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COMMENTARY

Challenges and Possible Solutions to Colorectal Cancer Screening for the Underserved

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Colorectal cancer (CRC) is a leading cause of cancer mortality worldwide. CRC incidence and mortality can be reduced through screening. However, in the United States, screening participation remains suboptimal, particularly among underserved populations such as the uninsured, recent immigrants, and racial/ethnic minority groups. Increasing screening rates among underserved populations will reduce the US burden of CRC. In this commentary focusing on underserved populations, we highlight the public health impact of CRC screening, list key challenges to screening the underserved, and review promising approaches to boost screening rates. We identify four key policy and research priorities to increase screening among underserved populations: 1) actively promote the message, "the best test is the one that gets done"; 2) develop and implement methods to identify unscreened individuals within underserved population groups for screening interventions; 3) develop and implement approaches for organized screening delivery; and 4) fund and enhance programs and policies that provide access to screening, diagnostic follow-up, and CRC treatment for underserved populations. This commentary represents the consensus of a diverse group of experts in cancer control and prevention, epidemiology, gastroenterology, and primary care from across the country who formed the Coalition to Boost Screening among the Underserved in the United States. The group was organized and held its first annual working group meeting in conjunction with the World Endoscopy Organization's annual Colorectal Cancer Screening Committee meeting during Digestive Disease Week 2012 in San Diego, California.

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Colorectal cancer (CRC) is a leading cause of cancer mortality worldwide (1), and screening can reduce CRC incidence and mortality (2,3). However, screening participation remains suboptimal, especially among underserved populations. In this commentary, we emphasize the public health impact of CRC among the underserved and identify key challenges to CRC screening in this population. We review promising approaches to increasing screening and underscore critical policies and research priorities for advancing the cause of screening among the underserved. Our intended audience includes patient advocates, health-care providers, policy makers, professional organizations, health systems, and others interested in improving screening for underserved populations.

CRC Incidence, Mortality, and Screening in the Underserved

For this commentary, we define underserved populations as groups with traditionally low rates of CRC screening. We recognize that a universally accepted definition of underserved populations does not exist. Proposed definitions include people without adequate access to health-care services and who often lack adequate insurance, have low socioeconomic position, have limited literacy and/or English language proficiency, and who are geographically isolated (4). These characteristics largely encompass groups exhibiting low rates of screening, as noted below.

Racial and ethnic disparities in CRC incidence and mortality exist (5). For example, blacks have among the highest incidence and mortality rates of any racial or ethnic group. Within racial and ethnic groups, striking differences in CRC mortality by education are present. Mortality for black men with less than 12 years of education is nearly twice as high as black men with 12 or more years of education (20.6 vs 11.30 per 100 000, respectively) (6). Similarly, among non-Hispanic whites, men with higher education level have lower mortality rates than non-Hispanic white men with lower education level (14.2 vs 7.9 per 100 000, respectively) (6). Socioeconomic factors beyond education and race/ethnicity also contribute to CRC risk. Risk has been linked to increasing neighborhood deprivation, as measured by factors such as rates of poverty and need for public assistance, in addition to education (7). Thus, defining underserved populations requires a wide definition that includes socioeconomic status (8).

Even as white, highly educated, and insured individuals are achieving the goal of 70% screening set by Healthy People 2020 (9,10), screening remains low in certain US subgroups. Disparities in screening can be elucidated by evaluating national survey data, such as from the National Health Interview Survey (NHIS), a

cross-sectional, in-person, population survey of US households that includes questions on exposure to CRC screening (11,12). The NHIS defines screen up-to-date as having a fecal occult blood test in the last year, sigmoidoscopy in the last 5 years, or colonoscopy in the last 10 years.

According to NHIS data, Hispanics, Asians, and individuals with low socioeconomic position have screening rates less than 50% (11) (Figure 1). These data also show strikingly low uptake for recent immigrants (21.3%) and the uninsured (20.7%) compared with US-born individuals (60.5%) and people with private insurance (65%). Although past NHIS reports offer a broad picture of health-care disparities, data on American Indian/Alaskan Natives and rural populations are limited. For example, the NHIS sample of American Indian/Alaskan Natives includes survey results from just 82 individuals, and NHIS data on rural populations have not been separately reported. Administrative claims data from the Indian Health Service suggest that screening rates for American Indian/Alaskan Natives who seek care at Indian Health Service facilities might be as low as 4% (13), whereas Medicare claims data from American Indians have reported rates as high as 32% (14). Similarly, national Behavioral Risk Factors Surveillance System telephone surveys and Medicare survey and administrative claims data demonstrate lower screening rates among individuals living in rural compared with urban areas, with variation by degree of isolation: rates might be as low as 42% among isolated rural residents (15–17).

Clearly, low rates of screening affect a large segment of the US population, which includes, but is not limited to, Hispanics, Native Americans, Asians, individuals living in rural areas, people with lower education levels and/or low socioeconomic status, and people without insurance or with access only to Medicaid. Suboptimal screening will likely contribute to continued high CRC burden in these populations without intervention (2,18).

