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Potential Effects of Lowering Colorectal Cancer Screening Age to 45 Years on Colonoscopy Demand, Case Mix, and Adenoma Detection Rate

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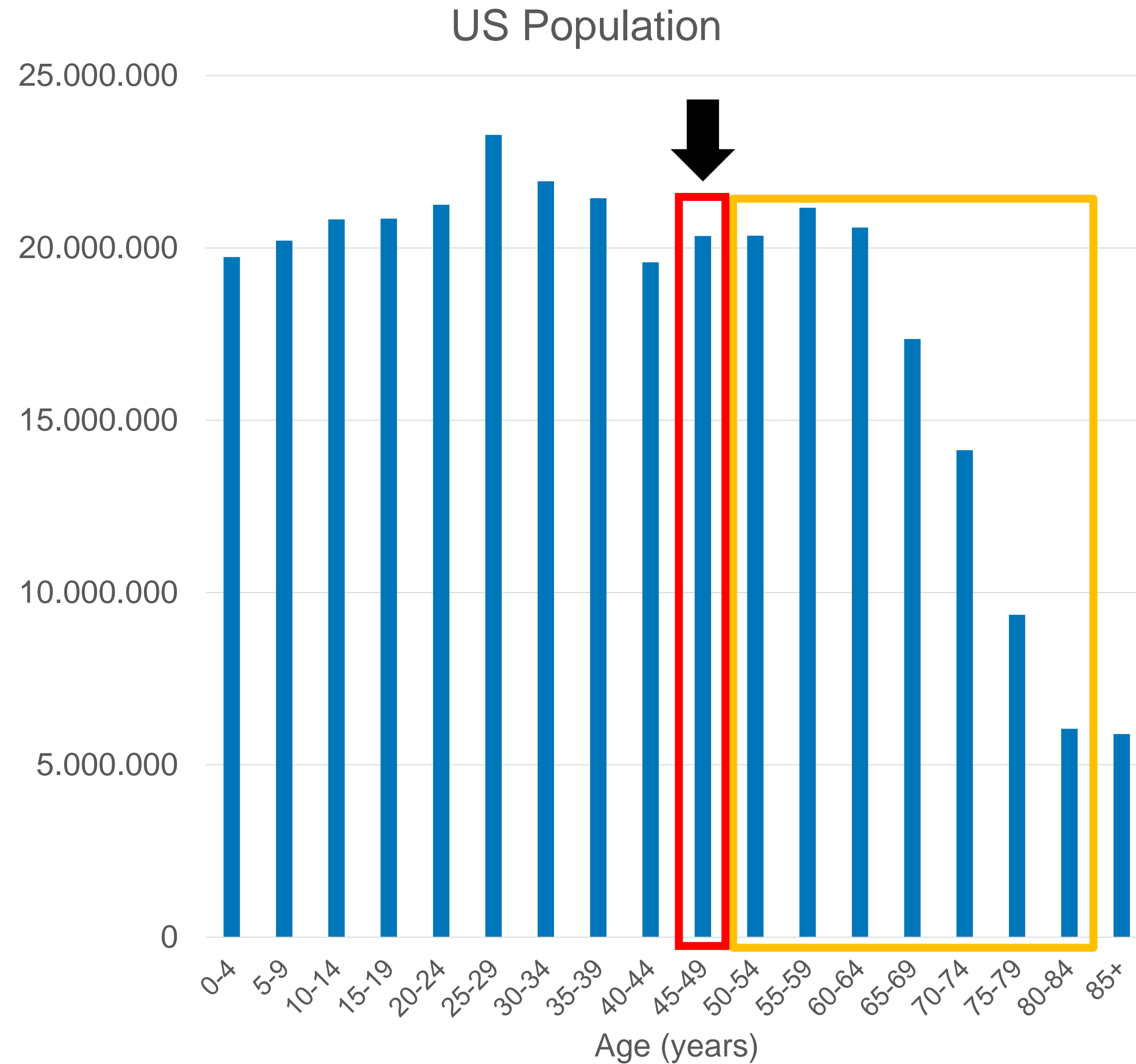


Background

- USPSTF, ACS, ACG, and US MSTF guidelines now all endorse initiating average risk CRC screening at age 45 (instead of 50) in US
- The goal of this change is to reduce the burden of CRC among patients aged 45-49
- It is expected that this change will lead to widespread adoption among clinicians, patients, and 3rd party payers
- However, the downstream effects of this shift in practice are yet to be realized



45-49 year old population

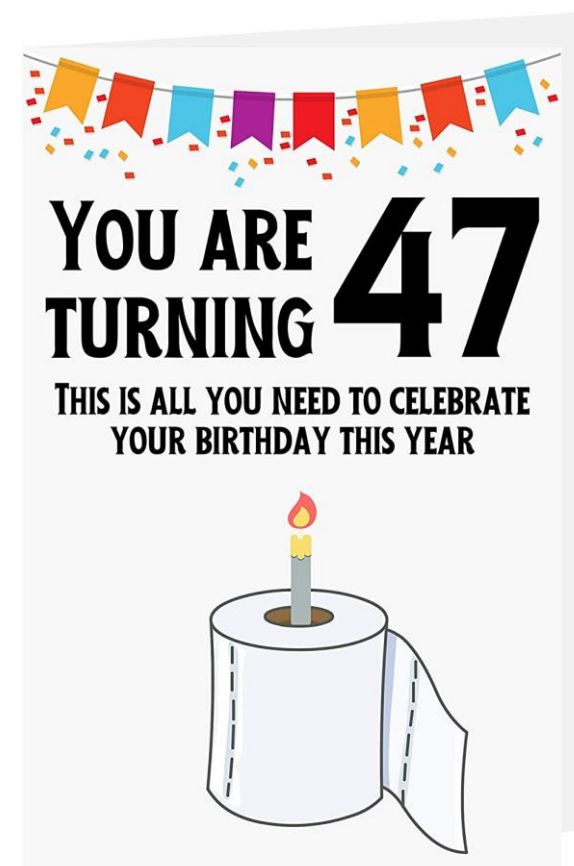
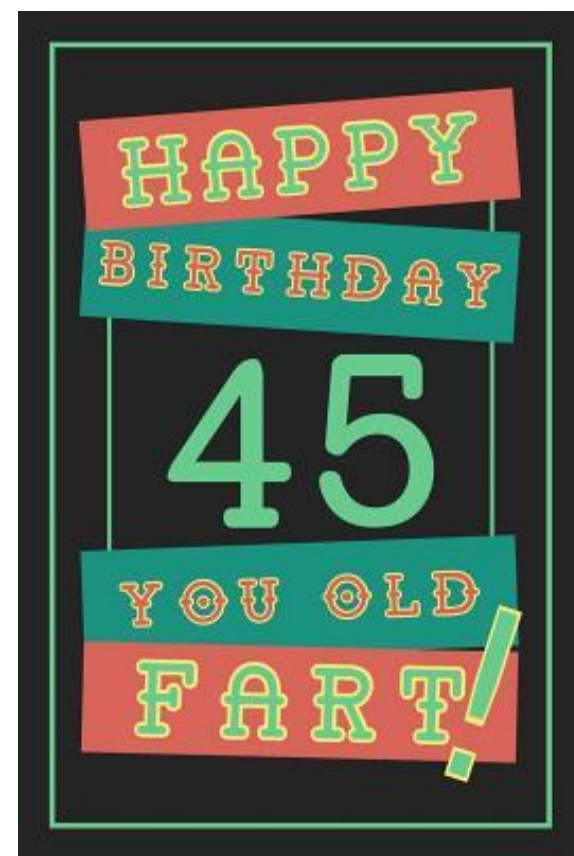


