

# Minding the gap: a review of current racial, ethnic, and socioeconomic disparities of colorectal cancer screening in the United States

## Abstract

Colorectal Cancer (CRC) currently stands as the third leading cause of cancer incidence and mortality in the United States. Screening methods for early detection and treatment offer an important tool to reduce cancer burden in the population. Although use of screening methods for CRC have effectively reduced the morbidity and mortality of this disease over recent years, significant disparities in the use of screening modalities persist among several patient groups. Specifically, African Americans still experience disproportionate rates of late-stage cancer diagnosis, delays to screening, and increased mortality. Similar issues face Hispanics, Asian Americans/Pacific Islanders, and American Natives/American Indians in the United States, with disparities existing at the intersection of race and socioeconomic status, education, health literacy, language barriers, and provider experience. Evidence-based strategies to increase CRC screening include comprehensive provider counseling, patient reminders, direct-access endoscopy, educational and decision tools, mail delivery of FOBT/FIT kits, and the creation of patient registries for effective follow up.

**Keywords:** colorectal cancer, prevention, screening, racial/ethnic disparities, socioeconomic disparities

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**Abbreviations:** CRC, colorectal cancer; US, United States; SES, socioeconomic status; USPTF, United States preventative services task force; FOBT, fecal occult blood testing; FIT, fecal immunochemical testing; ACG, American college of gastroenterology; AA, African American; SEER, surveillance; epidemiology; and end results; BRFSS, behavioral risk factor surveillance system; RCT, randomized control trial

## Introduction

Colorectal Cancer (CRC) is the third leading cause of cancer incidence and mortality in the United States (US).<sup>1</sup> Rates have steadily fallen over the past thirty years, owing largely to the increase in awareness and provision of screening services.<sup>2</sup> Multiple studies from recent years have validated current United States Preventive Services Task Force (USPTF) recommendations for screening among asymptomatic adults 50-75yrs old with a number of different modalities, including (a) annual Fecal Occult Blood Testing (FOBT)/Fecal Immunochemical Testing (FIT) analysis, (b) fecal DNA testing every 3years, (c) sigmoidoscopy or CT colonography every 5years, or (d) colonoscopy every 10years.<sup>3-8</sup> Despite the growth and success of increased screening in the US, up to 45% of adults aged 50 to 75-or nearly 35million people-were not up-to-date with screening in 2008.<sup>9</sup> Evidence shows consistently lower rates of CRC screening among certain sub-groups, including people with minimal education, low income, or no health insurance. Recent immigrants or those with language barriers or patients without usual source of healthcare or physician visits within a year also demonstrated lower rates of CRC screening.<sup>10</sup> Likewise, studies comparing the use of screening tools among various ethnic groups nearly all demonstrated some disparity between non-Hispanic whites and Hispanic, African American (AA), Asians, Native Hawaiians/Pacific Islanders (NH/PI) and American Indian/American Native (AI/AN). Racial minorities in the US face disproportionate reductions in access to healthcare, which would

in part contribute to these differences. Efforts to increase access to healthcare have shown population-wide effects on improving CRC screening rates; however these improvements have largely failed to eliminate disparities among several racial groups.<sup>11</sup> Moreover, these disparities exist even when examined among uniformly insured groups such as Medicare recipients and those within the VA system.<sup>12-13</sup> A more focused view of the challenges facing different minority groups is required to fully understand and address barriers to CRC screening. This review will discuss specific issues among various racial groups, identify divergent use patterns and opportunities within available screening modalities, and offer evidence-based approaches currently available in the US to address these disparities in CRC screening.

