Original Article

Treatment of Early-Stage Prostate Cancer Among Rural and Urban Patients

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BACKGROUND: Geographic barriers and limited availability of cancer specialists may influence early prostate cancer treatment options for rural men. This study compares receipt of different early prostate cancer treatments between rural and urban patients. **METHODS:** Using 2004-2006 SEER Limited-Use Data, 51,982 early prostate cancer patients were identified (T1c, T2a, T2b, T2c, T2NOS; no metastases) who were most likely to benefit from definitive treatment (< 75 years old, Gleason score < 8, PSA ≤ 20). Definitive treatment included radical prostatectomy, daily external beam radiation for 5 to 8 weeks, brachytherapy, or combination external beam radiation/brachytherapy. Adjusted definitive treatment rates were calculated by rural–urban residence overall, and for different sociodemographic and cancer characteristics, and different states based on logistic regression analyses, using general estimating equation methods to account for clustering by county. **RESULTS:** Adjusted definitive treatment rates were lower for rural (83.7%) than urban (87.1%) patients with early-stage prostate cancer ($P \leq .01$). Rural men were more likely than urban men to receive nondefinitive surgical treatment and no initial treatment. The lowest definitive treatment rates were among rural subgroups: 70 to 74 years (73.9%), African Americans (75.6%), American Indians/Alaska Natives (77.8%), single/separated/divorced (76.8%), living in New Mexico (69.3%), and living in counties with persistent poverty (79.6%). **CONCLUSIONS:** Between 2004 and 2006, this adjusted analysis found that men who were living in rural areas were less likely to receive definitive treatment for their early-stage prostate cancer than those living in urban areas. Certain rural patient groups with prostate cancer need particular attention to ensure their access to appropriate treatment. Rural providerss, rural health care systems, and cancer advocacy and support organizations should ensure resources are in place so that the most vulnerable rural groups (men between 60 and 74 years of age; African American men; men who are single, separated, or divorced; and men living in rural New Mexico) can make informed prostate cancer treatment choices based on their preferences. ***Cancer*** **2013;119:3067-75.** *© 2013 American Cancer Society.*

KEYWORDS: prostatic neoplasms; rural population; health care quality, access, and evaluation; SEER Program.

INTRODUCTION

Ensuring the highest quality care for rural cancer patients can be challenging due to the paucity of cancer care specialists, diagnostic services, and therapeutic services located in rural areas.[1] For example, roughly a third of colorectal cancer patients in small and isolated small rural areas must travel more than 50 miles to medical and radiation oncologists' offices.[2] Cancers such as early-stage prostate cancer, which has multiple treatment options, pose even further challenges.

Definitive treatment for early-stage prostate cancer includes radical prostatectomy, daily external beam radiation for 5 to 8 weeks, one-time prostatic implantation of radioactive seeds (brachytherapy), or a combination of external beam radiation and brachytherapy.[3] Survival with any of these treatments is roughly equivalent, yet their sequelae are quite different. Urinary continence and sexual function are better preserved after external beam radiation therapy than radical prostatectomy.[4,5] Both types of radiation therapy are associated with more bowel dysfunction than prostatectomy.[3] For a subset of older men with the earliest stage disease, active surveillance of their cancer is yet another option. Active surveillance avoids therapeutic sequelae, but is associated with higher mortality after 10 to 15 years.[3] Optimal care for early-stage prostate cancer should allow men to choose from among equivalent options after weighing the relative risks and benefits within the context of their individual preferences, yet differential access to these treatments due to the travel burden or to limited availability of cancer specialists may have a powerful relationship with rural patients' treatment choices. However, little is known about the treatments that patients in rural areas who have early-stage prostate cancer receive.

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This study helps fill this information gap by comparing rates of receipt of different early-stage prostate cancer treatments between rural patients and their urban counterparts who are not limited by geographic access or specialist availability. We hypothesized that patients with early-stage prostate cancer in rural areas are less likely to receive definitive treatment for their cancer, and that those who receive definitive treatment are more likely to use one-time treatments such as radical prostatectomy and brachytherapy rather than daily external beam radiation. We also sought to identify the contextual factors associated with use of receipt of definitive treatment among patients with early-stage prostate cancer. Documenting rural–urban differences in prostate cancer treatments can identify potential inequities in cancer care access and treatment choice. This information is important to the work of cancer centers, advocacy groups, and policy makers who plan and develop cancer care services and the cancer care workforce.

