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# The Colorectal Cancer Screening Continuum: Modeling and Achieving Screening Adherence in the Real World

A. Mark Fendrick, MD

University of Michigan Center for Value-Based Insurance Design

[Slides available at https://vbidcenter.org/weo-2026](https://vbidcenter.org/weo-2026)

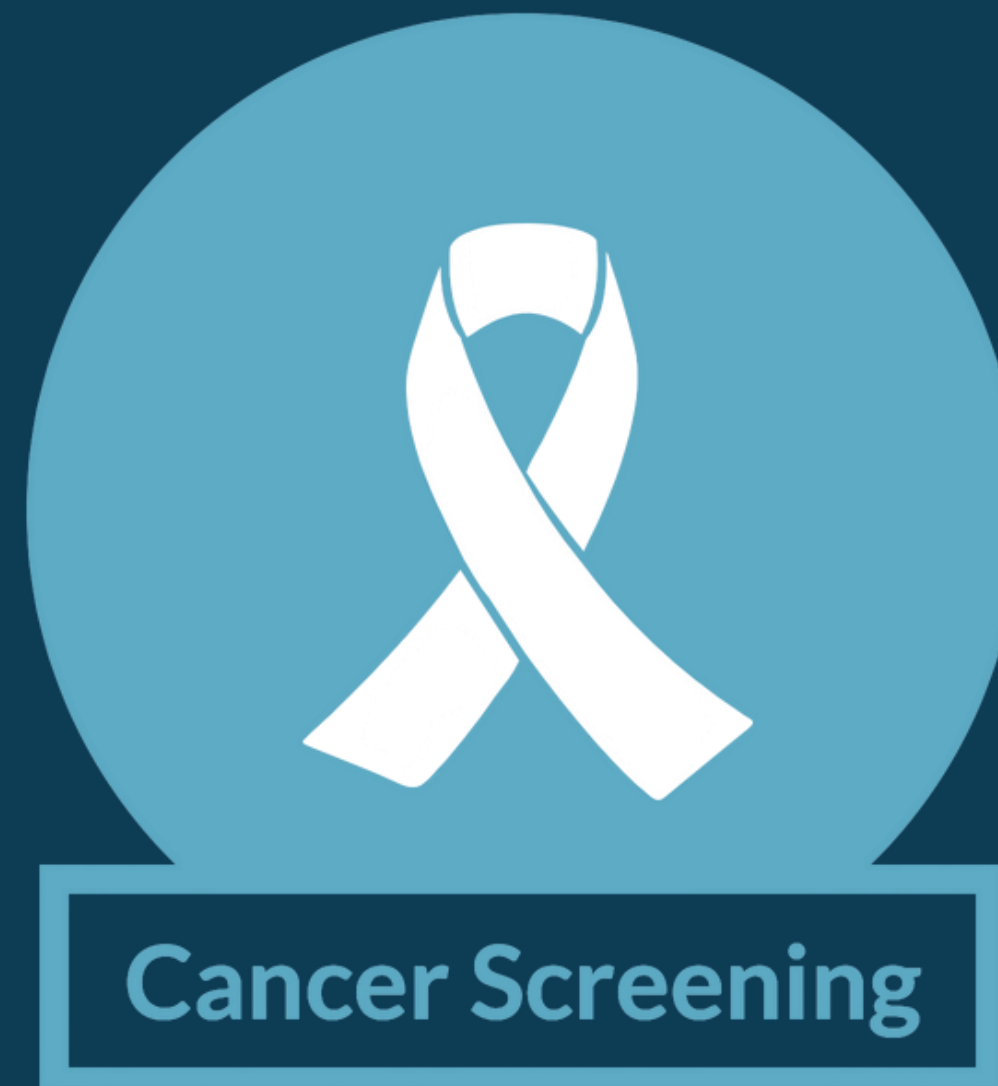


# Increase Adherence Across the Entire Colorectal Cancer Screening Continuum

## Agenda: Summarize 30 years of research and policy activities in 9 minutes

- Brief comments about initial colorectal cancer screening
- Focus on follow-up of initial positive non-invasive screening tests
- Acknowledge colonoscopy capacity limitations and the need to reallocate initial screening and indications for colonoscopy to achieve full benefits of screening
- A closing thought

