COLORECTAL CANCER PREVENTION MYTH BUSTERS: SCREENING, STOOL AND SCOPES

MAYIN LIN, DO, MPH

COLON AND RECTAL SURGERY

MERCY ONE SM

Disclosures

I have no disclosures

Outline

- What is screening?
- Who and why do we screen?
- Colon cancer epidemiology
- Guidelines
- Screening modalities & What's the data?
- How is Iowa doing?
- Sociodemographic disparities
- Screening during the COVID pandemic

What is screening?

"The application of tests, examinations or other procedures… to sort out apparently well persons who probably have a disease from those who probably do not." (Wilson and Jungner, 1968)

- Major health problem
- Natural history understood
- Suitable screening test
- Effective treatment exists
- Reduces disease incidence and disease-related mortality
- Cost-effective
- Ongoing process

Why do we screen?

- Lifetime incidence 5%
- Majority of cases occur after 50 years-old
- One-third of patients with colorectal cancer die from the disease
- Colon screening is cost effective
- **Colorectal cancer is a PREVENTABLE disease!**
- Goals:
  - To reduce colorectal cancer incidence and mortality
  - Detect early stage and curable cancers
  - Detect pre-cancerous lesions

Myth

- We are screening for colorectal cancer

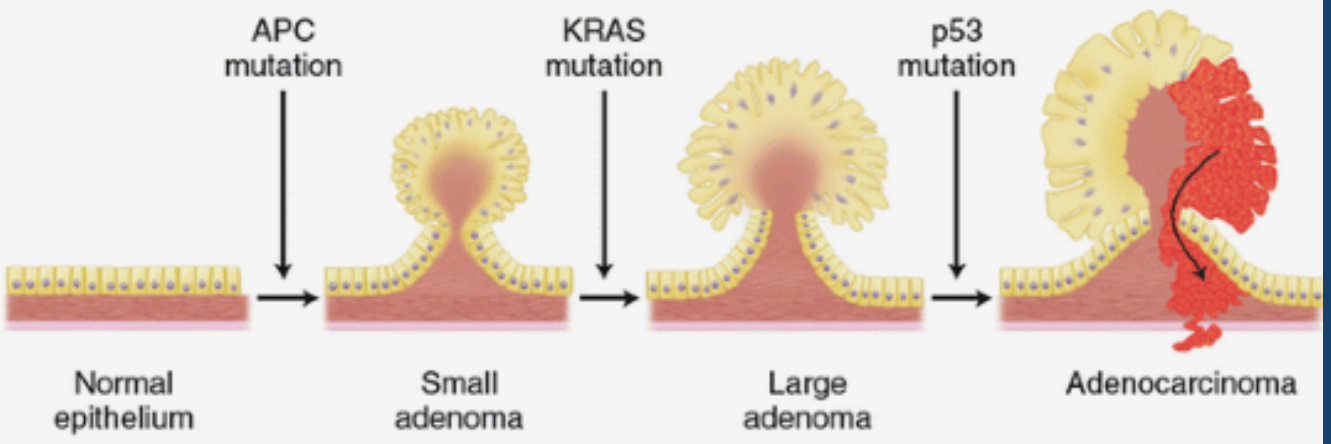


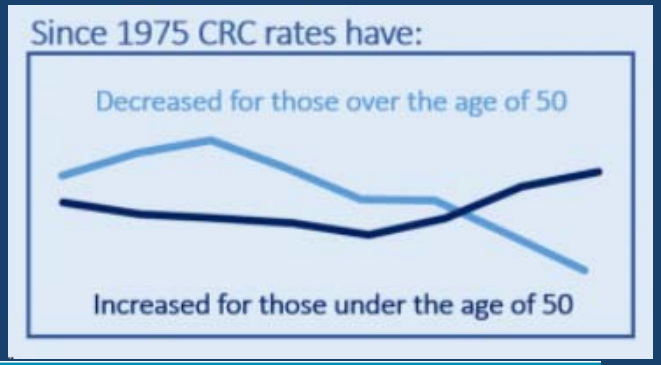
Figure 23-1. Schematic representation of the traditional adenoma-to-carcinoma sequence resulting in chromosomal instability.

Who do we screen?

- Who is an average-risk individual?
  - No family or personal history of colon cancer
  - No personal history of colon adenoma
  - No inflammatory bowel disease
  - No symptoms

Who do we screen?

- 50 years-old ?



U.S. Preventive Services TASK FORCE

USPSTF Bulletin

An independent, volunteer panel of national experts in prevention and evidence-based medicine

U.S. Preventive Services Task Force Issues Draft Recommendation on Screening for Colorectal Cancer

Colorectal cancer screening saves lives, and adults ages 45 to 75 should be screened

American Cancer Society

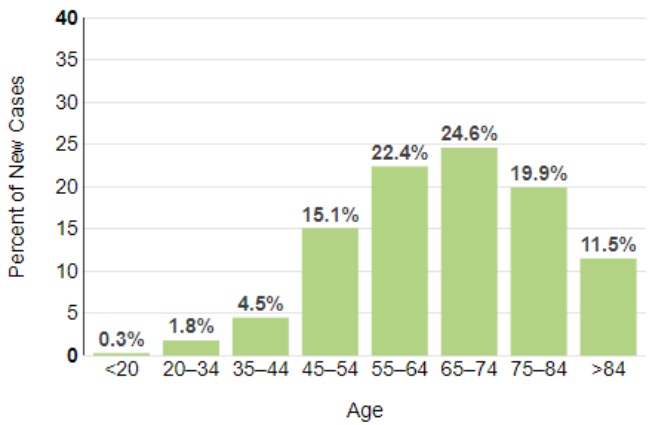
ASCRS American Society of Colon & Rectal Surgeons

*In 2018, secondary to new data on the increased risks of colon cancer in those under 50, the American Society of Colon and Rectal Surgery changed recommendations to consider starting screening at age 45.

