

**Title:** Factors Associated with Cancer Screening among Hopi Men

Ken Batai <sup>1,2</sup>, Priscilla R. Sanderson <sup>3</sup>, Chiu-Hsieh Hsu <sup>4</sup>, Lori Joshweseoma <sup>5</sup>, Dana Russell <sup>6</sup>, Lloyd Joshweseoma <sup>5</sup>, Jordan Ojeda<sup>3</sup>, Linda Burhansstipanov <sup>7</sup>, Sylvia R. Brown <sup>4</sup>, Delores Ami <sup>6</sup>, Kathylynn Saboda <sup>2</sup>, Robin B. Harris <sup>2,4</sup>

<sup>1</sup> Department of Urology, University of Arizona, Tucson, Arizona, U.S.A.

<sup>2</sup> University of Arizona Cancer Center, Tucson Arizona, U.S.A.

<sup>3</sup> Health Sciences Department, College of Health and Human Services, Northern Arizona University, Flagstaff, Arizona, U.S.A.

<sup>4</sup> Department of Epidemiology and Biostatistics, Mel and Enid Zuckerman College of Public Health, University of Arizona, Tucson Arizona, U.S.A.

<sup>5</sup> Hopi Tribe, Kykotsmovi, Arizona, U.S.A.

<sup>6</sup> H.O.P.I. Cancer Support Services, Department of Health and Human Services, Hopi Tribe, Kykotsmovi, Arizona, U.S.A.

<sup>7</sup> Native American Cancer Research Corporation, Pine, Colorado, U.S.A.

**Corresponding Authors**

Ken Batai, Ph.D.

University of Arizona Cancer Center

1515 N. Campbell Ave.

PO Box 245024

Tucson, AZ 85724

Phone: (520) 626-8024

[kbatai@email.arizona.edu](mailto:kbatai@email.arizona.edu)

0000-0002-0317-1118

Priscilla R Sanderson, Ph.D., M.S., CRC

Health Sciences Department

Student & Academic Services Center

Northern Arizona University

1100 South Beaver Street

PO Box #15095

Flagstaff, AZ 86011

Phone: 928-523-6741

Priscilla.Sanderson@nau.edu

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**Conflict of Interest**

The authors do not have conflict of interest to disclose.

**Compliance with Ethical Standard**

The research protocol was approved by Hopi Tribal Council and the University of Arizona Institutional Review Board.

**Authors' Contribution**

KB, PRS, LJ, DR, SRB, and RBH designed the research; KB, PRS, JO, RBH wrote the manuscript; PRS, LJ, LJ, DR, SRB, DA, RBH collected the data; CHH, KS performed statistical analysis; LB advise the research; all authors read and approved the final manuscript.

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2  
3

4 **Abstract**  
5

6 Cancer screening rates remain low among American Indian men, and cancer screening behaviors  
7 and barriers to cancer screening among American Indian men are not well understood. This  
8 study evaluated cancer screening behaviors in 102 Hopi men who were 50 years of age or older  
9 from the Hopi Survey of Cancer and Chronic Disease. Reported cancer screening frequencies  
10 were 15.7%, 45.1%, and 35.3% for Fecal Occult Blood Test (FOBT), colonoscopy, and Prostate  
11 Specific Antigen (PSA) test, respectively. Among men who reported having had a FOBT, 81.2%  
12 had the test more than one year ago. Among men who reported a colonoscopy, 60.8% had  
13 colonoscopy within the past three years. Similarly, among men who reported having had PSA,  
14 72.3% had PSA within the past three years. “*No one told me*” was the most common answer for  
15 not undergoing FOBT (33.7%), colonoscopy (48.2%), and PSA (39.4%). Men who reported  
16 having had a PSA or digital rectal exam were three times as likely to also report having a FOBT  
17 or colonoscopy (odds ratio [OR] 3.19, 95% confidence interval [CI]: 1.21-8.46). Younger age  
18 (<65) was associated with reduced odds of ever having prostate cancer screening (OR 0.28, 95%  
19 CI: 0.10-0.77). Ever having colorectal cancer screening and previous diagnosis of cancer  
20 increased odds of ever having prostate cancer screening (OR 3.15, 95% CI: 1.13-8.81 and OR  
21 5.28, 95% CI: 1.15-24.18 respectively). This study illustrates the importance of community  
22 cancer education for men to improve cancer screening participation.  
23

