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Association of Race and Ethnicity With Prescription of SGLT2 Inhibitors and GLP1 Receptor Agonists Among Patients With Type 2 Diabetes in the Veterans Health Administration System

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IMPORTANCE Novel therapies for type 2 diabetes can reduce the risk of cardiovascular disease and chronic kidney disease progression. The equitability of these agents' prescription across racial and ethnic groups has not been well-evaluated.

OBJECTIVE To investigate differences in the prescription of sodium-glucose cotransporter-2 inhibitors (SGLT2i) and glucagon-like peptide-1 receptor agonists (GLP-1 RA) among adult patients with type 2 diabetes by racial and ethnic groups.

DESIGN, SETTING, AND PARTICIPANTS Cross-sectional analysis of data from the US Veterans Health Administration's Corporate Data Warehouse. The sample included adult patients with type 2 diabetes and at least 2 primary care clinic visits from January 1, 2019, to December 31, 2020.

EXPOSURES Self-identified race and self-identified ethnicity.

MAIN OUTCOMES AND MEASURES The primary outcomes were prevalent SGLT2i or GLP-1 RA prescription, defined as any active prescription during the study period.

RESULTS Among 1 197 914 patients (mean age, 68 years; 96% men; 1% American Indian or Alaska Native, 2% Asian, Native Hawaiian, or Other Pacific Islander, 20% Black or African American, 71% White, and 7% of Hispanic or Latino ethnicity), 10.7% and 7.7% were prescribed an SGLT2i or a GLP-1 RA, respectively. Prescription rates for SGLT2i and GLP-1 RA, respectively, were 11% and 8.4% among American Indian or Alaska Native patients; 11.8% and 8% among Asian, Native Hawaiian, or Other Pacific Islander patients; 8.8% and 6.1% among Black or African American patients; and 11.3% and 8.2% among White patients, respectively. Prescription rates for SGLT2i and GLP-1 RA, respectively, were 11% and 7.1% among Hispanic or Latino patients and 10.7% and 7.8% among non-Hispanic or Latino patients. After accounting for patient- and system-level factors, all racial groups had significantly lower odds of SGLT2i and GLP-1 RA prescription compared with White patients. Black patients had the lowest odds of prescription compared with White patients (adjusted odds ratio, 0.72 [95% CI, 0.71-0.74] for SGLT2i and 0.64 [95% CI, 0.63-0.66] for GLP-1 RA). Patients of Hispanic or Latino ethnicity had significantly lower odds of prescription (0.90 [95% CI, 0.88-0.93] for SGLT2i and 0.88 [95% CI, 0.85-0.91] for GLP-1 RA) compared with non-Hispanic or Latino patients.

CONCLUSIONS AND RELEVANCE Among patients with type 2 diabetes in the Veterans Health Administration system during 2019 and 2020, prescription rates of SGLT2i and GLP-1 RA medications were low, and individuals of several different racial groups and those of Hispanic ethnicity had statistically significantly lower odds of receiving prescriptions for these medications compared with individuals of White race and non-Hispanic ethnicity. Further research is needed to understand the mechanisms underlying these differences in rates of prescribing and the potential relationship with differences in clinical outcomes.

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Supplemental content

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Achieving pharmacoequity is central to overcoming health care disparities that persist across race and ethnic groups.[1] Racial and ethnic minority individuals have been less likely than White persons to be prescribed novel guideline-recommended therapies with proven effectiveness.[1,2] These disparities may be particularly salient among patients with type 2 diabetes because Asian, Black, and Hispanic or Latino persons have a higher prevalence of diabetes and its complications than White patients.[3-5] Therefore, evaluating whether health care disparities exist in the prescription of guideline-recommended therapies that could reduce the cardiovascular and kidney complications of diabetes is of public health importance.

The advent of sodium-glucose cotransporter-2 inhibitors (SGLT2i) and glucagon-like peptide-1 receptor agonists (GLP-1 RA) has changed the approach to the management of type 2 diabetes because both classes have cardiovascular and kidney protective effects. Rather than relying on a glucose-centric approach to diabetes management and control, current guidelines recommend inclusion of these therapies to lower the risks of cardiovascular disease and chronic kidney disease (CKD) progression.[6,7] Recent research has shown that Black patients are less likely than White patients to be prescribed these therapies.[8,9] However, prescription was strongly associated with income, which may have influenced the results given the high cost-sharing incurred by patients for these medications.[10]

The primary objective of this study was to evaluate prescription patterns of SGLT2i and GLP-1 RA across racial and ethnic groups in the Veterans Health Administration (VHA) system from January 1, 2019, to December 31, 2020. The VHA is the largest integrated health system in the US and provides uniform pharmacy access that offers discounted or free medications to patients, thereby minimizing the influence of medication costs.

Key Points

Question Among patients with type 2 diabetes in an integrated health care system with minimal medication cost-sharing, does prescription of sodium-glucose cotransporter-2 inhibitors (SGLT2i) and glucagon-like peptide-1 receptor agonists (GLP-1 RA) differ by race and ethnicity?

Findings In this cross-sectional study that included 1 197 914 patients in the Veterans Health Administration system, the proportion of patients with an active prescription was 10.7% for SGLT2i and 7.7% for GLP-1 RA. Individuals of several different racial groups and those of Hispanic ethnicity had statistically significantly lower odds of receiving prescriptions for these medications compared with individuals of White race and non-Hispanic ethnicity.

Meaning Among patients with type 2 diabetes in the Veterans Health Administration system, prescription of SGLT2i and GLP-1 RA was low overall, and there were differences in prescribing by race and ethnicity.

Methods

This study was deemed minimal risk and was approved by the University of California, San Francisco institutional review board (19-29496). Participant informed consent was waived by the institutional review board.

Study Design, Setting, and Participants

We conducted a cross-sectional study to establish the prevalence of SGLT2i and GLP-1 RA prescription from January 1, 2019, to December 31, 2020, among patients with type 2 diabetes using the VHA Corporate Data Warehouse. It contains individual-level information on sociodemographic characteristics, outpatient and inpatient clinical encounters, medication prescriptions and fills, medical conditions, procedures, and laboratory results. It also organizes the 171 VHA medical centers and 1283 outpatient facilities into 130 distinct health care networks known as VHA stations. Patients were assigned to one of these stations based on where they received most of their health care within the VHA.

Type 2 diabetes was ascertained by adapting the Electronic Medical Records and Genomics Network algorithm for ascertainment of diabetes in electronic health records.[11,12] It combines *International Classification of Diseases* (*ICD*) codes, hemoglobin A_{1C} values, and diabetes medication use (eFigure 1 in the Supplement). We included all VHA patients with type 2 diabetes who had at least 2 primary care encounters during the study period (eFigure 2 in the Supplement).

Exposures

Race and ethnicity at the VHA are ascertained through a 2-question self-identified method included in the VHA Form 10-10EZ at the time of application for health benefits or at the time of inpatient or outpatient visits to a VHA facility.[13,14] The first question asks patients to classify their ethnicity: Hispanic or Latino (yes or no; hereafter referred to as Hispanic) (eTable 1 in the Supplement). The second question asks patients to classify their race (>1 classification may be selected): American Indian or Alaska Native; Asian; Black or African American (hereafter referred to as Black); Native Hawaiian or Other Pacific Islander; White; and unknown race by patient or declined to answer. If self-identification of race and ethnicity is impossible, these categories may be assigned by a proxy or by a VHA enrollment coordinator/clerk. In this sample, more than 99% of the race and ethnicity categories were self-identified. Because relatively few patients self-identified as Native Hawaiian or Other Pacific Islander, we combined those individuals with the Asian group. We included those with unknown or declined to answer in an "unknown" race category. We also created a multiracial category for patients who marked more than 1 race category. Race and ethnicity groups were analyzed separately.