MATERIALS AND METHODS

Data Sources

This research used the 2004-2006 SEER Limited-Use Data from 8 state-based cancer registries (California, Connecticut, Hawaii, Iowa, Kentucky, Louisiana, New Mexico, Utah) and 3 county-based cancer registries (Atlanta, rural Georgia, Seattle/Puget Sound) in 2 other states. These SEER registries include 303 rural and 165 urban counties. All SEER registries were represented except Detroit, Michigan, and New Jersey, which were excluded because they are comprised of only urban counties. SEER data provide detailed chart-abstracted information on cancer histology, type, stage, extent of disease, and initial treatment (eg, surgery, radiation); Federal Information Processing Standard (FIPS) county codes; and demographic characteristics (eg, age, sex, race/ethnicity). The Area Resource File (ARF)[6] was used to identify whether there was a radiation oncologist or a urologist in each county for each study year. The ARF uses physician preferred professional mailing address information from the American Medical Association Physician Masterfile and from the American Osteopathic Association. The US Department of Agriculture 2004 Economic Research Service (ERS) County Typology codes identify counties that are low education (25% or more of residents 25 to 64 years old had neither a high school diploma nor a General Equivalency Diploma [GED] in 2000), low-employment (less than 65% of residents 21-64 years old were employed in 2000), and persistent poverty (20% or more of residents were poor as measured by each of the last 4 censuses, 1970, 1980, 1990, and 2000).[7] This research study was approved by the University of Washington Human Subjects Division.

Study Population

We identified 149,822 individuals ages 18 years and older at the time of a first diagnosis with prostate cancer. We excluded the 18,637 individuals who had had a previous cancer of another type, and the 1109 individuals whose prostate cancer diagnosis was made on death certificate or at autopsy. We further restricted our analytic group to the 112,863 cases with tumor categories T1c, T2a, T2b, T2c, and T2NOS and one of the following typical morphology codes (combines histologic type and behavior code from the *International Classification of Diseases for Oncology*, Third Edition): 8000.3, 8140.3, 8255.3, 8480.3, 8481.3, and 8570.3.[8,9] We excluded patients who were either missing information on radiation and/or surgery treatment or the type of radiation or surgery was not specified (n = 3043), because this was our primary outcome of interest. We excluded those patients with metastatic disease or with a type of radiation (radioisotopes) that could have been used for metastatic disease (n = 2729). Finally, in order to identify patients who were most likely to benefit from definitive treatment, we required patients to be less than 75 years of age with a Gleason score less than 8 and a PSA level of 20 or less. These exclusions resulted in a study sample that included 51,982 patients. Table 1 indicates the patient demographic characteristics, cancer stage, and county level characteristics of our study population and the number of cases in rural and urban counties.

Study Variables

Outcome Variable

Receipt of definitive therapy was our primary research outcome of interest. Definitive therapy included radical prostatectomy, beam radiation, brachytherapy or a combination of beam radiation and other radiation. The SEER data indicate the type of treatment received (surgery, radiation) and the method of radiation therapy for those who received it as part of the first course of treatment. When a patient received more than one type of treatment, SEER data indicate which therapy was conducted first. Secondary research outcomes included types of definitive treatment, including receipt of one-time (radical prostatectomy and brachytherapy) versus multiple (external beam radiation or combined external beam and other radiation) treatments.

Independent Variables of Interest

The residence location of each cancer patient was the primary independent variable for this study. Each patient's

TABLE 1. Patient Sociodemographic, Cancer, and Contextual Characteristics by Residence Location

