

# AGE, RACE, AND REPEATED PROSTATE-SPECIFIC ANTIGEN (PSA) TEST USE IN THE NATIONAL HEALTH INTERVIEW SURVEY

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**Background:** Prostate cancer is the second leading cause of cancer death in American men. Prostate-specific antigen (PSA) test use was examined in US men aged  $\geq 40$  years to clarify the relationship with age and race.

**Methods:** The National Health Interview Survey (2000) collected information about PSA test use in a representative sample of the US population. This study examined whether men reported having had three or more PSA tests within the past five years by age and race subgroups.

**Results:** Prostate-specific antigen (PSA) test use rates were lowest in men aged 40–49 and highest in men aged 65–79. Receipt of three or more PSA tests within the past five years varied by age and race. Use was higher for African-American men, compared with White men aged 40–49; similar for African-American and White men aged 50–64; higher for White than African-American men aged 65–79; and similar for African-American and White men aged  $\geq 80$ .

**Conclusion:** The PSA test use patterns showed variation by age and race subgroups, and these patterns are better understood when examining both variables at the same time. (*Ethn Dis.* 2006;16:244–247)

**Key Words:** Age Factors, Prostate Cancer, Prostate-Specific Antigen, Race, Screening

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## INTRODUCTION

Prostate cancer is the most common cancer among men in the United States and is the second leading cause of cancer deaths in men after lung cancer.<sup>1</sup> An estimated 232,090 men will be diagnosed with prostate cancer during 2005, and an estimated 30,350 men will die from prostate cancer.<sup>1</sup> Debate continues, however, about the efficacy of the prostate-specific antigen (PSA) test in diagnosing prostate cancer.<sup>1–3</sup>

Major medical professional organizations disagree on their screening recommendations. The American Cancer Society (ACS) and the American Urological Association (AUA) recommend that all men should be offered the screening tests annually beginning at age 50, and that PSA testing should be offered even earlier for men who are at high risk (ie, are African-American or have a family history of prostate cancer).<sup>1,4</sup> Other organizations, including the United States Preventive Services Task Force, the American Academy of Family Physicians, the American College of Physicians, and the American College of Preventive Medicine, suggest that evidence is insufficient to support prostate cancer screening.<sup>5</sup> Despite these varying opinions and recommendations, most practicing physicians use the PSA test,<sup>6,7</sup> and major medical organizations recommend that physicians discuss with their patients the benefits and limitations of screening.<sup>5</sup>

This study examined repeated PSA test use by categories of age and race from a national sample of men aged  $\geq 40$  years to clarify findings from previous studies on PSA test use among White and African-American men. One older study found higher PSA test use among White men compared with

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African-American men,<sup>8</sup> whereas other studies reported the opposite finding (ie, higher PSA test use among African-American men compared with White men).<sup>9,10</sup>

## METHODS

The National Health Interview Survey (NHIS) obtains information from a nationally representative sample and contains questions about several health-related issues. This multipurpose health survey is conducted annually and includes questions about the respondent's health, sociodemographic information, and access to and use of health services. In 2000, the NHIS collected information related to cancer prevention and control.<sup>11</sup> The NHIS 2000 cancer control supplement contains questions that specifically address prostate cancer screening and test use. One sample adult was randomly selected from each family participating in the NHIS. The NHIS 2000 release uses a complex sample design involving stratification, clustering, and multistage sampling. Also, the NHIS oversamples African-American and Hispanic populations to allow for more precise estimations of health-related attitudes and behaviors. Men aged  $\geq 40$  years were asked questions related to prostate cancer aware-

ness and test use. The overall response rate was 72.1%.

