RAPID COMMUNICATIONS

Is There Endoscopic Capacity to Provide Colorectal Cancer Screening to the Unscreened Population in the United States?

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See editorial on page 1841.

Background & Aims: Screening rates for colorectal cancer remain low compared with screening rates for other cancers. The size of the unscreened population and the capacity to provide widespread screening are unknown. We estimated the number of average-risk persons aged 50 years or older not screened for colorectal cancer, the number of procedures required for this population, and the endoscopic capacity to satisfy this unmet need. *Methods:* Using data from the US Census Bureau and the Centers for Disease Control and Prevention's National Health Interview Survey, we designed a forecasting model to estimate the number of persons in the United States currently not screened for colorectal cancer and the number of examinations needed to screen these persons. Test need was compared with available capacity, based on results from the national Survey of Endoscopic Capacity, assuming different proportions of available capacity were used for colorectal cancer screening. *Results:* Approximately 41.8 million average-risk people aged 50 years or older have not been screened for colorectal cancer according to national guidelines. Sufficient capacity exists to screen the unscreened population within 1 year using fecal occult blood testing followed by diagnostic colonoscopy for positive tests. Depending on the proportion of available capacity used for colorectal cancer screening, it could take up to 10 years to screen the unscreened population using flexible sigmoidoscopy or colonoscopy. *Conclusions:* The capacity exists for widespread screening with fecal occult blood testing. The capacity for screening with flexible sigmoidoscopy or colonoscopy depends on the proportion of available capacity used for colorectal cancer screening.

Colorectal cancer is the second leading cause of cancer-related deaths in the United States.[1] Despite evidence showing the effectiveness of colorectal cancer screening tests,[2–8] they are underused when compared with rates of use of other cancer screening tests.[9] Two of the Centers for Disease Control and Prevention's health behavior surveillance systems, the National Health Interview Survey (NHIS) and the Behavioral Risk Factor Surveillance System, regularly monitor the use of fecal occult blood testing (FOBT) and endoscopy (sigmoidoscopy/colonoscopy), and both show that only approximately one half of survey respondents aged 50 years or older have been screened for colorectal cancer according to recommended guidelines.[9,10]

Ample capacity should exist for screening with FOBT, a test that is inexpensive and widely available. Capacity limitations may, however, exist for flexible sigmoidoscopy and colonoscopy because only certain specialists are trained to perform them and they are more expensive than FOBT. Further, all positive screening tests are typically followed by a diagnostic colonoscopy. In planning for widespread colorectal cancer screening, several important resource questions regarding endoscopic examinations must be answered. (1) What is the current capacity for endoscopic screening and follow-up examinations in the United States? (2) What is the size of the currently unscreened population in the United States? (3) Can sufficient screening and follow-up examinations be provided to the unscreened population with the current endoscopic capacity?

Estimates of the current volume of endoscopic procedures are presented in a separate report of the Centers for

Abbreviations used in this paper: DCBE, double-contrast barium enema; FOBT, fecal occult blood testing; NHIS, National Health Interview Survey; SECAP, Survey of Endoscopic Capacity.

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Disease Control and Prevention's national Survey of Endoscopic Capacity (SECAP).[11] Approximately 2.8 million flexible sigmoidoscopies and 14.2 million colonoscopies were reported to have been performed in 2002. These estimates represented 29% and 63% of the potential volume of flexible sigmoidoscopies and colonoscopies that survey respondents reported they could perform, suggesting a potentially available capacity of 6.7 million flexible sigmoidoscopies and 8.2 million colonoscopies that could be used to provide screening and follow-up to the unscreened population in the United States. This report compares that available capacity with the number of tests needed for the currently unscreened population, assuming that all or one half of the available capacity is used for colorectal cancer screening. We focused on the average-risk population in this analysis because consensus exists about when to begin and how to screen the average-risk population for colorectal cancer. The size of and screening test needs for the increased-risk population will be addressed in a separate analysis.

Materials and Methods

We designed a forecasting model to (1) estimate the number of average-risk people aged 50 years or older who have not been screened for colorectal cancer, (2) describe the sociodemographic characteristics of this population, and (3) estimate the annual number of procedures required to provide screening and follow-up examinations for this population.