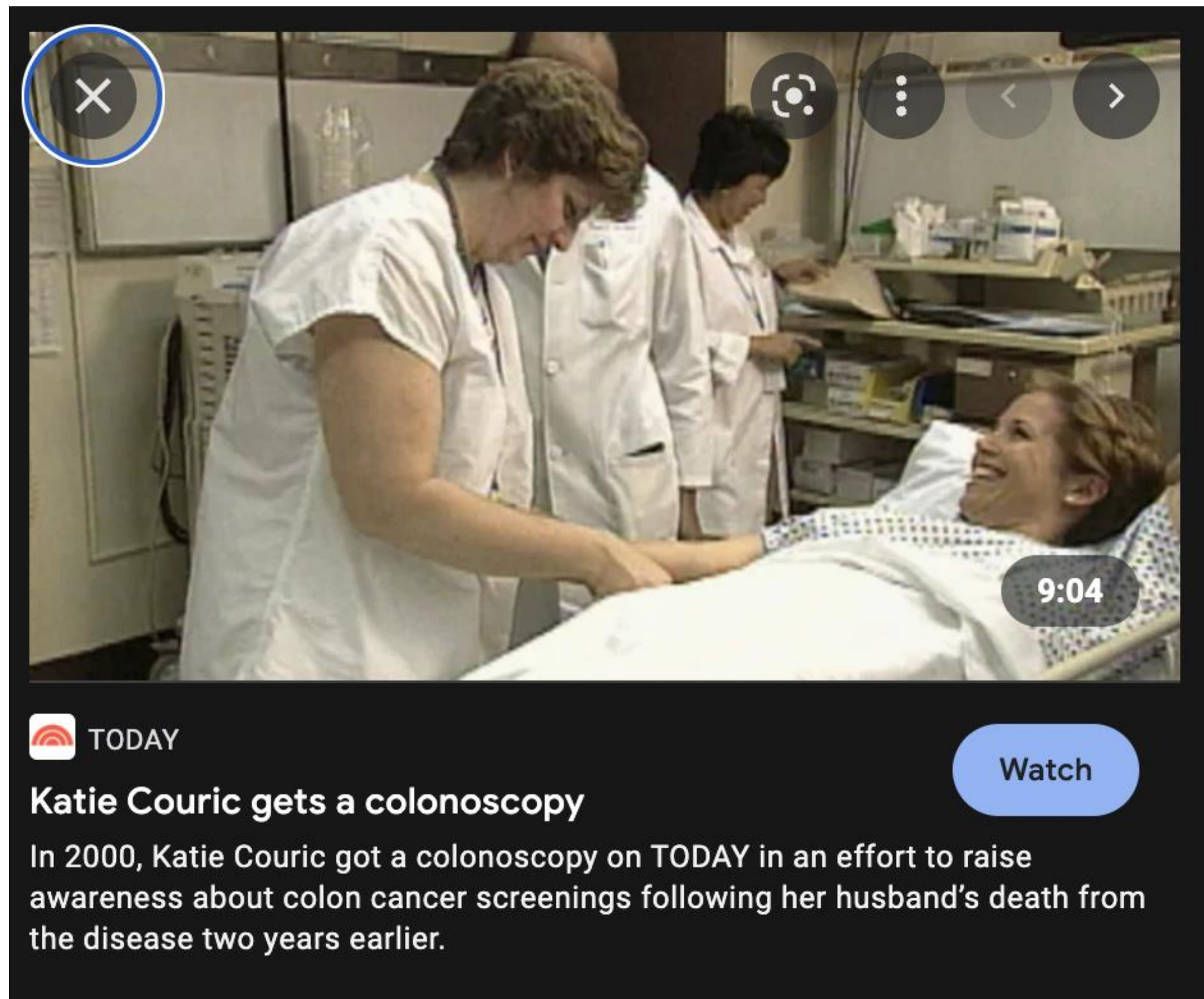
# INITIAL SCREENING



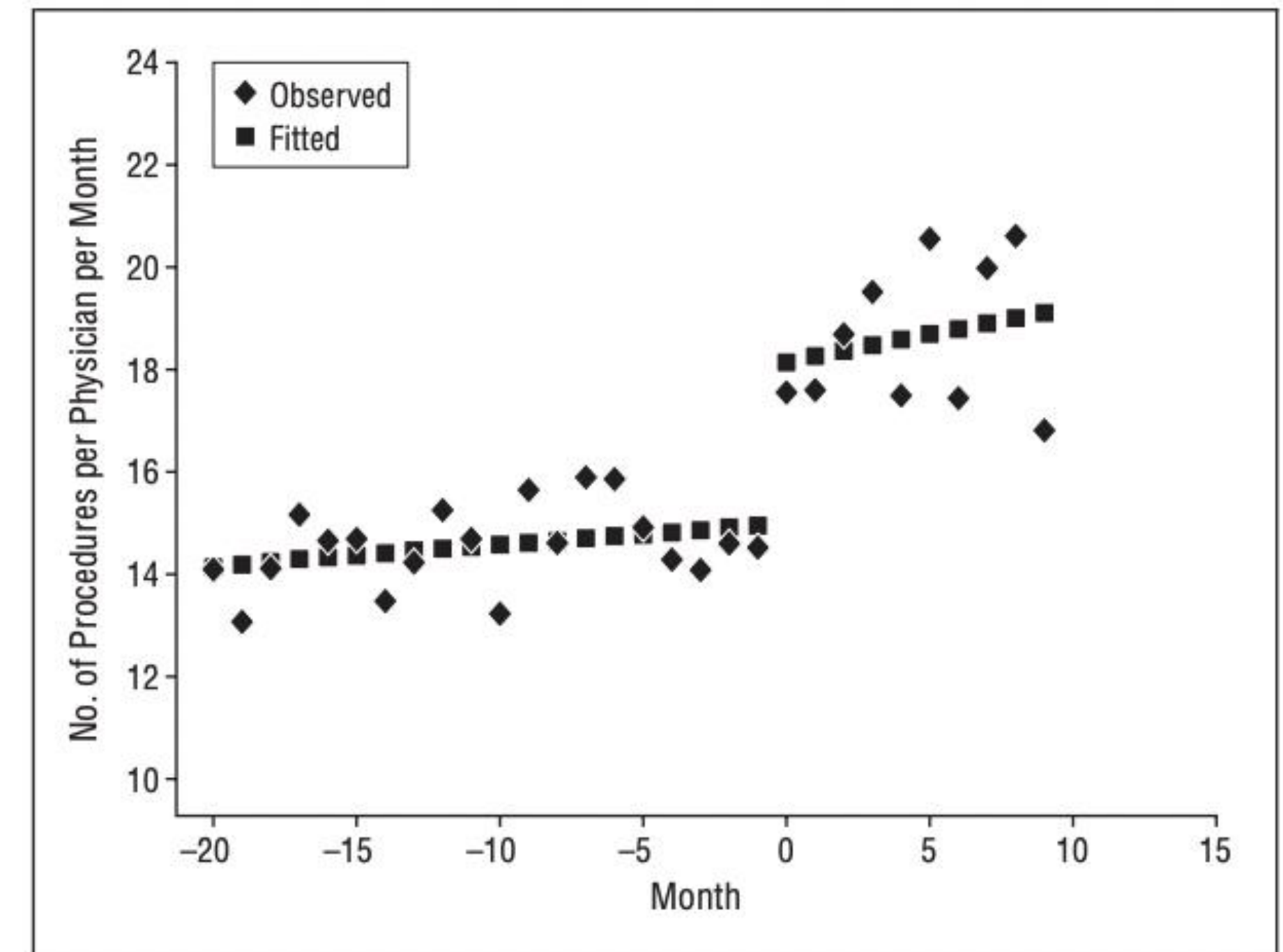
# The Impact of a Celebrity Promotional Campaign on the Use of Colon Cancer Screening

## The Katie Couric Effect

Peter Cram, MD, MBA; A. Mark Fendrick, MD; John Inadomi, MD; Mark E. Cowen, MD, SM; Daniel Carpenter, PhD; Sandeep Vijan, MD, MS



2000



**Figure 1.** Monthly colonoscopy rates in the Clinical Outcomes Research Initiative database from July 1998 to December 2000. Ms Couric's cancer awareness campaign was televised on the *Today Show* in March 2000 (month 0).

2003



# Use of Modeling to Project the Impact of the 'Katie Couric Effect' on Colonoscopy Demand

## *Projections of demand and capacity for colonoscopy related to increasing rates of colorectal cancer screening in the United States*

S. VIJAN\*†, J. INADOMI\*†, R. A. HAYWARD\*†, T. P. HOFER\*† & A. M. FENDRICK†

\*Veterans Affairs Health Services Research and Development (HSR&D), Ann Arbor, MI; †Department of Internal Medicine, University of Michigan, MI, USA

Accepted for publication 19 March 2004

- Projections suggest that demand for colorectal cancer screening will exceed the supply of colonoscopy appointments in the U.S.

# Not Only Screening: Modeling Used to Estimate the Cost-effectiveness of Colorectal Cancer Chemoprevention



**Annals of Internal Medicine**<sup>®</sup>

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Articles | 6 November 2001

## Aspirin as an Adjunct to Screening for Prevention of Sporadic Colorectal Cancer: A Cost-Effectiveness Analysis

Uri Ladabaum, MD, MS , Cathy Lee Chopra, MD, MS, Grace Huang, MD, MS, James M. Scheiman, MD, Michael E. Chernew, PhD, and A. Mark Fendrick, MD [See Less](#) 

THE AMERICAN JOURNAL  
*of* MEDICINE

Official Journal of the Alliance for Academic Internal Medicine

> [Am J Med.](#) 2003 May;114(7):546-54. doi: 10.1016/s0002-9343(03)00095-0.

## Potential effect of cyclooxygenase-2-specific inhibitors on the prevention of colorectal cancer: a cost-effectiveness analysis

Uri Ladabaum <sup>1</sup>, James M Scheiman, A Mark Fendrick

# Modeling USPSTF 2008 Colorectal Cancer Screening Recommendations: All recommended screening modalities are better than no screening

## Clinical Gastroenterology and Hepatology

Volume 2, Issue 7, July 2004, Pages 554-563

## Gastroenterology

Gastroenterol. 2004;126(5):1270- 1279

Original Article

Colorectal neoplasia screening with  
virtual colonoscopy: when, at what cost,  
and with what national impact?

Uri Ladabaum <sup>\*</sup>, <sup>†</sup>  , Kenneth Song <sup>‡</sup>, A. Mark Fendrick <sup>§</sup>, <sup>¶</sup>, <sup>||</sup>

## Fecal DNA Testing Compared With Conventional Colorectal Cancer Screening Methods: A Decision Analysis

KENNETH SONG,<sup>\*</sup> A. MARK FENDRICK,<sup>†,§,||</sup> and URI LADABAUM<sup>\*,¶</sup>

<sup>\*</sup>Department of Medicine, University of California, San Francisco, California; <sup>†</sup>Department of Internal Medicine, <sup>§</sup>Department of Health Management and Policy, School of Public Health, <sup>||</sup>Consortium for Health Outcomes, Innovation, and Cost-Effectiveness Studies (CHOICES), University of Michigan, Ann Arbor, Michigan; and <sup>¶</sup>Division of Gastroenterology, University of California, San Francisco, California

# Modeling USPSTF Recommended Colorectal Cancer Screening Modalities: Adherence to initial screening and follow up colonoscopy are critical inputs

RESEARCH BRIEF | MAY 25 2021

## Impact of Patient Adherence to Stool-Based Colorectal Cancer Screening and Colonoscopy Following a Positive Test on Clinical Outcomes

A. Mark Fendrick ; Deborah A. Fisher ; Leila Saoud; A. Burak Ozbay; Jordan J. Karlitz; Paul J. Limburg

- Colorectal cancer (CRC) screening models commonly assume 100% adherence, which is inconsistent with real-world experience
- Incorporating realistic adherence rates for CRC screening influences modeled outcomes and should be included when assessing real-world comparative effectiveness

doi: 10.1158/1940-6207.CAPR-21-0075.

