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## Prostate cancer screening and health care system distrust in Philadelphia

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### Abstract

**Objective**—We aim to examine whether distrust of health care system (hereafter distrust) is associated with prostate cancer screening and whether different dimensions of distrust demonstrate similar relationships with prostate cancer screening.

**Method**—With data on 1,784 men aged 45–75 from the Philadelphia metropolitan area, we first applied factor analysis to generate factor scores capturing two distrust sub-scales: competence and values. We then implemented logistic regressions to estimate the relationships between distrust and prostate cancer screening, controlling for covariates related to demographics (e.g., race and age), socioeconomic status (e.g., poverty status and education), health care resources (e.g., insurance status), and health status (i.e., self-rated health).

**Results**—Without considering any other covariates, both competence and values distrust were negatively associated to the receipt of prostate cancer screening. After accounting for other covariates shown above, values distrust remained negatively associated with the odds of receiving prostate cancer screening (OR=0.89, 95% CI=[0.81, 0.98]) but competence distrust was not a significant predictor.

**Conclusions**—Values distrust was independently associated with prostate cancer screening. Macro-level change in the health care system may influence men's health behaviors. Our findings suggested that efforts to make the health care system more transparent and enhanced communications between men and health providers may facilitate prostate cancer screening.

### Keywords

Prostate cancer screening; health care system distrust; Philadelphia

### Introduction

Prostate cancer is a major threat to men's health. It is the most commonly found cancer and the second leading cause of cancer deaths among American men. In 2010 more than 210,000 new patients were diagnosed and approximately 32,000 men died of prostate cancer (Jemal, Siegel, Xu, & Ward, 2010). Recent data reveal that prostate cancer screening rate has

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increased since 1995 in the US (Farwell, Linder, & Jha, 2007) and hence more attention has been paid to the exploration of the correlates of taking prostate specific antigen (PSA) and/or digital rectal examination (DRE). However, the effect of prostate cancer screening on reducing mortality is debated and remains controversial (Andriole et al., 2009; Schröder et al., 2009). There is no evidence that PSA testing prolongs survival or prevents morbidity (Albertsen, 2006; Lin, Lipsitz, Miller, & Janakiraman, 2008) and therefore many men in the U.S. may be screened without clear benefits, and exposed to risk of overtreatment. Given that the contexts for weighing the risks and benefits of PSA screening is highly individualistic, men aged between 45 and 75 (life expectancy greater than 10 years) are encouraged to discuss the potential benefits, harms, and limitations associated with PSA and DRE with their health providers so that an informed decision about testing is made (U.S. Department of Health and Human Services, 2010; Xu, Kochanek, Murphy, & Tejada-Vera, 2010), and men at high risk of having prostate cancer (e.g., family history), the discussion should begin at age 40 (Smith, Cokkinides, & Brawley, 2009). The American Cancer Society (ACS) Prostate Cancer Advisory Committee concluded that it is inappropriate for clinicians to recommend testing to all men, or to avoid screening or discourage discussing testing (Smith et al., 2009). As a result, gaining access to PSA and/or DRE screening is likely a complex process that requires scrutiny by the provider and willingness of the informed patient to be screened, ideally when it has been determined that screening will produce an overall benefit for that patient given the risks and limitations of the tests.

Previous research found several factors associated with the decision making process regarding prostate cancer screening. Specifically, the frequency and/or odds of prostate cancer screening vary by socioeconomic and demographic features, such as income (Consedine, Morgenstern, Kudadjie-Gyamfi, Magai, & Neugut, 2006; Richardson, Aronson, James, McGregor, & Bryant, 2007), education (Wallner et al., 2008), marital status (Meiser et al., 2007; Wallner et al., 2008), age (Farwell et al., 2007; Odedina et al., 2004; Richardson et al., 2007), and race/ethnicity (Consedine et al., 2006; Farwell et al., 2007; Steele, Miller, Maylahn, Uhler, & Baker, 2000). Access to health care resources and self-rated health status also have been identified as important correlates of receiving PSA or DRE (Consedine et al., 2007).

In contrast to the socioeconomic, demographic, and the health care accessibility issues, an individual's cognitive and attitudinal characteristics may be modifiable through intervention and as such have drawn increasing attention from prostate cancer researchers (Consedine, Christie, & Neugut, 2009). This knowledge stream can be traced back to the health belief model (Maiman & Becker, 1974), which has been utilized in recent prostate cancer screening research. For example, fear of screening and worrying about cancer are associated with prostate cancer screening frequency (Consedine, Adjei, Ramirez, & McKiernan, 2008). Furthermore, attitudes toward prostate cancer (e.g., efficacy and knowledge of prostate cancer treatment) are associated with the use of PSA and DRE (Consedine et al., 2007). Support for cognitive and attitudinal factors has been observed in qualitative research. Based on interviews, a trusting relationship with health providers (e.g., personal physician) (Jones, Steeves, & Williams, 2009) and distrust of the medical community (e.g., health care system) (Sanchez, Bowen, Hart, & Spigner, 2007) have been associated with prostate cancer screening. Several researchers have emphasized the role of health providers in the prostate cancer screening decision making process (Consedine et al., 2008; Pandhi, Guadagnolo, Kanekar, Petereit, & Smith, 2010); however, the importance of distrust of the medical community has been underexplored.