Key Challenges to CRC Screening for Underserved Populations

Identifying Unscreened Individuals in Underserved Communities

To improve screening in underserved populations, we must overcome multiple challenges, starting with identifying unscreened individuals. In general, the absence of national approaches to

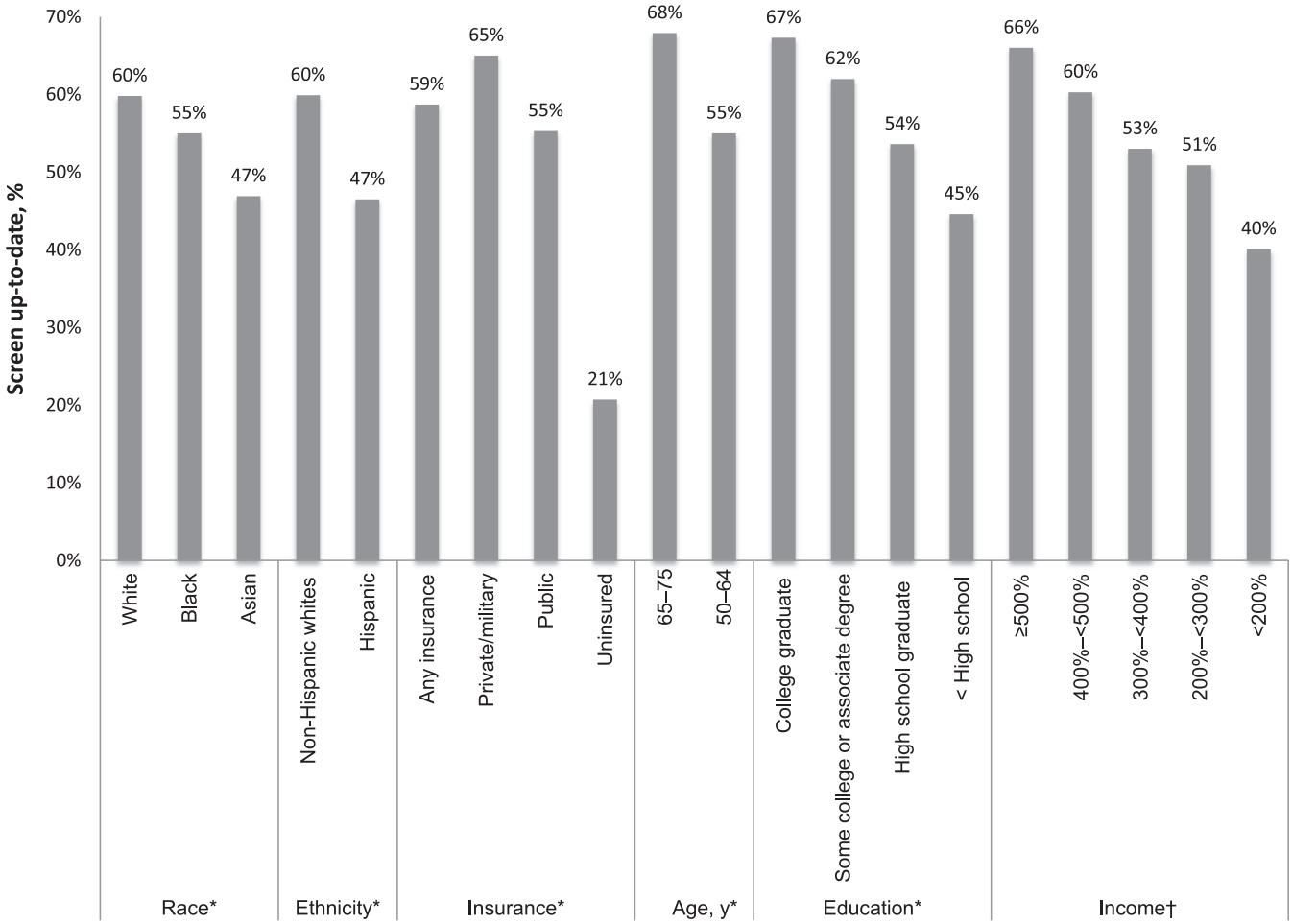

Figure 1. Colorectal cancer screening rates by race, ethnicity, insurance, age, education, and income based on the National Health Interview Survey (NHIS). Rates rounded for presentation. Screen up-to-date is defined by having a fecal occult blood test in the last year, sigmoidoscopy in the last 5 years, or colonoscopy in the last 10 years. Income is estimated as percentage of federal poverty level. HP 2020, Healthy People 2020 (9). *NHIS 2010 data (11). †NHIS 2008 data (12).

identifying unscreened individuals is a key barrier to improving screening (19). The problem is even more serious in underserved populations. Systems commonly used to identify unscreened individuals rely on insurance or a regular place for health care. Because uninsured people often do not seek or receive regular health care and are not recognized as needing screening, they cannot receive invitations and other interventions to complete screening. This is a particular challenge for population-based strategies for boosting screening, such as mailed outreach invitations, which at a minimum must be able to define a target population for outreach. We need novel approaches to finding unscreened, underserved individuals.