Population Estimates

To estimate the size of the US population currently unscreened for colorectal cancer, we first estimated the size of the total US population aged 50 years or older in 2001, stratified by sex, race, ethnicity, income, region, and age, using US Census Bureau 2000 Public Use Microdata Sample data.[12] Insurance status by sex, race, ethnicity, income, region, and age was estimated using data from the March Current Population Surveys for 2000 and 2001.[13]

Increased-Risk Population Estimates

We then identified and removed persons at increased risk for colorectal cancer, including those with a personal or family history of colorectal cancer and those with inflammatory bowel disease, because our model estimated the need for average-risk persons only. Colorectal cancer prevalence rates by age, race, ethnicity, and sex were obtained from the Surveillance, Epidemiology and End Results program.[14] The size of the population with a family history of colorectal cancer was obtained from the 2000 NHIS.[15] Persons were considered to have a family history of colorectal cancer if they had a parent, sibling, or child who had been diagnosed with colorectal cancer at any age. The number of individuals with inflammatory bowel disease was obtained from the National Institute of Diabetes and Digestive and Kidney Diseases.[16] Although the prevalence of inflammatory bowel disease varies by age, race/ethnicity, and sex, we assumed an equal prevalence across age, race/ethnicity, and sex and assumed a mortality rate for inflammatory bowel disease equal to that of the general population. Approximately 1.0 million persons (1.3% of the population aged 50 years or older) with a personal history of colorectal cancer, 5.2 million persons (6.8% of the population aged 50 years or older) with a family history of colorectal cancer, and .17 million persons (.2% of the population aged 50 years or older) with inflammatory bowel disease, all considered at increased risk for colorectal cancer, were excluded from the total population in need of screening.

Screening Test Prevalence Estimates

We used a 2-step modeling method to determine the size of the screened population. In step 1, we used data from the 2000 NHIS[15] to construct a multivariate multinomial logistic regression model to determine the relationship between sociodemographic characteristics (eg, age, sex, race, income level, health insurance status, region of the United States) and the probability that an individual has been screened for colorectal cancer according to current guidelines: FOBT in the past year, endoscopy (flexible sigmoidoscopy, colonoscopy, or proctoscopy) in the past 10 years, both FOBT in the past year and endoscopy in the past 10 years, or none of the above. NHIS respondents were asked about their use of any lower endoscopic procedure (sigmoidoscopy, colonoscopy, or proctoscopy) but were only asked to identify which of the 3 endoscopic procedures they had received most recently. We therefore measured the use of all endoscopies combined and used 10 years as a measure of screening according to recommended guidelines to fully capture colonoscopy use. NHIS respondents were not asked about their use of double-contrast barium enema (DCBE). Stata 6.0 was used to account for the sampling weights and survey design and to calculate 95% confidence intervals.[17]

In step 2, the coefficients (Table 1) from the logistic regression model described previously were used to estimate the proportion of persons who have been screened. These proportions were applied to the average-risk US population aged 50 years or older to generate counts of the population already screened for colorectal cancer.

Finally, we subtracted the number of individuals who have already been screened from the total average-risk population to produce an estimate of the number of average-risk persons in the US population currently in need of colorectal cancer screening (Figure 1).

Demand for Screening Procedures in Various Screening Scenarios

To determine the number of procedures needed to screen this unscreened average-risk population, we modeled 5 program options under which screening could occur. The first program assumed that screening would occur with a combination of screening tests in proportions consistent with the current test used based on the 2000 NHIS.[15] To determine

Table 1. Multinomial Logistic Regression Results Used to Estimate the Proportion of Average-Risk Individuals Who Have Been Screened According to Current Guidelines

