

Ethnic Differences in Breast Cancer Incidence and Mortality in the US-Mexico Border States



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Comparison of Outcomes Following Allogeneic Hematopoietic Cell Transplant




The Arnold Building and Vessel sculpture photo credit: Fred Hutch Cancer Research Center

Why a thesis?

- Shows ambition to learn
- Develop writing skills
- Deeper understanding of the field
- Contributions to research
- “Stronger application if you apply for a PhD” – Dr. Barrington
- “Gives you something to talk and impress employers with during your job search” – Former Student


Research topic

- Help from advisors Drs. Gard and Sroka
- Literature search
- Southwest Institute for Health Disparities Research (SWIHDR) workshop



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BACKGROUND

- Hispanics in the US commonly have socioeconomic characteristics pertaining to high levels of poverty and a higher percentage of uninsured^{1,2}
- Prior studies have shown the 'Hispanic paradox' in the US where despite having a lower socioeconomic status, the Hispanic white population has an overall lower mortality rate than non-Hispanic whites in the US³
- For example, in 2015, 14% of US breast cancer deaths were Hispanic white women while 21% were non-Hispanic white women⁴
- Nonetheless, in 2015 a study found that, among Hispanic women in the US, breast cancer was the leading cancer for diagnosis (estimated 29%) and deaths (16%)⁵

STUDY OBJECTIVES

1. To compare ethnic differences in breast cancer incidence rates in the US-Mexico border states
2. To compare ethnic differences in breast cancer mortality rates in the US-Mexico border states
3. To investigate breast cancer screening facility availability in the US-Mexico border states

STUDY POPULATION

- Hispanics and non-Hispanic white women living in the four border states including California, Arizona, New Mexico, and Texas (Figure 1.)
- This study included 1,067,569 women diagnosed with breast cancer, 173,706 breast cancer deaths, and 1,493 mammography facilities
- Breast cancer diagnosis sample size breakdown: Arizona 19%, California 36%, New Mexico 17%, and Texas 28%
- Breast cancer deaths sample size breakdown: Arizona 19%, California 37%, New Mexico 16%, and Texas 29%
- Mammography facility sample size breakdown: Arizona 11%, California 50%, New Mexico 31%, and Texas 36%

RESULTS

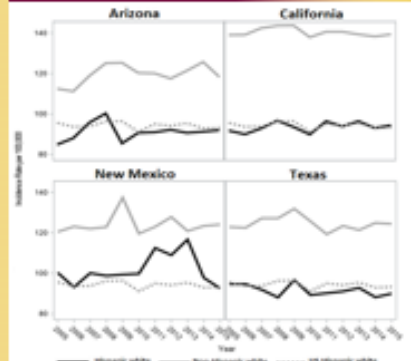


Figure 1. Border states age-adjusted breast cancer incidence rate by year and ethnicity.

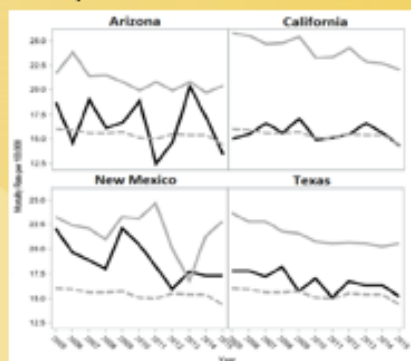


Figure 2. Border states age-adjusted breast cancer mortality rate by year and ethnicity.




Figure 3. The US-Mexico border region is red.

METHODS

Data

- We used the WONDER online database from the Centers for Disease Control and prevention to analyze breast cancer incidence and mortality rates over a 10-year period (2005 to 2015)
- We retrieved mammography facility data from the U.S. Food and Drug Administration (last updated 04/01/19)
- 2017 bridged-race population estimates from the WONDER database website
- Both Hispanic and non-Hispanic ethnicities were limited to white race

Analysis

- We plotted ethnic trends over time using age-adjusted rates for breast cancer incidence and mortality
- We calculated mammography facilities rate per 10 million using the

DISCUSSION

Women in the border states have a lower breast cancer incidence (Figure 2.) and mortality rate (Figure 3.) if they are Hispanic white than if they are non-Hispanic white

Arizona

- Arizona experienced notable inconsistencies in breast cancer mortality for Hispanic white women (Figure 3.) and had the highest rate of mammography facilities per 10 million.

