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ORIGINAL ARTICLE

# Prostate cancer screening and informed decision-making: provider and patient perspectives

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**The objective was to determine the extent of informed decision making for prostate cancer screening in a defined population. A state-wide population based survey of men aged 50 and above (Behavioral Risk Factor Surveillance System, 2004, Washington state) and a simple random sample of primary care physicians, were conducted in the same geographic area. We examined prostate cancer screening rates among the men (defined as either PSA or digital rectal examination within the past year) and prostate cancer screening practices among the physicians. Screening rates were 56% at ages 50–64, 68% at ages 65–79 and 64% among men age 80 and older. Adjusted analyses indicated that age, income, marital status, possessing health insurance and a personal health care provider, and talking with a provider about prostate cancer screening tests were all positively associated with screening status. In the physician survey, most physicians recommend screening to their average-risk male patients. Three-fourths (74%) of physicians discussed benefits and risks of PSA testing with their patients; but few used educational tools. Only 35% discussed the side effects of prostate cancer treatment with their patients. The rates of screening reported by men were relatively high, given that current recommendations promote informed decision making rather than universal screening. The majority of physicians recommend prostate cancer screening to their patients, with few decision-making tools used. All relevant information may not be provided in the discussion. These results point to the need for increasing informed decision making about prostate cancer screening.**
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**Keywords:** prostate screening; primary provider; decision-making

## Introduction

Prostate cancer is the most common form of cancer (excluding skin cancers) among men in the United States. In 2009, it is estimated that 218 890 new cases were diagnosed and that 27 050 men died from prostate cancer.[1] The two primary prostate cancer screening tests are the PSA test and digital rectal examination (DRE). PSA is a blood test and is publicly available at a reasonable cost (est $20–40 per test). DRE is a manual examination of the prostate through the rectum and is conducted as an additional examination for enlarged prostate. The primary goal of prostate cancer screening is to discover clinically significant disease early in the disease process in order to prevent morbidity and mortality through treatment.[2,3]

According to the United States Preventive Services Task Force and the American College of Preventive Medicine, there are currently insufficient data to recommend for or against routine screening among men at average risk of prostate cancer.[3–5] Instead, men are advised to learn about the benefits and risks of early detection modalities and match them with their values to make informed decisions about whether or not to undergo screening through a process of considering the issues and their own personal views and priorities.[4] Recommendations from the American Urological Association are that prostate cancer screening be 'offered' to age-eligible men; these guidelines also include language about discussing the risks and benefits and alignment of choices with personal values and goals with a physician before deciding whether to screen.[6] These recommendations indicate that prostate screening is not a simple choice and that men need to be supported in making informed decisions about whether to obtain screening.[7]

Decision making has been described as a process by which patients can consider relevant information and values to make decisions about procedures that are not medically recommended.[7] *Informed decision making* involves patients considering the pros and cons of a specific screening test and the resulting activities, considering the options together with personal values,

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and making a decision. An emphasis upon dialogue and collaboration between clinician and patient is called *shared decision making*.[8,9] Although shared decision making has been discussed since the early 1980's, it is relatively new in preventive cancer care. If we apply this model to decisions about prostate cancer screening, then communication and information exchange between patient and provider could be an important factor in the final decision to obtain testing.

Several variables have been noted in the literature to be related to the decision to obtain prostate cancer screening, including personal and individual variables such as knowledge and broader social ecological variables, such as institutional and provider variables.[10] For example, prostate check up and symptom knowledge was low in both African American and Caucasian men.[11] Beliefs varying by culture and ethnicity of surveyed men were important in how they approached prostate cancer screening and treatment.[12] These data indicate that men without information and ways to make sense of that information are at risk for being unable to make an informed decision about whether to get screened for prostate cancer. The other half of the relationship, the interaction with provider, is also important, in that access to a provider was a key variable in predicting prostate cancer screening, independent of demographic variables.[11] The provider has an important role in screening decisions; provider communication style, provider encouragement and provider sharing information with the patient all were significantly and positively related to screening.[10] Providers often have knowledge and attitudes that influence their abilities to assist patients in medical decisions. Unfortunately, discussions about decisions do not happen as frequently as desired; patients do not report accurate and extensive conversations with their provider about screening.[13] These data point to the need to identify both patient- and provider-level variables that help us understand how and why men receive prostate cancer screening.

