

Raslan D¹, Estrada J¹, Simonsen N², Leonardi C², and Scribner R²

¹Stanley S. Scott Cancer Center, Louisiana State University Health Sciences Center, New Orleans, LA, USA.

²Department of Public Health, Louisiana State University Health Sciences Center, New Orleans, LA, USA

INTRODUCTION

- Triple Negative Breast Cancer (TNBC) subtype is an aggressive cancer that disproportionately affects Black Women (BW) and carriers of BRCA1 mutation.
- TNBC cancer means that the cells in the tumor are negative for progesterone (PR), estrogen (ER), and epidermal growth factor 2 (HER2/neu) receptors. Common treatments like hormone therapy and drugs that target progesterone, estrogen, and HER-2 are ineffective due to lack of their receptors in cancer cells.
- The scientific evidence concludes: 1) Black Women with TNBC have worse clinical outcomes as opposed to White Women (WW), 2) Differences in mortality are still being debated, and 3) **Social determinants** (e.g., health care & SES) as well as **biological determinants** (e.g., genetics & molecular mechanisms) contribute to the risk and clinical presentation of breast cancer.
- Preliminary data from the Louisiana Tumor Registry (LTR) via Loch et al. (unpublished) showed differences in TNBC between BW and WW regarding incidence, age of onset, and urban vs. rural residence: TNBC incidence is higher in BW overall and higher in BW living in urban areas

Prevalence of Triple Negative Among All Incident Breast Cancers in Louisiana 2010-2012		
	White Women	Black Women
Statewide:	9.7%	20.8%
Metro vs. Non-metro:	9.9 vs. 8.6%	21.1 vs. 19.2%

Table 1. Source: LTR/SEER % of all new breast cancers that are TNBC subtype.

