Short Communication

Patterns of Colorectal Cancer Screening Uptake among Men and Women in the United States

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Abstract

Objective: **The purpose of this report is to examine (*a*) gender-specific correlates of colorectal cancer test use using recent national data from 2003 and (*b*) patterns of colorectal cancer screening by gender and test modality over time.**

Methods: **We analyze data from the 1987, 1992, 1998, 2000, and 2003 National Health Interview Surveys. Our sample consists of men and women ≥50 years never diagnosed with colorectal cancer and who reported a recent fecal occult blood test and/or endoscopy.**

Results: **In 2003, both men and women reported higher rates of colonoscopy (32.2% and 29.8%, respectively) than use of FOBT (16.1% and 15.3%, respectively) or sigmoidoscopy (7.6% and 5.9%, respectively). Men reported higher use of endoscopy than women if they had a usual source of health care, had talked to a general doctor, and had two to five visits to the doctor in the past year. Men and women 65 years and older had higher rates of any recommended colorectal cancer test (55.8% and 48.5%, respectively) than persons 50 to 64 years (males, 41.0%; females, 31.4%). Use of colorectal cancer tests also was higher among both genders if they were not Hispanic, had higher educational attainment, were former smokers, had health insurance or a usual source of care, or if they talked to a general doctor. Recent use of colorectal cancer tests has increased since 2000 for both women and men largely due to increased use of colonoscopy.**

Conclusions: **Colorectal cancer testing is increasing for both men and women, although the prevalence of testing remains higher in men. Our data support previous findings documenting socioeconomic disparities in colorectal cancer test use. Access barriers to screening could be particularly difficult to overcome if colonoscopy becomes the preferred colorectal cancer screening modality.** (Cancer Epidemiol Biomarkers Prev 2006;15(2):389–94)

Introduction

Despite expert consensus and national guidelines (1) endorsing colorectal cancer screening as an effective strategy for reducing colorectal cancer incidence and mortality, uptake of screening has remained relatively low. In 2000, less than half (42%) of U.S. age-eligible adults reported receiving any of the recommended colorectal cancer screening tests (2). This relatively low rate of use has left many wondering why we have not witnessed the same steep increase in colorectal cancer screening that was observed with mammography after evidence-based recommendations for breast cancer screening were published. All the elements were in place by 2000 for the takeoff. The U.S. Preventive Services Task Force first published guidelines recommending colorectal cancer screening in 1996 (3). Two years later, colorectal screening became a covered Medicare benefit (http://healthservices.cancer.gov/seermedicare/considerations/testing.html). In 2000, most health plans in the United States covered at least one of the recommended colorectal cancer screening modalities (4). Nevertheless, rates of colorectal cancer screening remain low.

Correlates of colorectal cancer test use are similar to those observed for mammography and Papanicolaou tests and include race; ethnicity; age; education; income; and having health insurance coverage, a usual source of health care, a recent physician visit, use of other cancer screening tests, and a recommendation from a physician for screening (2, 5, 6). However, other characteristics of colorectal cancer screening distinguish it from breast and cervical screening, including a range of test modalities from which patients and physicians can choose [fecal occult blood testing (FOBT), sigmoidoscopy, colonoscopy, and double-contrast barium enema], patient responsibility in preparing for or completing the test, and the fact that this preventive service is recommended for both men and women.

Differences in colorectal cancer test use by gender have been documented. In general, studies have shown that men are more likely than women to be tested for colorectal cancer (7, 8) and that patterns of use by gender differ by test modality. For example, Seeff et al. (2) reported greater use of FOBT by women compared with men in 2000, but found that men had endoscopy more often than women. That colorectal cancer test use is higher in men than women is surprising because, in general, men tend to have lower use of medical services than women (9). One also would expect that high rates of breast and cervical cancer screening (5) would translate into greater opportunities for women to learn about and receive recommendations for colorectal cancer screening. Having seen a physician in the past year is strongly associated with colorectal cancer test use and increases with increasing numbers of physician visits (2). Furthermore, men have more colonic adenomas than do women (10) and there is a belief that colorectal cancer is a man's disease. This belief, coupled with years of publicity focusing women's attention on breast rather than colon cancer, may have contributed to the slower uptake of colorectal cancer screening among women compared with men (11, 12).

