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Surveillance of Colorectal Cancer Screening in New Mexico Hispanics and Non-Hispanic Whites

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Abstract

The incidence of colorectal cancer (CRC) among Hispanics in the state of New Mexico has increased in the past decade while that among whites has declined significantly. Using the 2006 New Mexico Behavioral Risk Factor Surveillance System (BRFSS) survey, we compared CRC screening among Hispanics and whites by gender to examine the influence of demographic, socioeconomic, preventive health, and clinical measures on the utilization of CRC screening. Although we found no ethnic differences in the prevalence of current breast, cervical and cancer screening, Hispanics were less likely to be current with CRC screening than whites. These differences were observed across a range of socioeconomic and other explanatory measures and in both genders. Hispanics also had a higher prevalence of CRC-related risk factors than whites, including inactivity, obesity, and diabetes, and ranked lower for most socioeconomic measures. Adjusting for healthcare coverage, education, and income in logistic regression models eliminated the Hispanic-white differences in CRC screening among men, and substantially reduced but did not eliminate screening differences among women. Innovative methods are needed to reach Hispanics to raise awareness of and participation in CRC screening. Because many CRC risk factors are potentially modifiable, appropriate cultural and linguistic interventions tailored to specific Hispanic subgroups and aimed at promoting CRC screening and reducing CRC risk factors may decrease ethnic disparities in CRC incidence.

Keywords

Behavioral risk factor surveillance system; Hispanics; Healthcare disparities; Colorectal cancer; Screening

Introduction

Colorectal cancer (CRC) is the third most commonly diagnosed cancer and the third leading cause of cancer death in the United States in both men and women. Nationally, colorectal cancer incidence and mortality rates have declined for men and women and for all racial/ethnic groups over the past decade [1]. However, in New Mexico, the incidence of CRC among Hispanics has continued to increase in the last decade while incidence among whites has declined significantly [2].

Reasons for the ethnic differences in CRC incidence are unclear. A number of explanations have been proposed based on national data related to screening uptake and risk factors. Screening is recommended for average-risk adults beginning at age 50. Fecal occult blood testing [FOBT] and lower endoscopy are proven to reduce CRC incidence and are highly recommended screening tests [3]. Though CRC screening rates have increased in the US, Hispanic men and women are less likely to comply with screening guidelines than whites at both the state and national levels [4–7]. Combined data from the 2004 and 2006 New Mexico Behavioral Risk Factor Surveillance System (BRFSS) surveys showed that 45.7 % of Hispanic respondents, and 57.6% of white respondents were currently screened for CRC based on having had either a FOBT in the previous year and/or a lower endoscopy within the previous ten years [3]. English-language proficiency and country of origin have also been shown to influence CRC screening uptake among Hispanics [8]. Hispanics also tend to have a higher prevalence of CRC risk factors than whites, including physical inactivity, overweight or obesity, and diabetes, though the prevalence of these factors vary among Hispanic subgroups [9]. Explaining the disparities in CRC incidence in New Mexico is difficult because to date little is known about differences in CRC screening patterns and CRC risk factors between Hispanics and whites.

We used data from the 2006 New Mexico Behavioral Risk Factor Surveillance System (BRFSS) survey to (a) compare the prevalence of CRC screening, and demographic, socio-economic, preventive health, and clinical measures in Hispanics and whites by gender, and (b) to examine the influence of these measures on the utilization of CRC screening.

Methods

BRFSS Data

Data for the current analysis were obtained from the 2006 BRFSS survey of 3303 New Mexico respondents 50 years of age and older [10]. The BRFSS is a nationwide, random-sample, telephone survey that has collected data on health-related behaviors, preventive health practices, and access to health care among the non-institutionalized, civilian US population age 18 years and older since 1994. The study participants were a population-based sample of respondents to the 2006 New Mexico BRFSS, a federally funded annual

survey implemented in collaboration with state health departments. Random-digit dialing methods were used to derive a probability sample of households with telephones to collect data on health-related behaviors and risk factors for respondents aged 18 years or older. Survey respondents who identified themselves as Hispanic or Latino were categorized as such regardless of race. In New Mexico, the predominant Hispanic subgroups are Mexican, Mexican- American and Spanish American, whose ancestors became US citizens following annexation in 1848.

Measures

Every two years, respondents aged 50 years and older are asked questions about CRC screening by fecal occult blood test (FOBT), or sigmoidoscopy/colonoscopy (lower endoscopy), and when these tests were last performed. To be consistent with previous BRFSS reports and screening guidelines, we define current CRC screening as having had an FOBT within the past year and/or lower endoscopy within the past 10 years [7].

