

Quantitative Research

Reported Barriers to Cancer Screening: Montana Behavioral Risk Factor Surveillance System 2007

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Abstract

Purpose. To determine self-identified barriers to cancer screening participation in Montana among respondents to the Behavioral Risk Factor Surveillance System (BRFSS).

Design. The 2007 BRFSS survey.

Setting. State of Montana.

Subjects. A total of 3433 respondents (2029 women) 50 years and older.

Measures. Respondents who had never had an endoscopy and women who had not had a recent mammogram were asked why they had not been screened.

Analysis. Associations between health care access variables and screening participation were assessed using χ^2 test. Joint effects of multiple independent predictors of screening participation were assessed using odds ratios (ORs) and 95% confidence intervals (CIs) from multiple logistic regression analysis.

Results. The strongest predictor of having an endoscopy (OR, 23.62; 95% CI, 18.42–30.28) or recent mammogram (OR, 10.87; 95% CI, 6.42–18.40) was provider recommendation. The most common reasons for not being screened were respondent's belief that it was not necessary (44% for endoscopy and 39% for mammography), no provider recommendation (22% for endoscopy), and cost (12% for endoscopy and 19% for mammography). Among unscreened respondents whose providers recommended endoscopy and mammography, 30% and 36%, respectively, believed that it was not necessary.

Conclusions. Many Montanans remain unaware of the importance of cancer screening. Health care providers and public health officials must increase patient education, and providers must continue to refer patients for screening. (*Am J Health Promot* 2009;24[1]:1–5.)

Key Words: Cancer Prevention, Screening Participation, Barriers. Manuscript format: research or brief research report; Research purpose: descriptive; Study design: survey; Outcome measure: behavioral; Setting: state of Montana; Health focus: medical self-care; Strategy: behavioral change; Target population: adult; Target population circumstances: Montana

PURPOSE

The Behavioral Risk Factor Surveillance System (BRFSS) provides population-based estimates of health care access and behaviors, including cancer screening participation.¹ Barriers to screening can be inferred by examining associations between screening participation and responses to questions about access to health care, but these inferences may not reflect barriers experienced by respondents.

Investigators have reported the following five main barriers to cancer screening: fear of the procedures,^{2,3} cost and lack of insurance,^{4–8} lack of access to services,^{4,9} lack of provider encouragement,^{10–14} and lack of awareness of the importance of screening.^{12,15–17} Previous studies focused primarily on national surveys^{4,5,7,16,17} or urban or suburban populations.^{2,3,6,10,13,14} Montana is a frontier state, defined by low population density and long distances to essential services, including health care.¹⁸ Distance and limited access to specialized screening facilities such as endoscopy or mammography may be especially pertinent in Montana and other rural states. To reach unscreened populations effectively, it is necessary to identify the barriers experienced by Montana residents.

METHODS

Design

The BRFSS is an anonymous, randomly dialed telephone survey conducted annually as a cooperative agreement between the Centers for Disease Control and Prevention (Atlanta, Georgia) and all 50 states, Washington, D.C., and three territories.¹ Montana interviews approxi-

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Table 1

Core Questions About Health Care Access and State-Added Questions About Endoscopy and Mammography Screening Participation, Montana Behavioral Risk Factor Surveillance System, 2007*

Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?

Do you have one person you think of as your personal doctor or health care provider?

Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?

About how long has it been since you last visited a doctor for a routine checkup? A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition.

Sigmoidoscopy and colonoscopy are exams in which a tube is inserted into the rectum to view the bowel for signs of cancer or other health problems. Has a health care provider ever recommended that you have a sigmoidoscopy or colonoscopy?

Have you ever had either of these exams?

If not, what is the main reason you have not had a sigmoidoscopy or colonoscopy?