24 (240/250)  
25

26 **Keywords**

27 Hopi, Native Americans, American Indians, Men, Cancer Screening  
28

## 29 **Background**

30 Historically, improvement of cancer screening behaviors among women is promoted by  
31 activities and advocacy of national programs, such as Centers for Disease Control and Prevention  
32 (CDC) for breast and cervical cancer screenings [1], AVON Foundation for Women, and Susan  
33 G. Komen for the Cure® for breast health. More recently the voices of men are being heard,  
34 particularly from American Indian and Alaska Native (AI/AN) men, concerning their health and  
35 cancer screenings [2,3]. However, there are few studies about AI/AN men that address the need  
36 to improve cancer screening participation [4].

37 Overall, cancer incidence among AI/ANs is lower compared to non-Hispanic Whites  
38 (NHWs), but AI/ANs have higher overall cancer mortality rates [5]. AI/AN men also have higher  
39 mortality from colorectal cancer (CRC) and prostate cancer (PCa) [6,7]. In Indian Health  
40 Service (IHS) Contract Health Service Delivery Area (CHSDA) counties, AI/AN men  
41 experience a 37% higher CRC mortality rate [6] and a 9% higher PCa mortality rate than NHW  
42 men [8].

43 Potential causes of the higher CRC and PCa mortality rates among AI/ANs include late  
44 stage diagnosis due to lower cancer screening rates, increased barriers to health care access (e.g.,  
45 their home locations in rural and remote areas and inaccessibility to cancer centers or health care  
46 centers), and lack of knowledge about cancer screenings [9,3,4]. Screening rates among AI/ANs  
47 are generally lower compared to NHWs [10,11]. Arizona Behavioral Risk Factor Surveillance  
48 System Survey (BRFSS) reports that AI/ANs in Arizona have lower CRC and PCa screening  
49 rates compared to NHWs. The 2010 Arizona BRFSS survey was the last statewide survey that  
50 asked if men ever had prostate specific antigen (PSA) screening and estimated that less than 20%  
51 of AI/ANs ever had a PSA test. The 2016 Arizona BRFSS then reported that 37.0% of NHWs

52 and 25.7% of AI/ANs ever had a Fecal Occult Blood Test (FOBT), and 72.0% of NHWs and  
53 37.6% of AI/ANs ever had a sigmoidoscopy or colonoscopy. Although the cancer screening  
54 rates for AI/ANs show improvement, these screening rates compared to NHWs remained low.  
55 Furthermore, in recent conversations among our research team and the Hopi Tribe in Northern  
56 Arizona, community members raised concerns about cancer burden among Hopi men. Therefore,  
57 we sought to identify factors associated with these cancer screening behaviors in order to  
58 develop culturally appropriate cancer education and intervention programs to reduce cancer  
59 burden in AI/AN men.

60 The current study used data from 2012 Hopi Survey of Cancer and Chronic Disease to  
61 understand cancer screening behavior among Hopi men 50 years of age or older. The Hopi  
62 Survey of Cancer and Chronic Disease was a community survey conducted in 2012 on the Hopi  
63 Reservation for both men and women. The results for cancer screening behaviors for women  
64 and self-identified caregivers have been reported [12,13] and show that cancer screening  
65 participation for Hopi adult women living on the reservation increased over the years since the  
66 1990s when Hopi Cancer Support Services received CDC funding for their Breast and Cervical  
67 Cancer Program [14,12]. However, the survey data on cancer screening participation have not  
68 previously been thoroughly examined for Hopi men.

69

## 70 **Materials and Method**

### 71 *Community Survey*

72 This cross-sectional study used the data collected in the 2012 Hopi Survey of Cancer and  
73 Chronic Disease, a population-based survey of randomly selected adult Hopi members (age 18 or  
74 older) living on the reservation. A goal of survey was to characterize chronic disease burden and

75 health behaviors. The survey was conducted between June 2012 and December 2012. The 2012  
76 survey was a collaborative project between the Hopi Tribe, The University of Arizona, and  
77 Northern Arizona University. The research team cooperatively worked to obtain funding, design  
78 and conduct survey, and disseminate of survey findings. The survey protocol was approved by  
79 Hopi Tribal Council and University of Arizona Institutional Review Board.