Patient Characteristics	% Urban (N = 45,964)	% Rural (N = 6018)	% Total (N = 51,982)
Individual Characteristics			
Age*			
40-49 y	4.3	3.0	4.2
50-59 y	29.2	26.3	28.9
60-69 y	47.6	49.1	47.8
70-74 y	18.9	21.7	19.2
Race/ethnicity*			
White non-Hispanic	71.4	87.6	73.3
Black non-Hispanic	11.7	6.9	11.1
AI/AN non-Hispanic	0.2	0.7	0.3
Asian non-Hispanic	5.6	1.8	5.1
Latino/Hispanic	11.0	3.0	10.0
Other non-Hispanic	0.2	0.1	0.2
Marital status*			
Married/partnered	79.2	81.3	79.4
Single/separated/divorced	18.1	15.0	17.8
Widowed	2.7	3.7	2.8
Cancer Characteristics			
Prostate cancer T category*			
T1c	62.5	59.0	62.1
T2a	6.5	5.9	6.4
T2b	1.8	2.1	1.9
T2c	9.5	9.4	9.5
T2NOS	19.7	23.6	20.1
PSA category*			
≤10	86.4	84.9	86.2
>10-20	13.6	15.1	13.8
Gleason score*			
≤6	60.3	57.4	59.9
7	39.7	42.6	40.1
Contextual Characteristics			
State*			
California	58.8	14.4	53.6
Connecticut	6.5	3.7	6.2
Georgia	5.7	2.6	5.4
Hawaii	1.4	3.2	1.6
Iowa	2.9	21.5	5.0
Kentucky	3.9	22.2	6.0
Louisiana	5.4	13.7	6.3
New Mexico	2.6	6.7	3.1
Utah	4.3	4.8	4.3
Washington	8.5	7.3	8.4
Urologist and/or radiation oncologist in residence county*[a]			
Neither	2.8	47.6	8.0
Urologist only	2.8	29.1	5.8
Radiation oncologist only	0.2	1.4	0.4
Both	94.2	22.0	85.8
Persistent poverty*	1.4	21.0	3.7
Low employment*	4.9	29.7	7.8
Low education*	22.2	24.7	22.5

[a] The presence of a urologist and/or radiation oncologist in a county is defined by the physicians' preferred professional mailing address from the American Medical Association Physician Masterfile and the American Osteopathic Association, and does not include additional satellite locations.

* $P \leq .001$.

Missing data: race/ethnicity urban 1100, rural 44; marital status urban 2727, rural 411.

Abbreviations: AI/AN, American Indian/Alaska Native; NOS, not otherwise specified; PSA, prostate-specific antigen.

county of residence was classified as metropolitan (urban) or nonmetropolitan (rural) as defined by the Office of Management and Budget.[10] Additional county-level variables served as secondary independent variables examining the association of contextual characteristics with receipt of radiation therapy in rural counties. These included whether the county was designated as persistent poverty, low employment, or low education, and whether there was a practicing radiation oncologist and/or urologist in the year of diagnosis.

Control Variables

A number of factors may confound the primary relationship between rural/urban status and prostate cancer treatment. These include patient sociodemographics (age, sex, marital status, and race/ethnicity), and state, which represents regional practice variation.

Analysis

We first described the sociodemographic, cancer, and contextual characteristics of the study's cancer patients. We calculated unadjusted rates of radiation therapy receipt by rural–urban residence location overall and for patients with different sociodemographic, stage, and contextual characteristics. We used logistic regression analysis to examine the relationship between the contextual variable residence location (rural versus urban) and definitive treatment receipt, controlling for those variables that either improved the fit of the regression model or were significant predictors of definitive treatment. These variables included sociodemographic characteristics (age, race/ethnicity, marital status), tumor category (T category), prostate-specific antigen (PSA) level prior to biopsy, Gleason score, residence state, and county level contextual characteristics (persistent poverty and low employment county only; urologist supply, radiation oncologist supply, and low education county did not meet criteria to be included in the regression model). We tested for, but did not find significant interactions between all of the sociodemographic, cancer, and contextual characteristics of the study's patients and their rural–urban residence location. Among patients who received definitive treatment, we conducted parallel regression analyses to examine the relationship between residence location and receipt of one-time versus multiple treatments. Among those who received one-time treatments, we examined the relationship between residence location and receipt of radical prostatectomy versus brachytherapy.

We applied general estimating equation methods in all regression analyses to account for clustering of patients by county.[11] From these logistic models, we calculated adjusted rates of our study outcomes by rural–urban residence location overall. We also calculated adjusted rates of definitive therapy for patients with different sociodemographic, cancer, and contextual characteristics, testing for statistically significant rural–urban differences using z-scores. Because we found a powerful association between state of residence and receipt of definitive therapy use, and rural patients were largely found in certain states, we report only our adjusted findings.