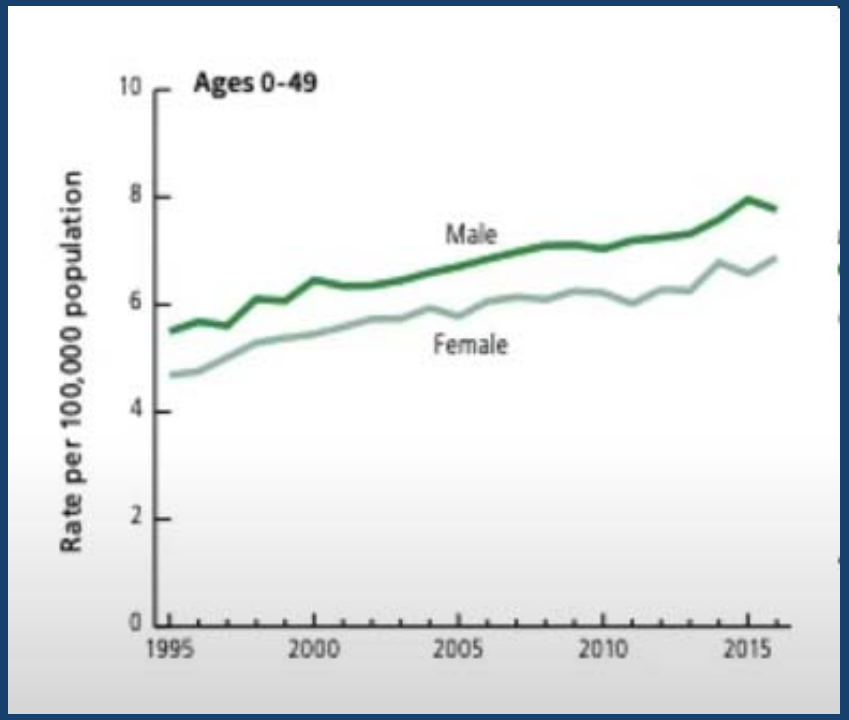
Myth

- Colorectal cancer only happens in older people

Percent of New Cases by Age Group: Colorectal Cancer



SEER 21 2013–2017, All Races, Both Sexes



Rates are age adjusted to the 2000 US standard population. Incidence rates are adjusted for reporting delays and exclude appendix.
Source: Incidence – NAACCR, 2019. Mortality – NCHS, 2019.

Screening modalities

- Fecal occult blood test or fecal immunochemical test
  - Yearly
- Sigmoidoscopy
  - Every 5 years
- Colonoscopy
  - Every 10 years
- Virtual colonoscopy
  - Every 5 years
- Fecal DNA
  - Every 1 or 3 years

Myth

- All screening modalities are created equal

Fecal occult blood test (FOBT)

- Aimed at detecting subtle blood loss in GI tract
- Requires at least 2 mL of blood loss a day to become positive
- Strict dietary adjustments prior to collecting sample
- Poor sensitivity
- Repeat annual testing
  - Compliance?
- Costs:
  - If positive, will need colonoscopy within 1 year of abnormal result
    - Studies report only 25-59% of patients with a positive FOBT receive diagnostic evaluation [1]

[1] Miglioretti DL, et al. Improvement in the diagnostic evaluation of a positive fecal occult blood test in an integrated health care organization. Med Care. 2008;46(9 Suppl 1): S91– 6.

Fecal occult blood test (FOBT)

- Several randomized controlled trials demonstrating a benefit of FOBT in reducing mortality from colorectal cancer [1,2]
  - Approximately 15% reduction
    - Likely due to FOBT with subsequent follow-up colonoscopy
- Much of the data on FOBT was published in the 1990s
  - Data collected in the 1970-80s

[1] Kronborg O, et al. Randomised study of screening for colorectal cancer with fecal-occult-blood test. Lancet. 1996;348(9040): 1467–71.
[2] Hardcastle JD, et al. Randomised controlled trial of fecal-occult-blood screening for colorectal cancer. Lancet. 1996;348(9040): 1472–7.

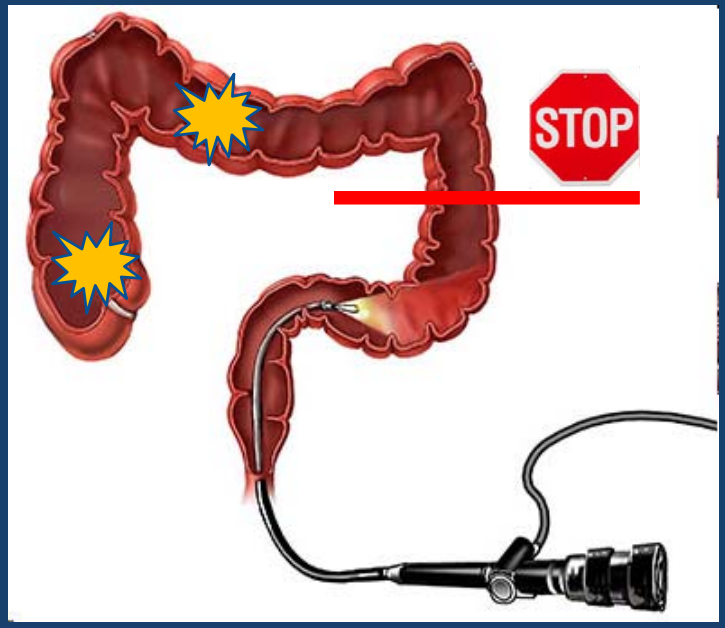
Fecal immunochemical test (FIT)

- Utilizes specific antibodies to detect globin
- Has replaced most FOBT tests
  - Improved detection of hemoglobin compared to gFOBT
    - Increased sensitivity and specificity
    - Can pick up as little as 0.3 mL of blood in stool
  - No requirements for dietary restrictions
- Overall accuracy 95% [1]
  - 79% sensitivity and 94% specificity
- Adenoma detection only 28% [2]
- No good data suggesting that FIT lowers colon cancer mortality

[1] Lee JK, et al. Accuracy of fecal immunochemical tests for colorectal cancer: systematic review and meta-analysis. Ann Intern Med. 2014;160(3): 171.
[2] Rennert G. Fecal occult blood screening– trial evidence, practice and beyond. Recent Results Cancer Res. 2003;163: 248– 53. discussion 64-6.