# Patient and Physician Preferences of Initial Colorectal Cancer Screening Tests

Although 90% of Surveyed US Gastroenterologists and Primary Care Physicians prefer colonoscopy as a CRC screening modality, 3 out of 4 patients prefer a non-invasive option

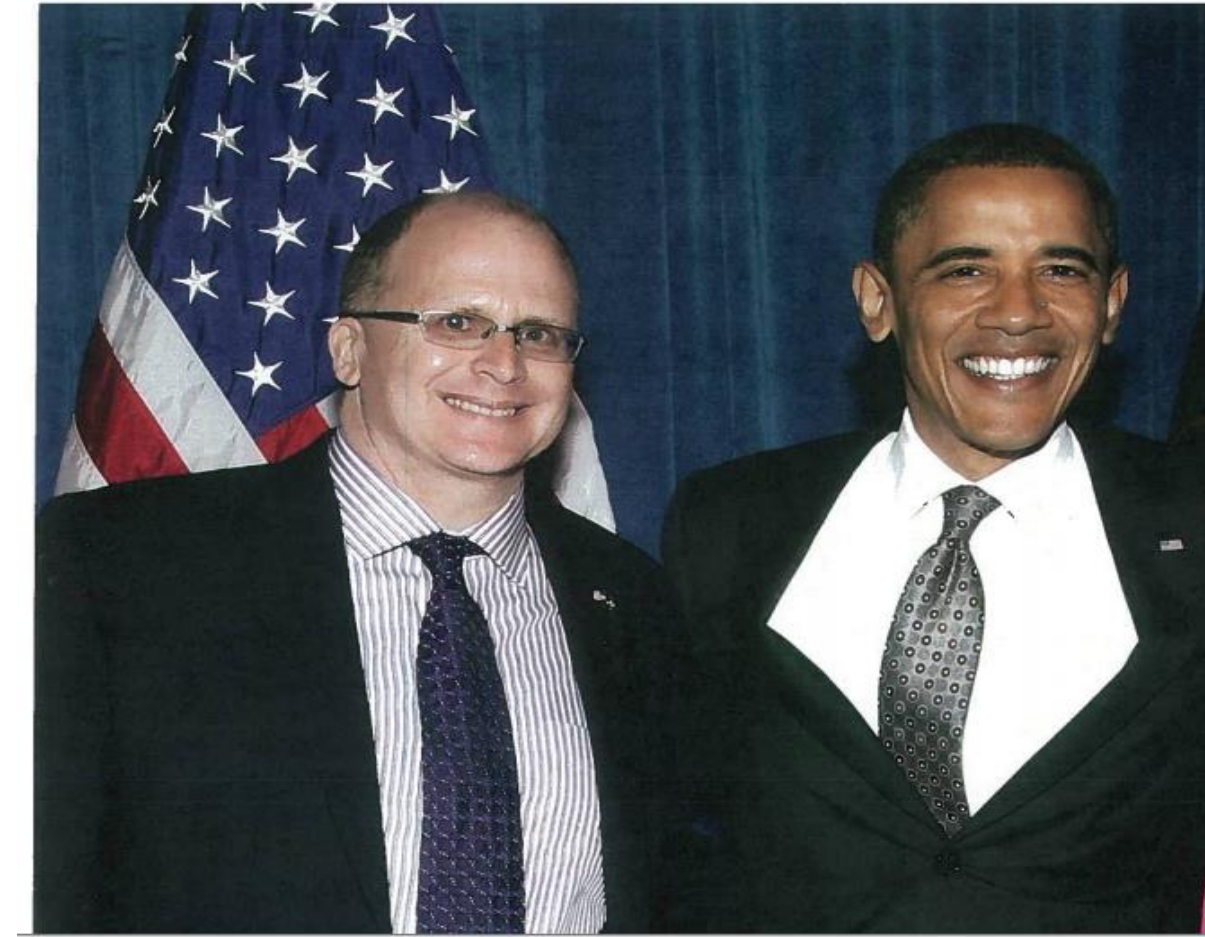
Current Medical Research and Opinion. 2025 Oct 18:1-16.

All better than no screening, colonoscopy critical

# Translating Research Into Policy: ACA Preventive Services Provision (2010) Requires that Selected Preventive Services Must be Provided without Patient Cost-Sharing

- Receiving an A or B rating from the United States Preventive Services Taskforce (USPSTF)
  - Includes *initial* CRC screening tests
- Immunizations recommended by the Advisory Committee on Immunization Practices (ACIP)
- Preventive care and screenings supported by the Health Resources and Services Administration (HRSA)

Over 230 million Americans have enhanced access to preventive services



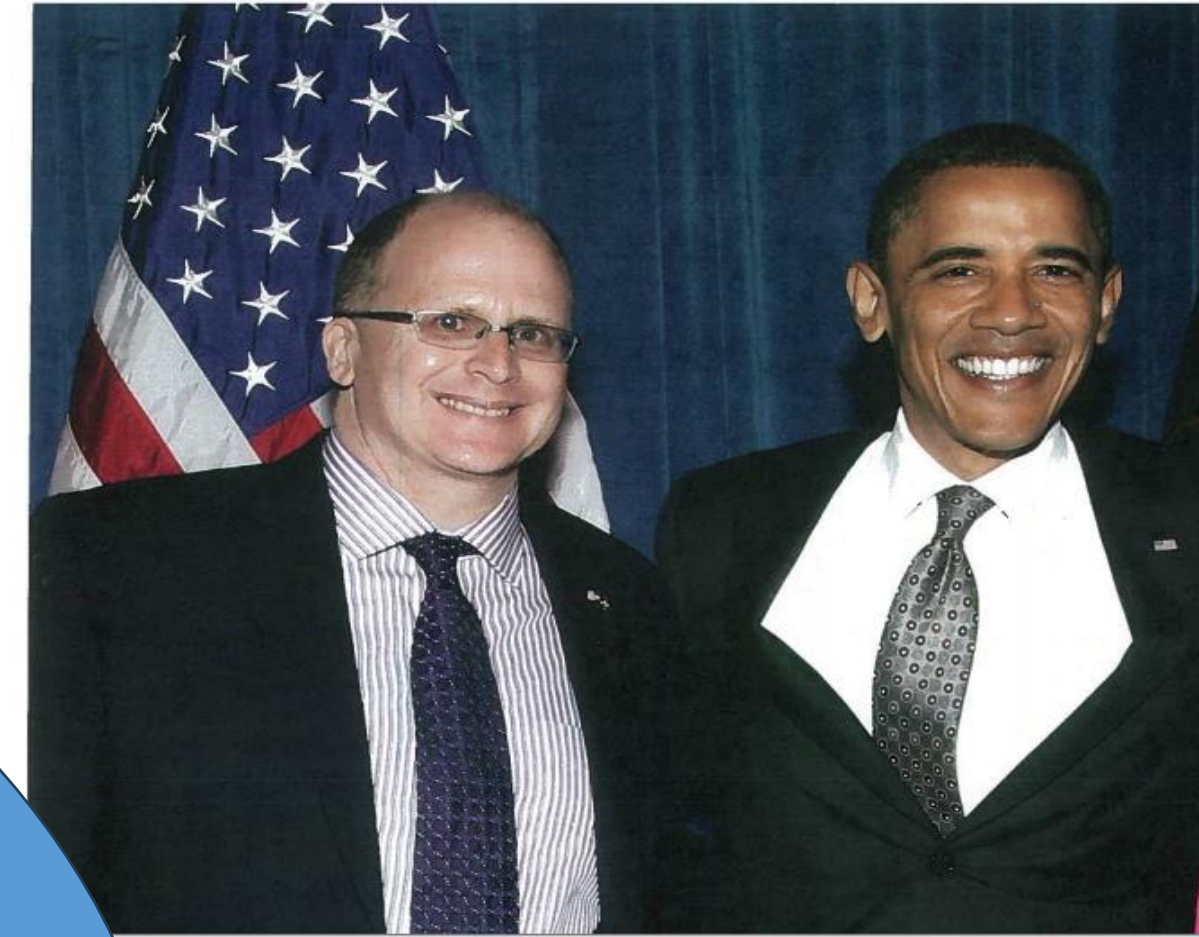
# Impact of ACA Preventive Services Provision on CRC Screening

