

## Short Communication

# Trends in Colorectal Cancer Screening Utilization among Ethnic Groups in California: Are We Closing the Gap?

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### Abstract

**Background:** Given the low prevalence of and racial/ethnic disparities in colorectal cancer screening, it is important to monitor whether prevalence and disparities are increasing or decreasing over time.

**Methods:** We estimated the prevalence of colorectal cancer screening by year (2001, 2003, and 2005), modality (endoscopy, fecal occult blood test, either), and recency (ever had, up-to-date) for the California population as a whole, major racial/ethnic groups (White, Black, Latino, Asian), and selected Asian subgroups (Chinese, Filipino, Japanese, Korean, Vietnamese) using data from the California Health Interview Survey. All prevalence estimates were age- and gender-standardized.

**Results:** From 2001 to 2005, prevalence of up-to-date screening increased significantly among Whites and

Latinos but not among Blacks and Asian Americans. Screening prevalence varied substantially among Asian subgroups, with Korean, Filipino, and Vietnamese Americans having the lowest prevalence. Korean Americans were the only group in the analysis with a significant decline in screening prevalence from 2001 to 2005. The gap between the highest and the lowest up-to-date screening prevalence using any screening modality, exhibited by Japanese and Korean Americans, increased from 18% in 2001 to 30% in 2005.

**Conclusions:** Findings suggest that we need to intensify efforts to increase colorectal cancer screening, especially among Korean Americans but also among Filipinos, Vietnamese, and Latinos. (Cancer Epidemiol Biomarkers Prev 2009;18(3):752–9)

### Introduction

Colorectal cancer is the second leading cause of cancer deaths in the United States (1). According to the U.S. Preventive Services Task Force, routine screening of all men and women 50 years and older could reduce colorectal cancer deaths by 15% to 59% (2, 3). Colorectal cancer screening is unique in that two different types of screening tests are recommended: fecal occult blood test (FOBT), a take-home test in which the patient applies small amounts of stool onto a card and returns the card to the provider for analysis, or endoscopic exams (colonoscopy and sigmoidoscopy), which are invasive, time-consuming procedures that must be done by a health professional. Colonoscopy is becoming the test of choice in the general population and in minority groups (4, 5), although primary screening through FOBT would be much cheaper on a population basis (6).

Despite the effectiveness of screening in decreasing both prevalence and incidence of colorectal cancer (by removing precancerous polyps), screening utilization is low. In 2005, only 56% of the population in California had received colorectal cancer screening according to the guidelines (7). Disparities in colorectal cancer screening prevalence exist, with nonwhite persons less likely to be screened than whites, both nationwide (4, 8, 9) and in California (5, 10).

Given the low prevalence and disparities in colorectal cancer screening, it is important to monitor trends in screening utilization to determine whether prevalence and disparities are increasing or decreasing over time. However, few studies have examined trends in colorectal cancer screening by ethnic group (11–13). To address this need, we compare trends in colorectal cancer screening from 2001 to 2005 by ethnic group using data from the California Health Interview Survey (CHIS). California data are especially suitable for such comparisons because of the state's ethnically diverse population (43% White, 36% Latino, 6% African American, 12% Asian American and Pacific Islander; ref. 14). Our analyses estimate and compare trends for Whites, Latinos, African Americans and Asians, with Asians further disaggregated into subgroups.

In addition to receipt of any colorectal cancer screening, our analyses distinguish type of screening test received, i.e., endoscopy versus FOBT. These tests require very different resources (gastroenterologist or

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**Table 1. Estimated age- and gender-standardized proportions of California residents age 50 y and older who have ever received colorectal cancer screening\***