	FOBT		Endoscopy		FOBT and endoscopy	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Male	−0.241	0.082	0.112	0.056	0.232	0.091
Black, non-Hispanic	−0.050	0.123	−0.181	0.084	−0.266	0.166
Hispanic	−0.625	0.151	−0.413	0.098	−0.777	0.231
Native American	−0.400	0.334	−0.532	0.214	−0.622	0.454
Asian	−0.746	0.509	−0.485	0.431	0.217	0.642
Other race	−0.273	0.664	−0.025	0.343	0.609	0.483
Age	0.362	0.036	0.319	0.024	0.569	0.045
Age squared/100	−0.265	0.029	−0.223	0.019	−0.402	0.036
<250% of poverty level	−0.180	0.093	−0.348	0.064	−0.659	0.121
Health insurance	0.759	0.181	1.151	0.144	1.256	0.303
South	−0.067	0.112	0.047	0.082	−0.089	0.134
Midwest	0.049	0.121	−0.095	0.096	0.048	0.143
West	0.223	0.121	0.034	0.090	0.259	0.167
Intercept	−14.389	1.121	−12.988	0.757	−22.596	1.493

NOTE. No colorectal cancer screening is the omitted category.

the number and type of tests needed in this scenario, the coefficients of the logistic regression analysis were applied to the unscreened average-risk population to predict the numbers of required screening tests (FOBT only, sigmoidoscopy only, sigmoidoscopy plus FOBT, and colonoscopy) based on sociodemographic characteristics of the unscreened average-risk population. To determine endoscopies by type, we assumed that the most recent test reported in the NHIS was the only test performed. The other 4 programs were selected because they each represent screening options recommended by national guidelines.[18–20] These programs assumed that the unscreened population would be screened with (1) annual FOBT with diagnostic colonoscopy for positive tests, (2) FOBT plus sigmoidoscopy, (3) sigmoidoscopy with diagnostic colonoscopy for positive tests, or (4) colonoscopy. For the program

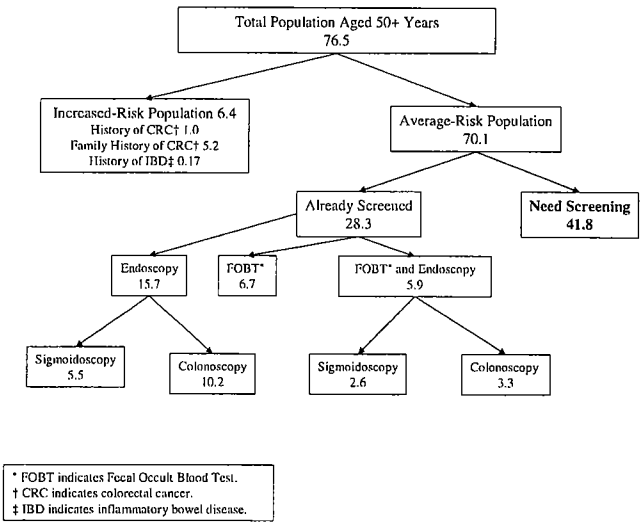

Figure 1. Number of people in the United States requiring colorectal cancer screening and follow-up examinations (in millions).

using FOBT and sigmoidoscopy, we assumed that all persons would first be screened with FOBT, with positive FOBTs followed by a diagnostic colonoscopy. Persons with a negative FOBT would be offered screening sigmoidoscopy with positive sigmoidoscopies followed by a diagnostic colonoscopy.

We separately modeled a program designed for a limited population of men and women between 50 and 64 years of age with no health insurance and an annual income less than 250% of the poverty level. The National Breast and Cervical Cancer Early Detection Program,[21] a program administered through cooperative agreements between the Centers for Disease Control and Prevention and all 50 states, the District of Columbia, and several territories and tribal nations, provides funding for the delivery of breast and cervical cancer screening tests for underinsured and uninsured women; a national colorectal cancer screening program might similarly focus on the underinsured and uninsured population. For this population, we proposed screening program options to include (1) a program using a set combination of tests to include FOBT for 50% of the unscreened population, FOBT plus flexible sigmoidoscopy for 25% of the unscreened population, and screening colonoscopy for 25% of the unscreened population; (2) annual FOBT with diagnostic colonoscopy for positive tests; (3) sigmoidoscopy with diagnostic colonoscopy for positive tests; or (4) colonoscopy. Logistic regression analysis was used to estimate the number of low-income people 50–64 years of age without insurance who are at average risk for colorectal cancer and have already received screening tests for colorectal cancer.

