Health Disparities in Colorectal Cancer Screening in the United States: An Application of the Social Ecological Model

Dana M. Greene, Ph.D., M.A

Institute for the Environment
University of North Carolina, USA

greenedm@email.unc.edu

Abstract
Colorectal cancer (CRC) is the third most common cancer in the United States, yet the screening rate remains extremely low among certain populations, thereby making colorectal cancer screening an important and urgent public health issue. While it is well known among medical practitioners that CRC is almost 100% preventable if screened for and caught early, there exist significant racial, ethnic, socioeconomic, educational, and regional disparities with regard to those populations who are screened for CRC early and often, and those for whom are not. This paper draws upon the social ecological perspective to evaluate these social inequities in the US healthcare system and focuses primarily on the intersection between individual and ecological factors in the screening factors to identify possible interventions against unhealthy behaviours associated with CRC (i.e., neglecting to be screened).

Introduction
Colorectal cancer (CRC) is the third most common cancer in the United States, yet the screening rate for this disease remains extremely low, most notably among African Americans, thereby making colorectal cancer screening an important and urgent public health issue (Ananthakrishnan et al, 2007). While CRC is almost 100% preventable if screened for and caught early, there exist significant racial, ethnic, socioeconomic, educational, and regional disparities with regard to those populations who are screened for CRC early and often, and those for whom are not (James, et al, 2006). Current CRC screening guidelines are published by the US Preventative Services Task Force for all people of average risk, and are straightforward and simple: all people over the age of 50 should have at least one, if not more of the following tests on a regular basis: a fecal occult blood test (FOBT) annually, a flexible sigmoidoscopy examination (FSIG) every five (5) years, a double-contrast barium enema (DCBE) every five (5) years, a FOBT and a FSIG every five (5) years, and a screening colonoscopy every ten (10) years (Ananthakrishnan et al, 2007). Given that CRC is 100% preventable, it is imperative that those specializing in public health practices take a strong look at the real and perceived barriers to CRC screening, and posit necessary interventions so that the CRC-related death rate will begin to drop. Per the American Cancer Society, during 2010, there were “102,900 new cases of colon cancer diagnosed (49,470 in men and 53,430 in women, and 39,670 new cases of rectal cancer diagnosed (22,630 in men and 17,050 in women)” (http://www.cancer.org/cancer/colonandrectumcancer/detailedguide/colorectal-cancer-key-statistics). These numbers, while alarmingly high, do not break down the incidence of CRC among racial and ethnic minorities, the under or uneducated, those living at or below the poverty line (low SES ≤ $10,289) (http://www.irp.wisc.edu/faqs/faq1.htm), and those for whom access to a testing centre is limited or non-existent. As such, the associated death
rate, however, for African Americans is double that of the white population (O’Malley et al, 2005).

This paper takes a social ecological approach to CRC by focusing primarily on the intersection between individual and ecological factors in the screening process to identify possible interventions against unhealthy behaviours (i.e., neglecting to be screened) with the hope of creating a social environment that consists of more health conscious citizens (i.e., more people are screened and the significant health concerns relating to CRC become a thing of the past) (McLeroy et al, 1998).

**COLORECTAL CANCER SCREENING AS A PUBLIC HEALTH PROBLEM AND ISSUE**

In his seminal book entitled The Sociological Imagination, sociologist C. Wright Mills notes that issues in society may be viewed as both trouble and issues. His framework may be extended to the social ecological framework in such a way that a diagnosis with CRC may be termed a personal trouble if the diagnosis impacts only one person, but when there are competing events that influence barriers or gateways (including issues of social capital) to CRC screening, such becomes a social issue (in “The Sociological Imagination,” 1954). As such, and as will be demonstrated, racial/ethnic and socio-economic (SES) disparities in CRC screening represent a notable social and public health issue.

