Breast Cancer and Comorbidities Missouri, 2002–2012

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Presenter Disclosures

Jeannette Jackson-Thompson

(1)   The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose

Acknowledgments

Background

- Comorbidities (e.g., diabetes and hypertension) can significantly impact mortality among women with a recent diagnosis of breast cancer;

- The extent to which comorbidities can explain disparities in survival is unknown.

Background (cont'd)

- Missouri has high rates of mortality from female breast cancer as well as a variety of cardiovascular risk factors (e.g., diabetes, hypertension and obesity).
- Comorbidity rates are higher among individuals with certain characteristics (i.e., low household income, less education, African American or elderly).

Background (cont'd)

- The Missouri Cancer Registry (MCR) has population-based data on cancer incidence and survival but not on comorbidities.
- We linked MCR data with DHSS's population-based hospital discharge data.
- MU and JHU researchers then collaborated on a pilot project.

Purpose

- Conduct a pilot project to test the hypothesis that the co-existence of breast cancer and comorbidities contributes to disparities in mortality.

Methods

- MU & JHU researchers developed inclusion criteria for women (N≈55,000) diagnosed with breast cancer:
  - ≥18,
  - diagnosed 1/1/2002–12/31/2012, &
  - Missouri resident
- MU researchers conducted a preliminary analysis on MCR data.

Methods (cont'd)

- We merged data extracted from the MCR database (previously linked with Missouri death files and the National Death Index) with individual-level data from the Missouri Patient Abstract System (PAS; hospital discharge database for 1/1/2001–12/31/2014).

Methods (cont'd)

- After linkage, MCR researchers removed identifiers and sent the linked MCR-PAS dataset to JHU researchers for further analysis to assess mortality/survivorship by:
  - age,
  - race,
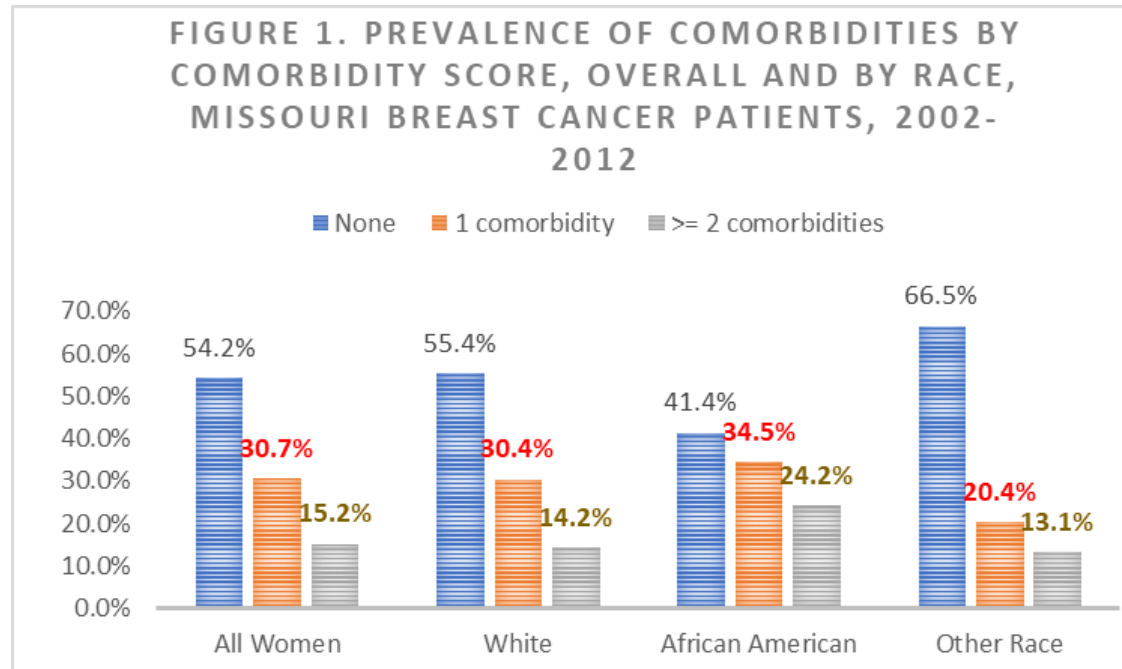 - geographic location (urban v. rural), &
  - income.