Expanding the scope of identifying the correlates of cancer screening behaviors to cognitive or attitudinal factors provides practitioners with viable approaches to improve screening uptake (Consedine, Magai, Horton, Neugut, & Gillespie, 2005). The distrust in services

industries implies that the business or services provided by the system would be self serving and not conducted solely in the best interest of the individual client or consumer (Hall, Dugan, Zheng, & Mishra, 2001). Recently, distrust of the health care system (hereafter distrust) has been identified as a dual-dimension construct, namely *values* and *competence* distrust (Shea et al., 2008). These dimensions distinguish distrust specific to the values of the health care system perceived to promote patients' health from distrust related to medical technology or capacity to maintain or promote health. Applying the distrust concept to the case of prostate cancer screening, without universal policies based on age, or other objective qualities, both dimensions of distrust may be key and logical correlates of receipt of PSA/DRE testing. More specifically, an individual's values distrust may prevent him from engaging in the discussion of taking PSA/DRE testing with the health providers and hence discourages prostate cancer screening. Similarly, even after discussing with his physician, a man with high competence distrust may opt not to take prostate cancer screening tests because of the lack of confidence in the technology and ability of the health care system.

The goal of this study is to contribute to the literature on prostate cancer screening by investigating the importance of individual's distrust of health care system (both values and competence) in the use of PSA/DRE testing among men aged 45–75 and to understand if distrust is associated with prostate cancer screening after taking patient demographic, health care access and health status into account.

A theoretical confounder of the relationship between distrust and health care receipt is not having regular access to a provider, or to a health care practice. Potentially, lack of access might foster distrust by limiting interactions with health care practices or to interaction continuity with providers; people with low access to health care may also have low awareness of prostate cancer screening and the risk for prostate cancer. Therefore, one empirical question specific to this study is whether an association of PSA/DRE screening with health care system distrust could operate through an individual not taking the PSA/DRE examinations because he feels taking these tests benefits the health care system (e.g., is revenue generating) more so than his own health.

This study aims to test two primary hypotheses. First, we hypothesize that men with high distrust of the health care system are less likely to receive prostate cancer screening than counterparts with low distrust and this relationship is independent of explanatory covariates, such as patient access to health care resources. Second, two empirical factors of distrust—values and competence distrust—will each be negatively associated with the likelihood of having a PSA/DRE test.

## Methods

### Data Source

Men over 45 with a life expectancy greater than 10 years may benefit most from PSA/DRE tests (Calonge et al., 2008; Smith et al., 2009). In this study we used data on men 45–75 ( $n = 1,784$ ) in the Philadelphia Health Management Corporation's (PHMC) 2008 Southeastern Pennsylvania Household Health Survey. Using computerized telephone random digit dialing and a stratified sampling framework, the biannual survey ensured representation from the five counties in the Philadelphia metropolitan area (PHMC, 2008). Though the response rate for the PHMC was not high (25%) (American Association for Public Opinion Research (AAPOR), 2004), these data have been found to be valid and reliable. For example, the socioeconomic and race/ethnic compositions of the PHMC study area closely matched those reported in the American Community Survey 3-year estimate 2006–2008 (U.S. Census Bureau, 2009) and the percentage of population reporting fair/poor health in the PHMC mirrored the Behavioral Risk Factor Surveillance System (BRFSS) 2008 Philadelphia data

(Centers for Disease Control and Prevention, 2008). Moreover, recent studies have challenged the conventional idea that a high response rate is necessary for quality surveys (Holbrook, Krosnick, & Pfent, 2007; Keeter, Kennedy, Dimock, Best, & Craighill, 2006). In order to adjust for sampling bias, the PHMC survey provided users the balancing weight that gives additional weight to underrepresented populations and reduces weight to overrepresented groups. The balancing weight was recommended as it retains the sample size of the survey and representativeness of the population in the study area (PHMC, 2008).

### Statistical Analysis

We were interested in whether respondents utilized prostate cancer screening in the recommended time interval. The PHMC asked men “How long has it been since you last had a PSA test or rectal exam for prostate cancer?” The PHMC divided the responses into “one year or less,” “1–2 years,” “2–5 years,” “5–10 years,” “more than 10 years,” and “never.” As the ACS recommends that health care providers should discuss the benefits and limitations of prostate cancer screening with men every year (Smith et al., 2009), we coded as 1 those reporting “one year or less” as having received prostate cancer screening in the recommended time, with all others coded 0. The analysis used logistic regression to model the likelihood of having prostate cancer screening in the past year (Agresti, 2002). Variance inflation factors (VIFs) were used to detect multicollinearity among the explanatory variables (Kutner, Nachtsheim, & Neter, 2004).

