Comparisons of Medical Care Trajectories between Non-Hispanic White and Non-Hispanic Black Lung Cancer Patients

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BACKGROUND

- $183 billion in associated medical care costs estimated in the US in 2015 for all cancers. Projections suggests an increase to $246 billion by 2030.
- Lung cancer (LC) is reported to be the deadliest cancer. Estimates suggest that in 2023: 238,340 new cases and 127,070 deaths.
- LC is the leading cancer and cancer-related death in Texas after breast and prostate cancer. Texas Medicaid paid over $22 million in LC-related charges in 2020.
- LC in Texas: 5-year survival rate is 22.8%.
- Part AB of Medicare covers inpatient and outpatient care. Part D of Medicare provides prescription drug coverage.
- Racial disparity of cancer care cost from diagnosis to death of LC patients will be important for budget planning.
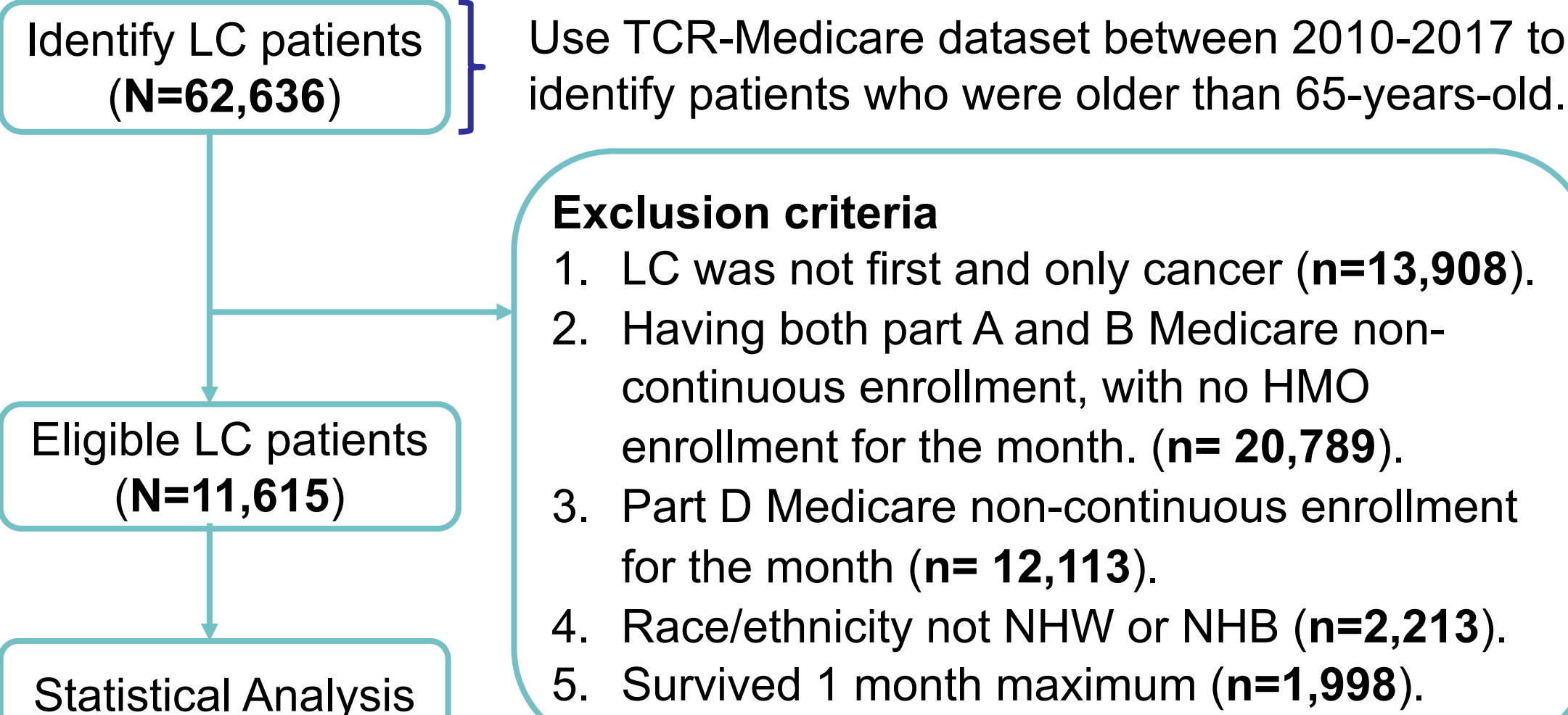
OBJECTIVE

The goal is to compare:

- Monthly medical cost trajectories between non-Hispanic white (NHW) and non-Hispanic black (NHB) LC patients.
- Monthly medical cost trajectories stratified by racial groups and time to death.