Identifying the Most Effective Screening Test Approach

Available tests for screening include sensitive guaiac-based or immunochemical fecal occult blood tests (gFOBT and FIT), sigmoidoscopy, and colonoscopy. Modeling studies suggest that these strategies are comparable in their potential to achieve reductions in CRC mortality when compared with no screening (2,20). However, these studies assume 100% participation and perfect screening quality and test follow-up—something never achieved in standard clinical practice.

Complicating efforts to determine population effectiveness, different CRC tests vary in invasiveness, patient time investment, sensitivity for neoplasia, risks, and required supporting infrastructure and costs. These characteristics cast uncertainty on the ultimate population effectiveness of any single modality, particularly for underserved populations. The "preferred colonoscopy" recommendation approach attempts to address this uncertainty by promoting a single message to be screened with colonoscopy, emphasizing its superior one-time sensitivity for detecting polyps and cancer (21). In New York City and Delaware, this approach resulted in near elimination of racial and ethnic disparities in screening rates (22,23). Key factors that likely supported the success of the New York City efforts included sufficient capacity to provide colonoscopy within the city, strong endorsement by the Commissioner of Health and the New York City Department of Health and Mental Hygiene, and a robust state Medicaid program for treating patients if CRC was diagnosed. Although the New York City and Delaware experiences suggest that a preferred colonoscopy approach can address disparities, this approach may not be feasible in all settings and regions in the United States for a number of reasons.

First, available data suggest that current capacity to deliver colonoscopy to underserved populations on a national level is inadequate (24), exacerbated by probable colonoscopy "deserts" throughout the country—areas where disadvantaged individuals have limited access to colonoscopy (19). In addition, although increased capacity and access are necessary for widespread delivery, studies suggest that greater colonoscopy availability might paradoxically augment disparities (25–27). This is because greater colonoscopy availability might create the perception of access for all patients but a reality in which insured and previously screened individuals are preferentially tested (25–27). In any case, we currently do not have overall national capacity to deliver colonoscopy screening to all eligible individuals (19), so in some settings, focusing only on colonoscopy for CRC screening is impractical.

Second, colonoscopy is expensive relative to other tests. For example, Medicare colonoscopy reimbursement is approximately $620 (for outpatient hospital procedures, including physician fees), whereas FIT reimbursement is approximately $23 (11). Given that safety-net health providers and systems are under financial constraints, promotion of colonoscopy as the only screening test may create a financially untenable mandate. This is concerning, given that alternative, less expensive modalities such as stool blood testing and sigmoidoscopy exist and have been shown to reduce mortality in randomized controlled trials (28–30). In many settings, colonoscopy requires a very substantial patient copay that may discourage screening completion (31,32). For individuals insured privately or by Medicare, the Patient Protection and Affordable Care Act (ACA) will eliminate all copays for screening tests endorsed by the US Preventive Services Task Force, but for those insured by Medicaid, individual states will be financially encouraged but not required to offer no-cost screening (31,32). Most important, cost-effectiveness analyses suggest that programmatic screening with modalities such as FIT can achieve similar outcomes at lower cost compared with population-based colonoscopy screening (20).

Third, promotion of colonoscopy as the best test might ignore the test preferences of underserved populations. Colonoscopy is the most invasive of all screening modalities. It requires full bowel preparation, sedation, an adult escort, and time away from work, often resulting in loss of patient wages on the procedure day (33). Logistical and psychological complexities associated with having a colonoscopy may contribute to mistrust of the medical system and may challenge screening colonoscopy implementation among racial/ethnic minorities and the socioeconomically disadvantaged (34). Empirical data suggest important differences in test acceptability among underserved groups. For example, offering an informed choice between gFOBT and colonoscopy enhances screening uptake compared with offering only a single modality (35). Some population subgroups may prefer colonoscopy because of its sensitivity and ability to detect and remove lesions simultaneously, whereas others may favor gFOBT/FIT and sigmoidoscopy for comfort, convenience, and low adverse event risk (36,37). Overall, practitioners and public health entities must identify the most effective screening approaches for underserved populations, taking into account test sensitivity, infrastructure to deliver a given screening test, and test-specific acceptability to the population.

Barriers to Receiving Screening Offers, Access, and Acceptance

Most CRC screening in the United States is visit based, requiring a patient to visit a doctor and a doctor to offer screening. However, groups with low screening are more likely to be uninsured and have limited access to primary care (12). Even with primary care access, underserved individuals may not have access to screening. For example, colonoscopy access for primary screening or diagnostic work-up after abnormal gFOBT, FIT, or sigmoidoscopy can be constrained by lack of colonoscopists or the ability of health systems to pay for or provide colonoscopy. Other traits of underserved populations that may reduce screening completion include low-income status and sociocultural factors such as cultural cancer beliefs, language barriers, distrust of the medical system, and immigration status (38–41).

Access to CRC Treatment

Many underserved individuals lack health insurance that provides treatment if CRC is detected. As a result, the uninsured consistently

have lower stage-specific CRC survival than the insured (42). Uninsured individuals in some states can obtain emergency Medicaid after CRC diagnosis, but many states lack this provision. Even with Medicaid, outcomes can be suboptimal: stage-specific survival for people with Medicaid is lower than for other insured populations (42).