The purpose of the present study is to identify and compare the prostate cancer screening behaviors of patients and providers in a similar geographic area. We were able to examine state-wide survey data on men's self reports of screening and data from primary care physicians in Washington state. This comparison will perhaps shed light on the similarities and differences in the views of these two groups and will provide direction for future intervention to improve the shared decision-making process.

## Study 1

### *Patient reports of prostate cancer screening*

*Methods. Survey procedures*: We used data from the Washington State Behavioral Risk Factor Surveillance System (BRFSS), a collaborative project of the Centers for Disease Control and Prevention (CDC) and US states and territories. The BRFSS is an ongoing data collection program designed to measure behavioral risk factors in the adult population (18 years of age or older) living in households, via a telephone survey of a probability sample of all households with telephones in the state. The interviewing process used computer-assisted telephone interviewing. Interviewer performance was monitored for quality. Telephone interviewing was conducted during each calendar month, and calls were made 7 days per week, during both daytime and evening hours. Standard procedures were followed for rotation of calls over days of the week and times of day. BRFSS procedural rules are described on their website.[14,15] The response rate using CASRO methods was 43%, with a cooperation rate of 69%.

*Survey data*: We conducted analyses on the prostate cancer screening module of the BRFSS data for 2004, focusing on prevalence rates for current prostate cancer screening (defined as PSA screening, and/or DRE screening within the past year). All men ages 40 and over were asked whether they had ever had PSA or DRE, and if yes, when the most recent test occurred. These items are part of the BRFSS core cancer screening measures and were developed and tested at CDC. Men were also asked whether they had ever discussed prostate cancer screening tests with their health care provider. This item was developed and pre-tested by the Washington State Department of Health BRFSS team. Due to current guidelines for average-risk men, we restricted our analysis to men age 50 and older.

Analyses presented in this report were performed using SUDAAN 9.0, (Research Triangle Institute, NC, USA) so that we could account for the BRFSS' sample design and weighting and obtain rates representative of Washington's population (Washington also conducts the BRFSS with a much larger sample than most states: even restricting our analyses to men age 50 and older, our analyses include 2840 men). Prevalence estimates were calculated using the 'final weight' calculated for each participant. The final weight indicates the number of people in the Washington population of men ages 50 and older represented by each observation. Participants with 'don't know' or 'refused' responses were excluded from analyses.

Prevalence rates and confidence intervals were calculated (a) overall, (b) by age, (c) by race, (d) by education level, (e) by income level, (f) by marital status, (g) by rural/urban commuting area, (h) by insurance coverage, (i) by whether participants had a personal health care provider and (j) by whether participants had talked with their provider about prostate cancer screening tests. We then conducted multivariate logistic regression models, with current prostate cancer screening as the outcome variable. We calculated adjusted prevalence ratios from the odds ratios, using Zhang and Yu's methods for calculating risk and prevalence ratios from multivariate analyses of common behaviors.[15]

*Results*

A total of 1680 men, or 59.63%, reported current prostate screening. Table 1 presents prostate screening rates by demographic group. Men with household incomes $<$\$20 000 per year and between \$20 000 per year and \$49 000 per year were less likely to have current prostate cancer screening than men with the highest household incomes. Widowed men were less likely to report prostate cancer screening than coupled men. The majority of men in this sample did possess health insurance of some kind; men with insurance were much more likely to be screened than men without any

**Table 1** BRFSS 2004: current prostate cancer screening via PSA and/or DRE in past year; unadjusted rates and adjusted odds ratios from multiple logistic regression among men age 50 and older ($N = 2840$)

