



Debate: Colorectal Cancer Screening Guidelines

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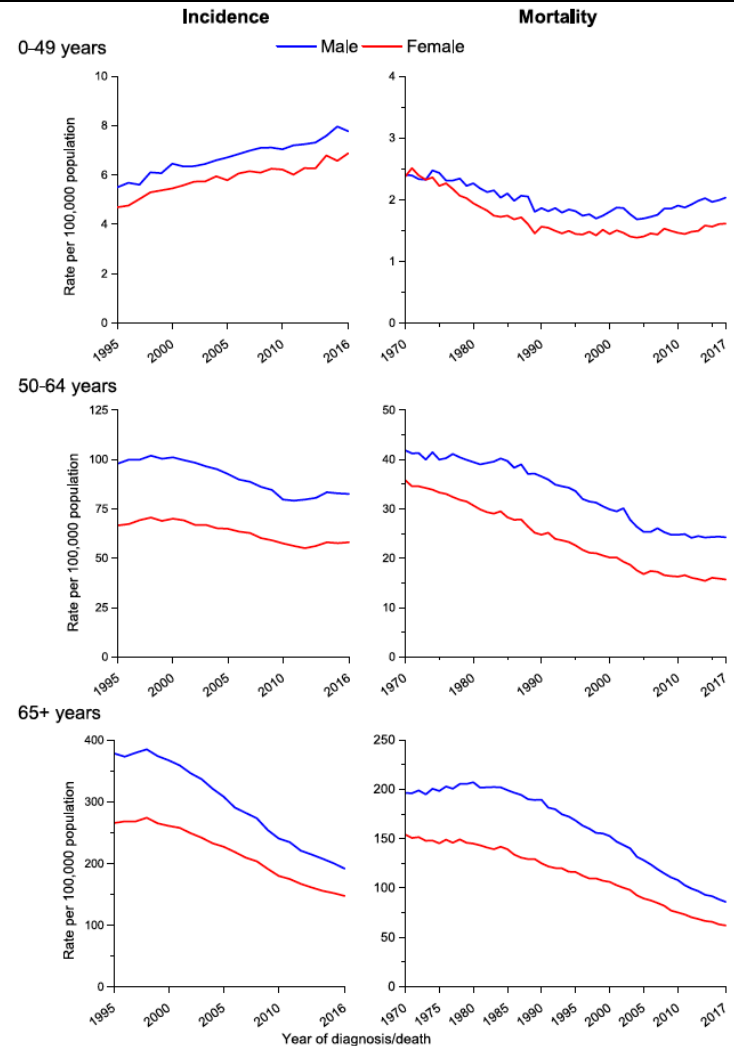
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Among individuals at average risk for colorectal cancer, should screening be initiated at age 45 instead of 50?