All sample weights were included in the NHIS data file. Analyses were poststratified to the US Census distributions by age and race for the year 2000 to provide estimates representative of men in the general population.<sup>12</sup> The survey data analysis statistical computer package (SUDAAN, Research Triangle Institute, Research Triangle Park, NC) was used to account for the complex, multistage probability sampling design of the NHIS 2000. Additional details of the survey methods are reported elsewhere.<sup>12</sup>

This study examined the frequency of PSA test use with age and race. Respondents were asked, "How many PSA tests have you had in the last five years?" Men who reported being diagnosed with prostate cancer were excluded from the analysis. The number of PSA tests reported during the past five years was dichotomized to differentiate between those men who had three or more PSA tests, indicating more regular PSA use, and those who had none to two PSA tests. Repeated, more frequent, or regular PSA test use offers a more consistent pattern than a one-time measure of the PSA test (ie, "ever had a PSA test" or "ever ordered a PSA test"). Race was recoded into three categories: non-Hispanic White; non-Hispanic African American; and all other men, including Asian, Hispanic, and American Indian. Age was recoded into four categories: 40–49, 50–64, 65–79, and  $\geq 80$  years.

## RESULTS

The total number of men aged  $\geq 40$  years who could recall the number of PSA tests that they had undergone within the past five years and who had not been diagnosed with prostate cancer was 7257. The number of men in each age category and their respective percentages of having had three or more

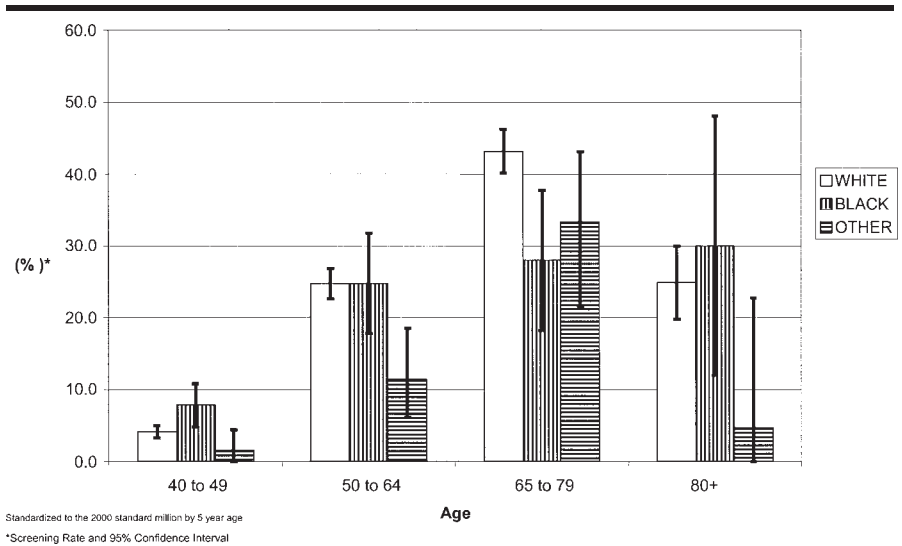


Fig 1. Percentage of men having 3+ PSAs in the past five years by age and race

PSA tests within the past five years were as follows: ages 40–49 (2688, 4.4%), ages 50–64 (2659, 23.8%), ages 65–79 (1539, 41.7%), and age  $\geq 80$  (371, 26.5%). Figure 1 shows the percentage of men who had reported three or more PSA tests within the past five years by race and age. The largest percentage of men who reported being tested three or more times within the past five years was in the 65–79 age category.

African-American men reported higher PSA testing percentages than both Whites and all others in the 40–49 age range. For the 50–64 age group, Whites and African Americans were approximately equal. Among men aged 65–79 years, however, Whites reported higher PSA testing percentages than African Americans. In the  $\geq 80$  group, White and African-American men had PSA test use percentages that were  $\approx 25\%$  and  $\approx 30\%$ , respectively.

## DISCUSSION

The PSA test has been used for several years as a tool to assist in the diagnosis of prostate cancer. Studies have examined PSA test use with variation in findings.<sup>13</sup> However, most studies show that African-American

men have lower testing rates than White men.<sup>8,10,14</sup> One study found that African-American men had higher testing rates than Whites but only before age 50, suggesting a possible interaction effect.<sup>9</sup> The current study shows this variation between age and race with greater specificity.