| *Characteristic* | *Men ⩾50 years old* | *Unadjusted screening rate (95% CI)* | *Adjusted prevalence ratio (95% CI)* | P *value* |
|---|---|---|---|---|
| *Age group* | | | | |
| 50–64 | 1688 | 55.51 (52.46–58.53) | 0.86 (0.71–1.00) | 0.05 |
| 65–79 | 896 | 68.02 (64.11–71.69) | 1.04 (0.90–1.16) | 0.55 |
| ⩾80 | 256 | 64.24 (56.71–71.12) | REF | — |
| *Race/ethnicity* | | | | |
| White | 2588 | 60.30 (57.88–62.68) | REF | — |
| African American | 30 | 47.64 (28.60–67.39) | 0.88 (0.53–1.21) | 0.52 |
| Asian/Pacific Islander | 31 | 59.71 (39.84–76.83) | 1.07 (0.69–1.37) | 0.70 |
| American Indian/Alaska Native | 32 | 47.99 (26.49–70.26) | 1.02 (0.67–1.30) | 0.93 |
| Hispanic | 78 | 53.04 (38.58–67.01) | 1.04 (0.78–1.27) | 0.75 |
| Other/multiracial | 81 | 56.28 (41.91–69.67) | 0.98 (0.72–1.22) | 0.88 |
| *Annual household income* | | | | |
| <$20 000 | 359 | 47.97 (40.60–55.43) | 0.95 (0.80–1.09) | 0.54 |
| $20 000–$49 999 | 1280 | 56.02 (52.53–59.45) | 0.91 (0.82–0.99) | 0.03 |
| ⩾$50 000 | 1201 | 64.79 (61.39–68.04) | REF | — |
| *Education* | | | | |
| <High school | 188 | 43.64 (34.74–52.98) | 0.85 (0.68–1.02) | 0.09 |
| High school graduate | 615 | 57.70 (52.30–62.93) | 1.02 (0.91–1.13) | 0.65 |
| Some college | 768 | 58.83 (54.37–63.15) | 1.01 (0.91–1.10) | 0.78 |
| College graduate | 1269 | 62.76 (59.38–66.02) | REF | — |
| *Marital status* | | | | |
| Married/couple | 1914 | 62.61 (59.91–65.23) | REF | — |
| Divorced/separated/never married | 676 | 48.61 (43.54–53.72) | 0.91 (0.81–1.01) | 0.10 |
| Widowed | 250 | 53.00 (44.75–61.10) | 0.83 (0.67–0.99) | 0.04 |
| *Rural/urban residence* | | | | |
| Urban | 1309 | 60.36 (57.21–63.43) | REF | — |
| Large town | 365 | 61.20 (55.29–66.79) | 1.02 (0.90–1.14) | 0.69 |
| Small town | 405 | 57.15 (51.56–62.57) | 0.98 (0.86–1.09) | 0.70 |
| Rural | 723 | 60.82 (42.43–76.58) | 0.92 (0.81–1.04) | 0.21 |
| *Health insurance* | | | | |
| Any | 2618 | 61.91 (59.51–64.25) | REF | — |
| None | 222 | 30.05 (22.70–38.59) | 0.79 (0.63–0.96) | 0.01 |
| *Personal doctor* | | | | |
| Yes | 2495 | 63.84 (61.40–66.21) | REF | — |
| No | 345 | 27.52 (22.02–33.80) | 0.58 (0.45–0.70) | 0.01 |
| *Talked with Doctor about screening* | | | | |
| Yes | 1714 | 69.87 (67.15–72.45) | REF | — |
| No | 1126 | 43.30 (39.58–47.09) | 0.69 (0.61–0.76) | 0.01 |

Abbreviations: 95% CI, 95% confidence interval; BRFSS, Behavioral Risk Factor Surveillance System; DRE, digital rectal examination; REF, reference value.
Note: adjusted prevalence ratios are from the model adjusted for all variables shown. Current screening was defined as PSA test and/or digital rectal examination within the past year.

insurance. Similarly, most of the men reported that they had a personal doctor and were more likely to report screening if they had a personal doctor. More than half of the men had spoken with their health care provider about a prostate cancer screening test, and these men were much more likely to be screened than men who had not had this discussion with their healthcare provider. However, a significant minority of men who had not discussed screening tests with their healthcare provider (43.30%) reported either a PSA test or a DRE in the past year.

Table 2 presents the associations between background variables and reported talking with providers about prostate screening. Men with lower education and income report lower frequency of talking to their providers. Having a personal provider was related to talking to a provider about prostate screening.

