Published in final edited form as:
*Cancer Causes Control*. 2013 October ; 24(10): 1893–1899. doi:10.1007/s10552-013-0257-2.

# Diabetes and prostate cancer screening in black and white men

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## Abstract

**Purpose—**Prior studies conducted primarily among white men, find a reduced risk of prostate cancer associated with time since developing diabetes. While biologic explanations are plausible, the association may in part arise from more frequent prostate cancer screening among those with a diabetes diagnosis. The purpose of the present study was to investigate the association between diabetes and prostate cancer screening.

**Methods—**We examined differences in prostate cancer screening (prostate-specific antigen and/or digital rectal examination) testing practices after a diabetes diagnosis among lower-income persons living in the southeastern United States and enrolled in the Southern Community Cohort Study between 2002 and 2009. Baseline in-person interviews collected information on history of diabetes and prostate cancer screening from 18,809 black and 6,404 white men aged 40-79 years.

**Results—**After adjustment for confounding, diabetic black (odds ratio (OR) 1.12, 95% confidence interval (CI) 1.01-1.25) and white (OR 1.25, 95% CI 1.03-1.51) men were more likely to undergo recent prostate cancer screening compared to non-diabetic men of the same race. The increased risk for prostate cancer screening, however, occurred primarily within the first 12 months after diabetes diagnosis.

**Conclusions—**Our results suggest that a diabetes diagnosis modestly increases the likelihood of having a prostate cancer screening test for both black and white men. The prevalence of screening was higher nearer to the time of diabetes diagnosis, which may contribute to an early increase in prostate cancer detection followed by lower prostate cancer detection after an extended time.

### Keywords

Race; prostate cancer screening; diabetes; cohort study

## Introduction

Increasing evidence suggests that diabetes is associated with reduced prostate cancer risk [1-3], with a summary relative risk (RR) of 0.84 (95% confidence interval (CI) 0.76-0.93) in

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**Conflict of Interest**: The authors declare that they have no conflict of interest.

a published meta-analysis [3]. However, two large prospective studies, the Cancer Prevention Study II [1] and Health Professionals Follow-up Study [2], found that prostate cancer risk initially increased for 3 years (RR=1.2) and 1 year (RR=1.3), respectively, following a diabetes diagnosis, before decreasing with longer time since diabetes diagnosis (RR=0.63 and RR=0.75-0.82). Possible explanations for an inverse association between diabetes and prostate cancer include a direct effect of diabetes on reduced prostate cancer growth by lowering insulin [3] or bioavailable testosterone [4] levels, a secondary effect of diabetes drugs such as metformin on prostate carcinogenesis [5], or alternatively an indirect effect due to changes in prostate cancer screening after diabetes diagnosis [6].

Few studies have included black men [3], despite greater diabetes and prostate cancer burdens compared to white men. In the Multiethnic Cohort Study (MEC), a weaker reduction in prostate cancer risk was observed among black (RR=0.89) than white (RR=0.65) men followed for eight years after diabetes diagnosis, despite similar PSA screening frequency by diabetes status in both groups [7]. A cohort study of United States (US) veterans, conducted before the introduction of prostate-specific antigen (PSA) screening, observed similar reductions in prostate cancer risk associated with diabetes among black (RR=0.91) and white (RR=0.88) men, with median follow-up time of 10.5 years for diabetics and 11.9 years for non-diabetics [8].

We investigated the relationship between diabetes and prostate cancer screening, in an attempt to determine its mediating effect on the diabetes and prostate cancer association. Several studies have shown reduced breast cancer screening among diabetic women, but no study has evaluated the association between diabetes and timing of prostate cancer screening. We wished to assess the possibility that decreased prostate cancer screening among diabetics, as seen with the association between diabetes and breast cancer screening, may partially explain the observed reduced risk of prostate cancer associated with diabetes. We hypothesized that prostate cancer screening would be most prevalent near the time of diabetes diagnosis, and, to explain the stronger reduction in prostate cancer risk associated with diabetes among white than black men seen in the MEC [7], that white diabetic men would undergo prostate cancer screening more frequently than white non-diabetic men. In contrast, there would be no association between diabetes and prostate cancer screening among black men.