The demographic measures collected in the BRFSS included age, marital and veteran status and the language in which the survey was administered, either Spanish or English. Socioeconomic measures include health care coverage, current employment status, annual household income, and high school-level education. Veteran status was only included as an indicator for health care coverage among men due to the low numbers of female veterans in the survey population. The clinical measures included perceived general health, self-reported diabetes, and self-reported height and weight (used to calculate body mass index (BMI)). Lifestyle measures included smoking, risk for heavy alcohol consumption, and physical activity. Preventive health measures include screening for breast, cervical, prostate, and colorectal cancer and annual influenza vaccination. Female respondents who reported having a Pap smear or mammogram in the past 12 months would be considered currently adhering to cervical and breast cancer screening guidelines. Male respondents who had a prostate-specific antigen (PSA) test in the past 24 months were considered current for prostate cancer screening.

Statistical Analysis

We report weighted population-based proportions with confidence intervals (CI) to describe the distribution of CRC screening and other measures (Table 1). *P* values for Chi square analyses are reported for prevalence estimates stratified by gender and comparing Hispanics to whites within the gender groups. Differences in CRC screening prevalence between Hispanics and whites, stratified by sex, and adjusted by individual survey measures are shown in Table 2. Differences within gender and ethnicity groups were evaluated by comparing confidence intervals. Table 3 shows the “risk” of Hispanics being current with CRC screening as compared to whites, stratified by sex, and adjusted for demographic, socioeconomic, clinical, life-style and preventive health factors. Odds ratios (OR) were estimated by multivariate logistic regression sequentially adjusted for groups of demographic, socioeconomic, clinical, lifestyle, and preventive measures, and all measures combined. Interactions between the individual study measures and Hispanic versus white ethnicity, and survey language were tested. The data were analyzed using SUDAAN 10.1 (RTI, Research Triangle Park, NC).

Results

Sample Characteristics

The 2006 New Mexico BRFSS data included 355 Hispanic men (mean age 61.5 years), 640 Hispanic women (mean age 62.4 years), 908 white men (mean age 63.7 years), and 1438 white women (mean age 65.2 years). Twenty percent Hispanic men and 15 % of Hispanic women were interviewed in Spanish. Compared to whites, Hispanics in this data set were younger, had less education and lower household income, were more likely to be smokers, less physically active, and perceive their general health to be fair or poor (Table 1). Regardless of gender, a larger proportion of Hispanic than white respondents reported being uninsured, having diabetes and a calculated BMI in the overweight to obese range, but a larger proportion of whites reported current for CRC screening. We noted no differences in CRC screening prevalence between men and women within the white and Hispanic groups based on overlapping confidence intervals. Hispanic men were more likely to have never been screened for prostate cancer or CRC than white men. Among those men who were current for CRC screening at the time of interview, screening by lower endoscopy was less common among Hispanics, but there were no ethnic difference in screening by FOBT. Hispanic women reported similar prevalence of current cervical and breast cancer screening as white women ($P > 0.05$), but lower prevalence of current CRC screening by either lower endoscopy or FOBT.

Current CRC Screening

When we examined current CRC screening adjusted for individual measures in men and women stratified by ethnicity (Table 2). The measures that were associated with being current for CRC across genders and ethnicities include older age, being married, retired, a non-smoker, an armed services veteran (males), and English speaker (Hispanics), being up-to-date with influenza vaccination and other cancer screening tests, and having a high school level education or greater. Several within ethnicity differences in CRC screening by gender are observed. White respondents, regardless of diabetic status, and Hispanic diabetics had similar prevalence of CRC screening, but the prevalence of CRC screening among Hispanic females who were non-diabetic was significantly lower. The proportion of CRC screening in men and white women increased with increasing BMI, but decreased at overweight and obese BMI among Hispanic women. Also, the difference in CRC screening between smokers and non smokers was larger among Hispanic women than white women.

Overall, the prevalence of CRC screening reported by Hispanic respondents was lower than the prevalence of CRC screening reported by white respondents who had the same characteristics. For example, approximately 47 % of Hispanics with health care coverage were up to date with CRC screening, compared to 60 % of whites with coverage. Male smokers were an exception. In this group, white men were less likely to be screened than Hispanic men.

Adjusted CRC Screening Rates

In logistic regression models adjusted only for age, Hispanic males were 31 % less likely to be currently screened for CRC (95% CI 0.51–0.94) than white males, and Hispanic

females were 45 % less likely (95% CI 0.44, 0.70) to have current screening than white females (Table 3). In subsequent models, adjusting for socioeconomic status, language preference, and preventive health factors reduced ethnic differences in CRC screening among males (95% CI included 1.00). Adjusting for socioeconomic status, Hispanic women were 27 % less likely (95% CI 0.56, 0.97) to be up-to-date for CRC screening as compared to white women. Hispanic women were less likely to be current in their CRC screening when compared to white women according to all the logistic regression models. Lower odds for current CRC screening persisted between Hispanic and white women even in the model that adjusted for all risk factor measures simultaneously.