Sigmoidoscopy

- Examines only 1/3 of the colon
- Benefits:
  - More tolerable to perform without sedation
  - Can be performed by variety of operators
  - Minimal bowel preparation
- If adenoma detected, requires formal colonoscopy
- Does not evaluate the more proximal colon



Sigmoidoscopy

- Large RCT demonstrated 21% reduction in colorectal cancer incidence and 26% reduction in mortality [1]
  - Mortality from proximal colorectal cancer was not affected
  - Morality reduction of 50% for only distal colorectal cancer
- Recent RCT compared flexible sigmoidoscopy +/- FOBT [2]
  - 63% adherence
  - 28% reduction in colorectal cancer
  - 12% reduction in mortality
- No difference between flexible sigmoidoscopy alone or in combination with FOBT

[1] Schoen RE, et al. Colorectal-cancer incidence and mortality with screening flexible sigmoidoscopy. N Engl J Med. 2012;366(25): 2345–57.
[2] Holme Ø, et al. Effect of flexible sigmoidoscopy screening on colorectal cancer incidence and mortality: a randomized clinical trial. JAMA. 2014;312(6): 606–15.

Stool DNA testing

- Most recent advancement
- Use DNA testing of stool samples
  - Tests for DNA mutations and methylations of common genes associated with colorectal cancer
- Requires large stool sample (mailed)
- No dietary restrictions
- **False positives** (more than FIT)
  - 16% of all tests are positive, 66-75% of which are false positives [1]
- Polyps >1 cm can be detected [2,3]
  - Sensitivity 57%

[1] Imperiale TF, et al. Multitarget stool DNA testing for colorectal-cancer screening. N Engl J Med. 2014 Apr 3;370(14):1287-97.
[2] Heigh RI, et al. Detection of colorectal serrated polyps by stool DNA testing: comparison with fecal immunochemical testing for occult blood (FIT). PLoS One. 2014;9(1): e85659.
[3] Lidgard GP, et al. Clinical performance of an automated stool DNA assay for detection of colorectal neoplasia. Clin Gastroenterol Hepatol. 2013;11(10): 1313– 8.

Myth

- If I have a positive stool DNA test that means I have cancer

Stool DNA testing

- "Multitarget Stool DNA Testing for Colorectal-Cancer Screening" (Imperiale et. al., NEJM 2014)
  - RCT of FIT vs stool DNA
  - All patients received colonoscopy as gold standard

Table 1. Sensitivity and Specificity of the Multitarget Stool DNA Test and the Fecal Immunochemical Test (FIT) for the Most Advanced Findings on Colonoscopy.

Most Advanced Finding	Colonoscopy (N=9989)	Multitarget DNA Test (N=9989)		FIT (N=9989)	
		Positive Results	Sensitivity (95% CI)	Positive Results	Sensitivity (95% CI)
	no.	*no.*	%	*no.*	%
Colorectal cancer					
Any	65	60	92.3 (83.0–97.5)	48	73.8 (61.5–84.0)
Stage I to III*	60	56	93.3 (83.8–98.2)	44	73.3 (60.3–83.9)
Colorectal cancer and high-grade dysplasia	104	87	83.7 (75.1–90.2)	66	63.5 (53.5–72.7)
Advanced precancerous lesions†	757	321	42.4 (38.9–46.0)	180	23.8 (20.8–27.0)
Nonadvanced adenoma	2893	498	17.2 (15.9–18.6)	220	7.6 (6.7–8.6)
			Specificity (95% CI)		Specificity (95% CI)
All nonadvanced adenomas, non-neoplastic findings, and negative results on colonoscopy	9167	1231	86.6 (85.9–87.2)	472	94.9 (94.4–95.3)
Negative results on colonoscopy	4457	455	89.8 (88.9–90.7)	162	96.4 (95.8–96.9)

Imperiale TF, et al. Multitarget stool DNA testing for colorectal-cancer screening. N Engl J Med. 2014 Apr 3;370(14):1287-97.

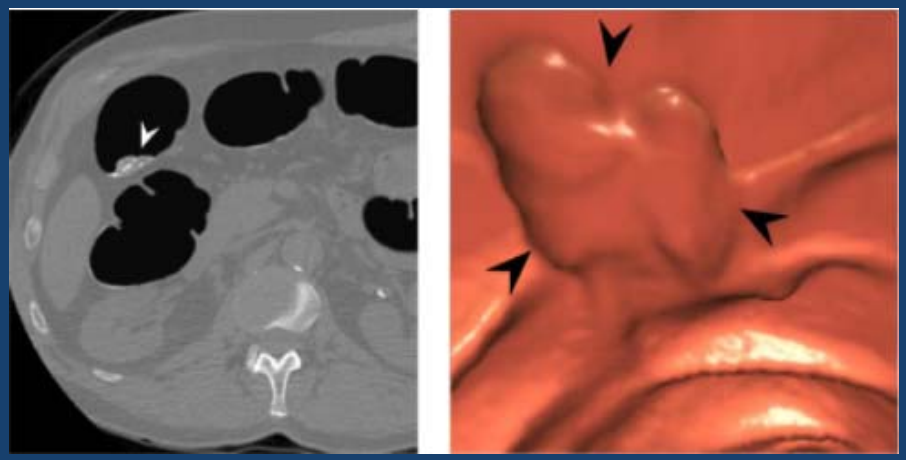
Stool DNA testing

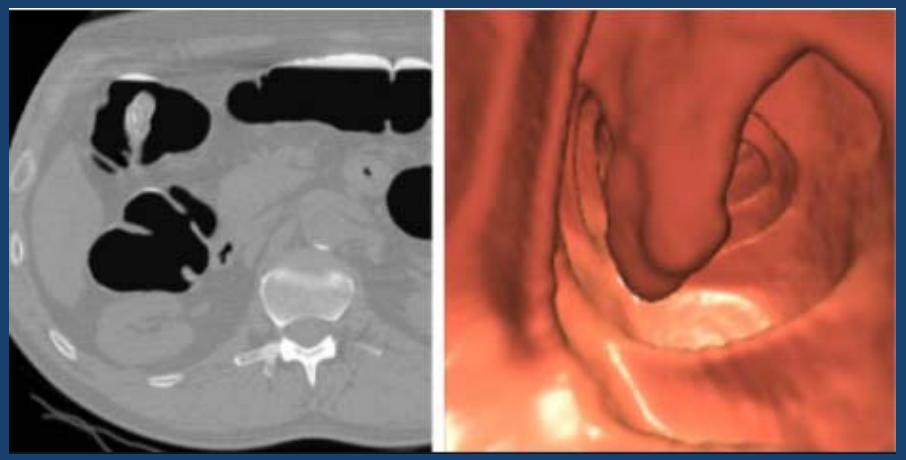
PROS

- Non-invasive
- Does not require bowel preparation
- Can be done at home
- Better than FIT
- More patient willingness