Trends in colorectal cancer test use to date suggest that patterns of use by gender and test modality may be changing.

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Table 1. Colorectal cancer testing trends by gender

	Home FOBT within past year				Sigmoidoscopy within 5 y	
	Males		Females		Males	
	n	% (95% CI)	*n*	% (95% CI)	*n*	% (95% CI)
Totals	4,692	16.1 (14.8-17.5)	6,856	15.3 (14.3-16.5)	**4,622**	**7.6 (6.7-8.5)**
Race						
White	4,026	16.2 (14.8-17.7)	5,795	15.3 (14.1-16.5)	3,983	7.6 (6.7-8.6)
Black	530	18.1 (14.2-22.8)	881	15.1 (12.8-17.7)	506	7.6 (5.1-11.3)
Other	136	8.7 (4.6-15.8)	180	17.6 (10.8-27.2)	133	5.6 (2.6-11.4)
Hispanic or Latino						
Yes	514	12.3 (8.4-17.7)	777	10.1 (7.7-13.2)	504	4.0 (2.3-6.9)
No	4,178	16.4 (15.1-17.8)	6,079	15.7 (14.6-17.0)	**4,118**	**7.8 (6.9-8.8)**
Age (y)						
50-64	2,793	14.2 (12.6-15.9)	3,582	13.6 (12.3-15.0)	2,772	7.0 (6.0-8.2)
≥65	1,899	19.3 (17.2-21.5)	3,274	17.6 (16.1-19.3)	1,850	8.5 (7.2-10.1)
Education						
<High school	1,011	12.2 (10.0-15.0)	1,625	11.4 (9.7-13.5)	968	3.5 (2.4-5.1)
High school graduate	1,320	15.4 (13.2-17.9)	2,221	14.5 (12.8-16.5)	1,299	5.0 (3.8-6.5)
Some college	1,078	16.6 (14.3-19.2)	1,712	17.0 (14.8-19.4)	1,072	8.0 (6.5-10.0)
College graduate	1,238	19.2 (16.6-22.1)	1,220	19.3 (16.8-22.0)	1,235	12.3 (10.3-14.6)
Annual household income*						
<$20,000	1,117	13.9 (11.5-16.6)	2,491	12.2 (10.7-13.9)	1,084	3.3 (2.3-4.9)
$20,000-34,999	1,094	14.3 (11.9-17.0)	1,613	15.0 (13.1-17.2)	1,073	5.6 (3.9-8.0)
$35,000-54,999	933	17.7 (14.9-20.9)	1,144	16.8 (14.2-19.8)	925	7.5 (5.7-9.7)
$55,000-74,999	544	15.6 (12.0-19.9)	593	14.4 (11.2-18.3)	539	8.1 (5.6-11.7)
≥$75,000	1,004	18.1 (15.1-21.4)	1,015	19.0 (16.3-22.0)	1,001	11.6 (9.4-14.3)
Marital status						
Married	2,784	17.2 (15.7-18.9)	2,699	16.3 (14.8-18.0)	2,757	8.1 (7.0-9.3)
Unmarried	1,892	13.1 (11.3-15.1)	4,131	14.1 (12.9-15.5)	1,849	6.1 (4.9-7.4)
Health coverage						
None	396	4.1 (2.3-6.9)	535	5.3 (3.5-7.8)	385	1.6 (0.7-3.6)
Public	811	17.9 (15.0-21.2)	1,642	14.2 (12.1-16.5)	800	5.8 (3.9-8.5)
Private	3,475	16.9 (15.4-18.5)	4,662	16.7 (15.4-18.1)	3,428	8.4 (7.4-9.6)
Usual source of care						
Yes	4,233	17.3 (15.9-18.7)	6,451	15.9 (14.7-17.0)	**4,176**	**8.1 (7.2-9.1)**
No (ER included)	454	2.9 (1.5-5.5)	401	6.7 (4.1-10.6)	442	1.5 (0.6-3.3)
Seen or talked to a general doctor (men and women)						
Yes	3,584	19.1 (17.5-20.7)	5,611	16.8 (15.6-18.0)	**3,527**	**8.3 (7.4-9.4)**
No	1,108	5.8 (4.5-7.5)	1,240	8.7 (7.0-10.9)	1,094	4.9 (3.6-6.7)
No. physician visits in past year						
None	728	2.8 (1.5-5.2)	599	2.4 (1.4-4.0)	719	3.7 (2.4-5.8)
One	624	12.1 (9.5-15.4)	731	10.6 (8.5-13.1)	612	5.7 (3.9-8.1)
2-5	1,928	18.1 (16.0-20.3)	2,833	16.5 (15.0-18.3)	**1,892**	**8.9 (7.5-10.4)**
≥6	1,378	21.3 (18.8-24.1)	2,639	18.4 (16.6-20.3)	1,365	8.5 (6.9-10.4)
Mammogram within past 2 y						
Yes	0	NA	4,797	19.6 (18.2-21.1)	0	NA
No	0	NA	1,984	4.4 (3.4-5.6)	0	NA
Papanicolaou smear within past 3 y						
Yes	0	NA	4,683	18.4 (17.0-19.8)	0	NA
No	0	NA	2,048	8.4 (7.1-10.0)	0	NA
PSA within past year						
Yes	1,912	26.5 (24.1-29.0)	0	NA	1,883	11.8 (10.2-13.7)
No	2,630	8.0 (6.9-9.4)	0	NA	2,595	4.3 (3.6-5.3)
Smoking status						
Never	1,761	14.2 (12.2-16.5)	4,037	15.1 (13.7-16.6)	1,735	7.8 (6.4-9.5)
Former	1,990	18.6 (16.7-20.7)	1,787	18.6 (16.5-21.0)	1,964	8.2 (7.0-9.6)
Current	923	14.3 (11.9-17.2)	1,003	10.4 (8.2-13.1)	905	5.6 (4.1-7.5)