Ever screened by endoscopy or FOBT					
Ethnic group	2001	2003	2005	Change, 2001 to 2005	<i>P</i> , difference between 2001 and 2005
All	69%	70%	73%	4%	<0.001
White (W)	74%	75%	78%	4%	<0.001
Black (B)	71%	70%	76%	5%	0.06
Asian (A)	58%	59%	62%	4%	0.07
Latino (L)	49%	55%	60%	11%	<0.001
<i>P</i> , comparisons among groups	<i>P</i> < 0.001: WA, WL, BA, BL, AL	<i>P</i> < 0.001: WA, WL, BA, BL	<i>P</i> < 0.001: WA, WL, BA, BL		
Asian subgroups					
Japanese (J)	71%	72%	77%	6%	0.29
Chinese (C)	59%	64%	64%	5%	0.20
Filipino (F)	56%	54%	66%	10%	0.07
Vietnamese (V)	53%	63%	60%	7%	0.18
Korean (K)	49%	43%	33%	-16%	0.002
<i>P</i> , comparisons among groups	<i>P</i> < 0.001: JV, JK <i>P</i> < 0.01: JF <i>P</i> < 0.05: JC, CK	<i>P</i> < 0.001: JK, CK <i>P</i> < 0.01: JF, VK	<i>P</i> < 0.001: JK, CK, FK, VK <i>P</i> < 0.01: JC, JV <i>P</i> < 0.05: JF		
Ever screened by endoscopy					
	2001	2003	2005	Change, 2001 to 2005	<i>P</i> , difference between 2001 and 2005
All	52%	53%	60%	8%	<0.001
White (W)	56%	58%	65%	9%	<0.001
Black (B)	55%	55%	59%	4%	0.19
Asian (A)	42%	44%	52%	10%	<0.001
Latino (L)	37%	38%	47%	10%	<0.001
<i>P</i> , comparisons among groups	<i>P</i> < 0.001: WA, WL, BA, BL	<i>P</i> < 0.001: WA, WL, BA, BL <i>P</i> < 0.01: AL	<i>P</i> < 0.001: WA, WL, BL <i>P</i> < 0.05: WB, BA		
Asian subgroups					
Japanese (J)	57%	55%	67%	10%	0.09
Chinese (C)	43%	47%	55%	12%	0.003
Filipino (F)	35%	41%	50%	15%	0.01
Vietnamese (V)	36%	46%	50%	14%	0.02
Korean (K)	37%	33%	30%	-7%	0.18
<i>P</i> , comparisons among groups	<i>P</i> < 0.001: JF, JV, JK <i>P</i> < 0.01: JC	<i>P</i> < 0.001: JK <i>P</i> < 0.01: JF, CK	<i>P</i> < 0.001: JK, CK <i>P</i> < 0.01: JF, FK, VK <i>P</i> < 0.05: JC, JV		
Ever screened by FOBT					
	2001	2003	2005	Change, 2001 to 2005	<i>P</i> , difference between 2001 and 2005
All	50%	51%	50%	0%	0.29
White (W)	57%	56%	55%	-2%	0.01
Black (B)	53%	50%	56%	3%	0.29
Asian (A)	38%	38%	36%	-2%	0.22
Latino (L)	27%	37%	35%	8%	<0.001
<i>P</i> , comparisons among groups	<i>P</i> < 0.001: WA, WL, BA, BL, AL <i>P</i> < 0.05: WB	<i>P</i> < 0.001: WA, WL, BA, BL <i>P</i> < 0.01: WB	<i>P</i> < 0.001: WA, WL, BA, BL		

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**Table 1. Estimated age- and gender-standardized proportions of California residents age 50 y and older who have ever received colorectal cancer screening\* (Cont'd)**

Ethnic group	Ever screened by FOBT				
	2001	2003	2005	Change, 2001 to 2005	<i>P</i> , difference between 2001 and 2005
Asian subgroups					
Japanese (J)	51%	52%	48%	-3%	0.63
Chinese (C)	40%	38%	36%	-4%	0.26
Filipino (F)	38%	35%	44%	6%	0.28
Vietnamese (V)	29%	44%	29%	0%	0.97
Korean (K)	24%	21%	4%	-20%	<0.001
<i>P</i> , comparisons among groups	<i>P</i> < 0.001: JV, JK <i>P</i> < 0.01: CK, FK <i>P</i> < 0.05: JF, CV	<i>P</i> < 0.001: JK, CK, VK <i>P</i> < 0.05: JC, JF, FK	<i>P</i> < 0.001: JK, CK, FK, VK <i>P</i> < 0.01: JV <i>P</i> < 0.05: JC, FV		
	Sample sizes				
	2001	2003	2005		
All	23,866	19,111	21,692		
White	18,355	14,236	16,912		
Black	1,094	1,174	913		
Asian (all)	1,572	1,418	1,586		
Latino	1,881	1,574	1,537		
Asian subgroups*					
Japanese	214	195	210		
Chinese	388	503	541		
Filipino	276	248	229		
Vietnamese	310	175	224		
Korean	250	177	248		