No

Incidence is rising, but absolute risk is low



Projected benefit is small

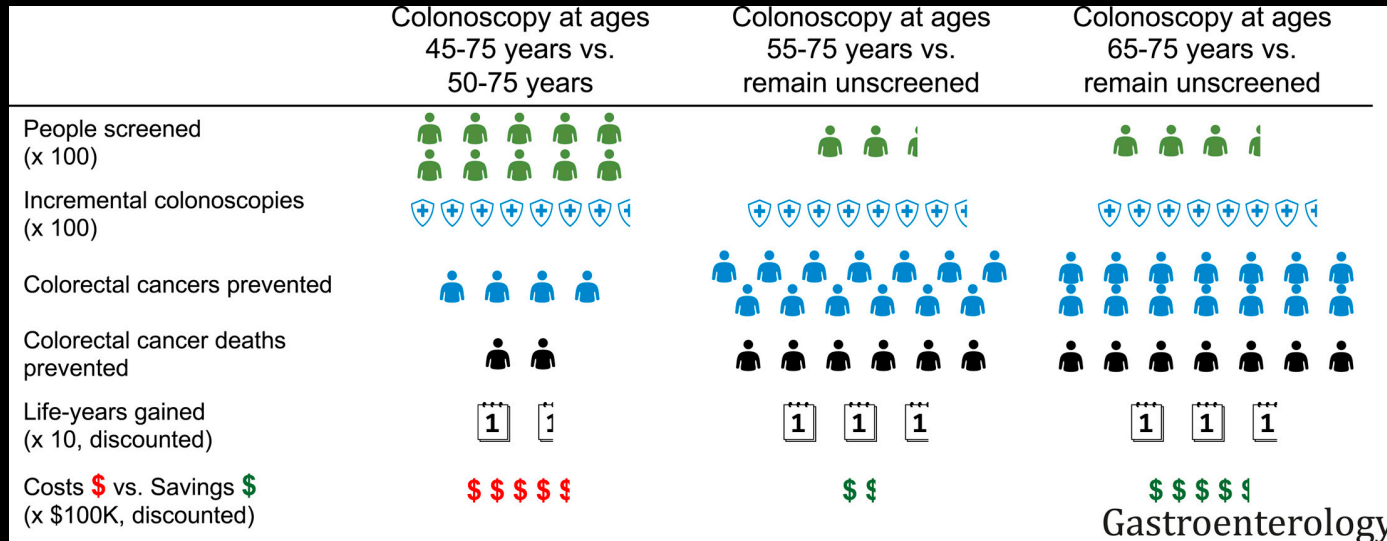
- For every 1000 persons screened starting at age 45 instead of 50 only:
 - 3 fewer CRC cases
 - 1 less death
- Models used have many assumptions
 - 100% uptake
 - Effectiveness of tests

Investing in increasing screening over age 50 is cheaper and more effective than screening at age 45

Cost-Effectiveness and National Effects of Initiating Colorectal Cancer Screening for Average-Risk Persons at Age 45 Years Instead of 50 Years



















Uri Ladabaum,¹ Ajitha Mannalithara,¹ Reinier G. S. Meester,¹ Samir Gupta,² and Robert E. Schoen³

- Spend \$3.4B vs \$10.4B to avert 3-fold more deaths



Gastro 2019

Investing in increasing screening over age 50 is cheaper and more effective than screening at age 45

	Colonoscopy at ages 45-75 years vs. 50-75 years	Colonoscopy at ages 55-75 years vs. remain unscreened	Colonoscopy at ages 65-75 years vs. remain unscreened
People screened (x 100)			
Incremental colonoscopies (x 100)			
Colorectal cancers prevented			
Colorectal cancer deaths prevented			
Life-years gained (x 10, discounted)			
Costs \$ vs. Savings \$ (x \$100K, discounted)			