RESULTS

Of the 51,982 patients with early-stage prostate cancer who met our study criteria, 45,964 (88%) lived in an urban and 6,018 (12%) in a rural county (Table 1). Rural patients with early-stage prostate cancer were significantly older than urban patients (70.8% versus 66.5%, ages 60-74 years, $P \leq .001$), more likely to be white, non-Hispanic (87.6% versus 71.4%, $P \leq .001$), and more likely to have T2NOS disease (23.6% versus 19.7%, $P \leq .01$), a higher PSA level prior to biopsy (PSA > 10-20, 15.1% versus 13.6%, $P \leq .001$), and a higher Gleason score (Gleason score = 7, 42.6% versus 39.7%, $P \leq .001$). More than half (58.8%) of urban patients were from California, which includes 4 SEER registries. Almost half (43.7%) of the rural patients were from Iowa and Kentucky. Other states with over 10% of the rural patients were California (14.4%) and Louisiana (13.7%).

Almost all patients with early-stage prostate cancer who lived in an urban county (94.2%) had a radiation oncologist and a urologist in their county; 51.1% of patients with early-stage prostate cancer who lived in a rural county had a urologist, 23.4% a radiation oncologist in their county. Rural patients had significantly lower median household incomes ($37,468) than urban patients ($51,882, $P \leq .001$), and were significantly more likely than urban patients to live in a county with low employment (29.7% versus 4.9%, $P \leq .001$).

Overall, rural patients with early-stage prostate cancer had significantly lower adjusted rates (83.7%) of definitive treatment than urban patients (87.1%), although most urban and rural patients with early-stage prostate cancer received definitive treatment (Table 2). Rural patients were 1.8 times as likely as urban patients to receive nondefinitive surgery without radiation (adjusted rates: rural 2.5% versus urban 1.4%, $P \leq .05$), and 1.2 times more likely to receive no initial treatment (adjusted rates: rural 13.6% vs urban 11.4%, $P \leq .01$). Among

TABLE 2. Adjusted Rates of Early Prostate Cancer Treatments by Residence Location[a]

Treatment	% Urban N=42,542	% Rural N=5579
Definitive treatment***	87.1	83.7
Radical prostatectomy*	55.9	52.9
Beam radiation	21.4	21.9
Brachytherapy	17.9	20.7
Combination of radiation therapies	4.9	4.6
Nondefinitive surgery without radiation*	1.4	2.5
No treatment**	11.4	13.6

[a] Adjusted for age, race/ethnicity, marital status, tumor category (T category), prostate-specific antigen level prior to biopsy, Gleason score, residence state, persistent poverty county, and low employment county.
*$P \leq .05$.
**$P \leq .01$.
***$P \leq .001$.

those patients with early-stage prostate cancer who received definitive treatment, rural (73.6%) and urban (73.8%) patients were about equally likely to receive a one-time treatment (radical prostatectomy or brachytherapy). Among patients who received these one-time treatments, rural patients were significantly more likely to receive brachytherapy (28.3% rural, 24.2% urban, $P \leq .05$), and urban patients more likely to receive radical prostatectomy (75.8% urban, 71.7% rural, $P \leq .05$).

The rural–urban differences in receipt of definitive treatment were consistent across many patient sociodemographic characteristics, including age (60-69, 70-74), race (Caucasian, African American), and marital status (married/partnered, single/separated/divorced) (Fig. 1). Some states had more dramatic rural–urban differences (New Mexico, Georgia) than others (California, Connecticut, Utah, Washington). In addition, there were significant rural-urban differences in definitive treatment rates among patients with T categories T1c and T2c, but not patients with categories T2a, T2b, or T2NOS.

Numerous factors beyond rural–urban residence location were significantly associated with receipt of definitive treatment for patients who had early-stage prostate cancer (Table 3), including patient demographics (age, race/ethnicity, marital status), tumor-related characteristics (T category, PSA at time of diagnosis, Gleason score), and environmental characteristics (state, low employment county, persistent poverty county). The variation in definitive treatment receipt was greater between cancer patients with different sociodemographic, tumor, and environmental characteristics than between rural and urban patients overall (Fig. 1). Overall, the lowest definitive treatment rates were among certain rural subgroups: those 70 to 74 years old, African Americans, American Indians/Alaska Natives, single/separated/divorced patients, those living in New Mexico, and those living in persistent poverty counties (Fig. 1).