“If you make people pay less for something, they will buy more of it”

- Receiving preventive services  
Task

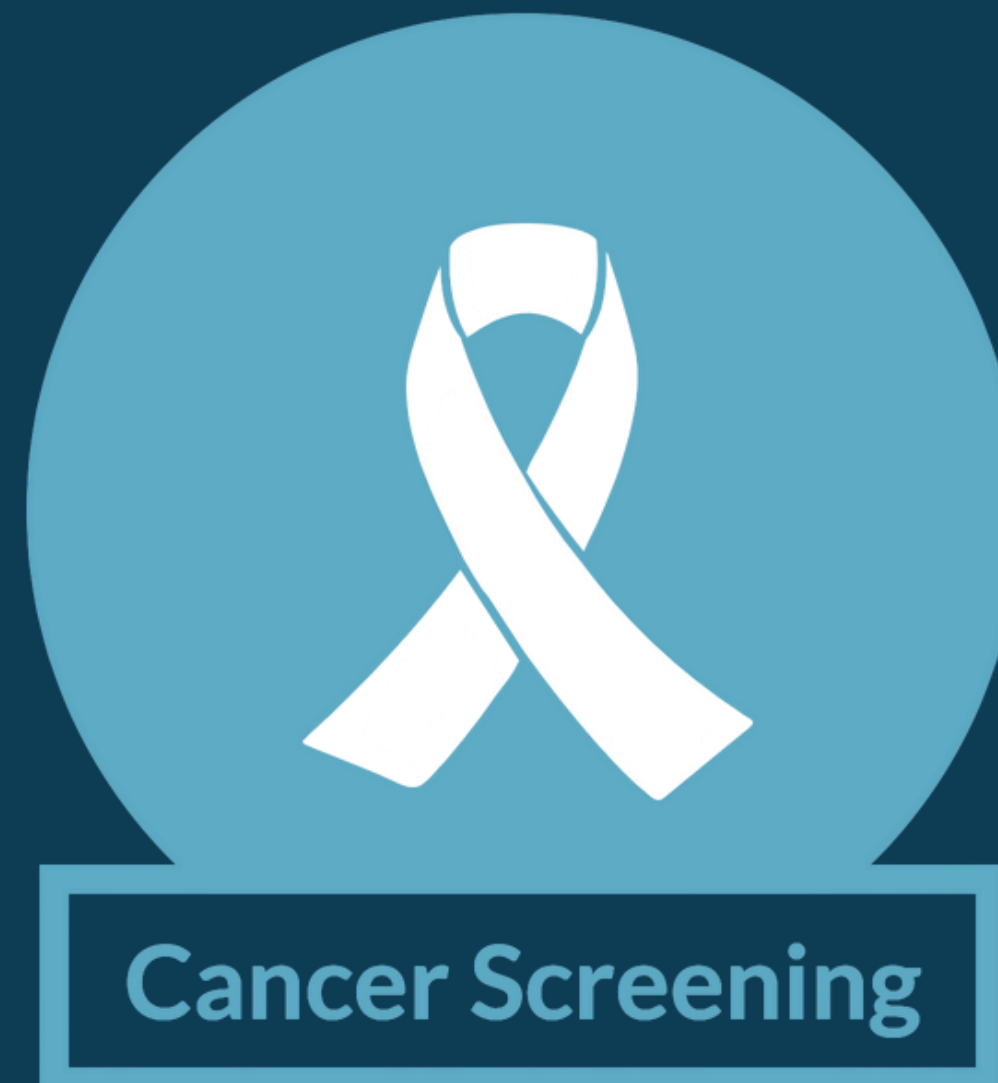
The elimination of cost sharing for CRC screening due to the ACA was associated with a decrease in age-, race/ethnicity-, and sex-adjusted CRC incidence and CRC-related mortality

Am J Prev Med. 2021 Nov 8;62(3):387–394



Over preventive services

# FOLLOW-UP OF INITIAL POSITIVE NON-INVASIVE SCREENING TESTS



Screening is a process, not a single test; it is only complete when all follow-up procedures are performed



Research Letter | Gastroenterology and Hepatology

## Out-of-Pocket Costs for Colonoscopy After Noninvasive Colorectal Cancer Screening Among US Adults With Commercial and Medicare Insurance

A. Mark Fendrick, MD; Nicole Princic, MS; Lesley-Ann Miller-Wilson, PhD; Kathleen Wilson, MPH; Paul Limburg, MD

Even when faced with no costs for *initial* CRC screening tests, non-trivial out-of-pocket costs for follow-up colonoscopy were incurred by nearly half of commercially insured U.S. patients and > 75% of those covered by Medicare

# Modeling Follow-up Colonoscopy Compared to Screening Colonoscopy: Better clinical outcomes, more colonoscopy revenue and lower CRC costs

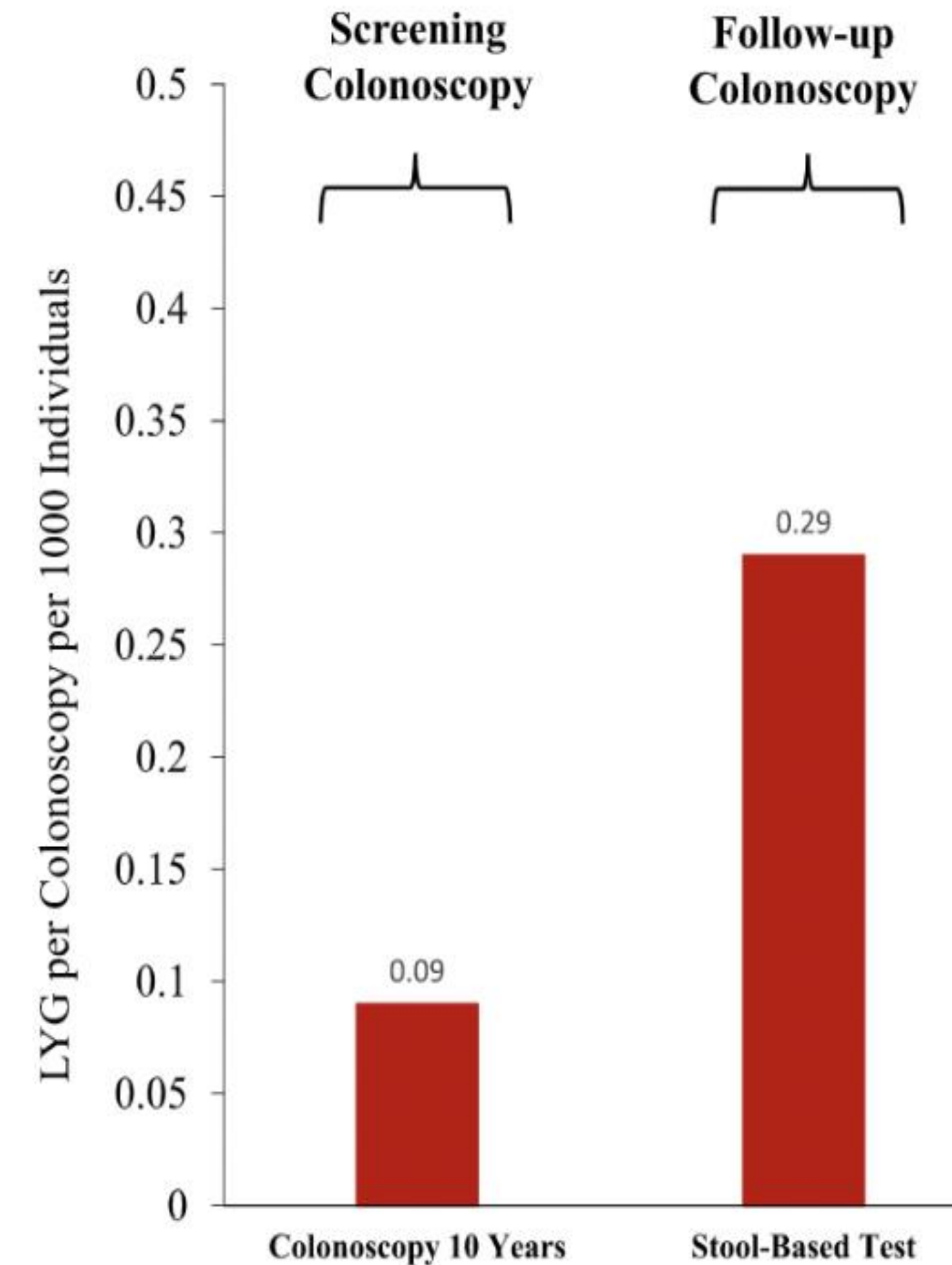


Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Preventive Medicine Reports

journal homepage: [www.elsevier.com/locate/pmedr](https://www.elsevier.com/locate/pmedr)