Gastroenterology

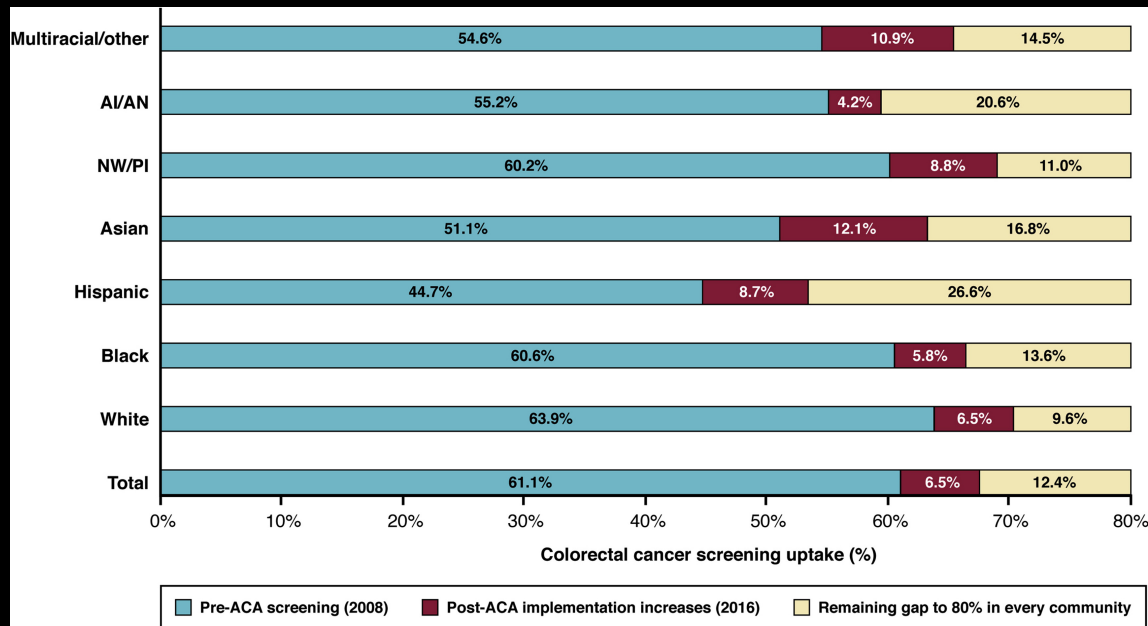
- Spend \$3.4B vs \$10.4B to avert 3-fold more deaths

“...given the choice over how to deploy a fixed number of colonoscopies, the clinical benefits would be **far greater** if screening were performed among the 44% of 55 year-olds and 37% of 65-year-olds who remain unscreened, or if colonoscopies were allocated to improve colonoscopy completion after abnormal FIT, than if average-risk screening were initiated at age 45,” Professor Uri Ladabaum, MEDPAGE Today 4/1/19

Unintended consequences

- Disparities likely to widen

- Racial/ethnic minorities, foreign born, low socioeconomic position least likely be screened
- Need to focus new investments on increasing screening for these groups



May FP CGH 2019; Demb
J Gupta S CGH 2019

Among individuals at average risk for colorectal cancer, should screening be initiated at age 45 instead of 50?

No

- Incidence is rising, but absolute risk is low
- Projected benefit is small
- Optimizing screening above age 50 would be cheaper and more effective
- Unintended consequence of increasing cancer disparities