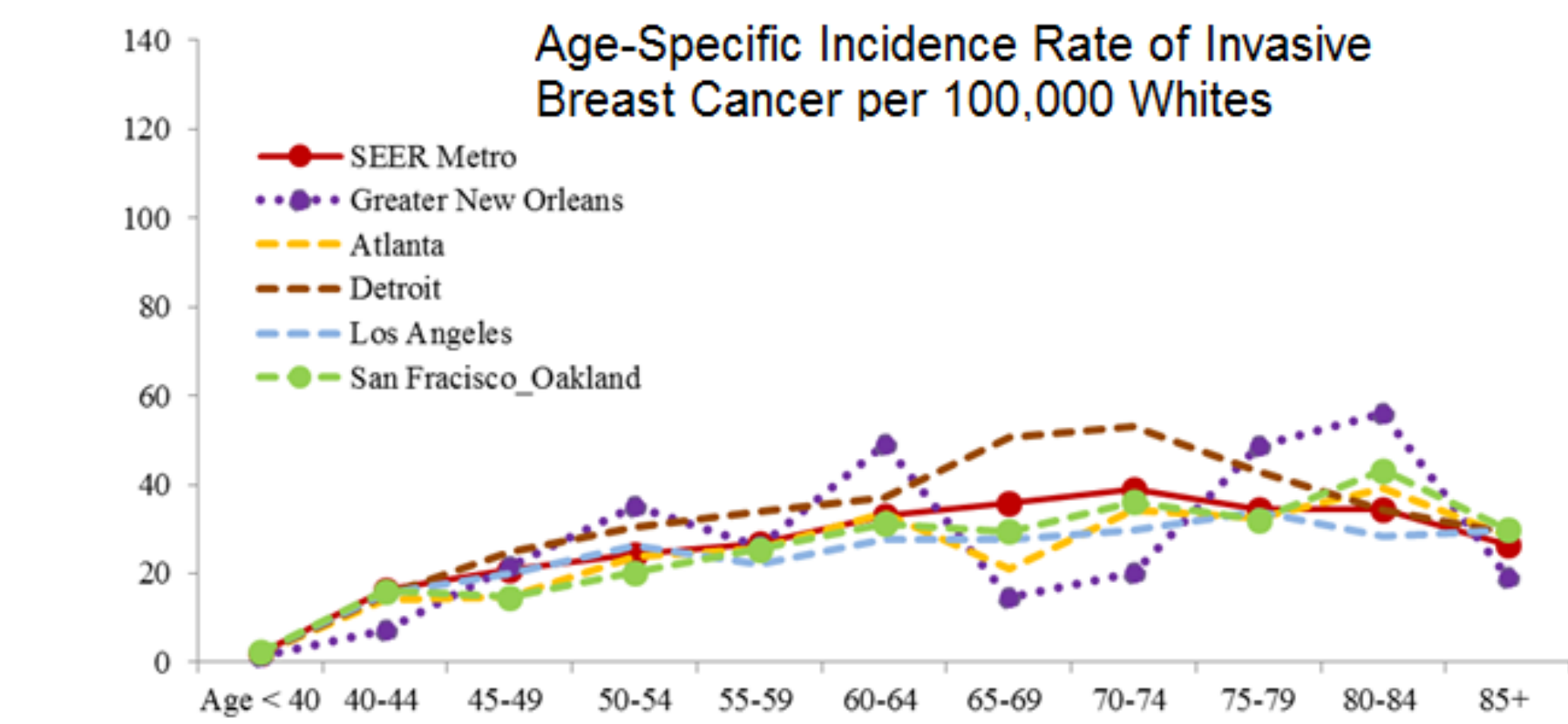


Figure 1a. Age-Specific Incidence Rate of Invasive Breast Cancer per 100,000 Whites

