Uneven Progress: A Two-Decade Analysis of Regional Variations in Breast Cancer Mortality in the United States

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Background

Breast cancer remains a leading cause of cancer death among U.S. women. Despite significant advances in breast cancer screening and treatment leading to declining national mortality rates, regional disparities in healthcare access and socioeconomic factors may contribute to uneven progress across U.S. geographic regions. This study aims to quantify these disparities and identify areas where tailored interventions may be needed.

Method and Materials

- Study design: Retrospective cohort study using CDC WONDER database (ICD-10)
- Population: Women who died of breast cancer as underlying cause of death, 2000-2023.
- Outcome measure: Age-adjusted mortality rates per 100,000 persons, standardized to 2000 US census data.
- Stratification: Rates analyzed by census region (Northeast, Midwest, South, West).
- Analysis: Linear regression models used to calculate average annual reduction (AAR) and overall 24-year trends. Regional differences assessed to identify geographic disparities in mortality outcomes.

Results

A total of 995,078 deaths from breast cancer were identified between 2000 and 2023 in the United States.

Census-Specific Breast Cancer Mortality Trends in Women (2000–2023)

Census Region	AAMR (95% CI)	AAMR Percent Decline	Average Annual Reduction	Notable Observation
National Average	21.8 (20.7–22.9)	31.3%	1.30%	Sustained national improvement over 24 years.
Northeast	21.8 (21.3–22.3)	39.4%	1.68%	Highest reduction; model for regional progress.
Midwest	22.4 (21.9–22.8)	33.2%	1.44%	Strong improvement, slightly below Northeast.
South	22.3 (21.9–22.7)	24.4%	1.02%	Lowest reduction; priority region for intervention.
West	20.8 (20.4–21.3)	27.7%	1.20%	Moderate gains with recent fluctuations.

Conclusions

- One of the largest population-based studies, analyzing nearly 1 million breast cancer deaths in women (2000–2023)
- Mortality declined 31.3% overall, with an average annual reduction of 1.30%
- Regional disparities:
  - Northeast: Leading decline (39.4%, 1.68% annually)
  - South: Most modest decline (24.4%, 1.02% annually)
- To ensure equitable mortality reductions nationwide, findings highlight need for region-tailored strategies, such as enhancing screening outreach, closing healthcare access gaps, and addressing socio-demographic risk factors

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