METHODS

Figure 1: Cohort ascertainment process.

Identify LC patients (**N=62,636**) — Use TCR-Medicare dataset between 2010-2017 to identify patients who were older than 65-years-old.

Exclusion criteria
1. LC was not first and only cancer (**n=13,908**).
2. Having both part A and B Medicare non-continuous enrollment, with no HMO enrollment for the month. (**n= 20,789**).
3. Part D Medicare non-continuous enrollment for the month (**n= 12,113**).
4. Race/ethnicity not NHW or NHB (**n=2,213**).
5. Survived 1 month maximum (**n=1,998**).

Eligible LC patients (**N=11,615**)

Statistical Analysis

Statistical Analysis

- Kaplan-Meier survival curve p-value: log-rank test.
- Wilcoxon Rank-Sum Test between the average monthly costs of NHW and NHB patients for respective plots.

$$H_o : Y(t)_{NHW} = Y(t)_{NHB} \quad \text{vs.} \quad H_a : Y(t)_{NHW} \neq Y(t)_{NHB}, \ 0 \leq t \leq \tilde{T}$$

DATA / STATISTICAL ANALYSIS

Table 1: Summary statistics of study sample.

Characteristics	Overall (n=11,615)	NHW (n=10,410)	NHB (n=1,205)	p-value*
Sex				0.33
Male	5,349 (46%)	4,778 (46%)	571 (47%)	
Female	6,266 (54%)	5,632 (54%)	634 (53%)	
Age Group				0.01
65-74	6,141 (53%)	5,456 (52%)	685 (57%)	
75-84	4,284 (37%)	3,885 (37%)	399 (33%)	
85+	1,190 (10%)	1,069 (10%)	121 (10%)	
Census tract poverty indicator				<0.001
0% - 5% poverty	1,656 (14%)	1,596 (15%)	60 (5.0%)	
5% - 10% poverty	2,447 (21%)	2,347 (23%)	100 (8.3%)	
10% - 20% poverty	4,449 (38%)	4,115 (40%)	334 (28%)	
20% - 100% poverty	3,059 (26%)	2,348 (23%)	711 (59%)	
Unknown	4 (<0.1%)	4 (<0.1%)	0 (0%)	
Cancer Stage				<0.001
In Situ	17 (0.1%)	15 (0.1%)	2 (0.2%)	
Localized/Regional	5,136 (44%)	4,710 (45%)	426 (35%)	
Distant	5,180 (45%)	4,526 (43%)	654 (54%)	
Unknown/Unstaged	1,282 (11%)	1,159 (11%)	123 (10%)	
	Overall Mean [Median]	NHW Mean [Median]	NHB Mean [Median]	
Monthly costs, $	3100 [2650]	2580 [2170]	3630 [3590]	
Survival, months	18 [9]	19 [9]	14 [7]	