California

- California has the highest breast cancer incidence (Figure 2.) and mortality rate (Figure 3.) for non-Hispanic white women than any other border state and experiences the greatest gap between the two ethnicities
- California has the lowest rate of mammography facility per 10 million

New Mexico

- New Mexico experienced a spike in breast cancer incidence for Hispanic white women in 2010 to 2014 and for non-Hispanic white women in 2009 (Figure 2.)
- Both ethnicities follow similar breast cancer mortality trends in New Mexico and Hispanic white women overall hold higher mortality rates than all other border states with the exception of Arizona in 2003 (Figure 3.)

Texas

- Breast cancer mortality in Texas decreased over 10 years for both ethnicities (Figure 3.) while breast cancer incidence had little change (Figure 2.)

FUTURE DIRECTIONS

- Further refinement of breast cancer incidence and mortality rates at the county level are recommended to limit the influence from the entire state on the border region
- Mapping the mammography facilities in the US-Mexico border states is presently a work in progress
 - The objective is to highlight any rural areas that lack a near by facility and to explore the relationship with screening rates and proximity to the closest facility
- Though not examined in this study, breast cancer screening rates differences along the US-Mexico border region are of interest moving forward
 - Breast cancer screening rates are anticipated to help bridge a relationship between incidence and mortality

ACKNOWLEDGEMENTS

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- **SWIHDR WORKSHOP PRESENTERS:** M. A. McDonald (Director), Charlotte C. Gard, Leonard J. Paulozzi, Christopher J. Sroka

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State	Mammography Facilities per 10,000,000
Arizona	10
New Mexico	8.8
Texas	8.6
California	7.4

Study population and objectives



Study population: Women living in California, Arizona, New Mexico, and Texas

Study Objectives:

To compare the US-Mexico border states

1. For ethnic differences in breast cancer **incidence rates**
2. For ethnic differences in breast cancer **mortality rates**
3. For breast cancer **screening facility availability**

Data Source

Data - Breast cancer incidence and mortality

- Cancer statistics WONDER online database from the Centers for Disease Control and prevention (CDC)

Data - Mammography facility

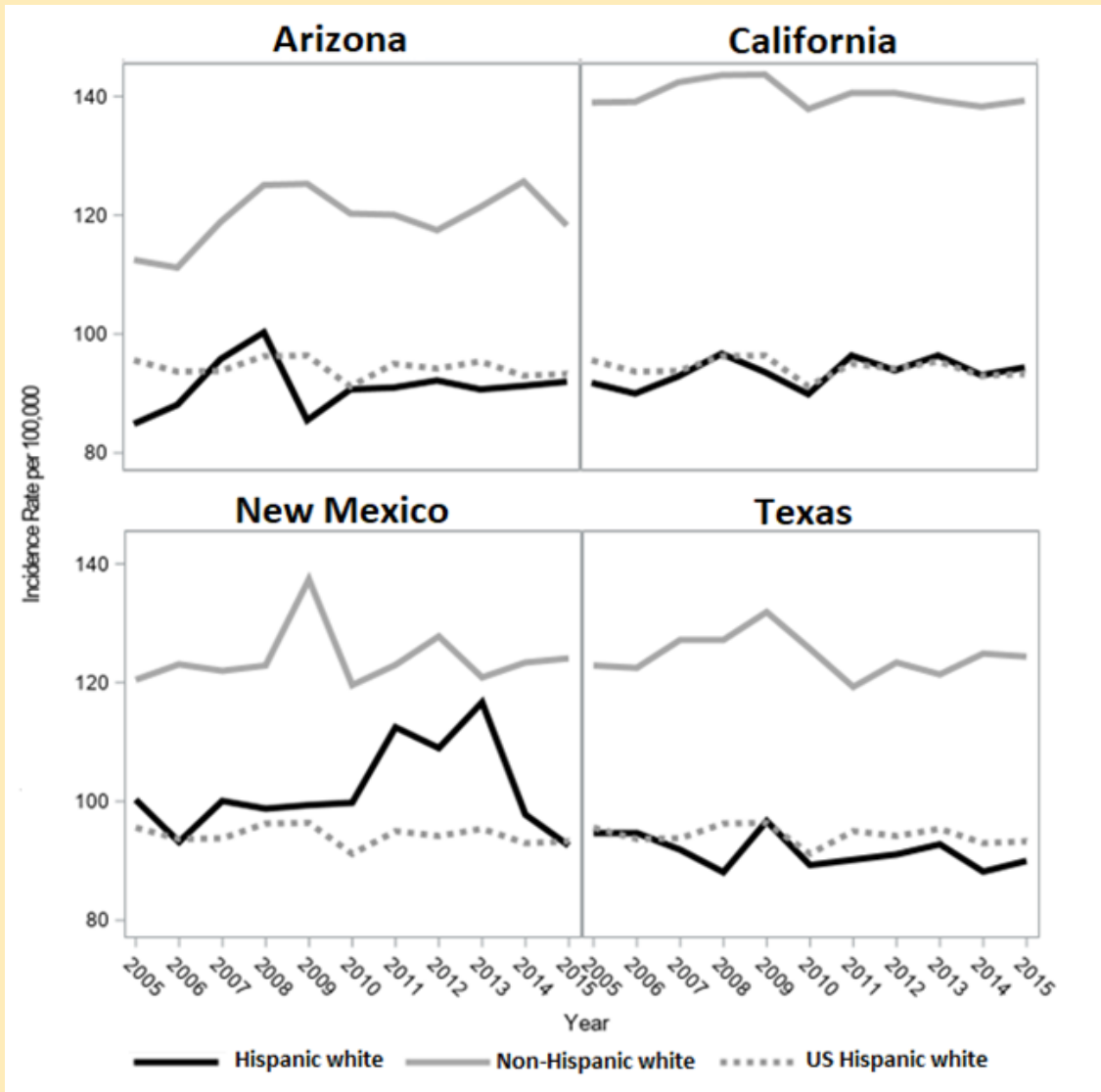
- U.S. Food and Drug Administration (FDA)