80 Recruitment and survey procedures of the 2012 Hopi community survey were described  
81 previously [13]. Briefly, a study coordinator provided Hopi interviewers with a list of potential  
82 study participants to call. The list of potentially eligible study participants was provided by the  
83 Hopi tribal enrollment office, which had then been randomized to assure that all villages were  
84 represented for both men and women with a goal to recruit 250 men and 250 women. The  
85 interviewers called potential study participants up to five times to schedule at home survey.  
86 Surveys were conducted either in English or Hopi. A total of 500 Hopi community members  
87 participated in the 2012 survey, and 248 were men, including 146 aged <50 years old and 102  
88 aged  $\geq 50$  years old.

89 The 2012 Hopi survey included 206 questions on basic demographic information, chronic  
90 diseases, previous cancer diagnosis, cancer screening participation, and family history of cancer.  
91 The survey asked the last time that men had received a FOBT, colonoscopy, or PSA screening,  
92 the main reasons for undergoing screening, and reasons for not having completed a cancer  
93 screening. The survey also asked questions to evaluate knowledge and attitudes on cancer  
94 screening (e.g., how strongly the study participants agreed with a statement about cancer and  
95 cancer screening). Other questions were about seeking cancer information and attending cancer  
96 education events. The survey questions were multiple choice for quantitative analysis.

97 In 2016, Hopi Department of Health and Human Services and Hopi community  
98 stakeholders identified men's health as a priority area for disease prevention. The Hopi Cancer  
99 Support Services responded to this priority area and re-established a collaboration with The  
100 University of Arizona and Northern Arizona University to develop a plan to understand Hopi  
101 men's needs for cancer prevention and to conduct a secondary analysis of the 2012 survey data.  
102 Criteria for inclusion for this secondary analysis was Hopi men who completed the survey and  
103 were age 50 years or older regardless of a prior diagnosis of cancer.

104

#### 105 *Statistical analysis*

106 The characteristics and cancer screening rates of the study participants were summarized  
107 by the associated frequencies and percentages. Odds ratios (OR) and the associated 95 %  
108 confidence intervals (CI) were calculated using logistic regression to identify factors associated  
109 with having a prior cancer screening for CRC (ever having FOBT or colonoscopy) and PCa (ever  
110 having digital rectal exam or PSA test). Based on a moderate sample size of 102, this study used  
111 a more restrictive rule to decide what factors to include in the adjusted analysis. Specifically,  
112 factors with a significant unadjusted OR at a significance level of 5% were included in adjusted  
113 analyses. All analyses were done in SAS 9.4.

114

#### 115 **Results**

116 This study included a total of 102 Hopi men who were aged 50 years or older (**Table 1**).  
117 Most men (n=91, 89.2%) were in the recommended age group for cancer screening (age 50-74).  
118 About half of the men reported a high school education or less than high school education (n=56,  
119 54.5%), while 13 men (12.8%) completed two or more years of college. Of 13 men, four men

120 had a bachelor degree. Approximately, a quarter of men (n=29, 28.9%) had a full-time job.  
121 More than half (n=57, 55.9%) had household income of less than \$25,000 and 16.7% (n=17) did  
122 not have reliable transportation. About half of the men (n=53, 52.0%) spoke Hopi as a primary  
123 language at home. Use of traditional medicine in past five years was not common (n=4, 3.9%).  
124 Less than half of the men (n=46, 45.1%) self-reported having diabetes.

125 In this population, 14 men (13.7%) were cancer survivors, while 36 men (35.3%) had a  
126 family history of cancer. A small proportion of men reported that they had sought cancer  
127 information; 22.6% of men (n=23) had sought cancer information for themselves and 10.8%  
128 (n=11) had their family member sought cancer information for them. Only 19.6% of men (n=20)  
129 answered that they have attended at least one cancer education presentation offered by Hopi  
130 Cancer Support Services. A majority of men (n=84; 82.4%) strongly agreed to the statement  
131 “*cancer screening helped find cancer earlier.*” Thirty-four men (33.3%) strongly agreed that  
132 “*cancer is almost always fatal,*” while 14.7% strongly agreed that “*cancer is often caused by a*  
133 *person’s lifestyle.*”