### Measures of Distrust

The concept of distrust was the primary variable of interest. Shea and colleagues developed a 9-item distrust scale, which captures two dimensions of distrust –competence and values distrust (Shea et al., 2008). The former captures the failures of the health care system to improve patients’ health (e.g., making patients healthy), whereas the latter measures the integrity and transparency of the health care system (e.g., profit-oriented decisions). Question themes included whether or to what extent a health care system seeks to give excellent medical care and whether a health care system seeks to covers up its mistakes. This new 9-item scale was included in the PHMC survey. Respondents answered nine questions on a 5-level Likert scale (strongly disagree, disagree, neither agree/disagree, agree, or strongly agree). We used factor analysis with varimax rotation to generate two factor scores for the distrust dimensions (see Table 1). Note that our factor analysis was a confirmatory factor analysis model as we attempted to compare our classifications with the original work by Shea and colleagues. The two factors explained over 53 percent of the total variance among the nine items. While the validity and reliability were reported elsewhere (Armstrong et al., 2008; Shea et al., 2008; Yang, Matthews, & Hillemeier, 2011), we sought to validate the factor structure with the PHMC sample and used these measures in this study. The Cronbach alpha coefficient for each sub-scale was 0.75 (competence) and 0.74 (values), respectively. These alpha coefficient values closely matched those reported in another study (Armstrong et al., 2008). Importantly, the original paper (Shea et al., 2008), found the reliability for competence distrust ranged from 0.77 (among African Americans) to 0.79 (among whites) and for values distrust from 0.73 (African Americans) to 0.77 (whites). These comparisons suggested that the distrust measures in this study are reliable. [Table 1]

The exact descriptions of the 9 items and factor analysis results are presented in Table 1. Each item was categorized into one of the two dimensions when the factor loading for that assigned dimension was greater (and the other factor loading was lower) than 0.5. Even though missing data were uncommon on the nine items (6.5% of the total values are missing and the highest missing percentage of a single variable is 12%), we imputed missing values with the expectation-maximization (EM) algorithm for continuous variables and then rounded to the nearest whole number to reflect the Likert scale (Hill, 1997). This EM

algorithm for maximum likelihood missing data estimation has been widely used (Hox, 1999; Schafer & Graham, 2002).

The covariates in our analytical models are based on four main dimensions of interest: demographics, socioeconomic status (SES), access to health care resources, and health status.

### Demographics

Age, race/ethnicity, and marital status have all been found to be associated with receiving prostate cancer screening (Consedine et al., 2009; Gilligan, Wang, Levin, Kantoff, & Avorn, 2004; Vadaparampil et al., 2004). Age was treated as a continuous variable. Three dummy variables were created to account for race/ethnicity: White (reference group, coded 0), Black, Hispanic, and other races. Similarly, marital status was divided into three groups (two dummy variables): single (reference group), married/cohabiting, and widowed, divorced, or separated (WDS in tables).

### SES

SES variables, such as poverty and education, have been seen as primary covariates associated with prostate cancer screening behaviors (Ward et al., 2008). Based on the 2008 federal poverty guideline, those men in household with incomes below the poverty line were categorized as poor (coded 1) with the non-poor as the reference group (coded 0). We trichotomized employment status into employed, unemployed, and others (e.g., disabled or retired); with the last as the reference group (coded 0). Educational attainment was classified into five categories (four dummy variables): no high school diploma (reference group), graduated high school, some college, graduate from college/university, and post-college.

### Health care resources

Beyond individual SES, access to health care also should be considered as a covariate of prostate cancer screening (Hoffman et al., 2009; Ward et al., 2008). We generated two variables to assess individual health care resources. The first was derived from the question of whether participants have a regular source of care to go to when sick or wanted advice about health. We coded those reporting “yes” as 1, and otherwise 0. Our second variable, health insurance status, was dichotomized into the uninsured (reference group) and the insured (coded 1).

### Health status

We considered health status in this study. Our proposition is that less healthy people are, on average, more likely to use health care and their more frequent interactions with different parts of the health care system may lead to either changes in distrust or use of screening tests. The former may affect prostate cancer screening behaviors and the latter may directly contribute to the likelihood of taking PSA/DRE tests. We categorized self-rated health into four groups (three dummy variables): excellent (reference group), good, fair, and poor. Including self-rated health in the analysis should help to account for the effects of emotions that may confound the relationship between distrust and prostate cancer screening.

### Results

The descriptive statistics of all variables in this study are shown in Table 2. In the Philadelphia metropolitan area, approximately 58 percent of the men aged 45–75 received PSA or DRE within a year. From 2008 BRFSS data we calculated that 55 percent of men aged 45–75 received a PSA or DRE within a year (Centers for Disease Control and Prevention, 2008).

With respect to the explanatory variables, the ranges of both competence and values distrust scores were about 7, but their maximums and minimums were different. The average age of our respondents was 57 and three out of four participants were White. More than 75 percent of survey respondents were married/cohabiting, with 13 percent single. About 65 percent of the men were employed. One out of five participants possessed a post-college degree and over 45 percent of men received at least some college education. The poverty rate and percent of African Americans among the male respondents aged 45–75 in PHMC survey were 7 and 17 percent, respectively; similar to those estimated in the 2005–2009 American Community Survey (8 percent and 17 percent respectively) (U.S. Census Bureau, 2010), and validating the representativeness of the data. Given the relatively low poverty rate in the specific age-sex group (the overall poverty rate in the Philadelphia metropolitan area was about 12 percent) (Centers for Disease Control and Prevention, 2008), it is not surprising that almost all (95 percent) respondents had health insurance and over 90 percent had a regular source of care they can use for health care and advice. Finally, about 80 percent reported excellent or good overall health, with 4 percent poor health.

