Prostate Cancer Screening and Diagnoses in the Transfeminine Population

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OBJECTIVE To examine the frequency and rate at which transfeminine patients receive prostate-specific antigen testing compared to a matched cisgender cohort.

METHODS Patients with prostates who had encounters in our health system, are currently age 46 or older, and who are alive were included in our study. Transfeminine patients were identified through diagnosis codes and chart review. A 1:5 matched cohort was created based on patient age, race, and area deprivation index. Conditional logistic regression was done to compare odds of receiving any testing and Poisson regression was done to compare the total tests.

RESULTS A total of 275,112 patients were included in the study, of which 315 were confirmed to be transfeminine. A well-matched 1:5 propensity-matched cohort was created. Our results suggest that transfeminine patients were 0.28 (95% CI 0.20-0.38, $P < .001$) times as likely as cisgender patients to receive at least 1 PSA test at our institution and received only 32% (95% CI 27%-37%, $P < .001$) as many total PSA tests.

CONCLUSION Until more is known about the best practices for PSA testing in the transfeminine population, these patients should receive PSA testing. However, our results suggest that transfeminine patients are significantly less likely to receive any testing and significantly fewer tests in their lifetimes, which may represent a significant healthcare disparity. UROLOGY 197: 80–87, 2025. © 2024 Elsevier Inc. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

Prostate cancer (PCa) is the most commonly diagnosed non-cutaneous cancer and the second most common oncological cause of mortality among cisgender men (men whose sex assigned at birth and gender identity are both male) in the United States.[1] Prostate-specific antigen (PSA) testing has been shown to be associated with earlier detection of PCa and a lower risk of PCa specific mortality (PCSM) in cisgender men.[2,3] Unfortunately, little is known about prevalence of PCa in the transfeminine (women who were assigned male at birth) population.[4] On the other hand, overuse of PSA testing has been shown to have negative impacts on patients by leading to overdiagnosis and overtreatment.[5] The risk of overdiagnosis from PSA testing has led researchers to examine alternative methods for screening, including MRI[6] and urine tests[7] (eg, SelectMDX). While these methods show promise, no research has compared their usage in cisgender and transfeminine patients. Recent studies have attempted to compare PSA testing between transfeminine and cisgender individuals.[8-10] These studies identified a lower frequency of PSA testing in transfeminine patients. However, these studies suffer from several issues, including non-representative samples (ie, private insurance patients only), survey-based responses, and a lack of data granularity. Given the significant differences between transfeminine and cisgender people in terms of access to healthcare and disparities, it is important to better understand current PSA testing practices in transfeminine individuals.[11] Previous research has also shown that transfeminine individuals not on gender-affirming hormone therapy (GAHT) have similar risk of PCa to cisgender individuals,[12] though at the time of diagnosis with PCa, they tend to have more advanced stage.[13] While for transfeminine patients who are on GAHT, insufficient research has been done into PSA testing and PCa. Hence,

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until more is known about this topic, it is important that transfeminine patients, both on and off GAHT, receive similar PCa testing to cisgender individuals.

To enhance knowledge on this emerging subject, we compared PSA testing and PCa diagnoses between cisgender and transfeminine patients using a large, contemporary North American cohort. We further analyzed the subgroup of transfeminine patients to compare those with and without GAHT. We hypothesized that transfeminine patients will be less likely to receive PSA testing and get fewer total PSA tests.

METHODS

Study Cohort

We utilized our institutional database which includes electronic medical records for all patients with prostates receiving care at our health system between 1995 and 2023. We included patients who were at least 46 years of age as of 2023. Patients were excluded if they had a diagnosis of PCa before age 46, were missing covariates of interest, or died before 2024 (see Supplementary Fig. 1). These criteria were chosen to ensure patients eligible for PSA testing were included and that current age matching could be done and result in individuals matched with those eligible for PSA testing for the same amount of time.