Methods (cont'd)

- Based on the ICD-9 diagnosis codes from the PAS hospital discharge data, JHU researchers identified & focused on 3 comorbidities at diagnosis:
  - Essential hypertension,
  - Cardiovascular disease (CVD), &
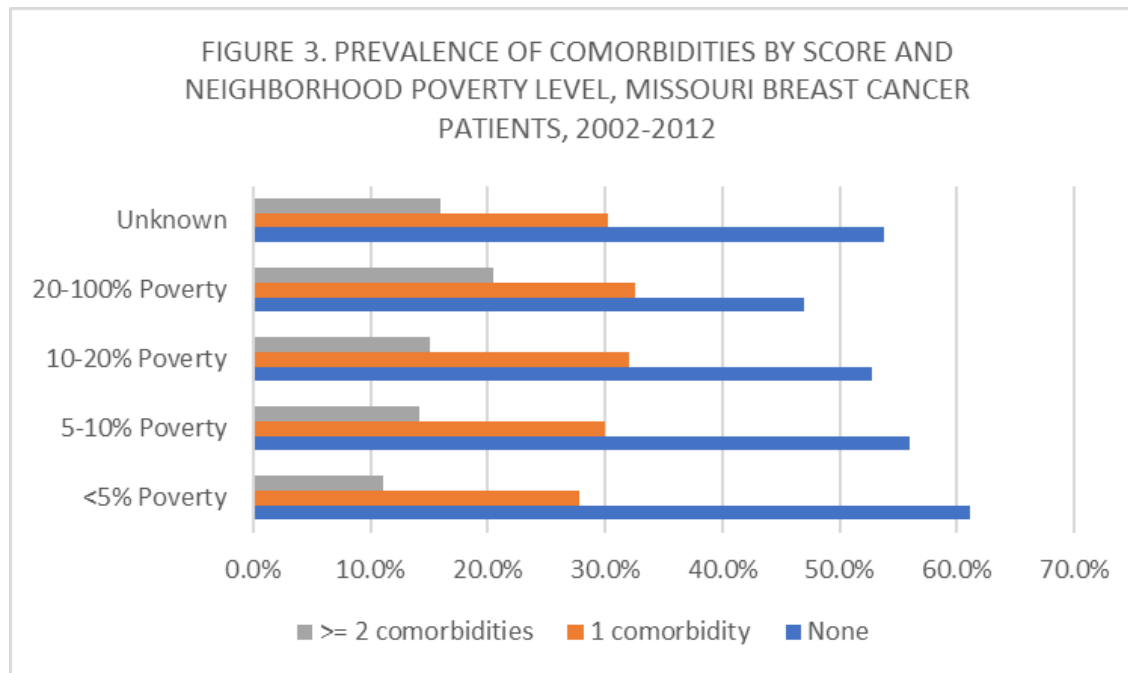 - Type-2 diabetes

Methods (cont'd)

- Adjusted hazard ratios (HRs) and 95% confidence intervals (CIs) were calculated by stratified Cox proportional hazards regression models for associations with mortality outcomes overall and by our selected groups.

- The model adjusted for selected comorbidities (hypertension, CVD, type-2 diabetes), age at diagnosis, race, breast cancer stage, estrogen/progesterone receptor (ER/PR) status, breast cancer treatment, and urban/rural residence.

