

Contributing Factors to the High Breast Cancer Death Rates among Black Women in Louisiana

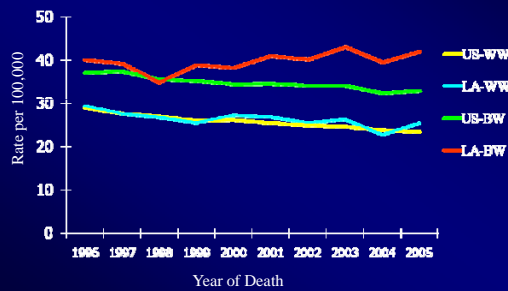
Xiao-Cheng Wu, Xiang-Rong Li, Vivien W Chen,
Patricia Andrews, Donna Williams

NAACCR Annual Meeting, Quebec, QC, Canada, 2010

Background

- Breast cancer death rates have decreased in the past 15 years among both white and black women in the US.
- In Louisiana, decreases in breast cancer death rate occurred among white women only; the death rate among black women remains stable.
- Breast cancer death rates were 64% higher among blacks than whites in Louisiana in 2003-2007; much higher than in the US (40% higher).

Breast Cancer Death Rates by Race and Year
Louisiana vs. US



Background

- Associated factors with elevated breast cancer death rate
 - high incidence rate
 - late diagnosis
 - aggressive tumor characteristics
 - treatment
 - comorbidity

Background

- Incidence rates:**
118 per 100,000 (whites) vs. 122 per 100,000 (blacks) in Louisiana, 2003-2007
- Advanced stage (regional + distant):**
30% (whites) vs. 40% (blacks) in Louisiana, 2003-2007
- Tumor aggressiveness:** Blacks were more likely than whites to have more aggressive breast cancers (ER/PR negative, high grade, Her2 positive)

Background

- Treatment:** Blacks were less likely to receive guideline-concordant care than whites for surgery, radiation, and hormone therapy according to 1997 data collected through the CDC-NPCR POC 1 study .
- Comorbidity:** Blacks were more likely to have a higher comorbidity score than whites.
- The CDC POC BP study provided an opportunity to do this analysis with more current and complete information.

Objectives

- Determine contributing factors to the higher breast cancer death rate in blacks than whites in Louisiana.
- Identify target areas for reducing racial disparity in breast cancer death

Methods

- Data from the CDC-NPCR funded Patterns of Care study (CDC POC BP)
- 1,727 in situ and invasive female breast cancers first primary) diagnosed in 2004. Cases randomly selected through race-stratified random sampling
- Data were abstracted from hospital medical records and verified with treating physicians

Methods

- Follow-up and census tract-level socioeconomic status (SES) supplemented to the analytic data set
- Socioeconomic measures at census tract-level from the 2000 US Census
 - **poverty**: <20 or 20%/+ persons under poverty level
 - **education**: <25% or 25% + no high school education
 - **working class**: <66% or 66%+ working class persons
 - **residence**: urban, rural, and mixed

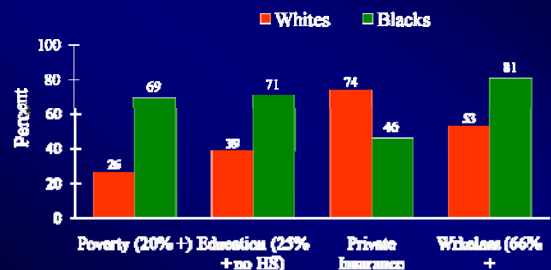
Methods

- Chi-square test , Kaplan–Meier method, and Cox proportional hazards regression were used (significant level $p < 0.05$).
- All causes survival were examined (14% unknown cause of death)
- SAS-callable –Sudaan 10.0.1 was used to analyze the weighted data

Results

- 1,004 whites and 723 black breast cancer cases.
- Compared with whites, blacks were younger, more likely to be unmarried, live in urban, and areas with high poverty and working class and low education.
- Blacks were less likely to have private insurance and more likely to have public or no insurance.

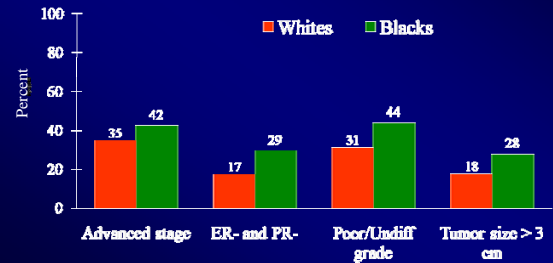
Racial Differences in Socioeconomic Characteristics
Breast Cancer, Louisiana, 2004



Results

- Blacks were more likely to be diagnosed at late stage and have large size and aggressive tumors.
- 50% of breast cancers detected by mammogram screening in whites but only 41% in blacks