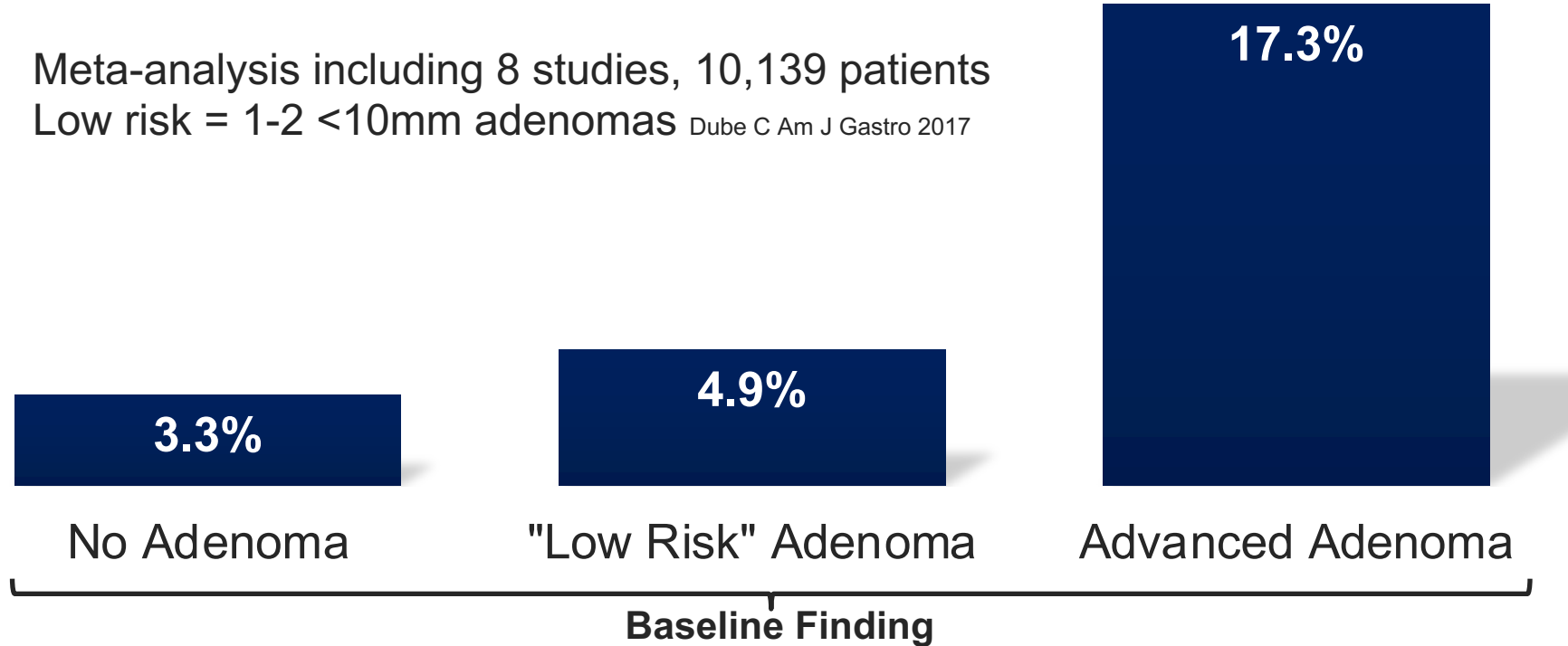
Discussion

Among individuals with 1-2 adenomas <10 mm, should a shorter vs longer follow up interval be recommended?

Longer

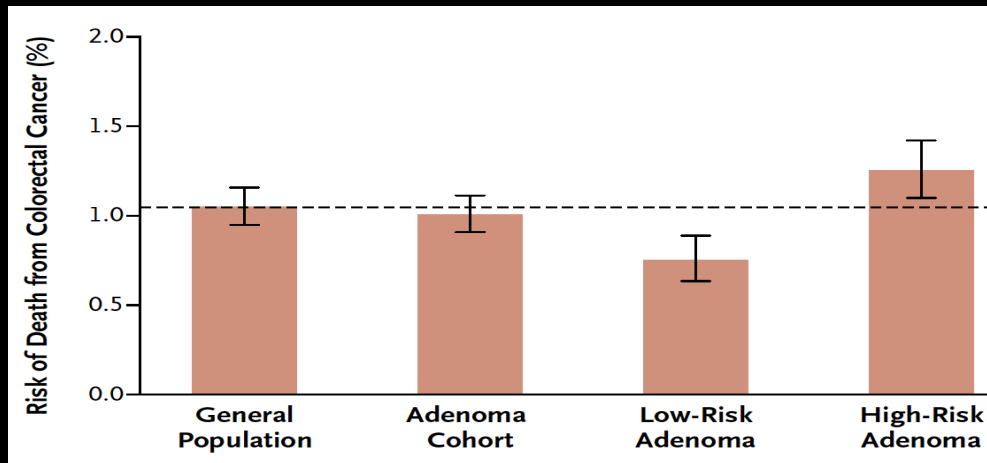
Low risk for metachronous advanced neoplasia

- Meta-analysis including 8 studies, 10,139 patients
- Low risk = 1-2 <10mm adenomas Dube C Am J Gastro 2017



Low risk for incident and fatal CRC compared to the general population

- CRC incidence reduced among LRA patients compared to general population
 - SIR 0.68, 95% CI: 0.44-0.99 Cottet 2012
- Risk for fatal CRC reduced among those with single LRA compared to general population
 - SMR 0.75, 95% CI, 0.63 to 0.88 Løberg 2014