NOTE: Data are from NHIS 2003: counts, weighted percentages, and 95% confidence intervals. Respondents are men and women ages 50 years and older who have never been diagnosed with colorectal cancer. *n* denotes the actual number of valid NHIS 2003 respondents and % denotes the weighted percentage of respondents with a recent test. Subjects who received a proctoscopy in the past 5 years are excluded from analysis. Values in boldface indicate a significant difference between males and females.

Abbreviations: 95% CI, 95% confidence interval; ER, emergency room; NA, not applicable.

*Missing Incomes are imputed via The National Center for Health Statistics NHIS 2003 Imputed Family Income Files.

The purpose of this report is to examine (*a*) gender-specific correlates of colorectal cancer test use using recent national data from 2003 and (*b*) patterns of colorectal cancer screening by gender and test modality over time. We report national trends for colorectal cancer test use for any purpose and for screening.

Materials and Methods

We analyze data from the 1987, 1992, 1998, 2000, and 2003 National Health Interview Surveys (NHIS). The NHIS is the leading source of health information on the civilian, noninstitutionalized population in the United States (13). It is an in-person household survey that collects demographic and health information on an annual basis. The NHIS survey design oversamples Hispanics and African Americans to improve the precision of estimates for those populations (14, 15).

The NHIS includes questions on the use of FOBT and colorectal endoscopy, but the questions evolved over time to accommodate new technologies and research. The 2000 NHIS was the first time that questions specifically

Table 1. Colorectal cancer testing trends by gender (Cont'd)