Results: distribution of the 3 selected comorbidities

FIGURE 1. PREVALENCE OF COMORBIDITIES BY COMORBIDITY SCORE, OVERALL AND BY RACE, MISSOURI BREAST CANCER PATIENTS, 2002-2012
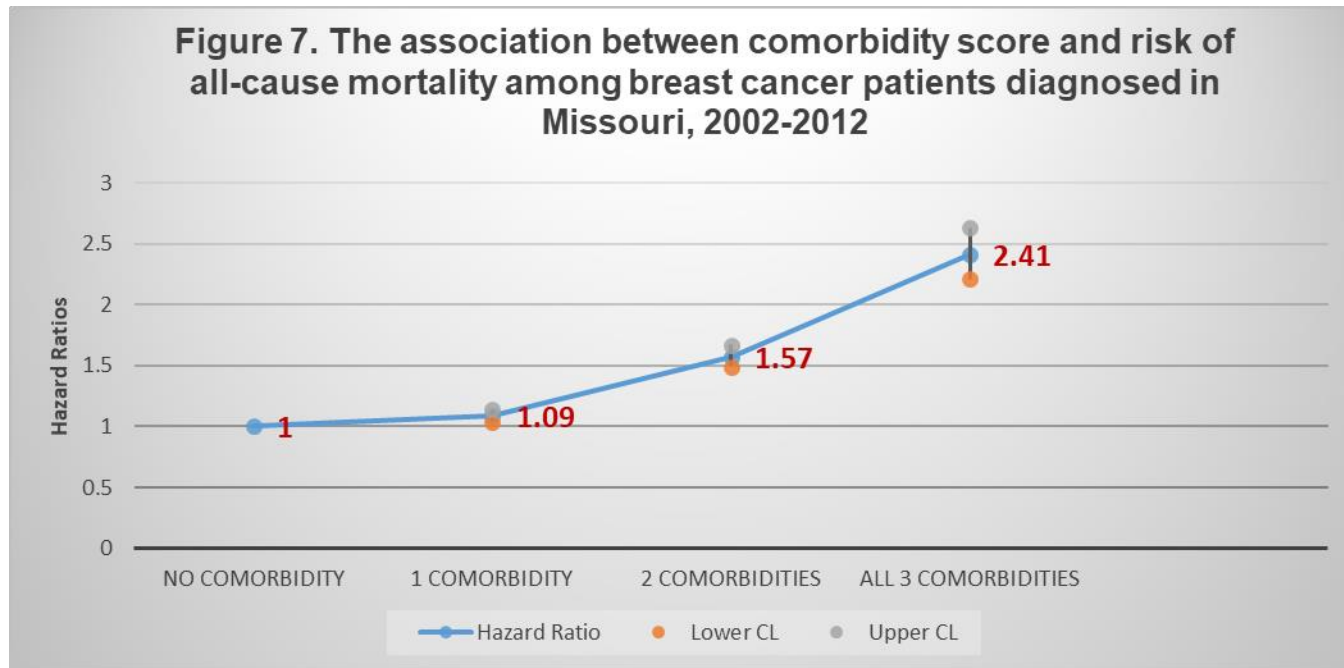
- 30.7% of women had 1 comorbidity, 15.2% had 2+.
- The prevalence of the 3 comorbidities was higher among African American women:
  - Over half had 1+ comorbidity (34.5% had 1, while 24.2% had 2+ comorbidities).

Results: distribution of the 3 selected comorbidities (cont'd)