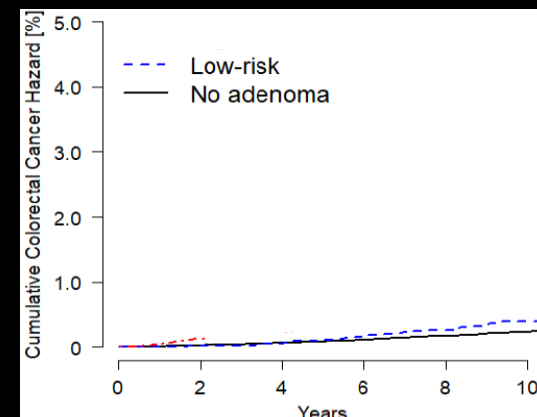
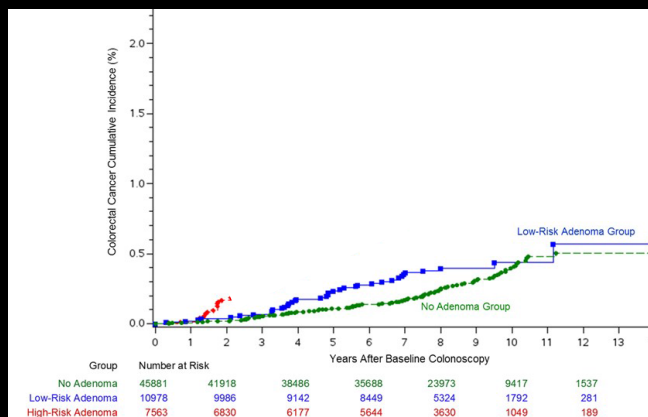
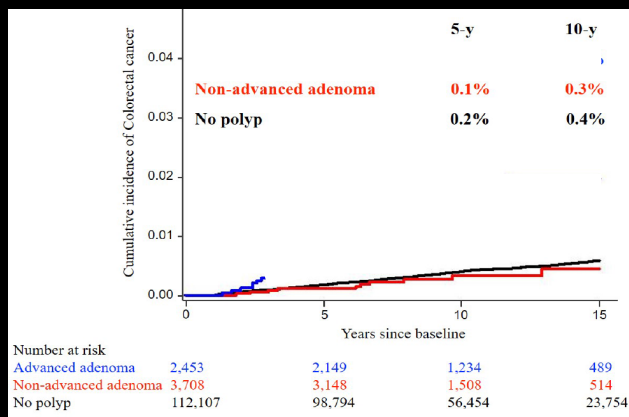
Low risk for incident and fatal cancer compared to those with normal colonoscopy

Incidence @ 10 years

Mortality @ 10 years

Baseline Finding	He (n=122,899)	Lee (n=64,422)	Wieszczy (n=236,089)	Lee	Wieszczy
Normal	0.4%	0.39%	0.24%*	0.07%	0.10%*
Low risk adenoma	0.3%	0.44%	0.39%	0.03%	0.14%
Hazard Ratio (95% CI)	1.23 (0.65-2.31)	1.29 (0.89-1.88)	1.49 (1.13-1.98)	0.65 (0.19-2.18)	1.48 (0.88-2.46)

*cumulative hazard; **data retrieved through personal correspondence



Huge resource implications

- In Lee study, 17% (10,978/64,422) with baseline colonoscopy 2004-2010 had low risk adenoma

Even a 7 to 10 year follow up is conservative

- European Society of GI Endoscopy 2020:
 - Return to screening
- British Society of GI/Association of Coloproctology of Great Britain and Ireland/Public Health England:
 - Return to screening

Hassan C Endoscopy 2020; Rutter MD Gut 2019

Among individuals with 1-2 adenomas <10 mm, should a shorter vs longer follow up interval be recommended?

Longer!