Demand for Diagnostic Follow-up Colonoscopies

For any of the proposed screening programs, positive FOBTs and flexible sigmoidoscopies would be followed by a diagnostic colonoscopy. To estimate the number of diagnostic colonoscopies that would be generated by screening the un-

screened population, we applied a positivity rate of 2.5% for unrehydrated FOBT and 5% sigmoidoscopy.[2,22–24] For individuals undergoing both FOBT and sigmoidoscopy during 1 year, a 6.25% positivity rate was applied, which assumes that FOBT is performed annually but only one fifth of the people receive sigmoidoscopy each year and one half of the positive cases identified through sigmoidoscopy are not identified by FOBT.

Years Over Which Examinations Provided

After estimating test need for the unscreened population, we estimated how many years it might take to provide screening and follow-up examinations to this unscreened population.

Capacity Estimate

For both flexible sigmoidoscopy and colonoscopy, the available capacity measured in the SECAP[11] (the difference between the current and potential volume) was compared with the number of endoscopic examinations needed for the unscreened population in each of the proposed hypothetical screening programs. We estimated overall capacity assuming that either one half or all of the available capacity is used for colorectal cancer screening.

Sensitivity Analysis

Because we could not include the role of screening DCBE or the size of the population requiring postpolypectomy surveillance in our forecasting model, we addressed these in a sensitivity analysis. To assess the effect of DCBE utilization on overall demand for screening tests, we assumed that 2.4 million DCBEs are performed per year[25] and then recalculated the size of the target population and test demand based on this assumption. We assumed that the test is performed every 5 years and individuals screened with DCBE do not receive another colorectal cancer screening test. The prevalence of persons with adenomatous polyps is not readily available, and the frequency with which postpolypectomy surveillance currently occurs is unknown. To explore this issue, we estimated the number of colonoscopies that would be generated by persons in our model who would require postpolypectomy surveillance. We assumed that persons would require postpolypectomy surveillance if their screening colonoscopy detected a polyp >1 cm, multiple polyps, or a villous adenoma, and we estimated the percentage of colonoscopies with these findings based on published literature.[26,27] We estimated numbers of colonoscopies if postpolypectomy surveillance were performed annually, every 3 years, or every 5 years.

Results

Of the 70.1 million persons in the United States aged 50 years or older at average risk for colorectal cancer, 28.3 million people (40.4%) have been screened within recommended intervals: approximately 15.7 million with endoscopy (flexible sigmoidoscopy or colonoscopy) only, 6.7 million with FOBT only, and 5.9 million with both FOBT and endoscopy. The remaining 41.8 million people have not been screened for colorectal cancer (Figure 1). Of those, approximately 23.2 million are women (55%), 38.5 million are non-Hispanic (92%), and 16.7 million (40%) are aged 65 years or older. By race, approximately 34.5 million (82.5%) are white, 4.2 million (10.0%) are black, .3 million (.7%) are Native American, 1.5 million (3.6%) are Asian, and 1.3 million (3.1%) are classified as "other" race. Approximately 26.1 million people (62.5%) have incomes greater than 250% of the federal poverty level, and 37.3 million people (89.2%) have health insurance. By region, 8.5 million unscreened persons (20.3%) live in the Northeast, 9.6 million (23.1%) in the Midwest, 15.2 million (36.4%) in the South, and 8.5 million (20.3%) in the West. Approximately 2.7 million people are between 50 and 64 years of age, uninsured, and below 250% of the federal poverty level; 2.3 million of these people have not been screened. The screening rate for this low-income uninsured group is 13.5% compared with 40.4% for all average-risk people older than 50 years of age.[15]

The number of tests needed for screening and follow-up of both the general and the low-income uninsured population varied according to the type of screening program offered (Table 2). For the 41.8 million unscreened persons, a program based on current screening patterns would require ~16 million sigmoidoscopies and colonoscopies. A program using screening FOBT only would require the least number of colonoscopies, 1.0 million, as diagnostic follow-up for the FOBTs. Programs using screening sigmoidoscopies would require >40 million sigmoidoscopies and would also generate between 2 and 3 million diagnostic colonoscopies. A program using screening colonoscopy would require 41.8 million colonoscopies.