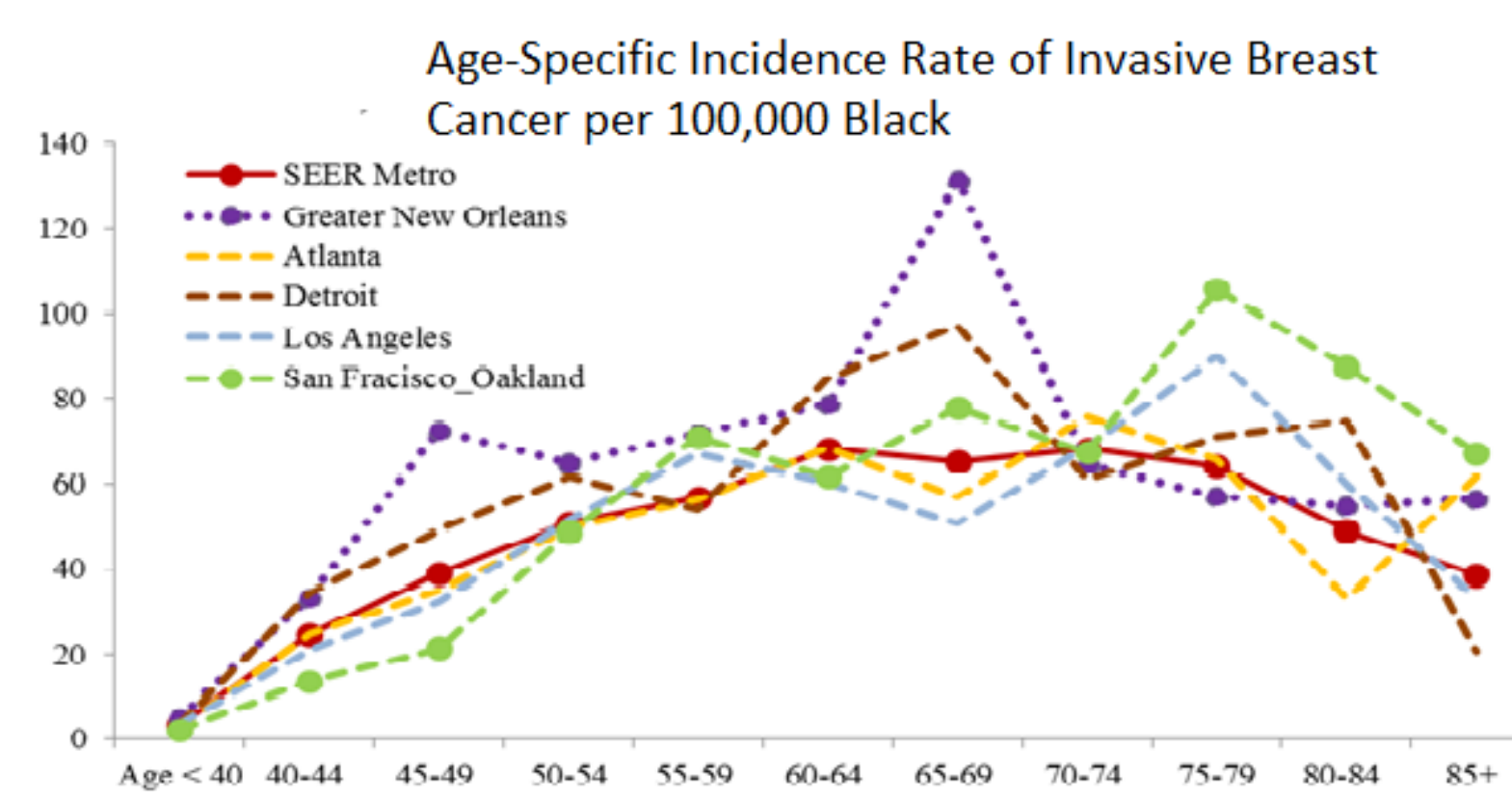


Figure 1b. Age-Specific Incidence Rate of Invasive Breast Cancer per 100,000, Blacks

- Understanding the interplay of social and biological determinants would enhance the development of models of risk, predictors of clinical outcome, and factors to consider in policy regarding TNBC disparities. We propose the following conceptual model to guide our research.