## African Americans and CRC screening

### Epidemiology and anatomic differences in CRC

African Americans face the largest disparities in outcomes related to CRC incidence, morbidity and mortality, with the shortest survival time and the worst survival rate from diagnosis of any racial group.<sup>14,15</sup> Data from the Surveillance, Epidemiology, and End Results (SEER) Program also showed that African Americans had significantly higher stage of disease at presentation than their white counterparts.<sup>16</sup> Of note, multiple studies have shown a significantly higher rate of proximal (i.e., right-sided) cancer prevalence among African Americans.<sup>17,18</sup> This is relevant insofar as proximal lesions have led to higher mortality compared with distal lesions.<sup>19</sup> Therefore, this data argues for the advantage of colonoscopy for African Americans as a CRC screening tool, as colonoscopy has demonstrated superiority over any other screening modality in the identification of proximal lesions.<sup>20,21</sup>

### Screening guidelines

Recognizing the disproportionately higher cancer burden amongst African Americans, in 2005 the American College of

Gastroenterology (ACG) and American Society of Gastrointestinal Endoscopists (ASGE) initiated recommendations for all African Americans beginning at age 45.<sup>22</sup> Best practices guidelines from the American College of Physicians (ACP) even recommend screening begin at age 40.<sup>23</sup>

### Patient perspective

Barriers to healthcare within the African American community are both patient and provider related. Patient fear/anxiety about colonoscopy, lack of interest or knowledge about CRC, and low perceived risk of CRC development all played a role in non-adherence to colonoscopy recommendations in many studies. Likewise, time, cost, and overall social burden were identified as self-reported reasons for non-adherence among African Americans.<sup>24,25</sup>

### Provider Practice

Differences among providers caring for African Americans can account for some CRC screening disparity. Among the factors positively correlated with CRC screening, direct provider recommendation is one of the strongest predictors of test completion.<sup>26,27</sup>

Unfortunately, a 2011 study collecting patient reports of provider practices have shown that Blacks were consistently 10% less likely than Whites to receive a recommendation for CRC screening at every point in the study survey, spanning from 2002-2008.<sup>28</sup> Likewise, a 2013 study by Coleman et al. showed that African Americans were up to 33% less likely to receive a CRC screening recommendation, a disparity that persisted even after controlling for gender, family income, education level, and number of physician visits per year. Although insurance status did not play a role, this same study showed an increase in provider recommendations proportional to higher patient education level, and decreased recommendations for lower reports of income.<sup>29</sup> This suggests practice differences that exclude vulnerable patient groups based on presumed health behaviors, and thus perpetuates those behaviors by not providing the same level of healthcare afforded to the less vulnerable patient population.

Moreover, evidence suggests that awareness of screening guidelines in high-risk populations is inadequate among providers. A survey of gastroenterologists, internists, and family physicians showed that only 28% of providers could correctly identify the recommended screening initiation point for African Americans.<sup>30</sup> Likewise, insurance companies are also slow to recognize and reimburse for early screening among African Americans as per ACG and ASGE guidelines.<sup>31</sup> The data on CRC burden in blacks highlight an increased need for screening in this population, and put the risk of CRC in African American patients similar to other high risk groups such as those with personal history, genetic predisposition, or a family history of CRC.<sup>32</sup> Attention to disparities between African Americans and Non-Hispanic Whites thus has heightened importance for providers to apply effective and appropriate counseling.

### Asians, Hispanics and other non-white groups and CRC screening

In contrast to studies among African Americans, less research in the US has focused on the specific differences in CRC screening among other non-White groups, including Asians, Hispanics, Native Hawaiian/Pacific Islanders (NH/PI), and American Indian/American Natives (AI/AN). However, unique differences do emerge when patient outcomes are compared head-to-head among these groups (Table 1). Most evidence around cancer screening behaviors is derived from the 2010 Behavioral Risk Factor Surveillance System