*Pearson's Chi-squared test
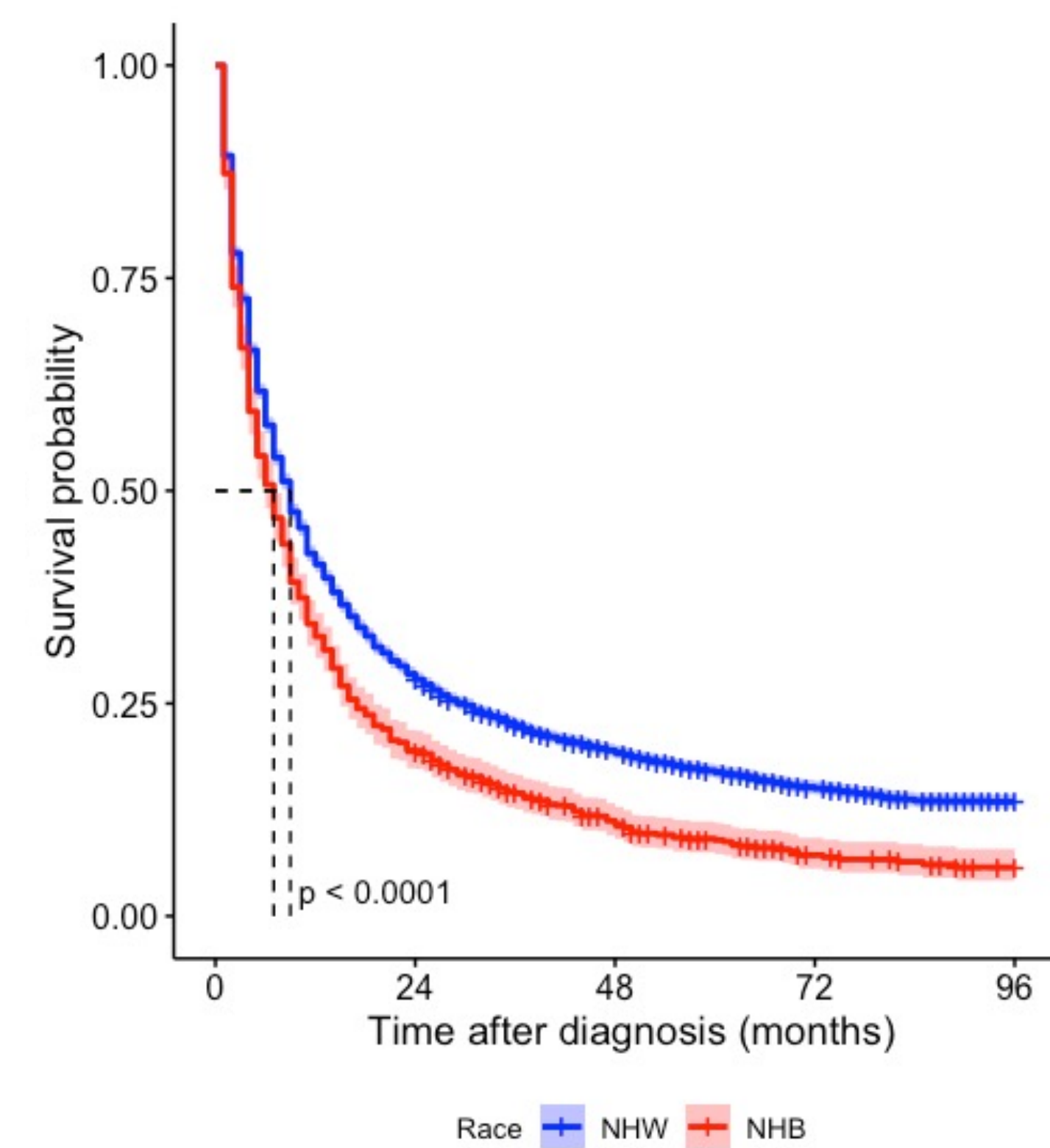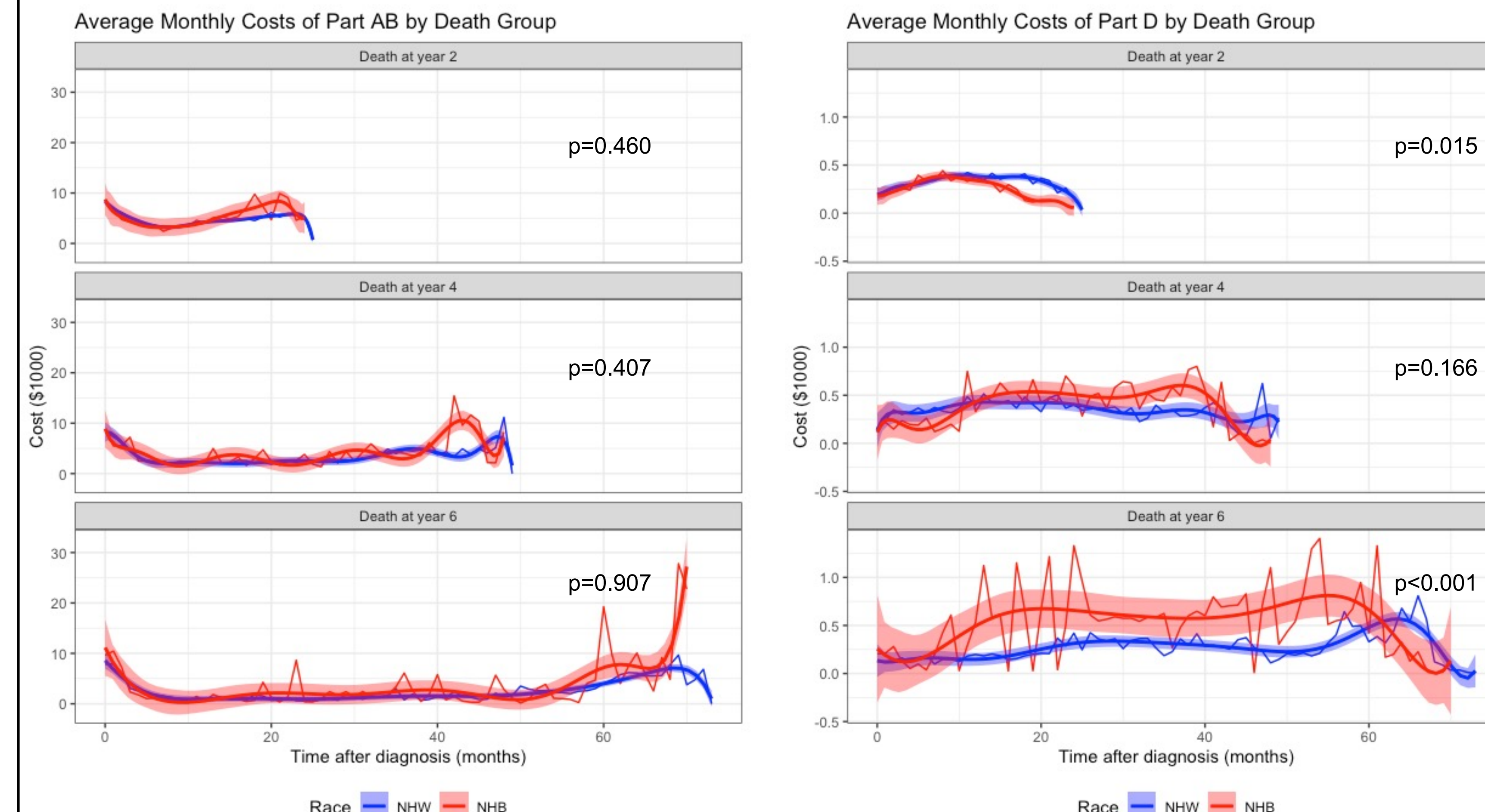