FIGURE 3. PREVALENCE OF COMORBIDITIES BY SCORE AND NEIGHBORHOOD POVERTY LEVEL, MISSOURI BREAST CANCER PATIENTS, 2002-2012
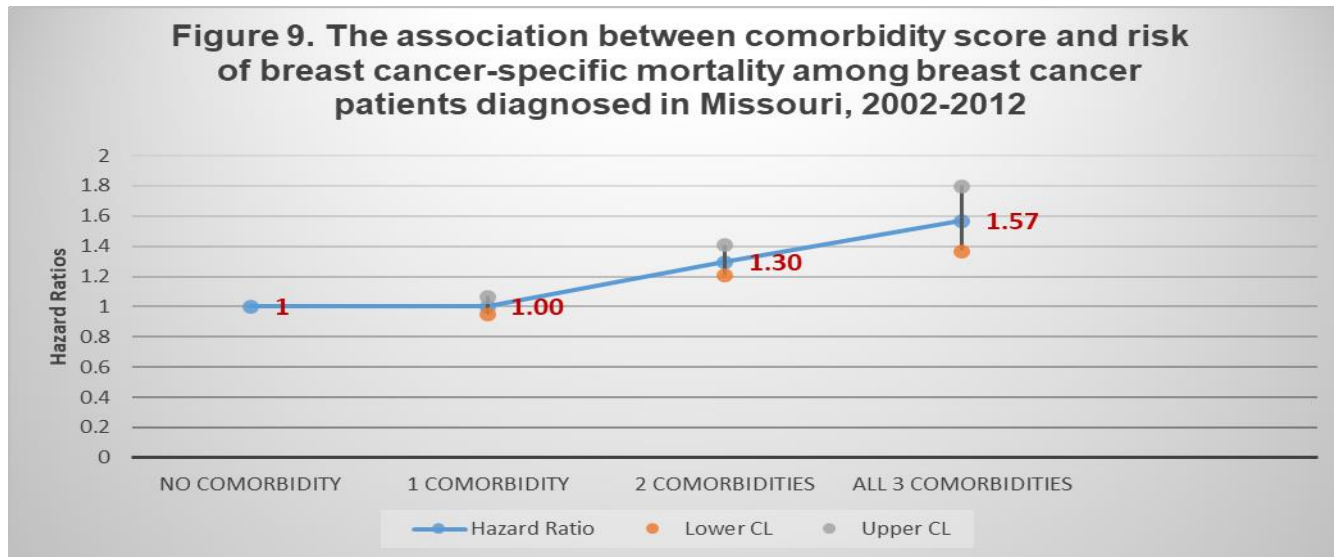
- 20.5% of women living in neighborhoods with >20% of the population below poverty were burdened by 2+ comorbidities.
- But only 11.1% living in neighborhoods with <5% of the population below poverty.
- **The results suggest that the higher the population in poverty, the greater the prevalence of comorbidities.**

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Results: survival

Figure 7. The association between comorbidity score and risk of all-cause mortality among breast cancer patients diagnosed in Missouri, 2002-2012

- Increasing number of comorbidities was significantly associated with all-cause mortality ($p_{trend} < 0.001$).
- **Breast cancer patients with all 3 comorbidities had over a 200% increase in risk of death compared to those without these comorbidities (HR, 2.41; 95% CI 2.21-2.63).**

Results: survival (cont'd)

Figure 9. The association between comorbidity score and risk of breast cancer-specific mortality among breast cancer patients diagnosed in Missouri, 2002-2012

- **Similarly, for BC-specific survival:**
  - the greater the number of comorbidities the higher the risk of breast cancer mortality ($p_{trend} < 0.001$).
  - Women with 2 comorbidities had a 30% increase in BC mortality,
  - And a 57% increase with 3 comorbidities.

Conclusions/Discussion

- A total 46% of women with breast cancer had at 1+ of the 3 comorbidities.
- The prevalence of comorbidity was higher among African American women, with over half of them having 1+ comorbidities.
- A higher percentage of women living in neighborhoods with >20% of the population in poverty were burdened by 2+ comorbidities (20.5%) compared to breast cancer patients living in neighborhoods with <5% of the population in poverty (11.1%).

Conclusions/Discussion (cont'd)

- There were differences in mortality based on the presence of comorbidities by age, race and poverty.
- Women with 2 comorbidities had a 30% increase in breast cancer mortality and with 3 comorbidities, a 57% increase in breast cancer mortality.

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