In 1998, the Centers for Medicare (insurance available to those 65 and older) and Medicaid (insurance available to those with a demonstrated financial need) began reimbursing the costs of “commonly used CRC [screening] tests, covering 100% of charges for FSIG and colonoscopy for high-risk individuals. Coverage was extended to include colonoscopy [screening] for average risk individuals in July, 2001” (Ko et al, 2005, p. 1-2). Whether a patient has health insurance (either private insurance or Medicare/ Medicaid, but there is nothing that guarantees that a patient will have any type of insurance, as is the case in European nations) represents an interesting variable in determining whether that patient will undergo the recommended CRC screening, as data indicates that despite guidelines indicating who should be screened and at which intervals, patient follow-through with recommended CRC testing remains low – especially for racial and ethnic minorities and those in lower socioeconomic brackets. This trend perpetuates within these populations despite assurances of full and complete Medicare or Medicaid reimbursement for the tests, yet analyses have shown that having insurance coverage for screening tests does not eliminate the disparities in CRC screening utilization. Instead, trends indicate that other mitigating factors may exist that prevent poor racial and ethnic minorities from undergoing CRC screening. Among these factors are the embarrassing nature of the tests, general awkwardness of collecting and storing stool samples at home, or even discussing bowel-related issues with doctors. As such, patients tend to shy away from medical tests involving the collection of stool, because “people find them stigmatizing and embarrassing” (http://coloncancer.about.com/b/2011/12/08/stool-testing-what-it-says-about-your-colon.htm). It is clear therefore, that embarrassment at obtaining stool samples presents a mitigating factor against regular CRC screening – especially among racial and ethnic minorities and members of the lower and working class (Robb et al, 2008). Consequently, having medical insurance coverage for CRC screening, while confounded by race/ethnicity and SES, present interesting data on the prevalence (or lack thereof) of consistent CRC screening among vulnerable populations. To further demonstrate this point, and owing to this already alarming trend, Cynthia W. Ko, et al studied demographic differences in CRC screening, and noted that 9.2% of the beneficiaries were likely to consent to a FOBT, but fewer people (7.2%) followed through with a recommended colonoscopy, FSIG, or DCBE (Ko et al, 2005).
This trend is not unique to Ko et al’s study, however. Further research has indicated that African Americans are less likely to report having had a screening colonoscopy within the last ten years citing lack of insurance as a rationale for not getting the test. This finding is furthered by the points offered by McAlearney, et al that low income (<$15,000) African American women have exceptionally low rates of CRC screening, despite the guidelines, and these findings are further impacted by significant social contributors to lower SES, including lower levels of education, awareness of CRC screening protocols, and perceptions that health insurance will not cover bills and lower age (McAlearney et al, 2007). The variable “awareness of CRC screening protocols” represents a significant factor in future public health interventions (to be discussed later), as whites are more likely than Blacks to know about the tests that screen for CRC, that, in turn, influences compliance with medical protocols (ibid). Even when patients are educated about CRC screening protocols, data indicate that there still exist racial disparities in CRC screening follow-through, with patients noting specific barriers to testing, including fear of screening results, embarrassment of specimen collection, not knowing where to get a FSIG, lack of time, and high cost. Among African Americans, specifically, rates of CRC screening compliance are particularly low, while whites are more likely than other racial group to receive any kind of CRC screening test. Further, while rural residents are more likely to have a FOBT done, they are also less likely to receive invasive (FSIG or colonoscopy) screening tests (Ko et al, 2005). Moreover, it has become clear in the literature that while whites receive CRC screening tests earlier and more often, racial and ethnic minorities are more likely to go to the doctor and undergo CRC screening tests if health problems are already being experienced. This, in turn, relates to the higher rates of CRC diagnoses as well as with the associated increased morbidity and mortality rates among racial and ethnic minorities in the United States (James et al, 2006).

Significant racial, ethnic, and SES disparities in CRC testing have resulted in documented differences in CRC outcomes, with higher morbidity (being diagnosed in the later stages of the disease instead of receiving regular colonoscopy or FSIG screening tests that could detect precancerous adenomatous polyps and during which a polypectomy may be performed that would potentially eliminate the possibility that CRC will develop in these individuals) and accompanying higher mortality rates among African Americans and Hispanics (Cooper et al, 2006). The question remains whether the information glitch exists on the part of the patients or on the part of the healthcare delivery system. Regardless, racial disparities exist not only in the implementation of CRC screening procedures, but also in the indications for such testing. Significantly, African Americans are diagnosed more frequently with CRC at later stages of the disease, suggesting that there may be parity in how health care providers approach patients of different races (e.g., African American patients and/or health care providers may be more likely to defer CRC screening procedures until symptoms or signs of illness develop, which may account for the higher rate of colorectal carcinoma incidence among African Americans) (ibid). The confluence of various socio-demographic factors, (income, education, presence of Medicare supplemental insurance) therefore, may also be affected by the higher prevalence of comorbid illnesses in the African American population (diabetes, high blood pressure, obesity, sickle cell anaemia, among others), and thus recommendations for CRC testing may not be delivered in the same way to this population as it is to a more highly educated, higher SES white population.