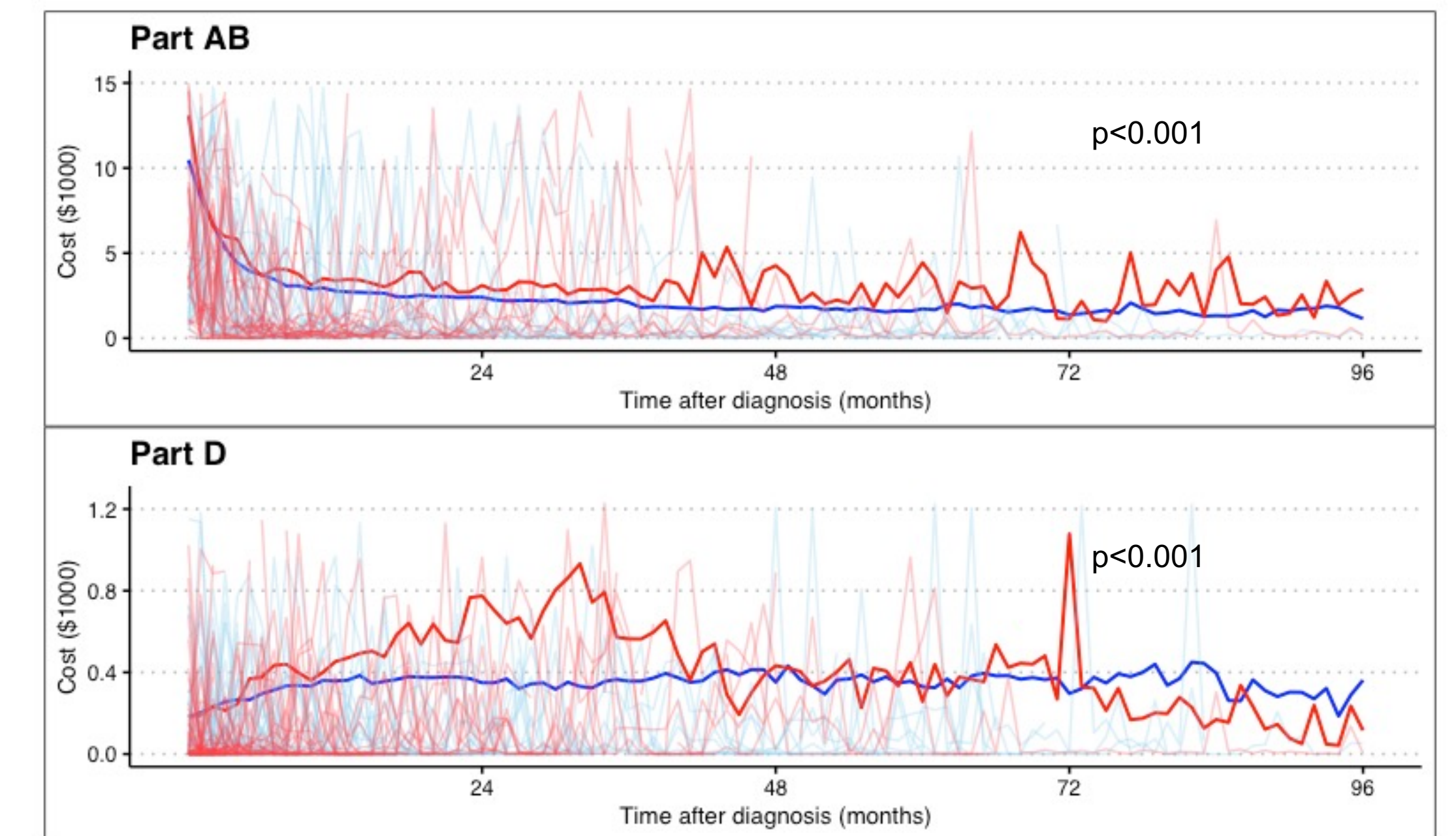
Figure 2: Kaplan-Meier curve for NHW and NHB patients.