Covariates

Covariates were ascertained at baseline prior to January 1, 2019 (first day of the study period), with a look-back to October 1, 2015, when migration from *ICD-9* to *ICD-10* codes occurred. Exceptions were variables that denoted clinical care such as primary care, endocrinology, cardiology, or nephrology visits; patient residence; COVID-19 diagnoses; and all diabetes

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Table. Demographic and Clinical Characteristics of Patients With Type 2 Diabetes in the Veterans Health Administration System From 2019 to 2020 by Race Categories[a]

Characteristic	No. (%)					
	American Indian or Alaska Native (n = 10 127)	Asian, Native Hawaiian, or Other Pacific Islander (n = 24 663)	Black or African American (n = 234 932)	White (n = 850 648)	Multiracial (n = 9795)	Unknown race (n = 67 749)[a]
Sociodemographic						
Age, mean (SD), y	65 (11)	64 (12)	63 (10)	69 (10)	65 (12)	68 (11)
Sex						
Female	557 (6)	1242 (5)	18 187 (8)	25 269 (3)	617 (6)	2543 (4)
Male	9570 (94)	23 421 (95)	216 745 (92)	825 379 (97)	9178 (94)	65 206 (96)
Hispanic or Latino ethnicity	1349 (13)	2040 (8)	3584 (2)	64 278 (8)	939 (10)	12 844 (19)
Service-connected disability >50%[b]	5374 (53)	15 563 (63)	124 927 (53)	358 836 (42)	5239 (53)	30 904 (46)
Diabetes service connection[b]	2662 (26)	7318 (30)	48 219 (21)	224 174 (26)	2333 (24)	16 360 (24)
Lowest zip code median income quartile (income <$44 818)	3264 (32)	2885 (12)	85 538 (36)	186 233 (22)	2328 (24)	16 220 (24)
Highest Social Deprivation Index quartile (score >73)	3391 (33)	6102 (25)	106 340 (45)	150 468 (18)	2614 (27)	18 832 (28)
Rural or highly rural zip code	5057 (50)	3977 (16)	44 644 (19)	367 240 (43)	3120 (32)	23 505 (35)
Lifestyle						
Unhealthy alcohol use[c]	843 (8)	1683 (7)	18 746 (8)	68 620 (8)	688 (7)	5724 (8)
Current smoking	1985 (20)	3406 (14)	43 868 (19)	143 093 (17)	1865 (19)	10 269 (15)
Diabetes management and control, HbA_{1c}, %						
≤7	4700 (46)	12 019 (49)	126 258 (54)	438 173 (52)	5072 (52)	33 371 (49)
>7-8	2134 (21)	5403 (22)	44 953 (19)	200 231 (24)	2100 (21)	14 695 (22)
>8-9	1213 (12)	2594 (11)	22611 (10)	90 275 (11)	1062 (11)	7008 (10)
>9	1406 (14)	2739 (11)	28917 (12)	73 232 (9)	1067 (11)	6760 (10)
Unknown	674 (7)	1908 (8)	12193 (5)	48 737 (6)	494 (5)	5915 (9)
Lifetime maximum HbA_{1c} level, %						
Mean (SD)	9.1 (2)	8.7 (2)	9.0 (3)	8.6 (2)	8.9 (2)	8.7 (2)
Median (IQR)	8.7 (7.2-10.6)	8.2 (7.0-10.0)	8.3 (6.9-10.6)	8.2 (7.1-9.8)	8.4 (7.1-10.3)	8.2 (7.1-10.0)
Clinical characteristics						
Hypertension	8856 (87)	21 433 (87)	215 486 (92)	766 377 (90)	8891 (91)	58 127 (78)
BMI ≥30	5926 (59)	11 013 (45)	133 893 (57)	480 217 (56)	5578 (57)	36 748 (54)
CKD	2583 (26)	6411 (26)	49 524 (21)	251 752 (30)	2571 (26)	18 190 (27)
Unknown CKD	2311 (23)	6820 (28)	67 993 (29)	201 885 (24)	2314 (24)	18 373 (27)
ASCVD	2324 (23)	4589 (19)	39 209 (17)	243 897 (29)	2276 (23)	15 181 (22)
Heart failure	577 (6)	1092 (4)	14 963 (6)	58 994 (7)	676 (7)	3689 (5)
VHA station parent facility complexity level[d]						
1a (Highest)	3383 (33)	12 405 (50)	113 848 (48)	347 922 (41)	4083 (42)	33 345 (49)
1b (High)	2164 (21)	3805 (15)	56 435 (24)	121 167 (14)	1807 (18)	10 311 (15)
1c (Mid-high)	1235 (12)	1823 (7)	35 792 (15)	139 034 (16)	1327 (14)	7933 (12)
2 (Medium)	1708 (17)	1276 (5)	18 501 (8)	125 404 (15)	1326 (14)	8358 (12)
3 (Low)	1601 (16)	4076 (17)	9703 (4)	114 057 (13)	1209 (12)	7631 (11)

(continued)

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Table. Demographic and Clinical Characteristics of Patients With Type 2 Diabetes in the Veterans Health Administration System From 2019 to 2020 by Race Categories[a] (continued)

Characteristic	No. (%)						
	American Indian or Alaska Native (n = 10 127)	Asian, Native Hawaiian, or Other Pacific Islander (n = 24 663)	Black or African American (n = 234 932)	White (n = 850 648)	Multiracial (n = 9795)	Unknown race (n = 67 749)[a]
Census region of VHA station						
South	3945 (39)	6559 (27)	156 987 (67)	360 166 (42)	4583 (47)	27 662 (41)
West	3826 (38)	13 719 (53)	22 645 (10)	154 481 (18)	2383 (24)	21 275 (31)
Midwest	1800 (18)	1911 (8)	33 787 (14)	209 175 (25)	1551 (16)	12 919 (19)
Northeast	514 (5)	1049 (6)	19 792 (8)	112 807 (13)	1155 (12)	4893 (7)

Abbreviations: ASCVD, atherosclerotic cardiovascular disease; BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); CKD, chronic kidney disease; GLP-1 RA, glucagon-like peptide-1 receptor agonist; HbA_{1c}, hemoglobin A_{1c}; SGLT2i, sodium-glucose cotransporter 2 inhibitor; VHA, Veterans Health Administration.

[a] The VHA collects race and ethnicity information based on a 2-question self-identified method. The first question asks patients to classify their ethnicity: Hispanic or Latino (yes or no). The second question asks patients to classify their race (>1 classification may be selected): American Indian or Alaska Native; Asian; Black or African American; Native Hawaiian or Other Pacific Islander; White; and unknown race by patient or declined to answer.

[b] The VHA assigns a given disability (eg, diabetes) a rating to indicate the severity of their service-connected condition. Patients with a disability rating greater than 50% and those for whom diabetes is a service-connected condition do not have co-payments for their medications.

[c] Alcohol Use Disorder Identification Test score of 3 or greater for women and 4 or greater for men.

[d] VHA complexity rating is assigned to each VHA station based on the classification of the parent facility within the station encompassing facility volume, intensive care availability, number of subspecialists per patient, and teaching/research capacity.

medication prescriptions, for which ascertainment was extended to December 31, 2020. Because the VHA does not collect individual-level information on socioeconomic characteristics, we used the median per capita income of residential zip code and the zip code–level Social Deprivation Index as proxies for socioeconomic status using data derived from the American Community Survey.[15,16] We assessed rurality using Rural-Urban Commuting Area codes, which consider population density and closeness of a community's socioeconomic linkage to large urban centers.[17] We used the VHA service-connection disability information as proxies for medication cost-sharing.[18] Patients do not have co-payments for their medications if they have more than 50% health coverage for service-connected conditions and those for whom diabetes is a service-connected condition.

For system-level characteristics, we used the VHA 4-tier facility complexity rating, which encompasses facility volume, intensive care availability, number of subspecialists per patient, and teaching/research capacity (eTable 2 in the Supplement). This rating is assigned to each station based on the classification of the parent facility within the station. To assess the geographic location of each VHA station, we used the Census Bureau classification of US Regions and Divisions. eTable 3 in the Supplement summarizes covariate descriptions.