As further evidence of this trend, Green et al note that among African Americans, 21.6% of individuals 50 years of age or older had not had a FOBT within the past year, and less than half of this population had a FSIG or screening colonoscopy within the last five years, thereby underscoring the need to heighten awareness and promote the necessary nature of CRC screening examinations at regular intervals (Green et al, 2007). What has become
even more apparent, however, is the disparity in information dissemination (at the individual, physician, and institutional levels) and subsequent racial/ethnic/SES associated patient follow-through with CRC screening tests. As such, while significant advances have been made in CRC screening, and a protocol has been set forth for payment of CRC screening tests by Medicare and Medicaid Services, attention needs to be shifted back to getting patients aged 50 and over (regardless of race or SES) screened for CRC (with, as noted earlier, an annual FOBT, FSIG every five years, DCBE every five years, FSIG and FOBT every five years, and a colonoscopy every ten years). This shift must be made at the community level; with CRC screening prioritized in the same way as various vaccinations (e.g., tetanus, polio, influenza, among others) have been, in the past.

**Examples of Community-Based Approaches to Increased CRC Screening**

A community-based approach to CRC screening follows the conceptual framework set forth in the Health Belief Model (HBM) that explains why people engage or fail to engage in preventive healthcare actions (like CRC screening). This particular approach suggests that taking a specific health action is largely dependent upon an individual's personal “susceptibility to the illness, the degree of severity of the consequences of contracting CRC, the health action’s potential benefits in preventing susceptibility to CRC, as well as the physical, psychological, financial and other barriers related to the advocated behaviour” (ibid, p. 207). Further, there needs to be some sort of social impetus to cue an individual to seek out CRC screening. Here, we can look at some of the barriers to seeking out CRC screening, not the least significant of which is the role of real and perceived social capital in the healthcare process.

Perceptions of social capital and the perceived “social worth” of a patient within the healthcare system has long been a source of discussion within scholarly circles, as there exist significant disparities in treatments, numbers and costs of tests ordered, and even with the degree to which a physician maintains a solid relationship with a patient that is based predominately upon the race, SES, and insurance status of that patient. To this end, issues pertaining to a patient's race, SES, geographic region in which s/he resides, type of occupation in which the patient works, and even the type of health insurance that a patient has (e.g., private health insurance versus Medicare or Medicaid) all have been found to dictate the quality of care that a patient receives. With regard to CRC screening, these perceptions of social capital and perceived social worth of the patient could prove deadly for those patients whose lives are not valued as highly (by virtue of race, SES, insurance status [e.g., ability to pay whatever remains after insurance pays their part]) as those who do have access to these resources. In essence, these perceptions of social capital create anomic communities that are seemingly disconnected from the mainstream patient base. Indeed, it is these communities that require interventions with CRC screening the most. To this end, Green et al identify several “cues to action” that must occur to trigger an appropriate response to a perceived threat to one's health (ibid).

When one thinks of “cues to action” with regard to valuable information relating to CRC screening, attention must be focused on the types of knowledge that underserved populations (e.g., poor African American) receive with regard to screening practices. Studies have shown that impoverished communities of colour over the age of 50 have not received adequate information to make informed decisions for themselves regarding CRC testing. As such, low income minority women are more likely to identify barriers to CRC screening than are their male counterparts, but less than 50% of Green’s sample passed a basic CRC screening knowledge test (ibid), which gives further fuel to the argument that as one’s educational level increases, their likelihood of being screened appropriately for CRC also
increases (e.g., the threat of CRC decreases because of perceived compliance with screening protocols).

**Interventions**

Given the community-based approach described above, several interventions are useful in protecting low-income racial and ethnic minorities from CRC. First, educational programs should be directed at correcting the misconception that CRC is usually fatal at diagnosis. This misperception, alone, may be responsible for large numbers of racial and ethnic minorities not volunteering to undergo CRC screening for fear of the "unknown" or that they will "lose their colon" if the results are positive for CRC. Further, educational programs should address how CRC screening is completed (and how it differs from previously painful screening procedures that used to use rigid nonflexible instruments) (ibid, p. 214). Further, given that fear is as much of a detractor as it is a motivator, community CRC interventions need to focus on the importance of early detection and on the role of positive outcomes (e.g., pre-cancerous adenomatous polyps can be removed during routine FSIG and colonoscopies thereby reducing significantly the likelihood that the patient will develop CRC).