CONS

- Not preventative
- Advanced adenoma detection 42%
- Adenoma detection 17%
- Subsequent diagnostic colonoscopy required
- Not therapeutic





CT colonography/Virtual colonoscopy

CT colonography/Virtual colonoscopy

- “Minimally invasive”
- Uses CT to generate 2D images with 3D reconstruction
- Still requires bowel preparation
- Requires distention of colon
  - Rectal catheter insertion to allow for manual/automatic continuous inflation carbon dioxide
- If polyps are detected, therapeutic colonoscopy is required

CT colonography/Virtual colonoscopy

- American College of Radiology Imaging Network national multicenter CTC trial assessed over 2500 patients [1]
  - Sensitivity of 90% for polyp or cancer detection ≥1 cm and 78% for ≥6 mm
- Another study looked at outcomes in 1000 cases where screening CTC exams were negative [2]
  - 1 internal cancer and 11 large adenomas were noted after a mean follow-up of 4.7 years
- CTC has a current 5-year screening interval

[1] Johnson CD, et al. Accuracy of CT colonography for detection of large adenomas and cancers. N Engl J Med. 2008;359(12): 1207–17.
[2] Kim DH, et al. Five year colorectal cancer outcomes in a large negative CT colonography screening cohort. Eur Radiol. 2012;22(7): 1488–94.

CT colonography/Virtual colonoscopy

- Extracolonic findings
  - Approximately 66% of scans will find something incidental
  - Additional workup in about 25%
  - Clinically relevant in 2-3%
  - Screening other organs?
    - AAA
    - Liver disease

CT colonography/Virtual colonoscopy

PROS

- Has the ability to detect polyps
- “Minimally invasive”
- No sedation needed
- Extracolonic findings

CONS

- Not therapeutic
- Needs bowel preparation
- Has not been widely accepted/utilized
- Extracolonic findings

Colonoscopy

PROS

- Highest sensitivity for cancer and all pre-cancerous lesions
  - Multiple studies
- Both diagnostic and therapeutic at the same time
- Up to 10 years between evaluations

CONS

- Requires full bowel preparation
- Complications
  - Perforation
  - Bleeding
- Discomfort

Myth

- The prep is horrible

Myth

- A colonoscopy has to be painful

Myth

- Colonoscopies are dangerous

CANCER PREVENTION WORKS

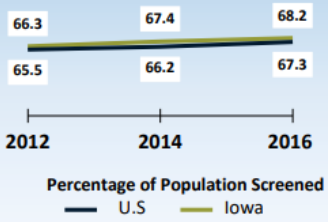
Quick Facts

Colorectal Cancer (CRC) Screening in Iowa

Behavioral Risk Factor Surveillance System - 2016

CRC screening test use* in Iowa has increased since 2012.

In 2016, 68.2% of age-eligible residents had a current CRC screening test. 293,000 residents were not currently screened. Whites and Hispanic/Latinos were similar when it came to having a current screening test. Screening occurred more frequently in women and people aged 65 to 75, who were likely insured by Medicare.



CRC screening test use, by race/ethnicity:

Whites (69.0%)

Hispanic Latinos (69.0%)

CRC screening test use, by insurance status:

Insured (66.4%)

Uninsured (21.7%)

CRC screening test use, by sex:

2012 – 69.2%
2014 – 68.6%
2016 – 68.2%

2012 – 63.3%
2014 – 66.1%
2016 – 68.1%

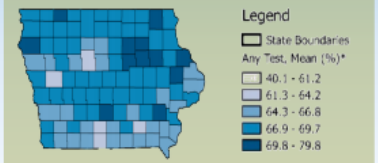
CRC screening test use, by age:

50 to 64 Years (64.2%)

65 to 75 Years (75.8%)

Men and women aged 65 to 75 years were eligible for Medicare insurance.

Estimated CRC Screening Test Use by County, 2014



County-level CRC testing prevalence was derived from small-area estimate models (Berkowitz, et al. CEBP 2018)

Factors that affect CRC screening: Data on factors—such as poverty, educational level, and insurancestatus—that affect who gets CRC screening tests are available at statecancerprofiles.cancer.gov

CRC Screening Info and Resources:
Iowa Comprehensive Cancer Control Program
www.cdc.gov/cancer/ncccp
www.cdc.gov/cancer/crccp

Learn more about CRC incidence and mortality at CDC's Cancer Data Visualizations Tool.

Proportion of people who reported completing a screening test for CRC among all people who could be screened based on age (50 – 75 years). People who were current with CRC screening in 2016 either received a home-based blood stool test within the past year; a colonoscopy within the past 10 years; or sigmoidoscopy within the past 5 years combined with a blood stool test within in the past 3 years (2008 US Preventive Services Task Force Recommendations).

Footnotes:

Prevalence of screening test use account for the differences in age among states; estimates based on small numbers not shown. The U.S. CRC screening test use prevalence estimate excludes Puerto Rico.
Self-reported screening test use comes from CDC's Behavioral Risk Factor Surveillance System, 2016.
Population estimates for states and D.C. are from CDC's National Center for Health Statistics (released 6/26/2017). Available on CDC WONDER
Population estimates for Puerto Rico are from the U.S. Census Bureau, Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2016 (Release Date: June 2017).