- This guideline change could strain endoscopic resources in the US
- There are approximately 110 million persons between 50-84, and 20 million persons aged 45-49 in the US
- **Including 45-49 year olds will expand the screen eligible population by 19%**
- Numerically, this group is larger than the entire population of Chile, Malawi, or the Netherlands, and comparable to the population of Finland, Sweden, and Norway combined

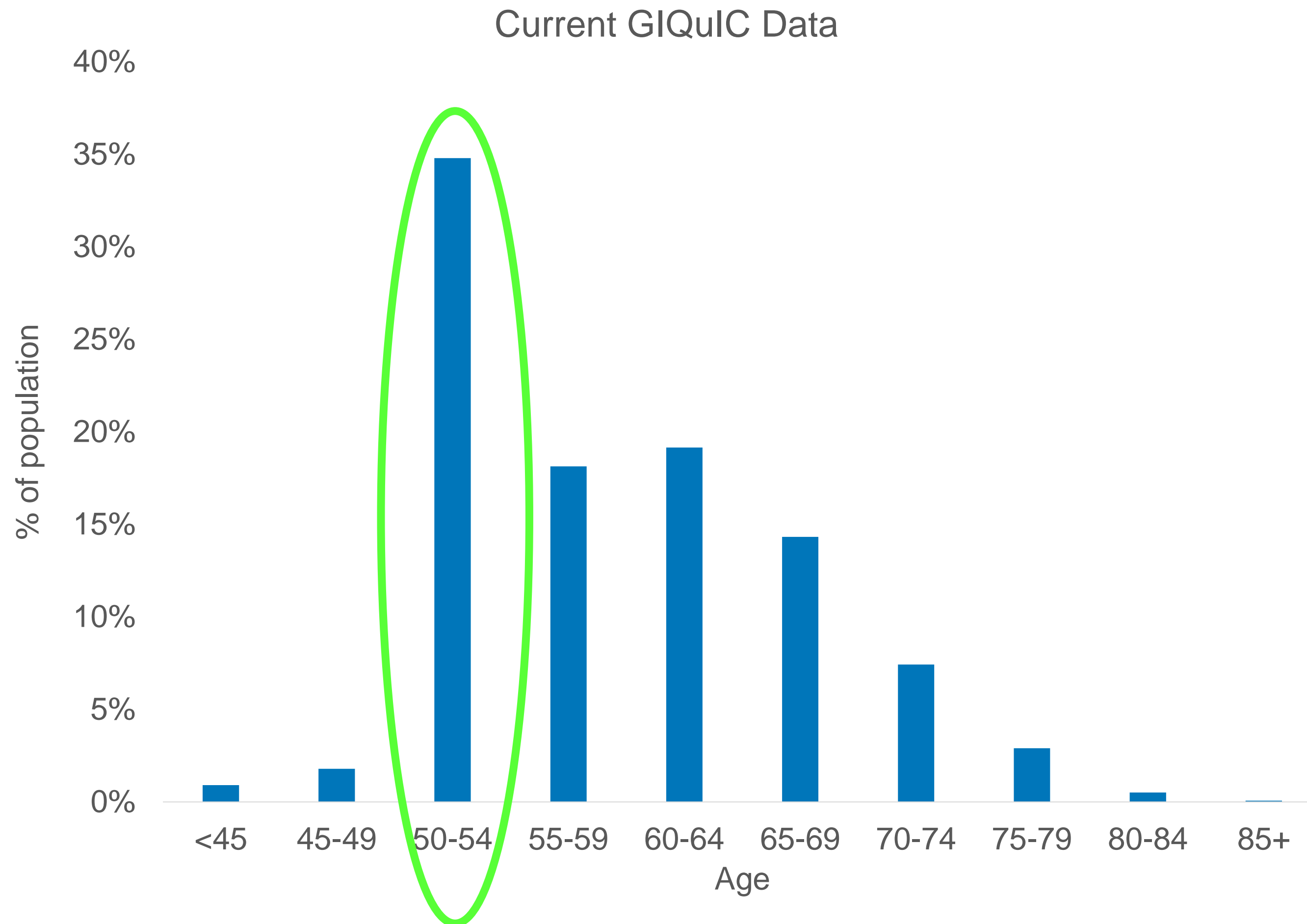


45-49 year old population: bolus effect?

- Given guideline change, ALL 45-49 year olds become eligible at once
- Instead of the roughly 4 million Americans turning 50 each year, ~**25 million people** will turn 45, 46, 47, 48, 49, or 50 this year.
- This could lead to a surge in demand for colonoscopy capacity



45-49 year old population: the new 50-54?