NOTE: Analyses were conducted using California Health Interview Survey data with survey replicate weights and survey data procedures for proportion estimation. *P* values are from Wald tests of hypotheses of equality of two proportions.

\*Sample sizes for Asian subgroups do not sum to the Asian total because the Asian category includes smaller Asian subgroups not listed separately.

trained health professional versus a simple lab test). Thus, it is important to examine trends separately for these screening modalities to estimate future demands on the health care system.

## Materials and Methods

The CHIS, a telephone survey conducted biennially since 2001, is one of the largest health surveys in the United States (15). Each biennial survey includes over 40,000 households and is designed to provide population-based statewide estimates of health indicators for all major ethnic groups as well as several Asian ethnic groups. The CHIS employs a multistage sampling design in which households within geographic strata are selected through random-digit dialing. Supplements are used to achieve target sample sizes of certain ethnic groups, including Vietnamese and Korean respondents. Each biennial sample is cross-sectional; respondents are not followed longitudinally. Interviews are conducted in English, Spanish, Cantonese, Mandarin, Korean, and Vietnamese. The overall response rates for adults were 37.7%, 33.5%, and 26.9% in 2001, 2003, and 2005, respectively; however, response rates for older adults were substantially higher (16-18). The response rates are comparable with other random digit dialing surveys (19). The demographic

similarity between the CHIS sample and U.S. Census data for California and comparability of health indicator estimates derived from the CHIS and from other data sources suggest that the CHIS samples are representative and provide reliable statewide estimates (20).

We merged data from the 2001, 2003, and 2005 surveys and created an analysis dataset consisting of adults 50 y of age and older with no history of colorectal cancer. We defined "ever screened by FOBT" as an affirmative response to "Have you ever had a blood stool test using a home test kit?" Respondents who responded affirmatively were also asked how long ago their test was:  $\leq 1$ ,  $>1$  to 2,  $>2$  to 3,  $>3$  to 5, or  $>5$  y ago. We defined "up-to-date with FOBT" as FOBT  $\leq 1$  y ago. We defined "ever screened by endoscopy" as an affirmative response to "Have you ever had a sigmoidoscopy or colonoscopy?" In 2001 and 2003, this question also included proctoscopy. In 2005 only, respondents were asked whether the exam was a sigmoidoscopy or colonoscopy. Respondents with a past exam were asked how long ago their most recent exam was:  $\leq 1$ ,  $>1$  to 2,  $>2$  to 3,  $>3$  to 5,  $>5$  to 10, or  $>10$  y ago. Due to the inability to identify type of exam and time frame consistently across all surveys, we defined "up-to-date with endoscopy" as any endoscopic exam during the past 5 y. "Up-to-date by endoscopy or FOBT" was defined as FOBT  $\leq 1$  y ago and/or any endoscopic procedure during the past 5 y. Because the reason for

**Table 2. Estimated age- and gender-standardized proportions of California residents age 50 y and older who have received up-to-date colorectal cancer screening\***

