

New Tools May Better Predict Breast Cancer in Women of African Descent

Women of African ancestry with high polygenic risk scores might benefit from earlier and more intensive screenings.

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A large consortium of scientists has developed [new tools](#) for more accurately predicting breast cancer in women of African ancestry, a historically underserved population with disproportionately high death rates.

The genetic risk assessment tools will help promote more equitable cancer prevention, the scientists wrote in *Nature Genetics*. Dezheng Huo of the University of Chicago led the 20-institution consortium that included Xiaoyu Wang of the Frederick National Laboratory for Cancer Research.

The breast cancer fatality rate for women of African ancestry remains elevated – 40% higher than women of European descent – because of later-stage diagnosis, greater susceptibility to aggressive cancers (such as triple-negative), and the failure of existing genetic tests to accurately predict risk for this group, the scientists said.

To address this issue, the researchers developed new polygenic risk factor models, which analyze many thousands or millions of small genetic variants across an individual's genome and generate a personalized risk score that can predict disease in early stages, when prevention and close monitoring are most effective.

The consortium used genetic data from more than 36,000 women from the African Ancestry Breast Cancer Genetics consortium, the largest such dataset available for breast cancer in women of African ancestry and twice the sample size of existing models. They also incorporated genetic data from 94,075 individuals of European descent to account for racial blending.

“By accounting for genetic diversity and shared ancestry between African and European populations, these methods increased the statistical power and accuracy of our polygenic risk score models in women of African ancestry,” the scientists noted. They “currently have the highest reported predictive performance” in women of African ancestry.

The validated computer models were built around four especially aggressive breast cancer

phenotypes: overall breast cancer, estrogen-receptive-positive and ER-negative disease, and triple-negative breast cancer, all of which rapidly worsen and have poor outcomes. The models were also validated in external studies. The group also created simplified models for improved usability at lower cost, a potential step toward clinical use.

The American Cancer Society urges women to begin regular annual mammography screenings at age 45. Women of African ancestry with high PRS scores might benefit from earlier and more intensive screenings with mammography or magnetic resonance imaging, the researchers said.

Elevated polygenic risk scores for estrogen-positive breast cancer combined with other risk factors may warrant consideration of chemoprevention for women of African ancestry, the scientists said.

Polygenic risk scores are not widely used in the clinic but are moving in that direction as one element in assessing risk for chronic diseases, such as cancer. They are, however, [only one component](#) of determining disease risk that also includes clinical variables, family history, lifestyle, environmental exposures and other data.

Collaborator Xiaoyu Wang is a scientist in the Frederick National Laboratory's Cancer Genomics Research Laboratory.

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