Lack of universal access to treatment when CRC is diagnosed by screening is unethical (43) and likely hinders development and implementation of screening programs. For example, the Cancer Prevention and Research Institute of Texas annually solicits applications for evidence-based programs to increase breast, cervical, and CRC screening of underserved populations. The agency requires applicants to secure plans for treatment of patients in whom cancer is diagnosed but notes that many do not submit proposals for CRC screening programs because of an inability to identify a health-care entity willing to guarantee CRC care (Becky Garcia, personal communication). This limitation is not seen with cervical and breast applications, likely because of National Breast and Cervical Cancer Early Detection Program sites in Texas, which provide emergency Medicaid treatment for uninsured women diagnosed with breast or cervical cancer. No such program supports CRC screening. Overall, lack of access to treatment is likely a major barrier to improving CRC disparities because screening programs cannot be developed without adequate, timely access to CRC care.

Addressing Challenges to Screening the Underserved

Based on the challenges described above, we have identified the following strategies for addressing CRC screening in underserved populations: 1) actively promote the message, "The best test is the one that gets done"; 2) develop and implement strategies for identifying unscreened, uninsured individuals; 3) develop and implement organized strategies for screening; and 4) fund and enhance programs and policies that address the CRC continuum. To enhance screening, these strategies must be considered and implemented in parallel by those interested in improving screening for underserved populations. A complete understanding of challenges to screening underserved populations can be enhanced by placing them in context of the Quality in the Continuum of Cancer Care conceptual framework. Quality in the Continuum of Cancer Care highlights that challenges to high-quality cancer care, including cancer screening, exist at multiple population levels, such as the individual patient, practice/system, and policy level (Figure 2) (44–46); this is especially true for challenges to screening underserved populations. For example, identifying the most effective screening test is a challenge at nearly all of the potential population levels that can affect cancer screening outcomes (Figure 2). Patients struggle with choosing the best test, providers must balance test sensitivity against