Further interventions need to be made at the health professional level, as when health professionals are kept abreast of the latest official CRC screening recommendations, they can then pass this information on to their patients. Moreover, the literature on possible interventions into CRC screening note that advanced practice nurses should "be encouraged to incorporate current recommendations for CRC screening into routine medical exams," so that CRC screening is not viewed as an "add-on," but as part of a regular check-up examination (ibid), and that physicians should promote medical office visits as actual opportunities to provide CRC screenings (which, in turn, would help to increase CRC screening rates, while simultaneously educating patients about the importance of CRC screening to detect colon cancer early so that it can be treated) (McAlearney et al, 2007, p. 397). Further trends have emerged indicating that if one's regular treating physician has a "good bedside manner" and can discuss CRC screening using terms that a lay person can understand, compliance with CRC screening protocols are likely to be higher (Starr, 1984). This fits with Eliot Friedens's (1988) notion of how medical personnel need to interact with their patients. That is, Friedsen posits that physicians not take on a God complex as though the physician knows "everything," but, instead, place the agency back into the hands of the patient who is well armed with information to make the best decisions regarding CRC screening for him or herself. In so doing, patients are not merely passive followers of protocol and policy, but become active actors in their own overall healthcare.

**Applying the Social Ecological Framework to CRC Screening**

The Social Ecological Framework (SEF) was posited by McLeroy et al (1998) as a means for understanding health-related behaviours at various levels in much the same way that Anthony Giddens views his iterative concept of structuration; namely, that individuals influence and shape their environment as the environment influences and shapes individuals. Given that McLeroy's SEF allows for interventions that alter individual beliefs to improve behaviour, the environment to reinforce healthy behaviours, and the environment to improve individual health beliefs, one can translate this model into a four-tiered set of concentric circles (as depicted in Figure 1) in which individual health behaviours are at the centre of the model (because individual beliefs about CRC or any other health issue will govern individual behaviours in that same realm, p. 352).
As Figure 1 depicts further, the ring around the centre ring is interpersonal - social networks and support - and represents the social network to which the patient belongs, and whether s/he would have support for undergoing even base-level FOBT CRC screening. These two initial levels represent the key areas in which individual agency play a part in determining whether an individual will not only engage in a health promoting behaviour (like CRC screening), but will also have the support network of family and friends within which to deal with the realities of what the screening might reveal. It is at these two perfunctory levels that the Health Belief Model (HBM) plays a significant role. When thinking about the HBM, it has become clear that individuals move between subjective and objective risks as they evaluate the risk/benefit expectancies, paying particular attention to perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action in terms of the likelihood of changing one’s behaviour (in this case, opting to follow through with recommended CRC screening). The third concentric circle represents that of one’s community or place characteristics. It is here that most interventions toward increasing CRC screening need to focus because CRC screening is not solely an individual phenomenon, and it is not solely a societal trend; rather CRC screening must be instituted and promoted at the meso (community) level in such a way as to be at the educational level and language of the residents residing in the target community. Here, one may extrapolate a bit further that in order to instill trust in a predominately minority and lower SES community, it is helpful further for the health practitioners to not only practice medicine in the community, but to also live there, speak the same language, and look the same (e.g., be of the same race or ethnicity) as their patient base (that is, there is much to the social psychological theories that maintain that one will trust someone of their own race if that person is advocating a potentially scary screening test (e.g., CRC screening), than if a white physician is recommending that same test to a person of colour for whom English is not a first language) (Heirich, 1997). The
fourth, and final, concentric circle represents the population. It is at this level that the distribution of power and resources are doled out, and thus it is also at this level that certain forces toward social change (within the social ecological model) need to be focused.

**Application of the SEM to CRC Screening**

CRC screening has long been associated with lower CRC morbidity and mortality rates among the white middle to upper middle class population, but knowledge and consent to screening among minority and lower SES groups varies greatly by educational level and outreach to these communities at risk. Indeed, minority and lower SES groups are at greater risk for CRC because they do not have the same continuity of care that is documented among their white counterparts. Thus, established research by noted gastroenterologists and sociologists of health and illness shows that the SEM is an appropriate model for outlining how various factors at the individual, interpersonal, community, and population level impact CRC screening and interventions aimed at increasing CRC screening.