Outcomes

Across each race and ethnicity category, we assessed the prevalence of SGLT2i and GLP-1 RA prescription, defined as any active prescription, including VHA formulary and nonformulary medications, from January 1, 2019, through December 31, 2020. For SGLT2i, ertugliflozin, canagliflozin, dapagliflozin, and empagliflozin were evaluated. For GLP-1 RA, semaglutide, liraglutide, albiglutide, and dulaglutide were evaluated because they have demonstrated protective cardiovascular effects. Only empagliflozin and semaglutide are included in the VHA national formulary; however, clinicians can prescribe nonformulary medications with prior authorization.

Statistical Analysis

The association of race and ethnicity categories with SGLT2i and GLP-1 RA prescription was examined using multilevel, multivariable mixed-effect models with VHA station-specific random intercepts. Adjusted odds ratios (ORs) were calculated from models that specified a binomial distribution with a logit link function and included station-specific random effects following previously published methods.[19] The models were 2 level, with individual patients clustered within VHA stations. To estimate prescription prevalence, we fitted 4 sequential multilevel models separately for SGLT2i and GLP-1 RA prescription: (1) a model with only the VHA station random intercept; (2) a model that added patient-level demographic characteristics; (3) a model adding patient-level clinical characteristics; and (4) a final model adding VHA station-level characteristics: facility complexity rating and Census division.

Age-adjusted rates of SGLT2i and GLP-1 RA prescription across race and ethnicity groups were calculated using

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predicted probabilities from multilevel logistic models that included a random intercept with race and ethnicity categories as predictors.[20] Absolute risk differences were calculated from the sequential multilevel logistic regression models with conditional predicted probabilities for each race and ethnicity group, age set to the mean value, and balanced levels for categorical covariates so that all levels within a given covariate were equal. The differences from those predicted probabilities (absolute risk differences) were calculated, comparing all other race groups with White patients and Hispanic patients with non-Hispanic patients. Overall model discrimination was assessed with C-statistic calculations for models that included random intercepts and patient-level characteristics and for models that added system-level characteristics.

Analyses comparing SGLT2i and GLP-1 RA prescription within each race category vs White race and among Hispanic vs non-Hispanic ethnicity were conducted, stratifying by patient- and system-level characteristics. For all models, adjusted ORs were obtained using multivariable logistic regression. Because of the potential for type I error from multiple comparisons, findings for these analyses should be interpreted as exploratory. Additional analyses calculated incident prescription rates (eAppendix in the Supplement) using regression models that adjusted for age, sex, race, ethnicity, and CKD status and specified a Poisson distribution with a log link function.

To assess the relative contribution of the VHA station-level characteristics to overall prescription, we calculated the median ORs and the intraclass correlation coefficient (ICC). The median OR allows for quantifying heterogeneity between clusters.[19,21,22] It compares the prescription prevalences between individuals from VHA stations with different prescription prevalences but same patient-level covariate values. The ICC is the relative proportion of cluster variance to total variance (ie, higher ICC signifies larger variability attributable to VHA station differences). ICCs were first calculated for the null models to estimate the proportion of SGLT2i and GLP-1 RA prescription variation attributable to the VHA stations. Subsequently, we calculated ICCs for VHA stations in models that adjusted for patient-level characteristics.

When missing data were present, an indicator variable denoted as "unknown" was entered in the regression models. All primary and secondary analyses of the study outcomes used 2-sided testing and an $\alpha = .05$. All statistical analyses were conducted using SAS software version 9.4.6 of the SAS system for Unix (SAS Institute Inc). Sensitivity analyses are described in the eAppendix in the Supplement. Tolerances for assessment of multicollinearity were greater than 0.1 and all variance inflation factors less than 2.2. The ratio of the Pearson χ^2 was less than 1, indicating properly modeled variability.

Results

The study sample comprised 1 197 914 patients with type 2 diabetes, of whom 10.7% and 7.7% were prescribed an SGLT2i or a GLP-1 RA, respectively (eFigure 2 in the Supplement). The mean (SD) age of the sample was 68 (10) years, and 96% were male. Race and ethnicity categories were distributed as follows: 1% American Indian or Alaska Native; 2% Asian, Native Hawaiian, or Other Pacific Islander; 20% Black; 71% White; and 7% of Hispanic ethnicity (**Table**). The frequency of missing data was low (<5%) across most covariates, and missing data did not significantly differ between racial or ethnic categories.

Race and Ethnicity Differences in the Prescription of SGLT2i and GLP-1 RA

The crude proportions with prescription for SGLT2i and GLP-1 RA, respectively, were 11% and 8.4% among American Indian or Alaska Native patients; 11.8% and 8.0% among Asian, Native Hawaiian, or Other Pacific Islander patients; 8.8% and 6.1% among Black patients; 11.3% and 8.2% among White patients; 11.5% and 8.7% among multiracial patients; and 10% and 7% among patients with unknown race. Prescription rates for SGLT2i and GLP-1 RA, respectively, were 11% and 7.1% among Hispanic patients and 10.7% and 7.8% among non-Hispanic patients. In age-adjusted models, absolute prescription rates for SGLT2i and GLP-1 RA, respectively, were 8.3% (95% CI, 7.4%-9.2%) and 8.5% (95% CI, 7.4%-9.6%) among American Indian or Alaska Native patients; 8.6% (95% CI, 7.8%-9.5%) and 6.9% (95% CI, 6.1%-7.8%) among Asian, Native Hawaiian, or Other Pacific Islander patients; 6.8% (95% CI, 6.2%-7.5%) and 6.3% (95% CI, 5.6%-7.0%) among Black patients; 9.6% (95% CI, 8.7%-10.5%) and 9.5% (95% CI, 8.5%-10.5%) among White patients; 8.4% (95% CI, 7.5%-9.4%) and 8.7% (95% CI, 7.6%-9.8%) among multiracial patients; and 8.5% (95% CI, 7.7%-9.3%) and 7.9% (95% CI, 7.0%-8.8%) among patients of unknown race. In age-adjusted models, absolute prescription rates for SGLT2i and GLP-1 RA were 8.3% (95% CI, 7.5%-9.1%) and 7.7% (95% CI, 6.8%-8.5%) among Hispanic patients and 8.6% (95% CI, 7.8%-9.4%) and 8.1% (95% CI, 7.2%-8.9%) among non-Hispanic patients, respectively.

All racial groups had statistically significant lower odds and absolute risk differences of SGLT2i and GLP-1 RA prescription compared with White individuals after adjusting for patient- and system-level characteristics (**Figure 1** and **Figure 2**; eFigures 3 and 4 in the Supplement). Compared with White patients, the odds of prescription for SGLT2i and GLP-1 RA, respectively, were 0.85 (95% CI, 0.80-0.92) and 0.89 (95% CI, 0.82-0.97) for American Indian or Alaska Native patients; 0.95 (95% CI, 0.91-1.0) and 0.80 (95% CI, 0.76-0.85) for Asian, Native Hawaiian, or Other Pacific Islander patients; 0.72 (95% CI, 0.71-0.74) and 0.64 (95% CI, 0.63-0.66) for Black patients; 0.88 (95% CI, 0.82-0.94) and 0.90 (95% CI, 0.83-0.97) for multiracial patients; and 0.92 (95% CI, 0.90-0.95) and 0.87 (95% CI, 0.84-0.91) for patients of unknown race. The absolute risk differences for SGLT2i and GLP-1 RA prescription, respectively, were −1.8% (95% CI, −2.5% to −1.0%) and −1.0% (95% CI, −1.7% to −0.3%) for American Indian or Alaska Native patients; −0.5% (95% CI, −1.1% to 0%) and −1.9% (95% CI, −2.4% to −1.3%) for Asian, Native Hawaiian, or Other Pacific Islander patients; −3.4% (95% CI, −3.9% to −2.9%) and −3.4% (95% CI, −4.1% to −2.8%) for Black patients; −1.5% (95% CI, −2.3% to −0.7%) and −0.9% (95% CI, −1.6% to −0.2%) for multiracial patients; and −0.9% (95% CI, −1.3% to −0.5%) and −1.2% (95% CI, −1.6% to −0.8%)