134 **Table 2** shows that Hopi men had low cancer screening rates; self-reported cancer  
135 screening rate was 15.7% (n=16), 45.1% (n=46), and 35.3% (n=36) for FOBT, colonoscopy, and  
136 PSA, respectively. Among men who reported a prior FOBT, a majority had the FOBT more than  
137 one year ago (n=13, 81.2%). Among men who had a colonoscopy previously, 60.8% (n=28) had  
138 a colonoscopy within the past three years, and only one man had colonoscopy more than 10  
139 years ago. Similarly, 72.3% of men (n=26) reported a PSA screening within three years, and  
140 only two men had a PSA test over 10 years ago. Among men who reported receiving a cancer  
141 screening, many men self-reported that their routine test was the main reason for having FOBT  
142 (n=11, 68.8%), colonoscopy (n=28, 60.9%), and PSA screening (n=25, 69.4%). On the other

143 hand, over 70% of Hopi men who have not had CRC or PCa screening reported, “*no one told*  
144 *me*,” “*never heard of cancer screening*,” “*don’t know much about it*,” or “*don’t know where to*  
145 *get tested*” as reasons for not having had cancer screening. “*No one told me*” was the most  
146 common answer for not undergoing FOBT (n=29, 33.7%), colonoscopy (n=27, 48.2%), and PSA  
147 (n=26, 39.4%).

148 Multiple variable logistic regression analysis was performed to identify factors associated  
149 with reporting a CRC and PCa screening. Only a history of having PCa screening was  
150 significantly associated with ever having received a CRC screening (**Table 3**). Men who  
151 reported ever receiving a PCa screening had over 3-fold increased odds of a CRC screening (OR  
152 3.19, 95% CI: 1.21-8.46). Three factors were statistically significantly associated with ever  
153 having PCa screening (**Table 4**). Younger age (<65) was associated with reduced odds (OR  
154 0.28, 95% CI: 0.10-0.77) of ever having PCa screening, while ever having a CRC screening and  
155 a previous diagnosis of cancer increased odds of ever having PCa screening (OR 3.15, 95% CI:  
156 1.13-8.81 and OR 5.28, 95% CI: 1.15-24.18 respectively). Higher income also showed a  
157 borderline significance (OR 3.12, 95% CI: 0.98-9.86).

158

## 159 **Discussion**

160 This secondary analysis evaluated CRC and PCa screening behavior among Hopi men  
161 age 50 years or older living on the Hopi Tribal lands. Many Hopi men in this age group  
162 understood that cancer screening helped detect cancer early. However, CRC and PCa screening  
163 rates were low, perhaps because Hopi men did not have adequate knowledge on cancer  
164 screening, or they did not receive sufficient information on cancer screening. Many Hopi men  
165 did not seek cancer information themselves or did not attend cancer education sessions held

166 within the reservation. Important factors associated with undergoing screening were having had  
167 cancer screening previously and a prior diagnosis of cancer.

168 Low cancer screening rates among AI/ANs were previously reported [11,15,16]. The  
169 2000-2010 U.S. BRFSS data show 61.5% of NHW men and 44.3% of AI/AN men living in IHS  
170 CHSDA counties reported having a FOBT within one year or an endoscopy (sigmoidoscopy or  
171 colonoscopy) within five years [15]. Similarly, 54.6% of NHW men and 42.5% of AI/AN men  
172 living in IHS CHSDA counties reported undergoing a PSA test within one year. The 2013  
173 National Health Interview Survey and 2008 Health and Retirement Study data similarly show  
174 lower CRC and PCa screening rates for AI/ANs compared to NHWs [11,16]. Moreover, the  
175 2000-2010 BRFSS data showed evidence for even lower cancer screening rates for AI/AN men  
176 in the Southwest region [15]. CRC screening rates were 44.3% for overall AI/AN men, but  
177 36.6% for AI/AN men in the Southwest. PSA screening rates were 42.5% for overall AI/AN  
178 men, but 35.1% for AI/AN men in the Southwest. It is of note that in 2010, the Hopi Tribe  
179 initiated a state-funded program to promote CRC screening, and the current study found that  
180 Hopi men had slightly higher CRC screening rate among Hopi men (51.0% having had either  
181 FOBT or coloscopy) compared to other AI/AN men. PCa screening rates for Hopi men (35.3%)  
182 were similarly as low as AI/AN men in the Southwest.