- Compared to when colonoscopy is used as the initial CRC screening test, follow-up colonoscopy after a positive non-invasive screening test **prevents twice as many CRC deaths**
- Follow-up colonoscopy generates significantly more revenue when compared to screening
- Lower total CRC costs due to prevention and early detection



	Colonoscopy 10 Years	Stool-Based Test
LYG	281.1	267.7
Colonoscopies	3,139	935
LYG/Colonoscopy	0.09	0.29

# Colorectal Cancer: Screening

May 18, 2021

2021 USPSTF CRC screening recommendations provide legislative authority to cover follow-up colonoscopy without cost-sharing.

“Positive results on stool-based screening tests require follow-up with colonoscopy for the screening benefits to be achieved.”

<https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/colorectal-cancer-screening#:~:text=Adults%2045%20years%20and%20older,Recommended%20screening%20strategies%20include:>



# FAQS ABOUT AFFORDABLE CARE ACT IMPLEMENTATION PART 51, FAMILIES FIRST CORONAVIRUS RESPONSE ACT AND CORONAVIRUS AID, RELIEF, AND ECONOMIC SECURITY ACT IMPLEMENTATION

January 10, 2022

**Q7: Are plans and issuers required to cover, without the imposition of any cost sharing, a follow-up colonoscopy conducted after a positive non-invasive stool-based screening test or direct visualization test (e.g., sigmoidoscopy, CT colonography)?**

Yes. A plan or issuer must cover and may not impose cost sharing with respect to a colonoscopy conducted after a positive non-invasive stool-based screening test or direct visualization screening test for colorectal cancer for individuals described in the USPSTF recommendation.

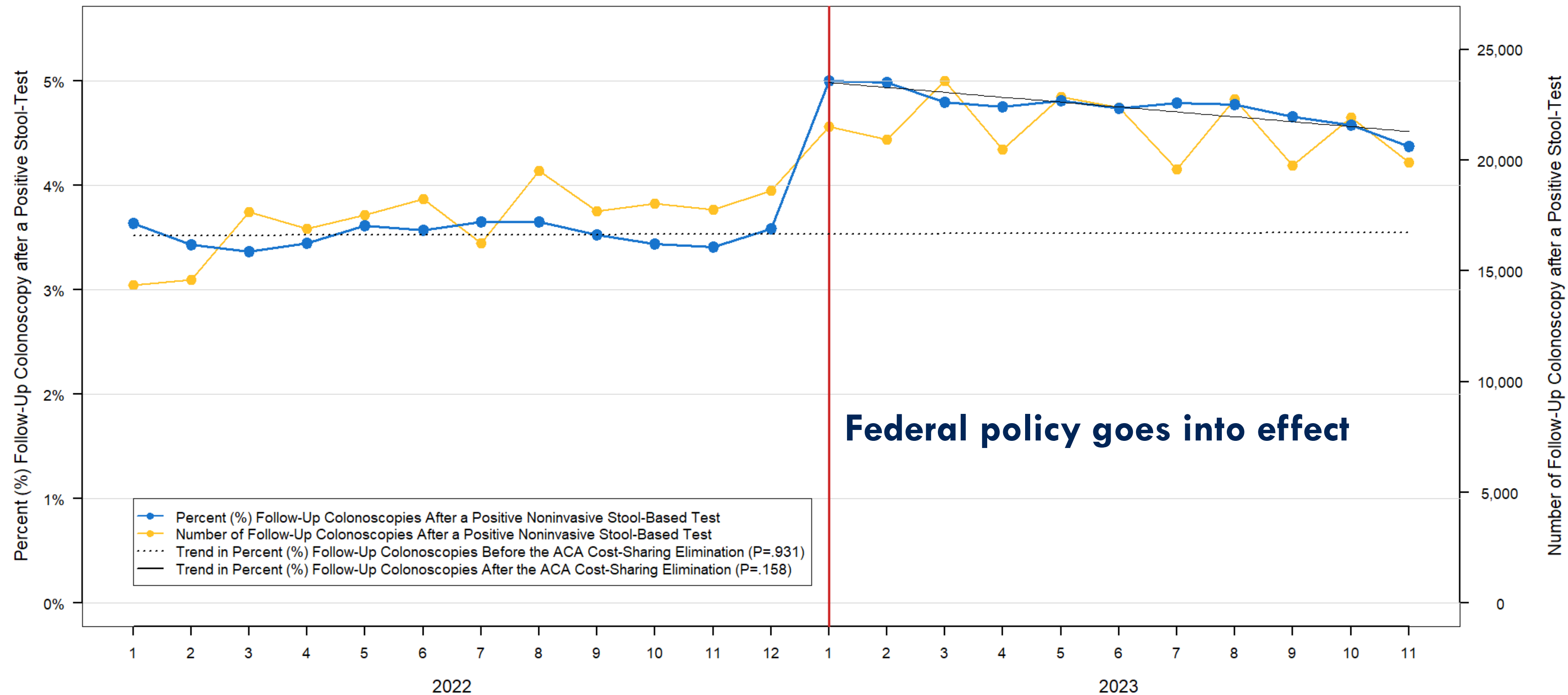
As stated in the May 18, 2021 USPSTF recommendation, the follow-up colonoscopy is an integral part of the preventive screening without which the screening would not be complete.<sup>31</sup>

The follow-up colonoscopy after a positive non-invasive stool-based screening test or direct visualization screening test is therefore required to be covered without cost sharing in accordance with the requirements of PHS Act section 2713 and its implementing regulations.