- Does not apply to me / Do not feel I need it
- Doctor has not recommended it
- Fear of or aversion to the procedure
- Cost or lack of insurance coverage
- Distance to the facility
- Lack of transportation
- Inconvenient appointment hours
- Too long a delay for an appointment
- Too long a wait in the waiting room
- No access for people with disabilities
- Provider does not speak my language
- No specific reason
- Other, please specify

A mammogram is an x-ray of each breast to look for cancer. Has a health care provider ever recommended that you have a mammogram?

Have you had a mammogram within the past 2 years?

If not, what is the main reason you have not had a mammogram?

Response categories same as sigmoidoscopy and colonoscopy above.

* HMO indicates Health Maintenance Organization.

mately 6000 adult participants 18 years and older each year. Questions about health care access (having insurance coverage, having a personal health care provider, having a recent routine physical examination, and having experienced cost as a barrier to obtaining health care in the past year) are asked every year.

Measures

For the 2007 Montana BRFSS survey, state-added questions were adapted from prior surveys to elicit reasons for not having endoscopy or mammography (Table 1). Respondents were asked if a provider had recommended the procedures, if they had the procedures, and if not, why not. Interviewers were instructed to code the first reason volunteered by respondents into a preexisting category or to transcribe responses they could not code. Uncoded responses were reviewed and

99% were coded into a category. Respondents 50 years and older were asked about endoscopy, and women 50 years and older were asked about mammography.

Sample

The response rate for the 2007 Montana BRFSS as a whole was 65%. There were 3744 respondents (2230 women) 50 years and older to the 2007 survey; 3433 respondents (2029 women) had complete data for all variables included in the analysis.

Statistical Analysis

The data were analyzed using SAS¹⁹ (SAS Institute, Inc., Cary, North Carolina)–callable SUDAAN²⁰ (Research Triangle Institute, Research Triangle Park, North Carolina) to accommodate the complex sample design of the BRFSS. Univariate associations between health care access and screening

participation were assessed using χ^2 test. The joint effects of multiple independent predictors of screening participation were assessed using odds ratios (ORs) and 95% confidence intervals (CIs) generated by multiple logistic regression analysis. For logistic regression analysis, several factors (distance to facility, lack of transportation, inconvenient hours, delay for appointment, lack of access for persons with disabilities, and language barrier) were combined into a single category of accessibility, which in the aggregate accounted for less than 4% of responses for each procedure.

Education, income, and race/ethnicity were highly correlated with health care access responses. As a result, these sociodemographic variables did not achieve the minimum statistical significance ($p < .05$) to enter the logistic regression models and are not further considered in this analysis. Women who reported bilateral mastectomies were excluded from mammography analysis.

RESULTS

Most respondents reported having health care coverage (89%), a personal health care provider (81%), and a routine physical examination within 2 years (83%). Few experienced cost as a barrier to obtaining health care in the past year (8%). Forty-three percent had never had an endoscopy, and 20% of women had not had a mammogram within 2 years.

In univariate analysis, each question about health care access was significantly associated with ever having an endoscopy or having a recent mammogram ($p < .001$, χ^2 test) (Table 2). Provider recommendation was also significantly associated with ever having an endoscopy or having a recent mammogram ($p < .001$). Age older than 65 years was significantly associated with having an endoscopy ($p < .001$) but not with having a recent mammogram. Sex was not significantly associated with ever having an endoscopy.

Although health care access variables were highly intercorrelated, most had independent effects on the likelihood of screening participation in multivariate analysis (Table 3, model 1). Having health coverage, a personal

Table 2
Health Care Access Factors Associated With Endoscopy and Mammography Participation, Montana Behavioral Risk Factor Surveillance System, 2007