DISCUSSION

Rural patients with early-stage prostate cancer were significantly less likely than urban patients to receive definitive cancer treatment in our study. This is one of the first published studies comparing rural–urban differences in definitive treatment for prostate cancer in the United States. One prior abstract comparing receipt of curative treatment between rural and urban patients with prostate cancer demonstrated no rural–urban differences, though this study was limited to a single state.[12] Our study examines prostate cancer treatment across multiple states, and found substantial regional variation, with lower definitive treatment rates for rural compared to urban patients with prostate cancer in 4 of the study's 10 states. In no state was the rural definitive treatment rate higher than the urban rate.

There is a limited literature examining rural–urban differences in cancer treatment, with mixed findings among the published studies. Numerous studies have demonstrated that rural patients with early-stage breast cancer receive different types of treatment than their urban counterparts. Rural patients with early-stage breast cancer are more likely to receive mastectomy than breast conserving therapy, and, among those who receive breast-conserving therapy, less likely to receive radiation therapy than their urban counterparts.[2,13–22] A recent study that included cancers other than breast found no rural–urban differences in radiation therapy use for 4 cancer types (anus, cervix, small cell lung, and rectum), but lower radiation therapy rates among rural compared to urban patients who had stage IIIA non–small cell lung cancer.[2] Another study found that rural patients were no less likely than urban patients to receive comprehensive ovarian cancer surgery, but that rural hospitals were less likely to provide comprehensive ovarian cancer surgery than urban hospitals,[23] suggesting that many of these rural patients with cancer traveled to urban locations for their care.

The rural–urban differences that we found in definitive treatment for early stage prostate cancer were consistent across many sociodemographic, tumor, and environmental characteristics. There were several notable exceptions, however. For men under 60 years of age, the definitive treatment rates were near 90% for both rural and urban men with early stage prostate cancer. Men in several states were equally likely to receive definitive treatment for their prostate cancer, regardless of whether they lived in rural or urban locations, and in the majority of states the definitive treatment rate was more than 85%. Further exploring the cancer care systems in these states might provide clues to why rural and urban patients are equally likely to receive definitive treatment. Despite these encouraging findings in some states, rural patients in certain demographic groups—older, African American, and single, separated, or divorced men—had much lower definitive treatment rates. Unfortunately, these findings are not surprising, as these subgroups have been less likely to receive recommended cancer treatments in numerous previous studies.[24–29]

A surprising finding is that rural patients were no more likely than their urban counterparts to have had one-time treatments for their prostate cancer. This is consistent with findings from the study by Steenman et al