National Comprehensive Cancer Control Program

Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion

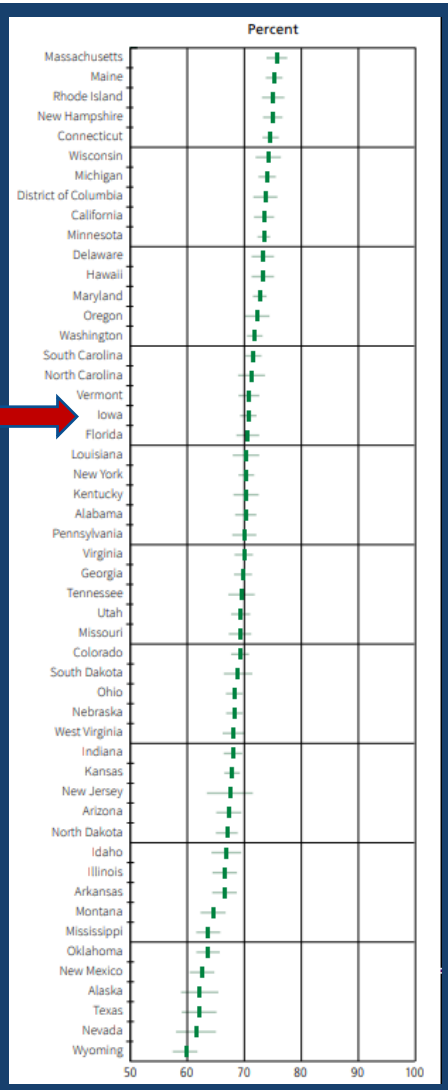
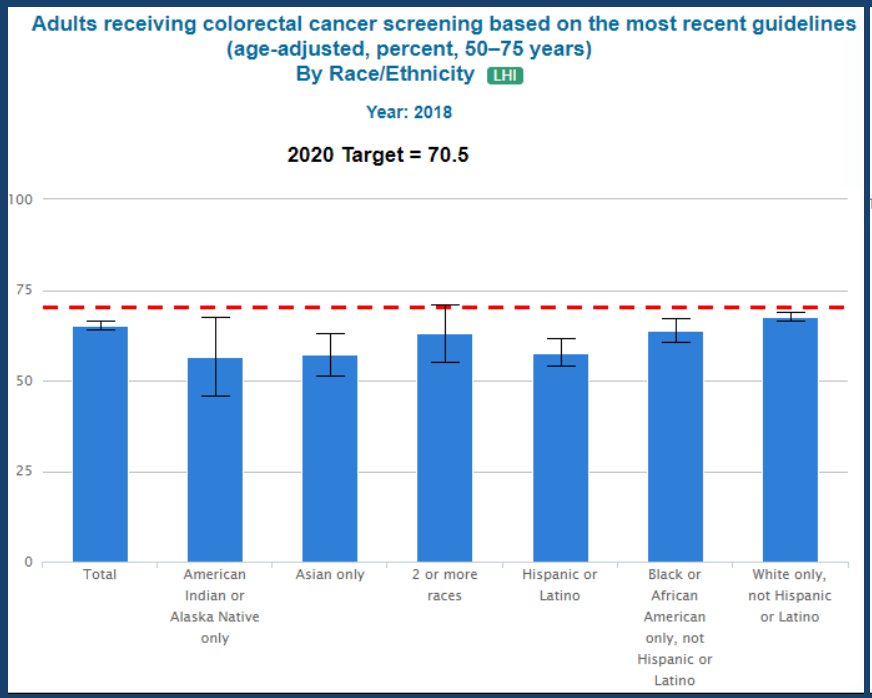


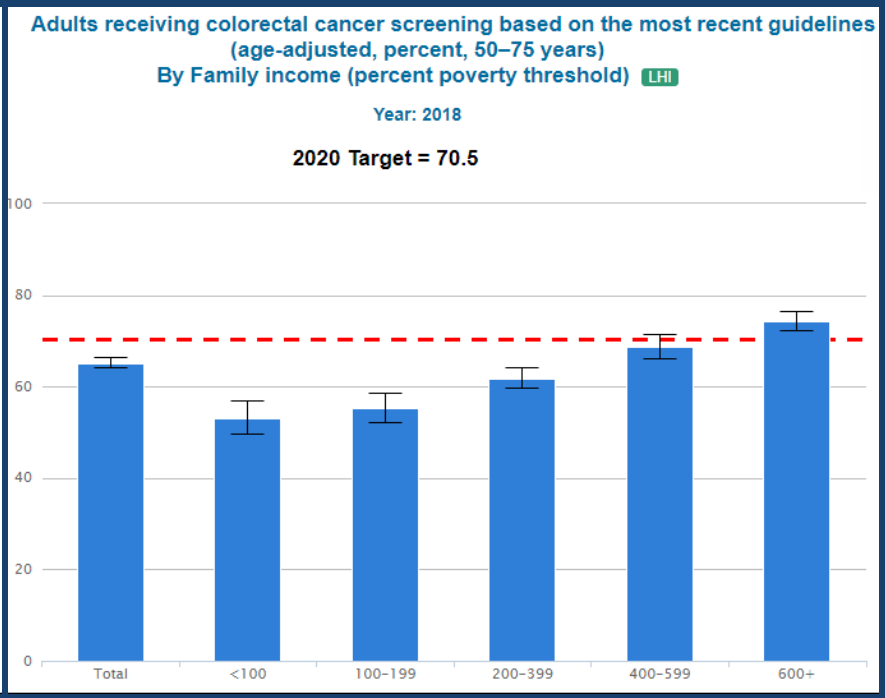
Figure 12. Colorectal Cancer Screening* (%), Adults 50 Years and Older by State, 2018

*Blood stool test, sigmoidoscopy, or colonoscopy in the past 1, 5, and 10 years, respectively. Note: Estimates are age adjusted to the 2000 US standard population and do not distinguish between examinations for screening and diagnosis.

Source: Behavioral Risk Factors Surveillance System, 2018. See Sources of Statistics (p. 32) for complete citation and more information.

Sociodemographic Disparities in CRC Screening





Data Source: National Health Interview Survey (NHIS), CDC/NCHS

Social Determinants of Health

- Social policies
- Structural racism
- Discrimination
- Health literacy
- Employment status
- Poverty
- Living environment
- Access to high-quality healthcare
- Medical mistrust