## Study 2

*Provider reports of prostate screening recommendations*

*Methods. Sample*: The authors obtained a mailing list of primary care physicians in Washington state from the Washington State Medical Association. This mailing list included physicians from the following specialties: family practice, general practice, internal medicine and obstetrics/gynecology (physicians identifying obstetrics/gynecology as their specialty did not answer

**Table 2** BRFSS 2004: speaking with a health care provider about prostate cancer screening tests; unadjusted rates and adjusted odds ratios from multiple logistic regression among men age 50 and older ($N = 2840$)

| *Characteristic* | *Men ⩾50 years old* | *Unadjusted screening rate (95% CI)* | *Adjusted prevalence ratios (95% CI)* | P *value* |
|---|---|---|---|---|
| *Age group* | | | | |
| 50–64 | 1688 | 59.42 (56.38–62.39) | 0.90 (0.74–1.05) | 0.19 |
| 65–79 | 896 | 66.30 (62.36–70.03) | 1.06 (0.91–1.19) | 0.42 |
| ⩾80 | 256 | 61.61 (53.97–68.71) | REF | — |
| *Race/ethnicity* | | | | |
| White | 2588 | 61.99 (59.57–64.36) | REF | — |
| African American | 30 | 57.69 (36.90–76.08) | 1.09 (0.77–1.33) | 0.56 |
| Asian/Pacific Islander | 31 | 66.28 (46.03–81.91) | 1.11 (0.78–1.36) | 0.47 |
| American Indian/Alaska Native | 32 | 41.18 (20.88–65.02) | 0.84 (0.49–1.18) | 0.39 |
| Hispanic | 78 | 56.26 (41.53–69.97) | 1.09 (0.82–1.30) | 0.51 |
| Other/multiracial | 81 | 56.27 (41.96–69.61) | 0.92 (0.66–1.15) | 0.52 |
| *Annual household income* | | | | |
| <$20 000 | 359 | 44.76 (37.56–52.18) | 0.79 (0.65–0.92) | 0.01 |
| $20 000–$49 999 | 1280 | 55.77 (52.27–59.21) | 0.84 (0.76–0.92) | 0.01 |
| ⩾$50 000 | 1201 | 69.32 (66.01–72.43) | REF | — |
| *Education* | | | | |
| <High school | 188 | 37.56 (28.97–47.00) | 0.63 (0.48–0.80) | 0.01 |
| High school graduate | 615 | 53.01 (47.70–58.25) | 0.84 (0.75–0.94) | 0.01 |
| Some college | 768 | 59.61 (55.11–63.95) | 0.92 (0.83–1.00) | 0.06 |
| College graduate | 1269 | 68.84 (65.51–71.99) | REF | — |
| *Marital status* | | | | |
| Married/couple | 1914 | 63.51 (60.82–66.12) | REF | — |
| Divorced/separated/never married | 676 | 53.58 (48.42–58.66) | 1.01 (0.91–1.10) | 0.85 |
| Widowed | 250 | 58.46 (50.10–66.36) | 0.97 (0.82–1.11) | 0.68 |
| *Rural/urban residence* | | | | |
| Urban | 1309 | 63.46 (60.32–66.49) | REF | — |
| Large town | 365 | 60.44 (54.53–66.06) | 0.97 (0.85–1.07) | 0.54 |
| Small town | 405 | 56.22 (50.58–61.70) | 0.92 (0.81–1.02) | 0.12 |
| Rural | 723 | 56.78 (51.36–62.05) | 0.94 (0.83–1.04) | 0.23 |
| *Health insurance* | | | | |
| Any | 2618 | 63.05 (60.66–65.38) | REF | — |
| None | 222 | 41.20 (32.96–49.97) | 0.97 (0.80–1.12) | 0.69 |
| *Personal doctor* | | | | |
| Yes | 2495 | 64.94 (62.51–67.29) | REF | — |
| No | 345 | 35.16 (29.07–41.77) | 0.58 (0.47–0.71) | 0.01 |

Abbreviations: 95% CI, 95% confidence interval; BRFSS, Behavioral Risk Factor Surveillance System; REF, reference value.
Note: adjusted prevalence ratios are from the model adjusted for all variables shown. Dependent variable was whether men had ever discussed prostate cancer screening tests with their health care provider.

survey questions about prostate cancer screening and will not be discussed further). The list included names and contact information for 5125 physicians practicing in Washington state. Power calculations revealed that a sample of 700 physicians (assuming a 70% response rate) would have sufficient power to estimate physicians' screening knowledge, attitudes and behaviors with confidence intervals of ±5%. A simple random sample of 700 names was drawn from this list with a random number generator.