		Colonoscopy within 10 y				Any recommended test			
Females		Males		Females		Males		Females	
n	% (95% CI)	*n*	% (95% CI)	*n*	% (95% CI)	*n*	% (95% CI)	*n*	% (95% CI)
6,773	**5.9 (5.2-6.6)**	4,618	32.2 (30.6-33.8)	6,760	29.8 (28.4-31.2)	**4,592**	**46.5 (44.9-48.2)**	**6,710**	**43.1 (41.6-44.6)**
5,719	6.1 (5.4-7.0)	3,980	33.1 (31.4-34.8)	5,711	30.6 (29.1-32.1)	3,954	**47.5 (45.8-49.3)**	**5,674**	**44.1 (42.5-45.8)**
881	4.1 (2.9-5.8)	505	27.3 (22.6-32.5)	876	25.7 (22.8-28.9)	505	42.8 (37.2-48.5)	865	37.5 (34.2-40.9)
173	3.7 (1.6-8.6)	133	21.1 (14.4-29.8)	173	18.2 (12.8-25.3)	133	28.9 (21.3-37.9)	171	32.1 (23.9-41.4)
760	3.1 (1.9-4.9)	503	21.1 (16.9-26.1)	759	22.3 (19.1-25.9)	497	30.4 (25.3-36.0)	758	31.4 (27.7-35.2)
6,013	**6.1 (5.4-6.9)**	4,115	33.0 (31.3-34.7)	6,001	30.3 (28.9-31.8)	**4,095**	**47.7 (46.0-49.5)**	**5,952**	**44.0 (42.4-45.6)**
3,555	5.4 (4.5-6.4)	2,770	27.8 (25.8-29.9)	3,551	26.7 (24.9-28.5)	2,754	41.0 (38.8-43.2)	3,536	39.0 (37.1-41.0)
3,218	6.5 (5.6-7.6)	**1,848**	**39.5 (37.1-41.9)**	**3,209**	**33.7 (31.8-35.8)**	**1,838**	**55.8 (53.2-58.3)**	**3,174**	**48.5 (46.3-50.7)**
1,583	2.6 (1.8-3.8)	965	21.2 (18.3-24.4)	1,579	24.9 (22.3-27.7)	964	31.8 (28.5-35.4)	1,571	34.2 (31.3-37.2)
2,199	5.3 (4.2-6.6)	1,294	33.8 (30.8-36.8)	2,197	28.9 (26.7-31.2)	1,291	45.2 (42.1-48.3)	2,169	42.0 (39.6-44.4)
1,704	6.9 (5.5-8.6)	1,074	33.7 (30.7-36.9)	1,701	31.2 (28.6-33.9)	1,065	49.1 (45.6-52.5)	1,696	45.4 (42.6-48.2)
1,211	9.0 (7.1-11.3)	1,237	36.7 (33.6-39.9)	1,208	35.5 (32.5-38.6)	1,229	55.5 (52.3-58.7)	1,205	52.6 (49.3-55.8)
2,441	4.0 (3.1-5.0)	1,081	27.0 (24.1-30.3)	2,433	25.8 (23.8-27.9)	1,077	38.6 (35.5-41.9)	2,410	36.6 (34.4-38.8)
1,591	5.6 (4.2-7.3)	1,071	32.0 (28.4-35.9)	1,588	30.5 (27.6-33.7)	1,066	43.8 (40.2-47.5)	1,579	42.8 (39.3-46.3)
1,143	5.9 (4.4-7.8)	926	33.2 (29.7-36.8)	1,143	31.7 (28.4-35.2)	917	47.8 (44.2-51.6)	1,132	46.5 (42.9-50.1)
588	7.4 (5.3-10.3)	539	34.0 (29.3-38.9)	586	31.1 (25.8-37.1)	537	48.1 (43.1-53.1)	587	44.7 (39.4-50.2)
1,010	7.8 (6.1-10.0)	1,000	34.0 (30.6-37.7)	1,010	31.6 (27.8-35.6)	994	52.1 (48.3-55.9)	1,003	48.2 (44.0-52.3)
2,693	6.6 (5.6-7.8)	**2,757**	**34.8 (32.8-36.9)**	**2,691**	**30.2 (28.3-32.1)**	**2,744**	**49.7 (47.6-51.7)**	**2,676**	**44.5 (42.4-46.7)**