Based on the results of the SECAP, there is an available capacity of 6.7 million flexible sigmoidoscopies and 8.2 million colonoscopies.[11] We compared this estimated available capacity with the number of examinations needed in each proposed program, for tests distributed over multiple years if 50% or 100% of the capacity were used for colorectal cancer screening (Figures 2 and 3). The need for sigmoidoscopy and the need for colonoscopy are displayed in separate figures. In each set of graphs, the numbers of tests needed for each screening program over time are shown compared with a horizontal line across all years representing the available capacity. The need for sigmoidoscopy is compared with 100% versus 50% of the available capacity (Figure 2). Assuming all available sigmoidoscopic capacity is used for colorectal cancer screening, the capacity would exist to screen the

Table 2. Number of Colorectal Cancer Screening and Follow-up Examinations Needed for Unscreened Population in Different Screening Programs (in Millions)

Screening programs[a]	FOBT	Flexible sigmoidoscopy	Colonoscopy		
			Screening colonoscopy	Follow-up colonoscopy	Total colonoscopy
US average-risk population, 50 years or older					
Current screening practices[b]	18.5	16.1	15.2	1.2	16.3
100% FOBT	41.8	NA	NA	1.0	1.0
FOBT plus sigmoidoscopy[c]	41.8	40.8	NA	3.0	3.0
100% sigmoidoscopy	NA	41.8	NA	2.1	2.1
100% colonoscopy	NA	NA	41.8	NA	41.8
US population, 50–64 years old, <250% of poverty level, no health insurance					
Mixed tests[d]	1.7	0.6	0.6	0.07	0.65
100% FOBT	2.3	NA	NA	0.06	0.06
FOBT plus sigmoidoscopy	2.3	2.3	NA	0.17	0.17
100% sigmoidoscopy	NA	2.3	NA	0.12	0.12
100% colonoscopy	NA	NA	2.3	NA	2.3

NA, not applicable.
[a]All positive screening FOBTs and sigmoidoscopies would be followed by a diagnostic colonoscopy.
[b]Current patterns of screening.
[c]FOBT performed first; sigmoidoscopy performed only if FOBT negative.
[d]50% FOBT, 25% FOBT plus flexible sigmoidoscopy, and 25% colonoscopy.

unscreened population with a program based on current screening patterns if tests were offered over 3 or more years, but 6 years would be required to screen the unscreened population using 100% sigmoidoscopy or FOBT plus sigmoidoscopy. If only one half of the available capacity were used for screening, it would take 5 years to screen the unscreened population based on current screening patterns and 10 years using screening sigmoidoscopy or FOBT plus sigmoidoscopy. This would not take into account repeat screening tests needed within that time period or tests needed to keep the screened population current with their screening tests.

Comparing the need for colonoscopy with available capacity (Figure 3), if all available capacity were used for screening, it would take 5 years to screen the unscreened population using 100% screening colonoscopy and 2 years using a program based on current screening patterns. Two of the programs that have available colonoscopy capacity would require sigmoidoscopy as well; sigmoidoscopy is in a shortage until the sixth year (Figure 2). For a program using screening FOBTs with diagnostic colonoscopies for positive tests, there would be enough capacity to provide the necessary follow-up colonoscopies within 1 year. If only one half of the available colonoscopy capacity were used for screening, it