183 The identified factors that were associated with cancer screening participation were  
184 consistent with findings from other studies in AI/ANs. First, studies have consistently found that  
185 younger age was associated with not having cancer screening [17-20]. In this study, younger  
186 men were less likely to have PCa screening than other men, and younger Hopi women also had  
187 reduced odds of undergoing CRC screening compared to old women in a previously study [12].  
188 Second, studies in AI/ANs have shown that having a family history of cancer, a previous

189 diagnosis of cancer, a personal health care provider, and multiple chronic medical conditions  
190 increased cancer screening [18-20]. Among Hopi men, previous cancer screening and having a  
191 cancer diagnosis increased the likelihood of having cancer screening. Having been treated for  
192 any medical conditions or exposure to health care system personally or through family members  
193 may have increased cancer screening awareness and facilitate cancer screening behaviors.  
194 Furthermore, in the Education and Research Towards Health study, additional factors associated  
195 with increased odds of cancer screening were having higher educations and income, while native  
196 language use at home was associated with reduced odds of cancer screening [20]. In this study,  
197 Hopi men with higher income showed a trend for significant association with cancer screening  
198 participation, but the use of Hopi language was not associated with undergoing cancer screening.

199         A lack or inadequate of knowledge on cancer screening was probably one of the major  
200 reasons why Hopi men reported that they did not have CRC or PSA screening, especially for  
201 men who did not report being treated for any medical conditions. Although 82% of men  
202 understood that cancer screening could help with early detection, it was not associated with  
203 cancer screening participation. Many men never looked for cancer information or had not  
204 attended cancer education presentations. Also, over 70% of Hopi men who have not had CRC or  
205 PCa screening reported lack of or insufficient knowledge and information on cancer screening as  
206 major reasons for not undergoing screening. *“No one told me,” “never heard of cancer*  
207 *screening,” “don’t know much about it,”* or *“don’t know where to get tested”* were common  
208 reasons for not having had cancer screening. Previous studies in AIs have also reported the lack  
209 of and limited knowledge on cancer screening. A study conducted among AIs and NHWs who  
210 were newly diagnosed with cancer reported that AIs had significantly lower scores of cancer  
211 screening knowledge even after adjusting for socioeconomic and demographic factors [21]. A

212 study to identify barriers to CRC screening for AI men and women from Kansas and Missouri  
213 reported that AI community members did not openly talk about CRC and lacked knowledge on  
214 CRC screening [4]. Another study also found a low level of cancer knowledge among AI/AN  
215 community members [22].

216 The findings from current study and other studies in AI/AN communities illustrate needs  
217 for community education program to improve cancer screening awareness and cancer screening  
218 rates among Hopi men and in other AI/AN communities. The study participants in the studies in  
219 AI/AN communities expressed desire for more community cancer education [4,22]. Community  
220 education, maybe led by Native Patient Navigators from their own communities, may improve  
221 cancer knowledge and increase cancer screening participation among AI/ANs [23,24]. Many  
222 Hopi male study participants who were aged 50 years and older reported speaking Hopi language  
223 at home suggesting that cancer education may need to be conducted in both English and Hopi.

224 Changes in cancer screening guidelines may have increased confusion for community  
225 members. The U.S. Preventative Services Task Force (USPSTF) recommends annual screening  
226 for CRC beginning aged 50 years old [25]. However, PCa screening guidelines are controversial  
227 [26-28]. For men with average risk, the USPSTF recommends individually-based decision  
228 making after discussing benefits and harms of PCa screening with their health care provider [26].  
229 The USPSTF concluded that there was not enough evidence to provide recommendations for  
230 high-risk men. In contrast, the American Urological Association and the American Cancer  
231 Society emphasize the importance of early detection, discussion with clinicians about risks and  
232 benefits, and screening for high-risk men [27,28]. The USPSTF recommendations are based on  
233 the number and quality of publications from cancer screening trials. However, due to the lack of  
234 high-quality publications on AI/AN men or men from other medically underserved racial/ethnic

235 minority groups, the USPSTF cannot provide specific recommendations for AI/ANs. While high  
236 quality research may help develop cancer screening recommendation for AI/AN men, Hopi  
237 Cancer Support Services should play a critical role in educating men on risk factors for cancers  
238 and cancer screening guidelines.