Data – Breast cancer screening (in progress)

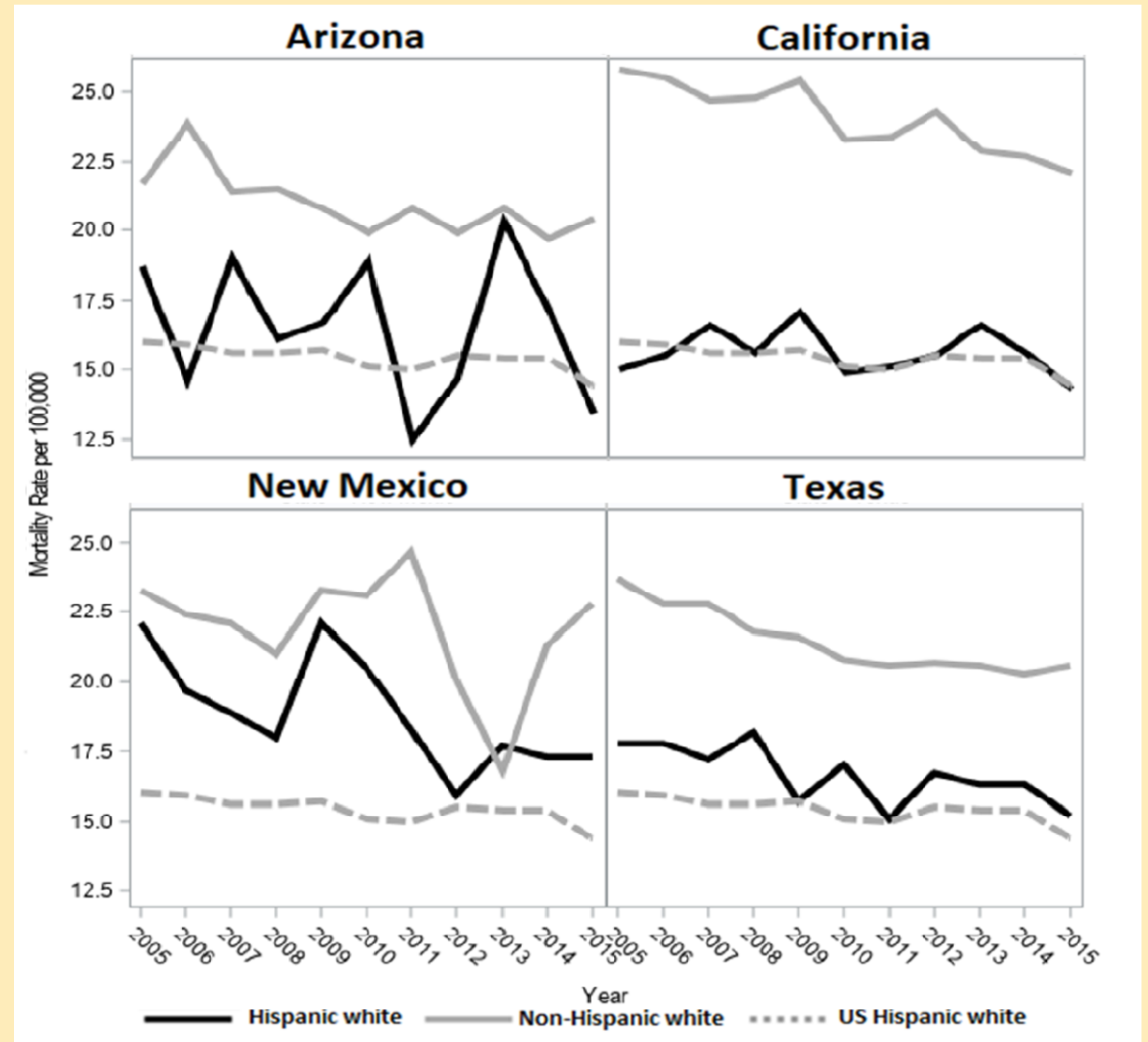
- Behavioral Risk Factors Surveillance System (BRFSS)
- Breast Cancer Surveillance Consortium (BCSC)