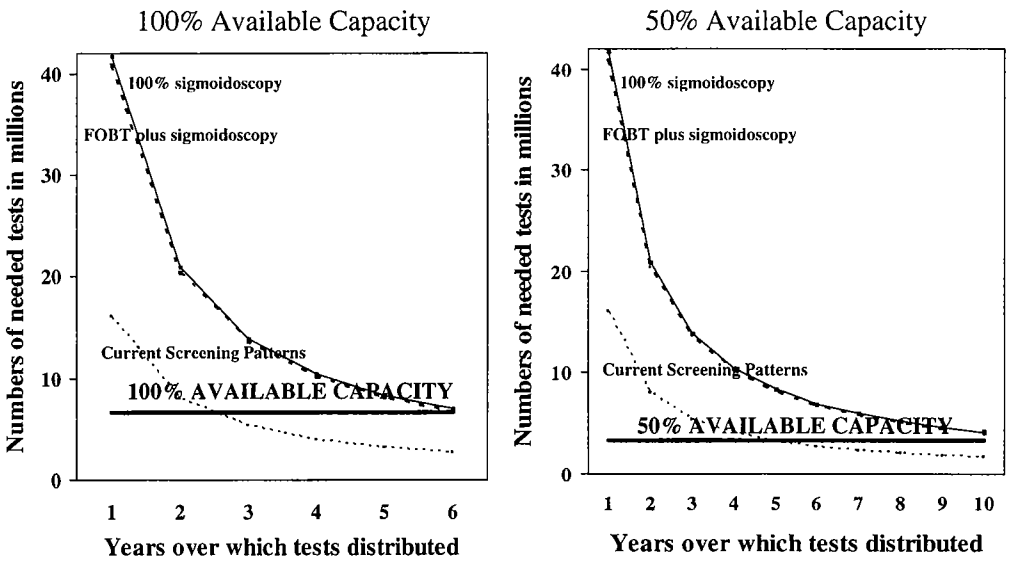

Figure 2. Available sigmoidoscopic capacity compared with test need for different screening programs over multiple years (in millions).

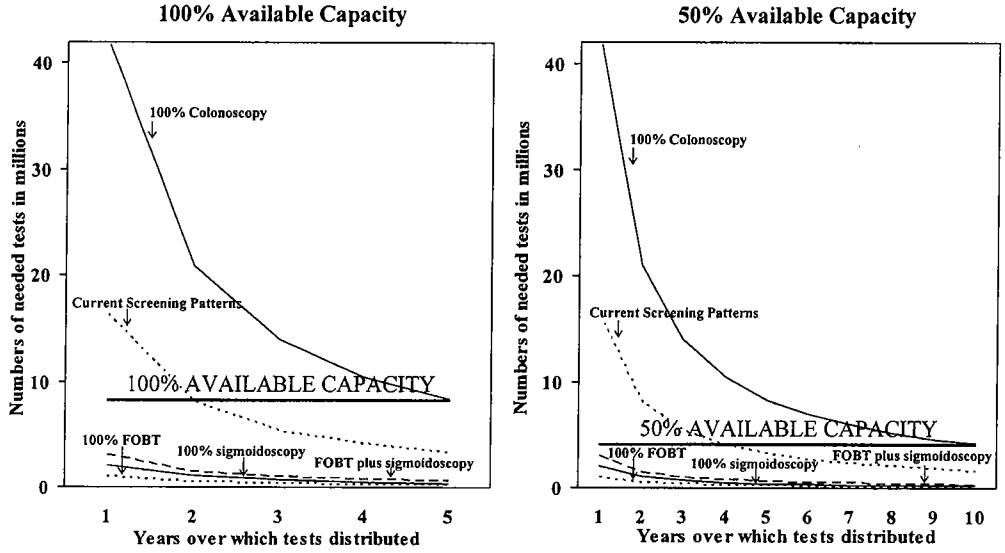

Figure 3. Available colonoscopic capacity compared with test need for different screening programs over multiple years (in millions).

would take 4 years to screen the unscreened population using a program based on current screening patterns and 10 years using 100% colonoscopy.

For a program designed to screen only an uninsured, low-income population between 50 and 64 years of age, there is enough sigmoidoscopic and colonoscopic capacity to screen the unscreened population within 1 year using any of the proposed programs (Figure 4).

We explored the size of the unscreened population by census region. Under current screening practices, the need is greatest in the South (Table 3). There would not be enough available sigmoidoscopies or colonoscopies in any census region for tests to be performed in a single year.

Results of the sensitivity analyses are presented in Table 4. Factoring use of DCBE into our estimates would reduce the size of the unscreened population by 10 million persons and reduce the number of required sigmoidoscopies and colonoscopies by approximately 3.3 million each. Numbers of required postpolypectomy surveillance colonoscopies varied according to the frequency of the test. A total of 2.2 million colonoscopies would be required for annual postpolypectomy surveillance colonoscopy, .7 million colonoscopies for surveillance every 3 years, and .4 million colonoscopies for surveillance every 5 years over a 10-year period.

