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Evolution of Homologous Recombination Repair (HRR) Genetic Testing by Race Among Patients with Metastatic Prostate Cancer (mPC) in a Large Community Oncology Setting in the US, 2015–2024

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The US Oncology Network

Background

- Prostate cancer is marked by persistent racial inequities, with Black men experiencing earlier onset, more advanced disease at diagnosis, and higher mortality compared with White men.[1]
- Despite guideline advances in molecularly guided therapy, concerns remain that access to recommended diagnostic innovations may be uneven across racial groups in routine oncology care.[2]
- HRR gene alterations (e.g., BRCA1/2, ATM, PALB2) affect approximately 20 to 30% of patients with metastatic prostate cancer (mPC) and guide poly (ADP-ribose) polymerase inhibitors (PARPi) use; inequitable access to timely next-generation sequencing (NGS)-based testing may therefore worsen existing racial disparities in outcomes.[3-6]
- While racial differences in genomic testing have been reported in oncology, real-world evidence characterizing HRR testing uptake by race in community oncology settings remains limited.

Objective: To quantify HRR testing patterns by race among patients with mPC treated in community oncology practices.

Methods

- **Study Design**: Retrospective observational cohort study
- **Data Source**: iKnowMed, an oncology-specific electronic health record (EHR) system that captures outpatient practice encounter histories for patients seen in The US Oncology Network and selected non-Network practices
- **Study Population**: Adult patients diagnosed with mPC (de novo or those that progressed to metastatic) between January 01, 2015 - December 31, 2024, and followed through December 31, 2024.
- **Statistical Methods**:
  - Patient demographic and clinical characteristics were described at baseline (last value any time prior to or on index).
  - Evidence of HRR genetic testing (HRR, BRCA1/2, ATM, and PALB2) via NGS or other assay was within 24 months after mPC diagnosis overall and by race.

Table 1. Baseline Characteristics

Characteristic	Overall N=26,789	White n=17,335	Black/African American n=2,897	Other Race* n=1,634
Median age (IQR) in years at diagnosis	73 (66, 80)	72 (66, 79)	69 (63, 76)	72 (66, 79)
De novo status, n (%)				
De novo	18,628 (69.5%)	12,159 (70.1%)	2,054 (70.9%)	1,195 (73.1%)
Progressed	2,927 (10.9%)	2,169 (12.5%)	266 (9.2%)	111 (6.8%)
Unknown	5,234 (19.5%)	3,007 (17.3%)	577 (19.9%)	328 (20.1%)
Documented stage at diagnosis, n (%)				
I	222 (1.0%)	171 (1.2%)	21 (0.9%)	5 (0.4%)
II	1,441 (6.7%)	1,079 (7.5%)	136 (5.9%)	46 (3.5%)
III	1,264 (5.9%)	919 (6.4%)	109 (4.7%)	60 (4.6%)
IV	18,628 (86.4%)	12,159 (84.9%)	2,054 (88.5%)	1,195 (91.5%)

IQR = interquartile range
Note: 4,923 patients did not have documented staging information but had another indicator of metastatic disease.
*Other Race included patients with the following reported racial categories: Asian, American Indian or Alaska Native' or 'Native Hawaiian or Other Pacific Islander'.