*Procedures*: Gilmore Research Group (GRG), a survey research company that conducts quantitative and qualitative research studies, administered the survey in November and December 2004. All physicians in the sample received a notification letter via fax; this letter described the survey and explained that a survey package would arrive the following day in an overnight-mail envelope. The survey package included: a cover letter explaining the survey, the survey itself, a check for $50.00 as an incentive to participate and a prepaid overnight return envelope.

Physicians had the option to complete the survey by using the paper copy mailed to them, or by using an online version available on the World Wide Web (the cover letter included access information). GRG mailed reminder postcards to physicians who had not yet completed the survey at 2 and 4 weeks post the initial mailing. Physicians who had not completed the survey after a month received telephone follow-up. The procedures and survey were reviewed by the Washington State Institutional Review Board before fielding the survey.

*Survey questionnaire*: The survey questionnaire included four sections: (1) recommendations for colon cancer screening, (2) colon cancer screening performance and follow-up, (3) practice and personal characteristics and (4) prostate cancer screening practices (Sections 1 and 2 are not relevant to this paper and will not be

described further). The prostate cancer screening section of the survey included items measuring physicians' current recommendations for prostate cancer screening, and several items assessing whether risks and benefits associated with screening are discussed with patients, and whether informational tools are used during the discussion (brochures and so on). These items were adapted from a survey of providers in the literature or created by the study team.[16]

The Washington Comprehensive Cancer Control Partnership Prostate Cancer Task Force (which includes cancer survivors, academics, physicians and members of community organizations) provided feedback on early drafts of the survey questionnaire and suggested additional items. GRG pre-tested the survey with four physicians; they all found the survey questionnaire easy to understand and were able to complete it in 10–15 min. Their comments were incorporated into the final version of the survey questionnaire (available from the authors on request).

*Statistical analyses*: We used descriptive statistics and contingency tables with $\chi^2$-tests to analyze physicians' screening knowledge, attitudes and practices. These analyses were stratified by the primary care specialties included in the study. We also conducted a multivariate logistic regression analysis to determine which physician characteristics are associated with good informed decision making practice for PSA testing. As in Study 1, we calculated adjusted prevalence ratios and present these in place of odds ratios.

### *Results*

*Response rate.* Of the 700 physicians in the sample, 92 (13%) were not eligible to participate (most commonly due to not having an active practice or not self-identifying as a primary care physician) and 53 (8%) were not reachable at the contact information provided in the mailing list. Of the 555 remaining physicians, 397 completed the survey, 11 refused and 147 did not respond, resulting in a response rate of 69% (assuming that all non-responders were eligible; dividing non-responders into eligible and ineligible categories resulted in a 74% response rate). Most of the participants (351; 88%) completed the paper survey. The remaining 46 participants (12%) completed the survey online (analyses revealed only minor differences in physician responses by survey mode).

*Physician sample characteristics.* Most of the physicians in the survey were family practitioners ($N = 214$). Very few physicians described their specialty as general practice ($N = 15$), and these were grouped with family practitioners for all analyses. The other physicians described their specialty as internal medicine ($N = 116$), resulting in a final sample of 345 physicians (excluding the 52 obstetrician/gynecologists who completed the survey, but not the prostate screening items). Most of these physicians were in single-specialty practices (64%), with most physicians (82%) in urban locations.

Most of the physicians were male (69%) and white (83%). Time since completing medical school was fairly evenly distributed, with 15% completing medical school less than 10 years ago, 32% completing 10–19 years ago, 33% completing 20–29 years ago and 20% completing 30 or more years ago.

*Physician recommendations and informed decision-making practices.* Most of the physicians reported recommending DRE (90%) and PSA (83%) to average-risk male patients. Most physicians recommended beginning testing during the mid-forties (*M* start age = 45 for DRE and 48 for PSA). Only 37% of physicians reported that they stopped performing DRE at a given age (*M* stop age = 79 years), and 52% reported stopping PSA (*M* stop age = 78 years). Most of the physicians (74%) reported that they 'always or almost always' discuss the risks and benefits of PSA testing; about half (52%) reported that they always/almost always discuss risks and benefits of prostate cancer screening when they perform DRE. Very few physicians (10%) reported always using any materials to discuss prostate cancer screening. Physicians were most likely to report use of written materials, with 37% reporting use of written materials sometimes and 9% always or almost always. Very few physicians used videotapes and websites.