## Methods

Detailed methods of the Southern Community Cohort Study (SCCS), which enrolled black and white men and women in the southeastern US aged 40-79 years, appear elsewhere [9]. Approximately 85 percent of participants completed in-person interviews at the time of enrollment at Community Health Centers (CHC), with the remainder recruited through general population sampling and completion of mailed questionnaires. After exclusion of men of other racial/ethnic groups, men with a history of any cancer or a severe comorbidity (e.g., HIV/AIDS, chronic obstructive pulmonary disease, and history of myocardial infarction) that would preclude screening, and men whose PSA/digital rectal exam (DRE) screening history was not available, the study population for the current analysis comprised 18,809 black and 6,404 white men.

Men were classified as diabetic at baseline if they reported being told by their doctor they had diabetes or high blood sugar, and were further characterized by time since diabetes diagnosis (<1-year, then 5-year categories), year of diagnosis (pre- and post-1994), and use of diabetes medications (oral, insulin). PSA and/or DRE screening was categorized as having occurred within the past 12 months. We stratified by race rather than assess it as an effect modifier because the MEC study reported a stronger association between diabetes and

prostate cancer among white than among black men [7]. Covariates of interest included: age, annual household income, educational level, marital status, health insurance coverage, recruitment source, body mass index (BMI, kg/m$^2$) at age 21 years and maximum, hypertension, cholesterol medication use (previously associated with PSA testing) [10], smoking, and leisure-time moderate and vigorous physical activity during their 30s in hours per week, all self-reported on the baseline questionnaire and categorized as in Table 1. Based on previous studies of diabetes and prostate cancer, age [2, 8] and maximum BMI [2, 8] were assessed as effect modifiers of the diabetes and prostate cancer screening association prior to being assessed as confounders, as were marital status and health insurance, both of which are strong predictors of prostate cancer screening in these data [11].

Statistical analyses were performed in SAS version 9.2. We assessed statistically significant (two-sided, $p<0.05$) differences between diabetics and non-diabetics for potential confounders using chi-square tests. We used unconditional logistic regression to estimate the odds ratios (OR) and 95% CIs for prostate cancer screening associated with diabetes. Interaction terms, the product of diabetes and the putative effect modifiers (age, maximum BMI, marital status and health insurance), were added to logistic regression models and likelihood ratio tests were performed to test for effect modification.

## Results

Table 1 presents characteristics of black men who were (n=4,283, 23.8%) and were not (n=13,695) screened for prostate cancer in the past 12 months. Compared to men who were not screened, black men who were screened were significantly older, had a higher household income and educational level, and were more likely to be married or living with a partner, have private insurance, have a higher maximum BMI, have hypertension, be taking cholesterol medications, and be never or former smokers. Similar patterns were seen when comparing screened (n=1,913, 31.3%) and unscreened (n=4,201) white men.

Table 2 presents the association between diabetes measures and prostate cancer screening within the past 12 months by race, adjusted for all variables except smoking whose addition to the model did not materially change OR estimates. Overall, 22.1% of non-diabetic black men and 33.1% of diabetic black men had been screened for prostate cancer. Prostate cancer screening was modestly but significantly more prevalent among men with versus without diabetes (OR 1.12, 95% CI 1.01-1.25). Utilizing <1 year between diabetes diagnosis and prostate cancer screening as the reference, prostate cancer screening among diabetics was greatest in the first year after diabetes diagnosis, after which no excess was observed and screening remained fairly stable with time. There was no significant effect of year of diabetes diagnosis or use of diabetes medications on prostate cancer screening.

Among white men, 29.8% of non-diabetics and 39.8% of diabetics had been screened for prostate cancer. Diabetes was significantly associated with increased odds of prostate cancer screening (OR 1.25, 95% CI 1.03-1.51). Among those with diabetes, we did not observe statistically significant differences according to time since diabetes diagnosis, but similar to the pattern in blacks, there appeared to be an excess of screening in the first year after diabetes diagnosis, after which the prostate cancer screening rate remained stable. Again, similar to black men, there was no effect of year of diabetes diagnosis or use of diabetes medications on prostate cancer screening. Age, maximum BMI, marital status and health insurance did not significantly modify the association between diabetes and prostate cancer screening among blacks or whites (not shown).

