# Racial/Ethnic Disparities in Colorectal Cancer Screening Across Healthcare Systems

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**Introduction:** Racial/ethnic disparities in colorectal cancer (CRC) screening and diagnostic testing present challenges to CRC prevention programs. Thus, it is important to understand how differences in CRC screening approaches between healthcare systems are associated with racial/ethnic disparities.

**Methods:** This was a retrospective cohort study of patients aged 50–75 years who were members of the Population-based Research Optimizing Screening Through Personalized Regimens cohort from 2010 to 2012. Data on race/ethnicity, CRC screening, and diagnostic testing came from medical records. Data collection occurred in 2014 and analysis in 2015. Logistic regression models were used to calculate AORs and 95% CIs comparing completion of CRC screening between racial/ethnic groups. Analyses were stratified by healthcare system to assess differences between systems.

**Results:** There were 1,746,714 participants across four healthcare systems. Compared with non-Hispanic whites (whites), odds of completing CRC screening were lower for non-Hispanic blacks (blacks) in healthcare systems with high screening rates (AOR=0.86, 95% CI=0.84, 0.88) but similar between blacks and whites in systems with lower screening rates (AOR=1.01, 95% CI=0.93, 1.09). Compared with whites, American Indian/Alaskan Natives had lower odds of completing CRC screening across all healthcare systems (AOR=0.76, 95% CI=0.72, 0.81). Hispanics had similar odds of CRC screening (AOR=0.99, 95% CI=0.98, 1.00) and Asian/Pacific Islanders had higher odds of CRC screening (AOR=1.16, 95% CI=1.15, 1.18) versus whites.

**Conclusions:** Racial/ethnic differences in CRC screening vary across healthcare systems, particularly for blacks, and may be more pronounced in systems with intensive CRC screening approaches.

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## Introduction

Despite effective strategies for prevention, early detection, and treatment,[1-9] there continue to be differences in colorectal cancer (CRC) incidence and survival by race/ethnicity.[10-14] Specifically, African Americans have higher CRC incidence and lower 5-year survival rates than other racial/ethnic groups.[10,11] This disparity may be due, in part, to differences in the

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utilization of CRC screening or access to health care.[12,15,16]

Utilization of CRC screening and access to health care can be influenced by many factors. Based on the Health Beliefs Model, CRC screening behaviors vary by race/ethnicity because different racial/ethnic groups have distinct beliefs about the risks and benefits of CRC screening.[17] These beliefs may interact with system-level factors, such as the healthcare delivery system's approach to CRC screening. Different approaches to CRC screening include relying on providers to recommend screening during office visits, mailing reminder letters, and sending stool-based test kits to patients who are due for screening.[18-20] Although some studies have evaluated health disparities in national or regional screening programs,[21-23] few have examined racial/ethnic differences in the receipt of CRC screening and diagnostic testing between health systems in the U.S. that use different screening approaches.[24,25]

Additionally, stool-based testing, including the fecal immunochemical test (FIT) and guaiac-based fecal occult blood test (gFOBT), is an important part of many CRC screening programs, and requires timely follow-up of positive stool-based test results with a colonoscopy to complete the screening episode. Prior studies that only measure initiation of CRC screening, but do not include follow-up of abnormal results, may overestimate CRC screening in the population and miss potential differences in CRC screening completion and diagnostic testing between groups.

The underlying hypothesis is that the association between race/ethnicity and colorectal cancer screening completion differs between healthcare systems that use different approaches to CRC screening outreach. Thus, this study evaluates racial/ethnic differences in receipt of CRC screening and follow-up diagnostic testing across four diverse health systems and patient populations.

# Methods

## Study Setting and Population

This study was conducted as part of the National Cancer Institute–funded consortium Population-based Research Optimizing Screening Through Personalized Regimens (PROSPR). The overall aim of PROSPR is to conduct multisite, coordinated, transdisciplinary research to evaluate and improve cancer screening processes. The ten PROSPR Research Centers reflect the diversity of U.S. delivery system organizations. The PROSPR CRC sites for this study were Group Health Research Institute (GH), the Kaiser Permanente consortium (Kaiser Permanente Northern California [KPNC] and Kaiser Permanente Southern California [KPSC]), and the Parkland Health and Hospital System/University of Texas Southwestern Medical Center (PHHS-UTSW).[26]

During the study period, the healthcare delivery systems employed different approaches to CRC screening; all centers offered endoscopic and stool-based tests.[26] However, how these tests were offered varied by system. GH patients received take-home gFOBT/FIT test kits or recommendations for endoscopic screening during office visits. Patients also received annual reminder letters about screening and follow-up calls and could request that a stool-based test kit be mailed to them. KPNC and KPSC had intensive programs that relied on mailed FIT tests for all members not up to date with screening, regardless of whether or not members requested a test or had an office visit.[18] PHHS-UTSW, the safety-net provider for Dallas County residents, relied on providers to recommend and order tests based on patient preference.

The study population included screening-eligible cohort members from January 1, 2010 to December 31, 2012. For GH, KPNC, and KPSC, eligible patients included those who were aged 50–75 years. PHHS-UTSW patients included in the study had at least one visit with a Parkland primary care provider in 2010–2012 and were aged 50–64 years. This upper age limit of 64 years for PHHS-UTSW was due to incomplete data capture on Medicare-eligible patients.

Patients with a known history of colectomy; CRC prior to cohort entry; or incomplete data on race/ethnicity, cohort entry date, or sex were excluded. The authors also excluded those with a history of colonoscopy within 10 years or sigmoidoscopy within 5 years prior to cohort entry, because these cohort members were considered up to date with CRC screening.[27] Protocols and study procedures for PROSPR were approved by the IRBs at each research center and at the Fred Hutchinson Cancer Research Center, which manages the pooled PROSPR data.

## Data Collection

Each healthcare system in the PROSPR CRC consortium uses comprehensive electronic medical record systems and administrative databases that were used to collect demographic information (e.g., age, sex, and race and ethnicity) and track patient utilization, health insurance, orders, test results, and pathology results.[26]

Cohort members were followed up for procedures and tests occurring from the time of cohort entry until the first of the following events: 18 months of follow-up; December 31, 2012; death; disenrollment; or, in the case of PHHS-UTSW, known relocation outside of Dallas County. Prior history of sigmoidoscopy and colonoscopy, including time since the last procedure, were retrospectively collected from electronic databases, going back to 2006 for GH, 1999 for KPNC and KPSC, and 2010 for PHHS-UTSW. The study also collected data on continuous months of enrollment in the healthcare system (allowing for a 90-day gap in enrollment) prior to cohort entry and demographic information. Data collection occurred in 2014.

## Measures

The key variable of interest, race/ethnicity, was generally obtained from patient self-report during health system enrollment or at office visits. Race/ethnicity was categorized as non-Hispanic white (white), non-Hispanic black (black), Hispanic, Asian/Pacific