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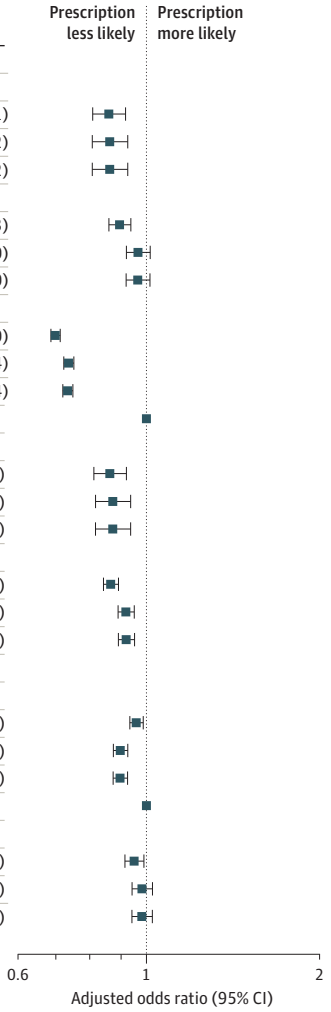
Figure 1. Association Between Race and Ethnicity Groups and Sodium-Glucose Cotransporter-2 Inhibitor (SGLT2i) Prescription With Sequential Adjustment for Patient- and System-Level Characteristics

Racial or ethnic group	Patients prescribed SGLT2i, No./total (%)	Adjusted odds ratio (95% CI)
Race		
American Indian or Alaska Native	1117/10 127 (11.0)	
Demographic factors only		0.85 (0.80-0.91)
Additional patient-level characteristics		0.85 (0.80-0.92)
Additional system-level characteristics		0.85 (0.80-0.92)
Asian, Native Hawaiian, or Other Pacific Islander	2921/24 663 (11.8)	
Demographic factors only		0.89 (0.85-0.93)
Additional patient-level characteristics		0.96 (0.91-1.00)
Additional system-level characteristics		0.95 (0.91-1.00)
Black or African American	20 618/234 932 (8.8)	
Demographic factors only		0.69 (0.68-0.70)
Additional patient-level characteristics		0.73 (0.71-0.74)
Additional system-level characteristics		0.72 (0.71-0.74)
White	95 959/850 648 (11.3)	1 [Reference]
Multiracial	1122/9795 (11.5)	
Demographic factors only		0.87 (0.81-0.92)
Additional patient-level characteristics		0.88 (0.82-0.94)
Additional system-level characteristics		0.88 (0.82-0.94)
Unknown race	6786/67 749 (10.0)	
Demographic factors only		0.87 (0.84-0.90)
Additional patient-level characteristics		0.92 (0.89-0.95)
Additional system-level characteristics		0.92 (0.90-0.95)
Ethnicity		
Hispanic or Latino	9317/85 034 (11.0)	
Demographic factors only		0.96 (0.94-0.99)
Additional patient-level characteristics		0.90 (0.88-0.93)
Additional system-level characteristics		0.90 (0.88-0.93)
Not Hispanic or Latino	115 189/1 072 958 (10.7)	1 [Reference]
Unknown ethnicity	4017/39 922 (10.1)	
Demographic factors only		0.95 (0.92-0.99)
Additional patient-level characteristics		0.98 (0.94-1.02)
Additional system-level characteristics		0.98 (0.94-1.02)



The demographic factors only model includes age, sex, and self-identified race and ethnicity. The additional patient-level characteristics model includes demographic factors and zip code median income; zip code Social Deprivation Index; Veterans Health Administration (VHA) diabetes and service connection; rurality; smoking status; unhealthy alcohol use; hemoglobin A_{1C} level; other antidiabetic agents; hypertension; body mass index; mental health diagnosis; atherosclerotic cardiovascular disease; heart failure; no chronic kidney disease; chronic kidney disease: estimated glomerular filtration rate and albuminuria categories; number of primary care, cardiology, endocrinology, and nephrology visits; VHA frailty index; and COVID-19 diagnosis. The additional system-level characteristics model includes VHA station parent facility-complexity level and US Census division.

for patients of unknown race. Compared with non-Hispanic ethnicity, the odds of prescription among Hispanic patients were 0.90 (95% CI, 0.88-0.93) for SGLT2i and 0.88 (95% CI, 0.85-0.91) for GLP-1 RA. Absolute risk differences were −1.1% (95% CI, −1.4% to −0.8%) for SGLT2i and −1.0% (95% CI, −1.3 to −0.7%) for GLP-1 RA.

VHA System-Level Characteristics and SGLT2i and GLP-1 RA Prescription

Across VHA stations, the prescription prevalence ranged from 1.8% to 28.9% for SGLT2i and 1.1% to 20% for GLP-1 RA (eFigures 5 and 6 and eTable 4 in the Supplement for system-level characteristics). For a patient within a VHA station of higher vs lower likelihood for prescription of these medications, the adjusted median ORs were 1.72 (95% CI, 1.61-1.84) for SGLT2i and 1.95 (95% CI, 1.79-2.14) for GLP-1 RA. The between VHA variance in prescription was low (adjusted ICC, 8.9% [95% CI, 7.0%-1.0%] for SGLT2i and 12.9% [95% CI, 10.2%-16.3%] for GLP-1 RA).

Figure 3 and **Figure 4** show stratified analyses by patient- and system-level characteristics for the comparison of prescriptions between Black vs White patients and between Hispanic vs non-Hispanic patients, respectively. Except among patients with concurrent diagnosis of heart failure, the results across these strata were qualitatively consistent with the overall findings; however, not all estimates reached statistical significance in the comparisons by ethnicity. eFigures 7, 8, 9, and 10 in the Supplement display the remaining comparisons.

Results of sensitivity analyses were consistent with the main findings, including those stratified by patients' site of

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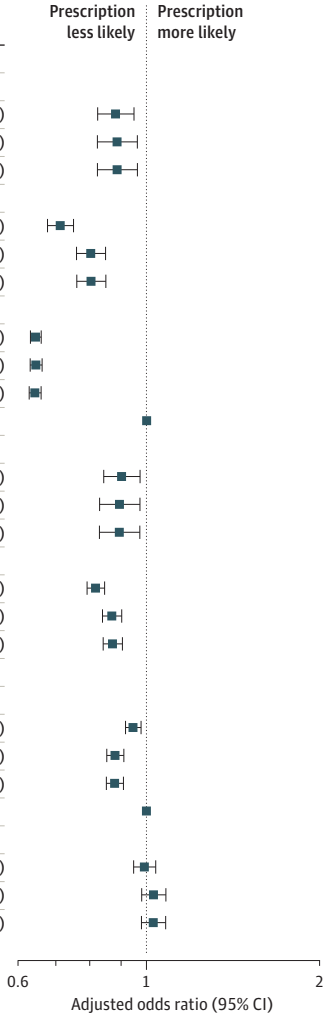
Figure 2. Association Between Race and Ethnicity Groups and Glucagon-like Peptide-1 Receptor Agonist (GLP-1 RA) Prescription With Sequential Adjustment for Patient- and System-Level Characteristics

