Impact of Comorbidities and Race in Breast Cancer Survival Across Cancer Stages

INTRODUCTION

- Racial disparities and outcomes in breast cancer are well-documented. This may be due to socioeconomic inequalities, diagnostic delays, and comorbid conditions.
- Specific comorbidities including diabetes, hypertension, and congestive heart failure, have been independently linked to poorer survival outcomes in breast cancer patients.
- The aim of this study is to evaluate the independent and combined effects of race and comorbidities on all-cause mortality (ACM) in breast cancer patients.

METHODS

- This is a retrospective cohort study using the Syapse database (2018–2023) to analyze breast cancer patients across the United States.
- Patients were categorized into two racial groups: White/Asian (W/A) and Black/Native American/Pacific Islander (B/O).
- Baseline comorbidities assessed included cardiovascular disease (CVD), diabetes (DM), chronic obstructive pulmonary disease (COPD), congestive heart failure (CHF), peripheral vascular disease (PVD), and renal disease (CKD).
- Cox regression and random forest models were utilized to determine predictors of all-cause mortality (ACM).

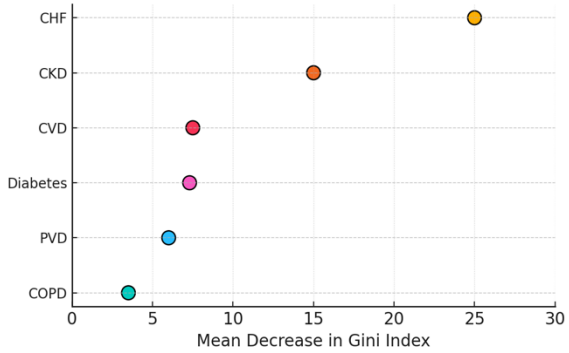


Figure 1: Variable Importance of Comorbidities based on Mean Decrease in Gini Index from Random Forest analysis. Higher values indicate greater significance in predicting outcomes.

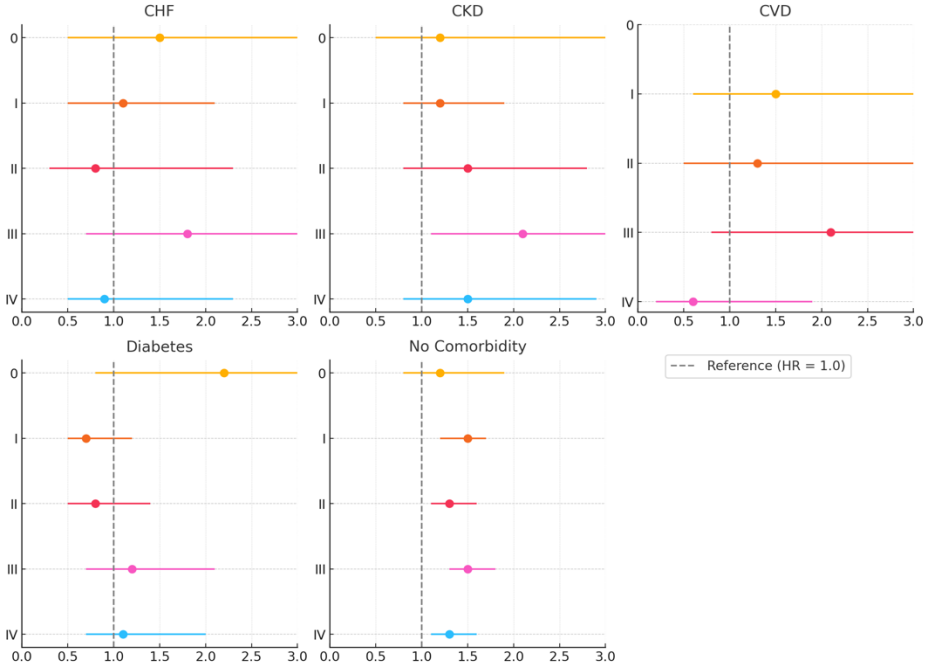


Figure 2: Hazard Ratios for Mortality by Cancer Stage and Comorbidity Status. Forest plots represent the hazard ratios (HR) comparing mortality risk of White/Asian patients to Black/Other patients within each cancer stage (0-IV), stratified by specific comorbidities.

RESULTS

- 31,150 patients were included (W/A = 26,136; B/O = 5,014); median ages were 61 (W/A) and 62 (B/O).
- Black/Other patients had higher all-cause mortality (ACM) vs. W/A when adjusting for comorbidities (HR 1.3; 95% CI: 1.2–1.4).
- All comorbidities were associated with increased ACM: CKD (HR 2.6), CHF (HR 2.5), CVD (HR 2.5), PVD (HR 2.3), DM (HR 1.6), COPD (HR 1.5).
- CKD and CHF were the strongest comorbidity predictors of ACM (Figure 1); breast cancer stage was the most significant overall factor (HR 17.4).
- Racial survival differences across stages I–IV were observed only in patients without comorbidities, with Black/Other patients showing higher mortality (Figure 2).

Conclusions:

- Black/Other patients demonstrated higher mortality even after controlling for comorbidities. This indicates other factors such as socioeconomic factors or a delay in diagnosis as a cause of ACM in these patients.
- Regardless of race, comorbidities increased ACM with CKD and CHF having the highest risk of ACM.
- While cancer stage is the most important driver of ACM, it has no association with comorbidities.

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