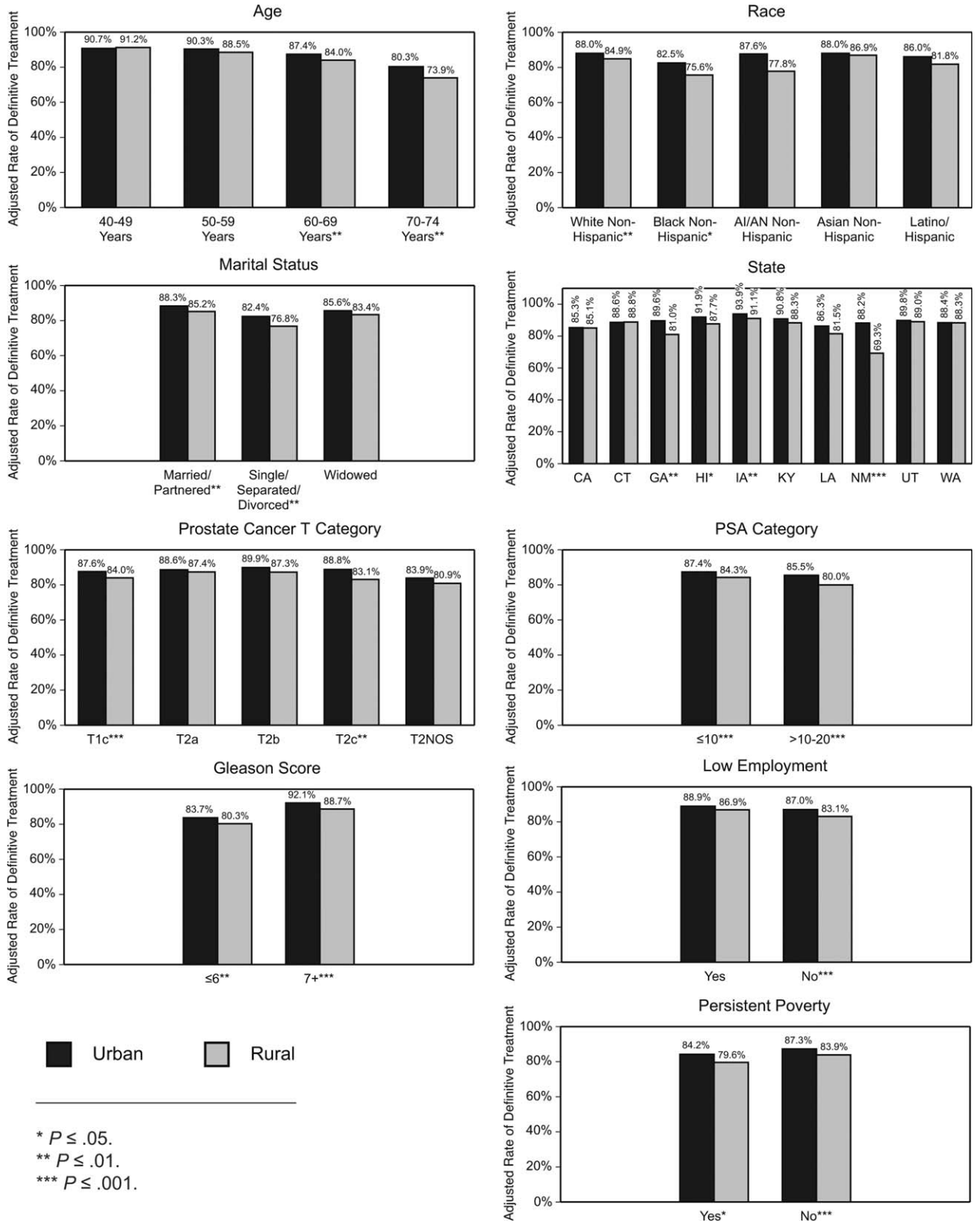

Figure 1. Adjusted definitive treatment rates are shown by residence location and sociodemographic, cancer, and contextual characteristics. Abbreviations: AI/AN, American Indian/Alaska Native; NOS, not otherwise specified; PSA, prostate-specific antigen.

TABLE 3. Adjusted Odds of Definitive Treatment by Patient Sociodemographic, Cancer, and Contextual Characteristics

Characteristic	Odds Ratio N=48,121
Residence location	
Rural	Ref
Urban	1.34 (1.21-1.48)
Individual Characteristics	
Age	
40-49 y	Ref
50-59 y	0.94 (0.81-1.10)
60-69 y	0.69 (0.59-0.80)
70-74 y	0.39 (0.33-0.45)
Race/ethnicity	
White/other non-Hispanic	Ref
Black non-Hispanic	0.62 (0.57-0.68)
AI/AN non-Hispanic	0.83 (0.52-1.32)
Asian non-Hispanic	1.01 (0.88-1.15)
Latino/Hispanic	0.83 (0.76-0.91)
Marital status	
Married/partnered	Ref
Single/separated/divorced	0.61 (0.57-0.65)
Widowed	0.79 (0.68-0.92)
Cancer Characteristics	
Prostate cancer T category	
T1c	Ref
T2a	1.12 (1.00-1.26)
T2b	1.27 (1.01-1.60)
T2c	1.10 (0.99-1.21)
T2NOS	0.73 (0.68-0.78)
PSA category	
≤10	Ref
>10-20	0.83 (0.77-0.89)
Gleason score	
≤6	Ref
7+	2.27 (2.14-2.41)
Contextual Characteristics	
State	
California	Ref
Connecticut	1.36 (1.20-1.53)
Georgia	1.45 (1.27-1.66)
Hawaii	1.87 (1.42-2.47)
Iowa	2.51 (2.13-2.97)
Kentucky	1.76 (1.53-2.02)
Louisiana	1.09 (0.96-1.22)
New Mexico	0.95 (0.80-1.11)
Utah	1.56 (1.34-1.82)
Washington	1.35 (1.21-1.50)
Persistent poverty	
No	Ref
Yes	0.75 (0.64-0.88)
Low employment	
No	Ref
Yes	1.26 (1.13-1.42)