Up-to-date screening, by endoscopy or FOBT					
Ethnic group	2001	2003	2005	Change, 2001 to 2005	<i>P</i> , difference between 2001 and 2005
All	53%	52%	56%	3%	<0.001
White (W)	56%	55%	59%	3%	<0.001
Black (B)	56%	55%	57%	1%	0.84
Asian (A)	46%	45%	49%	3%	0.12
Latino (L)	40%	41%	47%	7%	0.003
<i>P</i> , comparisons among groups	<i>P</i> < 0.001: WA, WL, BA, BL <i>P</i> < 0.01: AL	<i>P</i> < 0.001: WA, WL, BA, BL	<i>P</i> < 0.001: WA, WL, BL <i>P</i> < 0.01: BA		
Asian subgroups					
Japanese (J)	57%	55%	59%	2%	0.78
Chinese (C)	47%	51%	53%	6%	0.18
Filipino (F)	43%	38%	46%	3%	0.56
Vietnamese (V)	42%	53%	49%	7%	0.22
Korean (K)	39%	34%	29%	-10%	0.04
<i>P</i> , comparisons among groups	<i>P</i> < 0.01: JV, JK <i>P</i> < 0.05: JF	<i>P</i> < 0.001: JK, CK <i>P</i> < 0.01: JF, VK <i>P</i> < 0.05: CF, FV	<i>P</i> < 0.001: JK, CK, FK, VK <i>P</i> < 0.05: JF		
Up-to-date screening with endoscopy					
	2001	2003	2005	Change, 2001 to 2005	<i>P</i> , difference between 2001 and 2005
All	43%	44%	48%	5%	<0.001
White (W)	45%	47%	52%	7%	<0.001
Black (B)	48%	45%	50%	2%	0.35
Asian (A)	36%	38%	42%	6%	0.005
Latino (L)	33%	31%	39%	6%	0.005
<i>P</i> , comparisons among groups	<i>P</i> < 0.001: WA, WL, BA, BL	<i>P</i> < 0.001: WA, WL, BL <i>P</i> < 0.01: BA, AL	<i>P</i> < 0.001: WA, WL, BL <i>P</i> < 0.01: BA		
Asian subgroups					
Japanese (J)	49%	49%	53%	4%	0.50
Chinese (C)	38%	42%	46%	8%	0.05
Filipino (F)	31%	32%	37%	6%	0.24
Vietnamese (V)	32%	42%	43%	10%	0.08
Korean (K)	30%	31%	28%	-2%	0.64
<i>P</i> , comparisons among groups	<i>P</i> < 0.01: JF, JV, JK <i>P</i> < 0.05: JC	<i>P</i> < 0.01: JF, JK <i>P</i> < 0.05: CK	<i>P</i> < 0.001: JK, CK <i>P</i> < 0.01: JF, VK		
Up-to-date screening with FOBT					
	2001	2003	2005	Change, 2001 to 2005	<i>P</i> , difference between 2001 and 2005
All	23%	19%	20%	-3%	<0.001
White (W)	25%	20%	21%	-5%	<0.001
Black (B)	24%	22%	20%	-4%	0.08
Asian (A)	19%	15%	16%	-3%	0.23
Latino (L)	14%	17%	17%	3%	0.07
<i>P</i> , comparisons among groups	<i>P</i> < 0.001: WA, WL, BL <i>P</i> < 0.01: BA, AL	<i>P</i> < 0.001: WA, BA <i>P</i> < 0.01: WL, BL	<i>P</i> < 0.01: WA <i>P</i> < 0.05: WL		

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**Table 2. Estimated age- and gender-standardized proportions of California residents age 50 y and older who have received up-to-date colorectal cancer screening\* (Cont'd)**

Ethnic group	Up-to-date screening with FOBT				
	2001	2003	2005	Change, 2001 to 2005	<i>P</i> , difference between 2001 and 2005
Asian subgroups					
Japanese (J)	25%	19%	19%	-6%	0.24
Chinese (C)	18%	17%	18%	0%	0.96
Filipino (F)	18%	11%	19%	1%	0.77
Vietnamese (V)	16%	17%	10%	-6%	0.10
Korean (K)	14%	7%	2%	-12%	<0.001
<i>P</i> , comparisons among groups	<i>P</i> < 0.05: J, JK	<i>P</i> < 0.01: JK, CK <i>P</i> < 0.05: VK	<i>P</i> < 0.001: JK, CK, FK <i>P</i> < 0.01: VK <i>P</i> < 0.05: CV, FV		

NOTE: \*Analyses were conducted using California Health Interview Survey data with survey replicate weights and survey data procedures for proportion estimation. *P* values are from Wald tests of hypotheses of equality of two proportions. Sample sizes are provided in Table 1.