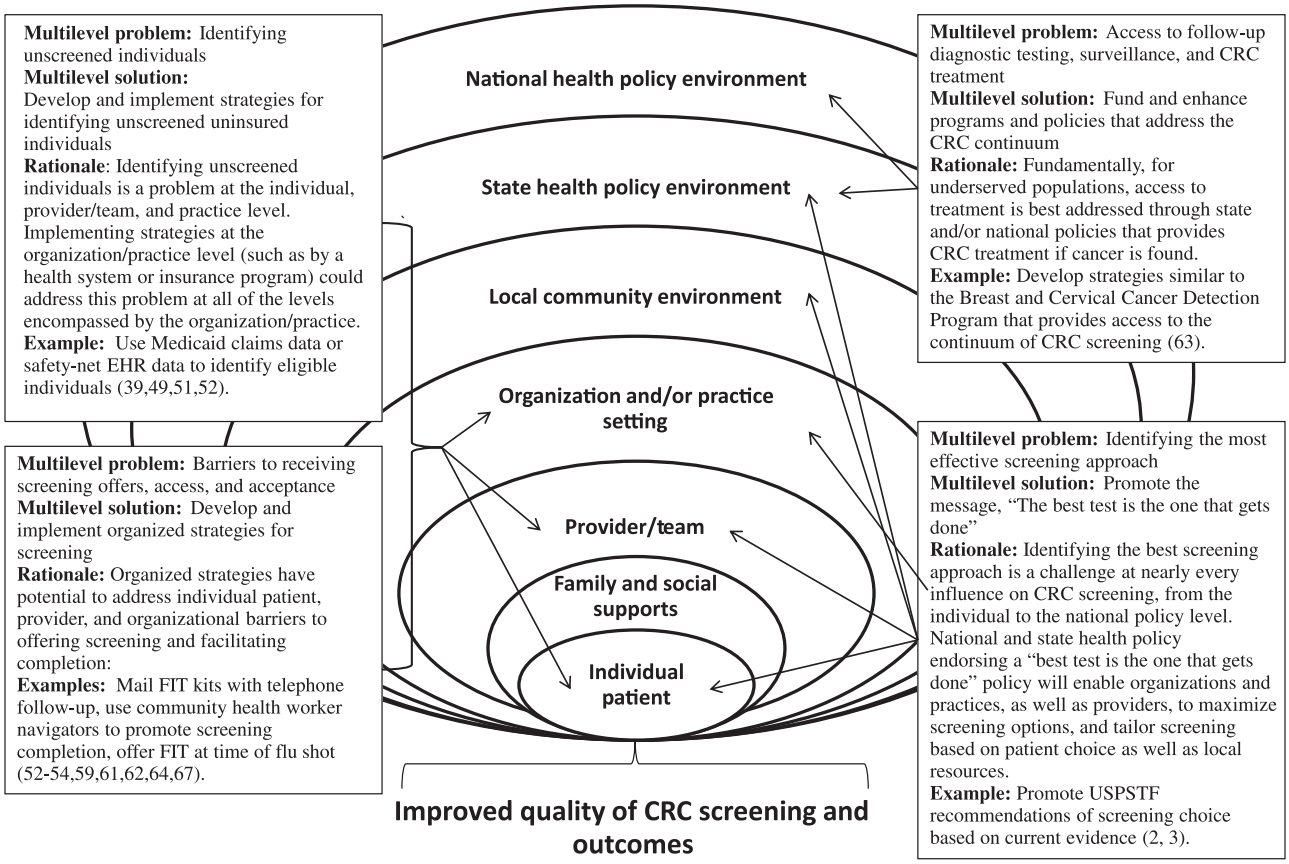

Figure 2. Potential multilevel impact of recommendations for increasing colorectal cancer (CRC) screening among the underserved. The figure follows the Quality in the Continuum of Cancer Care framework of potential multilevel influences in the cancer care continuum, including screening (44–46). We have highlighted that challenges to screening underserved populations operate at multiple population levels of influence and that our four recommendations have multilevel characteristics that can address this complexity. The figure was adapted, with permission, from work by Zapka et al. (46). EHR = electronic health record; FIT = fecal immunochemical test; USPSTF = US Preventive Services Task Force.

acceptability, health-care organizations must reconcile test choices with ability to deliver tests due to capacity, and state/national policymakers must weigh not only test sensitivity for CRC and polyps but also test acceptability and availability in their screening policy recommendations. Indeed, all of the challenges highlighted above operate at multiple levels, emphasizing that solutions for these challenges must be multilevel in nature for meaningful impact. Accordingly, the solutions we propose for addressing challenges to screening underserved populations are multilevel (Figure 2).

Actively Promote the Message, "The Best Test Is the One That Gets Done"

We have seen that the ability to provide primary colonoscopy screening varies regionally and that test-specific characteristics affect test acceptability. Our recommended message, which emphasizes the importance of screening regardless of modality, is likely to maximize the reach of screening efforts to underserved populations. Specific screening programs should choose tests to implement based on both their ability to deliver screening on a population basis and test acceptability by the target population, in addition to sensitivity for neoplasia.

Develop and Implement Strategies for Identifying Unscreened, Uninsured Individuals

Both the American Cancer Society and the National Committee on Quality Assurance provide systematic approaches for determining whether individuals within a population are screen up-to-date (47). These approaches can identify individuals who would benefit from interventions to increase screening. However, these approaches rely on up-to-date, individual-level data on screening status. For individuals with limited access to health care, this is obviously a problem, but several solutions are available.

First, safety-net facilities that care for underserved populations, such as public hospital systems, have successfully used administrative and/or electronic health records to identify individuals not up-to-date with screening for screening interventions (39). Federally qualified health centers are now forming networks that share electronic health records, making this approach particularly feasible for patients served by these safety-net centers as well.

Second, imminent expansion of Medicaid coverage in many states through the ACA (31,32) could facilitate identifying individuals in need of screening through Medicaid claims data (48–50). For newly insured individuals, Medicaid claims data could be used to identify individuals age eligible (50 years and older) for CRC screening for interventions that verify need for screening and offer it. This approach has been reported on recently for delivering telephone reminders for screening completion in a managed Medicaid setting and resulted in modest improvements in adherence (49). The approach could be extended to delivering mailed outreach invitations encouraging patients not up-to-date to complete FIT with an enclosed kit or contact their primary provider to schedule colonoscopy (51–54). Over time, longitudinal claims data might allow for a more tailored approach of focusing only on individuals without evidence of screening. Approaching the growing number of individuals on Medicaid could have a large impact, given current low screening rates among Medicaid-insured individuals (12). Private health maintenance organizations have successfully used medical claims–based approaches to both document improvements in screening and identify individuals not up to date for screening interventions (55). However, despite the potential for use of Medicaid data for identifying unscreened individuals for screening interventions, it should be noted that the ultimate success may differ from private efforts because Medicaid programs and associated data infrastructure may vary substantially from state to state and, historically, Medicaid populations have had interruptions in coverage.

Third, community awareness campaigns, such as through advertising or church-based education, could reach people missed by the other proposed approaches. The two solutions described above have the advantage of systematically identifying unscreened individuals within a population, but not all underserved groups use safety-net health systems or Medicaid. Community awareness campaigns, although limited by the potential reach of advertising and other promotional methods, might reach these people. Overall, a combination of our suggested approaches and others will be required to identify as many unscreened, underserved individuals as possible for screening interventions.

Develop and Implement Organized Strategies for Screening

Organized screening requires "an explicit policy with defined age categories, method, and interval for screening in a defined target population with a defined implementation and quality assurance structure, and tracking of cancer in the population" (55). This principle covers outreach and in-reach strategies that address barriers on the patient, provider, and/or health system level (56).

Outreach strategies target all eligible individuals in a defined population regardless of scheduled health-care visits. Examples include use of mailed invitations to complete FIT screening among screen-eligible health plan members (55). Outreach can also occur outside the context of a specific organization's defined target population. An example is community-wide outreach that occurs in some regions during National Colon Cancer Awareness month (57).

In-reach programs engage individuals by offering screening at the point of routine medical care (55,58). An example is automated electronic health record prompts that occur during primary care visits for patients due for screening (55) reminding the provider to discuss and order screening.