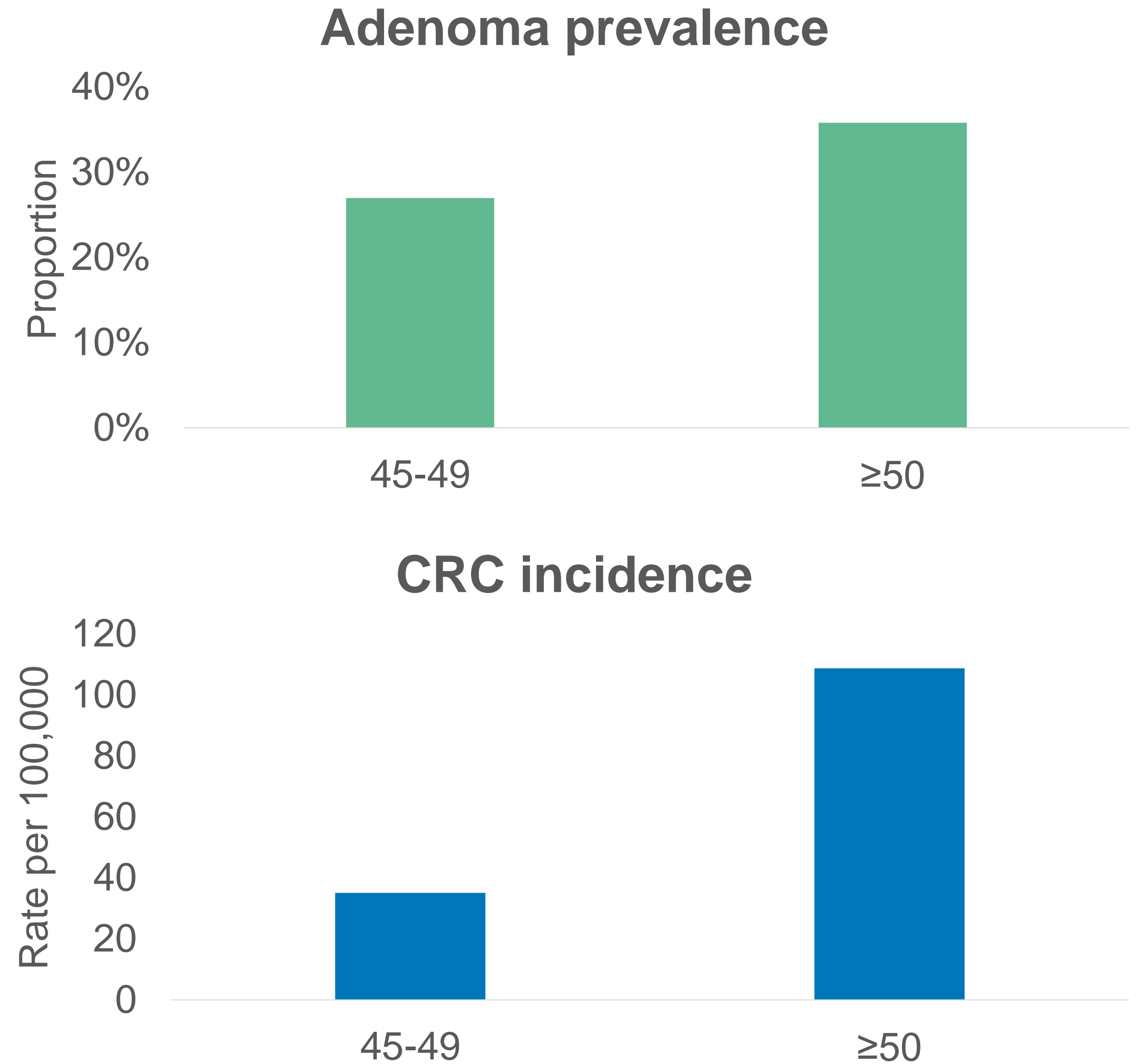


- The guideline change will likely shift the age distribution of screenees
- 50-54 year olds presenting for initial screening currently make up the most populous age group for colonoscopy screening in the US
- In time, we should expect that 45-49 year olds will supplant 50-54 year olds to become the largest age stratum



45-49 year old population is lower risk

- 45-49 year olds have a lower prevalence of CRC and precancerous polyps (specifically adenomas)
- How will including this group affect ADR measurement?



Potential Effects of Lowering Colorectal Cancer Screening Age to 45 Years on Colonoscopy Demand, Case Mix, and Adenoma Detection Rate



Aim: to model the potential effects of lowering the CRC screening age on colonoscopy providers in the US



Potential Effects of Lowering Colorectal Cancer Screening Age to 45 Years on Colonoscopy Demand, Case Mix, and Adenoma Detection Rate



Using data from GIQuIC and US Census, we modeled the effect of 3 scenarios:

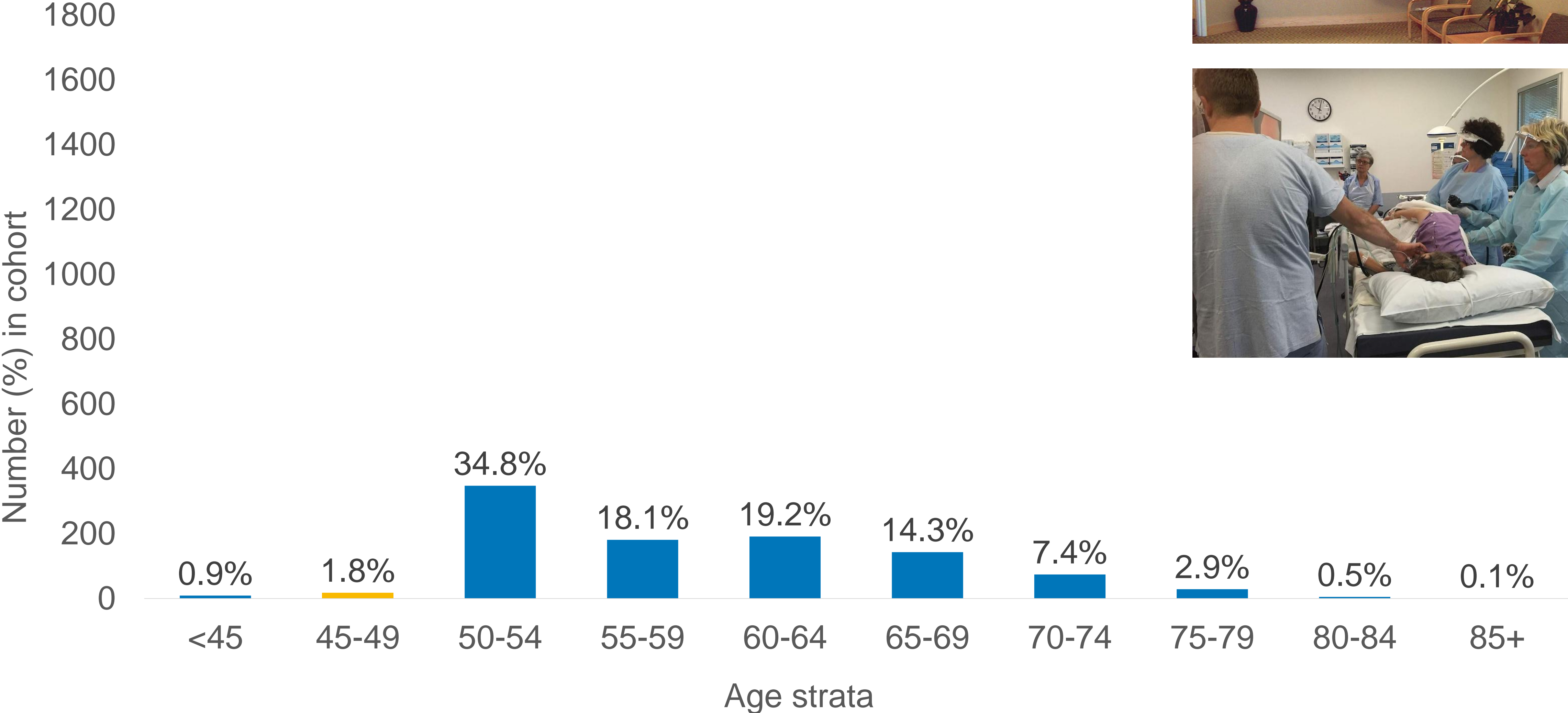
- 1) **Future steady state:** 45-49 year olds displace 50-54 year olds to become most common age group
- 2) **2x bolus scenario:** Twice as many new screenees present compared to typical group
- 3) **5x bolus scenario:** 5x as many new screenees present compared to previous