FOBT/endoscopy was asked in 2001 and 2003 but not 2005, we estimated prevalence of colorectal cancer screening for any reason to maintain consistency across surveys.

We estimated screening prevalence by year (2001, 2003, and 2005) and modality (endoscopy, FOBT, either) for the California population as a whole, major ethnic groups (White, Black, Latino, Asian), and Asian subgroups with sufficient sample size (Chinese, Filipino, Japanese, Korean, Vietnamese). Prevalences were estimated using the CHIS-provided replicate weights and the survey proportion command in Intercooled Stata 9.1 (21). We estimated both crude prevalences and adjusted prevalences that standardized the prevalences in each ethnic group in each year to the age and gender distribution of the 2001 California population. We tested for differences in prevalence between 2001 and 2005 within each ethnic group, and among groups in each year, using Wald tests of hypotheses of equal proportions. These tests followed guidelines for hypothesis tests using multiple CHIS surveys (19).

## Results

The numbers of respondents included in the analyses are provided at the bottom of Table 1. Tables 1 and 2 display standardized prevalences of ever and up-to-date colorectal cancer screening, respectively, by year for each ethnic group. Crude prevalences were generally similar to the standardized prevalences; the largest differences were for the Latino and Vietnamese populations, which tended to have prevalences adjusted upward 1% to 3% due to the standardization (data not shown).

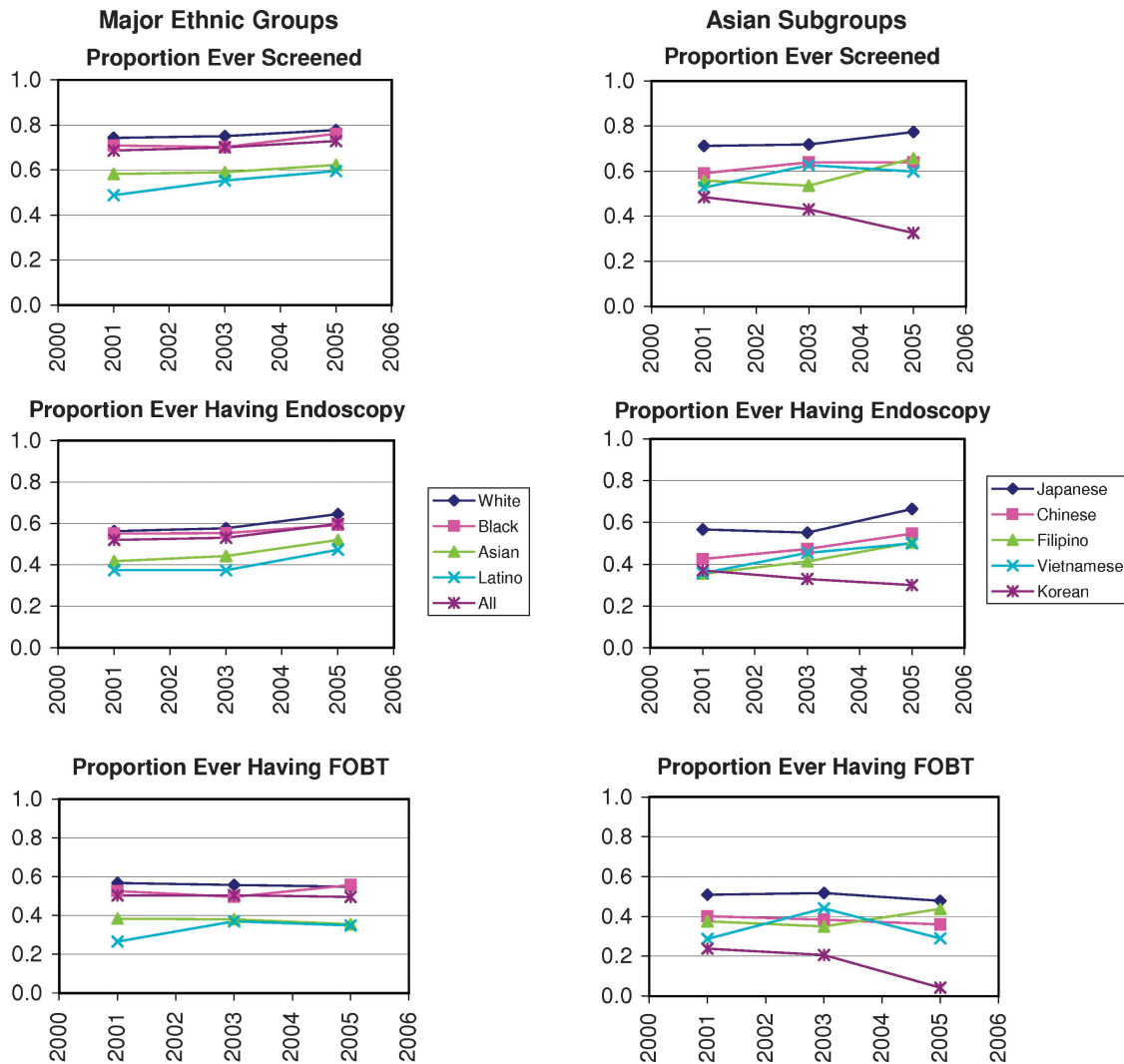
Table 1 provides prevalences of ever receiving colorectal cancer screening. These trends are also illustrated in Fig. 1. Prevalences of ever screened by FOBT or endoscopy were higher among Whites and Blacks than among Latinos and Asians (all Asian ethnicities combined) over all three surveys. Among major ethnic groups, the greatest disparity in 2001 was a difference of 25% [95% confidence interval (95% CI),