We performed a sensitivity analysis among diabetic men only who had been screened for prostate cancer (not shown). Time between diabetes diagnosis and recent prostate cancer

screening was categorized as <1 year, 1-2 years, 3-5 years, 6-9 years and 10 or more years. Among diabetic men who were screened for prostate cancer, white men were significantly more likely than black men to have been screened within one year of diagnosis (14.7% vs. 11.6%, p=0.04). In contrast, black men were significantly more likely than white men to have been screened 10 or more years after their diagnosis (34.0% vs. 26.4%, p=0.001).

## Discussion

Research on the role of prostate cancer screening in the association between diabetes and prostate cancer risk raised the possibility of a variable effect depending upon timing of the screening. A meta-analysis [3] found a more pronounced inverse association between diabetes and prostate cancer risk for studies conducted after 1994 (RR 0.73, 95% CI 0.64-0.83), when PSA screening became widespread, than those conducted before 1994 (RR 0.94, 95% CI 0.85-1.03). However, a case-control study of black and white men conducted after initiation of widespread PSA testing found no difference in the reduction of prostate cancer risk associated with diabetes among those men who reported they received annual prostate cancer screening (OR 0.68, 95% CI 0.41-1.12) compared to those screened less frequently (OR 0.61, 95% CI 0.36-1.01) [12].

In contrast with studies of diabetes and breast cancer screening which reported negative associations [13-16], we found that diabetes is modestly but significantly associated with increased likelihood of having a recent prostate cancer screening test among black and white men. However, the influence of diabetes on screening practices appeared largely restricted to the first year after a diabetes diagnosis, with similarly elevated OR estimates for screening during the first year among black and white men, albeit statistically significant only among black men. The associations between diabetes and breast and prostate cancer also differ, with greater likelihood of postmenopausal breast cancer associated with diabetes [17-20] and less likelihood of prostate cancer associated with diabetes [21].

Healthcare access, insurance coverage, and other socio-economic characteristics, as well as race, are all associated with PSA testing practices and cancer stage at detection. In our study population of black and white men with similarly low socioeconomic status (SES) and similar access to care, a positive association between diabetes and prostate cancer screening may be expected. Additionally, past prostate cancer screening recommendations [22-24], are consistent in suggesting increased prostate cancer screening for black men, who are at higher risk of prostate cancer compared with white men. Thus, primary care physicians face the challenge of not only considering the patient's age and race, but also overall health and co-morbidity status, in guiding the patient to an informed judgment as to the benefits of screening. Additionally, diabetes has been linked to increased risk of benign prostatic hyperplasia [25], suggesting the possibility that diabetes patients experiencing lower urinary tract symptoms should be preferentially screened at diagnosis to remove prostate cancer as a differential diagnosis. Furthermore, obesity is more prevalent among diabetes patients and thus may contribute to lower blood PSA levels [26-28], increasing the need for more frequent screening; however, we controlled for BMI in our analyses.

Preferential screening of men with diabetes may impact the interpretation of epidemiologic findings [1, 2] that prostate cancer risk initially increased following a diabetes diagnosis, before decreasing with extended follow-up. Thus, the long-term decreased risk of prostate cancer may result in part from enhanced detection near the time of diabetes diagnosis, as the lead time induced by active screening and removal of latent prostate cancers early during the follow-up period may remove prostate cancers that would have been diagnosed during extended follow-up. Future cohort investigations of diabetes and prostate cancer should consider collecting detailed data on PSA screening history to control for time varying effects

of prostate cancer detection. Indeed, interpretation of past prostate cancer analyses have been altered with adjustment for prostate cancer screening [29].