(BRFSS), a randomized telephone survey of health risk behaviors and clinical preventive service utilization that included observations from over 200,000 participants. It provides the most comprehensive survey of health practices among different racial groups in the US. Although data from the BRFSS suffers from response and recall bias among participants, the study boasts a high overall response rate of 75%, a reliable understanding of state-by-state disparities, and the inclusion of Spanish speakers, a sizable proportion of the US population but historically neglected on surveys.<sup>33-35</sup> Liss (2014) reviewed data from 2010-2013 in the BRFSS, and found significant differences between race and CRC screening that were not consistently related to Socioeconomic Status (SES), which varies by race and most importantly, differs based on language even within an identical racial group.<sup>36</sup> Grossly, Whites had the highest CRC screening rate (62.0%), followed by Blacks (59.0%); NH/PIs (54.6%); Hispanic-English speakers (52.5%); AI/ANs (49.5%); Asians (47.2%); and Hispanic-Spanish speakers (30.6%).

### Proportion of lifetime residing in the US for Asian Americans

Interestingly, controlling for SES increased the rate for screening among all racial groups in US except Asians and NH/PIs, suggesting disparities beyond income and insurance status. Similar to African Americans, studies of Asian Americans show a population-level lack of awareness about the importance of CRC screening, and lower rates of physician recommendation to complete screening.<sup>37</sup> Proportion of lifetime spent living in the US has been consistently shown to be a significant predictor for CRC screening across different groups of Asian Americans.<sup>38,39</sup> In one study, Korean Americans who spent greater than 25% of their lifetime within the US were more than twice as likely to complete CRC screening as those residing in the US less than 25% of their lifetime.<sup>40</sup>

### Hispanic patients and language barriers

The wide gap in screening between Hispanic-Spanish speakers and every other group in the same study by Liss highlights language as a powerful barrier for non-English speakers, and emphasize a greater need for language-concordant screening modalities. A retrospective analysis of Spanish-speakers in a primary care setting showed that physician-patient language-concordance increased the rate of screening practices for diabetes, cardiovascular disease, cervical cancer, and breast cancer. Unfortunately, these benefits did not apply to CRC screening, implicating other issues specific to CRC.<sup>41</sup> It is possible that language preference among Hispanics is confounded by other attitudes affecting rates of CRC screening. In general, studies show that Hispanics suffer lower health literacy,<sup>42</sup> lack of awareness about the need for CRC screening,<sup>43</sup> fatalistic attitudes towards CRC specifically,<sup>44</sup> and lower self-efficacy.<sup>45</sup> SES seemed to have mixed effects on rates of CRC screening among Hispanics in the US. The Liss study (conducted population-wide) showed that much of the disparity for Hispanics persists across income levels and access to healthcare. On the other hand, studies examining cancer screening practices in rural settings comparing Hispanic vs. non-Hispanic Whites show that disparities disappear after SES is controlled for, suggesting the source of disparity varies based on the practice setting (rural vs. urban).<sup>46</sup>

### Methods of CRC screening

#### Guidelines

Patient preference of CRC screening modality makes a significant impact on screening adherence. Per guidelines published in 2009, it is the ACG's explicit recommendation for colonoscopy over other

screening methods. In line with these recommendations, an analysis of the National Health Interview Survey demonstrated that between 2000-2008, there was a significant increase in the use of colonoscopy over FOBT and sigmoidoscopy.<sup>9</sup> However, these guidelines recognize that colonoscopy may be limited for the economically disadvantaged, and that some patients may object to undergoing endoscopy. For such groups, alternative screening modalities such as Fecal Occult Blood Testing (FOBT)/Fecal Immunochemical Testing (FIT), fecal DNA, or sigmoidoscopy are also considered acceptable.<sup>47</sup>

**Table 1** Barriers to CRC screening by race

<b>Common to All Non-White Patients</b>
Lower Health Literacy
Lower Education
Lower SES (in most studies)
Lack of knowledge about CRC screening recommendations
Fewer recommendations from providers
<b>African Americans</b>
Low Perceived Risk of CRC development
Fear/Anxiety about Colonoscopy
Time/Cost/Social Burden
<b>Asians</b>
Recent US Immigration
Language Barriers
<b>Hispanics</b>
Fatalistic Attitudes about CRC diagnosis
Lower Self-Efficacy
Language Barriers