Variables

In order to differentiate patients in our database multiple steps were taken. First, potential transfeminine patients were identified by ICD-9 or ICD-10 diagnosis codes indicating gender dysphoria or by comparing gender identity, sex assigned at birth, and legal sex (Supplementary Table 1).[14] Once potential transfeminine patients were identified, individual chart review was used to verify transfeminine status.

The following covariates were collected for each patient in the analysis dataset: age as of January 1, 2024, race (Black, White, Other, Unknown), and national Area Deprivation Index (ADI) percentile. ADI is a variable which is calculated by census block using income, educational level, home value, and quality of life. Each census block nationwide was then ranked into percentiles ranging from 1 to 100 with 1 representing the least deprived and 100 representing the most deprived census block based on the 2021 ADI data.[15] Patients' ADI was found by matching patients' current address to census blocks using their 9-digit zip codes.[16]

Among patients identified as transfeminine, an additional variable was collected: GAHT status. Chart review was used to determine whether patients have, at any time, been prescribed GAHT. If so, they were categorized as GAHT patients, while all other patients were categorized as non-GAHT.

Endpoints

Our primary endpoint was the receipt of at least 1 PSA test at any point. Secondary endpoints were the total number of PSA tests received per patient and a diagnosis of PCa at any time over the age of 45. First PSA value for each patient that received a PSA test was also recorded.

Statistical Analysis

Descriptive statistics were calculated and reported as median and interquartile range (IQR) for continuous variables and frequencies and percentages for categorical variables stratified by gender identity. Variables were compared between groups using t-tests and chi-square tests for continuous and categorical variables respectively. Further statistical analysis consisted of several steps. First, 2 multivariable regressions were done on the whole dataset. Logistic regression was used to assess the relative odds of a transfeminine patient getting at least 1 PSA test. Next, multivariable Poisson regression was used to assess the rate ratio (RR) for the number of PSA tests between eligible transfeminine and cisgender patients. By including age as a covariate, we are adjusting for the fact that older patients will have had more PSAs.

Next, in order to better account for confounding variables, a propensity-score matched dataset was created, which has been shown to be effective at reducing the effect of confounders.[17] A multivariable logistic regression model was created with the outcome being a transfeminine identity and variables in the model being age, race, and ADI. Greedy nearest neighbor matching with a caliper of 0.2 was then used to create a 1:5 propensity-matched dataset. The quality of matching was then assessed using the Absolute Standardized Mean Difference (ASMD), with an ASMD < 0.1 being considered excellent.[18]

This matched dataset was then used to replicate the same multivariable analyses done on the whole cohort. Variables with an ASMD < 0.1 were omitted from these regressions, while those with an ASMD > 0.1 remained. Conditional logistic regression was done on receiving at least 1 PSA and Poisson regression was done on the total number of PSA tests. All statistical analyses were 2-sided with $P < .05$ considered to be significant. All analyses were performed using SAS version 9.4 (SAS Institute, Cary, North Carolina).

Subgroup Analysis

In order to compare transfeminine patients by GAHT status, age, and ADI will be compared between transfeminine patients by GAHT status using t-tests while race will be compared by chi-square test. Previously described regressions will be repeated with GAHT as the variable of interest.

Sensitivity Analysis

It is possible that comorbidities may impact whether patients receive PSA testing. As a sensitivity analysis, we calculated CCI for all patients who received a PSA test at the time of their PSA test. We then compared CCI values between transfeminine and cisgender patients to

see if, among those for whom we have a reliable CCI value, there is a significant difference between them.

IRB Approval

Patients were retrospectively enrolled in IRB# 16323-01 and a waiver for informed consent was obtained prior to conducting the study.

RESULTS

Our inclusion and exclusion criteria resulted in a cohort of 275,112 patients aged 46 or over as of January 1, 2024, who are currently alive, of which 315 were confirmed to be transfeminine (Supplementary Fig. 1). Patients in the cisgender group were older (median age [IQR] 64 [55,72] vs 58 [51,68], $P < .0001$) and more likely to be Black race (19.2% vs 10.8%, $P < .0001$). ADI was not significantly different between groups (median [IQR] 61 [39,83] vs 67 [44,85], $P = .07$). In the cisgender group, 46.7% of patients had at least 1 PSA test compared to 19.4% in the transfeminine group ($P < .0001$). Cisgender patients also had more PSA tests total than transfeminine patients (median [IQR] 0 [0,3] vs 0 [0,0], $P < .0001$) [Table 1].