Discussion

The 2006 New Mexico BRFSS data show that Hispanic men and women were less likely to be current with recommended colorectal cancer screening than white men and women. Further, Hispanics also had a higher prevalence of CRC-related risk factors than whites, including inactivity, obesity, and diabetes. Ethnic differences in CRC screening were consistently observed across a range of socioeconomic, demographic, clinical, and health behavior factors. However, adjusting for socioeconomic factors essentially eliminated screening differences between Hispanic and white men, and substantially reduced screening differences between Hispanic and white women.

Our findings are consistent with previous reports on screening uptake. Even though CRC screening rates have increased since the launch of intervention programs targeting Hispanics, the increase has been less in Hispanics than in whites [5–7, 11]. CRC screening rates among Hispanics living in the western US have been significantly lower than rates in whites [12]. Similar to national studies, we noted no within-ethnicity gender differences in CRC screening, and Hispanic women are less likely to be screened for CRC than for breast or cervical cancer [11, 13].

Numerous socioeconomic-related barriers to CRC screening have been reported by Hispanics. These barriers range from cost of screening, lack of health insurance coverage or a usual source of health care to difficulty obtaining transportation to screening facilities [14]. Two factors, lack of insurance and not having a usual source of care, consistently explain Hispanic-white disparities in guideline-recommended preventive care services and colorectal cancer screening [14, 15]. In our logistic regression models, adjusting for health insurance coverage, income, education, and employment status eliminated screening differences between men, but did not completely account for the lower prevalence of CRC screening in Hispanic women. Hispanic women were less likely than white women to have health care coverage, and significantly more likely to report an annual household incomes of less than \$25,000, having less than a high school level education, and being unemployed.

Given that socioeconomic status is associated with access to health care and with higher cancer screening rates, the overall prevalence of being up-to-date with cancer screening again highlights that other factors influence CRC screening among Hispanic women. We found that, regardless of ethnicity, men who were current for prostate cancer screening were also current for CRC screening. Even though Hispanic women were less to be current

with CRC screening than White women, we found no ethnic differences in current breast or cervical screening rates.

Beyond SES and access to CRC screening, patient knowledge, attitudes and cultural beliefs about colorectal cancer screening also influence screening. Reported barriers to CRC screening among minority groups include lack of understanding about cancer, screening, and medical terminology as well as concerns about death, and anxiety surrounding the possibility of finding cancer if tested [16]. Ogedegbe et al. [17] noted common barriers to cancer screening among Hispanic and African American women, including lack of cancer screening knowledge, patient's perception of good health or absence of symptoms, fear of pain from cancer test, and lack of a clinician recommendation. These barriers may be differentially influencing CRC screening versus other cancer screening tests for our population of Hispanic women.

Additional cultural factors, such as including country of origin and level of acculturation (increased use of English), may also impact the prevalence of CRC screening and many CRC-related risk factors. In the current BRFSS analysis, up-to-date CRC screening was less prevalent among Spanish- versus English-speaking Hispanics. Spanish-language preference, in addition to being an indicator for acculturation, is also related to health literacy and cultural beliefs about disease and prevention, which may influence CRC screening uptake [5, 8, 18]. However, the sample size of Spanish-speakers was too small to test for differences in CRC risk factors by language preference.

Data from national surveys also indicate a higher prevalence of physical inactivity, high BMI, smoking and diabetes in Hispanics compared to whites [19]. The National Cancer Institute estimates a 40 % increase in CRC incidence for alcohol consumption exceeding 45 grams/day, an 18 % increased risk associated with cigarette smoking, and a 45 % increase risk in women with a BMI of more than 29 [20]. A 30 % increase in CRC incidence was reported by Larsson et al. [21]. In contrast, regular physical activity was associated with a 45 % reduction in CRC incidence. For New Mexican Hispanics, the potential magnitude of excess CRC risk associated with these factors is substantial.

Differences in socioeconomic measures may also be differentially influencing these lifestyle and clinical measures. Several studies have demonstrated an association between CRC risk factors and income, education, and employment status, measures of which were all lower among Hispanics than among whites in our survey data. For example, these socioeconomic measures have been demonstrated to be positively associated with the intake of fruits and vegetables and physical activity, and a negatively association with cigarette smoking, drinking alcohol, and cancer [22–26]. An association between socioeconomic measures and obesity has also been reported, although the direction of the association differs by gender: men of high socioeconomic status (SES) are more likely to be over-weight than men of low SES, but women of high SES are less likely to be overweight than women of low SES [27]. Because risk factors generally affect disease development over the long term rather than the short term, the current risk factor data potentially reflect years of unhealthy life-styles among Hispanics which has important public health and policy implications for reducing the burden of colorectal cancer in this population.