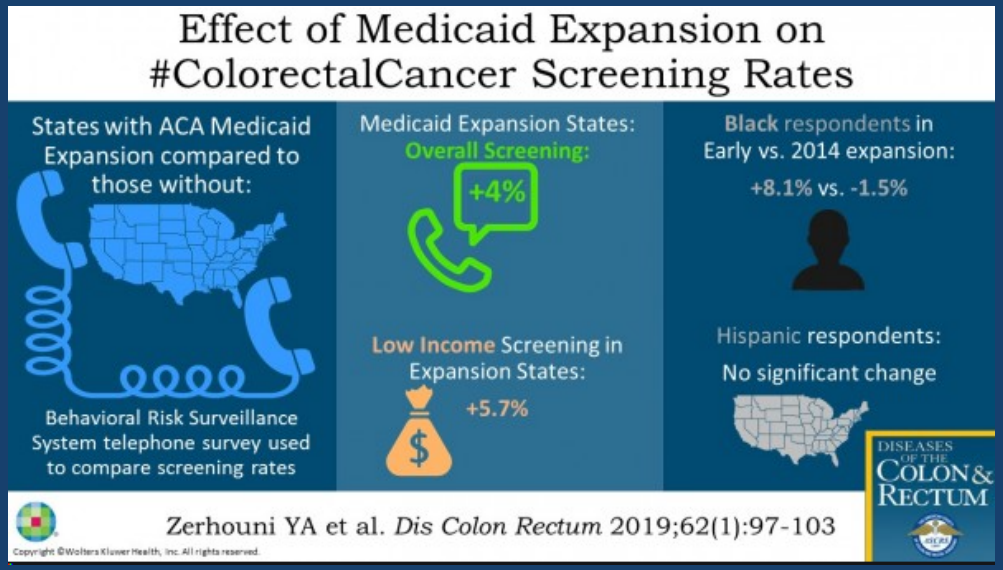
Myth

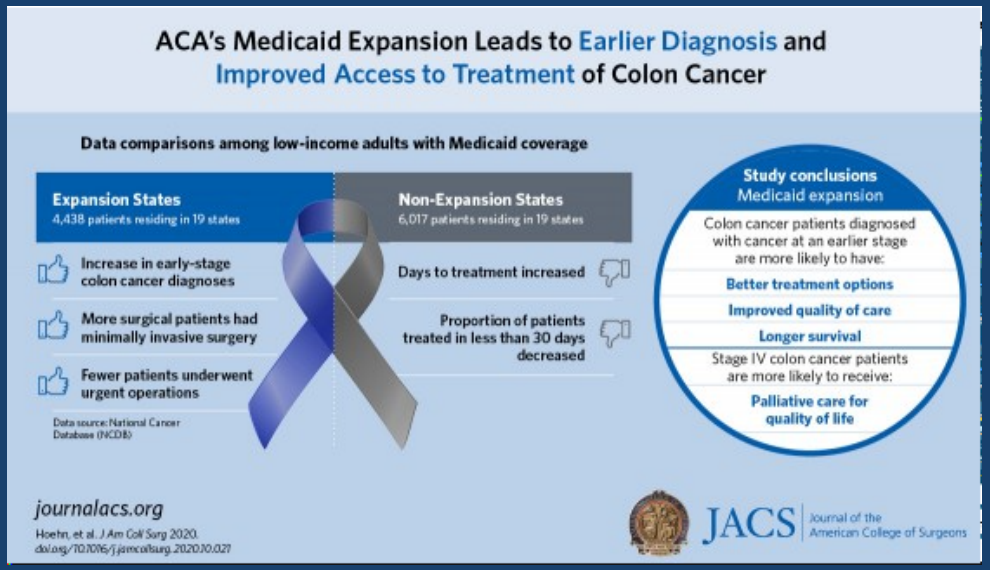
- Colorectal cancer screening is equally obtainable and widely available to everyone

Barriers to Screening

Patient-level factors	Systemic and Policy-level factors	Provider-level factors
❖ Lack of knowledge ❖ Beliefs and cultural factors ❖ Education ❖ Health literacy ❖ Language ❖ Cost and lack of insurance	❖ Access to screening tests ❖ Colonoscopy capacity ❖ Cost and insurance policy	❖ Knowledge ❖ Beliefs ❖ Practice setting ❖ Counseling practices ❖ Lack of recommendation ❖ Discrimination ❖ Time constraints ❖ Perceived need ❖ Referral practices ❖ Lack of support

May, FP, et al. Disparities in Colorectal Cancer Screening in the United States Before and After Implementation of the Affordable Care Act. CGH. 2020;18(8): P1796-1804.


Effect of Medicaid Expansion on #ColorectalCancer Screening Rates
States with ACA Medicaid Expansion compared to those without:
Behavioral Risk Surveillance System telephone survey used to compare screening rates
Medicaid Expansion States: Overall Screening:
+4%
Low Income Screening in Expansion States:
+5.7%
Black respondents in Early vs. 2014 expansion:
+8.1% vs. -1.5%
Hispanic respondents:
No significant change
Zerhouni YA et al. Dis Colon Rectum 2019;62(1):97-103
DISEASES OF THE COLON & RECTUM
Copyright ©Wolters Kluwer Health, Inc. All rights reserved.


ACA's Medicaid Expansion Leads to Earlier Diagnosis and Improved Access to Treatment of Colon Cancer
Data comparisons among low-income adults with Medicaid coverage
Expansion States
4,438 patients residing in 19 states
Increase in early-stage colon cancer diagnoses
More surgical patients had minimally invasive surgery
Fewer patients underwent urgent operations
Data source: National Cancer Database (NCDB)
Non-Expansion States
6,017 patients residing in 19 states
Days to treatment increased
Proportion of patients treated in less than 30 days decreased
Study conclusions
Medicaid expansion
Colon cancer patients diagnosed with cancer at an earlier stage are more likely to have:
Better treatment options
Improved quality of care
Longer survival
Stage IV colon cancer patients are more likely to receive:
Palliative care for quality of life
journalacs.org
Hoehn, et al. J Am Coll Surg 2020.
doi.org/10.1016/j.jamcollsurg.2020.10.027
JACS Journal of the American College of Surgeons

