USE OF ADVANCED IMAGING AMONG UNITED STATES MEDICARE BENEFICIARIES WITH PROSTATE CANCER

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Background: Men in rural communities face significant challenges in accessing advanced diagnostics and targeted interventions for prostate cancer. The extent and nature of these geographic disparities, particularly between rural and urban areas, remain unclear. In this setting, the ROADMAP project (Rural Outpatient Advanced Diagnostics to Maximize Access to Prostate Health) seeks to identify disparities in the use of advanced diagnostics and targeted interventions. Herein we report national trends in in these services comparing rural and urban settings.

Methods: We conducted a retrospective cohort study using the Medicare insurance database to assess geographic disparities in the utilization of advanced diagnostics and targeted interventions for prostate cancer. Rural and urban differences were analyzed by categorizing patients based on location (rural vs. urban) focusing first on post-diagnostic utilization of advanced diagnostic tools. These included, advanced imaging modalities, and molecular diagnostics. Data were analyzed to compare diagnostic and therapeutic patterns across geographic regions, with an emphasis on identifying disparities in access to these advanced modalities between rural and urban populations. Surveyweighted logistic regression models clustered by hospital referral regions were used to test the association between urban/rural status and receipt of services of interest.

Results: We included a total of 484,818 men diagnosed with prostate cancer in 2019, 2020, 2021. Of these, 38,816 are located in rural areas, 56,104 are located in urban areas and the remainder were in metropolitan counties. Use of PSMA PET imaging was less common among rural beneficiaries (7.45% prostate cancer patients, vs. 8.62% in metropolitan beneficiaries) ($p<0.001$). Regarding prostate MRI, this was performed less commonly among rural beneficiaries with prostate cancer (18.63% versus 26.4% in metropolitan beneficiaries, $p< 0.001$). Both molecular

pathological biomarkers and (11.21% versus 14.41, p<0.001) and genetic testing (2.5% vs 2.6%, p<0.001) were less common in rural patients. In our surveyweighted logistic regression, there were lower odds off assessed diagnostic testing in rural areas (e.g. aOR 0.87 95% CI 0.82-0.93 in rural patients).

Conclusion: The initial results from ROADMAP performed as part of a national analysis of disparities in genetic testing, molecular biomarkers and advanced imaging demonstrate a small but significant unadjusted and adjusted prevalence in utilization of assessed services among rural beneficiaries. Next step will be a qualitative analysis to assess specific barriers to these services among these groups.

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Table 1: Baseline Characteristics of patients living in rural and urban areas with Prostate Cancer in 100% Me and Standardized Differences					
	Overall *n= 485 818 (100%)*	***Metro*** *n= 385 418(79.33%)*	***Urban*** *n= 56 104 (11.55%)*	***Rural*** *n= 38 816 (7.99%)*	***Unknown*** *n= 5 480 (1,13%)*
Demographics and Health Status					
Age Group					
66-70	*121 106 (24.93%)*	*95 561(24.79%)*	14 412 (25.69%)	9 920 (25.56%)	1 213 (22.14%)
71-75	*135 561(27.90%)*	*108 012(28.02%)*	15 607 (27.82%))	10 560 (27.21%)	1 382 (25.22%)
76-80	*101 548 (20.90%)*	*80 516 (20.89%)*	11 630 (20.73%)	8 255 (21.39%)	1 147 (20.93%)
81+	*127 603 (26.27%)*	*101 329 (26.29%)*	14 455 (25,76%)	10 081 (25.97%)	1 738 (31.72%)
PET					
Yes	40 722 (8.38%)	33 228 (8.62%)	4 190 (7.47%)	2 892 (7.45%)	412 (7.52%)
No	445 096 (91.62%)	352 190 (91.38%)	51 914 (92.53%)	35 924 (92.55%)	5 068 (92.48%)
Race					
White	406 919 (83.76%)	317 941 (82.49%)	49 382 (88.02%)	34 892 (89.89%)	4 854 (86.12%)
Black	44 983 (9.26%)	38 296 (9.94%)	4 118 (7.34%)	2 242 (5.78%)	328 (5.82%)
Hispanic	4 979 (1.02%)	4 503 (1.17%)	285 (0.51%)	137 (0.35%)	55 (0.98%)
Asian	5 503 (1.13%)	5 310 (1.38%)	113 (0.20%)	27 (0.07%)	54 (0.96%)
Other	9 589 (1.97%)	7 862 (2.04%)	923 (1.65%)	718 (1.85%)	87 (1.54%)
Unknown	13 845 (2.85%)	11 506 (2.99%)	1 283 (2.29%)	800 (2.06%)	258 (4.58%)
US Region, n(%)					
South	178 527 (36.75%)	140 517 (36.46%)	22 112 (39.41%)	15 776 (40.64%)	122 (2.23%)
West	99 928 (20.57%)	83 526 (21.67%)	10 392 (18.42%)	5 927 (15.27%)	83 (1.51%)
Midwest	102 353 (21.07%)	72 341 (18.77%)	15 805 (28.17%)	14 148 (36.45%)	59 (1.08%)
Northeast	105 010 (21.62)	89 034 (23.10%)	7 795 (13.89%)	2 965 (7.65%)	5 216 (95.18%)
Dual eligibility for Medicaid	33 622 (6.92%)	26 218 (6.80%)	3 652 (6.51%)	3 111 (8.01%)	641 (11.70%)
Yes	452 196 (93.08%)	359 200 (93.20%)	52 452 (93.49%)	35 705 (91.99%)	4 839 (88.30%)
No					
Disability as the original reason for Medicare entitlement	42 586 (8.77%)	31 394 (8.15%)	6 052 (10.79%)	4 722 (12.17%)	418 (7.63%)
Yes	443 232 (91.23%)	354 024 (91.85%)	50 052 (89.21%)	34 094 (87.83%)	5 062 (92.37%)
No					
Year, n (%)		167 033 (43.34%)			
2019	210 734 (43.38%)	111 883 (29.03%)	24 478 (43.63%)	16 780 (43.23%)	2 443 (44.58%)
2020	141 215 (29.07%)	106 502 (27.63%)	16 323 (29.09%)	11 478 (29.57%)	1 531 (27.94%)
2021	133 869 (27.56%)		15 303 (27.28%)	10 558 (27.20%)	1 506 (27.48%)
CCI, n (%)					
0	21 230 (4.37%)	16 035 (4.16%)	2 761 (4.92%)	2 244 (5.78%)	190 (3.47%)
1	26 836 (5.52%)	20 435 (5.30%)	3 485 (6.21%)	2 632 (6.78%)	285 (5.18%)
2	44 152 (9.09%)	34 139 (8.86%)	5 529 (9.85%)	3 981 (10.26%)	503 (9.18%)
≥3	407 496 (81.35%)	314 809 (81.68%)	44 329 (79.01%)	38 816 (77.18%)	4 503 (82.17%)