- Low risk for metachronous advanced neoplasia
- Lower risk for incident and fatal CRC compared with population
- No increased risk for incident or fatal CRC compared with normal colonoscopy
- Big resource implications
- Any colonoscopy surveillance is conservative

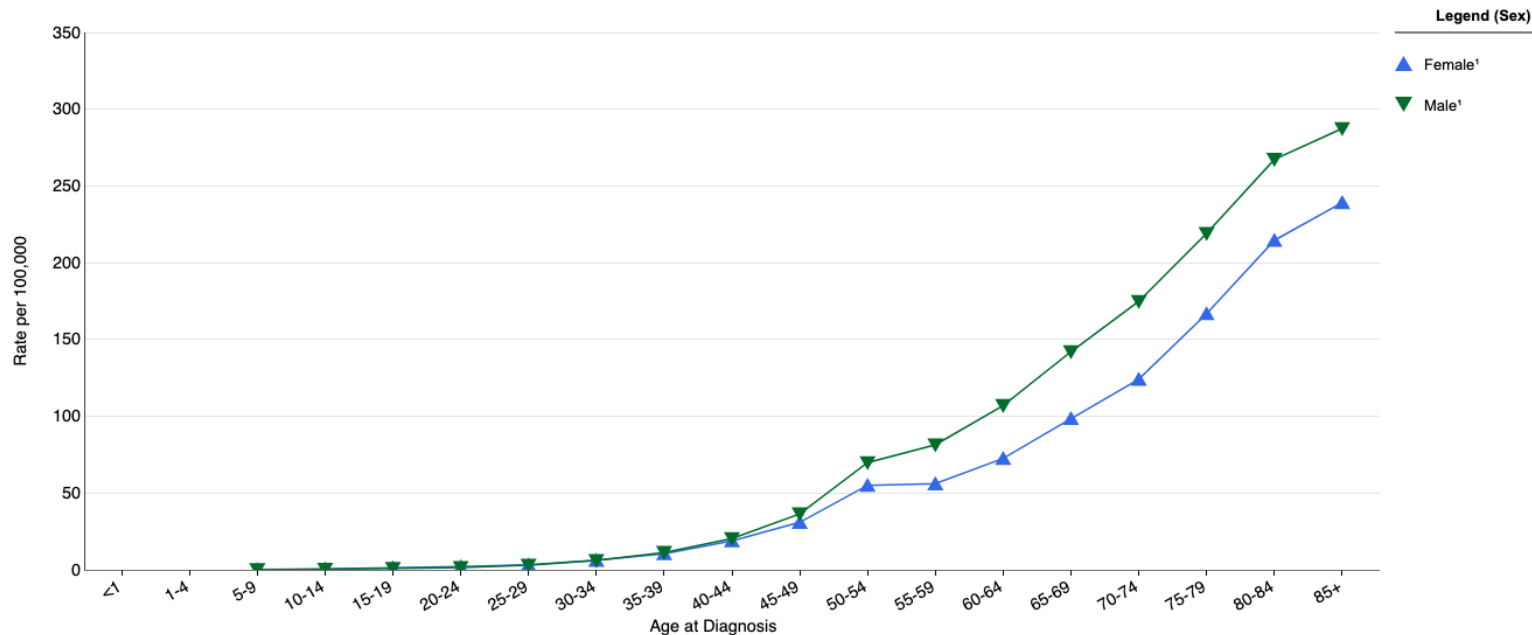
Discussion

Among individuals at average risk for CRC, should screening be initiated at a later age for women than men?