p < 0.0001

Race — NHW — NHB

Figure 4: Average monthly costs by death group.

Average Monthly Costs of Part AB by Death Group — Death at year 2: p=0.460; Death at year 4: p=0.407; Death at year 6: p=0.907

Average Monthly Costs of Part D by Death Group — Death at year 2: p=0.015; Death at year 4: p=0.166; Death at year 6: p<0.001

Race — NHW — NHB

DATA / STATISTICAL ANALYSIS

Figure 3: Average monthly costs for NHW and NHB patients.

Part AB: p<0.001

Part D: p<0.001

CONCLUSIONS

- Kaplan-Meier curve yields a significant p-value. Over time, we can see that NHB patients had a lower probability of survival than NHW patients.
- There is a difference in the average monthly costs between NHW and NHB patients for parts AB and D.
- There is a difference in the average monthly costs between NHW and NHB patients who died at year 2 or year 6 for part D.
- Pointwise NHB monthly average medical costs were higher than NHW overtime, however NHB had a lower survival probability.

Future Directions:

- Why NHB LC patients have a significantly lower survival probability than NHW LC patients.
- Why does end-of-life treatment differ for Part AB and Part D.

REFERENCES

Liu, Y., Wang, S., Li, L., Xu, Y., Shen, Y., & Tina Shih, Y. C. (2023). Comparisons of Medical Cost Trajectories Between Non-Hispanic Black and Non-Hispanic White Patients With Newly Diagnosed Localized Prostate Cancer. *Value in health : the journal of the International Society for Pharmacoeconomics and Outcomes Research*, S1098-3015(23)03018-8.

ACKNOWLEDGEMENTS