Table 3 summarizes physicians' reports of the topics they address when discussing PSA tests. Physicians were likely to report discussion of issues about the PSA test's performance characteristics, such as efficacy in detecting prostate cancer and the possibility of false-positive results (64% 'very likely' to discuss). Most physicians did not report discussion of 'downstream' issues, such as the possible side effects of treatment for prostate cancer (35% 'very likely' to discuss).

About half of the physicians (55%) collect family history information for prostate cancer for 75% or more of their male patients. Given that family history is a significant risk factor for prostate cancer and should inform individual men's prostate cancer screening decisions, it is surprising that many physicians do not routinely collect this information from their patients.

*Associations with prostate cancer screening best practices.* For these analyses, we defined best practice as always or almost always discussing the risks and benefits of prostate cancer screening when deciding whether to order PSA, because of the clinical guidelines (for example, American Cancer Society[2] and American Urological Association[6]). In this sample of primary care physicians, 74% reported always or almost always using best practices, with 21% sometimes and 5% rarely or never using best practices.

Table 4 presents use of best practices for prostate cancer screening by physician background and characteristics. Physician specialty was the only characteristic associated with best practice in this model. Family practitioners were more likely to always discuss risks and benefits than internal medicine physicians.

## Discussion

Most men are screened, and more men are screened for prostate cancer than for colorectal cancer (total screening rate with either PSA or DRE = 59.63%; only 55.89% of

**Table 3** Proportion of physicians reporting issues they discuss when deciding whether to order PSA tests

| | *Family practice* (N = *229*) | *Internal medicine* (N = *116*) |
|---|---|---|
| Efficacy of PSA in detecting prostate cancer | 68.42% (62.08–74.15) | 53.91% (44.74–62.83) |
| Efficacy of PSA in reducing mortality from prostate cancer | 56.39% (49.84–62.72) | 52.63% (43.44–61.65) |
| PSA may prompt further tests that may not reveal cancer | 65.79% (59.37–71.68) | 59.48% (50.29–68.05) |
| Anxiety may occur while waiting for results or taking more tests | 32.89% (27.08–39.28) | 24.14% (17.19–32.78) |
| Prostate cancer may not cause significant morbidity if untreated | 55.95% (51.82–62.30) | 59.48% (50.29–68.05) |
| Efficacy of treatment options for prostate cancer | 35.68% (29.70–42.15) | 34.78% (26.62–43.95) |
| Possible side effects of treatments for prostate cancer | 34.36% (28.45–40.80) | 35.65% (27.41–44.84) |

Note: 95% confidence intervals in parentheses. Percentage reflect physicians saying they 'always or almost always' discuss the issue. Remaining response options were 'unlikely' and 'somewhat likely' to discuss. Physicians' responses were approximately equally divided across the three response options for discussing treatment efficacy and side effects of treatment for prostate cancer, and anxiety that may occur while waiting for results. For other issues, the majority of responses (80% or more) fell into either 'somewhat likely' or 'very likely' to discuss.

**Table 4** Associations between physician characteristics and prostate cancer screening informed decision-making best practice

| *Characteristic* | *Physician* N | *Unadjusted best practice rate (95% CI)* | *Adjusted prevalence ratio (95% CI)* | P *value* |
|---|---|---|---|---|
| *Specialty* | | | | |
| Family/general practice | 229 | 78.41 (72.49–83.52) | REF | REF |
| Internal medicine | 116 | 64.04 (54.51–72.81) | 0.81 (0.64–0.95) | 0.01 |
| *Practice type* | | | | |
| Single specialty | 218 | 75.00 (68.67–80.63) | 0.98 (0.80–1.12) | 0.81 |
| Multiple specialty | 124 | 71.54 (62.72–79.31) | REF | REF |
| *Practice location* | | | | |
| Urban | 283 | 73.84 (68.26–78.89) | REF | REF |
| Rural | 62 | 72.58 (59.77–83.15) | 0.97 (0.77–1.12) | 0.70 |
| *Physician sex* | | | | |
| Male | 239 | 72.88 (66.73–78.45) | REF | REF |
| Female | 105 | 75.00 (65.55–82.97) | 1.04 (0.87–1.17) | 0.62 |
| *Time since medical school* | | | | |
| <10 years | 50 | 74.00 (59.66–85.37) | REF | REF |
| 10–19 years | 111 | 70.00 (60.52–78.37) | 0.96 (0.71–1.14) | 0.69 |
| 20–29 years | 114 | 79.46 (70.80–86.51) | 1.08 ( 0.86–1.22) | 0.44 |
| 30+ years | 68 | 70.15 (57.73–80.72) | 0.96 (0.68–1.16) | 0.76 |