There are several inherent limitations to drawing inference from BRFSS data. First, the BRFSS is a telephone survey, thus only households with landline telephones are represented, potentially creating a selection bias. Response bias is of concern. Responses are self-reported and not confirmed by medical records review. Because the BRFSS is a cross-sectional survey, we cannot conclude that the ethnic differences we observed in CRC screening and risk factors actually account for the differences in CRC incidence among Hispanics and whites. Second, the design does not allow us to evaluate ethnic differences in adherence with recommended CRC screening tests over time. Last, the BRFSS defines current as having completed a fecal blood test within the past one year and/or lower endoscopy within the past 10 years. However, the appropriate interval for flexible sigmoidoscopy is 5 years, thus the current analysis for New Mexico may overestimate up-to-date CRC screening [3]. A recent survey of primary care physicians in New Mexico, though, suggests that flexible sigmoidoscopy is infrequently offered to patients [27].

Much of the difference in CRC screening observed between Hispanics and white respondents is attributable to socioeconomic factors, which may also confound the association between critical risk factors and CRC. Socioeconomic indicators likely operate through multiple mechanisms that influence the risk of colorectal cancer, and not solely access to health care and screening tests [28]. Health reform will increase access for CRC screening (U.S. Preventive Health Services A rating), which will help overcome the socioeconomic barriers to access [3]. While overcoming these barriers is necessary, it will not be sufficient for achieving an increase in CRC screening. Efforts must also be made to overcome the cultural, linguistic and knowledge barriers, which also influence CRC screening. Results from a recent national survey indicate that health care providers were an extremely important information source for cancer screening [28]. In particular, women were more likely than men to report that health care providers were an extremely important source of CRC screening information. Physicians can also help patients understand the role of risk factors in CRC. Shike et al. [29] found that offering CRC screening to minority women at the time of mammography—without requiring a physician’s referral—was an effective way to increase screening. Innovative approaches are needed to reach Hispanics to raise the awareness of and participation in CRC screening. Because many CRC risk factors are potentially modifiable, cultural and linguistic appropriate interventions tailored to specific the Hispanic subgroups in New Mexico, which promote CRC screening and the reduction of CRC risk factors may decrease ethnic disparities in CRC incidence seen in our state.

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Table 1

Distribution of colorectal cancer risk factors (demographic, socioeconomic, clinical and health maintenance) reported by Hispanic and white New Mexicans age 50 years and over, stratified by sex and Hispanic/white ethnicity: data from the New Mexico 2006 BRFSS survey

	Males		Females		P value ^a	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	P value ^d
	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)						
Demographic factors										
Age										
50–60 years	53.7 (47.6–59.7)	47.2 (43.4–51.0)	49.2 (44.4–45.1)	40.8 (37.7–44.0)	.03					<.001
61–70 years	26.8 (21.8–32.5)	25.7 (22.5–29.2)	29.5 (25.2–34.2)	27.5 (24.9–30.2)						
>70 years	19.4 (15.2–24.5)	27.1 (23.8–30.6)	21.2 (17.7–25.2)	31.7 (28.9–34.6)						
Survey language										
English	80.1 (74.3–84.8)	99.9 (99.6–99.9)	85.3 (81.6–88.2)	100.0	<.001					<.001
Spanish	19.9 (15.2–25.6)	0.1 (0.1–0.4)	14.8 (11.7–18.4)	0.0						
Marital status										
Married, unmarried couple	77.4 (72.3–81.1)	76.9 (73.6–79.4)	56.7 (51.9–61.3)	58.6 (55.5–61.4)	.86					.49
Divorced, widowed, separated never married	22.6 (18.4–27.1)	23.1 (20.3–26.0)	43.3 (38.7–48.0)	41.4 (38.3–44.3)						
Live in or near a metropolitan area										
Yes	60.0 (54.3–65.4)	64.1 (60.9–67.1)	62.1 (57.9–66.1)	63.7 (61.2–66.0)	.23					.56
No	40.0 (34.5–45.7)	35.9 (32.8–39.1)	37.9 (33.8–42.1)	36.4 (34.0–38.7)						
Armed services veteran	44.0 (37.9–50.2)	52.7 (48.9–56.5)	<i>d</i>		.02					
Socioeconomic factors										
Education										
<High school	27.1 (21.9–32.8)	5.8 (4.3–7.7)	32.4 (28.1–37.0)	5.8 (4.5–7.2)	<.001					<.001
High school	72.9 (67.0–77.9)	94.2 (92.2–95.6)	67.5 62.8–71.8)	94.3 (92.4–95.2)						
Annual household income										
<\$25,000	46.7 (40.4–53.2)	17.4 (14.8–20.4)	55.3 (50.0–60.5)	28.1 (25.4–31.0)	<.001					<.001
\$25,000–\$50,000	27.7 (22.3–33.8)	31.2 (27.6–34.9)	27.5 (22.9–32.5)	30.0 (27.1–33.2)						
>\$50,000	25.5 (20.1–31.8)	51.4 (47.4–55.3)	17.2 (13.6–21.5)	41.8 (38.5–45.2)						
Employment										
Employed	47.4 (41.2–53.7)	51.1 (47.2–54.9)	38.0 (33.4–42.8)	37.4 (34.4–40.5)	.006					.001
Retired	36.1 (30.5–42.1)	40.4 (36.7–44.1)	30.9 (26.8–35.5)	39.7 (36.8–42.8)						