Our study relied on self-reports of diabetes and prostate cancer screening which may have been affected by faulty memory or low literacy, or misclassification due to undiagnosed diabetes or inaccurate reports of timing of prostate cancer screening. However, the majority of SCCS participants were patients at CHCs, which provide primary healthcare to the underserved, and a validation sub-study found over 95% of self-reported diabetes in the SCCS could be confirmed through medical chart review [9]. It is possible that initiation of prostate cancer screening preceded or occurred simultaneously with a diabetes diagnosis in a subset of the baseline cohort, however we analyzed prostate cancer screening in the 12 months prior to cohort entry so that diabetes preceded prostate cancer screening for the vast number of study participants reporting a diabetes diagnosis. While we adjusted for health care coverage as a dimension of health care access, we were unable to adjust for usual source of care.

Study strengths include the large size of the population allowing for investigation of associations in black and white men separately. Confounding by socioeconomic factors is likely to be minimal, because blacks and whites were of similar SES upon recruitment and residual differences in education and income were accounted for in the statistical analyses. We adjusted for a wide range of confounders including obesity, hypertension, and cholesterol medication use, as well as health insurance coverage to isolate the effect of diabetes on prostate cancer screening apart from its effect on access to care.

In conclusion, diabetes was positively associated with prostate cancer screening especially during the short term following a diabetes diagnosis. Although racial differences in healthcare recommendations have been described by the Institute of Medicine [30], we found similar results for prostate cancer screening by diabetes status among black and white men. The early increase in prostate cancer detection, followed by lower prostate cancer detection over time, may partially explain the overall reduction in prostate cancer risk associated with diabetes.

## Acknowledgments

The Southern Community Cohort Study was supported by the National Cancer Institute (NCI; grant R01 CA92447). Maureen Sanderson, Jay Fowke and Flora Ukoli received partial funding from the Department of Defense (DOD; grant W81XWH 11 PCRP STPA). Margaret K. Hargreaves received partial funding from the National Institutes of Health (NIH; grants 5P60 DK20593-24 and 5U01 CA114641-05). The authors would like to thank Jacquelyn S. Favours for her work on the manuscript.

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**Table 1**

**Demographic characteristics of men who were and were not screened for prostate cancer within the past 12 months, Southern Community Cohort Study, 2002-2009**

| | Screened[a] | | Not screened | | |
|---|---|---|---|---|---|
| **Characteristic** | **n** | **%** | **n** | **%** | **p-value** |
| **Black Men** | | | | | |
| Age (years) | | | | | <0.0001 |
| 40-44 | 711 | 16.6 | 4341 | 31.7 | |
| 45-49 | 931 | 21.7 | 3751 | 27.4 | |
| 50-54 | 980 | 22.9 | 2833 | 20.7 | |
| 55-59 | 713 | 16.7 | 1521 | 11.1 | |
| 60-64 | 504 | 11.8 | 708 | 5.2 | |
| 65-69 | 256 | 6.0 | 326 | 2.4 | |
| 70-74 | 134 | 3.1 | 151 | 1.1 | |
| 75-79 | 54 | 1.3 | 64 | 0.5 | |
| Annual household income | | | | | <0.0001 |
| <$15,000 | 2065 | 48.9 | 8321 | 61.3 | |
| $15,000-$24,999 | 885 | 21.0 | 3045 | 22.4 | |
| $25,000-$49,999 | 726 | 17.2 | 1581 | 11.7 | |
| $50,000-$99,999 | 420 | 9.9 | 507 | 3.7 | |
| ≥$100,000 | 128 | 3.0 | 115 | 0.9 | |
| Educational level | | | | | <0.0001 |
| <9 years | 355 | 8.3 | 1009 | 7.4 | |
| 9-11 years | 812 | 19.0 | 3572 | 26.1 | |
| Completed high school or GED | 1372 | 32.1 | 5263 | 38.5 | |
| Vocational/Some college | 1085 | 25.3 | 2936 | 21.5 | |
| Graduated from college | 390 | 9.1 | 657 | 4.8 | |
| Graduate school | 267 | 6.2 | 250 | 1.8 | |
| Marital status | | | | | <0.0001 |
| Single | 956 | 22.5 | 4790 | 35.1 | |
| Married/living with a partner | 1729 | 40.7 | 3856 | 28.2 | |