Starting with a hypothetical base case of 1000 screenees, we assessed the change in cohort size and composition based on scenarios above.

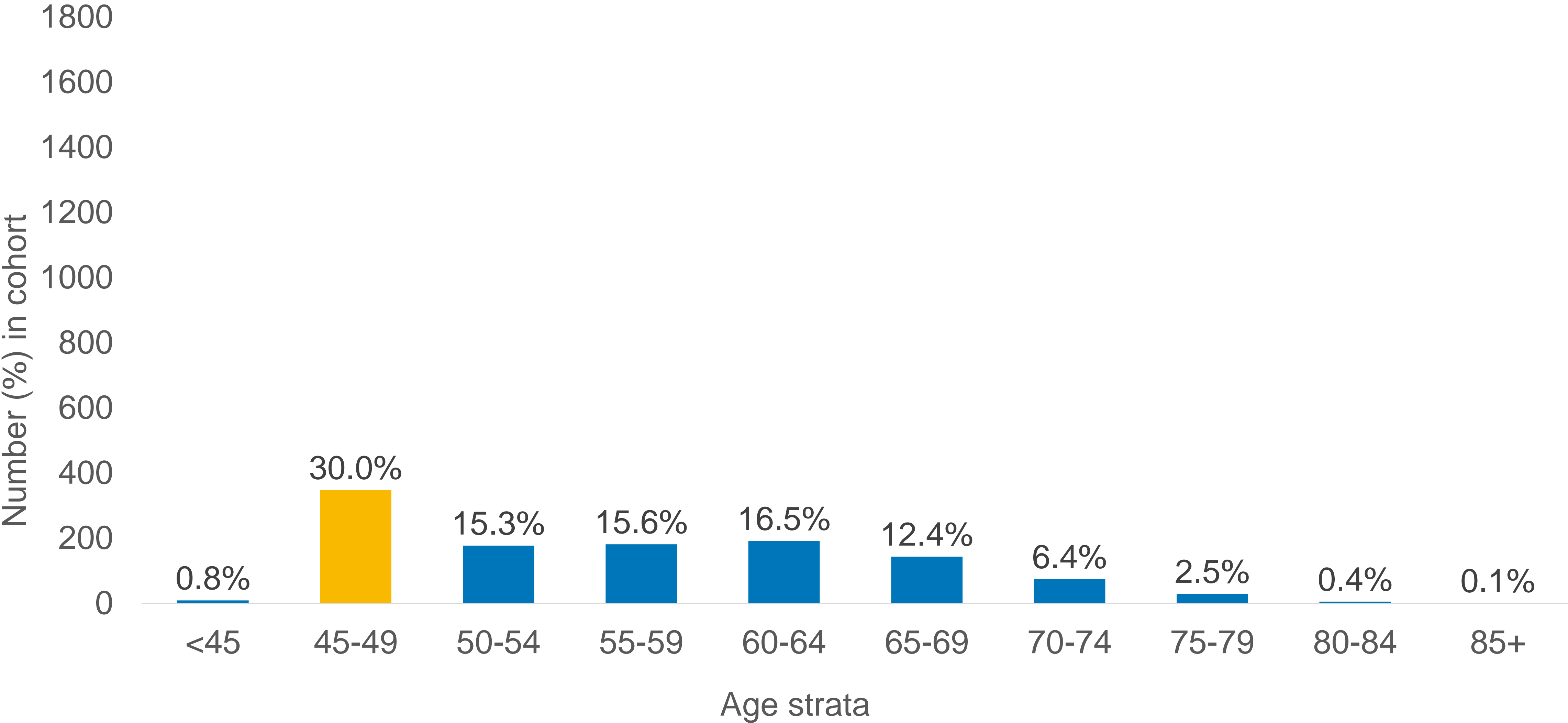
Also assessed effect of each scenario on provider ADRs, across a range of baseline ADRs from 25% to 45%