Independent Variable	Percentage (95% Confidence Interval)	
	Ever Had Endoscopy	Mammogram Within 2 Years
Total	56.3 (54.8–58.8)	79.8 (77.7–81.7)
Male	57.3 (54.1–60.4)	...
Female	56.4 (53.8–58.9)	79.8 (77.7–81.7)
Age 50–64 y	46.2 (43.5–49.0)	79.5 (76.6–82.2)
Age ≥65 y	73.7 (71.1–76.2)*	80.1 (76.9–82.9)
Have health care coverage	60.3 (58.1–62.3)	82.8 (80.7–84.7)
No health care coverage	28.0 (22.9–33.8)*	51.1 (42.6–59.6)*
Have regular care provider	62.3 (60.1–64.4)	85.1 (83.1–86.9)
No regular care provider	33.1 (28.7–37.8)*	47.7 (40.9–54.5)*
Experienced cost as barrier to care	41.2 (34.5–48.2)	64.7 (55.7–72.7)
Has not experienced cost as barrier	58.1 (56.0–60.2)*	81.1 (78.9–83.1)*
Routine health examination within 2 y	63.9 (61.7–66.0)	87.3 (85.4–89.0)
No health examination within 2 y	30.0 (25.7–34.8)*	35.4 (29.2–42.2)*
Provider has recommended procedure	80.3 (78.2–82.9)	84.0 (81.9–85.8)
Provider has not recommend procedure	13.3 (11.3–15.7)*	23.7 (16.5–32.7)*

* $p < 0.001$, χ^2 Test.

provider, and a physical examination within 2 years were statistically significant predictors of ever having an endoscopy or having a recent mammogram. Taking these variables into account, experiencing cost as a barrier to obtaining health care was not an independent predictor of screening participation.

Adding provider recommendation to the models resulted in modest changes in the effects of the other independent variables (Table 3, model 2). Provider recommendation was the strongest predictor of ever having an endoscopy (OR, 23.62; 95% CI, 18.42–30.28) or having a recent mammogram (OR, 10.87; 95% CI, 6.42–18.40).

Among participants who had not been screened, the most common reason given was the participant's belief that it was not necessary (44% for endoscopy and 39% for mammography). The second reason for not having an endoscopy was lack of provider recommendation (22%), and the third was cost (12%). The second reason for not having a mammogram was cost (19%), and the third was lack of provider recommendation (11%). For both endoscopy and mammography, each other reason (except "no specific reason" [11% for endoscopy and 17% for mammography]) was given by less than 3% of respondents. In the aggregate, less than 4% of those who had not had an endoscopy or a recent mammogram cited limitations of accessibility (distance, transportation, inconvenient hours, delays for appointments, poor access for persons with disabilities, or language barriers) as a reason for not having the procedures.

Among respondents who said that their provider recommended endoscopy but who had not been screened, 30% believed that it was not necessary. Cost was mentioned by 21% and fear of or aversion to the procedure by 14%. Among women who said that their provider recommended mammography but who had not been screened within 2 years, 36% believed that it was not necessary, and 19% cited cost.

Table 3
Multivariate Models of Endoscopy and Mammography Participation, Montana Behavioral Risk Factor Surveillance System, 2007

Independent Variable	Odds Ratio (95% Confidence Interval)			
	Endoscopy		Mammography	
	Model 1*	Model 2†	Model 1*	Model 2†
Male	1.28 (1.07–1.54)	1.42 (1.13–1.78)
Age ≥65 y	2.69 (2.24–3.23)	3.01 (2.39–3.80)	0.54 (0.40–0.74)	0.61 (0.44–0.85)
Have health care coverage	1.79 (1.20–2.46)	1.11 (0.72–1.71)	2.34 (1.46–3.74)	2.25 (1.34–3.79)
Have regular care provider(s)	2.08 (1.61–2.67)	1.23 (0.87–1.74)	3.34 (2.30–4.86)	2.49 (1.65–3.76)
Experienced cost as barrier to care	0.88 (0.62–1.23)	0.76 (0.49–1.17)	0.71 (0.41–1.23)	0.73 (0.41–1.30)
Routine health examination within 2 y	2.77 (2.13–3.60)	1.84 (1.31–2.59)	8.03 (5.58–11.56)	7.85 (5.32–11.56)
Provider has recommended procedure	...	23.62 (18.42–30.28)	...	10.87 (6.42–18.40)

* Model 1 includes sex, age group, having health care coverage, having one or more personal health care providers, and having had a routine physical examination within 2 years. Education, income, and race/ethnicity did not meet the minimum criterion ($p < 0.05$) for inclusion in the model.