Discussion

We present the first national estimate of the size of the unscreened population and new results on the capacity to screen the entire eligible US population for

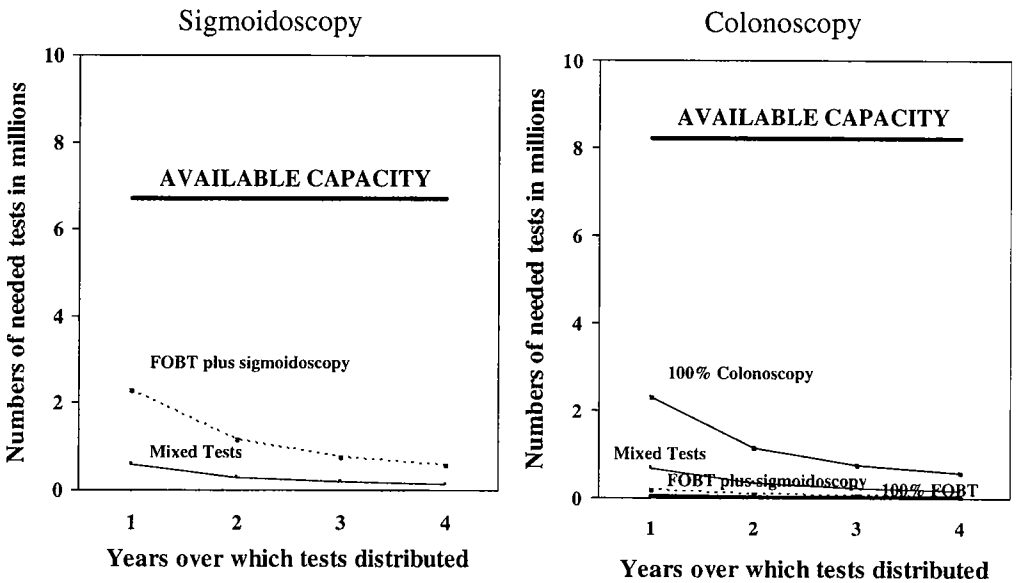

Figure 4. Available capacity compared with lower endoscopic test need for different screening programs over 1, 2, 3, or 4 years for an uninsured population, 50–64 years, living in poverty (in millions).

Table 3. Capacity by US Census Region to Perform Lower Endoscopic Procedures According to Current Screening Practices for Average-Risk Persons Aged 50 Years or Older[a] (in Millions), 2000

	Current volume[b] (95% confidence interval)	Potential volume[b] (95% confidence interval)	Available capacity[c]	Test need[d]	Available capacity minus test need
Flexible sigmoidoscopy					
Total	2.8 (2.4–3.1)	9.5 (8.4–10.5)	6.7	16.1	−9.4
Northeast	0.7 (0.4–1.0)	2.5 (1.7–3.2)	1.8	3.3	−1.5
Midwest	0.7 (0.6–0.9)	2.2 (1.8–2.7)	1.5	3.7	−2.2
South	0.8 (0.6–0.9)	3.2 (2.8–3.6)	2.4	5.7	−3.3
West	0.6 (0.4–0.7)	1.6 (1.3–1.9)	1.0	3.4	−2.4
Colonoscopy[e]					
Total	14.2 (12.1–16.3)	22.4 (20.1–24.8)	8.2	16.3	−8.1
Northeast	4.2 (2.2–6.1)	5.9 (3.9–7.8)	1.7	3.4	−1.7
Midwest	3.1 (2.6–3.7)	5.1 (4.4–5.9)	2.0	3.6	−1.6
South	4.8 (4.3–5.4)	8.0 (7.1–8.9)	3.2	6.3	−3.1
West	2.1 (1.8–2.5)	3.5 (2.9–4.0)	1.4	3.1	−1.7

[a]According to 2000 NHIS.
[b]Based on results of SECAP; 100% FOBT, follow-up with colonoscopy.
[c]Difference between current and potential volume.
[d]Based on results of forecasting model.
[e]Includes screening plus follow-up.

colorectal cancer. Our results show that 41.8 million US adults have not been screened for colorectal cancer according to national guidelines. If all of the currently available endoscopic capacity were used for screening, tests would be immediately available for an FOBT screening program, where the only necessary endoscopy would be follow-up colonoscopy for positive FOBT. If only one half of the available capacity were used for screening, the number of years required to screen the unscreened population would increase. A screening colonoscopy program would require 10 years to screen the unscreened population. By comparing only a portion of the available capacity with test need, we were able to show how clinicians might increase their capacity for screening while maintaining other clinical duties. Even if the available capacity presented here were accurate, it may not be practical to assume that it could be used entirely for colorectal cancer screening, because this might require an untenable shift in clinical resources.