Among underserved individuals, a number of randomized controlled trials have studied outreach and in-reach strategies to boost screening. Table 1 provides an illustrative sample of these studies. Effective outreach strategies have included mailed invitations to complete gFOBT or FIT (with or without telephone reminders or patient navigation) and tailored telephone calls to promote awareness. Effective in-reach strategies have included systematically offering gFOBT or FIT at the time of annual flu vaccination and patient education to encourage discussion of CRC screening with providers. Although lessons can be learned from successful breast and cervical cancer screening interventions targeting underserved populations, requirements and solutions unique to CRC screening are evident. The need for interventions to reach men and women and the variety of screening options available for CRC are the most striking of these differences. For example, designers of the CRC interventions illustrated in Table 1 targeted both men and women and had to select from a menu of screening options. Indeed, in some cases, offering a choice of screening tests vs a single modality (35) or offering a back-up

Table 1. Examples of randomized controlled outreach and in-reach trials to boost colorectal cancer screening among underserved populations*

Author	Year	Description/intervention type	Intervention	Underserved Groups	Sample size	Key findings
Outreach†						
Lasser (59)	2011	Primary care clinic–based RCT of patient navigation-based intervention with choice of gFOBT or colonoscopy compared with usual care	Introductory letter from PCP with educational materials, followed by telephone calls from a language-concordant navigator to educate about CRC screening, address potential barriers, and offer screening choices of colonoscopy and gFOBT. Up to 6 hours of navigation was provided.	Underserved immigrants from Azores, Brazil, Haiti, and Portugal served by 15 community health centers in Massachusetts	465	1) Navigation was superior to usual care for CRC screening (33.6% vs 20%), colonoscopy screening (26.4% vs 13%), and adenoma detection (8.1% vs 3.99%). 2) Intervention was more beneficial for individuals who were non-native English speakers and for those older than 60 years.
Percac-Lima (64)	2009	Community health center–based RCT of a culturally tailored navigator program compared to usual care	Introductory letter with educational material followed by phone or in-person contact by a language-concordant navigator. Further individual tailored interventions were patient education, procedure scheduling, translation and explanation of bowel prep, and help with transportation and insurance coverage.	Low-income, ethnically diverse population served by a single community health center	1223	1) Navigation was superior to usual care for CRC screening (27% vs 12%), and colonoscopy screening (21% vs 10%). 2) Intervention was more beneficial for women, older individuals, non-Latinos, English speakers, and those without private insurance.
Coronado (65)	2011	Primary care clinic-based RCT of usual care, mailed gFOBT only, mailed gFOBT + a *promotora*-delivered telephone reminders and home visits	Mailed gFOBT-only group: Mailed package of a letter, gFOBT card with instructions, and stamped, addressed envelope for the test. Mailed gFOBT and promotora-delivered education: Mailed package + promotora-delivered telephone reminders, followed by a promotora-delivered low-literacy education at home visit.	Underserved Hispanics at a single community health center in King County, WA	501	1) Mailed gFOBT and mailed gFOBT + *promotora* were superior to usual care for FOBT screening: 26%, 31%, and 2%, respectively. 2) Unclear if addition of *promotora* phone calls and home visits superior to mailed gFOBT alone.
Walsh (53)	2010	Primary care clinic–based RCT of usual care, mailed gFOBT + brochure, mailed gFOBT + brochure + tailored telephone counseling	Mailed gFOBT + brochure: Free FOBT kit with stamped return envelope and an introductory letter from PCP, plus bilingual culturally tailored brochure on CRC screening. Mailed gFOBT + brochure+ counseling: Free gFOBT kit and culturally tailored brochure, followed by tailored telephone counseling from a language-concordant trained community health advisor.	Latino and Vietnamese individuals at 5 safety-net health system primary care clinics in Santa Clara, CA	1358	1) Mailed gFOBT and mailed gFOBT + telephone counseling were superior to usual care for CRC screening: 11.9%, 21.4%, and 4.1%, respectively. 2) Telephone counseling was superior to mailed gFOBT alone for Vietnamese but not Latino participants.

(Table continues)

Table 1 (Continued).

Author	Year	Description/intervention type	Intervention	Underserved Groups	Sample size	Key findings
In-reach‡						
Inadomi (35)	2012	Primary care clinic–based RCT of 3 in-clinic recommendation strategies: 1) gFOBT only, 2) colonoscopy only, or 3) choice of gFOBT or colonoscopy	In each randomly allocated 3-month block, PCPs recommend only 1 of 3 screening strategies: 1) gFOBT, 2) colonoscopy, 3) choice of gFOBT or colonoscopy. Individuals were provided language-concordant written and verbal information on screening.	Safety-net health system primary care clinic patients, including blacks, Hispanics, and Chinese in San Francisco, CA	997	1) Screening participation rates for choice of gFOBT or colonoscopy as well as gFOBT alone were superior to offering colonoscopy alone: 69%, 68%, and 38%, respectively. 2) Latinos and Asians had a higher screening rate than blacks. 3) Nonwhites preferred FOBT, whereas whites preferred colonoscopy.
Katz (66)	2012	Primary care clinic–based RCT of patient activation intervention compared with screening information alone	Patient activation intervention: 12-minute video on CRC screening and patient activation + 1 patient activation brochure + 1 CRC prevention brochure, followed by telephone barrier counseling as reminders Control: 10-minute informational video on CRC screening only + 1 CRC prevention brochure	Low-income, Uninsured, low literacy, >70% blacks at a single federally qualified health center in Columbus, OH	270	1) gFOBT completion was superior for patient activation compared with provision of screening information alone (19.6% vs 9.9%).
Potter (67)	2011	Primary care–based RCT offering gFOBT at time of annual flu shots	Flu gFOBT intervention Trained nurses routinely offered gFOBT to eligible individuals who were receiving flu shots Flu-only group (Control) Nurses provided gFOBT with flu only when ordered by PCP during usual care	Low-income blacks, Hispanics, whites, and Asian Americans	1372	1) Screening rates increased by 13% for Flu gFOBT vs 4.3% for controls