4,050	4.9 (4.2-5.7)	**1,845**	**24.9 (22.6-27.3)**	**4,039**	**29.4 (27.8-31.0)**	1,832	37.8 (35.2-40.6)	4,007	41.4 (39.7-43.2)
527	1.6 (0.7-3.4)	383	13.4 (9.5-18.6)	528	10.9 (8.2-14.4)	383	17.2 (13.1-22.4)	525	16.6 (13.3-20.5)
1,601	4.1 (3.1-5.5)	799	30.0 (26.6-33.5)	1,594	25.4 (22.8-28.3)	**786**	**45.1 (41.0-49.3)**	**1,577**	**37.6 (34.6-40.8)**
4,627	6.8 (5.9-7.7)	3,427	34.3 (32.4-36.3)	4,620	32.8 (31.2-34.5)	3,414	49.5 (47.6-51.5)	4,590	47.3 (45.5-49.1)
6,376	**6.1 (5.4-6.9)**	4,173	**34.1 (32.5-35.9)**	6,364	**30.9 (29.5-32.3)**	**4,148**	**49.5 (47.8-51.3)**	**6,314**	**44.7 (43.2-46.3)**
393	2.4 (1.1-5.0)	441	10.1 (7.3-13.9)	392	10.1 (7.3-13.9)	439	12.5 (9.4-16.5)	392	15.5 (11.8-20.3)
5,544	**6.3 (5.5-7.2)**	**3,523**	**36.6 (34.7-38.5)**	**5,532**	**32.9 (31.4-34.4)**	**3,505**	**53.0 (51.0-55.0)**	**5,489**	**47.2 (45.6-48.8)**
1,225	4.0 (3.0-5.4)	1,094	17.0 (14.6-19.8)	1,224	15.4 (13.2-17.8)	1,087	24.2 (21.4-27.2)	1,217	24.2 (21.3-27.3)
594	1.6 (0.8-3.2)	719	11.2 (8.6-14.3)	594	7.4 (5.3-10.2)	714	16.4 (13.2-20.2)	591	10.0 (7.7-13.0)
726	4.4 (3.1-6.1)	613	22.0 (18.6-25.8)	724	18.5 (15.4-22.0)	610	32.0 (28.1-36.2)	720	30.0 (26.4-33.8)
2,790	**6.0 (4.9-7.3)**	**1,891**	**37.1 (34.5-39.7)**	**2,787**	**29.1 (27.2-31.2)**	**1,892**	**53.1 (50.5-55.8)**	**2,770**	**43.7 (41.7-45.7)**
2,611	7.1 (6.0-8.4)	1,361	40.1 (37.4-42.9)	2,603	39.0 (36.9-41.2)	1,343	58.5 (55.5-61.5)	2,579	54.0 (51.5-56.4)
4,739	7.3 (6.4-8.3)	0	NA	4,736	35.8 (34.2-37.4)	0	NA	4,714	52.4 (50.7-54.1)
1,964	2.2 (1.5-3.1)	0	NA	1,957	14.2 (12.5-16.1)	0	NA	1,937	18.8 (16.9-20.9)
4,633	6.9 (6.0-7.8)	0	NA	4,629	33.7 (32.0-35.3)	0	NA	4,607	49.2 (47.5-50.9)
2,019	3.5 (2.5-4.8)	0	NA	2,013	20.3 (18.3-22.5)	0	NA	1,995	28.3 (25.9-30.8)
0	NA	1,885	45.4 (42.9-48.0)	0	NA	1,885	66.7 (64.2-69.2)	0	NA
0	NA	2,590	21.8 (20.0-23.7)	0	NA	2,572	30.6 (28.6-32.7)	0	NA
3,991	6.2 (5.4-7.2)	1,732	29.1 (26.6-31.8)	3,980	27.9 (26.3-29.6)	1,719	43.7 (41.0-46.4)	3,950	41.5 (39.8-43.2)
1,766	6.7 (5.4-8.3)	1,963	39.4 (36.8-42.1)	1,763	37.2 (34.5-40.1)	1,952	53.9 (51.4-56.4)	1,754	52.4 (49.4-55.4)
991	3.0 (2.0-4.4)	905	21.7 (18.8-24.9)	992	23.7 (20.8-27.0)	904	35.3 (31.8-39.0)	982	33.0 (29.5-36.6)