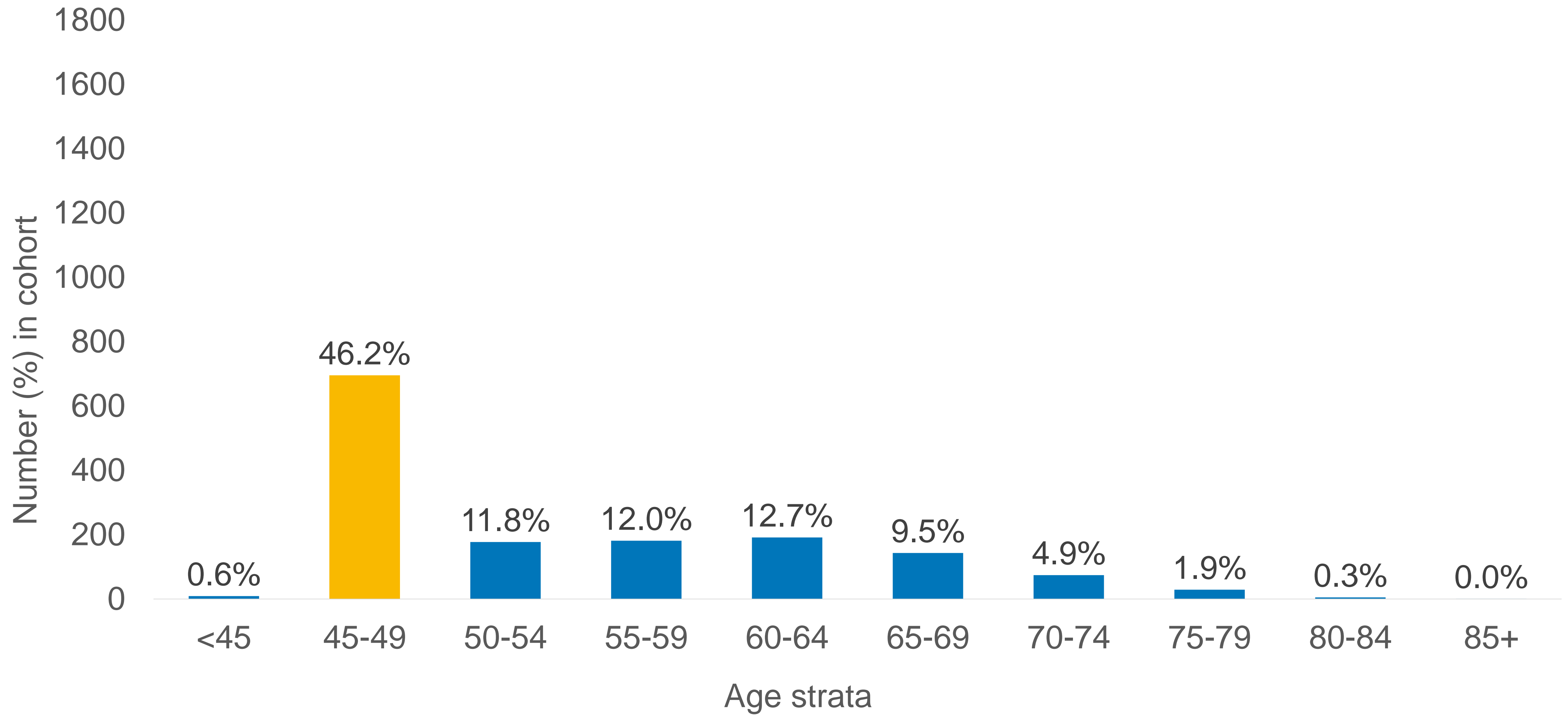
Base case (1,000 patients/year)



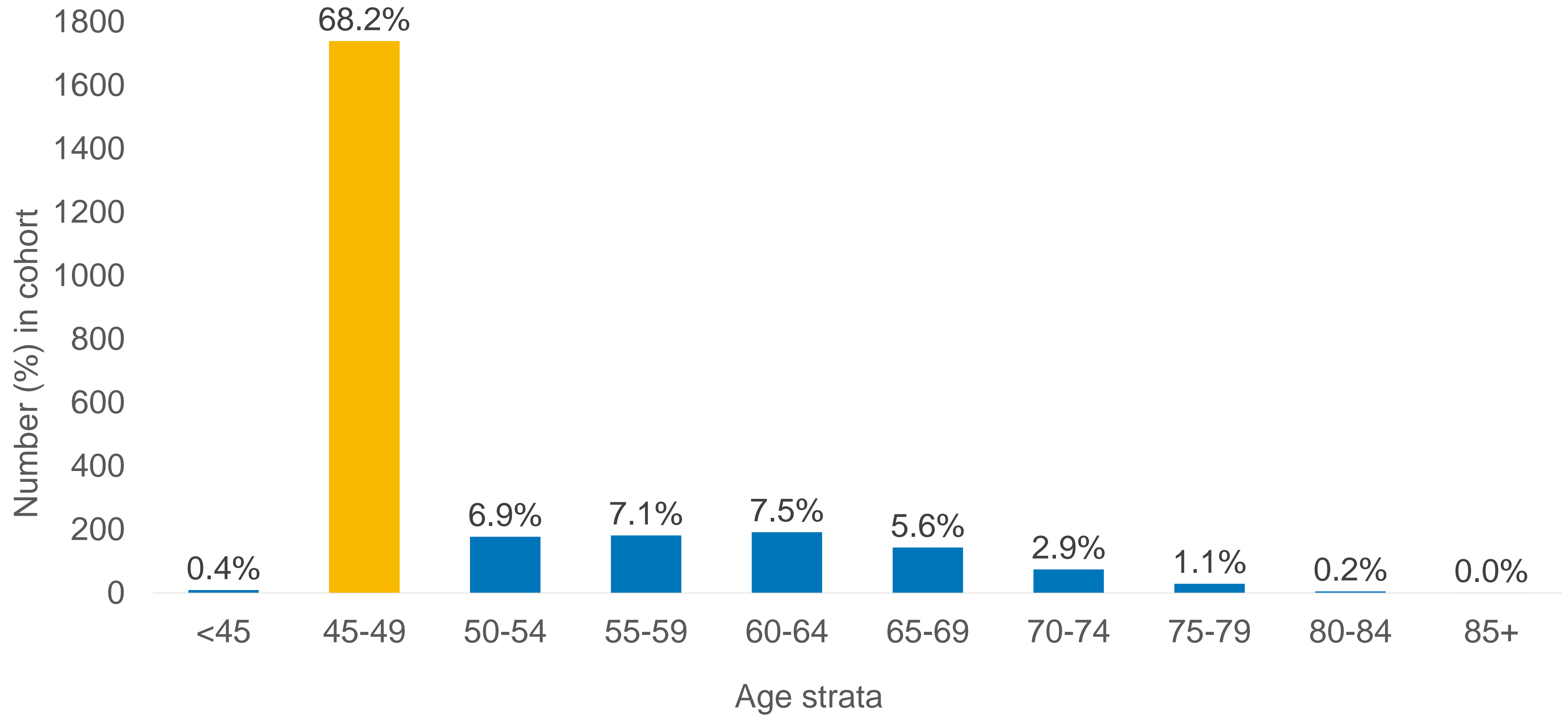
Future steady state (1,159 patients/year)