Results

Breast cancer incidence

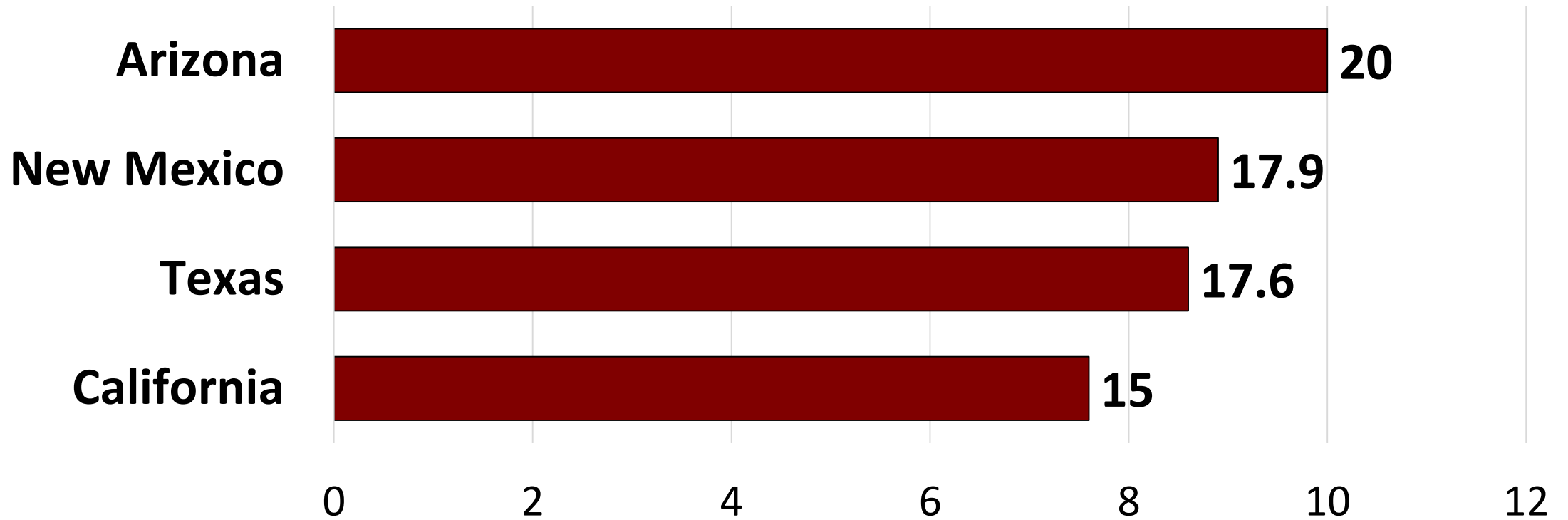


Breast cancer mortality



Results

Mammography Facilities per 100,000 Women



Future Directions

- Further refine breast cancer incidence and mortality rates at the county level
- Map the mammography facilities in the US-Mexico border states (work in progress)
- Ethnic differences in breast cancer screening rates along the US-Mexico border region (work in progress)

Thank you