Table 3 included four models with different sets of covariates. Our analytic strategy was to first determine whether there was an association between the distrust measures and prostate cancer screening without including any other covariates (Model I). Model II included the individual demographic and SES variables to examine the degree to which these covariates explain the associations between the distrust measures and prostate cancer screening. The health care resources and health status covariates were added to Model III and IV, respectively, and allowed us to determine whether the distrust measures remained significant predictors of prostate cancer screening behavior. In order to compare the magnitudes of the effects within a model, we employed the mean predicted probability method introduced by Kaufman (1996) to calculate standardized coefficients. However, due to the difficulty of interpretation (Menard, 2001), standardized coefficients only served to compare the magnitudes and were not reported here (these are available upon request).

Following this strategy, without controlling for other factors, high levels of distrust were associated with a low likelihood of receiving prostate cancer screening (Model I in Table 3). Specifically, the odds of prostate cancer screening decreased almost 13 percent (O.R.=0.87; 95% C.I. = [0.80, 0.94]) with one unit increase in competence distrust. The effect of values distrust on the likelihood was slightly stronger than competence distrust (O.R.=0.84; 95% C.I.=[0.78, 0.92]), and this was confirmed by the standardized coefficients. When demographic and SES variables were included (Model II), the statistical association between competence distrust and prostate cancer screening disappeared. Values distrust, however, remained significant. As expected, the other significant variables included age, marital status, and educational attainment. Model III added health care resources to the analysis. Values distrust remained negatively related to the odds of having a PSA or DRE in recommended time, though the effect size was smaller (O.R.=0.89; 95% C.I.=[0.81, 0.98]) than earlier models (confirmed by the standardized coefficients). The significant demographic and SES variables did not change. Health care resources were associated with prostate cancer screening among men aged 45–75. The odds of having PSA or DRE almost tripled among those insured (O.R.=2.83; 95% C.I.=[1.71, 4.68]) or had a regular source of care (O.R.=2.73; 95% C.I.=[1.90, 3.92]), compared with their counterparts without insurance or source of care respectively.

Model IV added health status covariates (Table 3). Controlling for the other covariates, we did not find evidence to support a significant association between self-rated health status and the odds of receiving prostate cancer screening. It is noteworthy that values distrust remained a correlate of receiving PSA or DRE and that this association changed little with the inclusion of the self-rated health covariate. The standardized coefficients of values

distrust were similar for Model III (-0.0292) and Model IV (-0.0287). Based on Model IV, a one year difference in age was found to elevate the odds of prostate cancer screening by roughly 8 percent (O.R.=1.08; 95% C.I.=[1.07, 1.10]). The odds of receiving these preventive health services were 1.74 times (95% C.I.=[1.29, 2.33]) higher among those who were married or lived with partners than those who were single. In contrast to the participants without a high school diploma, the odds of prostate cancer screening were about 1.55 to 2.15 times higher among those that at least graduated from high school. These associations were independent of other explanatory variables. The VIFs in Table 3 also provided evidence that multicollinearity was not a concern. In general, when VIF exceeds 10, multicollinearity needs to be addressed. In our models the highest VIF among the explanatory variables was 3.99, lower than the strict threshold of 4 (Kutner et al., 2004).

## Discussion

The utilization of prostate cancer screening in the U.S. has increased over the past few decades (Farwell et al., 2007). This study attempted to answer the question of whether distrust of the health care system is a correlate of being screened, net of other explanatory covariates. Using a multidimensional distrust scale that included concepts that closely replicated previous scale development (Shea et al., 2008), this study added to the literature on men's health behavior. Our study examined two hypotheses. First, we hypothesized that men with high distrust of the health care system were less likely to received prostate cancer screening than those with low distrust and this relationship would hold after controlling for other covariates. Our analytic results confirmed this, as revealed by the statistically significant relationship of values distrust with the likelihood of receiving PSA/DRE tests (across all models). Second, we hypothesized that both values and competence distrust dimensions were negatively associated with the odds of having PSA or DRE among men aged 45–75. The empirical results did not fully support our hypothesis. From this we may conclude that one of the important correlates to prostate cancer screening is that men did not trust the values of the health care system rather than the competence of the practice of health care. Empirical support for the values distrust hypothesis was not negated by model covariates related to SES or having regular access to health care. As noted earlier, one reason why a man may not agree to the PSA/DRE tests is because he feels that the screening benefits the health care system more so than his own health.

