

Breast Cancer Risk Assessment

Clinical Relevance

- The Breast Cancer Risk Assessment Tool (BCRAT) created by the National Cancer Institute is commonly used to estimate the average woman's 5-year and lifetime risk of development of invasive breast cancer.¹ Risk estimates are often considered during shared decision-making regarding breast cancer screening.
- Race and ethnicity are included under the demographics section as qualitative risk factors affecting calculation of risk. Notably, “white race increases the risk of breast cancer”.
- Per the disclaimer provided by NCI: “The tool **may underestimate risk in black women with previous biopsies and Hispanic women born outside the United States**. Because data on American Indian/Alaska Native women are limited, their risk estimates are partly based on data for white women and may be inaccurate.”¹
- Epidemiology: Age-adjusted incidences of breast cancer for all minority groups were lower when compared to white women². **Minority women, particularly Black women, are more likely to present with cancers with unfavorable characteristics** (eg. high grade, estrogen receptor negative) and have higher rates of mortality^{2,3}.

Historical Roots

- The Breast Cancer Risk Assessment Tool (BCRAT) is based on a statistical model known as the Gail Model, named after [Dr. Mitchell Gail](#), Senior Investigator in the Biostatistics Branch of the [NCI Division of Cancer Epidemiology and Genetics](#)
- The data utilized to develop the model are summarized at the bottom of this article. **White patients made up the vast majority of the sample population** (280,000 White patients vs 3,244 black patients, 1,563 AAPI patients, and 2,497 Hispanic/Latinx patients).

Frequent Misconceptions

- **Black race is a biological factor associated with increased mortality from breast cancer.**
 - Mortality rates in the US for Black women were lower than for White women prior to 1980. In the 1980s, mammography screening and adjuvant endocrine therapy were widely implemented in the US. Racial disparity in outcomes can be associated with advancement in breast cancer management and differences in access to care.⁴

How Adjustment Contributes to Health Inequity

- Models estimate the risk of being diagnosed with breast cancer rather than risk of mortality due to breast cancer. **It does not address or provide information about outcomes of disease.**

Authors: Dana Phan, she/her, MD candidate, Brown University

Reviewers: Sudheesha Perera, he/him, MD candidate, Brown University

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- The BCRAT estimates a lower risk of breast cancer development for Black women compared to white women, but this may lead to a false sense of security in clinical guidance given that Black women have higher mortality.
 - This lower risk may **influence individual patients' decisions to delay initiation of mammographic screening**, even though Black women tend to be diagnosed at a younger age compared to White women.⁵

Possible Solutions

- On an individual level:
 - Consider focusing on more individualized factors (eg. family history, age) in clinical decision-making regarding screening.
- On a systemic level:
 - Include more racial and ethnic diversity in studies that are used to develop and validate risk assessment tools
 - The NCI states, “The model needs further validation for Hispanic women and other subgroups.”¹
 - Health care literacy for immigrant and minority populations/promotion of preventative care

Takeaway Points

- Risk assessment tools estimate the risk of **diagnosis** of breast cancer, not **morbidity/mortality**.
- Access to preventative care resources may underestimate risk for women of racial/ethnic minorities.

References

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Appendix

Summary of Data Used in Development of BCRA^T

Racial/ethnic group	Study	Sample size
All	Surveillance, Epidemiology, and End Results (SEER) Program by National Cancer Institute	229,594
White	Breast Cancer Detection Demonstration Project (BCDDP)	280,000
Black	Contraceptive and Reproductive Experiences (CARE) Study	3,244 (1,607 women with invasive breast cancer, 1,637 without)
Asian and Pacific Islander (AAPI)	Asian American Breast Cancer Study (AABCS)	1,563 (597 women with invasive breast cancer, 966 without)
Hispanic/Latina	San Francisco Bay Area Breast Cancer Study (SFBCS)	2,497 (1,086 women with invasive breast cancer, 1,411 without)

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