| Characteristic | Screened[a] n | Screened[a] % | Not screened n | Not screened % | p-value |
|---|---|---|---|---|---|
| **Black Men** | | | | | |
| Divorced/widowed/separated | 1560 | 36.8 | 5015 | 36.7 | |
| Health insurance coverage | | | | | <0.0001 |
| None | 1436 | 33.7 | 7482 | 54.8 | |
| Medicare/Medicaid only | 1123 | 26.3 | 2827 | 20.7 | |
| Any private/CHAMPUS/other | 1709 | 40.0 | 3337 | 24.5 | |
| Recruitment source | | | | | <0.0001 |
| Community Health Centers | 3613 | 84.4 | 12941 | 94.5 | |
| General population | 670 | 15.6 | 754 | 5.5 | |
| Body mass index (kg/m$^2$) at age 21 | | | | | 0.03 |
| <18.5 | 284 | 7.0 | 953 | 7.3 | |
| 18.5-24.9 | 2428 | 59.7 | 8088 | 61.8 | |
| 25-29.9 | 1058 | 26.0 | 3081 | 23.6 | |
| 30-34.99 | 224 | 5.5 | 681 | 5.2 | |
| 35-39.99 | 51 | 1.3 | 178 | 1.4 | |
| 40 | 24 | 0.6 | 101 | 0.8 | |
| Body mass index (kg/m$^2$) maximum | | | | | <0.0001 |
| <20 | 25 | 0.6 | 137 | 1.0 | |
| 20-24.99 | 578 | 13.8 | 2684 | 19.9 | |
| 25-29.99 | 1468 | 35.0 | 4848 | 35.9 | |
| 30-39.9 | 1771 | 42.3 | 4872 | 36.1 | |
| 40 | 350 | 8.4 | 959 | 7.1 | |
| Hypertension | | | | | <0.0001 |
| No | 1652 | 38.6 | 7736 | 56.5 | |
| Yes | 2630 | 61.4 | 5954 | 43.5 | |
| Cholesterol medications | | | | | <0.0001 |
| No | 3464 | 81.3 | 12564 | 91.8 | |
| Yes | 797 | 18.7 | 1117 | 8.2 | |
| Smoking | | | | | <0.0001 |

| Characteristic | Screened[a] n | Screened[a] % | Not screened n | Not screened % | p-value |
|---|---|---|---|---|---|
| **Black Men** | | | | | |
| Never | 1144 | 26.9 | 2997 | 22.0 | |
| Former | 1160 | 27.3 | 2214 | 16.2 | |
| Current | 1944 | 45.8 | 8427 | 61.8 | |
| Moderate physical activity during their 30s (hours per week) | | | | | 0.12 |
| 0 | 244 | 5.9 | 916 | 6.8 | |
| 0.01-2.00 | 56 | 1.3 | 171 | 1.3 | |
| 2.01-4.99 | 69 | 1.7 | 255 | 1.9 | |
| ≥5 | 3802 | 91.2 | 12160 | 90.1 | |
| Vigorous physical activity during their 30s (hours per week) | | | | | 0.20 |
| 0 | 397 | 9.5 | 1340 | 9.9 | |
| 0.01-2.00 | 182 | 4.4 | 494 | 3.7 | |
| 2.01-4.99 | 134 | 3.2 | 434 | 3.2 | |
| ≥5 | 3463 | 82.9 | 11247 | 83.2 | |
| White Men | | | | | |
| Age (years) | | | | | <0.0001 |
| 40-44 | 152 | 8.0 | 1169 | 27.8 | |
| 45-49 | 261 | 13.6 | 1090 | 26.0 | |
| 50-54 | 348 | 18.2 | 758 | 18.0 | |
| 55-59 | 428 | 22.4 | 577 | 13.7 | |
| 60-64 | 360 | 18.8 | 334 | 8.0 | |
| 65-69 | 222 | 11.6 | 161 | 3.8 | |
| 70-74 | 99 | 5.2 | 85 | 2.0 | |
| 75-79 | 43 | 2.3 | 27 | 0.6 | |
| Annual household income | | | | | <0.0001 |
| <$15,000 | 441 | 23.6 | 1922 | 46.2 | |
| $15,000-$24,999 | 222 | 11.9 | 787 | 18.9 | |
| $25,000-$49,999 | 382 | 20.5 | 683 | 16.4 | |