1:5 propensity matching resulted in a cohort of 1890 patients. Patients were matched on age, race, and national ADI percentile. ASMD values between groups were 0.02, 0.05, and 0.05 on the 3 variables respectively, indicating excellent matching on all matching variables (Table 1).

Any PSA Tests

On multivariable logistic regression in the unmatched cohort, transfeminine patients were significantly less likely to have had at least 1 PSA test than cisgender patients with Odds Ratio (OR) [95% CI] = 0.33 [0.25-0.44]. Age, race, and ADI were also significantly associated with receipt of at least 1 PSA (Table 2). In the matched cohort on conditional logistic regression, transfeminine patients were also significantly less likely to have had at least 1 PSA test with OR [95% CI] = 0.28 [0.20-0.38] (Table 2). Among patients with a PSA test, there was not a significant difference in PSA values between groups in the unmatched and matched cohorts ($P = .9$, ASMD = 0.02).

Number of PSA Tests

On multivariable Poisson regression, transfeminine patients had significantly lower numbers of total PSAs with RR [95% CI] = 0.31 [0.26, 0.35]. Age, race, and ADI were also significantly associated with the total number of PSAs (Table 2). In the matched cohort on univariable Poisson regression, transfeminine patients also had significantly lower numbers of PSAs with RR [95% CI] = 0.32 [0.27, 0.37] (Table 2).

Prostate Cancer Diagnoses

Only one (0.3%) of the transfeminine patients had a diagnosis of PCa. Because of this very low incidence, we decided not to include results from this analysis as this low incidence led to large confidence intervals.

Subgroup Analysis

Of the 315 patients identified as transfeminine, 204 (65%) had evidence of GAHT. Within these patients, there were no significant differences between those patients with and without evidence of GAHT in terms of age ($P = .6$), race ($P = .03$), ADI ($P = .09$), and PSA value ($P = .7$) after adjustment for multiple comparisons (Table 3). On multivariable logistic regression, there was no difference in odds of receiving at least 1 PSA test between transfeminine patients by GAHT status (OR = 0.97 [0.51-1.81], $P = .9$). On multivariable Poisson regression, there was a significant difference in the number of PSA tests per patient, with a RR [95% CI] = 0.59 [0.44-0.80] (Table 4).

Sensitivity Analysis

There was not a significant difference in CCI for those patients who received a PSA test between transfeminine and cisgender patients in either the whole cohort (chi-square $P = .2$),the matched cohort (chi-square $P = .5$) [Table 1], or the subgroup analysis on transfeminine patients by GAHT ($P = .3$)[Table 3].

DISCUSSION

PCa testing has been shown to be associated with earlier detection of PCa and lower risk of PCSM,[2,3] though research into its' usage in transfeminine patients is lacking.[5] By extrapolation of rates in the general population, it is estimated that over 20,000 new cases of PCa will be diagnosed in transfeminine patients in the U.S. in 2024.[19] In the absence of further information, it is important that these patients receive PSA testing. Available studies into this topic have shown that transfeminine patients are significantly less likely to receive any PSA testing.[8-10] However, 2 of these studies used survey data, which relies on self-reported information, using the Behavioral Risk Factor Surveillance System (BRFSS).[8,10] Given the sensitive nature of these issues, these survey responses may not be complete. Additionally, given the nature of survey data, it was not possible to measure the number of PSA tests, only whether a patient had received any. Finally, the BRFSS is a voluntary survey with varying response rates that could cause non-response bias.[20] The third study used claims data from the MarketScan Database and focused exclusively on patients with private insurance.[9] Thus, their observations were based on a subcategory of patients that may not represent the general population. Additionally, race was not included in this study which makes determination of generalizability difficult. Our aim was to measure the likelihood of transfeminine patients

Table 1. Descriptive statistics of 275,112 patients, as well as 1890 patients in a propensity-matched cohort, stratified by gender identity.