	Males			Females		
	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	P value ^d	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	P value ^d
Not employed	16.5 (12.6–21.3)	8.6 (6.6–11.1)		31.1 (26.7–35.8)	22.8 (20.3–25.5)	
Health insurance	81.0 (74.8–84.6)	90.9 (88.5–92.8)	<.001	80.9 (76.4–84.1)	93.3 (91.5–94.6)	<.001
<i>Clinical factors</i>						
BMI						
25	24.5 (18.7–28.8)	34.4 (30.6–37.9)	0.006	32.9 (26.7–35.8)	47.4 (42.7–49.0)	<.001
26–30	49.5 (41.1–53.6)	46.3 (42.2–49.8)		39.8 (33.0–42.3)	32.9 (28.9–34.8)	
>30	26.0 (19.8–30.6)	19.3 (16.3–22.4)		27.2 (21.7–29.9)	19.7 (16.7–21.7)	
Diabetes	21.1 (16.4–26.6)	19.3 (7.1–11.7)	<.001	19.1 (15.6–23.1)	9.8 (8.0–11.8)	<.001
Perceived general health						
Excellent	16.3 (12.0–21.7)	21.6 (18.5–24.9)	<.001	13.3 (10.2–17.1)	20.7 (18.2–23.3)	<.001
Very good/good	46.3 (40.1–52.4)	59.8 (55.9–63.4)		49.4 (44.4–54.2)	60.9 (57.7–63.7)	
Fair/poor	37.4 (31.6–43.4)	18.6 (15.7–21.7)		37.3 (32.5–42.0)	18.4 (16.2–20.7)	
<i>Lifestyle factors</i>						
Current smoker	20.2 (15.8–25.3)	15.5 (12.8–18.4)	.09	18.4 (14.6–22.7)	13.7 (11.8–15.7)	.04
At risk for heavy alcohol consumption ^b	4.9 (2.9–7.7)	5.2 (3.7–6.9)	.85	1.6 (0.6–3.9)	4.2 (3.1–5.6)	.008
Physical activity or exercise in past 30 days ^c	69.5 (63.6–74.9)	78.7 (75.3–81.7)	.006	64.6 (59.8–69.2)	75.0 (71.9–77.3)	<.001
<i>Health behaviors</i>						
Influenza vaccine 12 months ago	44.8 (38.6–51.1)	50.2 (46.3–54.0)	.16	45.2 (40.4–50.1)	51.7 (48.5–4.8)	.03
CRC screening ^d						
Current	45.3 (39.2–51.6)	56.1 (52.3–60.0)	<.001	42.5 (37.7–45.4)	57.9 (54.8–60.9)	<.001
Not current	6.0 (3.8–9.3)	10.7 (8.5–13.3)		7.6 (5.5–10.5)	12.9 (10.9–15.2)	
Never	48.7 (42.5–54.9)	33.2 (29.7–36.9)		49.9 (45.0–54.9)	29.2 (26.4–32.1)	
FOBT						
12 months ago	13.0 (9.29–18.0)	12.6 (10.3–15.3)	<.001	11.0 (8.42–14.2)	13.0 (11.0–15.3)	<.001
>12 months ago	14.4 (10.7–19.7)	26.5 (23.1–30.1)		17.9 (14.4–22.0)	32.4 (29.4–35.4)	
Never						
Lower endoscopy						
10 years ago	39.4 (33.4–45.6)	51.3 (47.4–55.1)	.003	38.5 (33.9–43.3)	53.0 (49.9–56.2)	<.001
>10 years ago	2.3 (1.3–5.9)	3.8 (2.7–5.3)		2.0 (1.1–3.6)	5.0 (3.8–6.6)	