What did this study contribute to the literature on prostate cancer screening? Previous studies have explored the cognitive and attitudinal covariates associated with prostate cancer screening behaviors and these emphasized an individual's attitudes toward prostate cancer screening, knowledge of prostate cancer and treatment, and fear for prostate cancer (Consedine et al., 2009; Consedine et al., 2007; Pendleton et al., 2008). While these studies have been a valuable contribution, relatively little attention has been paid to an individual's level of distrust of the health care system. After taking demographic, socioeconomic, access to health care services and health status, our findings suggested that distrust of the health care system may contribute to the prostate cancer screening decision making process. Situated within a health belief model framework (Maiman & Becker, 1974) our findings indicated that the receipt of prostate cancer screening would be associated in part with an individual's assessment of the health care system.

While we identified two dimensions of distrust of the health care system, our findings indicated that only values distrust had a statistically significant association with receipt of PSA/DRE screening tests. That said, while PSA and DRE may be associated with different sociodemographic features (Consedine et al., 2008), men generally believed that the skills and techniques used within the health service system were trustworthy and as such it is perhaps not such a surprise that competence distrust was not found to be associated with

receipt of PSA/DRE tests. Because it is unknown in our study (due to data limitations) whether respondents had discussed prostate cancer screening tests with their health providers, they may not be able to precisely assess the competence of health care system especially regarding PSA/DRE tests. Explicitly, the variation in the understanding of PSA/DRE tests among our respondents may confound the relationship between competence distrust and prostate cancer screening. However, our measure of competence distrust may be an overall perception of the health care system efficacy. As such, it may be relevant to other aspects of prostate cancer screening behaviors, such as adherence to regular screenings.

We found no evidence of a relationship between being screened and belief about the capacity of the health care system to improve patients' health. We offered two potential explanations for this observation. First, competence is a technical attribute, which may be difficult for patients to assess. Hence, competence distrust may not be a factor that men consider in regard to taking PSA or DRE tests. Second, with the advance of medical technology, the technical competence of the health care system is rarely questioned. However, the values (e.g., integrity) of the U.S. health care system has been questioned and this issue has not been well addressed (Gallagher, Studdert, & Levinson, 2007; Gibson & Singh, 2003). For example, complex relationships between providers, health care systems and financial incentives for testing services have been linked to patterns of overuse of healthcare (GAO, 1994) and have resulted in restrictions in ownership or billing practices (Mitchell, 2007). The negative association between values distrust and prostate cancer screening stood out in this study. The finding echoes that of a recent study on breast and cervical cancer screening among women, where different types of cancer screenings were associated with different dimensions of distrust (values distrust was found to be associated with having clinical breast examination but unrelated to receiving Pap smear tests) (Yang et al., 2011).

Our findings correspond to early studies that suggested that education (Wallner et al., 2008), marital status (Meiser et al., 2007; Wallner et al., 2008), age (Odedina et al., 2004; Richardson et al., 2007), and health care resources (Consedine et al., 2009; Consedine et al., 2006; Odedina et al., 2004) were important covariates associated with receipt of PSA/DRE tests. Among these covariates, a regular source of care and health insurance were important. This result helped confirm the notion that access to, and discussion with, health professionals can facilitate prostate cancer screening (Jones et al., 2009; Sanchez et al., 2007). We also explored the interaction effects between all these variables and both dimensions of distrust of the health care system, but did not find significant effects (results not shown but available upon request). We noted that poverty and employment status were not significant predictors in our models. This may be because educational attainment served as a dominant proxy for the other SES-related variables. Although perception of health status was found to be associated with prostate cancer screening in a Canadian study (Richardson et al., 2007), we do not find this in the Philadelphia metropolitan area.

This paper has several limitations. First, though a recent study suggested that prostate cancer screening explained 45–70 percent of the observed decrease in prostate cancer mortality in the U.S. between 1980–2000 (Etzioni et al., 2008), the clinical evidence for the efficacy of prostate cancer screening remains mixed (Andriole et al., 2009; Schröder et al., 2009). Longitudinal research and/or clinical trials are needed to test the protection effect of prostate cancer screening. Bearing this in mind, we did not attempt to close the debate, but offered empirical evidence distrust is negatively associated with the likelihood of having a PSA or DRE. Second, the literature has found that the predictors for the frequency of using DRE and PSA screening differ (Consedine et al., 2007). Unfortunately, due to data limitations, the associations of distrust with DRE and PSA could not be investigated separately in this study. The PHMC survey is a general health survey and was not designed specifically for prostate



cancer screening research and as such many cognitive and attitudinal variables related to PSA/DRE screening (Consedine et al., 2009) were not available (e.g., fear and knowledge for prostate cancer). Third, this study focused on the distrust of health care system rather than on a patients' relationships with their physician and nor was family history data available (Meiser et al., 2007; Thom, Hall, & Pawlson, 2004; Whetten et al., 2006). In addition, this study only focused on distrust of the health care system. Other aspects of distrust, such as physicians and insurance companies, were not considered. Thus, future research should endeavor to answer whether different types of distrust have unique or cumulative impacts on screening behaviors. Fourth, this study was focused on men in the Philadelphia metropolitan area aged 45–75 and as such our findings cannot be generalized to other populations or areas. Specific to the distrust measures, it is worth noting that our confirmatory factor analysis do not fully validate the original work. Future studies should apply the 9-item distrust scale to other regions or samples to more thoroughly validate the distrust scale. Finally, the PHMC data are self-report and cross-sectional. Our analysis is thus subject to recall bias and other measurement errors (McGovern, Lurie, Margolis, & Slater, 1998; Newell, Girgis, Sanson-Fisher, & Savolainen, 1999).