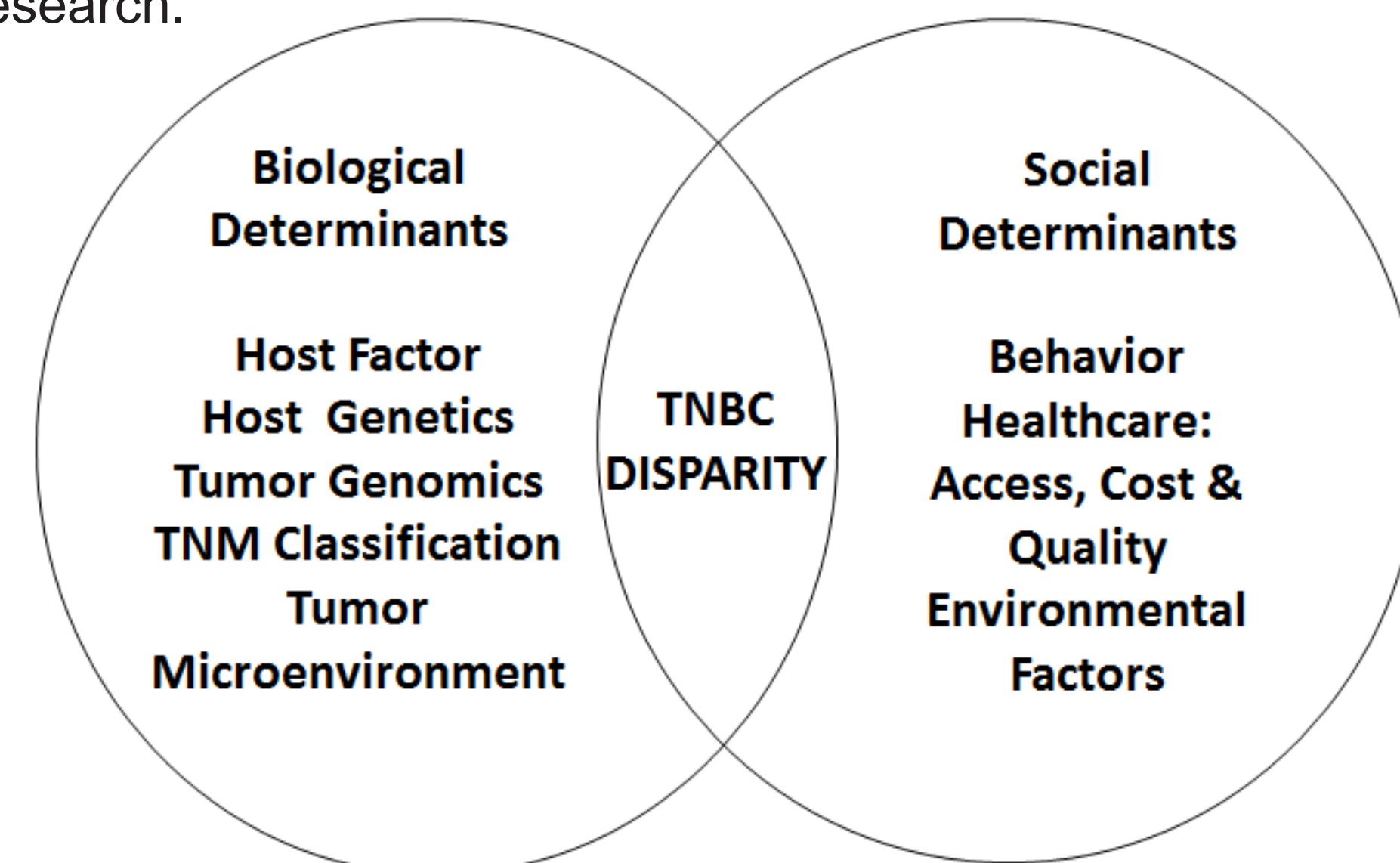


Figure 2. Conceptual model to explore the variables which may account for the TNBC racial disparity in Louisiana

- Based on this evidence, we hypothesize that Black women have a higher probability of TNBC and a higher mortality due to TNBC and that this racial disparity can be accounted for by biological and social factors.

METHODS

- SEER:** Surveillance, Epidemiology, and End Results Program Public-use Data were collected from 11,511 Breast cancer cases and 1,254 TNBC cases during the years 2010-2012 in Louisiana.
- SAS 9.4:** Data were analyzed using SAS 9.4. Multivariable logistic regression was used to determine odds ratios for investigated predictors versus outcomes.

RESULTS

- Incidence of TNBC is significantly higher among Black Women

TNBC Incidence in Louisiana VS. Incidence in Other States 2010-2012	
White Women	Black Women
11.9 (12.6)	25.8 (23.2)

Table 2. Incidence of TNBC in Louisiana vs. incidence found in 18 SEER registries by race (parenthesized) Rates are TNBC/100,000 women, age-standardized to 2000 US Census population