22-29%] between Latinos and Whites. Prevalences increased significantly from 2001 to 2005 in the state population overall and among Whites and Latinos. However, despite an 11% increase among Latinos, their rate was among the lowest for the major ethnic groups in 2005 and fell short of Whites by 18% (95% CI, 15-22%). Results for the Asian subgroups show even larger differences. Over all surveys, the Japanese had the highest prevalence whereas Koreans had the lowest prevalence (all *P* < 0.001). The difference in prevalence between these two groups increased from 22% (95% CI, 11-34%) in 2001 to 44% (95% CI, 34-55%) in 2005, attributable largely by a 16% decrease among Koreans from 2001 to 2005.

Between 2001 and 2005, prevalence of ever screened by endoscopy significantly increased in the state population overall and among Whites, Latinos, and Asians, as well as among Chinese, Filipino, and Vietnamese. There was no significant increase among Blacks, Japanese, or Koreans. Over all surveys, the highest prevalence of endoscopy was observed among Whites, followed by Blacks, Asians, and Latinos. Prevalence of endoscopy was significantly higher among Japanese Americans than among Korean and Filipino Americans in all three surveys.

Among major ethnic groups, Latinos had the lowest prevalence of ever screened by FOBT in 2001. This group had a significant increase of 8% over the 4-year period, and differences among these groups decreased from 2001 to 2005, with the largest difference in 2001, a difference of 30% (95% CI, 27-33%) between Whites and Latinos, decreasing to 20% in 2005 (95% CI, 17-23%). This decreasing gap reflected a significant decrease among Whites combined with a significant increase among Latinos. Among the Asian subgroups, the Japanese had the highest prevalence whereas Koreans had the lowest across all surveys. The difference in prevalence between these two groups increased from 27% (95% CI, 15-38%) in 2001 to 44% (95% CI, 35-52%) in 2005, due largely to a 20% drop in prevalence of FOBT receipt among Koreans from 2001 to 2005.

Trends were similar for up-to-date screening (Table 2). Prevalence of up-to-date screening by FOBT or endoscopy



**Figure 1.** Estimated age- and gender-standardized proportion of California residents age 50 y and older who have ever received colorectal cancer screening. Point estimates provided in Table 1.

increased in the population overall and among Whites and Latinos, and decreased among Korean Americans, who had low prevalence in all years and a 10% drop from 2001 to 2005. The gap between the highest and lowest up-to-date screening prevalence using any screening modality, exhibited by Japanese and Korean Americans, increased from 18% in 2001 to 30% in 2005. Prevalence of up-to-date endoscopy increased in most groups from 2001 to 2005, and prevalence of up-to-date FOBT showed declines or no increase. In 2005, lowest prevalences of being up-to-date with endoscopy were among Korean and Filipino Americans.