The highest percentages of repeated PSA testing were found in the 65–79 age category. Although men  $< 50$  had less opportunity to obtain three or more PSA tests within the past five years and  $< 5\%$  of the sample reported receiving PSA testing, PSA test use at these younger ages was more evident for African-American men than for White men. As noted, findings in this study were for repeated PSA test use. Patterns of test use should be examined over a period of time, rather than "one-time" or "ever" test use. Repetitive testing estimates consistent use of the PSA test and involves not a single test but several tests.

As noted, the percentages of PSA test use in the age category of  $\geq 80$  years were 25% and 30%, respectively, for White and African-American men. This finding is similar to the results of a study that found a PSA screening rate of 32.5% among men aged  $\geq 75$ .<sup>15</sup> This finding may be of particular interest

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because some organizations recommend that elderly men or those men with a remaining life expectancy <10 years should not be screened.<sup>5,15,16</sup> However, some prostate cancer screening decisions are less sensitive to patients' ages and may be linked with other variables, such as health status, competing causes of death, treatment complications, and existing comorbid conditions.<sup>9</sup>

A finding from this national study is that repeated PSA test use varies by age and race, and the age and race interaction has not been previously examined. The PSA test use in this study reflects actual NHIS reports of men aged  $\geq 40$ , not necessarily organizational guidelines that suggest when men should or should not begin testing. Findings are not consistent with any specific organizational policy (especially PSA testing in elderly men); however, the higher test use reported by African-American men <50 may, in part, reflect the following: 1) physician practices that might have been influenced by ACS and AUA recommendations or the physicians' own practice experiences<sup>1,4,5,16</sup>; 2) community initiatives, eg, screenings sponsored by churches, hospitals, industries, and/or businesses; or 3) media and health education messages in the African-American community.<sup>17</sup>

Also, the somewhat higher rate of PSA test use among elderly men suggests that many physicians may not use an arbitrary age to cease PSA testing and may base their decision to continue or cease testing on other factors, such as comorbidity, health status, and remaining life expectancy.<sup>16</sup> Results of this study are similar to a finding of

relatively high rates of PSA testing in men  $\geq 70$  years of age. Because the interview question sought information on the number of PSA tests conducted during the past five years, men in their early 50 s probably had some of their PSA tests done when they were in their 40 s, and men aged  $\geq 80$  likely had some of their PSA tests done after age 75.

This study has several strengths. The data are from a nationally representative sample with a relatively high response rate, compared to some previous studies that focused on more limited populations.<sup>8,10,16,18</sup> Among the several measures of PSA test use, this study included a more consistent measure of PSA testing by examining repeated PSA test use. The survey also oversampled African-American male populations, which allowed for more precise estimates of use.

Limitations of the study findings include those due to self-reporting in general, that is, the reliance on self-reports from participants on the number of PSA tests received during the past five years. Recalling the last five years may be problematic, especially for older men, and people may underestimate the length of time during which they received several PSA tests. While men with prostate cancer were excluded, the current analysis did not exclude some of the men who may have had repeat tests for monitoring, even when the biopsy might have been negative or if an isolated elevation in PSA was suspected. Some misreporting might also occur because people may have a variety of blood specimens ordered by their physicians over the years and may not always know the reasons.<sup>19</sup> Finally, misreporting can vary by personal and social characteristics that could lead to bias.<sup>20</sup>

The findings from this study suggest that PSA test use varies by age and race in a complex way. The findings also suggest various questions about how decisions regarding PSA test use

decisions are made, such as how physicians decide to offer PSA tests to individuals of different ages and races, whether physicians are influenced by organizational guidelines, whether physicians discuss the benefits and risks of the PSA test with their patients, and whether patients are involved in the decision to be screened. Future studies might explore characteristics and practice patterns related to whether physicians discuss the benefits and risks of PSA test use with their patients, and under what conditions they might recommend PSA testing for men.

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**AUTHOR CONTRIBUTIONS**

*Design and concept of study:* Ross  
*Acquisition of data:* Uhler  
*Data analysis and interpretation:* Uhler  
*Statistical expertise:* Uhler  
*Administrative, technical, or material assistance:* Ross, Uhler  
*Supervision:* Ross