A comparison of medical costs between residents of a public housing redevelopment and other public housing units in Seattle, King County

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BACKGROUND

Where we live and the quality of our housing and neighborhood determines many things, including access to healthy food, quality of education, and overall health and well-being (1-2). Place-based initiatives have shown promise in addressing health inequities of disadvantaged neighborhoods by investing in a continuum of support services across jobs, education, housing, and transportation (1-2). Yesler Terrace (YT) is a public housing neighborhood in Seattle currently undergoing such redevelopment with the aim of producing a mixed-income neighborhood with enhanced economic and educational opportunities. One outstanding question is whether community redevelopment initiatives can create healthier, more equitable neighborhoods, while also saving medical costs.

This study aimed to evaluate whether community redevelopment at YT was associated with lower medical costs compared with residents in low-density subsidized housing, known as scattered site units (SS). Medical costs were hypothesized to be lower among YT residents because of a greater use of preventive care and fewer avoidable medical encounters.

YESLER TERRACE REDEVELOPMENT STRATEGIES

- New dwellings, including Breathe Easy (asthma-free) homes
- Adult – social and job development
- Youth – educational and job development
- Health – screenings, education, community health workers
- Nutrition/environmental/physical activities
- Community center programs
- Neighborhood activities
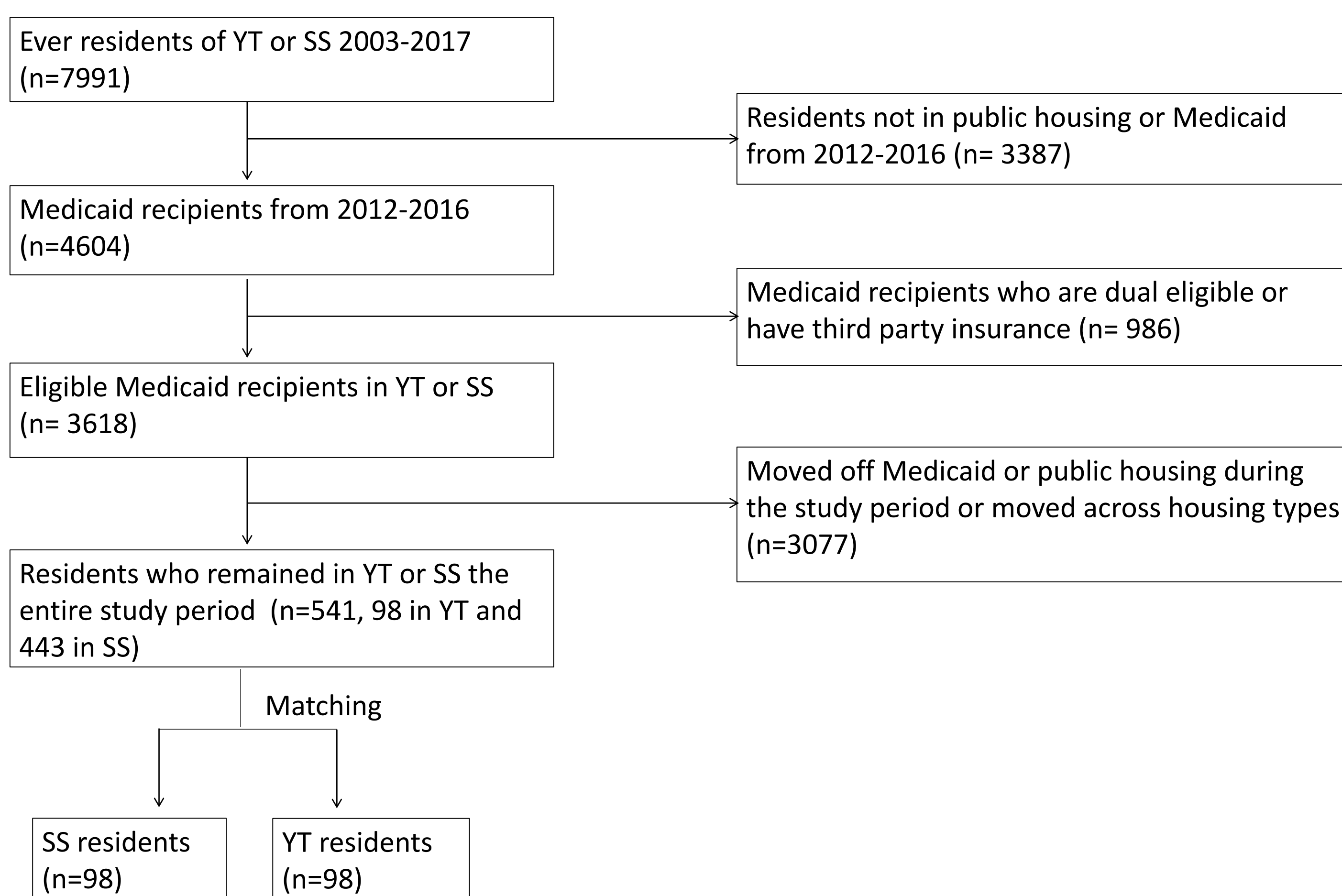
Figure 1. Yesler Terrace
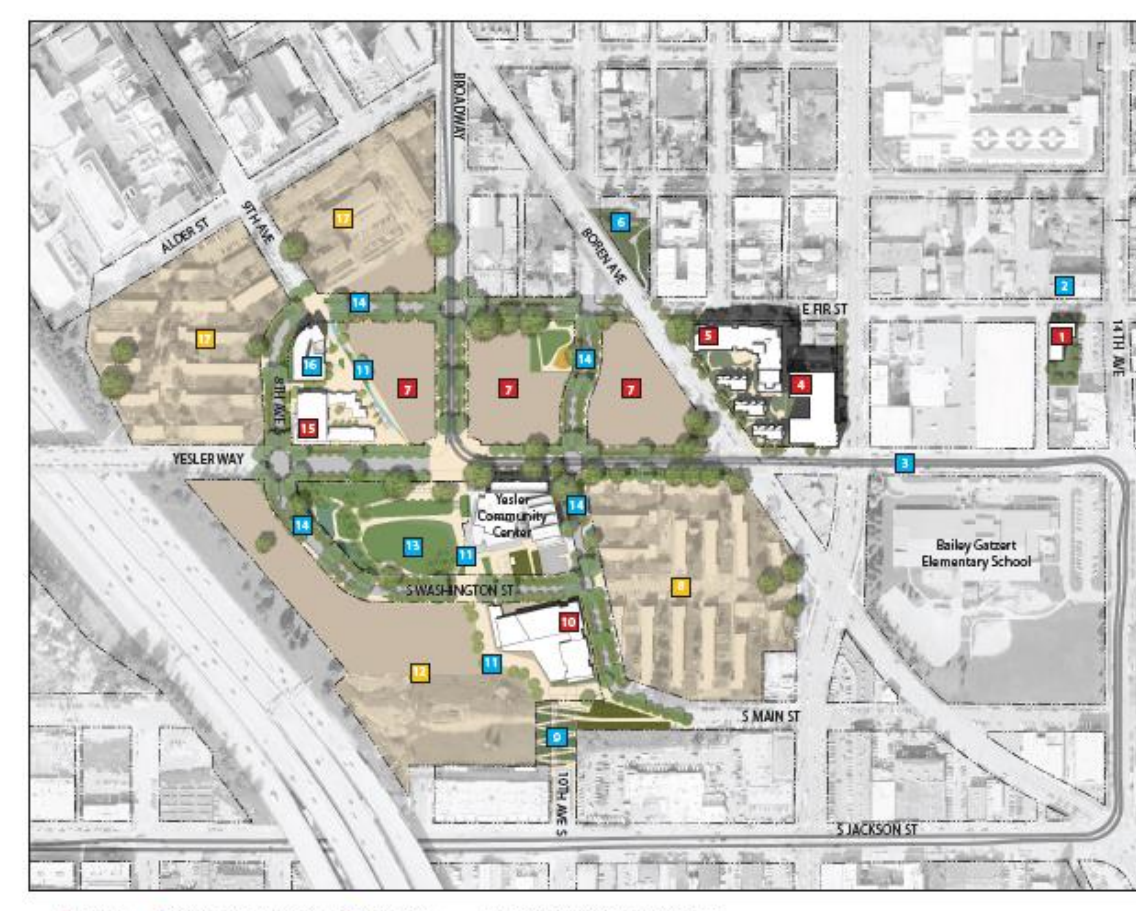
METHODS

Data source (Table 1). Participants were drawn from linked Medicaid claims and Seattle Housing Authority data from 2012-2016. Medicaid claims data included demographic information (e.g. race, gender, disability, coverage type and age), claim counts, and associated costs. Seattle Housing Authority data included place of residence.

Study population (Figure 2). Residents who were enrolled in Medicaid and remained in YT and SS properties during the entire study period were eligible for inclusion. Patients who had dual coverage with Medicare and Medicaid were excluded because Medicare claims data were unavailable.