In summary, we believe that our study has several important policy implications. First and foremost, since the importance of values distrust of the health care system in receiving prostate cancer screening was confirmed, it could be argued that efforts to rebuilding the collective trust among American men may produce change in preventive health behaviors. Several researchers have commented on how a transparent and responsible health care system may reduce distrust among men (Blendon, 2007; Gallagher et al., 2007), enhance the communication between men and their clinicians, and in turn may increase prostate cancer screening rates. Second, outreach to those men who do not have regular source of care or insurance via the provision of consultation from physicians or educational programs may increase early prostate cancer detection and reduce the prostate cancer mortality. Third, it would be helpful to disseminate information on the advantages and disadvantages of PSA and DRE to the men that would benefit most from these exams, which should help them to make an informed decision.

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**Table 1**

Factor loadings with Varimax rotation.

| Actual Questions   | Component   |             |
|--|-------------|-------------|
|  | Competence  | Values      |
| a. Health Care System makes patients' health better <sup>#</sup>           | <b>.718</b> | .205        |
| b. Health Care System covers up its mistakes                               | .006        | <b>.692</b> |
| c. Patients receive high quality care from Health Care System <sup>#</sup> | <b>.798</b> | .195        |
| d. Health Care System makes too many mistakes                              | .294        | <b>.606</b> |
| e. Health Care System puts making money above patients' needs              | .322        | <b>.675</b> |
| f. Health Care System gives excellent medical care <sup>#</sup>            | <b>.814</b> | .180        |
| g. Patients get same medical treatment regardless of race <sup>#</sup>     | <b>.558</b> | .250        |
| h. Health Care System lies to make money                                   | .255        | <b>.712</b> |
| i. Health Care System experiments on patients without them knowing         | .242        | <b>.611</b> |
| Eigenvalues  | 3.717       | 1.081       |
| % of variance explained  | 41.300      | 12.006      |

<sup>#</sup> Item is reverse coded

**Table 2**

Descriptive statistics of all variables used in this study (n=1,784)

|  | Minimum | Maximum | Mean or Proportion <sup>†</sup> | Std. Deviation |
|--|---------|---------|---------------------------------|----------------|
| <b>Response variable</b>                             |         |         |                                 |                |
| Receiving prostate cancer Screening in the past year | 0.000   | 1.000   | 0.575                           | 0.494          |
| <b>Explanatory variable</b>                          |         |         |                                 |                |
| <i><u>Distrust</u></i>                               |         |         |                                 |                |
| Competence distrust                                  | -2.835  | 4.028   | 0.000                           | 1.000          |
| Values distrust                                      | -4.129  | 2.877   | 0.000                           | 1.000          |
| <i><u>Demographics</u></i>                           |         |         |                                 |                |
| Age  | 45.000  | 75.000  | 56.628                          | 8.066          |
| Race/ethnicity                                       |         |         |                                 |                |
| White (Ref.) <sup>§</sup>                            | 0.000   | 1.000   | 0.766                           | 0.423          |
| Black  | 0.000   | 1.000   | 0.172                           | 0.377          |
| Hispanic   | 0.000   | 1.000   | 0.031                           | 0.172          |
| Other races  | 0.000   | 1.000   | 0.032                           | 0.175          |
| Marital Status                                       |         |         |                                 |                |
| Single (Ref.)  | 0.000   | 1.000   | 0.127                           | 0.333          |
| Married/Cohabiting                                   | 0.000   | 1.000   | 0.752                           | 0.432          |
| Widowed/divorced/separated (WDS)                     | 0.000   | 1.000   | 0.121                           | 0.326          |
| <i><u>SES</u></i>                                    |         |         |                                 |                |
| Poverty status                                       |         |         |                                 |                |
| Non-poor (Ref.)                                      | 0.000   | 1.000   | 0.926                           | 0.262          |
| Poor   | 0.000   | 1.000   | 0.074                           | 0.262          |
| Employment status                                    |         |         |                                 |                |
| Other statuses (Ref.)                                | 0.000   | 1.000   | 0.307                           | 0.461          |
| Employed   | 0.000   | 1.000   | 0.646                           | 0.478          |
| Unemployed   | 0.000   | 1.000   | 0.046                           | 0.210          |
| Educational attainment                               |         |         |                                 |                |
| No high school diploma (Ref.)                        | 0.000   | 1.000   | 0.068                           | 0.252          |
| High school graduate                                 | 0.000   | 1.000   | 0.290                           | 0.454          |
| Some college   | 0.000   | 1.000   | 0.185                           | 0.388          |
| College  | 0.000   | 1.000   | 0.256                           | 0.437          |
| Post college diploma                                 | 0.000   | 1.000   | 0.201                           | 0.401          |
| <i><u>Health care resources</u></i>                  |         |         |                                 |                |
| Insurance status                                     |         |         |                                 |                |
| Uninsured (Ref.)                                     | 0.000   | 1.000   | 0.053                           | 0.223          |
| Insured  | 0.000   | 1.000   | 0.947                           | 0.223          |
| Regular source of care                               |         |         |                                 |                |
| No regular source of care (Ref.)                     | 0.000   | 1.000   | 0.084                           | 0.277          |
| With regular source of care                          | 0.000   | 1.000   | 0.916                           | 0.277          |
| <i><u>Health Status</u></i>                          |         |         |                                 |                |