	Males			Females		
	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	P value ^d	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	P value ^d
Never	57.8 (51.6–36.9)	44.5 (40.8–48.4)		59.3 (54.5–64.0)	41.8 (38.8–44.9)	
PSA test						
24 months ago	76.4 (41.7–54.3)	77.2 (57.9–65.4)	.13	^e		
>24 months ago	13.2 (5.3–12.7)	16.6 (10.7–16.4)				
Never	10.4 (4.4–9.6)	6.2 (3.6–6.8)				
PAP test	^f					
12 months ago				39.4 (34.6–44.3)	39.0 (36.0–42.2)	.18
>12 months ago				15.1 (11.8–19.1)	16.6 (14.3–19.1)	
Never				4.1 (2.6–6.2)	1.9 (1.2–3.0)	
Had hysterectomy				41.5 (36.6–46.5)	42.4 (39.3–45.6)	
Mammogram	^f					
12 months ago				53.9 (48.8–58.8)	57.3 (54.1–60.5)	.10
>12 months ago				37.8 (33.0–42.7)	37.5 (34.4–40.7)	
Never				8.4 (6.0–11.0)	5.15 (4.0–6.5)	

BMI body mass index, *CRC* colorectal cancer, *FOBT* fecal occult blood test, *PSA* prostate-specific antigen, *PAP* Papanicolaou

^a *p*-value for Chi-square test for difference between racial/ethnic groups

^b Having more than two drinks per day for adult men; more than one drink per day for adult women

^c Physical activity and/or exercise outside of a regular job

^d Not reported in women due to low frequency

^e Not applicable to women

^f Not applicable to men

Current colorectal cancer screening by selected demographic, socioeconomic, clinical and health maintenance factors, stratified by sex, as reported by Hispanic and white New Mexicans age 50 years and over in the 2006 New Mexico Behavior Risk Factor Surveillance Survey

Table 2

	Males		Females		P value ^a	White Percent (95% confidence interval)	Hispanic Percent (95% confidence interval)	P value ^a	White Percent (95% confidence interval)	Hispanic Percent (95% confidence interval)	P value ^a
	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	White Percent (95% confidence interval)	Hispanic Percent (95% confidence interval)							
Demographic factors											
Age											
50–60 years	40.3 (31.9–49.3)	46.7 (41.0–52.5)	46.7 (41.0–52.5)	37.2 (30.5–44.4)	<.001	49.0 (43.8–54.2)	49.0 (43.8–54.2)		49.0 (43.8–54.2)	37.2 (30.5–44.4)	.11
61–70 years	47.8 (36.6–59.2)	64.1 (56.8–70.9)	64.1 (56.8–70.9)	48.7 (39.7–57.7)		66.0 (60.7–71.0)	66.0 (60.7–71.0)		66.0 (60.7–71.0)	48.7 (39.7–57.7)	
>70 years	55.8 (43.0–67.9)	64.9 (57.5–71.7)	64.9 (57.5–71.7)	46.2 (36.8–55.8)		62.3 (57.0–67.4)	62.3 (57.0–67.4)		62.3 (57.0–67.4)	46.2 (36.8–55.8)	
Survey language											
English	47.9 (41.2–54.7)	56.1 (52.2–59.9)	56.1 (52.2–59.9)	44.8 (39.5–50.1)	.02	57.9 (54.8–61.0)	57.9 (54.8–61.0)		57.9 (54.8–61.0)	44.8 (39.5–50.1)	<.001
Spanish	35.0 (21.6–51.3)	<.10	<.10	29.1 (18.9–42.0)		0.0	0.0		0.0	29.1 (18.9–42.0)	
Marital status											
Married, unmarried couple	47.7 (40.4–55.1)	59.7 (55.1–64.1)	59.7 (55.1–64.1)	45.0 (38.4–51.8)	<.001	61.3 (56.8–65.5)	61.3 (56.8–65.5)		61.3 (56.8–65.5)	45.0 (38.4–51.8)	.005
Divorced, widowed, separated never married	38.2 (29.0–48.4)	43.9 (37.4–50.6)	43.9 (37.4–50.6)	39.1 (32.6–46.1)		53.4 (49.1–57.5)	53.4 (49.1–57.5)		53.4 (49.1–57.5)	39.1 (32.6–46.1)	
Live in or near a metropolitan area											
Yes	35.6 (27.5–44.5)	56.0 (50.8–61.2)	56.0 (50.8–61.2)	42.8 (36.1–49.7)	.10	59.4 (55.1–63.6)	59.4 (55.1–63.6)		59.4 (55.1–63.6)	42.8 (36.1–49.7)	.21
No	51.9 (43.4–60.3)	56.4 (51.1–61.5)	56.4 (51.1–61.5)	42.0 (35.9–48.3)		55.2 (51.0–59.3)	55.2 (51.0–59.3)		55.2 (51.0–59.3)	42.0 (35.9–48.3)	
Armed services veteran											
Yes	53.9 (42.1–61.0)	62.3 (53.0–63.4)	62.3 (53.0–63.4)	d	<.001						
No	39.7 (31.7–48.2)	49.9 (44.3–55.5)	49.9 (44.3–55.5)								
Socioeconomic factors											
Education											
<High school	31.9 (21.8–44.1)	35.1 (22.4–50.2)	35.1 (22.4–50.2)	33.9 (26.8–41.9)	<.001	46.0 (34.6–57.9)	46.0 (34.6–57.9)		46.0 (34.6–57.9)	33.9 (26.8–41.9)	<.001
High school	50.4 (43.2–57.7)	57.5 (53.5–61.4)	57.5 (53.5–61.4)	46.7 (40.7–52.8)		58.7 (55.5–61.9)	58.7 (55.5–61.9)		58.7 (55.5–61.9)	46.7 (40.7–52.8)	
Annual household income											
<\$25,000	36.5 (28.0–45.9)	45.3 (36.9–53.9)	45.3 (36.9–53.9)	36.7 (30.4–43.4)	.001	49.3 (43.6–55.0)	49.3 (43.6–55.0)		49.3 (43.6–55.0)	36.7 (30.4–43.4)	<.001
\$25,000–\$50,000	53.4 (41.4–65.0)	50.3 (43.3–57.2)	50.3 (43.3–57.2)	41.6 (32.0–51.9)		61.2 (55.1–67.0)	61.2 (55.1–67.0)		61.2 (55.1–67.0)	41.6 (32.0–51.9)	
>\$50,000	59.8 (46.1–72.1)	63.1 (57.2–68.6)	63.1 (57.2–68.6)	54.1 (41.5–66.1)		61.1 (55.4–66.6)	61.1 (55.4–66.6)		61.1 (55.4–66.6)	54.1 (41.5–66.1)	
Employment status											