	Unmatched Cohort		Matched Cohort			
	Cisgender (N = 274,797)	Transfeminine (N = 315)	*P*-value	Cisgender (N = 1575)	Transfeminine (N = 315)	ASMD[c]
PSA screening, n (%)			< .0001[a]			
No PSA tests from 2012-2022	146,483 (53.3%)	254 (80.6%)		908 (57.7%)	254 (80.6%)	
At least one PSA test from 2012-2022	128,314 (46.7%)	61 (19.4%)		667 (42.3%)	61 (19.4%)	
Total number of PSA screens			< .0001[b]			
Median (IQR)	0 (0, 3)	0 (0, 0)		0 (0, 2)	0 (0, 0)	
Prostate cancer diagnosis, n (%)			.006[a]			
No prostate cancer diagnosis	266,760 (97.1%)	314 (99.7%)		1550 (98.4%)	314 (99.7%)	
Prostate cancer diagnosis	8037 (2.9%)	1 (0.3%)		25 (1.6%)	1 (0.3%)	
PSA value [1st PSA] (ng/mL)						
Median (IQR)	0.8 (0.5, 1.4)	0.8 (0.4, 1.7)	.9[b]	0.8 (0.5, 1.5)	0.8 (0.4, 1.7)	0.02
Patient age as of 1/1/2024			< .0001[b]			0.02
Median (IQR)	64 (55, 72)	58 (51, 68)		58 (51, 68)	58 (51, 68)	
Patient race, n (%)			< .0001[a]			0.05
Black	52,883 (19.2%)	34 (10.8%)		168 (10.7%)	34 (10.8%)	
Other	19,901 (7.2%)	38 (12.1%)		178 (11.3%)	38 (12.1%)	
Unknown	18,579 (6.8%)	23 (7.3%)		93 (5.9%)	23 (7.3%)	
White	183,434 (66.8%)	220 (69.8%)		1136 (72.1%)	220 (69.8%)	
National area deprivation index percentile			.07[b]			0.05
Median (IQR)	61 (39, 83)	67 (44, 85)		68 (46, 85)	67 (44, 85)	
Charlson comorbidity index (Patients with a PSA)			.2[a]			0.5[a]
0	58,551 (71.1%)	39 (63.9%)		299 (69.7%)	39 (63.9%)	
1	14,673 (17.8%)	15 (24.6%)		85 (19.8%)	15 (24.6%)	
2	5283 (6.4%)	2 (3.3%)		23 (5.4%)	2 (3.3%)	
3 +	3898 (4.7%)	5 (8.2%)		22 (5.1%)	5 (8.2%)	

[a] Chi-square *P*-value;
[b] Unequal variance 2 sample t-test;
[c] Absolute standardized mean difference

Table 2. Multivariable logistic and Poisson regressions on 275,112 patients in the unmatched cohort and conditional logistic and Poisson regressions on 1890 patients in the propensity-matched cohort.

		Logistic Regression (Any PSA)		Poisson Regression (Number of PSAs)	
Covariate	Level	Odds Ratio (95% CI)	Type 3 P-value	Rate Ratio (95% CI)	Type 3 P-value
Gender identity	Transfeminine	0.33 (0.25-0.44)	< .001	0.31 (0.26-0.35)	< .001
	Cisgender	-		-	
Age		1.04 (1.04-1.04)	< .001	1.05 (1.05-1.05)	< .001
Race	Black	1.11 (1.08-1.13)	< .001	1.38 (1.37-1.39)	< .001
	Other	0.64 (0.62-0.66)		0.87 (0.86-0.88)	
	Unknown	0.90 (0.87-0.93)		1.00 (0.99-1.01)	
	White	-		-	
National ADI percentile		0.99 (0.99-0.99)	< .001	0.99 (0.99-0.99)	< .001
		Conditional Logistic Regression (Any PSA)		Poisson Regression (Number of PSAs)	
Covariate	Level	Odds Ratio (95% CI)	Type 3 *P*-value	Rate Ratio (95% CI)	Type 3 *P*-value
Gender identity	Transfeminine	0.28 (0.20-0.38)	< .001	0.32 (0.27-0.37)	< .001
	Cisgender	-		-	

Table 3. Descriptive statistics for 315 transfeminine patients stratified by GAHT.