distinguished home from office FOBT and that questions distinguished among endoscopic tests (sigmoidoscopy, colonoscopy, and proctoscopy). Test descriptions were read to all eligible respondents for the first time in the 2003 NHIS.

Our sample consists of men and women age ≥50 years, reflecting the recommended starting age for colorectal cancer screening among persons at average risk. Because patterns in colorectal cancer test use over time were similar when stratified by age (50-64 and 65+), we display trends for both age groups combined. We report recent test use at intervals in compliance with published guidelines (1). Respondents who said that they had the test for follow-up or for a specific problem were classified as not having a recent test for screening purposes.

Results

Table 1 shows recent use of home FOBT, sigmoidoscopy, colonoscopy, and any recommended colorectal cancer test for men and women by selected sociodemographic variables. In 2003, both men and women reported higher rates of recent colonoscopy use (32.2% and 29.8%, respectively) than use of FOBT or sigmoidoscopy. There were no significant differences in the prevalence of FOBT by gender. Uptake of endoscopic tests was fairly comparable between men and women, with a few exceptions. Men with a usual source of health care, who had seen or talked to a general doctor, and who had two to five visits to the doctor in the past year reported higher use of sigmoidoscopy and colonoscopy than their female counterparts. Recent use of sigmoidoscopy was significantly greater

for men overall (7.6% for men versus 5.9% for women) and for non-Hispanic men (7.8% for men versus 6.1% for women). Men ages 65 years and older reported greater use of colonoscopy than women the same age (39.5% versus 33.7%). Having any recent colorectal cancer tests was significantly different for men and women overall (46.5% versus 43.1%) and by non-Hispanic ethnicity, age 65 years or older, married, public health insurance coverage, having a usual source of health care, seen or talked to a general doctor, and having two to five physician visits in the past year.

Men and women 65 years and older had higher rates of any recommended colorectal cancer test than persons 50 to 64 years of age. Use of colorectal cancer tests also was higher among men and women if they were not Hispanic or Latino, had higher educational attainment, were former smokers, had health insurance coverage, a usual source of care, or if they talked to a general doctor (Table 1). For example, 53% of men and 47% of women who saw or talked to a general doctor reported having any recommended colorectal cancer test compared with men and women who did not see or talk to a general doctor (only 24% of men and women in the latter group reported any recommended test). Likewise, women who reported recent mammography or Papanicolaou testing had higher rates of colorectal cancer test use than women who did not report having these other screening tests, as did men who reported having a recent prostate-specific antigen test. Former smokers of both genders (men, 53.9%; women, 52.4%) were more likely to report having any recommended colorectal cancer test than never (men, 43.7%; women, 41.5%) or current smokers (men, 35.3%; women, 33%). Colorectal cancer test use also increased for men and women as the number of visits to the doctor in the past year increased.

Figure 1 displays trends in recent use of colorectal cancer tests from 1987 to 2003 for women and men. The broken lines between 1998 and 2000 represent changes in the survey questions that were redesigned to more accurately distinguish between recommended screening tests. As can be seen, colorectal cancer testing rates have increased since 2000 for both women and men, and this increase is largely driven by a steep increase in colonoscopy use. Recent use of sigmoidoscopy has declined since 2000. Likewise, rates of home FOBT use among women (not shown in figure) declined from 17.5% in 2000 to 15.4% in 2003. Among men, rates of home FOBT in the past year were similar in 2000 and 2003 (16.6% and 16.3%, respectively).

We also examined trends in the proportion of colorectal cancer test use that could be attributed to uptake of tests for screening purposes. Figure 2 displays colorectal cancer test use for any reason as well as for screening specifically. By 2003, for men and women, almost all (e.g., 90%) home FOBT was done for screening purposes. Not surprisingly, a smaller percentage of all recent endoscopies were done specifically for screening, although the proportion of endoscopies being done for screening purposes seems to be rising in both men and women. In 1998, 68% of men and 54% of women reported that their recent endoscopy was for screening purposes. By 2000, the proportion of endoscopies done for screening rose to 74% in men and 68% in women.