Abbreviation: 95% CI, 95% confidence interval; REF, reference value.
Note: physicians were counted as using best practice if they indicated that they 'always or almost always' discussed the risks and benefits of PSA with patients before ordering the test. Adjusted prevalence ratios and *P*-values are from the model including all characteristics.

this sample reported fecal occult blood test in the past year, flexible sigmoidoscopy in the past 5 years, or colonoscopy in the past 10 years). This is concerning, considering the conflicting recommendations for prostate cancer screening and the lack of recommendations to screen by most recommending bodies. Reports of screening follow the demographic patterns presented in the literature in other studies, in that low income and minority men in general are screened less. In addition, these disadvantaged men report talking with their provider about prostate cancer screening less frequently than do men with more resources, indicating a possible mechanism for differences in screening rates.

How does this relatively high screening rate match with the recommendation from the provider? It seems that men are getting screened, in part, because providers are recommending the screening. The rates of provider recommendations, according to provider reports, are quite high and are one possible cause of screening in the majority of men. A higher proportion of general internists recommended screening, suggesting that guidelines might be better known among internal medicine physicians. On the other hand, family practice physicians are more likely to discuss the risks and benefits of PSA tests with their patients.

The second disturbing finding is that providers don't use decision-making materials or aids when providing recommendations to patients. The simple recommendation from providers to get screened (without cautions and caveats) might be the reason for the high rate of screening reported in men. The process of shared decision making is complex, and most providers report lack of skills and knowledge for this process.[17] Furthermore, most physician visits are very brief, and physicians may find the time required to explain the risks and benefits of PSA testing prohibitive. Using shared decision-making tools and materials might help, although few providers currently do so. A sizable number of men report obtaining prostate screening without discussing it with their physician. From our data we do not have a clear picture of how screening is obtained in this situation, but the patients could have been simply saying that no decision-making discussions occurred when they requested or were offered screening.

Of particular note is the relatively high screening rate among men over 80, higher than for the youngest men in

our sample. This relatively high proportion of older men who are obtaining screening is in contrast to the recent debates about the appropriateness of considering life expectancy when screening older men.[18] Given that the minor burden of screening is often followed by more invasive tests and treatments, we should consider whether screening for prostate cancer that is not likely to result in mortality is wise at older ages.

There are several limitations to the present study that somewhat curtail its applicability to a larger population. First, the response rate to the BRFSS is problematic at 43%, bringing the potential for selection bias in the survey and calling into question the representativeness of the existing responses. Second, the providers sampled are not a direct match for the patients surveyed, and this would have made for stronger conclusions about the role of providers in screening for prostate cancer. Third, these data are bounded by geography and time, and therefore might not be relevant to other settings.

Where shall we go from here? We are far from meeting the recommendations that discussions about the risks and benefits of prostate cancer screening occur between patient and provider before deciding whether to obtain prostate cancer screening. Providers must be better engaged in the framing of prostate cancer screening as a decision, not a conclusion. National policy guidelines indicate that prostate cancer screening needs to be approached as a decision of the patient, not as a goal for patient behavior. So, continuing to work with physicians to improve their decision-facilitating skills with patients is one direction. Physicians are faced with an increasing array of new screening and treatment options that have complicated risks and benefits, so increased skills in shared decision making should serve them well beyond the topic of prostate cancer screening.

Wide provision of existing tools and materials to help in the decision-making process might be another direction for future research. Creating opportunities for patients to learn the facts about prostate screening outside of the provider visit might make that visit more productive and useful to both physician and provider. These tools range from complicated written packages available online from home, to paper guides that can be distributed by physicians at their offices (for example, CDC guides), to easy-to-use electronic tools that could be installed in provider offices to be used before a visit. These tools might be an efficient way to increase the shared decision-making activities that occur about prostate cancer screening without creating extra burden for primary health care providers.

## Conflict of interest

The authors declare no conflict of interest.

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