	No GAHT (N = 111)	GAHT (N = 204)	Total (N = 315)	*P*-value
PSA screening, n (%)				.9[a]
No PSA tests from 2012-2022	90 (81.1%)	164 (80.4%)	254 (80.6%)	
At least one PSA test from 2012-2022	21 (18.9%)	40 (19.6%)	61 (19.4%)	
Total number of PSA screens				.3[b]
Median (IQR)	0 (0, 0)	0 (0, 0)	0 (0, 0)	
Prostate cancer diagnosis, n (%)				.2[a]
No prostate cancer diagnosis	110 (99.1%)	204 (100.0%)	314 (99.7%)	
Prostate cancer diagnosis	1 (0.9%)	0 (0.0%)	1 (0.3%)	
PSA value [1st PSA] (ng/mL)				.7[b]
Median (IQR)	1.0 (0.5, 1.9)	0.7 (0.4, 1.7)	0.8 (0.4, 1.7)	
Patient age as of 1/1/2024				.6[b]
Median (IQR)	59 (51, 68)	57 (50, 69)	58 (51, 68)	
Race, n (%)				.03[a]
Black	12 (10.8%)	22 (10.8%)	34 (10.8%)	
Other	21 (18.9%)	17 (8.3%)	38 (12.1%)	
Unknown	10 (9.0%)	13 (6.4%)	23 (7.3%)	
White	68 (61.3%)	152 (74.5%)	220 (69.8%)	
National area deprivation index percentile				.09[b]
Median (IQR)	69 (47, 93)	67 (43, 80)	67 (44, 85)	
CCI, n (%)				.3[a]
0	16 (76.2%)	23 (57.5%)	39 (63.9%)	
1	4 (19.0%)	11 (27.5%)	15 (24.6%)	
2	1 (4.8%)	1 (2.5%)	2 (3.3%)	
3 +	0 (0.0%)	5 (12.5%)	5 (8.2%)	
Missing	90	164	254	

[a] Chi-square *P*-value;
[b] Unequal variance 2 sample t-test;

Table 4. Multivariable logistic and poisson regressions on 315 transfeminine patients.

		Logistic Regression (Any PSA)		Poisson Regression (Number of PSAs)	
Covariate	Level	Odds Ratio (95% CI)	Type 3 *P*-value	Rate Ratio (95% CI)	Type 3 *P*-value
GAHT	No GAHT	-		-	< .001
	GAHT	0.97 (0.51-1.81)	0.9	0.59 (0.44-0.80)	
Age		1.05 (1.02- 1.08)	0.001	1.06 (1.05-1.08)	< .001
Race	Black	0.44 (0.13-1.55)	0.09	0.54 (0.27-1.06)	< .001
	Other	1.49 (0.63-3.48)		1.36 (0.92-2.00)	
	Unknown	0.13 (0.02-1.05)		0.05 (0.01-0.35)	
	White	-			
National ADI Percentile		0.99 (0.98-1.00)	0.04	0.99 (0.98-0.99)	< .001

getting PSA testing, as well as the frequency of PSA testing, compared to cisgender patients, in a large contemporary North American cohort that does not rely on survey or private claims data.