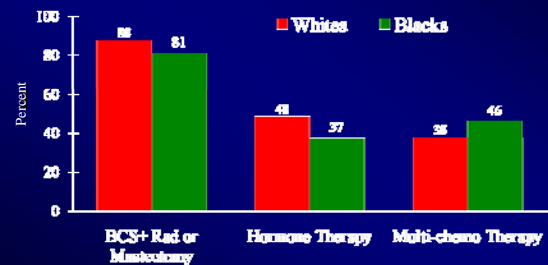
Racial Differences in Tumor Characteristics
Breast Cancer, Louisiana, 2004



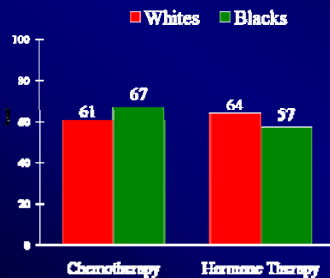
Results

- About 20% blacks received breast conserving surgery (BCS) without radiation or had no surgery; much higher than 12% in whites.
- Blacks were more likely than whites to receive multi-agent chemotherapy and less likely to receive hormone therapy.

Racial Differences in the 1st Course Treatment
Breast Cancer, Louisiana, 2004



Racial Differences in Receiving Guideline Adjuvant Therapy.¹ Breast Cancer, Louisiana, 2004



Chemotherapy Guidelines

Localized: Chemo for those under age 70 with tumor ≥ 1 cm or age 70+ with tumor ≥ 1 cm and comorbidity score = 0

Regional: Chemo for all under age 70 or those age 70+ comorbidity score = 0

Hormone therapy Guidelines:

ER or PR positive localized and regional tumors

Results

- The 5-year overall survival rate was 73% in blacks; much lower than 81% in whites.
- The Hazard ratio of blacks vs. whites was 1.71 after adjusting for age.
- All the socioeconomics, stage, tumor characteristics, and treatment were statistically significantly associated with the risk of all-cause death.

Black-White Differences in Risk of All-Cause Death

Variables in the model	Hazard Ratio of blacks to whites (95% CI)	% decreases in Hazard Ratio from Model 1
Model 1: Race + Age	1.71 (1.40 – 2.10)	
Model 1 + SES ¹	1.49 (1.17 – 1.88)	13%
Model 1 + Insurance ²	1.42 (1.15 – 1.75)	17%
Model 1 + Marital status ³	1.56 (1.27 – 1.92)	9%

¹ Census-level poverty, education, and working class as well as urban/rural
² Private insurance: private only, private + supplement to public insurance.
 Public insurance: Medicare, Medicaid and other federal or state funded insurance
³ Married, single, others, and unknown

Black-White Differences in Risk of All-Causes Death

Variables in the model	Hazard ratio of Blacks to Whites (95% CI)	% decreases in Hazard ratio from Model 1
Model 1: Race + Age	1.71 (1.40 – 2.10)	
Model 1 + Tumor stage	1.50 (1.20 – 1.86)	12%
Model 1 + Tumor characters (tumor size, grade, ER/PR)	1.43 (1.16 – 1.76)	16%
Model 1 + Comorbidity ¹	1.64 (1.33 – 2.01)	4%
Model 1 + Treatment (surgery, radiation, chemo, and hormone)	1.47 (1.18 – 1.83)	14%

Piccirillo comorbidity score (0, 1, 2/+)

Black-White Differences in Risk of All-Cause Death

Variables in the model	Hazard ratio of blacks to whites (95% CI)
Model 1: Race + Age	1.71 (1.40 – 2.10)
Model 2: Model 1 + Tumor stage	1.50 (1.20 – 1.86)
Model 3: Model 2 + Tumor characters	1.34 (1.07 – 1.68)
Model 4: Model 3 + Comorbidity	1.29 (1.03 – 1.63)
Model 5: Model 4 + Treatment	1.13 (0.90 – 1.42)
Model 6: Model 5+ Insurance	1.03 (0.80 – 1.32)
Model 7: Model 6 + Marital status	0.99 (0.77 – 1.28)
Model 8: Model 7 + SES	0.88 (0.65 – 1.18)

Discussion

- The high risk of all-cause death among black breast cancer patients was attributable to multiple factors: socioeconomics, clinical factors, and treatment.

Discussion

- Stage at diagnosis
 - Higher percent advanced disease in blacks than whites.
 - Community-level intervention are needed to increase breast cancer screening rate among blacks

Discussion

- Tumor characteristics contribute significantly to the low survival among blacks than whites
 - Percentage of large size, high grade, and receptor negative tumors were higher in blacks than whites.
 - Increase early detection of breast cancer
 - Increase the awareness of importance to breast cancer early detection at community level

Discussion

- The 1st course treatment contributed significantly to the black-white differences in risk of all-cause death is
 - Increase radiotherapy after BCS
 - Reduce pre-mature termination and low doses of chemotherapy
 - Increase use of hormone therapy for hormone receptor positive tumor

Discussion

- Comorbidity contributed to the black-white differences in the risk of all-cause death. The contribution was smaller than all other factors.
- Health insurance was an important factor. It may be related to education, access to care, and barriers for early detection and compliance with the guideline therapy.