Discussion

Our analysis of NHIS data suggests that 2000 may be the beginning of an increase in colorectal cancer screening similar to the increase in mammography observed between 1987 and 1992. Increases in test use are similar for men and women, although higher rates of sigmoidoscopy and colonoscopy in men who report having a usual source of health care, having seen or talked to a general doctor, and who report two to five doctor visits in the past year might suggest differential referral or acceptance of these tests by gender.

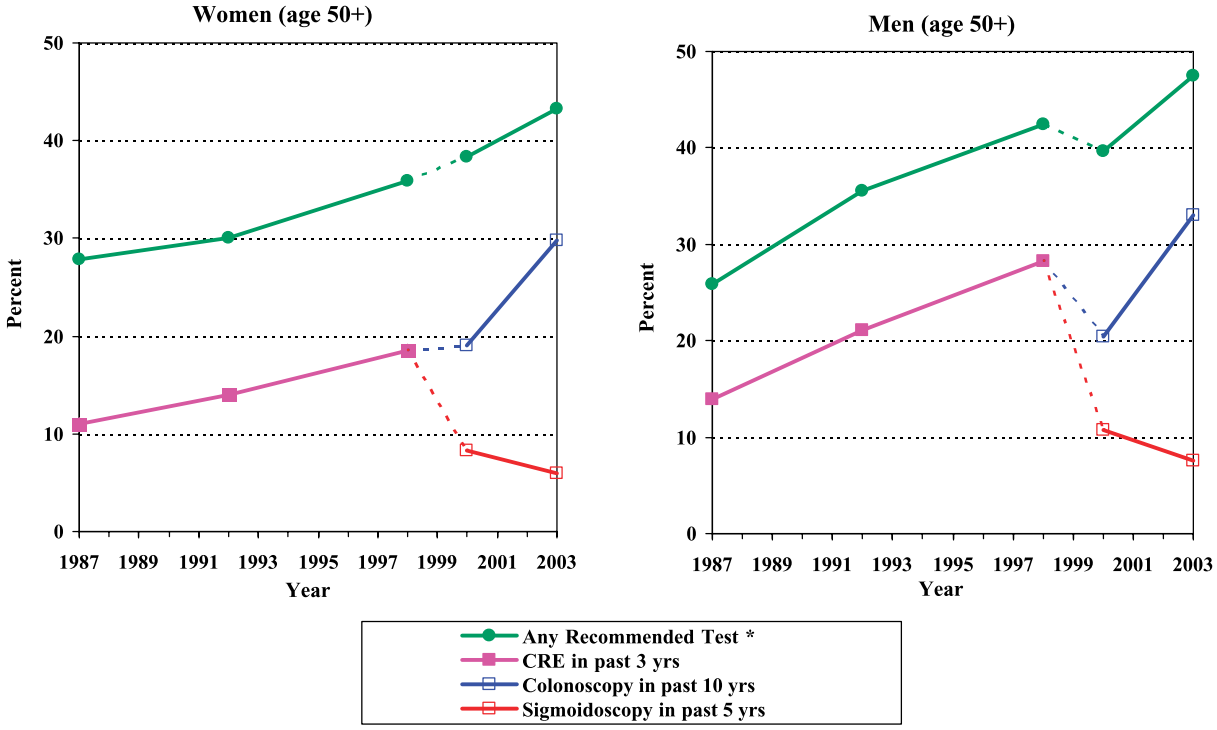

Figure 1. Recent use of colorectal cancer tests: 1987, 1992, 1998, 2000, and 2003. Percentages are standardized to the 2000 projected U.S. population by 5-year age groups. The relevant survey questions were redesigned after 1998; *broken lines* represent these changes. *, 1998 and before includes home or office FOBT, and colonoscopy, protoscopy, and sigmoidoscopy because we cannot adequately distinguish between tests during these years. Post 1998 includes home FOBT and sigmoidoscopy and colonoscopy. Source: NHIS.