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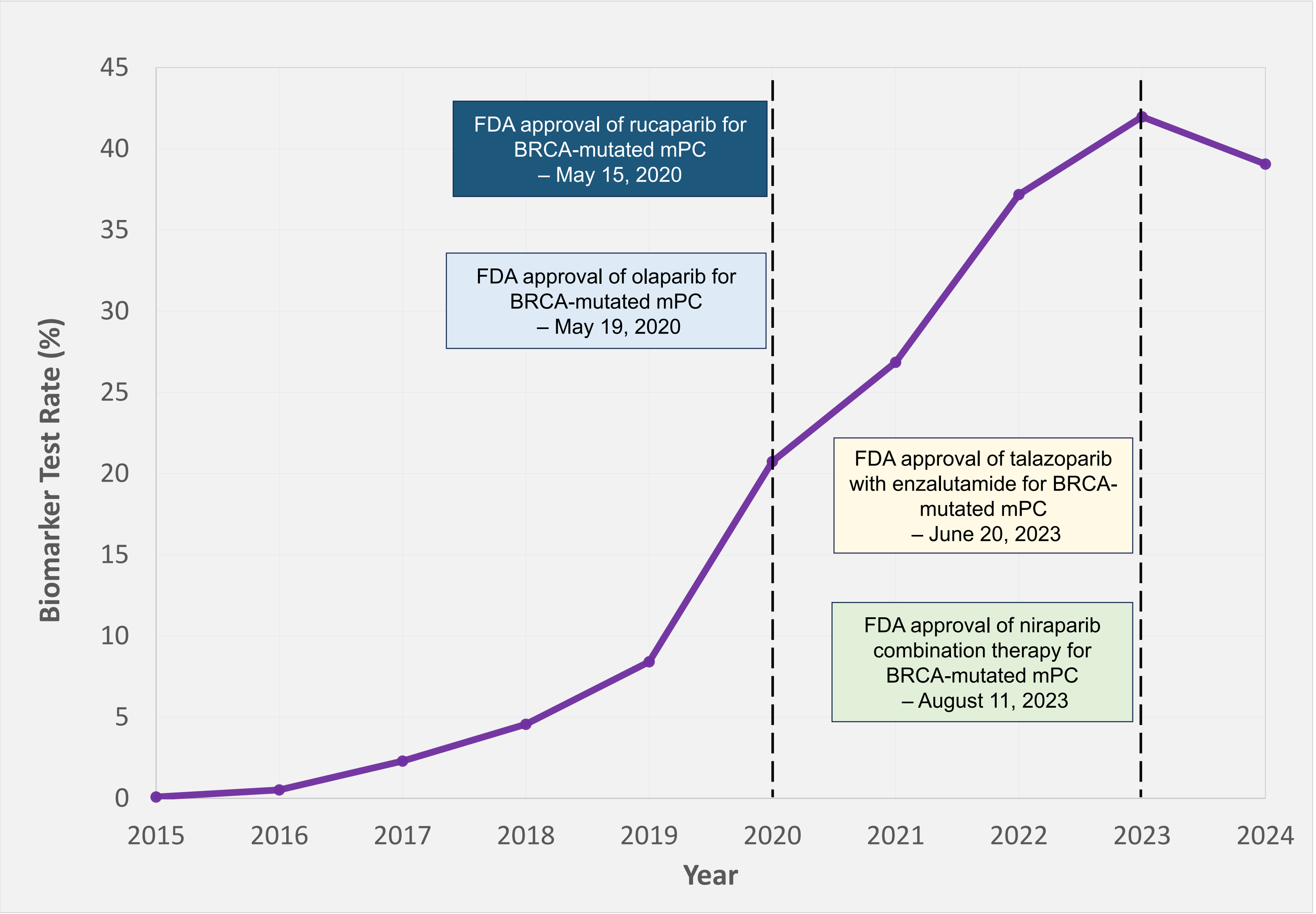
Results

Figure 1. Overall HRR Testing Rates by Year (n=26,789)



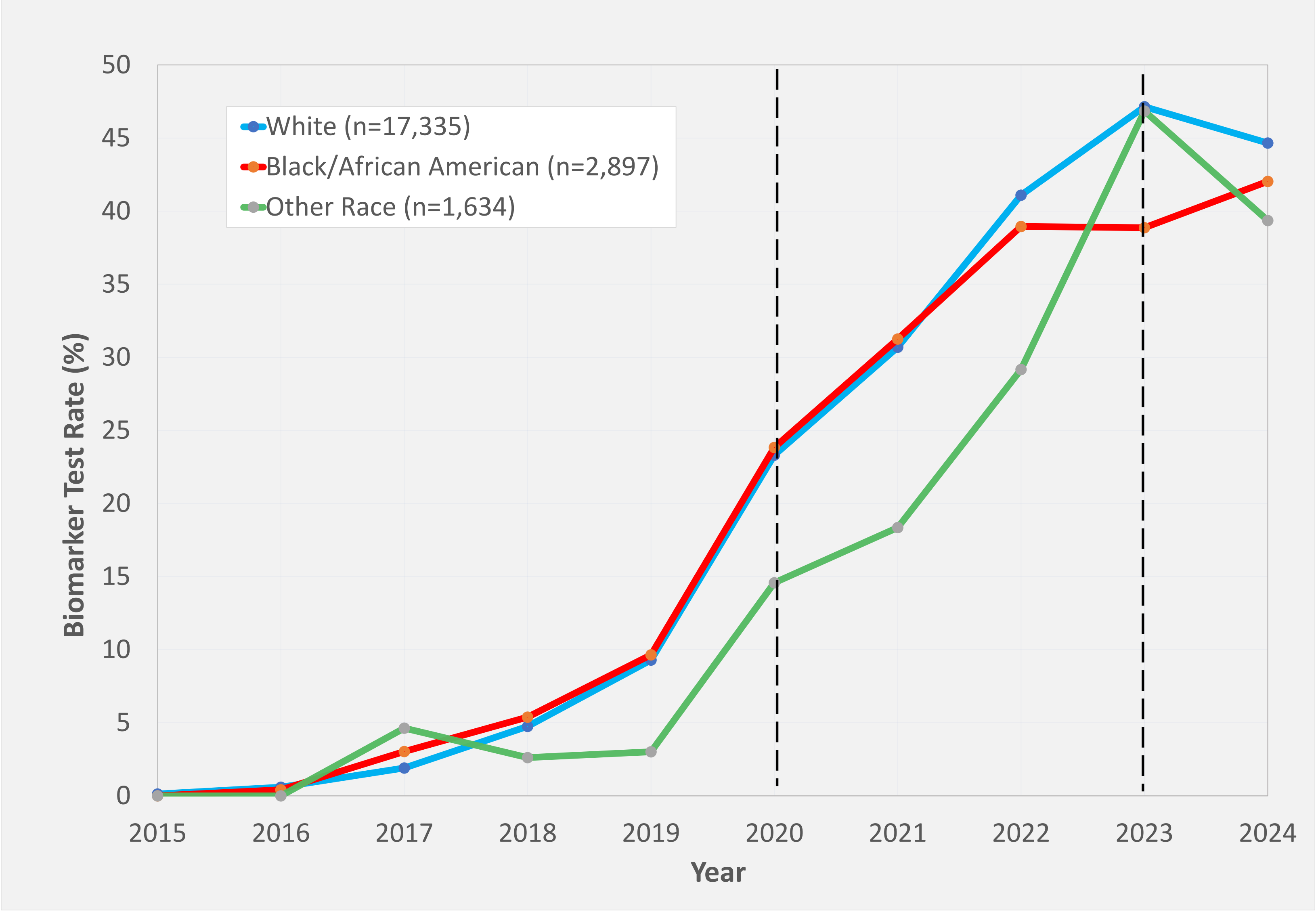
FDA approval of rucaparib for BRCA-mutated mPC – May 15, 2020