# Completing the colorectal cancer screening process: impact of eliminating cost-sharing for follow-up colonoscopy

If you make people pay less for something, they will buy more of it

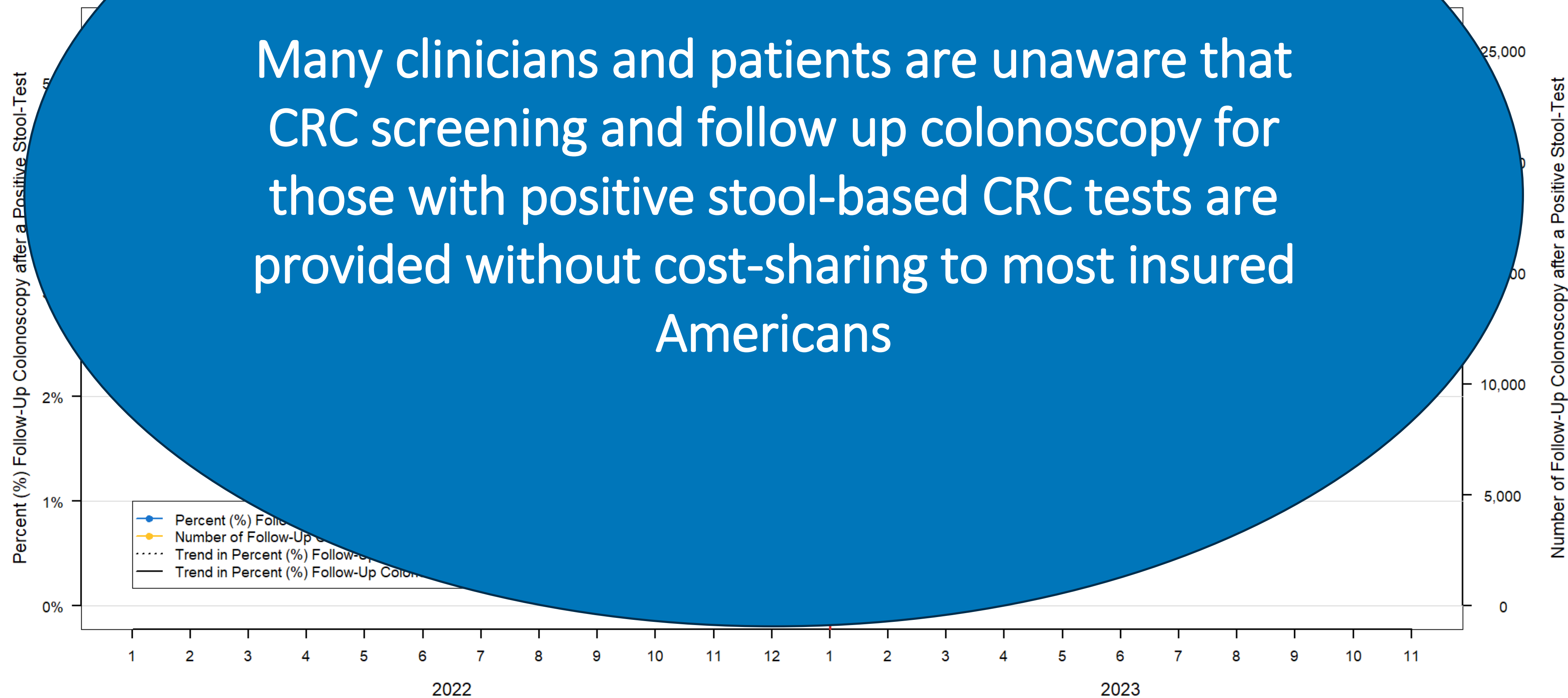


# Completing the colorectal cancer screening process: impact of eliminating cost-sharing for follow-up colonoscopy

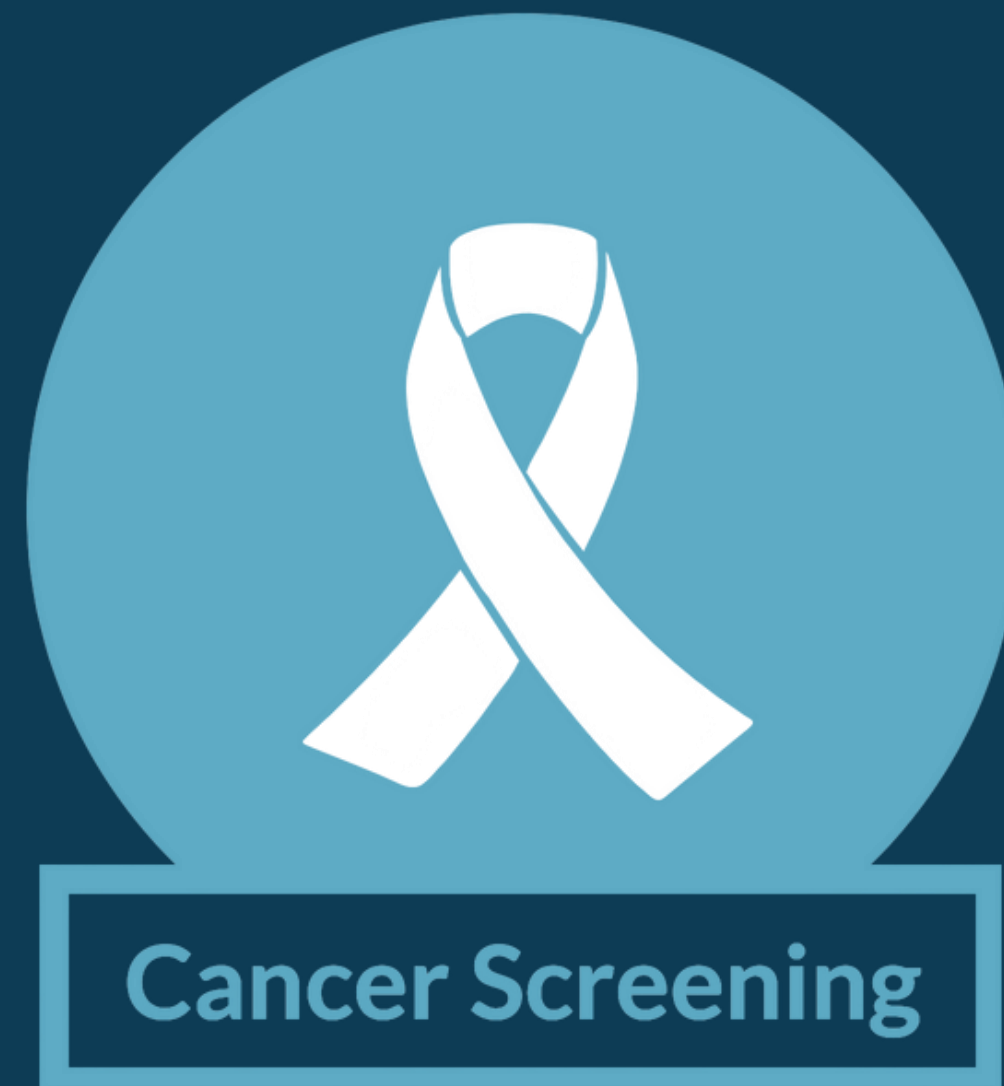
If you read this article, you will know more of it

more of it

Many clinicians and patients are unaware that CRC screening and follow up colonoscopy for those with positive stool-based CRC tests are provided without cost-sharing to most insured Americans



# OPTIMIZING COLONOSCOPY CAPACITY



# Modeling to Optimize CRC Screening Uptake and Colonoscopy Capacity

- Guidelines support endoscopic and stool-based testing for average-risk colorectal cancer (CRC) screening, but colonoscopy capacity is limited.
  - Use of non-invasive screening modalities is increasing, necessitating new strategies to ensure follow-up colonoscopy
- Given fixed US capacity, it is impossible to screen all eligible average risk individuals, and also perform necessary follow up, surveillance, etc.
- Thus we modeled scenarios in the US that 1) screened all eligible individuals and 2) optimized benefits of colonoscopy utilization for both screening and follow-up of non-invasive screening, while maintaining full colonoscopy capacity

# ORIGINAL RESEARCH—CLINICAL

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## Optimizing Colonoscopy Capacity to Maximize Colorectal Cancer Outcomes



A. Mark Fendrick,<sup>1</sup> Jacob E. Kurlander,<sup>1,2,3</sup> Vahab Vahdat,<sup>4</sup> Chris Estes,<sup>4</sup>  
Shrey Gohil,<sup>4</sup> Paul J. Limburg,<sup>4</sup> and David A. Lieberman<sup>5</sup>