Racial or ethnic group	Patients prescribed GLP-1 RA, No./total (%)	Adjusted odds ratio (95% CI)
Race		
American Indian or Alaska Native	852/10 127 (8.4)	
Demographic factors only		0.89 (0.82-0.95)
Additional patient-level characteristics		0.89 (0.82-0.96)
Additional system-level characteristics		0.89 (0.82-0.97)
Asian, Native Hawaiian, or other Pacific Islander	1975/24 663 (8.0)	
Demographic factors only		0.71 (0.67-0.75)
Additional patient-level characteristics		0.80 (0.76-0.85)
Additional system-level characteristics		0.80 (0.76-0.85)
Black or African American	14 371/234 932 (6.1)	
Demographic factors only		0.64 (0.63-0.66)
Additional patient-level characteristics		0.64 (0.63-0.66)
Additional system-level characteristics		0.64 (0.63-0.66)
White	69 734/850 648 (8.2)	1 [Reference]
Multiracial	854/9795 (8.7)	
Demographic factors only		0.91 (0.84-0.98)
Additional patient-level characteristics		0.90 (0.83-0.97)
Additional system-level characteristics		0.90 (0.83-0.97)
Unknown race	4711/67 749 (7.0)	
Demographic factors only		0.82 (0.79-0.85)
Additional patient-level characteristics		0.87 (0.84-0.91)
Additional system-level characteristics		0.87 (0.84-0.91)
Ethnicity		
Hispanic or Latino	6043/85 034 (7.1)	
Demographic factors only		0.95 (0.92-0.98)
Additional patient-level characteristics		0.88 (0.85-0.91)
Additional system-level characteristics		0.88 (0.85-0.91)
Not Hispanic or Latino	83 635/1 072 958 (7.8)	1 [Reference]
Unknown ethnicity	2819/39 922 (7.1)	
Demographic factors only		0.99 (0.95-1.04)
Additional patient-level characteristics		1.03 (0.98-1.08)
Additional system-level characteristics		1.03 (0.98-1.08)



The demographic factors only model includes age, sex, and self-identified race and ethnicity. The additional patient-level characteristics model includes demographic factors and zip code median income; zip code Social Deprivation Index; Veterans Health Administration (VHA) diabetes and service connection; rurality; smoking status; unhealthy alcohol use; hemoglobin A_{1C} level; other antidiabetic agents; hypertension; body mass index; mental health diagnosis; atherosclerotic cardiovascular disease; heart failure; no chronic kidney disease; chronic kidney disease: estimated glomerular filtration rate and albuminuria categories; number of primary care, cardiology, endocrinology, and nephrology visits; VHA frailty index; and COVID-19 diagnosis. The additional system-level characteristics model includes VHA station parent facility-complexity level, US Census division.

primary care and distance to a VHA facility, those that defined the outcome as 2 prescriptions per year, and those that only assessed incident prescriptions (eTables 5, 6, 7, 8, and 9 and eFigures 11, 12, 13, and 14 in the Supplement). The results from these analyses are summarized in the eAppendix in the Supplement.

Discussion

In this cross-sectional analysis of SGLT2i and GLP-1 RA prescription among more than 1 million patients with type 2 diabetes, prescription rates were low across all racial and ethnic groups. Compared with White patients, those of all other racial groups had significantly lower odds of prescription of these medications. Patients of Hispanic ethnicity had significantly lower odds of these prescriptions compared with non-Hispanic patients, even after accounting for individual- and system-level factors.

These results are consistent with recent research that found low prescription rates of SGLT2i and GLP-1 RA among racial and ethnic minority groups in commercial and Medicare Advantage health plans.[8,9] Given the high cost-sharing for these medications,[10] this study extends these findings to the VHA where the financial constraints impeding medication access are minimized. Consistent with these analyses and other recent research,[23,24] the absolute rates of prescription in this study were low even for patients with concomitant atherosclerotic cardiovascular disease (ASCVD), heart failure, or CKD, the 3 conditions for which guidelines recommend SGLT2i

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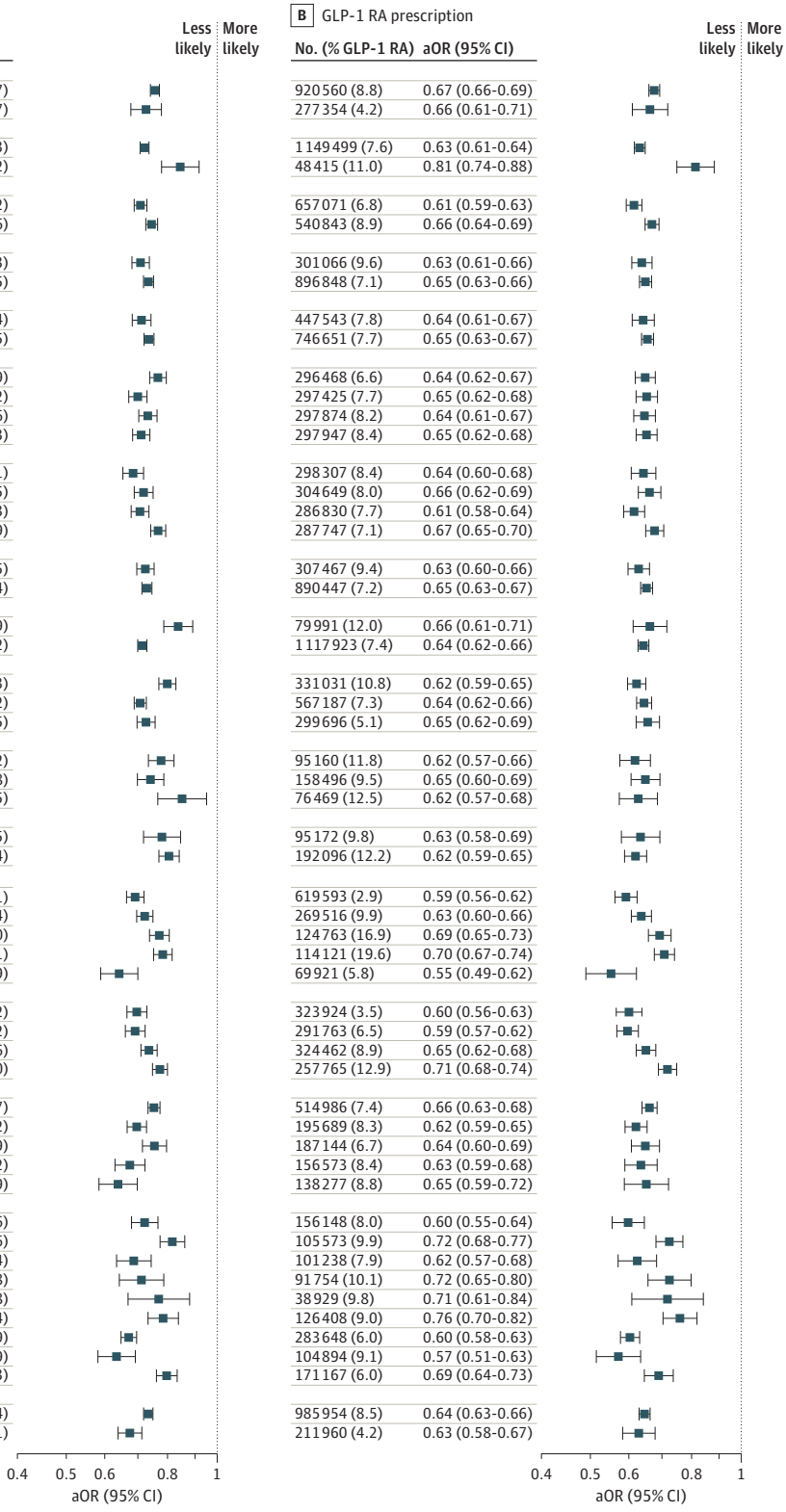
Figure 3. Prescription of Sodium-Glucose Cotransporter-2 Inhibitor (SGLT2i) and Glucagon-like Peptide-1 Receptor Agonist (GLP-1 RA) Comparing Black vs White Patients Across Patient- and System-Level Characteristics