| Characteristic | Screened[a] n | Screened[a] % | Not screened n | Not screened % | p-value |
|---|---|---|---|---|---|
| **Black Men** | | | | | |
| $50,000-$99,999 | 525 | 28.1 | 515 | 12.4 | |
| ≥$100,000 | 298 | 16.0 | 253 | 6.1 | |
| Educational level | | | | | <0.0001 |
| <9 years | 102 | 5.3 | 316 | 7.5 | |
| 9-11 years | 144 | 7.5 | 656 | 15.6 | |
| Completed high school or GED | 433 | 22.7 | 1400 | 33.4 | |
| Vocational/Some college | 467 | 24.5 | 1034 | 24.6 | |
| Graduated from college | 372 | 19.5 | 427 | 10.2 | |
| Graduate school | 392 | 20.5 | 364 | 8.7 | |
| Marital status | | | | | <0.0001 |
| Single | 153 | 8.4 | 764 | 18.4 | |
| Married/living with a partner | 1271 | 69.3 | 1889 | 45.6 | |
| Divorced/widowed/separated | 409 | 22.3 | 1493 | 36.0 | |
| Health insurance coverage | | | | | <0.0001 |
| None | 350 | 18.4 | 2043 | 48.8 | |
| Medicare/Medicaid only | 281 | 14.8 | 739 | 17.7 | |
| Any private/CHAMPUS/other | 1272 | 66.8 | 1405 | 33.6 | |
| Recruitment source | | | | | <0.0001 |
| Community Health Centers | 887 | 46.4 | 3217 | 76.6 | |
| General population | 1026 | 53.6 | 984 | 23.4 | |
| Body mass index (kg/m$^2$) at age 21 | | | | | 0.04 |
| <18.5 | 103 | 5.5 | 254 | 6.2 | |
| 18.5-24.9 | 1165 | 62.6 | 2480 | 60.3 | |
| 25-29.9 | 478 | 25.7 | 1067 | 25.9 | |
| 30-34.99 | 92 | 4.9 | 223 | 5.4 | |
| 35-39.99 | 11 | 0.6 | 63 | 1.5 | |
| 40 | 13 | 0.7 | 29 | 0.7 | |
| Body mass index (kg/m$^2$) maximum | | | | | <0.0001 |

| Characteristic | Screened[a] n | % | Not screened n | % | p-value |
|---|---|---|---|---|---|
| **Black Men** | | | | | |
| <20 | 7 | 0.4 | 27 | 0.7 | |
| 20-24.99 | 182 | 9.7 | 599 | 14.4 | |
| 25-29.99 | 697 | 37.0 | 1458 | 35.1 | |
| 30-39.9 | 819 | 43.5 | 1673 | 40.3 | |
| 40 | 179 | 9.5 | 394 | 9.5 | |
| Hypertension | | | | | <0.0001 |
| No | 942 | 49.2 | 2586 | 61.6 | |
| Yes | 971 | 50.8 | 1614 | 38.4 | |
| Cholesterol medications | | | | | <0.0001 |
| No | 1309 | 68.8 | 3622 | 86.5 | |
| Yes | 593 | 31.2 | 567 | 13.5 | |
| Smoking | | | | | <0.0001 |
| Never | 685 | 36.5 | 1031 | 24.8 | |
| Former | 789 | 42.1 | 1033 | 24.8 | |
| Current | 402 | 21.4 | 2102 | 50.5 | |
| Moderate physical activity during their 30s (hours per week) | | | | | <0.0001 |
| 0 | 92 | 5.0 | 281 | 6.8 | |
| 0.01-2.00 | 26 | 1.4 | 62 | 1.5 | |
| 2.01-4.99 | 80 | 4.4 | 100 | 2.4 | |
| ≥5 | 1635 | 89.2 | 3672 | 89.2 | |
| Vigorous physical activity during their 30s (hours per week) | | | | | <0.0001 |
| 0 | 180 | 9.8 | 447 | 10.9 | |
| 0.01-2.00 | 116 | 6.3 | 155 | 3.8 | |
| 2.01-4.99 | 111 | 6.1 | 124 | 3.0 | |
| ≥5 | 1427 | 77.8 | 3392 | 82.4 | |

[a]Prostate-specific antigen or digital rectal exam.