|                   | Minimum | Maximum | Mean or Proportion <sup>‡</sup> | Std. Deviation |
|-------------------|---------|---------|---------------------------------|----------------|
| Self-rated Health |         |         |                                 |                |
| Excellent (Ref.)  | 0.000   | 1.000   | 0.306                           | 0.461          |
| Good              | 0.000   | 1.000   | 0.490                           | 0.500          |
| Fair              | 0.000   | 1.000   | 0.163                           | 0.370          |
| Poor              | 0.000   | 1.000   | 0.040                           | 0.197          |

<sup>‡</sup> For dummy variables, the mean values could be interpreted as the proportion of those coded 1 in each group.

<sup>§</sup> Ref. indicates reference group in the logistic regression model.

**Table 3**  
 Logistic regression results modeling whether men aged 45–75 receive prostate cancer screening in recommended time (n=1,784)

|                               | VIF   | Model I |          |       | Model II |          |       | Model III |          |       | Model IV |          |       |       |       |       |       |
|-------------------------------|-------|---------|----------|-------|----------|----------|-------|-----------|----------|-------|----------|----------|-------|-------|-------|-------|-------|
|                               |       | O.R.    | 95% C.I. | Sig.  | O.R.     | 95% C.I. | Sig.  | O.R.      | 95% C.I. | Sig.  | O.R.     | 95% C.I. | Sig.  |       |       |       |       |
| <u>Distrust</u>               |       |         | Lower    | Upper |          | Lower    | Upper |           | Lower    | Upper |          | Lower    | Upper |       |       |       |       |
| Competence distrust           | 1.061 | 0.868   | 0.798    | 0.944 | ***      | 0.933    | 0.851 | 1.022     | 0.947    | 0.863 | 1.040    | 0.947    | 0.863 | 1.040 |       |       |       |
| Values distrust               | 1.101 | 0.844   | 0.775    | 0.920 | ***      | 0.857    | 0.779 | 0.942     | ***      | 0.887 | 0.805    | 0.977    | *     | 0.889 | 0.807 | 0.979 | *     |
| <u>Demographics</u>           |       |         |          |       |          |          |       |           |          |       |          |          |       |       |       |       |       |
| Age                           | 1.442 |         | 1.087    | 1.071 | 1.102    | 1.084    | 1.069 | 1.100     | ***      | 1.084 | 1.069    | 1.100    | ***   | 1.084 | 1.069 | 1.100 | ***   |
| Race/ethnicity                |       |         |          |       |          |          |       |           |          |       |          |          |       |       |       |       |       |
| White (Ref.)                  | --    |         | 1.000    | --    | --       | 1.000    | --    | --        | 1.000    | --    | --       | 1.000    | --    | --    | --    | --    | --    |
| Black                         | 1.152 |         | 1.185    | 0.917 | 1.532    | 1.205    | 0.928 | 1.565     | 1.201    | 0.923 | 1.562    | 1.201    | 0.923 | 1.562 | 1.201 | 0.923 | 1.562 |
| Hispanic                      | 1.063 |         | 0.763    | 0.447 | 1.304    | 0.890    | 0.511 | 1.553     | 0.890    | 0.509 | 1.554    | 0.890    | 0.509 | 1.554 | 0.890 | 0.509 | 1.554 |
| Other races                   | 1.035 |         | 0.877    | 0.528 | 1.457    | 0.965    | 0.571 | 1.630     | 0.958    | 0.567 | 1.619    | 0.958    | 0.567 | 1.619 | 0.958 | 0.567 | 1.619 |
| Marital Status                |       |         |          |       |          |          |       |           |          |       |          |          |       |       |       |       |       |
| Single (Ref.)                 | --    |         | 1.000    | --    | --       | 1.000    | --    | --        | 1.000    | --    | --       | 1.000    | --    | --    | 1.000 | --    | --    |
| Married/Cohabiting            | 1.916 |         | 1.810    | 1.358 | 2.413    | ***      | 1.736 | 1.295     | 2.328    | ***   | 1.736    | 1.293    | 2.329 | ***   | 1.736 | 1.293 | 2.329 |
| WDS                           | 1.805 |         | 0.888    | 0.612 | 1.287    | 0.887    | 0.607 | 1.295     | 0.891    | 0.610 | 1.303    | 0.891    | 0.610 | 1.303 | 0.891 | 0.610 | 1.303 |
| <u>SES</u>                    |       |         |          |       |          |          |       |           |          |       |          |          |       |       |       |       |       |
| Poverty status                |       |         |          |       |          |          |       |           |          |       |          |          |       |       |       |       |       |
| Non-poor (Ref.)               | --    |         | 1.000    | --    | --       | 1.000    | --    | --        | 1.000    | --    | --       | 1.000    | --    | --    | 1.000 | --    | --    |
| Poor                          | 1.285 |         | 0.705    | 0.475 | 1.047    | 0.762    | 0.508 | 1.144     | 0.779    | 0.517 | 1.175    | 0.779    | 0.517 | 1.175 | 0.779 | 0.517 | 1.175 |
| Employment status             |       |         |          |       |          |          |       |           |          |       |          |          |       |       |       |       |       |
| Other statuses (Ref.)         | --    |         | 1.000    | --    | --       | 1.000    | --    | --        | 1.000    | --    | --       | 1.000    | --    | --    | 1.000 | --    | --    |
| Employed                      | 1.762 |         | 0.910    | 0.706 | 1.171    | 0.937    | 0.725 | 1.210     | 0.929    | 0.713 | 1.209    | 0.929    | 0.713 | 1.209 | 0.929 | 0.713 | 1.209 |
| Unemployed                    | 1.295 |         | 0.669    | 0.410 | 1.091    | 0.926    | 0.552 | 1.555     | 0.918    | 0.545 | 1.547    | 0.918    | 0.545 | 1.547 | 0.918 | 0.545 | 1.547 |
| Educational attainment        |       |         |          |       |          |          |       |           |          |       |          |          |       |       |       |       |       |
| No high school diploma (Ref.) | --    |         | 1.000    | --    | --       | 1.000    | --    | --        | 1.000    | --    | --       | 1.000    | --    | --    | 1.000 | --    | --    |
| High school graduate          | 3.920 |         | 1.539    | 1.031 | 2.296    | *        | 1.552 | 1.033     | 2.331    | *     | 1.550    | 1.029    | 2.333 | *     | 1.550 | 1.029 | 2.333 |
| Some college                  | 3.205 |         | 1.961    | 1.283 | 2.999    | **       | 1.985 | 1.289     | 3.057    | **    | 1.981    | 1.283    | 3.058 | **    | 1.981 | 1.283 | 3.058 |
| College                       | 3.995 |         | 2.307    | 1.519 | 3.502    | ***      | 2.167 | 1.418     | 3.313    | ***   | 2.150    | 1.400    | 3.302 | ***   | 2.150 | 1.400 | 3.302 |
| Post college diploma          | 3.584 |         | 1.753    | 1.143 | 2.689    | **       | 1.684 | 1.091     | 2.598    | *     | 1.676    | 1.082    | 2.598 | *     | 1.676 | 1.082 | 2.598 |