239         There are three limitations for this secondary analysis study. First, the 2012 Hopi Survey  
240 of Cancer and Chronic Disease survey included self-reported cancer screening behaviors. Self-  
241 reporting of past behaviors may have introduced a recall bias with over- or under-estimates of  
242 cancer screening behavior and knowledge. Second, there were only small number of men  
243 eligible for this study which affected the power of the study. Moreover, men with previous  
244 diagnosis of cancer were included in this study to understand general cancer screening behavior  
245 among Hopi men. A study excluding men with a prior cancer diagnosis may be necessary to  
246 understand barriers to cancer screening, when they were not informed about cancer screening  
247 through their own experience of cancer diagnosis.

248

## 249 **Conclusion**

250         This study found low CRC and PCa screening rates among Hopi men who were 50 years  
251 and older and live on the Hopi Reservation. A lack of knowledge on cancer screening may be  
252 one of the major factors for men reporting not ever having a cancer screening, illustrating the  
253 importance of community cancer education to increase cancer screening awareness among Hopi  
254 men. These findings on rural Hopi men may also apply to other AI men living in rural and  
255 remote reservations, where community members may not have information on the latest cancer  
256 screening recommendations.

257

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**Table 1** Characteristics of Hopi men aged 50 years or older (n=102) in 2012 Hopi Survey of Cancer and Chronic Disease

<b>Variable</b>	<b>n (%)</b>
<b>Age</b>	
50-64 years	66 (64.7%)
65-74 years	25 (24.5%)
75+ years	11 (10.8%)
<b>Education</b>	
Never attended school	5 (4.9%)
Less than 8 <sup>th</sup> grade	10 (9.8%)
8-12 grade but did not graduate	29 (28.4%)
High school graduate/GED	12 (11.8%)
Trade, technical or vocational school after high school	17 (16.7%)
Some college but no degree	15 (14.7%)
2 year college graduate or greater	13 (12.8%)
Don't know/Refused	1 (1.0%)
<b>Married</b>	55 (53.9%)
<b>Employed full time</b>	29 (28.4%)
<b>Household income</b>	
Less than \$10,000	38 (37.3%)
\$10,000-\$24,999	19 (18.6%)
\$25,000-\$34,999	19 (18.6%)
\$35,000-\$49,999	14 (13.7%)
≥\$50,000	9 (8.8%)
Don't know/Refused	3 (2.9%)
<b>Has reliable transportation</b>	85 (83.3%)
<b>Use internet</b>	33 (32.4%)
<b>Hopi culture (Yes/No)</b>	
Primary language at home: Hopi	53 (52.0%)
Used traditional medicine at least once in past 5 years	4 (3.9%)
<b>Health status (Yes/No)</b>	
Diabetes	46 (45.1%)
Thinks his health is better than most	66 (64.7%)
<b>Healthy behaviors (Yes/No)</b>	
Current smoker	18 (17.7%)
Never smoked	42 (41.2%)
Have you ever visited a dentist?	73 (71.6%)
Have you ever had teeth cleaned	59 (57.8%)
Exercise at least once in past 30 days	75 (73.5%)
<b>Screening history (Yes/No)</b>	
Ever had colorectal cancer screening (had colonoscopy or FOBT)	52 (51.0%)
Ever had prostate screening (had PSA or DRE)	36 (35.3%)
<b>Cancer experience (Yes/No)</b>	
Has/had cancer	14 (13.7%)
Family history of cancer	36 (35.3%)
A caregiver	18 (17.7%)
Have you ever looked for information on cancer?	23 (22.6%)
Has a family member ever looked for information on cancer for you	11 (10.8%)

Applied for Radiation Exposure Compensation Education Program (RECEP)	6 (5.9%)
Attended at least 1 Hopi Cancer Support Services presentation	20 (19.6%)
<b>Attitudes about cancer</b> (strongly agree vs. somewhat agree/disagree/neither agree or disagree)	
Cancer almost always fatal	34 (33.3%)
Cancer often caused by a person's behavior or lifestyle	15 (14.7%)
Screening for cancer helps find cancer earlier	84 (82.4%)