Our study resulted in several noteworthy findings. First, our analysis corroborated and strengthened previous survey-based work that found transfeminine patients are less likely to receive PSA testing. Our matched analysis showed that transfeminine patients were 0.28 (95% CI 0.20-0.38, $P < .001$) times as likely as cisgender patients to receive at least 1 PSA test in our system. This is somewhat similar to previous research which showed an OR of 0.17 (0.16-0.17),[8] although this was based on survey data which may explain the lower OR. Conversely, an analysis of the MarketScan database found that 41.79% of transfeminine patients had any PSA testing compared to 19.4% in our analysis.[7] This disparity is likely due to the fact that MarketScan only contains data on patients with private insurance and thus not a representative sample.

Second, our findings are, to the best of the authors' knowledge, the first to look at the total number of PSA tests received by each patient. Our results suggest that transfeminine patients will have received only 32% (95% CI 0.27-0.37, $P < .001$) of the number of PSA tests as their matched cisgender counterparts.

Third, our findings are, to the best of the authors' knowledge, the first to compare PSA testing frequency in transfeminine patients by GAHT status. Our results suggest that there is not a significant difference in odds of receipt of PSA testing (OR [95% CI] = 0.97 [0.51-1.81], $P = .9$) between transfeminine patients by GAHT, though those on GAHT did have 59% (95% CI: 40-80, $P < .001$) the total number of PSA tests per person on multivariable Poisson regression.

The recent 15-year follow-up analysis of the Cluster Randomized Trial of PSA Testing for Prostate Cancer (CAP) trial revealed that a single invitation for PSA screening reduced PCa deaths at a 15-year median follow-up.[21] Thus, it is important that all patients with prostates, including transfeminine individuals, receive at least 1 PSA test. That said, the 16-year follow-up results of the European Randomized study of Screening for Prostate Cancer (ERSPC) revealed a larger reduction in PCSM with repeated screening invitations.[3] Therefore, it is important that these patients not only be screened once but receive repeated screening. The 3 previously discussed findings, taken together with the evidence supporting PSA screening and the similar PSA values between cisgender and transfeminine patients with a PSA, as well as between transfeminine patients by GAHT status, suggest a clear disparity in PCa testing in the transfeminine patient population both with and without a history of GAHT which could lead to more advanced disease at diagnosis and higher rates of PCSM. There are many potential causes for this, including dysphoria or clinician avoidance, though this is just speculation for the time being, and further research should be done to study the reasons behind this disparity.[22,23] The fact that GAHT patients had similar PSA values is surprising, and is likely due to the fact that we used the first PSA value, which most likely was taken before GAHT started, and the very low number of patients (19%) with a PSA.

Also of note is the fact that age, race, and ADI were all significantly associated with receipt of any PSA testing as well as the number of PSA tests in all multivariable analyses. This aligns with cisgender literature and speaks to other factors that are also associated with PCa screening.[24]

Our fourth goal was to compare the incidence of PCa between cisgender and transfeminine patients. However, only one transfeminine patient was diagnosed with PCa, which limited our statistical power and precluded us from fitting a multivariable model. There are a few possible explanations for this. It is possible that lower PSA testing frequency in these individuals may lead to lower PCa detection rate, and more missed diagnoses. It is also possible that the incidence of PCa in transfeminine patients is truly lower than cisgender patients, which could be caused by usage of GAHT. Given that 35% of the transfeminine patients in this study were not on GAHT, it is likely a combination of both. More research is needed to study and answer these important questions.

Although this study expands upon the previous literature, it does have limitations. First, we relied on diagnoses and chart review to identify transfeminine patients. It is possible that patients were missed in this identification process which may have led to underrepresentation of this community. Further prospective research should be done to determine the best practices for identifying transfeminine patients via diagnosis codes and/or chart review. We also used data from a wide time-period (1995-2021). We did so in order to include as many patients as possible, though this could introduce bias from changes in data quality and availability. Additionally, although we identified the largest single health system cohort of transfeminine patients to the best of the authors' knowledge, it is still a small sample of transfeminine patients, and we did not have enough to compare the incidence of PCa between transfeminine and cisgender patients. Furthermore, this did not allow us to examine the impact of GAHT on PCa diagnoses. In addition, we do not have data available to determine temporal relationships between GAHT and PSA testing and PCa diagnoses. We are currently limited to whether or not patients were prescribed GAHT at any point. Future research is needed to understand timing and length of GAHT, and its impact on PCa. Finally, we did not differentiate between PSA screening and PSA testing. Future research is needed to address these limitations.