Table 1. Data sources and outcome measures

		Data sources/type	
		Longitudinal data (2012-2016)	
	Measures	Medicaid claims	SHA admin
Outcomes	Demographics	✓	✓
	# of Moves		✓
	Time at YT		✓
	Medicaid claims	✓	
	Claims cost	✓	

Figure 2. Study population flow-chart

Ever residents of YT or SS 2003-2017 (n=7991)

Residents not in public housing or Medicaid from 2012-2016 (n= 3387)

Medicaid recipients from 2012-2016 (n=4604)

Medicaid recipients who are dual eligible or have third party insurance (n= 986)

Eligible Medicaid recipients in YT or SS (n= 3618)

Moved off Medicaid or public housing during the study period or moved across housing types (n=3077)

Residents who remained in YT or SS the entire study period (n=541, 98 in YT and 443 in SS)

Matching

SS residents (n=98)   YT residents (n=98)

Statistical analyses. Propensity score matching was used to balance treatment groups on race, gender, age, disability status and coverage type (e.g. managed care vs fee-for-service). Change in mean annual cost per person was examined using a generalized estimating equation approach with a gamma distribution and natural logarithm link function.

RESULTS

- The final analyses included 98 YT matched to 98 SS residents. Table 2 presents baseline demographics before and after propensity score matching. Before matching, a higher proportion of YT residents were older, Asian and disabled. After matching, standardized mean differences in baseline characteristics between YT and SS residents were less than 0.10 for all covariates. Nonetheless, gender, age and disability status were kept in the regression model to account for residual imbalance.

Table 2. Baseline descriptive statistics by treatment group before and after propensity score matching

Demographics		BEFORE MATCHING			AFTER MATCHING		
		YT (n=98)	SS (n=442)	Std. mean diff	YT (n=98)	SS (n=98)	Std. mean diff
Race (%)	Black only	37.76	48.08	**-0.2119**	37.76	37.76	0
	White only	5.10	11.51	**-0.2898**	5.10	5.10	0
	Multiple	25.51	30.02	**-0.1030**	25.51	26.53	**-0.0233**
	Asian only	31.63	9.71	**0.4691**	31.63	30.61	0.0218
	AIAN only	0	0.45	**Inf**	0	0	0
	NHPI only	0	0.23	**Inf**	0	0	0
Gender (%)	Male (2)	38.78	43.12	**-0.0886**	38.78	36.7	**0.0417**
Disability status (%)	Disabled	15.31	6.55	**0.2421**	15.31	12.24	0.0846
Coverage type (%)	Managed care	94.90	97.52	**-0.1184**	94.90	94.90	0
Mean age (years)		20.48	15.74	**0.2546**	20.48	20.11	**0.0197**