FDA approval of olaparib for BRCA-mutated mPC – May 19, 2020

FDA approval of talazoparib with enzalutamide for BRCA-mutated mPC – June 20, 2023

FDA approval of niraparib combination therapy for BRCA-mutated mPC – August 11, 2023

Figure 2. Annual HRR Testing Rates by Race Category



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Key Findings

- Consistent with the literature, Black/African American patients were diagnosed at a younger median age (69 years) compared with White patients (74 years) and had a higher proportion of stage IV disease at diagnosis (88.5% vs 86.6%).
- HRR testing uptake increased substantially over time, rising from <5% prior to 2019 to a peak of 42.0% in 2023, with rates remaining high in 2024 (39.1%), coinciding with the first PARPi therapy approval in May 2020 and additional combination regimen approvals in June/August 2023.
- HRR testing rates were nearly identical between White and Black/African American patients from 2015 to 2022. In recent years (2023-2024), White patients demonstrated slightly higher testing rates than Black/African American patients (e.g., 47.1% vs 38.9% in 2023; 45.0% vs 42.0% in 2024), though differences were modest.
- Patients grouped into 'Other Race' exhibited lower testing uptake until more recent years; however, this category represents a composite of smaller, heterogeneous racial groups, and findings should be interpreted cautiously given the limited sample size.
- Despite documented disparities in prostate cancer outcomes in prior literature, this real-world analysis did not observe pronounced racial disparities in HRR testing uptake between White and Black/African American mPC patients treated at community oncology practices.

Strengths & Limitations

- This study leveraged a large, longitudinal cohort of patients with mPC treated in community oncology practices, enabling evaluation of HRR testing by race over a decade, across key periods of PARPi adoption.
- HRR testing was identified using structured EHR fields only (sourced in part from commercial laboratory data); testing documented in physician notes or tests performed outside the network were not captured, resulting in potential underestimation of absolute testing rates. However, this limitation is not expected to differentially impact estimates by race.
- The study cohort included all patients with mPC. Because HRR testing may be more likely among patients with castration-resistant disease or treatment intent for PARPi therapy, inclusion of patients not yet clinically indicated for testing may contribute to lower observed rates.
- Findings may reflect characteristics specific to The US Oncology Network, such as integrated EHR infrastructure, centralized decision support, and access to molecular testing resources, and may not be fully generalizable.

Conclusions

- HRR testing rates have substantially increased in the community setting in the last 5 years likely due to the improvements in targeted therapy, such as the approval of PARPi-based therapies in 2020 and 2023.
- Although prior real-world studies report racial disparities in prostate cancer care, this analysis found similar testing rates for White and Black/African American patients, suggesting that community oncology system-level supports may help promote equitable biomarker testing access.
- Continued efforts are needed to increase overall testing rates and to ensure consistent guideline implementation across all patient subgroups.

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