**The “preferred” vs. “menu of options” approaches**

This difference in approach is conceptualized as colonoscopy being the “preferred” method, while also maintaining a “menu of options” approach to those with difficulty accessing colonoscopy. This use of the “preferred” approach likely enjoys greater adherence due to the simplicity, abbreviated patient-provider discussion, and direct provider recommendation. However, the goal of increasing CRC screening among disadvantaged minority and racial groups brings greater emphasis on the “menu of options” approach, as preferences vary widely among such populations.

The advantage of maintaining the “menu of options” approach over a strict recommendation solely for colonoscopy has been demonstrated to increase CRC screening adherence. In a randomized control trial (RCT), Inadomi and colleagues found that participants who were only given a recommendation for colonoscopy completed screening at a significantly lower rate (38%) than participants who were recommended FOBT (67%), or given a choice between FOBT and colonoscopy (69%). Specifically, non-White participants adhered more often to FOBT, while White participants adhered more often to colonoscopy.<sup>48</sup>

Ambivalence about method of screening seems to pervade across all racial groups among traditional screening methods such as colonoscopy, sigmoidoscopy, and FOBT. Interestingly minorities seem to show greater interest in novel screening modalities (CT colonography, Fecal DNA testing) than their White counterparts.<sup>49</sup> This contributes to a barrier to healthcare, as providers are often ill-equipped to offer the full “menu of options,” either by gaps in knowledge of screening modalities or insufficient time allocated

during patient visits. A 2006-2007 survey among 1266 primary care physicians showed that 73% offered only one or two screening modalities during CRC screening discussions.<sup>50</sup>

**FOBT/FIT Kits**

Attention to specific preferences among different populations has the potential to increase CRC screening. Surveys of Hispanic populations and those of lower SES show a significant preference for FOBT over colonoscopy.<sup>49,51,52</sup> Due to the relative ease of provision in low resource areas, FOBT and FIT cards have been highlighted as an effective screening method. Outreach programs utilizing mailed FOBT/FIT cards with simplified instructions for specimen submission have shown increased rates of screening over traditional clinic-based screening opportunities. Likewise, pilot studies of FOBT kit provision given during influenza vaccination sessions also shows promise for increasing screening.<sup>53</sup> It is worth noting that even with an alternative method such as FOBT/FIT by mail, Whites demonstrated greater adherence.<sup>54-56</sup>

**Abnormal results and follow-up diagnostic testing**

While FOBT/FIT kits show promise as a potential method to increase CRC screening, the obvious disadvantage of fecal testing - especially for patients living at a remote distance - resides in secondary adherence to follow-up for abnormal test results. The benefit of screening is only realized when it can result in timely diagnosis and treatment of a potential disease, and the utility of screening modalities has been shown to be closely related to adherence of follow-up for abnormal results.<sup>57,58</sup> Although mailed FOBT/FIT kits offer greater adherence to initial screening, a recent study by Gupta et al. demonstrated that of those with positive screens, over 18% did not get recommended follow up colonoscopy during the study period.<sup>54</sup> Specifically, we see that patients with lower SES and those belonging to non-White minority groups suffer longer delays in receiving appropriate diagnostic and treatment services after an abnormal screening test.<sup>59</sup> This in turn points to system-wide issues in healthcare access and patient navigation as areas of significant potential to improve rates of screening.<sup>60</sup>