	Males			Females		
	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	P value ^a	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	P value ^a
Employed	40.2 (31.1–50.1)	51.6 (46.0–57.1)	<.001	35.2 (28.1–43.0)	53.0 (47.6–58.5)	<.001
Retired	57.7 (48.1–66.8)	64.5 (58.7–70.0)		51.9 (43.6–60.2)	64.3 (59.7–68.6)	
Not employed	33.4 (21.8–47.5)	45.2 (32.2–58.9)		33.4 (21.8–47.5)	45.2 (32.2–58.9)	
Health insurance						
Yes	47.1 (40.3–54.0)	58.9 (54.8–62.9)	<.001	46.1 (40.9–51.5)	60.7 (57.5–63.9)	<.001
No	36.6 (23.4–52.1)	28.6 (18.3–41.6)		27.2 (17.2–40.2)	18.9 (11.0–30.5)	
<i>Clinical factors</i>						
BMI						
25	44.7 (32.9–57.0)	55.0 (48.6–61.3)	.91	47.3 (38.4–56.4)	57.3 (52.7–61.8)	.64
26–30	44.1 (35.2–53.4)	56.8 (51.0–62.4)		41.6 (33.8–49.8)	59.4 (53.9–64.7)	
>30	49.4 (37.4–61.6)	57.5 (48.2–66.2)		38.4 (30.1–47.4)	60.8 (53.7–67.4)	
Diabetes						
Yes	56.4 (43.0–69.0)	60.7 (47.2–72.6)	.20	56.0 (45.2–66.2)	57.8 (47.5–67.5)	.23
No	42.4 (35.6–49.4)	55.7 (51.6–59.7)		39.3 (34.1–44.8)	57.9 (54.6–61.1)	
Perceived general health						
Excellent	45.8 (30.1–62.4)	55.0 (46.6–63.1)	.06	39.5 (27.0–53.4)	57.7 (50.8–64.4)	.98
Very good/good	49.4 (40.6–58.3)	58.2 (53.2–62.9)		43.7 (37.1–50.6)	56.2 (52.1–60.2)	
Fair/poor	40.4 (31.0–50.4)	51.6 (42.6–60.6)		42.1 (34.6–50.1)	63.7 (56.9–69.9)	
<i>Lifestyle factors</i>						
Current smoker						
Yes	40.0 (27.8–53.7)	31.8 (23.4–41.7)	<.01	22.8 (14.7–33.8)	43.6 (36.2–51.3)	<.001
No	46.4 (39.4–53.4)	60.6 (56.4–64.6)		46.9 (41.6–52.2)	60.3 (56.9–63.6)	
At risk for heavy alcohol consumption ^b						
Yes	31.4 (14.7–54.9)	55.8 (39.7–70.7)	.47	35.9 (9.5–74.8)	68.9 (53.4–81.1)	.17
No	47.6 (41.2–54.2)	56.6 (52.6–60.5)		43.1 (38.2–48.1)	58.2 (54.9–61.3)	
Physical activity or exercise in past 30 days ^c						
Yes	46.4 (39.0–54.0)	57.4 (53.1–61.6)	.13	44.9 (38.9–51.0)	60.0 (56.4–63.5)	.002
No	43.0 (32.4–54.3)	51.6 (43.2–60.0)		38.1 (30.3–46.5)	51.6 (45.4–57.7)	
<i>Health behaviors</i>						