**Table 2** Profile of cancer screening behaviors among Hopi men, aged 50 years or older, by type of screening test

<b>Cancer Screening Type</b>	<b>FOBT</b>	<b>Colonoscopy</b>	<b>PSA</b>
<b>Ever Screened</b>	16 (15.7%)	46 (45.1%)	36 (35.3%)
<b>Last Screened</b>			
< 1 year	3 (18.8%)	10 (21.7%)	15 (41.7%)
1~2 years	1 (6.3%)	7 (15.2%)	6 (16.7%)
2~3 years	7 (43.8%)	11 (23.9%)	5 (13.9%)
3~5 years	3 (18.8%)	7 (15.2%)	6 (16.7%)
5~10 years	2 (12.5%)	7 (15.2%)	2 (5.6%)
10 years	0 (0%)	3 (6.5%)	0 (0%)
> 10 years	0 (0%)	1 (2.2%)	2 (5.6%)
<b>Main reason for most recent screen</b>			
Health provider told me	2 (12.5%)	13 (28.3%)	9 (25.0%)
Routine test	11 (68.8%)	28 (60.9%)	25 (69.4%)
Specific problems	3 (18.8%)	5 (10.9%)	2 (5.6%)
<b>Never screened</b>	86 (84.3%)	56 (54.9%)	66 (64.7%)
<b>Main reason for not screened</b>			
Afraid results	2 (2.3%)	3 (5.4%)	2 (3.0%)
Afraid screen	2 (2.3%)	1 (1.8%)	2 (3.0%)
Don't know where to get tested	7 (8.1%)	4 (7.1%)	6 (9.1%)
Embarrassed	0 (0%)	1 (1.8%)	0 (0%)
Don't know much about it	11 (12.8%)	7 (12.5%)	10 (15.2%)
I am healthy	2 (2.3%)	3 (5.4%)	3 (4.6%)
I am too young	0 (0%)	0 (0%)	1 (1.5%)
I am too old	1 (1.2%)	0 (0%)	1 (1.5%)
Never heard of cancer screening	15 (17.4%)	10 (17.9%)	11 (16.7%)
No one told me	29 (33.7%)	27 (48.2%)	26 (39.4%)
No transportation	1 (1.2%)	1 (1.8%)	1 (1.5%)
Going to die anyway	0 (0%)	0 (0%)	1 (1.5%)
Don't have time	1 (1.2%)	2 (3.6%)	2 (3.0%)
Other	3 (3.5%)	3 (5.4%)	6 (9.1%)
Don't know/Refused	6 (7.0%)	6 (10.7%)	6 (9.1%)

**Table 3** Factors associated with reporting CRC screening among Hopi men, aged 50 years or older

Variable	Unadjusted		Adjusted <sup>1</sup>	
	OR (95% CI)	p	OR (95% CI)	P
Age < 65	0.75 (0.33-1.70)	0.50		
At least some college education	1.39 (0.63-3.05)	0.41		
Married	1.36 (0.62-2.98)	0.44		
Employed full time	1.04 (0.44-2.47)	0.92		
Income ≥ \$35K	3.56 (1.27-9.99)	0.02	2.10 (0.68-6.53)	0.20
Has reliable transportation	2.97 (0.96-9.17)	0.06		
Use internet	1.48 (0.64-3.42)	0.36		
<b>Hopi culture</b>				
Primary language at home: Hopi	0.85 (0.39-1.85)	0.69		
Used traditional medicine at least once in past 5 years	3.00 (0.30-29.85)	0.35		
<b>Screening history</b>				
Ever had PCa screening	4.92 (1.99-12.15)	<0.001	3.19 (1.21-8.46)	0.02
<b>Cancer experience</b>				
Has/had cancer	4.20 (1.10-16.11)	0.04	2.53 (0.59-10.83)	0.21
Family history of cancer	0.79 (0.35-1.79)	0.58		
A caregiver	1.65 (0.58-4.66)	0.35		
Sought cancer information for self	2.13 (0.81-5.59)	0.13		
Family member sought cancer information for you	1.17 (0.33-4.12)	0.80		
Applied for RECP	5.21 (0.59-46.29)	0.14		
<b>Health status</b>				
Diabetes	2.07 (0.94-4.59)	0.07		
Current smoker	0.95 (0.34-2.64)	0.93		
Never smoked	0.57 (0.26-1.27)	0.17		
Thinks his health is better than most	0.90 (0.40-2.02)	0.79		
<b>Relationship with HCSS</b>				
Attended at least 1 HCSS presentation	2.05 (0.74-5.66)	0.17		
<b>Healthy behaviors</b>				
Has been to a dentist	3.18 (1.28-7.95)	0.01	2.03 (0.75-5.51)	0.17
Has had teeth cleaned	3.14 (1.38-7.13)	<0.01		
Exercise at least once in past 30 days	0.64 (0.26-1.55)	0.32		
<b>Attitudes about cancer (strongly agree)</b>				
Cancer almost always fatal	1.34 (0.59-3.07)	0.48		
Cancer often caused by a person's behavior or lifestyle	2.14 (0.68-6.79)	0.20		
Screening for cancer helps find cancer earlier	2.42 (0.83-7.06)	0.11		