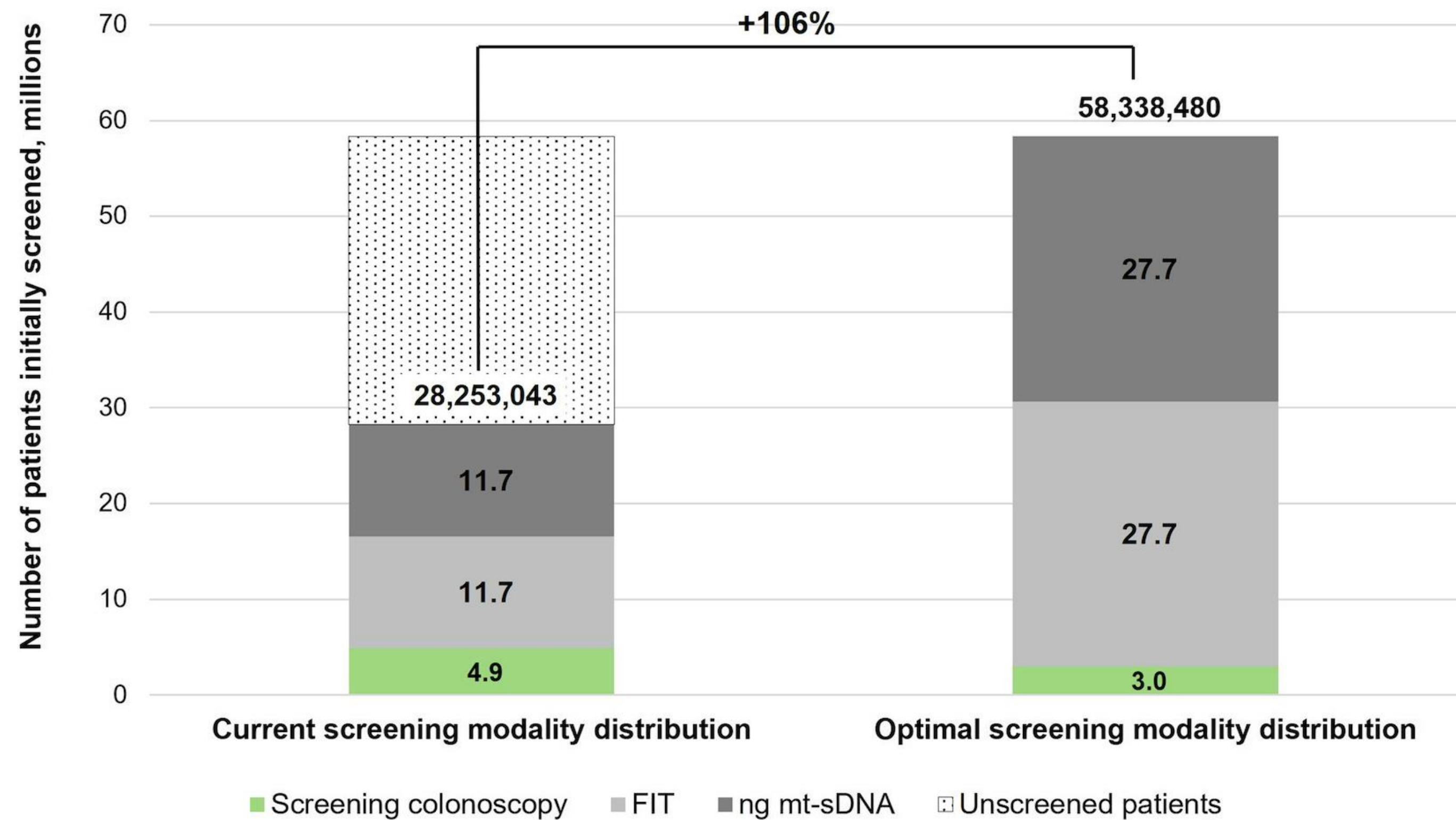
Substituting some screening colonoscopies with follow-up procedures – while maintaining full capacity –with a shift to more stool-based CRC testing, could:

[doi.org/10.1016/j.gastha.2026.100930](https://doi.org/10.1016/j.gastha.2026.100930).



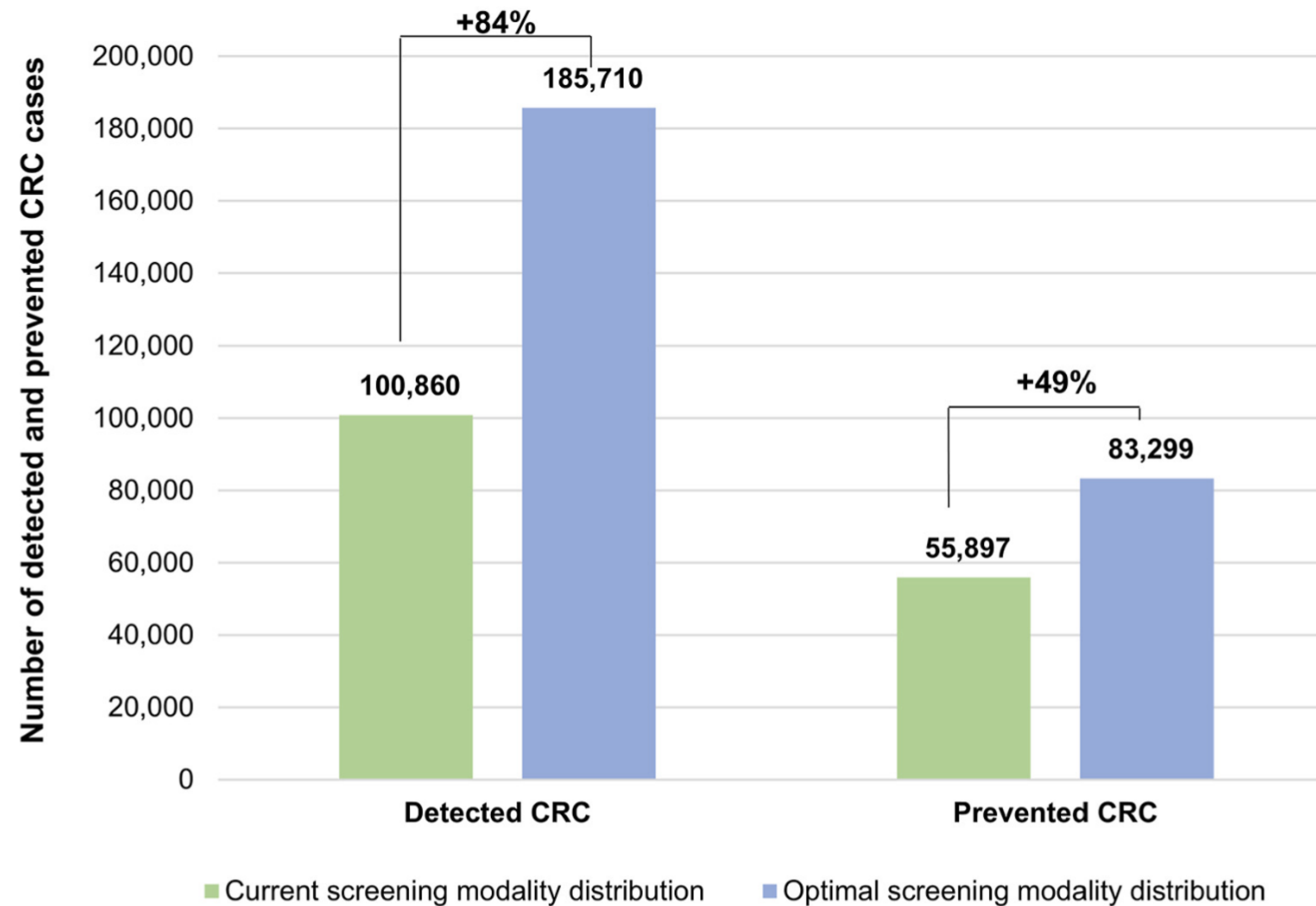
# Reallocating Colonoscopy Capacity: A “Win” for Patients, Clinicians and Payers