Yes

Age-specific incidence rises 5-10 years later for women

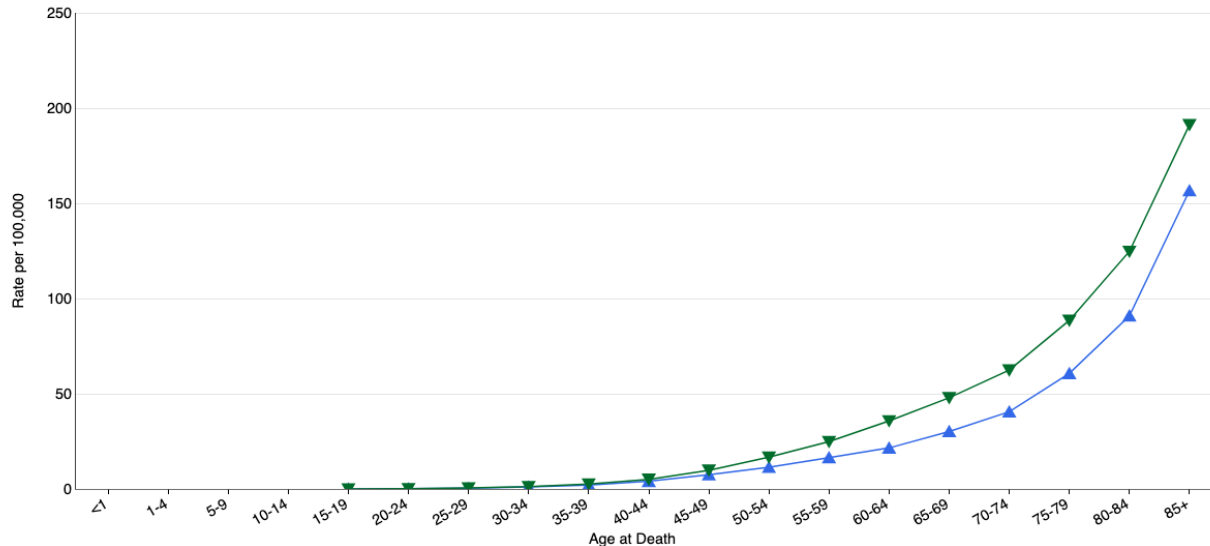
Colon and Rectum Cancer
SEER Incidence Rates by Age at Diagnosis, 2013-2017
By Sex, All Races (includes Hispanic), Delay-adjusted Rates



Created by <https://seer.cancer.gov/explorer> on Wed Oct 14 2020.
¹Estimates based on less than 16 cases are suppressed and not shown.

Age specific mortality is also delayed by 4 to 8 years for women

Colon and Rectum Cancer
U.S. Mortality Rates by Age at Death, 2014-2018
By Sex, All Races (includes Hispanic)



Created by <https://seer.cancer.gov/explorer> on Wed Oct 14 2020.

