

## **Title: Germline testing in Asian American and Pacific Islander women with breast cancer**

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**Background:** Per the American Cancer Society, the overall breast cancer incidence rate rose 1% per year from 2012 to 2021, while it increased 2.7% per year for Asian American and Pacific Islander(AAPI) women. Cases increased by 50% for AAPI women under age 50, on par with White women. This study was conducted to examine rates and results of germline genetic testing in AAPI women with breast cancer.

**Methods:** In this retrospective analysis, AAPI women with breast cancer were identified from a non-consecutive dataset of patients undergoing multi-gene panel testing (MGPT) at a national clinical diagnostic laboratory. Descriptive statistics were performed and differences in variant frequencies between groups were assessed using two-proportion z-tests.

**Results:** From January 2016 through April 2025, 3.8% of women who underwent germline genetic testing reported AAPI ancestry (50,043/1,320,261). AAPI women made up 4.1% of all women with breast cancer who underwent MGPT. Comparatively, the most recent U.S. Census data from 2024 showed 7.0% of the population self-identified as AAPI women.

The median age of AAPI women who underwent germline testing was 54 years and the most frequent pathogenic/likely pathogenic (P/LP) variants in order were BRCA2, BRCA1, ATM, PALB2, TP53, and CHEK2 (56.0% of P/LP variants). Most AAPI women (79%) resided in large metropolitan areas, and more than half (53%) had private insurance.

AAPI women with breast cancer had lower rates of P/LP variants compared with White women (6.8% vs. 9.2%;  $p < 0.0001$ ) and all non-AAPI women tested (6.8% vs 8.9%;  $p < 0.0001$ ). Among women  $\leq 50$  years, P/LP rates remained lower in AAPI compared with White women (7.9% vs 10.7%;  $p < 0.0001$ ) and all non-AAPI women (7.9% vs 10.5%;  $p < 0.0001$ ). Younger AAPI women exhibited higher P/LP rates than older AAPI women (11.2%  $< 40$  vs 6.24%  $> 40$ ), consistent with age-associated trends across ethnicities (14.0% all non-AAPI  $< 40$  vs 8.45% all non-AAPI  $> 40$ ).

**Conclusions:** In this study cohort, AAPI women with breast cancer make up a smaller than expected proportion of all tested women with breast cancer, despite similar breast cancer incidence rates as White women. AAPI women with breast cancer who had genetic testing tended to reside in large metropolitan areas and have private insurance. These factors and others should be considered when thinking about how to broaden access to genetic testing and counseling in the future, especially in younger AAPI women who have comparably higher rates of P/LP variants.