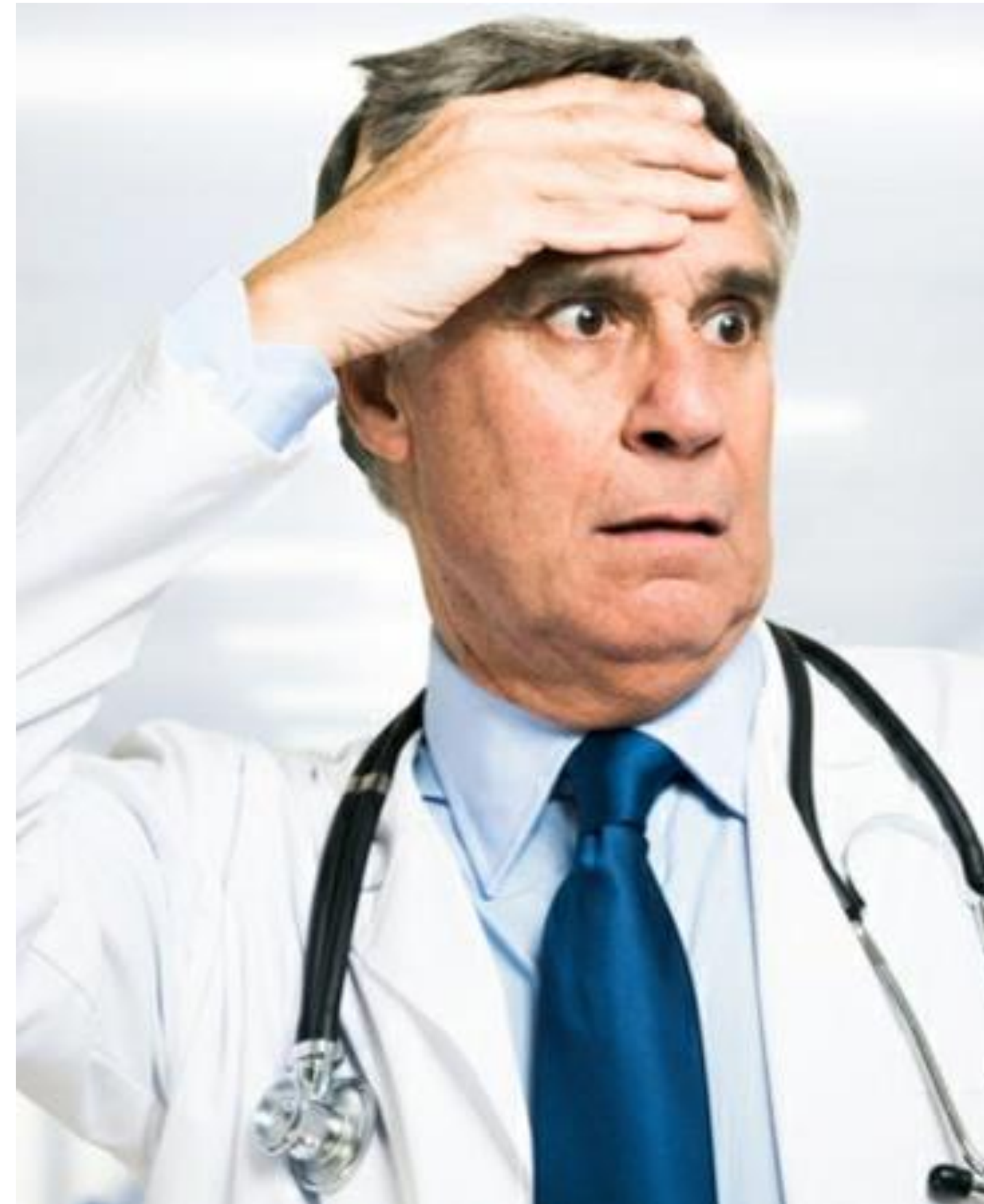
2-fold bolus (1,509 patients/year)



5-fold bolus (2,550 patients/year)



What about my ADR?



Predicting future ADRs

Estimated future ADR for ages ≥ 45 relative to an endoscopist's current baseline ADR for ages ≥ 50

	Estimated future ADR for ages ≥ 45		
	Baseline adenoma prevalence among 45-49 year olds (27%)		
Baseline Endoscopist ADR	Future steady state scenario	2-fold bolus scenario	5-fold bolus scenario
25%	23.6%	22.5%	21.0%
30%	28.3%	27.0%	25.2%
35%	33.0%	31.5%	29.4%
40%	37.7%	36.0%	33.6%
45%	42.4%	40.5%	37.7%



Predicting future ADRs

Table: Estimated future ADR for ages ≥ 45 relative to an endoscopist's current baseline ADR for ages ≥ 50

	Estimated future ADR for ages ≥ 45					
	Baseline adenoma prevalence among 45-49 year olds (27%)			5% lower adenoma prevalence among 45-49 year olds (22%)		
Baseline Endoscopist ADR	Future steady state scenario	2-fold bolus scenario	5-fold bolus scenario	Future steady state scenario	2-fold bolus scenario	5-fold bolus scenario ^B
25%	23.6%	22.5%	21.0%	22.5%	20.8%	18.6%
30%	28.3%	27.0%	25.2%	27.0%	25.0%	22.3%
35%	33.0%	31.5%	29.4%	31.5%	29.2%	26.0%
40%	37.7%	36.0%	33.6%	36.0%	33.3%	29.7%
45%	42.4%	40.5%	37.7%	40.5%	37.5%	33.4%



Predicting future ADRs

Table: Estimated future ADR for ages ≥ 45 relative to an endoscopist’s current baseline ADR for ages ≥ 50

	Estimated future ADR for ages ≥ 45								
	Baseline adenoma prevalence among 45-49 year olds (27%)			5% lower adenoma prevalence among 45-49 year olds (22%)			10% lower adenoma prevalence among 45-49 year olds (17%)		
Baseline Endoscopist ADR	Future steady state scenario	2-fold bolus scenario	5-fold bolus scenario	Future steady state scenario	2-fold bolus scenario	5-fold bolus scenario	Future steady state scenario	2-fold bolus scenario	5-fold bolus scenario
25%	23.6%	22.5%	21.0%	22.5%	20.8%	18.6%	21.4%	19.2%	16.2%
30%	28.3%	27.0%	25.2%	27.0%	25.0%	22.3%	25.7%	23.1%	19.4%
35%	33.0%	31.5%	29.4%	31.5%	29.2%	26.0%	30.0%	26.9%	22.7%
40%	37.7%	36.0%	33.6%	36.0%	33.3%	29.7%	34.3%	30.7%	25.9%
45%	42.4%	40.5%	37.7%	40.5%	37.5%	33.4%	38.6%	34.6%	29.1%



Implications

How do we accommodate potential increase in screening volume?

- Do more colonoscopies?
- Rely more on noninvasive testing (FIT, stool DNA, emerging blood tests)
- Caution not to displace other (higher risk) groups



What do we do about ADR effects?

Strategy	Problems/comments
Remove 45-49 year olds from the denominator	Ignores colonoscopy quality in this important (and large) group
Lower ADR thresholds	Would not improve outcomes and could negatively impact colonoscopy quality
Adjust ADR by age, sex, other factors	Adds complexity, impedes measurement/tracking
Continue measuring unadjusted ADR for all screenees	Current ADR thresholds are a low bar; those operating at the margin already have reason to engage in quality improvement efforts



Limitations



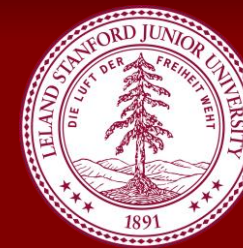
- Models \neq real life
- Our modeling was fairly simplistic, and did not incorporate effects on surveillance, differences in sex or proportion of healthy users, guideline effects on non-colonoscopy screening test use, and other variables that could affect projections
- Bolus scenarios may not be that realistic, but help illustrate the “worst case scenario” with respect to ADR and procedure volume changes.
- Guideline implementation could be delayed due to time needed for guideline dissemination to providers and patients, delays in insurance coverage, and COVID impacts.