† Model 2 includes sex, age group, having health care coverage, having one or more personal health care providers, having had a routine physical examination within 2 years, and having had a health care provider recommend the screening procedure. Education, income, and race/ethnicity did not meet the minimum criterion ($p < 0.05$) for inclusion in the model.

DISCUSSION

Based on questions about access to health care, it could be inferred that lack of insurance, experiencing cost as a barrier to obtaining care, and not having a personal health care provider or a recent physical examination are barriers to cancer screening participation in Montana. Although these factors were significantly associated with screening participation in univariate analysis, the strongest predictor of having either an endoscopy or a recent mammogram was provider recommendation.

When asked why they had not been screened, the most common reason respondents gave for both procedures was that they felt it was not necessary. For endoscopy, the second most common reason was that providers had not recommended screening. Even among respondents who said that their providers recommended screening, approximately one-third believed that they did not need endoscopy or mammography. Cost was cited by one-fifth of respondents whose providers recommended endoscopy or mammography. These results are consistent with previous studies²⁻¹⁷ of barriers to cancer screening, especially endoscopy for colorectal cancer screening.

The initial impetus for asking about barriers to colorectal and breast cancer screening was to determine if there were limitations of accessibility to specialized screening services such as endoscopy and mammography. Montana is a large and primarily rural and frontier state, with only one city with a population exceeding 100,000 and six cities with populations between 20,000 and 75,000.²¹ Only 35% of the state population lives in these cities; the remaining 65% live in small towns or rural and frontier areas characterized by long distances to medical services. Distance and other aspects of accessibility might be barriers for screening that require specialized facilities that are unequally distributed geographically. However, in the aggregate, only 4% of unscreened respondents cited distance, transportation, inconvenient hours, long waits for appointments, poor access for persons with disabilities, or language barriers as reasons for

SO WHAT? Implications for Health Promotion Practitioners and Researchers

The results of this analysis are consistent with those of other investigators who report that lack of awareness and lack of provider recommendation are the primary reasons for low cancer screening participation. This underscores the need for providers and public health practitioners to educate patients about the importance of these and other cancer screening behaviors and to refer patients for appropriate screening. Working with individuals to accept one screening test in an effort to improve preventive health care may lead to an overall shift in attitudes, making them receptive to other screening tests.

Further research should be conducted to examine knowledge, behavioral, and attitudinal correlates of cancer screening participation. For example, adults who exercise, maintain healthy weight, refrain from smoking, or are knowledgeable about cancer risks may be more likely to accept cancer screening than those individuals who do not practice such behaviors. Different strategies may be necessary for different groups of individuals based on these characteristics and behaviors. Examining sex differences in psychosocial variables such as knowledge, cancer-related beliefs, and cancer communication may suggest the use of sex-specific intervention strategies or messages to increase cancer screening participation.

As the public's awareness of the importance of screening increases, and as participation or the desire to participate in screening increases, other barriers such as cost or access to specialized and unequally distributed screening facilities may become more pertinent barriers. Therefore, ongoing investigation into the reasons for not being screened is also warranted.

not being screened. These results are consistent with the few other studies^{8,22,23} of cancer screening participation in rural areas, which report that

accessibility is not a stated barrier to participation and find that physician recommendation is the primary predictor of screening, just as it is in urban and suburban settings.

The low response rate of 65% for the 2007 Montana BRFSS is of concern when generalizing these conclusions to the entire state population. However, this response rate achieves the criterion considered statistically acceptable for the BRFSS.²⁴ A recent comparison of national BRFSS results (51% response rate) with those of the National Health Interview Survey (84% response rate) and the National Health and Nutrition Examination Survey (79% response rate) found good comparability of prevalence estimates among the three surveys, suggesting that the BRFSS remains an accurate survey system.²⁵

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