|                                  | VIF   | Model I |          |      | Model II |          |       | Model III |          |       | Model IV |          |      |
|----------------------------------|-------|---------|----------|------|----------|----------|-------|-----------|----------|-------|----------|----------|------|
|                                  |       | O.R.    | 95% C.I. | Sig. | O.R.     | 95% C.I. | Sig.  | O.R.      | 95% C.I. | Sig.  | O.R.     | 95% C.I. | Sig. |
| <u>Health care resources</u>     |       |         |          |      |          |          |       |           |          |       |          |          |      |
| Insurance status                 |       |         |          |      |          |          |       |           |          |       |          |          |      |
| Uninsured (Ref.)                 | --    |         |          |      | 1.000    | --       |       | 1.000     | --       |       | 1.000    | --       |      |
| Insured                          | 1.178 |         |          |      | 2.830    | 1.712    | 4.679 | ***       | 2.845    | 1.719 | 4.707    | ***      |      |
| Regular source of care           |       |         |          |      |          |          |       |           |          |       |          |          |      |
| No regular source of care (Ref.) | --    |         |          |      | 1.000    | --       |       | 1.000     | --       |       | 1.000    | --       |      |
| With regular source of care      | 1.070 |         |          |      | 2.727    | 1.897    | 3.920 | ***       | 2.725    | 1.895 | 3.919    | ***      |      |
| <u>Personal Health Status</u>    |       |         |          |      |          |          |       |           |          |       |          |          |      |
| Self-rated Health                |       |         |          |      |          |          |       |           |          |       |          |          |      |
| Excellent (Ref.)                 | --    |         |          |      | 1.000    | --       |       | 1.000     | --       |       | 1.000    | --       |      |
| Good                             | 1.397 |         |          |      | 0.966    | 0.777    | 1.201 |           | 0.966    | 0.777 | 1.201    |          |      |
| Fair                             | 1.475 |         |          |      | 1.015    | 0.746    | 1.382 |           | 1.015    | 0.746 | 1.382    |          |      |
| Poor                             | 1.256 |         |          |      | 0.837    | 0.493    | 1.422 |           | 0.837    | 0.493 | 1.422    |          |      |
| Pseudo R <sup>2</sup>            |       | 0.016   |          |      | 0.172    |          |       | 0.202     |          |       | 0.203    |          |      |

VIF: variance inflation factor; O.R.: odds ratio; C.I.: confidence interval; Sig.: significance levels;

\* p<0.05;

\*\* p<0.01;

\*\*\* p<0.001