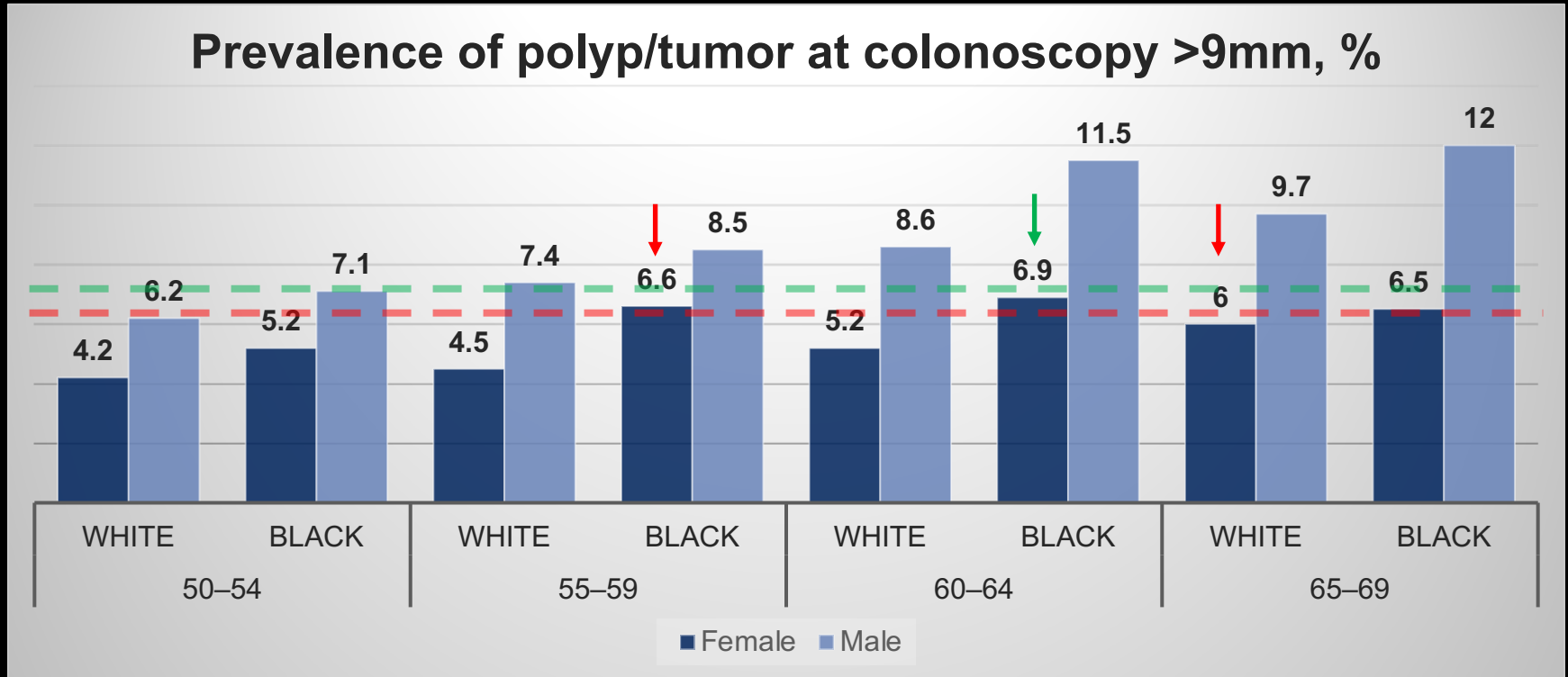
Legend (Sex)

▲ Female¹

▼ Male¹

Brenner Br J Cancer
2007

Age specific incidence of large polyps occurs later



Modeling suggests individualized screening could be better

- White men: 4 screenings from age 53 to 74 years every 7 years
- Black men: 5 screenings from age 47 to 75 years every 7 years
- White women: 4 screenings from age 53 to 77 years every 8 years
- Black women: 5 screenings from age 47 to 75 years every 7 years

TABLE 3. Results from cost-effectiveness analysis

Strategy	CRC cases/100,000 from age 40 y to age 100 y	CRC deaths/100,000 from age 40 y to age 100 y*	Life-expectancy at age 40 y†	Lifetime per person cost for CRC screening and treatment after age 40 y (\$)‡	ICER (\$)‡
No screening	5712	2027	22.3929	1663	Base case
Uniform 10-yearly colonoscopy	3026	794	22.4340	2310	Dominated
Uniform 8-yearly colonoscopy	2901	751	22.4362	2349	15,837
Individualized	2882	739	22.4363	2340	15,565

ICER, Incremental cost-effectiveness ratio.

*Includes procedural deaths from colonoscopy complications.

‡3% discounted.

Lansdorp-
Voegelaar GIE
2009

Among individuals at average risk for CRC, should screening be initiated at a later age for women than men?

Yes

- Older age-specific increases in incidence and mortality
- Older age-specific prevalence of large polyps
- More personalized strategy



Thank you!



Back up slides

Remaining evidence gap: accounting for impact of surveillance

Cumulative colonoscopy exposure by baseline finding

Study	No Adenoma	1-2 adenomas < 10 mm
He Gastro 2020	42% by 6 years 54% by 10 years	73% by 6 years 77% by 10 years
Wieszcy Gastro 2020	Cumulative exposure data not provided	
Lee Gastro 2020	9.3% at 6 years 19.8% at 10 years	40.5% at 6 years 58.8% at 10 years