CONCLUSION

Our analysis of a single large contemporary health system-based cohort found that transfeminine patients, both with and without GAHT, are significantly less likely to have received PSA testing in their lifetimes, as well as fewer PSA tests compared to their cisgender counterparts. This

represents a significant and important disparity in healthcare for transfeminine patients that could lead to more advanced disease at diagnosis and higher rates of PCSM. Until more research on the best practices of PSA testing, and PCa diagnoses and outcomes, is available, it is imperative that these patients receive PSA testing at a comparable rate to cisgender patients.

CRediT Authorship Contribution Statement

Firas Abdollah Faik: Writing—review and editing, Supervision, Project administration, Methodology, Conceptualization. Nabeel Shakir: Writing—review and editing, Supervision, Methodology, Conceptualization. Jessica Shill: Writing—review and editing, Supervision, Methodology, Conceptualization. Craig Rogers: Writing—review and editing, Supervision. Briar Shannon: Writing—review and editing, Methodology. Akshay Sood: Writing—review and editing, Methodology. Shane Tinsley: Writing—review and editing, Project administration, Data curation. Keinnan Hares: Writing—review and editing, Data curation. Caleb Richard: Writing—review and editing, Data curation. Jonathan Lutchka: Writing—review and editing, Data curation. Chase Morrison: Writing—review and editing, Data curation. Alex Stephens: Writing—review and editing, Writing—original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of Competing Interestddd

The authors have no conflict of interest to declare.

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None.

Data Availability

Data from our institutional database will be made available upon request in compliance with our institution and IRB regulations.

Disclosures

The authors declare that they have no relevant financial interests.

IRB Approval

Patients were retrospectively enrolled in IRB# 16323–01 and a waiver for informed consent was obtained prior to conducting the study.

Appendix A. Supporting Information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.urology.2024.11.029.