* The table is meant to be an illustrative rather than exhaustive list of interventions tested by randomized controlled trials among underserved populations for increasing screening. CRC = colorectal cancer; gFOBT = Guaiac-based fecal occult blood test; PCP = primary care provider; RCT = randomized controlled trial.

† Outreach strategies target all eligible individuals in a defined population regardless of scheduled health-care visits (see text for details).

‡ In-reach programs engage individuals by offering screening at the point of medical care that is unrelated to screening (see text for details).

Table 2. Implemented strategies for boosting screening among the underserved*

Group	Description/ intervention type	Underserved groups included	Method of ensuring CRC treatment if CRC found	Method of paying for screening and/ or diagnostic CRC	Entity performing colonoscopy	Status
UT Southwestern/ John Peter Smith Health System, Dallas and Fort Worth, TX (52,68)	Organized outreach program assigning patients to 1) mailed invitation to complete FIT 2) mailed invitation to complete free colonoscopy, or 3) usual medical care	Uninsured, blacks, Hispanics	Safety Net Health System Medical Assistance Program	Grant from Cancer Prevention and Research Institute of Texas	Safety net health system	After 1 year, both mailed FIT and mailed colonoscopy outreach were associated with marked increased screening participation compared with usual care. Organized colonoscopy resulted in higher screening rate compared with usual care.
University of Miami, Miami, FL†	Organized outreach program assessing the acceptability and feasibility of Community Health Workers in increasing adherence to FIT	Blacks, Haitians, Hispanics	Safety Net Health System Medical Assistance Program	Grant from Bankhead-Coley Florida Cancer Research Program	Safety net health system or private gastroenterologist per patient preference	Program ongoing. Community Health Worker intervention has resulted in higher-than-expected FIT adherence rates among Haitians.
University of Miami and University of Michigan, Miami FL (60)	Outreach program offering free flexible sigmoidoscopy at temporary mobile community clinics in Miami, FL	Haitians, Hispanics, uninsured	Safety Net Health System Medical Assistance Program	Industry support	Volunteer gastroenterologists	2 fairs completed, 104 individuals screened, >30 adenomas and 1 cancer removed
Howard University and District of Columbia Cancer Consortium, Washington, DC†	DC Screen for Life Program provided free education and offered free colon cancer screening with colonoscopy (as the preferred method) and FIT	Uninsured and underinsured DC residents aged 50–64 y	DC Medicaid for those who qualify	Grant from District of Columbia Cancer Consortium	Howard University, Georgetown University	Completed. Free education on CRC provided for 2900 residents; colonoscopy performed for 383 subjects, and 36 FIT performed.
Mount Sinai School of Medicine, New York, NY (69)	Colonoscopy with culturally targeted patient navigation to promote colonoscopy completion after screening referral (NCI funded)	Blacks, Hispanics	NY State Emergency Medicaid	Mostly Medicaid and Medicare	Full-time GI faculty	503 patients navigated; 395 (78.5%) completed colonoscopy
Project Access San Diego San Diego CA†	Provide diagnostic colonoscopies for uninsured patients referred from community clinics	All racial/ethnic groups	Kaiser Foundation Hospital San Diego donates surgical care	Health-care providers are local volunteers. Kaiser Hospital San Diego donates facilities, supplies, and needed medication	Kaiser Hospital's outpatient endoscopy centers	Since 2009, 102 diagnostic colonoscopies have found 5 cancers and 17 advanced adenomas. Surgical treatment donated by Kaiser Hospital San Diego.
Alameda County Medical Center, Oakland, CA†	Organized in-reach program with PCPs, launch of FIT-based CRC screening program	Uninsured, Blacks, Asians, Hispanics, recent immigrants	Safety Net Health System Medical Assistance Program	Grants from Kaiser Permanente Community Benefit Programs and the American Cancer Society	Safety net health system	Less than one year since the launch of the program, screening rates have nearly doubled from baseline

(Table continues)

Table 2 (Continued).

Group	Description/ intervention type	Underserved groups included	Method of ensuring CRC treatment if CRC found	Method of paying for screening and/ or diagnostic CRC	Entity performing colonoscopy	Status
San Francisco General Hospital and Trauma Center/University of California San Francisco, San Francisco, CA†	Nurse practitioners performing colonoscopy in patients with +FIT	Hispanics, blacks, uninsured	Safety Net Health System Medical Assistance Program	Not applicable	Safety net health system	Use of nurse practitioners performing colonoscopy has substantially reduced patient wait time for a colonoscopy and improved patient access to care in those with a +FIT

* The table depicts an illustrative rather than exhaustive list of programs that have been implemented for increasing screening among underserved populations. CRC = colorectal cancer; FIT = immunochemical fecal occult blood test; GI = Gastroenterology; NCI = National Cancer Institute; PCP = primary care provider.