ARE LOW-RISK 45-49 YEAR-OLDS PRESENTING FOR SCREENING AND AFFECTING CALCULATED ADR? AN ANALYSIS OF COLONOSCOPY VOLUMES AND ADR BEFORE AND AFTER THE PUBLICATION OF GUIDELINES ENDORSING CRC SCREENING AT AGE 45



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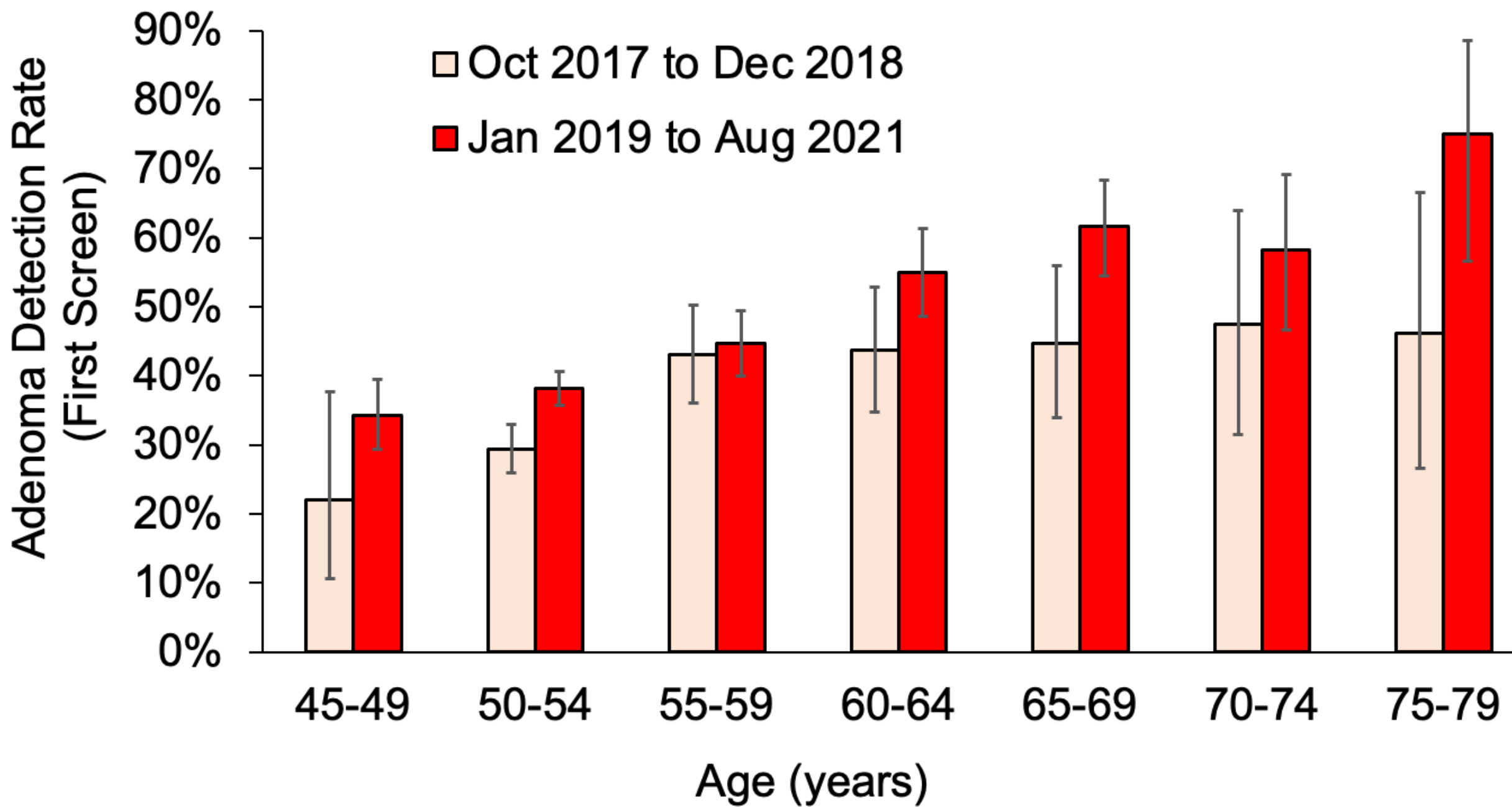
RESULTS

Figure 2: ADR trends

The proportion of first-time screening colonoscopies performed in 45-49 year-olds increased from 41/1,183 (3.5%) during Period I to 350/3,005 (11.6%) during Period II (RR 3.36 [95% CI,