References

1. Santucci C, Carioli G, Bertuccio P, et al. Progress in cancer mortality, incidence, and survival: a global overview. *Eur J Cancer Prev*. 2020;29:367–381. https://doi.org/10.1097/CEJ.0000000000000594
2. Hugosson J, Carlsson S, Aus G, et al. Mortality results from the Göteborg randomised population-based prostate-cancer screening trial. *Lancet Oncol*. 2010;11:725–732. https://doi.org/10.1016/S1470-2045(10)70146-7
3. Hugosson J, Roobol MJ, Månsson M, et al. A 16-yr follow-up of the european randomized study of screening for prostate cancer. *Eur Urol*. 2019;76:43–51. https://doi.org/10.1016/j.eururo.2019.02.009
4. Nik-Ahd F, Jarjour A, Figueiredo J, et al. Prostate-specific antigen screening in transgender patients. *Eur Urol*. 2023;83:48–54. https://doi.org/10.1016/j.eururo.2022.09.007
5. Loeb S, Bjurlin MA, Nicholson J, et al. Overdiagnosis and overtreatment of prostate cancer. *Eur Urol*. 2014;65:1046–1055. https://doi.org/10.1016/j.eururo.2013.12.062
6. Massanova M, Vere R, Robertson S, et al. Clinical and prostate multiparametric magnetic resonance imaging findings as predictors of general and clinically significant prostate cancer risk: a retrospective single-center study. *Curr Urol*. 2023;17:147–152. https://doi.org/10.1097/CU9.0000000000000173
7. Ferro M, Rocco B, Maggi M, et al. Beyond blood biomarkers: the role of SelectMDX in clinically significant prostate cancer identification. *Expert Rev Mol Diagn*. 2023;23:1061–1070. https://doi.org/10.1080/14737159.2023.2277366
8. Ma SJ, Oladeru OT, Wang K, et al. Prostate cancer screening patterns among sexual and gender minority individuals. *Eur Urol*. 2021;79:588–592. https://doi.org/10.1016/j.eururo.2020.11.009
9. Premo H, Gordee A, Lee HJ, et al. Disparities in prostate cancer screening for transgender women: an analysis of the MarketScan Database. *Urology*. 2023;176:237–242. https://doi.org/10.1016/j.urology.2023.03.016
10. Kalavacherla S, Riviere P, Kalavacherla S, et al. Prostate cancer screening uptake in transgender women. Published 2024 Feb 5. *JAMA Netw Open*. 2024;7:e2356088. https://doi.org/10.1001/jamanetworkopen.2023.56088
11. Green DC, Parra LA, Goldbach JT. Access to health services among sexual minority people in the United States. *Health Soc Care Community*. 2022;30:e4770–e4781. https://doi.org/10.1111/hsc.13883
12. Bertoncelli Tanaka M, Sahota K, Burn J, et al. Prostate cancer in transgender women: what does a urologist need to know? *BJU Int*. 2022;129:113–122. https://doi.org/10.1111/bju.15521
13. Ingham MD, Lee RJ, MacDermed D, Olumi AF. Prostate cancer in transgender women. *Urol Oncol*. 2018;36:518–525. https://doi.org/10.1016/j.urolonc.2018.09.011
14. Haley C, Tilea A, Stroumsa D, et al. Determining the sex assigned at birth of transgender and nonbinary populations in administrative claims databases utilizing diagnostic and procedure codes. Published 2023 Mar 31. *Transgend Health*. 2023;8:130–136. https://doi.org/10.1089/trgh.2021.0127
15. Kind AJH, Buckingham WR. Making neighborhood-disadvantage metrics accessible - the neighborhood atlas. *N Engl J Med*. 2018;378:2456–2458. https://doi.org/10.1056/NEJMp1802313
16. Center for Health Disparities Research, University of Wisconsin School of Medicine Public Health. 2015 Area Deprivation Index, version 2.0. August 1, 2021. Accessed October 11, 2023. ⟨https://www.neighborhoodatlas.medicine.wisc.edu⟩.
17. Austin PC. An introduction to propensity score methods for reducing the effects of confounding in observational studies.

Multivariate Behav Res. 2011;46:399–424. https://doi.org/10.1080/00273171.2011.568786
18. Zhang Z, Kim HJ, Lonjon G, Zhu Y. written on behalf of AME Big-Data Clinical Trial Collaborative Group. Balance diagnostics after propensity score matching. *Ann Transl Med*. 2019;7:16. https://doi.org/10.21037/atm.2018.12.10
19. American Cancer Society. *Cancer treatment & survivorship facts & figures 2022-2024*. Atlanta, GA: American Cancer Society,; 2022.
20. Schneider KL, Clark MA, Rakowski W, Lapane KL. Evaluating the impact of non-response bias in the Behavioral Risk Factor Surveillance System (BRFSS). *J Epidemiol Community Health*. 2012;66:290–295. https://doi.org/10.1136/jech.2009.103861
21. Martin RM, Turner EL, Young GJ, et al. Prostate-specific antigen screening and 15-year prostate cancer mortality: a secondary analysis of the CAP randomized clinical trial. Published online April 06 *JAMA*. 2024. https://doi.org/10.1001/jama.2024.4011. Published online April 06.
22. Kamen CS, Alpert A, Margolies L, et al. Treat us with dignity": a qualitative study of the experiences and recommendations of lesbian, gay, bisexual, transgender, and queer (LGBTQ) patients with cancer. *Support Care Cancer*. 2019;27:2525–2532.
23. Quinn GP, Sanchez JA, Sutton SK, et al. Cancer and lesbian, gay, bisexual, transgender/transsexual, and queer/questioning (LGBTQ) populations. *CA Cancer J Clin*. 2015;65:384–400.
24. Burnett AL, Nyame YA, Mitchell E. Disparities in prostate cancer. *J Natl Med Assoc*. 2023;115(2S):S38–S45. https://doi.org/10.1016/j.jnma.2023.02.003