	Males			Females		
	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	P value ^a	Hispanic Percent (95% confidence interval)	White Percent (95% confidence interval)	P value ^a
Influenza vaccine						
12 months ago	57.5 (48.5–66.1)	69.5 (64.1–74.4)	<.001	50.4 (43.4–57.4)	69.6 (65.6–73.4)	.001
>12 months ago	36.7 (28.7–45.4)	43.3 (38.0–48.9)		37.8 (31.3–44.7)	46.9 (42.3–51.5)	
PSA test				^e		
24 months ago	69.3 (60.8–76.7)	69.3 (64.5–73.7)	<.001			
>24 months ago	55.0 (32.5–75.5)	47.1 (35.0–58.5)				
Never	18.9 (11.8–29.1)	35.3 (20.5–35.2)				
PAP test	^f					
12 months ago				39.5 (32.0–47.3)	64.7 (59.8–69.3)	<.001
>12 months ago				31.0 (27.6–41.2)	33.5 (41.1–62.7)	
Never				11.2 (3.9–28.4)	11.1 (3.6–29.3)	
Had hysterectomy				57.5 (49.6–65.0)	67.8 (62.0–72.3)	
Mammogram	^f					
12 months ago				54.2 (47.3–61.0)	73.9 (70.2–77.3)	<.001
>12 months ago				37.2 (29.5–45.6)	44.7 (39.4–50.0)	
Never				16.9 (8.2–31.7)	12.5 (6.47–22.2)	

BMI/body mass index, CRC/colorectal cancer, FOBT/fecal occult blood test, PSA prostate-specific antigen, PAP/Papanicolaou

^a P-value for Chi-square test for difference between racial/ethnic groups

^b Having more than two drinks per day for adult men; more than one drink per day for adult women

^c Physical activity and/or exercise outside of a regular job

^d Not reported in women due to low frequency

^e Not applicable to women

^f Not applicable to men

Table 3

Odds ratios for current colorectal cancer screening in New Mexico Hispanics versus whites adjusted for demographic, socioeconomic, clinical, lifestyle and preventive health factors

Models ^a	Men Odds ratio (95% confidence interval)	Women Odds ratio (95% confidence interval)
Race/ethnicity	0.69 (0.51–0.94)	0.55 (0.44–0.70)
Race/ethnicity + survey language ^b	0.76 (0.55–1.05)	0.61 (0.47–0.78)
Race/ethnicity + demographic ^c	0.67 (0.50–0.91)	0.56 (0.44–0.71)
Race/ethnicity + socioeconomic ^d	1.09 (0.77–1.17)	0.73 (0.56–0.97)
Race/ethnicity + clinical ^e	0.70 (0.51–0.97)	0.54 (0.42–0.69)
Race/ethnicity + lifestyle ^f	0.73 (0.53–0.99)	0.58 (0.46–0.74)
Race/ethnicity + preventive health ^g	0.87 (0.63–1.21)	0.56 (0.43–0.74)
Race/ethnicity + survey language + demographics + economic + clinical + lifestyle + preventive health	1.26 (0.85–1.86)	0.65 (0.48–0.90)

Data from the 2006 New Mexico Behavior Risk Factor Surveillance Survey (BRFSS)

^a All models are adjusted for age, white is reference group

^b Survey Language includes Spanish and English

^c Demographic model includes age, marital status, urban versus rural residence, and veteran status for males

^d Socioeconomic model includes health care coverage, current employment status, annual household income and high school-level education
^e Clinical model includes perceived general health, obesity and diabetes

^f Lifestyle model includes smoking, heavy alcohol consumption, and physical activity

^g Preventive health model includes screening for breast, cervical, prostate and colorectal cancer and influenza vaccination