† Unpublished experiences.

test choice (59) was an important intervention feature. In each case, the interventions had to occur within a framework able to support the offered modality, such as infrastructure to follow up abnormal gFOBT or FIT, and/or sufficient capacity to provide screening and/or diagnostic colonoscopy.

Beyond randomized trials, a number of programs for boosting screening among underserved populations may increase screening completion. Table 2 provides illustrative examples of programs started by our coalition's members that have been successfully implemented across the United States. For example, offering portable flexible sigmoidoscopy at medical clinic fairs was feasible and effective in eliciting uptake of endoscopic screening in uninsured Haitian and Hispanic individuals in Miami, Florida (60). In New York, patient navigation after referral for colonoscopy has consistently increased screening completion among underserved groups, including low-income blacks and Hispanics (61,62).

Fund and Enhance Programs and Policies That Address the Entire CRC Screening Continuum

Screening programs must address barriers along the entire screening continuum, including access to screening, diagnostic follow-up, and treatment. Both private and public approaches may be considered. Project Access San Diego is an example of a private organization engaging with an underserved community to provide screening and treatment services (Table 2). Since 2008, Project Access has partnered with San Diego County's community health centers and Kaiser Hospitals to provide screening sigmoidoscopies and diagnostic colonoscopies, as well as CRC care. The partnership sponsors several Super Saturdays each year that provide free diagnostic procedures. Treatment is provided for people diagnosed with CRC. The program demonstrates how a voluntary, community-based partnership can provide screening and treatment services to the underserved while providing institutional financial benefit. Institutions such as Kaiser Permanente benefit because the provided care can be included as part the Financial Assistance Program that helps maintain its not-for-profit status. Although other private entities might consider this approach, whether this strategy can be sustained and has the capacity to address the needs of the many underserved individuals throughout the United States in need of screening and diagnostic services is unclear.

CRC screening and treatment for the underserved could also be supported through a public program, using the model of the National Breast and Cervical Cancer Early Detection Program, a Centers for Disease Control and Prevention initiative to screen underserved women and create a pathway to treatment (63). This program successfully expanded access to breast and cervical cancer screening and treatment for underserved women. Proposed legislation (the Colorectal Cancer Prevention, Early Detection, and Treatment Act) would use this model for a national program coordinated by the Centers for Disease Control and Prevention to provide underserved individuals access to CRC screening and treatment. At the time of submission of this commentary, this act had not been passed (63).

Finally, full implementation of the ACA is expected to substantially decrease disparities in screening and access to CRC treatment. The ACA mandates that individuals at more than 138% of the federal poverty level acquire health insurance (31). Moreover, the ACA mandates all health insurance plans provide preventive services graded A or B by the US Preventive Services Task Force at

no patient cost (32). Currently, this includes screening with colonoscopy, sigmoidoscopy, and stool testing. The health insurance mandate suggests individuals would have at least some access to care if CRC is diagnosed. Screening and treatment access might also increase in individuals at less than 138% of the federal poverty level living in states that expand Medicaid under the ACA. Medicaid plans that expand and provide optional diagnostic services will be required to provide US Preventive Services Task Force–recommended CRC screening and will be eligible for a 1% reimbursement bonus for services provided at no cost (32).

The full impact of the ACA on CRC screening is yet to be determined, and several questions remain. First, some uninsured individuals will forego coverage and pay the penalty instead. Second, although the ACA requires screening coverage, it does not mandate the amount a health plan must pay for screening tests. In response to requirements to cover tests such as colonoscopy, some health plans might reduce provider and facility reimbursement to a level that reduces screening access. Third, ACA does not require no-cost coverage of diagnostic colonoscopy after abnormal gFOBT, FIT, or sigmoidoscopy, which is needed for effective screening. Fourth, regardless of the ACA, we have an ongoing need for coordinated identification of screen-eligible individuals and consistent delivery of screening services. Thus, even if currently underserved individuals acquire insurance, they might remain unscreened for reasons other than coverage (7). Fifth, the reach of Medicaid expansion is uncertain because some states are considering nonexpansion. Advocacy at the state level to adopt Medicaid expansion could help reduce CRC disparities.

Concluding Remarks

Although uptake has increased in the United States, a substantial segment of the population does not get screened for CRC; this is particularly true for underserved populations. The poor, uninsured, racial/ethnic minorities, and recent immigrants continue to have low screening rates. Underserved populations with low rates of screening experience numerous barriers to test uptake and follow-up. These gaps in care lead to adverse outcomes, as indicated by poor survival after diagnosis of late-stage disease and an unequal burden of CRC morbidity and mortality. We encourage patient advocates, health-care providers, policy makers, professional organizations, and health systems interested in improving CRC outcomes to consider the actions proposed in this document to address screening disparities. CRC screening can save lives. We believe that by addressing our stated priorities we can improve CRC morbidity and mortality among underserved populations.

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