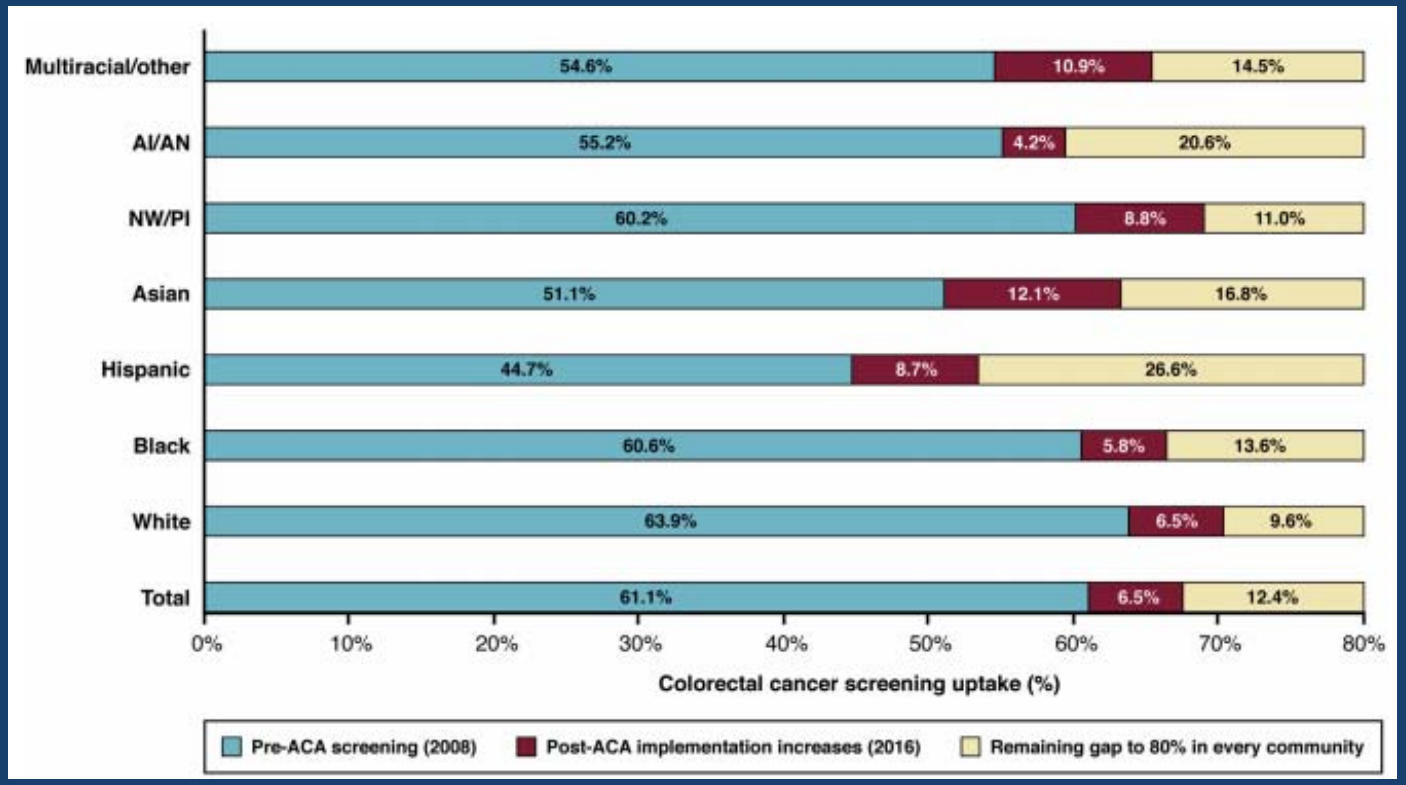
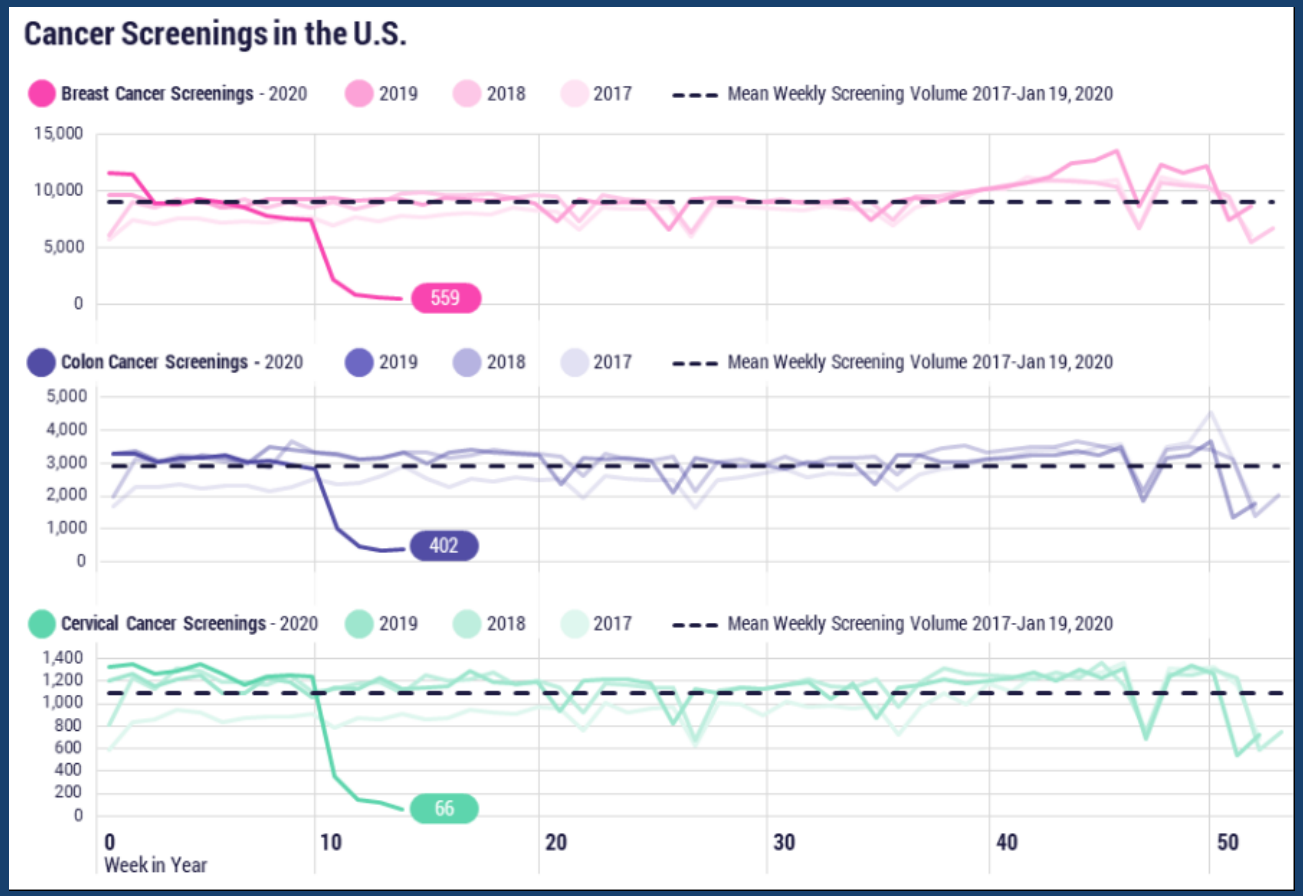