Odds of TNBC as an Outcome

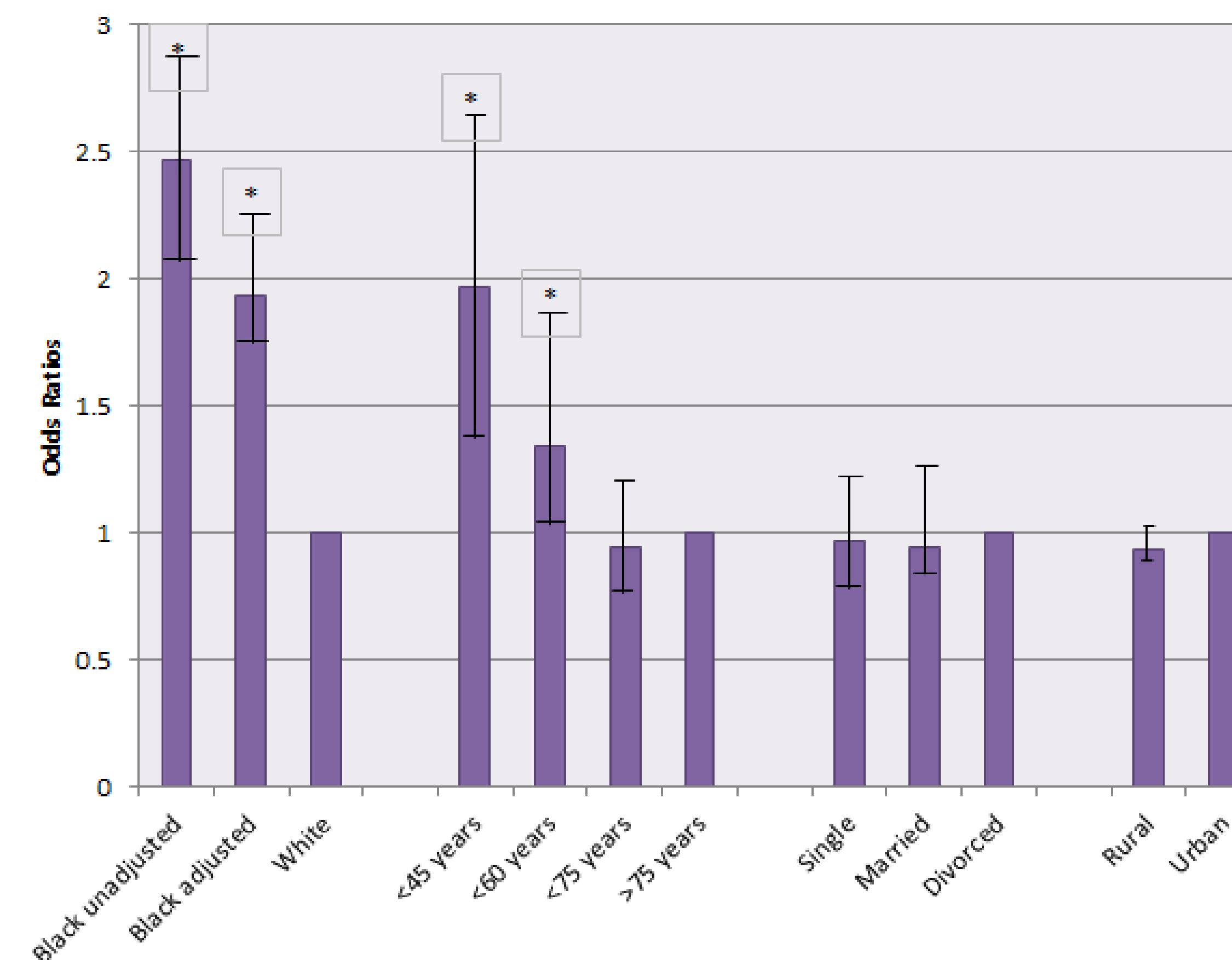


Figure 3. Odds Ratios for Specific Host and Environmental Predictors of Having TNBC Among All Women with Incident Breast Cancer, 2010-2012. *Statistically Significant

