Racial and Economic Disparities in Breast Cancer Incidence and Mortality in Pennsylvania

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ABSTRACT

In Pennsylvania (PA), a large socioeconomically diverse state, breast cancer mortality is similar among races when stratified by a municipality’s median income. We sought to characterize disparities in breast cancer incidence and mortality across counties and municipalities in Pennsylvania, comparing incidence and mortality rates for breast cancer by race, sex, and median income. Our analyses were conducted using data from the Pennsylvania Cancer Registry, which collects demographic information for breast cancer diagnoses. The incidence rate for developing breast cancer was also higher in non-White women when controlling for income (p < 0.001). BC incidence, associated with median income (p < 0.001) was greater in the bottom than the top 20% of municipalities. BC mortality was higher in non-White women (p = 0.01) and was significantly across income groups for all races (p < 0.001). Women had the highest rates of mortality across income groups except in the lowest income where women of other races had the highest mortality. Higher income = lower breast cancer mortality. Our results highlight that while breast cancer is more common in White women, mortality rates are higher in Black women. We conclude that while higher income is associated with lower mortality, other factors, such as access to care and quality of care, may play a role in these findings.

INTRODUCTION

Breast cancer outcomes are linked to socioeconomic and demographic variables

1. Non-white women are more likely to present with more advanced disease
2. Despite breast cancer being more common in White women, rates of mortality are higher in Black women
3. Breast cancer disparities are also seen within socio-economic and geographic variables
4. The interaction of biologic, socioeconomic and demographic variables is difficult to measure, especially in large population based data sets

Hypothesis: In Pennsylvania (PA), a large socioeconomically diverse state, breast cancer mortality is similar among races when stratified by a municipality’s median income.

METHODS

PA Cancer Registry — 2011-2016
2574 municipalities, 87 counties
Frequency of breast cancer diagnosis and mortality

RESULTS

FIGURE 1 — Population density from Pennsylvania in the 2010 U.S. Census.

FIGURE 2 — Female breast cancer incidence per 100,000 in years 2011-2015 by county

FIGURE 3 — Breast cancer incidence and mortality stratified by race and income.

DISCUSSION

Foot of high breast cancer incidence statewide in areas of both high and low population density

Disparities exist in both incidence and mortality for:

Income
• Higher income = lower incidence and mortality
• Community size

Race
• Black race = higher incidence and mortality
• White race = lower incidence and mortality

These factors interact with one another such that:
• Higher income decreases odds of mortality for all races, but is most pronounced in non-White patients
• Community size decreases odds of mortality only for White patients undergoing less socioeconomic deficiencies in urban patients

QUESTIONS & FUTURE WORK

• Are there differences in the rates of screening mammography among these demographic and socioeconomic groups?
• Are there differences in the rates and type of insurance between these groups?
• How do biologic factors such as stage at diagnosis and breast cancer subtype interact with socioeconomic and demographic variables?
• What is the mean distance to a healthcare facility for each community?
• Are these groups equivalent in the types of treatment modalities used and insurance coverage?
• Does the interaction of biologic and demographic variables affect outcomes?
• How do biologic factors such as stage at diagnosis and breast cancer subtype interact with socioeconomic and demographic variables?
• How do these factors interact with one another such that:
• Higher income decreases odds of mortality for all races, but is most pronounced in non-White patients
• Community size decreases odds of mortality only for White patients undergoing less socioeconomic deficiencies in urban patients

REFERENCES


TABLE 1 — Regression models of breast cancer incidence and mortality for race, income, and community size.