## Screen all eligible patients



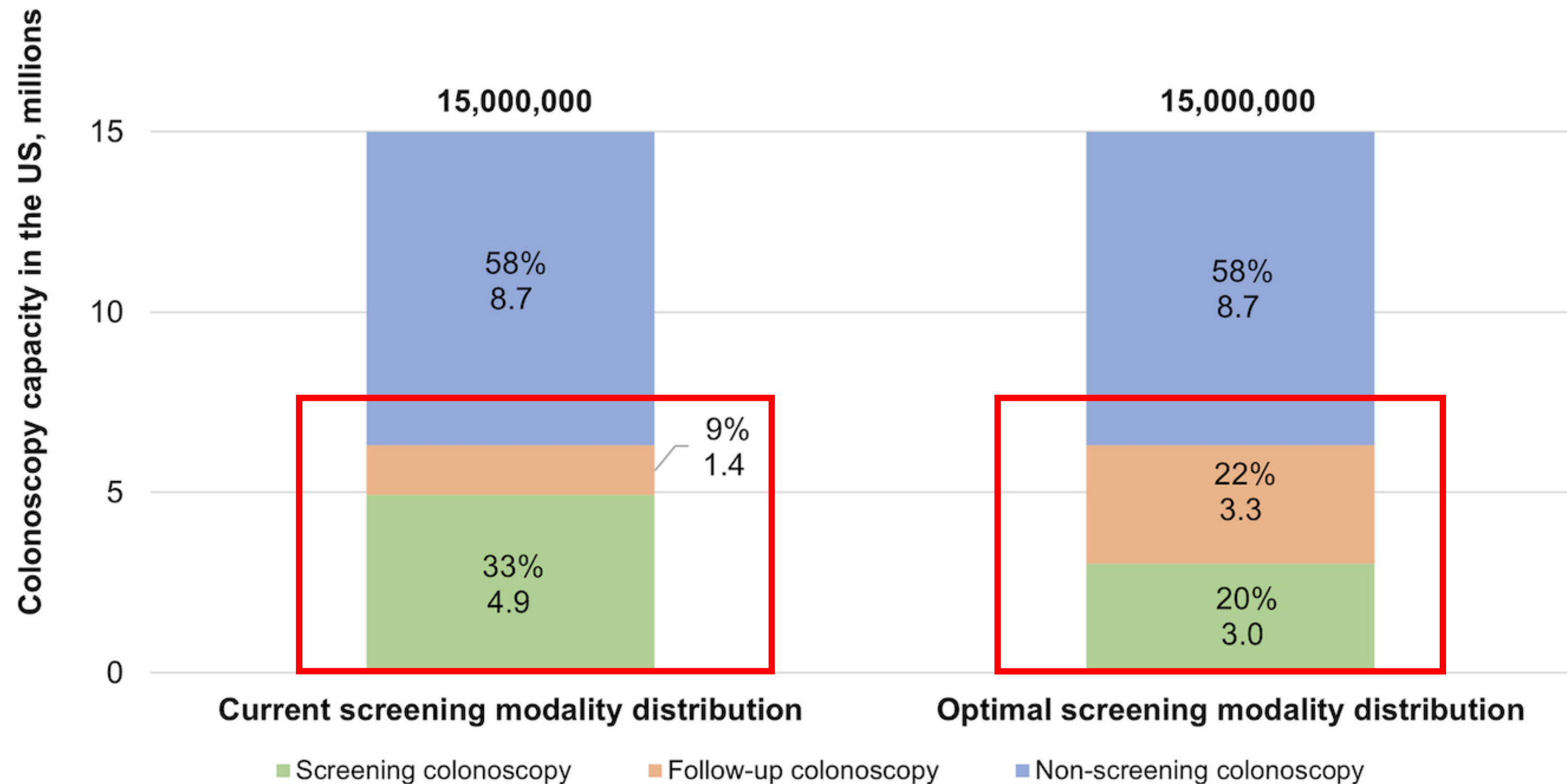
# Reallocating Colonoscopy Capacity: A “Win” for Patients, Clinicians and Payers

More CRC cases (84%) detected,  
More CRC cases (49%) prevented



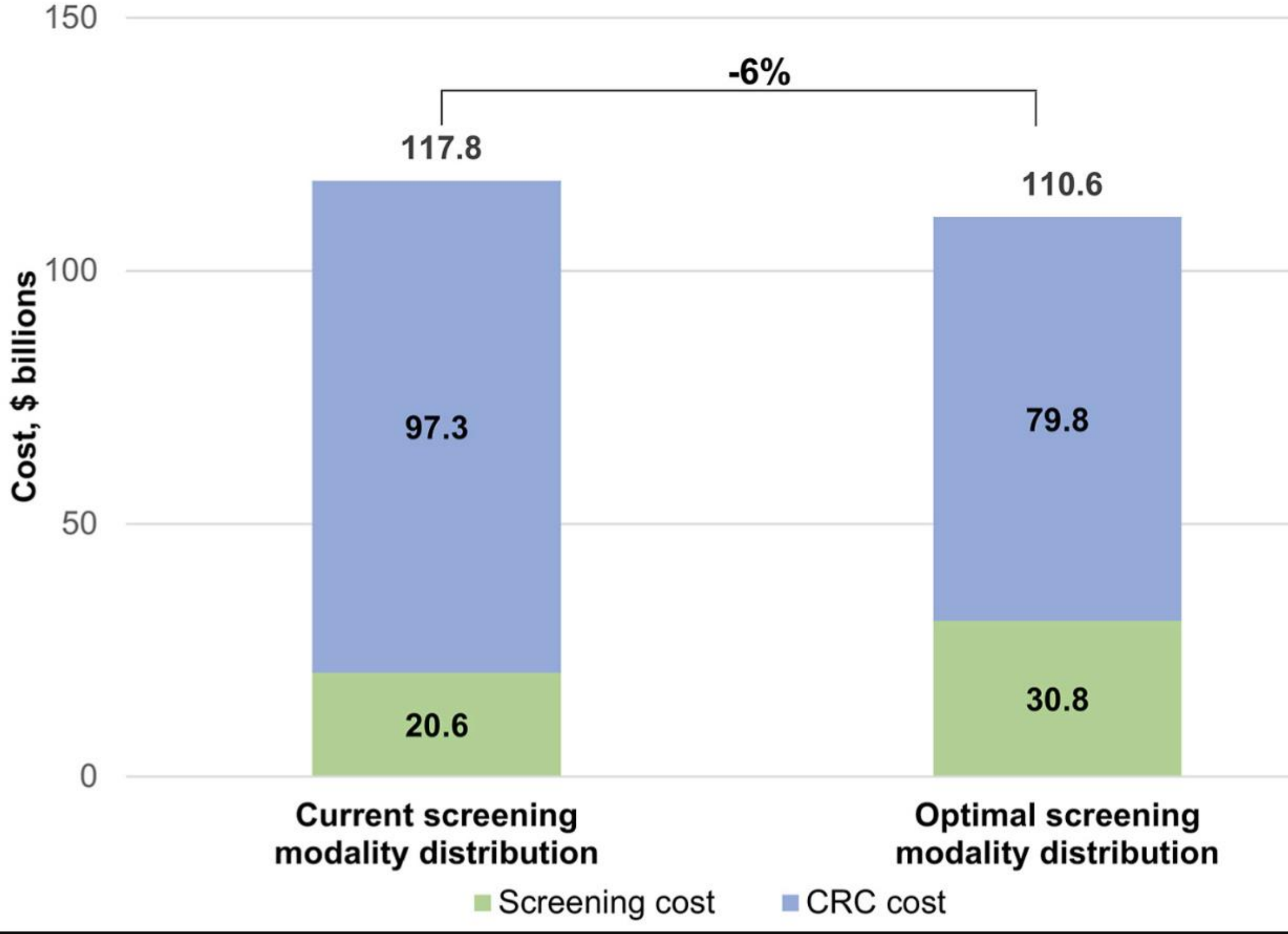
# Reallocating Colonoscopy Capacity: A “Win” for Patients, Clinicians and Payers

Maximize colonoscopy efficiency and increase revenue while maintaining full capacity



# Reallocating Colonoscopy Capacity: A “Win” for Patients, Clinicians and Payers

Lower total CRC costs, despite more screening and CRC cases detected



# Modeling to Optimize CRC Screening Uptake and Colonoscopy Capacity

- Future consideration: Lengthening the interval for colonoscopy surveillance following diagnosis of low-risk adenomas can create more colonoscopy capacity

# Modeling and Achieving Colorectal Cancer Screening Adherence in the Real World: Key Takeaways

- Identify and address patient-facing barriers to increase adherence of all steps of the CRC screening process
- Align incentives for clinicians and payers around CRC screening completion
- Address the role of colonoscopy capacity and clinical indications for its use
- Modeling suggests that the full clinical and economic benefits of CRC screening can be achieved (at least in the U.S.) with:
  - More initial stool-based CRC screening (and fewer screening colonoscopies)
  - More follow-up colonoscopies after positive stool-based tests, while maintaining full capacity

## Closing Thought: What keeps me up at night

- In an ideal scenario where all eligible individuals undergo screening and receive the necessary diagnostic follow-up tests, would evidence-based colonoscopy surveillance and CRC cancer treatments be accessible to all who would benefit?

Thank you



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