Odds of TNBC By Race and Marital Status

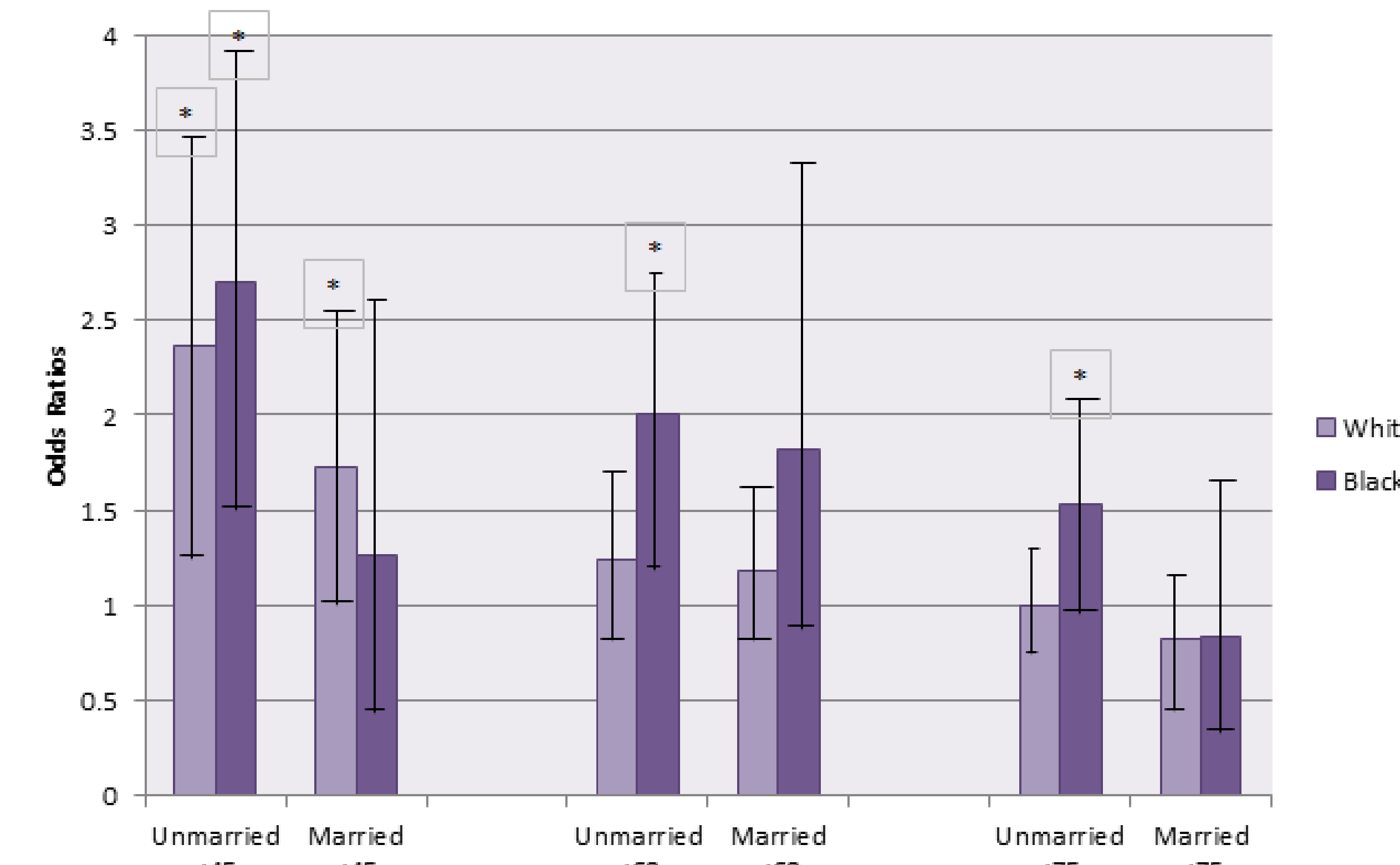


Figure 4. Odds Ratios for Having TNBC Among All Women with Incident Breast Cancer by Race and Marital Status. *Statistically Significant