Abbreviations: AI/AN, American Indian/Alaska Native; NOS, not otherwise specified; PSA, prostate-specific antigen; ref, reference value.

that examined southwest rural Georgia, where the most common treatment for prostate cancer was external beam radiation with or without brachytherapy.[30] Research demonstrates that rural patients with colorectal cancer must travel significantly farther for radiation therapy,[31] and this study showed that only 23.4% of the patients with early-stage prostate cancer in this study had a radiation therapist in their county, whereas 51.1% had a urologist. Despite these findings, almost equal percentages of rural patients with cancer chose daily external beam radiation therapy, suggesting that rural patients in the SEER registry areas were not making treatment decisions based on distance to care. It appears that rural patients were taking advantage of the multiple treatment options available for early-stage prostate cancer. Rural patients were significantly more likely to receive brachytherapy and less likely to receive radical prostatectomy, however, a finding that deserves further exploration.

Even though substantial proportions of both rural (13.6%) and urban (11.4%) men received no treatment for their early stage prostate cancer, this does not necessarily indicate that their care was inappropriate. Roughly a quarter of the men with prostate cancer in this study (24.6% of rural men, 24.7% of urban men) were ideal candidates for active surveillance (men 60-74 years of age, T1c or T2a category, initial PSA $\leq$ 10, Gleason score $\leq$ 6; 24.7% of the study population), an appropriate alternative for those whose lifespan is least likely to be impacted by early stage prostate cancer. Because SEER data report on first course of therapy only, however, our "no treatment" category cannot differentiate between those individuals who were not treated from those undergoing active surveillance. These men would appear as having received no therapy in our results. We conducted our analyses with and without the men who were candidates for active surveillance and found that in both analyses, rural patients were less likely than urban patients to receive definitive therapy. This suggests that the lower rate of definitive treatment in our rural study population cannot be explained by the higher use of active surveillance. We wanted to maintain the largest possible rural sample in this study. Because all of the men in our study population qualified for definitive treatment, and the majority of men in the subgroup that qualified for active surveillance received definitive therapy (roughly 80%), we used the larger, more inclusive group for our final analyses.

This study was limited by its use of SEER cancer registry data. These data include geographic identifiers at the county level only, and are missing a number of individual-level and other contextual factors that might be associated with different types of prostate cancer treatment, such as comorbidity, socioeconomic status, insurance status, and social support. The presence of urologists and radiation oncologists in counties is defined by the physicians' preferred professional mailing address from the American Medical Association Physician Masterfile and the American Osteopathic Association, and will not include additional satellite locations. This could underestimate the presence of these specialists in rural counties.

Definitive beam radiation treatment may be overestimated in the SEER database because individuals are coded as having received beam radiation if they started and were administered this treatment, even if it was not completed.

Another limitation was our inability to identify the subset of men with higher Gleason scores who were most likely to benefit from definitive local prostate cancer treatment. Many men with high-risk prostate cancer (Gleason score of 8 or higher) could be considered candidates for definitive local prostate cancer treatment. However, in aggregate, this group of men has a ~25% to 40% risk of biochemical recurrence, and may be more likely to be treated primarily with androgen deprivation. SEER cancer registry data are unable to fully ascertain receipt of androgen deprivation therapy, as identification of medical androgen deprivation therapy requires use of Medicare claims data, which was beyond the scope of this study. Given these limitations, we chose to exclude the subset of men with Gleason scores of 8 or higher.

Men with early-stage prostate cancer living in rural areas were less likely than those living in urban areas to receive definitive treatment for their prostate cancer, suggesting that residence location influenced their treatment. Rural men were more likely to receive nondefinitive surgical treatment and to receive no initial treatment. The good news is that despite these findings, over 80% of rural men overall received definitive treatment, and roughly a quarter of those who received no treatment qualified for active surveillance. Certain rural populations of prostate cancer patients were less likely to receive definitive treatment, and need particular attention to ensure they have access to treatment choices: men between 60 and 74 years of age, African American men, men who may be socially isolated because they are single, separated, or divorced, and men living in rural New Mexico. Providers, rural health care systems, and cancer advocacy and support organizations can use these data to reach out to men in these vulnerable groups and make sure they understand their treatment options, and have resources in place to make informed treatment choices based on their preferences.

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The authors made no disclosure.

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