Figure 3. Crude annual mean cost ($) per person with 95% confidence intervals, 2012-2016
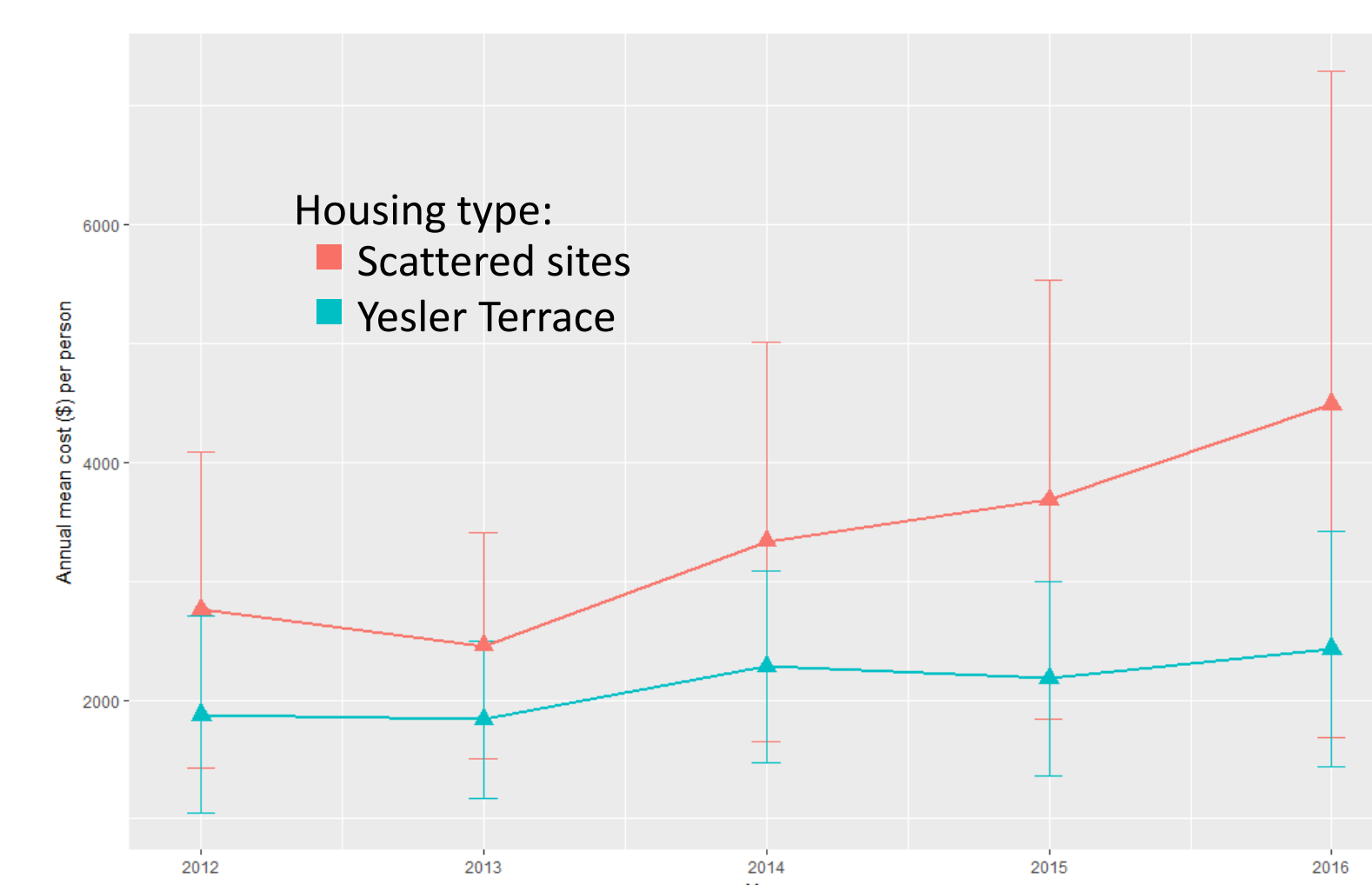
- The unadjusted analyses showed an increase in mean annual cost per person every year. Medical costs were higher among SS than YT residents, however the confidence intervals overlapped.
- Mean annual claims per person appeared similar numerically with overlapping confidence intervals.

Table 4. Comparison of mean annual cost over time between YT and propensity score Matched SS controls

	Main effects model	P-value	Crude with interaction	P-value	Adjusted model	P-value
Intercept	2662.48		2500.957		722.956	
Place	0.648	0.10965	0.735	0.294	0.716	0.11121
Time	1.106	0.00459*	1.141	0.026*	1.050	0.30058
Place*Time			0.939	0.360	1.035	0.57110
Age					1.035	0.00019*
Disability					2.126	0.19103
Gender					1.153	0.50793

- Across all years, mean annual medical costs were 28% lower among YT residents compared to SS residents, however this was not statistically significant (p-value = 0.11).
- Mean medical costs increased each year (~5%) but this was not statistically significant (p-value = 0.30)
- Furthermore, there was not a statistically significant difference in the rate of change in mean annual medical cost between YT and SS residents (p-value = 0.57).

CONCLUSIONS

- Based on this preliminary analysis, there has yet to be an observable change in mean annual medical cost over time among YT and SS residents.
- Further research is needed to investigate whether the results are consistent among the large number of residents who moved across housing types, on and off Medicaid and/or were dual-eligible in order to better inform SHA of policies, and funding decisions related to redevelopment and housing-linked services.

LIMITATIONS

- **Exposure time:** Renovations at Yesler Terrace began in 2013 and continue today, thus potentially not enough time has elapsed to see any measurable effect of the redevelopment.
- **Power:** The inclusion criteria restricted the sample size and may have led to insufficient power to detect any cost changes.
- **Representativeness:** Conclusions cannot be drawn to the large proportion of residents who moved on and off Medicaid and public housing and/or were on Medicare. The exclusion of residents who had dual Medicaid and Medicare coverage may have dampened the treatment effect, as those who are older and/or disabled potentially stand to gain the most from redevelopment.
- **Cost validity:** The cost data for Medicaid recipients on managed care had quality issues prior to 2015. The assumption was made that the quality limitations were equally present for both YT and SS residents. However, the jump we see in costs from 2014 to 2015 is more pronounced for people in SS, so it may be that this assumption was incorrect.

REFERENCES

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