Subgroup	A SGLT2i prescription No. (% SGLT2i)	A SGLT2i prescription aOR (95% CI)	B GLP-1 RA prescription No. (% GLP-1 RA)	B GLP-1 RA prescription aOR (95% CI)
Age, y				
<75	920 560 (12.3)	0.75 (0.74-0.77)	920 560 (8.8)	0.67 (0.66-0.69)
≥75	277 354 (5.5)	0.72 (0.67-0.77)	277 354 (4.2)	0.66 (0.61-0.71)
Sex				
Male	1 149 499 (10.8)	0.72 (0.70-0.73)	1 149 499 (7.6)	0.63 (0.61-0.64)
Female	48 415 (9.8)	0.84 (0.77-0.92)	48 415 (11.0)	0.81 (0.74-0.88)
Service connected, %				
<50	657 071 (9.8)	0.70 (0.68-0.72)	657 071 (6.8)	0.61 (0.59-0.63)
≥50	540 843 (11.9)	0.74 (0.72-0.76)	540 843 (8.9)	0.66 (0.64-0.69)
Service connection for diabetes				
Yes	301 066 (12.8)	0.70 (0.68-0.73)	301 066 (9.6)	0.63 (0.61-0.66)
No	896 848 (10.0)	0.73 (0.71-0.75)	896 848 (7.1)	0.65 (0.63-0.66)
Patient rurality				
Rural/highly rural	447 543 (10.6)	0.71 (0.68-0.74)	447 543 (7.8)	0.64 (0.61-0.67)
Urban	746 651 (10.8)	0.73 (0.72-0.75)	746 651 (7.7)	0.65 (0.63-0.67)
Zip code median income, $				
Quartile 1: <44 943	296 468 (9.5)	0.76 (0.73-0.79)	296 468 (6.6)	0.64 (0.62-0.67)
Quartile 2: 44 943-54 820	297 425 (10.5)	0.70 (0.67-0.72)	297 425 (7.7)	0.65 (0.62-0.68)
Quartile 3: 54 821-69 460	297 874 (11.2)	0.73 (0.70-0.76)	297 874 (8.2)	0.64 (0.61-0.67)
Quartile 4: >69 460	297 947 (11.8)	0.71 (0.68-0.73)	297 947 (8.4)	0.65 (0.62-0.68)
Zip code Social Deprivation Index				
Quartile 1	298 307 (11.7)	0.68 (0.65-0.71)	298 307 (8.4)	0.64 (0.60-0.68)
Quartile 2	304 649 (11.1)	0.71 (0.68-0.75)	304 649 (8.0)	0.66 (0.62-0.69)
Quartile 3	286 830 (10.4)	0.70 (0.67-0.73)	286 830 (7.7)	0.61 (0.58-0.64)
Quartile 4	287 747 (9.9)	0.76 (0.74-0.79)	287 747 (7.1)	0.67 (0.65-0.70)
ASCVD				
Yes	307 467 (14.0)	0.72 (0.69-0.75)	307 467 (9.4)	0.63 (0.60-0.66)
No	890 447 (9.6)	0.72 (0.71-0.74)	890 447 (7.2)	0.65 (0.63-0.67)
Heart failure				
Yes	79 991 (14.7)	0.84 (0.78-0.89)	79 991 (12.0)	0.66 (0.61-0.71)
No	1 117 923 (10.4)	0.71 (0.69-0.72)	1 117 923 (7.4)	0.64 (0.62-0.66)
Chronic kidney disease				
Yes	331 031 (11.4)	0.80 (0.77-0.83)	331 031 (10.8)	0.62 (0.59-0.65)
No	567 187 (11.5)	0.70 (0.68-0.72)	567 187 (7.3)	0.64 (0.62-0.66)
Unknown	299 696 (8.5)	0.72 (0.69-0.75)	299 696 (5.1)	0.65 (0.62-0.69)
KDIGO GFR stage, mL/min/1.73 m^2				
≥60	95 160 (16.5)	0.77 (0.73-0.82)	95 160 (11.8)	0.62 (0.57-0.66)
45-59	158 496 (10.9)	0.74 (0.69-0.78)	158 496 (9.5)	0.65 (0.60-0.69)
15-44	76 469 (6.0)	0.85 (0.76-0.95)	76 469 (12.5)	0.62 (0.57-0.68)
KDIGO albuminuria stage, mg/g				
ACR <30	95 172 (9.9)	0.78 (0.71-0.85)	95 172 (9.8)	0.63 (0.58-0.69)
ACR ≥30	192 096 (13.2)	0.80 (0.77-0.84)	192 096 (12.2)	0.62 (0.59-0.65)
Hemoglobin A_{1c} level, %				
≤7	619 593 (4.7)	0.69 (0.66-0.71)	619 593 (2.9)	0.59 (0.56-0.62)
>7-8	269 516 (14.8)	0.72 (0.69-0.74)	269 516 (9.9)	0.63 (0.60-0.66)
>8-9	124 763 (21.8)	0.77 (0.73-0.80)	124 763 (16.9)	0.69 (0.65-0.73)
>9	114 121 (22.1)	0.78 (0.75-0.81)	114 121 (19.6)	0.70 (0.67-0.74)
Unknown	69 921 (10.3)	0.64 (0.59-0.69)	69 921 (5.8)	0.55 (0.49-0.62)
VHA station crude rate of SGLT2i/GLP-1 RA use				
Quartile 1	308 798 (6.0)	0.69 (0.66-0.72)	323 924 (3.5)	0.60 (0.56-0.63)
Quartile 2	258 332 (8.7)	0.69 (0.66-0.72)	291 763 (6.5)	0.59 (0.57-0.62)
Quartile 3	311 188 (11.6)	0.73 (0.70-0.76)	324 462 (8.9)	0.65 (0.62-0.68)
Quartile 4	319 596 (16.1)	0.77 (0.74-0.80)	257 765 (12.9)	0.71 (0.68-0.74)
VHA station parent facility complexity level				
1a	514 986 (11.3)	0.75 (0.73-0.77)	514 986 (7.4)	0.66 (0.63-0.68)
1b	195 689 (10.0)	0.69 (0.66-0.72)	195 689 (8.3)	0.62 (0.59-0.65)
1c	187 144 (9.4)	0.75 (0.71-0.79)	187 144 (6.7)	0.64 (0.60-0.69)
2	156 573 (11.3)	0.67 (0.63-0.72)	156 573 (8.4)	0.63 (0.59-0.68)
3	138 277 (11.1)	0.63 (0.58-0.69)	138 277 (8.8)	0.65 (0.59-0.72)
Division				
East North Central	156 148 (10.4)	0.72 (0.68-0.76)	156 148 (8.0)	0.60 (0.55-0.64)
East South Central	105 573 (11.0)	0.81 (0.77-0.86)	105 573 (9.9)	0.72 (0.68-0.77)
Middle Atlantic	101 238 (9.4)	0.68 (0.63-0.74)	101 238 (7.9)	0.62 (0.57-0.68)
Mountain	91 754 (9.4)	0.71 (0.64-0.78)	91 754 (10.1)	0.72 (0.65-0.80)
New England	38 929 (12.9)	0.77 (0.66-0.88)	38 929 (9.8)	0.71 (0.61-0.84)
Pacific	126 408 (11.2)	0.78 (0.73-0.84)	126 408 (9.0)	0.76 (0.70-0.82)
South Atlantic	283 648 (9.9)	0.67 (0.64-0.69)	283 648 (6.0)	0.60 (0.58-0.63)
West North Central	104 894 (13.4)	0.63 (0.58-0.69)	104 894 (9.1)	0.57 (0.51-0.63)
West South Central	171 167 (11.8)	0.79 (0.76-0.83)	171 167 (6.0)	0.69 (0.64-0.73)
Type 2 diabetes status[a]				
Prevalent	985 954 (11.4)	0.73 (0.71-0.74)	985 954 (8.5)	0.64 (0.63-0.66)
Incident	211 960 (7.6)	0.67 (0.63-0.71)	211 960 (4.2)	0.63 (0.58-0.67)



The variables adjusted for in the multivariable models are listed in the Figure 1 legend. Adjusted odds ratios (aORs) <1 indicate Black persons were less likely to receive medications than White persons.

[a] Prevalent type 2 diabetes includes a diagnosis of type 2 diabetes before January 1, 2019. Incident type 2 diabetes includes a diagnosis between January 1, 2019, and December 31, 2020.