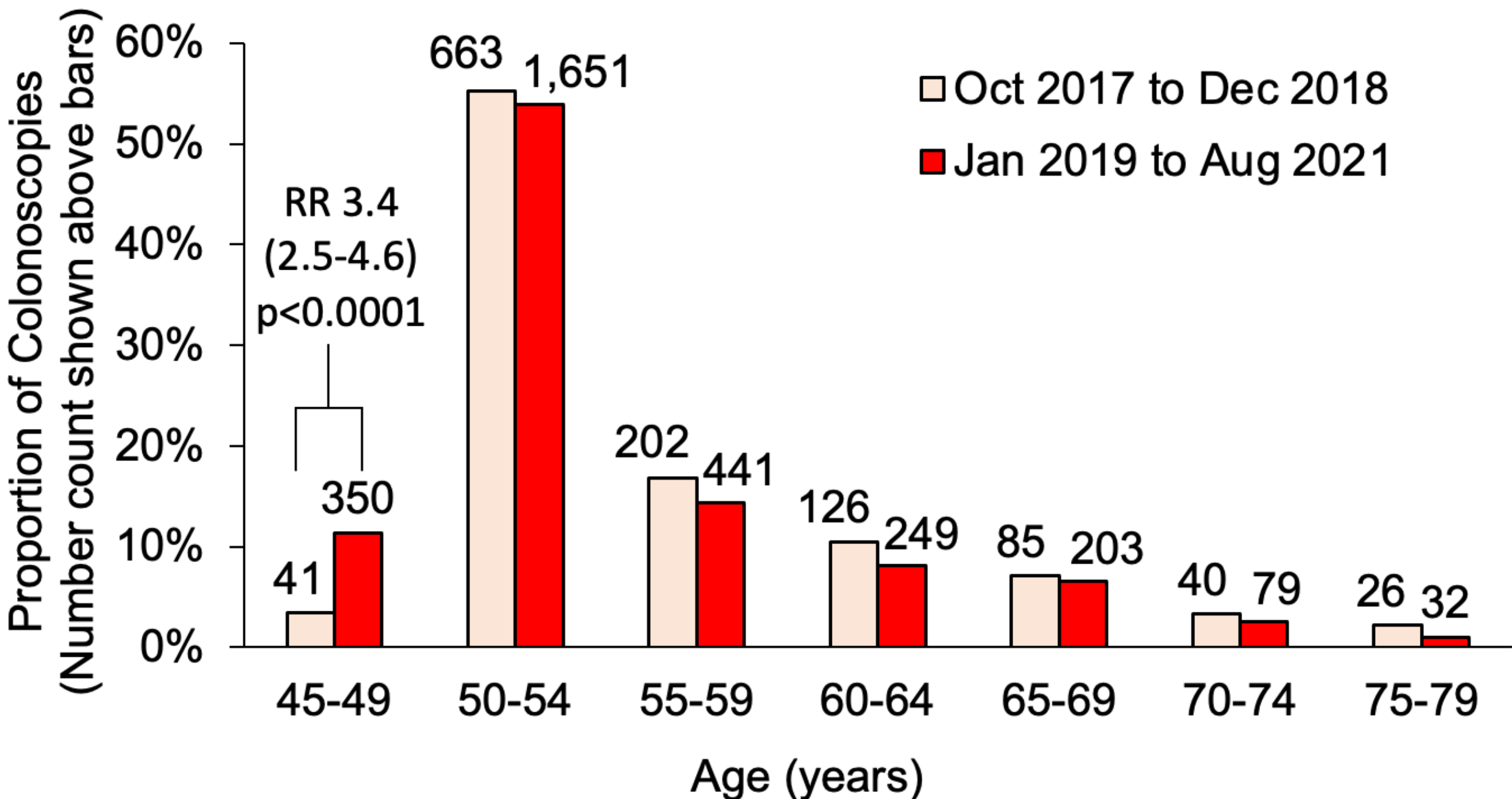
Adenoma Detection Rate by Age

Adenoma Detection Rate by Age

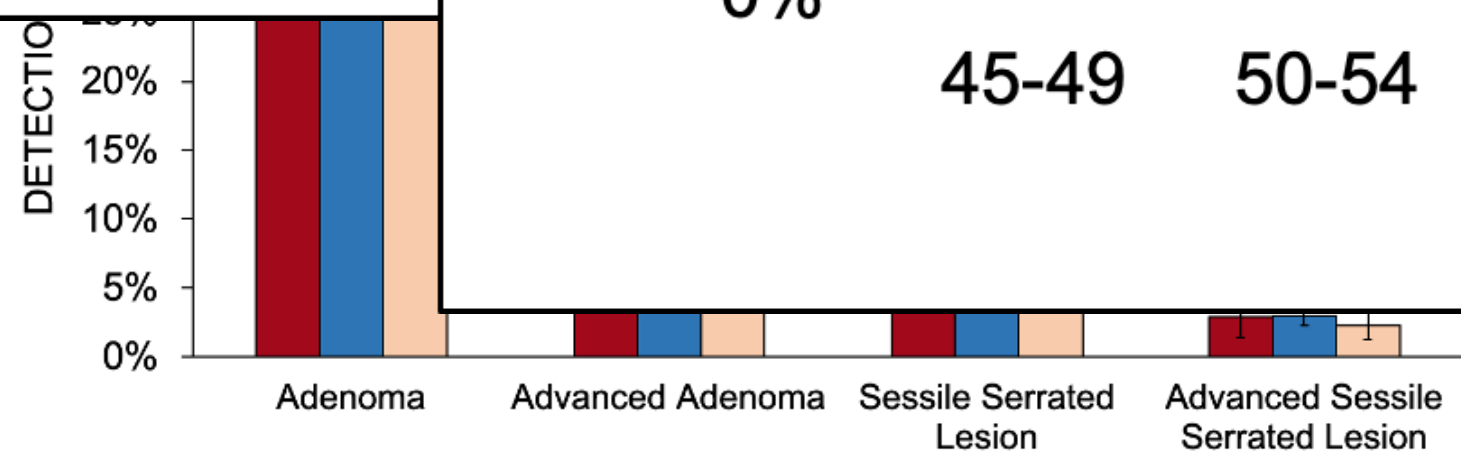
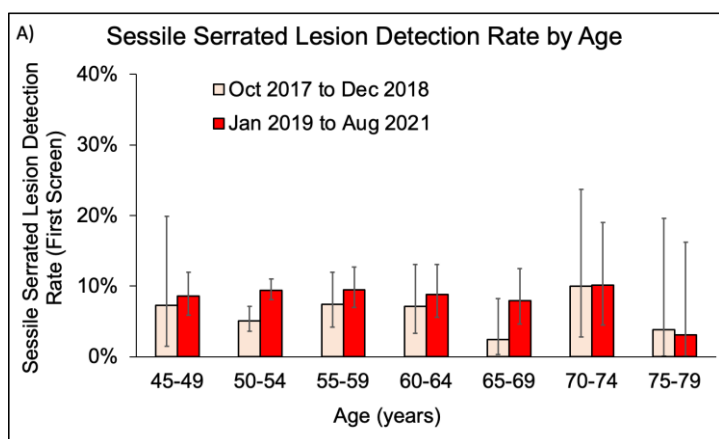


screening, and 60-64 year olds are screening.
National monitoring is needed to assess fully the impact of lowering the CRC screening initiation age.

First-time Screening Colonoscopy Volume by Age



- We compared colonoscopy volumes and lesion detection rates by age-group in our healthcare system during:
 - Period I (October 2017-December 2018), before the first change in guidelines
 - vs. Period II (January 2019-August 2021), the era of new guidelines
- Data: Stanford Colonoscopy Quality Assurance Program



Conclusions

- Guidelines now converge on initiating CRC screening at age 45 for average risk persons
- Group of 45-49 year olds in US is large
- Addition of this newly eligible group to the screening population may strain colonoscopy capacity and could modestly affect colonoscopy quality measurement (most impact on endoscopists with low ADRs)
- Pace of change uncertain, and questions remain regarding “real world” effects of the guideline change, resource utilization, and impact on existing CRC disparities



Thank you



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