11	3.8
IRA withdrawal	32	11.1
Gift/lump sum	24	8.3
Household size increase	16	5.5
Any Wave		
Imputation	57	19.4
Multiple Financial Reporter	41	14.1

As Expected, Cliff

	#	%
	749	24.0
Cliff Wave		
Retirement	83	11.1
Property sale	182	24.3
IRA withdrawal	100	13.3
Gift/lump sum	61	8.1
Household size increase	52	7.0
Any Wave		
Imputation	102	13.7
Multiple Financial Reporter	80	10.6

Unexpected, Cliff

	#	%
	829	26.5
Cliff Wave		
Retirement	89	10.7
Property sale	150	18.0
IRA withdrawal	102	12.3
Gift/lump sum	58	7.0
Household size increase	86	10.4
Any Wave		
Imputation	204	24.6
Multiple Financial Reporter	114	13.7

Churn

	#	%
	1,257	40.2
Cliff Wave		
Retirement	135	10.7
Property sale	180	14.3
IRA withdrawal	150	11.9
Gift/lump sum	86	6.9
Household size increase	116	9.2
Any Wave		
Imputation	463	36.9
Multiple Financial Reporter	158	12.5

Older Adult Budget: Out-of-Pocket Healthcare Spending

20 percent of all older adult health spending is out-of-pocket, not including premia (De Nardi, et al 2015)

- Out-of-pocket medical spending accounts for a large proportion of older adult income
 - 15 million older adults spend at least 20 percent of their income on out-of-pocket expenses (Schen, Davis & Willink 2017)
 - By 2030, more than 40 percent of traditional Medicare beneficiaries are anticipated to spend at least 1 of every 5 dollars on out-of-pocket healthcare (Cubanski, Neuman & Smith 2018)
- Out-of-pocket spending is responsive to health status
 - Medicare recipients face considerable out-of-pocket cost over the last 5 years of life (Kelley, et al 2012)