Multivariable logistic regression and HRR-clustered multivariable logistic regression of clinical variables associated with receiving PET						
	Multivariable logistic regression			HRR-clustered multivariable logistic		
	OR	*95% CI*	*p-value*	*OR*	*95%CI*	*p-value*
RUCC code, n (%)						
Metro	Ref.	Ref.		Ref.	Ref.	
Urban*	0.87	0.84-0.90	<0.001	0.87	0.82-0.92	<0.001
Rural*	0.87	0.84-0.91	<0.001	0.87	0.82-0.93	<0.001
Unknown*	0.88	0.80-0.98	0.017	0.89	0.77-1.01	0.1
Age Group						
66-70	Ref.	Ref.		Ref.	Ref.	
71-75*	1.05	1.02-11.08	<0.001	1.05	1.02-1.08	0.002
76-80*	1.11	1.08-1.15	<0.001	1.11	1.08-1.15	<0.001
>81*	0.86	0.84-0.89	<0.001	0.86	0.83-0.90	<0.001
Race						
White	Ref.	Ref.	Ref.	Ref.	Ref.	
Black*	0.81	0.78-0.85	<0.001	0.81	0.78-0.86	<0.001
Hispanic*	0.87	0.78-0.97	0.001	0.87	0.76-0.86	0.025
Asian	1.00	0.90-1.10	0.9	1.00	0.90-1.11	0.9
Other	0.97	0.90-1-04	0.4	0.97	0.88-1.06	0.5
Unknown*	0.95	0.89-1.01	0.1	0.95	0.89-1.01	0.1
US Region, n (%)						
South	Ref.	Ref.	Ref.	Ref.	Ref.	
West*	1.17	1.14-1.20	<0.001	1.17	1.04-1.23	0.01
Midwest	1.00	0.97-1.03	0.8	1.00	0.93-1.07	0.9
Northeast*	1.02	0.99-1-05	0.3	1.02	0.90-1.15	0.8
Dual eligibility for Medicaid	Ref.	Ref.	Ref.	Ref.	Ref.	
Yes	1.06	1.02-1.11	0.005	1.06	1.00-1.14	0.1
No						
Disability as the original reason for Medicare entitlement	Ref.	Ref.	Ref.	Ref.	Ref.	
Yes	1.02	0.98-1.07	0.2	1.02	0.98-1.07	0.3
No						
Year, n (%)	Ref.					
2019	0.95	Ref.		Ref.	Ref.	
2020*	0.71	0.92-0.99	<0.001	0.95	0.92-0.97	0.006
2021		0.67-0.74	<0.001	0.71	0.67-0.74	<0.001