**Closing the gap-strategies to increase rates of CRC screening among the underserved**

**Patient registry and navigation**

Recognition of racial disparities in CRC screening and survival has prompted research and innovation to help healthcare practices reach the underserved, with many positive results (Table 2). The organized delivery of FOBT/FIT kits via the postal system has given rise to the need for screening registries capable of tracking patients and monitoring for timely response to abnormal screening results, as has been established for mammography.<sup>61</sup> Many studies support the use of patient navigation services and direct case management to help close this gap between abnormal screening result and patient follow up.<sup>62</sup> Such benefits also extend to the use of patient navigators in traditional clinic settings offering initial colonoscopy. Interventions such as repeat patient phone calls to secure scheduling, to guide bowel preparation, and give appointment reminders all increased adherence to colonoscopy.<sup>63</sup> Beyond this, more intensive patient programs including assistance with transportation, translation services, one-on-one accompaniment to appointments, and referral to other social services as needed have all proven to increase rates of colonoscopy in urban settings, particularly among non-English speakers.<sup>64</sup>

**Table 2** Evidence-based methods to increase CRC screening

Mailed FOBT/FIT cards
“Menu of Options” Approach
Patient Registries
Patient Navigation Tools
One-on-One Counseling/Education
Cultural Training, Practice Updates for Physicians
Patient Centered Medical Homes
Direct Access Endoscopy

### Patient education

Poor health literacy stands out as a major barrier to many cancer-related screening behaviors. Several studies have demonstrated that improved health literacy through particular patient education methods is associated with screening completion. A meta-analysis published in 2012 reviewed thirteen studies offering different patient education media and interventions. Among these, no significant differences in CRC screening were appreciated in studies that offered patient-initiated educational media; e.g., via video, brochure, or computer-based programs. By contrast, approaches that offer direct patient contact sessions by trained professionals through telephone, one-on-one, or group education achieved significant improvements in initial CRC screening completion, by a median rate of 15%.<sup>65</sup> Such results were similarly demonstrated in a subsequent review highlighting the strongest levels of evidence for patient reminders and one-on-one interactions, with mixed evidence for decision aids.<sup>66</sup> Among these, culturally competent and language-specific decision aids increased screening-related knowledge, intent to complete screening, and reports of scheduled endoscopy.<sup>67</sup>

### Provider intervention

Interventions focusing on providers have also shown some benefit. Physician training in communicating with patients of low health literacy can improve the quality of counseling and increase CRC screening rates.<sup>68</sup> Systems that institute physician reminders and provide means to keep physicians up-to-date on current guidelines can also modestly improve adherence to CRC screening.<sup>69</sup>

### Healthcare system modification

In a changing era of healthcare reform, we are now provided with many systems-level opportunities to facilitate cancer screening. Several studies have shown promise with the patient-centered medical home model, with an emphasis placed on accessible, comprehensive, and fully coordinated care.<sup>70,71</sup> Novel systems piloting direct access endoscopy in New York City - forgoing the need for preliminary provider visits and offering bowel prep with direct outpatient colonoscopy scheduling - in combination with education and patient navigation have been shown to completely eliminate disparities between Whites, African Americans, and Hispanics, though gaps still existed among Asians, the uninsured, and those of limited income and education.<sup>72</sup>

### Conclusion

Despite growing success among strategies of increasing CRC screening, disparities will likely continue between various racial groups in the US. Attention to the particular issues faced by African Americans, Hispanics, Asians, and other non-White groups in the US is critical to the success of CRC screening in such patient populations. While many of these fall along the plane of socioeconomic status,

healthcare access, medical insurance, health literacy, and education level, specific differences unique to each racial community persist. Culturally tailored and multimodal approaches to patient engagement through provider counseling, one-on-one education sessions, and systematic reminders offer the greatest promise for increasing CRC screening uptake. Education to encourage providers stay updated on screening guidelines, to share cultural literacy with their patients, and to offer patient-specific screening modalities can increase patient adherence to CRC screening recommendations. Attention to the divergent needs of patients in different communities will help shape the growing era of healthcare reform to better help underserved patients. With better understanding of the reasons behind disparities among various racial groups in CRC screening, and the use of innovative approaches to reach such groups, we will be able to effectively reduce or eliminate disparities.

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### Conflicts of interest

Authors declare there are no conflicts of interest.

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