## Discussion

Our analysis indicates that the overall proportion of people who had ever been screened for colorectal cancer increased from 2001 to 2005 in California, with increases ranging from 4% among Whites to 11% among Latinos.

Although disparities in screening prevalence among the four major racial/ethnic groups decreased during this time period, the basic pattern remained, with Whites and African Americans having higher prevalence than Asian Americans and Latinos. Increases in colorectal cancer screening have also been observed in other analyses (12, 22, 23). Only one of these analyses provides colorectal cancer screening prevalence for the four major racial/ethnic groups and their findings are very similar to ours (23). Our findings are also consistent with the general trend of increasing utilization of colonoscopies and declining utilization of FOBT (11, 13, 23, 24); our analyses indicate, however, that Latinos had increased FOBT utilization.

Our analysis shows that combining Asian American groups masks disparities that exist between groups. Japanese Americans, many of whom have lived in the United States for several generations, had the highest screening prevalence of all Asian Americans and the highest prevalence of endoscopy. Their screening

prevalence was very similar to that of Whites, who generally had the highest prevalence. Korean Americans, on the other hand, had the lowest screening prevalence for endoscopy, FOBT, and the two combined, and were the only group in this analysis that had a significant decline in colorectal cancer screening. Korean Americans are among the more recent immigrant groups; 76% are foreign born and about 34% have no health insurance (25). These factors may explain their low colorectal cancer screening utilization (26, 27). During the same time period, prevalence of endoscopy significantly increased among Chinese, Filipino, and Vietnamese Americans, whereas their prevalences of FOBT receipt were not significantly changed. Thus, as among Whites, Blacks, and Latinos, increases in screening among Asian Americans were generally due to increased utilization of endoscopy. A recent analysis of colorectal cancer screening in Filipinos suggests that within ethnic subgroup, more educated and acculturated persons with higher income may tend to obtain endoscopies whereas more recent immigrants with lower levels of education and income tend to obtain FOBTs (28).

**Strengths and Limitations.** Our analysis used a population-based, ethnically diverse sample that included non-English-speaking Asian Americans, who are often excluded from national surveys. However, Japanese and Filipino Americans were only interviewed in English due to limited resources and the fact that >70% speak English very well (29). Overall, our results represent screening trends in California, but may not represent trends in other states. All data are based on self-report and may therefore be subject to social desirability and recall bias. Because of data limitations, some respondents who had had a colonoscopy 5 to 10 years ago may have been incorrectly classified as not up-to-date, resulting in an underestimate. Because the reason for last colorectal cancer test was not ascertained for all three surveys, our analysis included tests obtained for any reason, not routine screening exclusively. This may have overestimated routine screening prevalences.

## Conclusion

Our results show that disparities in colorectal cancer screening among racial/ethnic groups in California are persisting and in some cases increasing rather than decreasing. Screening trends varied substantially among Asian subgroups, with Korean, Filipino, and Vietnamese Americans having the lowest prevalence of up-to-date screening. Korean Americans were unique in being the only group in our analyses with screening prevalence that significantly declined between 2001 and 2005. This shows the importance of disaggregating Asian subgroups. During the same time period, up-to-date colorectal cancer screening increased significantly among Whites and Latinos. These trends suggest that we need to intensify efforts to increase colorectal cancer screening, especially among Korean Americans but also among Filipino and Vietnamese Americans and Latinos. Research suggests that screening programs that are culturally sensitive and that address beliefs and barriers pertaining to colorectal cancer

screening in these communities will be most effective. In conjunction with these efforts, we also need to establish programs that provide free or low-cost diagnostic follow-up and treatment for patients who have positive screening results and no health insurance coverage.

## Disclosure of Potential Conflicts of Interest

No potential conflicts of interest were disclosed.

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