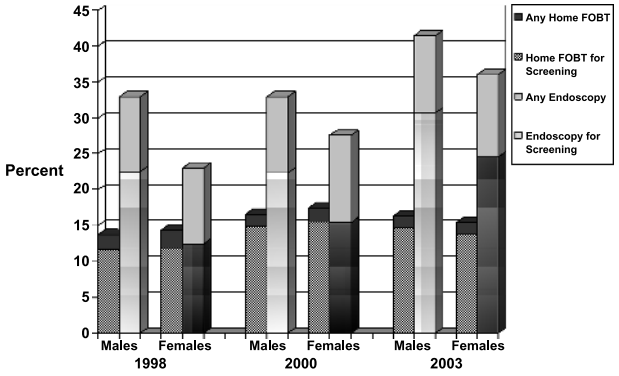

Figure 2. Recent colorectal cancer test use for any reason and for screening purposes. Respondents are age 50+ years. All percentages are standardized to the 2000 projected U.S. population by 5-year age groups. FOBT includes tests within the past year. Recent endoscopy includes tests within the past 5 years (also includes colonoscopies in the past 10 years for 2000 and 2003). Source: NHIS.

With the exception of age, correlates of colorectal cancer tests are similar to those for use of Papanicolaou tests and mammograms.

Increased use of colonoscopy is driving the increase in colorectal cancer testing. The extension of Medicare coverage for screening colonoscopy to average-risk beneficiaries in 2000 has likely contributed to this increase and is supported by our data. Test use rates among men and women ages 65 years and older are significantly higher than for those ages 50 to 64 years. Uptake of colonoscopy has also been influenced by media attention, professional endorsement of colonoscopy, and reimbursement. Katie Couric's televised colonoscopy on the *Today Show* in March 2000 was associated with a temporal increase in use of that test (16). The American College of Gastroenterology recommendation in 2000 of colonoscopy as the preferred colorectal cancer screening test for average-risk patients (17) and the greater profitability of colonoscopy compared with sigmoidoscopy also are probable contributors to the surge in colonoscopy. The current average Medicare reimbursement for both facility and professional fees is over thrice higher for screening colonoscopy than for screening sigmoidoscopy.[3] Low-profit margins make it difficult for most primary care physicians to incorporate sigmoidoscopy in practice (18) and many consequently refer their patients for colorectal endoscopy (19).

The menu of colorectal cancer screening tests allows for flexibility, but can render decisions about recommending or choosing a particular test difficult. Each test has tradeoffs in terms of efficacy, complications, discomfort, frequency, time, and cost. Which test is best is a matter of personal preference that should be considered when recommendations for screening are made (20). It is not possible for us to assess with these data whether the increasing trend in colonoscopy use and the concurrent decline in sigmoidoscopy and FOBT reflect patient or provider preferences.

Our study is limited by the fact that NHIS data are cross-sectional and limited to self-report of selected individual correlates of colorectal test use. Self-reports of screening could lead to overestimates of adherence (21). We are unable to explore the influence of other potentially important correlates of screening, such as provider characteristics and practices, patient-provider communication, health plan policies regarding colorectal cancer tests, and geographic capacity for screening. Furthermore, the redesign of relevant survey questions to ask about endoscopic tests separately after 1998 may exaggerate the rate at which sigmoidoscopy declined and colonoscopy rose since 1998. Nevertheless, the recent national data do indicate that prevalence of colorectal cancer test use is higher than in previous years and that recent colonoscopy accounts for most of colorectal test use.

That the increase in colorectal cancer test use is almost exclusively driven by colonoscopy has implications for public health practice in the United States. Colonoscopy is an expensive, invasive, relatively time-consuming test that currently must be done by a physician. Even assuming that capacity exists to perform screening colonoscopy for every age-eligible person at recommended frequency (18, 22), promotion of colonoscopy as the ''preferred'' colorectal cancer screening test may widen socioeconomic disparities. Our data support previous findings that there are disparities in the use of screening by educational attainment, household income, health insurance coverage, and having a usual source of health care (2, 23). These barriers to screening could be particularly difficult to overcome if colonoscopy becomes the preferred colorectal cancer screening modality. Clinicians, health advocates, and policy-makers alike need to carefully consider the messages that are communicated to the public about colorectal cancer test options. Reliance on colonoscopy alone may be insufficient for high participation in colorectal cancer screening at a population level, which will be required to effectively reduce morbidity and mortality from colorectal cancer.

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