We recognize that results from these national-level data may not bear out in smaller geographic areas. Similar assessments are currently under way in 9 states to provide finer estimates that can help guide local planning for colorectal cancer screening.[28]

Our capacity assessment relies on the strength of our model and the reliability of the SECAP results. While no external validation has been performed on our volume estimates, there is external consistency with other known data sources. The numbers of colonoscopies performed in 1 week among gastroenterologists as reported in the SECAP are consistent with numbers of colonoscopies performed in 1 week among gastroenterologists included in the Clinical Outcomes Research Initiative, a sample registry of endoscopic procedures performed by gastroenterology practices across the United States (personal communication, David Lieberman, February, 2004). Our estimates are also consistent with Medicare claims filed for colonoscopies in 2002 (personal communication, Car-

Table 4. Results of Sensitivity Analysis; Changes in Needed Numbers of Endoscopic Procedures Compared With the Need Under Current Screening Practices

Model assumptions	Change in needed flexible sigmoidoscopies	Change in needed colonoscopies
DCBEs	Decreased by 3.3 million	Decreased by 3.3 million
Assume 2 million DCBEs performed annually (reducing unscreened population by 10 million)		
Postpolypectomy surveillance		
Assume varying intervals over a 10-year period		
Every year	NA	Increased by 2.2 million
Every 3 years	NA	Increased by 0.7 million
Every 5 years	NA	Increased by 0.4 million

NA, not applicable.

rie Klabunde/Martin Brown, February, 2004). There is no method to validate the potential number of examinations that respondents reported they could do because we were asking respondents to speculate. However, our survey respondents were primarily physicians in charge of or performing endoscopy and were identified by their practices as being best able to describe endoscopy at their practice. While the magnitude of the unused capacity may not be precise, there clearly seems to be a substantial capacity to increase the current volume of endoscopies.

The SECAP results are nationally representative but are subject to the biases associated with self-reported data. We did not ask respondents to specify whether their ability to increase their numbers of one lower endoscopic test would preclude an increase in the other. Even if this were true, it would only impact our capacity estimates for programs that used both screening sigmoidoscopy and screening colonoscopy.

Current endoscopic capacity is influenced by the role that screening DCBE plays and the volume of colonoscopic resources being used for postpolypectomy surveillance. When previously performed screening using DCBE is taken into account, both the size of our estimated unscreened population and endoscopic test need were reduced. This estimate is probably closer to the true level of need because screening DCBEs certainly are performed. Guidelines for postpolypectomy surveillance recommend lengthening the interval between surveillance examinations,[19] but it is likely that postpolypectomy surveillance is still occurring at frequent intervals in clinical practice. Our results showed that extending the interval for postpolypectomy surveillance dramatically reduced the necessary number of colonoscopies required.

To address the estimated number of tests required to sustain a colorectal cancer screening program over time, a follow-up analysis is being undertaken that will address the projected rate at which the eligible population will grow, the number of people moving in and out of the eligible population over time, adherence to screening recommendations, the frequency of repeat screening tests and follow-up tests, and the number of procedures that would be required during initial start-up years versus long-term maintenance years of a large screening program. To fully describe the capacity for widespread endoscopic screening and follow-up examinations for all US persons aged 50 years or older, the size of and test needs for the increased-risk population also need to be evaluated. Lastly, cost-effectiveness, complication rates, and quality of the various screening tests were not addressed in this capacity assessment. These are all areas that require further investigation and will be incorporated into future designs of the forecasting model.

To our knowledge, this type of capacity assessment has not previously been performed. The findings in our study should provide critical baseline data from which planning for widespread colorectal cancer screening and follow-up at the national and regional levels can occur.

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