<sup>1</sup> Adjusted model include income, PCa screening, prior cancer diagnosis, having been to a dentist, and having had teeth cleaned.

**Table 4** Factors associated with having PCa screening among Hopi men, aged 50 years or older

Variable	Unadjusted		Adjusted <sup>1</sup>	
	OR (95% CI)	P	OR (95% CI)	P
Age < 65	0.31 (0.13-0.73)	<0.01	0.28 (0.10-0.77)	0.01
At least some college education	1.21 (0.54-2.75)	0.64		
Married	1.32 (0.58-2.99)	0.51		
Employed full time	0.61 (0.24-1.57)	0.31		
Income ≥ \$35K	4.03 (1.53-10.64)	<0.01	3.12 (0.98-9.96)	0.05
Has reliable transportation	5.00 (1.07-23.27)	0.04	3.41 (0.50-23.02)	0.21
Use internet	1.91 (0.81-4.48)	0.14		
<b>Hopi culture</b>				
Primary language at home: Hopi	0.53 (0.23-1.20)	0.13		
Used traditional medicine at least once in past 5 years	1.88 (0.25-13.96)	0.54		
<b>Screening history</b>				
Ever had CRC screening	4.92 (1.99-12.14)	<0.001	3.15 (1.13-8.81)	0.03
<b>Cancer experience</b>				
Has/had cancer	5.96 (1.71-20.74)	<0.01	5.28 (1.15-24.18)	0.03
Family history of cancer	0.88 (0.37-2.06)	0.76		
A caregiver	1.21 (0.42-3.45)	0.73		
Sought cancer information for self	1.24 (0.48-3.23)	0.66		
Family member sought cancer information for you	1.61 (0.46-5.71)	0.46		
Applied for RECP	0.91 (0.16-5.24)	0.92		
<b>Health status</b>				
Diabetes	2.30 (1.00-5.26)	<0.05	1.33 (0.49-3.64)	0.58
Current smoker	0.66 (0.21-2.02)	0.46		
Never smoked	0.60 (0.26-1.40)	0.24		
Thinks his health is better than most	0.79 (0.34-1.83)	0.58		
<b>Relationship with HCSS</b>				
Attended at least 1 HCSS presentation	2.15 (0.80-5.81)	0.13		
<b>Healthy behaviors</b>				
Has been to a dentist	3.54 (1.22-10.32)	0.02	1.47 (0.42-5.16)	0.55
Has had teeth cleaned	3.19 (1.30-7.81)	0.01		
Exercise at least once in past 30 days	0.73 (0.29-1.80)	0.49		
<b>Attitudes about cancer (strongly agree)</b>				
Cancer almost always fatal	0.67 (0.28-1.63)	0.38		
Cancer often caused by a person's behavior or lifestyle	1.27 (0.41-3.90)	0.68		
Screening for cancer helps find cancer earlier	3.24 (0.87-12.05)	0.08		

<sup>1</sup> Adjusted model includes age, income, transportation, CRC screening, prior cancer diagnosis, diabetes, having been to a dentist, and having had teeth cleaned.