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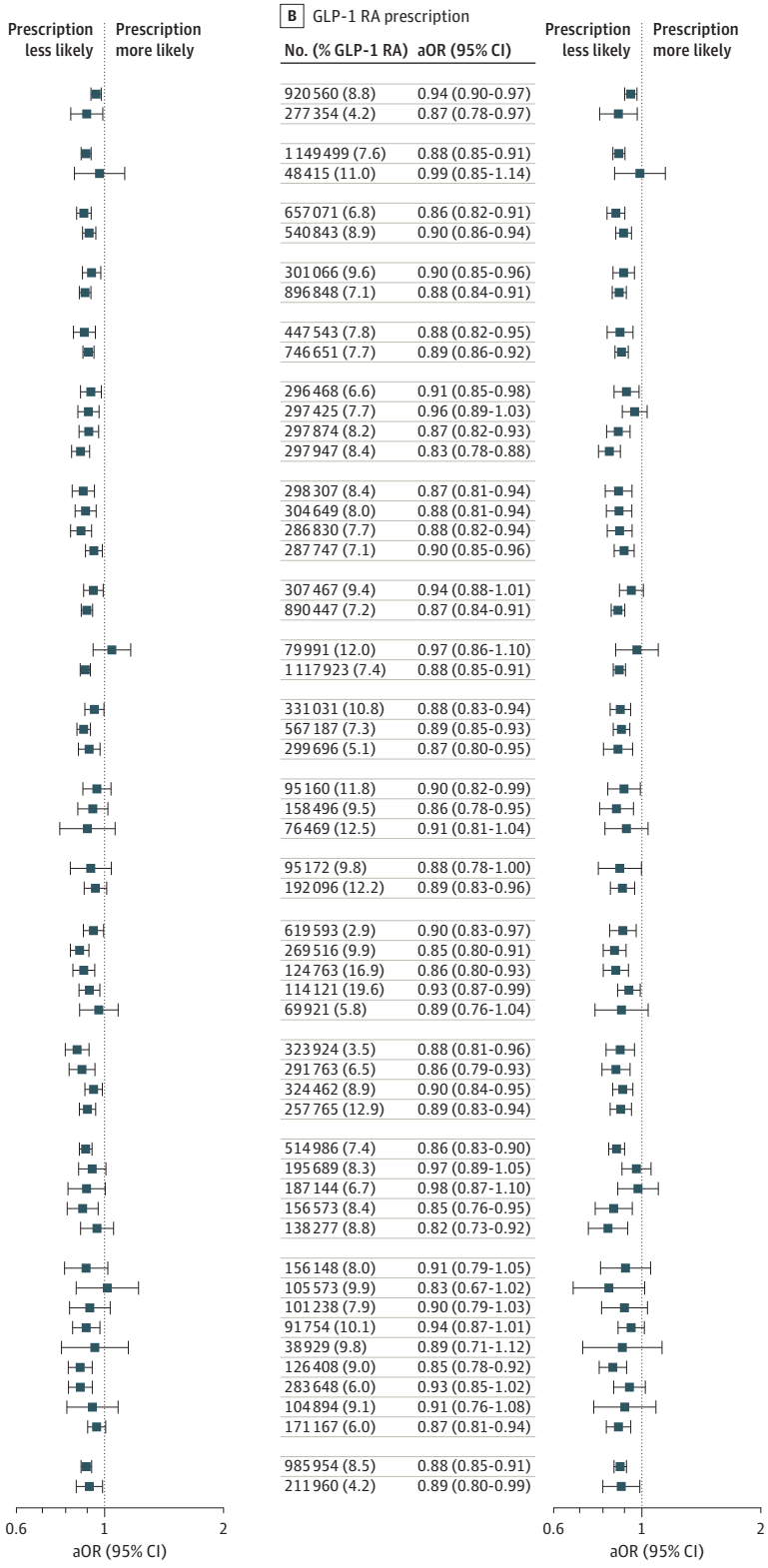
Figure 4. Prescription of Sodium-Glucose Cotransporter-2 Inhibitor (SGLT2i) and Glucagon-like Peptide-1 Receptor Agonist (GLP-1 RA) Comparing Hispanic or Latino Ethnicity vs Not Hispanic or Latino Ethnicity Across Patient- and System-Level Characteristics