At the individual and interpersonal levels, it is evident that clear-cut educational materials about the perceived benefits of CRC screening, together with “testimonials” from members of the community may be enough to strengthen individual trust in the medical system. This suggestion is strengthened by Becker et al’s qualitative findings, as they note that participants in focus groups “agreed that CRC is not on the public’s radar screen” (Becker, 2000, p. 271). Further, respondents in Becker’s study noted astutely that, “(j)ust the mention of “breast cancer” or “prostate” once made people squeamish…. so will publicity about CRC make it easier to say “rectum” or “colon””(ibid). Here we can focus on mapping social integration into the realm of CRC screening, and focus on how individual and interpersonal social network ties may be strengthened by using lay health advisors who teach about the importance of the life-saving CRC screening. After all, if we alter the practices of key individuals in a social network, the norms of that social network become altered, as well. At the individual and interpersonal levels, stressing that CRC is 100% preventable if the guidelines set forth by the US Preventive Services Task Force (in conjunction with the major health organizations governing gastroenterology) are met; namely, an annual FOBT, a FSIG every five (5) years, a DCBE (every five years), a FSIG and a FOBT (every five (5) years) and a colonoscopy (every ten (10) years) will set in motion a cycle by which patients will begin to see CRC screening as routine as moderating food choices and checking one’s blood sugar (if diabetic). Further, education (in multiple languages) about the symptoms of CRC, and knowing what might be problematic issues (if experienced) may also help to break down some of the barriers to CRC screening (by increasing an individual’s sense of self-efficacy and ownership in their own healthcare process), especially if the perceived barriers to care are taken away and are replaced by health care providers who are well versed in the community that they serve. If this can be accomplished at the individual and interpersonal levels in US society, it is quite likely that late stage CRC diagnoses will begin to decline among minority and lower SES individuals.

At the community and population levels, research in public health has indicated that the confounded issues of racism, classism, and lower educational levels has led to a lower rate of CRC screening tests, and thus a higher rate of CRC diagnoses at later stages of the disease. Further, qualitative students also suggest that “older Americans are more poorly informed about CRC screening and have limited interaction with their providers or peers about a major cancer killer in the United States” (ibid, p. 276). Once again, the question of logistics and where and how individuals can get the necessary information about CRC screening comes into play. Removing the issue of SES in the CRC screening process (by having Medicare and Medicaid cover 100% of the screening costs) represents one way that
the community may be reached without there being a stigma surrounding “inability to pay” for expensive screening tests. Cooper et al document this issue by stating that racial disparities exist not only in the use of CRC procedures, but also in the indications for such testing. As such, these disparities are consistent with delays in CRC diagnosis in minority populations (with different tests being ordered for racial and ethnic minorities than for whites), with such a rationale being proffered because there are comorbid illnesses in African Americans that confound the testing schemata (Cooper et al, 2003). Removing the socioeconomic/insurance component, however, should serve to equalize the “playing field” and enable CRC screening early and often for all segments of the US population. The remaining factor that needs to be addressed, however, is trust in the medical system.

One of the key interventions at the population level has to be re-instilling trust in the medical system for all people, but especially for racial and ethnic minorities. Distrust in the medical system and fear that patients are being led astray for physician’s own gain continue to be at the forefront of the African American mindset, which remains reminiscent of such events as the Tuskegee Experiment (syphilis) in which African American men were unknowingly infected with syphilis without informed consent as a means of social eugenics (http://www.cdc.gov/tuskegee/timeline.htm), family planning and involuntary sterilization, and the participation of the medical system in the justification of racism and discrimination in society. Further, Becker et al (2000) maintain that the "low visibility of CRC compared to other health issues, such as breast cancer, in the mass media may contribute to the perception that CRC is either unimportant, untreatable, or a “private” disease” (p. 273). As such, positive change must be instituted over time and with more positive interactions with the healthcare system than what has occurred in the past. At the population level, more regulation is needed to ensure that those who interact with the medical system for CRC screening are getting the tests for which they consented. Regaining trust at the population level will take time, and, indeed, it is the test of time that will determine whether CRC screening for ALL segments of society can reduce the high CRC morbidity and mortality rates that currently exist among minority populations.

CONCLUSION

While signing up for a FBOT, FSIG, or a colonoscopy CRC screening test may not be the most exciting thing that the average American does every few years, research has shown that these tests are a necessary evil, and that with the screening, can ensure that CRC morbidity and mortality rates decline over time. In order to ensure that members of all populations are reached, however, ardent efforts need to be made to reach racial and ethnic minorities in their communities (whilst remaining cognizant of cultural sensitivities relating to consenting to these tests) in their language(s), and with respect to their unique cultures and customs. Reaching out to these communities in these ways represent a series of “first steps” toward eradicating CRC as a major “killer” of racial and ethnic minorities, that when coupled with coverage through Medicare and Medicare (to cover the costs of CRC screenings 100%) should help to decrease the racial and ethnic disparities in CRC morbidity and mortality. Clearly, however, further research is needed on how to combat issues of lower SES and the impact of that on comorbid diagnoses (e.g., diabetes, obesity or being in a structural position wherein processed foods are more affordable than fresh fruits and vegetables) that can also affect CRC screening and diagnoses.
REFERENCES


http://www.cancer.org/cancer/colonandrectumcancer/detailedguide/colorectal-cancer-key-statistics

http://www.cdc.gov/tuskegee/timeline.htm


http://www.irp.wisc.edu/faqs/faq1.htm