RESULTS Continued

Breast Cancer-Specific Mortality Due to TNBC

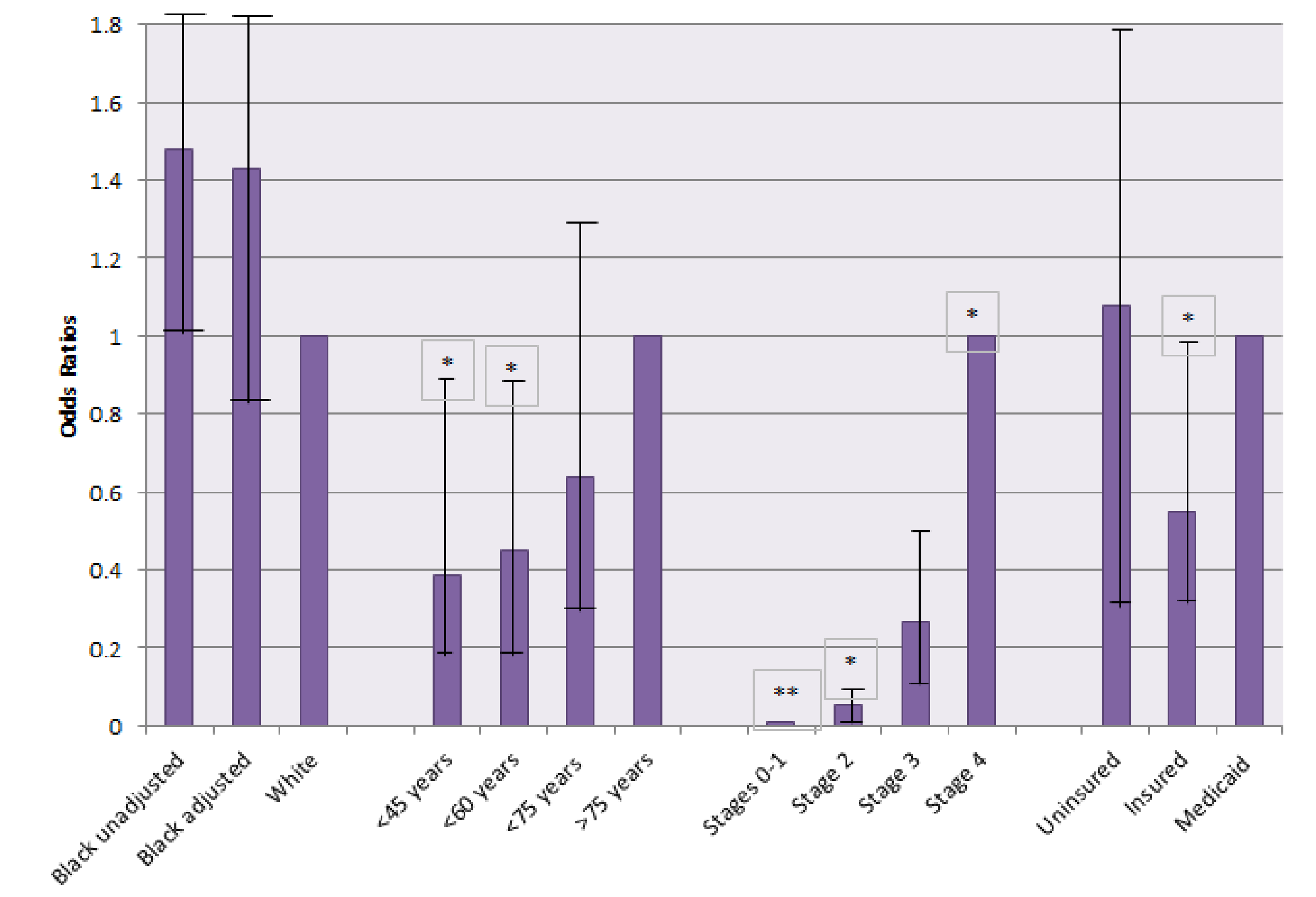


Figure 5. Odds Ratios for Model of Breast Cancer-Specific Mortality Among Women with TNBC. Statistically Significant *at p<0.05; ** at p<0.001.

CONCLUSIONS

- After adjusting for age, marital status, and urban setting, the odds of TNBC in black women compared to white women with breast cancer were reduced by 26.9%
 - A monotonic dose response was observed for age, with the odds of mortality rising with decreasing age. The association with urban parishes was not significant.
- After adjusting for race and marital status, the results indicate that younger, unmarried women have a higher odds of TNBC than older, married women. This presumably reflects the protective effect of parity on breast cancer development.
- After adjusting for age, stage, and insurance type, the odds of breast cancer-specific mortality due to TNBC in black compared to white women were reduced by 3.4%
 - A monotonic dose response was seen for age, with the odds of mortality rising with increasing age.
 - A similar monotonic dose response was seen for stage, with the odds of mortality rising with increasing stage.
- Thus, although a substantial amount of the racial disparity in odds of developing TNBC rather another form of breast cancer appear to be explainable by the factors in our model, this did not appear to be the case for breast cancer-specific mortality due to TNBC.

STRENGTHS AND LIMITATIONS

- Strengths:** SEER data accounts for all breast cancer cases originating from Louisiana for the years 2010-2012. Thus, the data is fully representative of the state of Louisiana, has undergone rigorous quality control, and provides a relatively large sample for investigation of black-white differences.
- Limitations:** Small numbers limited statistical power for evaluation of some combinations of factors. Additionally, data for a number of variables that could affect results were not available in the SEER database.