**Table 2**

**Odds ratios of prostate cancer screening within the past 12 months associated with diabetes measures by race, Southern Community Cohort Study, 2002-2009**

| | Screened[a] | | Not screened | | | |
|---|---|---|---|---|---|---|
| **Characteristic** | **n** | **%** | **n** | **%** | **OR[c]** | **95% CI[d]** |
| **Black Men** | | | | | | |
| Self-reported diabetes | | | | | | |
| No | 3327 | 77.7 | 11761 | 85.9 | 1.0 | Referent |
| Yes | 956 | 22.3 | 1934 | 14.1 | 1.12 | 1.01-1.25 |
| Time since diabetes diagnosis (years)[b] | | | | | | |
| <1 | 86 | 9.2 | 158 | 8.3 | 1.0 | Referent |
| 1-4 | 291 | 31.1 | 599 | 31.5 | 0.74 | 0.53-1.02 |
| 5-9 | 227 | 24.3 | 475 | 25.0 | 0.69 | 0.49-0.96 |
| 10-14 | 150 | 16.0 | 302 | 15.9 | 0.64 | 0.45-0.92 |
| 15-19 | 82 | 8.8 | 145 | 7.6 | 0.71 | 0.47-1.08 |
| ≥20 | 100 | 10.7 | 223 | 11.7 | 0.51 | 0.35-0.76 |
| Year of diabetes diagnosis[b] | | | | | | |
| Pre-1994 | 290 | 31.0 | 571 | 30.0 | 1.0 | Referent |
| Post-1994 | 646 | 69.0 | 1331 | 70.0 | 1.11 | 0.92-1.35 |
| Diabetes medications[b] | | | | | | |
| No | 134 | 14.1 | 310 | 16.1 | 1.0 | Referent |
| Yes | 819 | 85.9 | 1621 | 83.9 | 1.06 | 0.83-1.36 |
| White Men | | | | | | |
| Self-reported diabetes | | | | | | |
| No | 1559 | 81.5 | 3666 | 87.3 | 1.0 | Referent |
| Yes | 354 | 18.5 | 535 | 12.7 | 1.25 | 1.03-1.51 |
| Time since diabetes diagnosis (years)[b] | | | | | | |
| <1 | 41 | 11.8 | 54 | 10.2 | 1.0 | Referent |
| 1-4 | 112 | 32.2 | 186 | 35.2 | 0.65 | 0.36-1.16 |

| Characteristic | Screened[a] | | Not screened | | | |
|---|---|---|---|---|---|---|
| | n | % | n | % | OR[c] | 95% CI[d] |
| **Black Men** | | | | | | |
| 5-9 | 91 | 26.2 | 137 | 25.9 | 0.71 | 0.39-1.29 |
| 10-14 | 44 | 12.6 | 77 | 14.6 | 0.59 | 0.30-1.16 |
| 15-19 | 24 | 6.9 | 27 | 5.1 | 0.74 | 0.32-1.69 |
| ≥20 | 36 | 10.3 | 48 | 9.1 | 0.76 | 0.37-1.57 |
| Year of diabetes diagnosis[b] | | | | | | |
| Pre-1994 | 85 | 24.4 | 116 | 21.9 | 1.0 | Referent |
| Post-1994 | 263 | 75.6 | 413 | 78.1 | 0.86 | 0.59-1.26 |
| Diabetes medications[b] | | | | | | |
| No | 71 | 20.1 | 116 | 21.7 | 1.0 | Referent |
| Yes | 282 | 79.9 | 419 | 78.3 | 1.18 | 0.79-1.78 |

[a] Prostate-specific antigen or digital rectal exam.

[b] Among diabetics.

[c] Odds ratio adjusted for age, annual household income, educational level, marital status, health insurance coverage, recruitment source, BMI at age 21 years and maximum, hypertension, cholesterol medications, and leisure-time moderate and vigorous physical activity during their 30s as categorized in Table 1.

[d] 95% Confidence interval.