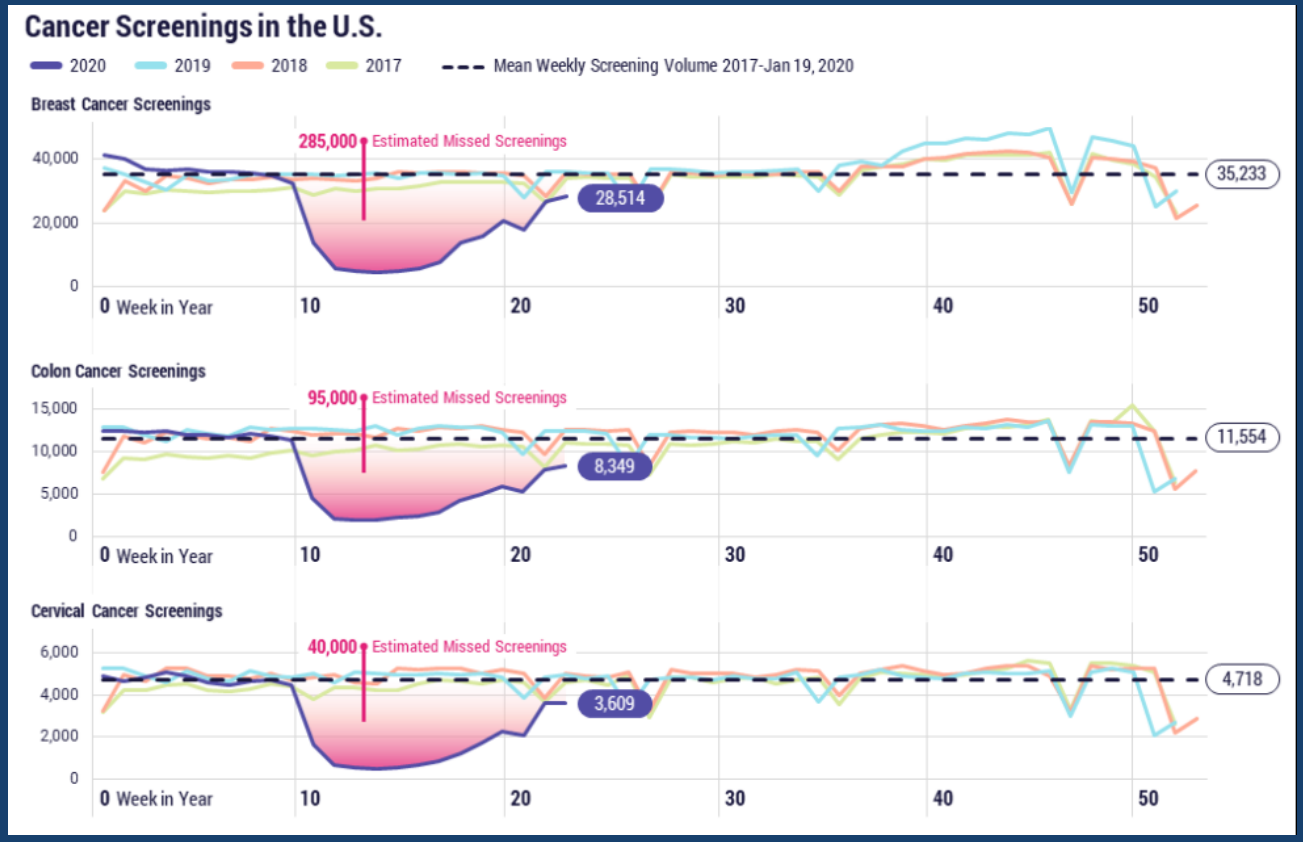
Figure 1. Progress toward achieving equity in colorectal cancer screening across racial/ethnic groups in the United States. Data from May et al[4] demonstrate pre-Patient Protection and Affordable Care Act variation in screening rates across racial/ethnic groups, with rates consistently lower for non-Hispanic whites compared with other groups. After implementation of ACA in 2010, screening rates improved across all racial/ethnic groups between 2008 and 2016. However, disparities between non-Hispanic whites and racial/ethnic groups persisted, and even got worse for some groups. The range of remaining gaps between current rates of screening and achieving equity in screening, defined as reaching 80% screening in every community, is much larger for racial/ethnic minorities (11.0%–26.6%) compared with whites (9.6%). These data suggest that substantial investments need to be made to target implementation of evidence-based interventions for achieving health equity in CRC screening. AI, American Indians; AN, Alaska Natives; NH, Native Hawaiian; PI, Pacific Islanders.

Demb J, Gupta S. Racial and Ethnic Disparities in Colorectal Cancer Screening Pose Persistent Challenges to Health Equity. CGH. 2020;18(8): P1691-93.



Screening in the times of COVID

"Delayed cancer screenings." Epic Health Research Network. (May 2020). Retrieved from: https://ehrn.org/articles/delays-in-preventive-cancer-screenings-during-covid-19-pandemic.



Screening in the times of COVID

"Delayed cancer screenings." Epic Health Research Network. (May 2020). Retrieved from: https://ehrn.org/articles/delays-in-preventive-cancer-screenings-during-covid-19-pandemic.

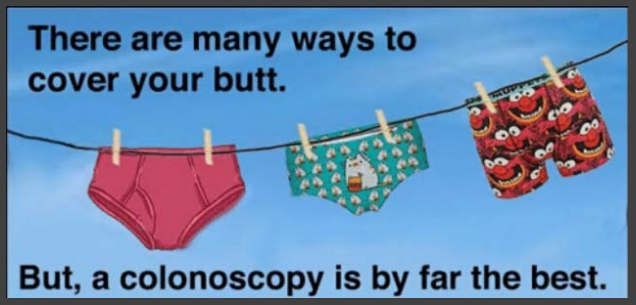
Myth

- It’s safer to just wait until the pandemic is over

Summary

- Colon screening reduces colorectal cancer incidence and mortality
- Colon screening is cost-effective
- Screening modalities
  - Colonoscopy is the gold standard
  - Ordering providers should know the data when ordering different screening tests
- 45 is the new 50
- Health equity is important for improving healthcare outcomes
- Thank you to the primary care providers!


March is colorectal cancer awareness month!
colorectal cancer alliance


There are many ways to cover your butt.
But, a colonoscopy is by far the best.


In the Know
Social Media for Public Health
VH OFFICE
HIV TESTING


Screening saves lives!
#GetScreened
colorectal cancer alliance


It always seems impossible until it is done.
– Nelson Mandela
colorectal cancer alliance