Subgroup	A SGLT2i prescription No. (% SGLT2i)	aOR (95% CI)	B GLP-1 RA prescription No. (% GLP-1 RA)	aOR (95% CI)
Age, y				
<75	920 560 (12.3)	0.95 (0.92-0.98)	920 560 (8.8)	0.94 (0.90-0.97)
≥75	277 354 (5.5)	0.90 (0.82-0.99)	277 354 (4.2)	0.87 (0.78-0.97)
Sex				
Male	1 149 499 (10.8)	0.90 (0.87-0.93)	1 149 499 (7.6)	0.88 (0.85-0.91)
Female	48 415 (9.8)	0.97 (0.84-1.12)	48 415 (11.0)	0.99 (0.85-1.14)
Service connected, %				
<50	657 071 (9.8)	0.89 (0.85-0.93)	657 071 (6.8)	0.86 (0.82-0.91)
≥50	540 843 (11.9)	0.91 (0.88-0.95)	540 843 (8.9)	0.90 (0.86-0.94)
Service connection for diabetes				
Yes	301 066 (12.8)	0.93 (0.88-0.98)	301 066 (9.6)	0.90 (0.85-0.96)
No	896 848 (10.0)	0.89 (0.86-0.92)	896 848 (7.1)	0.88 (0.84-0.91)
Patient rurality				
Rural/highly rural	447 543 (10.6)	0.89 (0.84-0.95)	447 543 (7.8)	0.88 (0.82-0.95)
Urban	746 651 (10.8)	0.91 (0.88-0.94)	746 651 (7.7)	0.89 (0.86-0.92)
Zip code median income, $				
Quartile 1: <44 943	296 468 (9.5)	0.92 (0.87-0.98)	296 468 (6.6)	0.91 (0.85-0.98)
Quartile 2: 44 943-54 820	297 425 (10.5)	0.91 (0.86-0.97)	297 425 (7.7)	0.96 (0.89-1.03)
Quartile 3: 54 821-69 460	297 874 (11.2)	0.91 (0.86-0.97)	297 874 (8.2)	0.87 (0.82-0.93)
Quartile 4: >69 460	297 947 (11.8)	0.87 (0.83-0.92)	297 947 (8.4)	0.83 (0.78-0.88)
Zip code Social Deprivation Index				
Quartile 1	298 307 (11.7)	0.88 (0.83-0.94)	298 307 (8.4)	0.87 (0.81-0.94)
Quartile 2	304 649 (11.1)	0.90 (0.84-0.95)	304 649 (8.0)	0.88 (0.81-0.94)
Quartile 3	286 830 (10.4)	0.87 (0.82-0.93)	286 830 (7.7)	0.88 (0.82-0.94)
Quartile 4	287 747 (9.9)	0.94 (0.90-0.99)	287 747 (7.1)	0.90 (0.85-0.96)
ASCVD				
Yes	307 467 (14.0)	0.94 (0.89-0.99)	307 467 (9.4)	0.94 (0.88-1.01)
No	890 447 (9.6)	0.90 (0.87-0.93)	890 447 (7.2)	0.87 (0.84-0.91)
Heart failure				
Yes	79 991 (14.7)	1.04 (0.94-1.16)	79 991 (12.0)	0.97 (0.86-1.10)
No	1 117 923 (10.4)	0.89 (0.87-0.92)	1 117 923 (7.4)	0.88 (0.85-0.91)
Chronic kidney disease				
Yes	331 031 (11.4)	0.94 (0.89-1.00)	331 031 (10.8)	0.88 (0.83-0.94)
No	567 187 (11.5)	0.89 (0.85-0.92)	567 187 (7.3)	0.89 (0.85-0.93)
Unknown	299 696 (8.5)	0.91 (0.86-0.97)	299 696 (5.1)	0.87 (0.80-0.95)
KDIGO GFR stage, mL/min/1.73 m^2				
≥60	95 160 (16.5)	0.96 (0.88-1.04)	95 160 (11.8)	0.90 (0.82-0.99)
45-59	158 496 (10.9)	0.93 (0.86-1.02)	158 496 (9.5)	0.86 (0.78-0.95)
15-44	76 469 (6.0)	0.91 (0.77-1.06)	76 469 (12.5)	0.91 (0.81-1.04)
KDIGO albuminuria stage, mg/g				
ACR <30	95 172 (9.9)	0.92 (0.82-1.04)	95 172 (9.8)	0.88 (0.78-1.00)
ACR ≥30	192 096 (13.2)	0.95 (0.89-1.01)	192 096 (12.2)	0.89 (0.83-0.96)
Hemoglobin A_{1c} level, %				
≤7	619 593 (4.7)	0.94 (0.88-0.99)	619 593 (2.9)	0.90 (0.83-0.97)
>7-8	269 516 (14.8)	0.87 (0.82-0.91)	269 516 (9.9)	0.85 (0.80-0.91)
>8-9	124 763 (21.8)	0.89 (0.83-0.94)	124 763 (16.9)	0.86 (0.80-0.93)
>9	114 121 (22.1)	0.92 (0.86-0.97)	114 121 (19.6)	0.93 (0.87-0.99)
Unknown	69 921 (10.3)	0.97 (0.87-1.08)	69 921 (5.8)	0.89 (0.76-1.04)
VHA station crude rate of SGLT2i/GLP-1 RA use				
Quartile 1	308 798 (6.0)	0.85 (0.80-0.91)	323 924 (3.5)	0.88 (0.81-0.96)
Quartile 2	258 332 (8.7)	0.88 (0.81-0.95)	291 763 (6.5)	0.86 (0.79-0.93)
Quartile 3	311 188 (11.6)	0.94 (0.89-0.99)	324 462 (8.9)	0.90 (0.84-0.95)
Quartile 4	319 596 (16.1)	0.91 (0.86-0.95)	257 765 (12.9)	0.89 (0.83-0.94)
VHA station parent facility complexity level				
1a	514 986 (11.3)	0.90 (0.86-0.93)	514 986 (7.4)	0.86 (0.83-0.90)
1b	195 689 (10.0)	0.93 (0.86-1.01)	195 689 (8.3)	0.97 (0.89-1.05)
1c	187 144 (9.4)	0.90 (0.81-1.00)	187 144 (6.7)	0.98 (0.87-1.10)
2	156 573 (11.3)	0.88 (0.81-0.96)	156 573 (8.4)	0.85 (0.76-0.95)
3	138 277 (11.1)	0.96 (0.87-1.05)	138 277 (8.8)	0.82 (0.73-0.92)
Division				
East North Central	156 148 (10.4)	0.90 (0.79-1.02)	156 148 (8.0)	0.91 (0.79-1.05)
East South Central	105 573 (11.0)	1.02 (0.85-1.22)	105 573 (9.9)	0.83 (0.67-1.02)
Middle Atlantic	101 238 (9.4)	0.92 (0.82-1.03)	101 238 (7.9)	0.90 (0.79-1.03)
Mountain	91 754 (9.4)	0.90 (0.83-0.97)	91 754 (10.1)	0.94 (0.87-1.01)
New England	38 929 (12.9)	0.95 (0.78-1.15)	38 929 (9.8)	0.89 (0.71-1.12)
Pacific	126 408 (11.2)	0.87 (0.81-0.93)	126 408 (9.0)	0.85 (0.78-0.92)
South Atlantic	283 648 (9.9)	0.87 (0.81-0.93)	283 648 (6.0)	0.93 (0.85-1.02)
West North Central	104 894 (13.4)	0.93 (0.80-1.08)	104 894 (9.1)	0.91 (0.76-1.08)
West South Central	171 167 (11.8)	0.96 (0.91-1.01)	171 167 (6.0)	0.87 (0.81-0.94)
Type 2 diabetes status[a]				
Prevalent	985 954 (11.4)	0.90 (0.87-0.93)	985 954 (8.5)	0.88 (0.85-0.91)
Incident	211 960 (7.6)	0.92 (0.85-0.99)	211 960 (4.2)	0.89 (0.80-0.99)



The variables adjusted for in the multivariable models are listed in the Figure 1 legend. Adjusted odds ratios (aORs) <1 indicate Hispanic persons were less likely to receive medications than non-Hispanic persons.

[a] Prevalent type 2 diabetes includes a diagnosis of type 2 diabetes before January 1, 2019. Incident type 2 diabetes includes a diagnosis between January 1, 2019, and December 31, 2020.

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and/or GLP-1 RA prescription irrespective of glycemic control. These findings align with 2 recent VHA studies that found low prescription rates of GLP-1 RA among patients with established ASCVD and similar facility-level variability in SGLT2i and GLP-1 RA prescription.[21,25]

The observed lower prescription of SGLT2i and GLP-1 RA for all race and ethnic groups relative to White patients and non-Hispanic patients persisted even after accounting for a broad array of patient- and system-level characteristics. Differences in comorbidities, social determinants of health at the zip code level, and access to primary and specialty care did not appear to explain observed racial and ethnic differences in these prescriptions. Indeed, system-level variation was low relative to overall variability in the prescription of SGLT2i and GLP-1 RA.

Racial and ethnic disparities in health and health care are pervasive in the US.[26] Although to a smaller magnitude, these disparities have been reproduced in the VHA,[27] indicating that financial constraints do not solely account for the observed differences across race and ethnic groups.

Racism—a system of structuring opportunity and assigning value based on the social interpretation of how one looks[28]—and other implicit biases may be playing a role. Prior research has identified that clinician perceptions and attitudes of risk and treatment benefits frequently underlie differential prescription of guideline-recommended therapies.[29,30] However, quantitative analyses can offer only a general overview of racial differences and cannot provide in-depth information about contextual determinants. For instance, clinician knowledge of these novel therapies, comfort with prescribing, and clinicians' race and ethnicity were not assessed in this study. Therefore, qualitative explorations are needed to further understand and contextualize these findings. In addition, the low prescription rates observed across all race and ethnic groups may be due to the relative novelty of these medications. As quality improvement initiatives are established to overcome this treatment gap, these findings suggest that such initiatives must take a racial and ethnic equity lens so that improvements in care can extend benefits to all.

Limitations

This study has several limitations. First, racial and ethnic disparities in the VHA system are less pronounced than in other US health systems.[31] Therefore, these results are not necessarily generalizable to other health systems. Second, there was low representation of women, which is inherent to the VHA. Third, the VHA does not retain individual-level information on socioeconomic characteristics; thus, unmeasured and residual confounding by individual-level socioeconomic characteristics may have partially accounted for these findings. Fourth, only 1 medication per class was available in the VHA national formulary, which may limit prescriptions. Fifth, the VHA facility complexity index does not necessarily indicate quality of care. Better indicators of facility-level quality might have demonstrated a larger contribution of facility characteristics to the observed findings. Sixth, this study includes all patients with type 2 diabetes and does not exclusively focus on patients with concomitant ASCVD, heart failure, and CKD, for whom SGLT2i and GLP-1 RA should be prioritized. Seventh, the cross-sectional design has limitations, which include prevalence-incidence bias and reverse causality. Eighth, this study did not assess the association of prescription and utilization of these medications with clinical outcomes.

Conclusions

Among patients with type 2 diabetes in the VHA system during 2019 and 2020, prescription rates of SGLT2i and GLP-1 RA medications were low, and individuals of several different racial groups and those of Hispanic ethnicity had statistically significantly lower odds of receiving prescriptions for these medications compared with individuals of White race and non-Hispanic ethnicity. Further research is needed to understand the mechanisms underlying these differences in rates of prescribing and the potential relationships with differences in clinical outcomes.

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Author Contributions: Drs Lamprea-Montealegre and Ms Madden had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.
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Acquisition, analysis, or interpretation of data: All authors.
Drafting of the manuscript: Lamprea-Montealegre, Madden, Shlipak, Estrella.
Critical revision of the manuscript for important intellectual content: All authors.
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