**APPENDIX**

**Supplemental Table 1: Details for the use of Administrative Data to Define the Study Population**

|  |  |
| --- | --- |
| Inclusion or Exclusion Criteria | Definition |
| Diagnosed Diabetes with Transition to Second-Line Medication Management | * 1. At least one dispensing event for one of the 6 classes of 2nd-line T2D medications (date of first fill = “index date”), AND
	2. At least one metformin medication fill in the 180 days before the index date, AND
	3. No diabetes class medication fills other than metformin before the index date, AND
	4. At least one metformin medication refill on the index date or in the 180 days after the index date, AND
	5. ≥1 inpatient or outpatient claim for diabetes, with ICD-9 of (250.x, 357.2, 366.41, 362.01–362.07) before the index date
 |
| Secondary Diabetes or related conditions | Excluded patients with any occurrence of hemochromatosis (275.0), acromegaly (253.0), cystic fibrosis (277.0x), secondary diabetes (ICD-9 CM: 249.xx), or any medication claim for an oral corticosteroid medication with more than 21 days supplied within 6 months before the index date |
| Pregnancy | Excluded evidence of pregnancy (a delivery within 180 days prior to the index date, using CPT codes 59400, 59510, 59610, 59618, 59409, 59410, 59514, 59515, 59612, 59614, 59620, 59622) |

**Supplemental Table 2: Details for the Use of Administrative Data to Define Covariates**

|  |  |
| --- | --- |
| Covariate | Definition |
| Obesity Diagnosis | Any occurrence of ICD 9 CM codes: 278.0, 278.00, 278.01, 278.02 |
| Poorly controlled or labile blood glucose control | ≥1 encounter with any of the following ICD-9-CM codes: 250.02; 250.03; 250.12; 250.13; 250.22; 250.23; 250.32; 250.33; 250.42; 250.43; 250.52; 250.53; 250.62; 250.63; 250.72; 250.73; 250.82; 250.83; 250.92; OR 250.93 |
| Encounters for hypoglycemia | Any occurrence of ICD-9-CM code: 250.3x; 251.0; 251.1; OR 251.2 |
| Percentage of provider’s overall medication prescribing that relates to diabetes medications  | By each prescriber ID, calculate:1. Total number of prescriptions written in the 90-days before the index date
2. Total number of prescriptions written for a T2D medication in the 90-days before the index date
3. Divide b by a
4. Categorize estimate of % of patients with diabetes into quartiles of low to high volume
 |
| Probability of prescribing each of the 6 classes of T2D medications in the past 3 months  | By each prescriber ID, calculate separately for each of the 6 T2D drug classes of interest: 1. Total number of health plan enrollees with a claim for ANY T2D medication in the same 90 days before the index date (patients dispensed a drug for diabetes)
2. Total number of health plan enrollees with a claim for a drug in the drug class of interest during the 90 days before the index date (patients dispensed a drug in the drug class)
3. Divide b by a
4. Categorize probability estimate into quartiles of low to high prescribing providers
 |
| Health plan coverage “richness” | By health plan ID, calculate1. Health plan median of total, per-person, direct medical expenditure (sum of all costs) during the 90 days before the index date
2. Health plan median of all out-of-pocket expenditure (sum of all cost-sharing responsible to the patient) during the 90 days before the index date
3. Divide b by a
4. Categorize estimate of percentage of costs that are responsibility of the patient into quartiles of low to high (lowest percent is considered highest coverage “richness”)
 |

**Supplemental Table 3a: Full Array of** **Unadjusted Patient, Prescriber, and Health Plan Characteristics (with Column Percentages) for each Second-Line Diabetes Medication Group\***

|  | **Total** | **DPP4** | **GLP1** | **INS/B** | **SGLT2** | **SFU** | **TZD** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **N (COLUMN %)** | 77,744 | (100) | 20,709 | (100) | 6,082 | (100) | 6,350 | (100) | 3,995 | (100) | 36,856 | (100) | 3,752 | (100) |
| Fill Year |
| 2011 | 18,324 | (23.6) | 4,355 | (21.0) | 1,334 | (21.9) | 1,672 | (26.3) | 0 | (0.0) | 9,409 | (25.5) | 1,552 | (41.4) |
| 2012 | 17,065 | (22.0) | 5,275 | (25.5) | 1,355 | (22.3) | 1,335 | (21.0) | 0 | (0.0) | 8,495 | (23.1) | 600 | (16.0) |
| 2013 | 14,274 | (18.4) | 4,278 | (20.7) | 1,197 | (19.7) | 1,132 | (17.8) | 250 | (6.3) | 6,892 | (18.7) | 523 | (13.9) |
| 2014 | 14,686 | (18.9) | 3,910 | (18.9) | 1,103 | (18.1) | 1,176 | (18.5) | 1,553 | (38.9) | 6,417 | (17.4) | 526 | (14.0) |
| 2015 | 13,403 | (17.2) | 2,891 | (14.0) | 1,093 | (18.0) | 1,035 | (16.3) | 2,192 | (54.9) | 5,643 | (15.3) | 551 | (14.7) |
| **Individual Patient Characteristics** |
| Gender |
| Women | 33,539 | (43.1) | 8,924 | (43.1) | 3,634 | (59.8) | 2,817 | (44.4) | 1,756 | (44.0) | 14,978 | (40.6) | 1,427 | (38.0) |
| Men | 44,205 | (56.9) | 11,785 | (56.9) | 2,448 | (40.3) | 3,533 | (55.6) | 2,239 | (56.1) | 21,878 | (59.4) | 2,325 | (62.0) |
| Age Category |
| 18-34 | 2,006 | (2.6) | 451 | (2.2) | 287 | (4.7) | 249 | (3.9) | 139 | (3.5) | 818 | (2.2) | 64 | (1.7) |
| 35-44 | 8,381 | (10.8) | 2,201 | (10.6) | 950 | (15.6) | 764 | (12.0) | 594 | (14.9) | 3,538 | (9.6) | 336 | (9.0) |
| 45-54 | 20,657 | (26.6) | 5,716 | (27.6) | 1,956 | (32.2) | 1,621 | (25.5) | 1,406 | (35.2) | 9,092 | (24.7) | 860 | (22.9) |
| 55-64 | 26,752 | (34.4) | 7,493 | (36.2) | 2,101 | (34.5) | 2,106 | (33.2) | 1,502 | (37.6) | 12,317 | (33.4) | 1,229 | (32.8) |
| 65-74 | 13,761 | (17.7) | 3,622 | (17.5) | 677 | (11.1) | 1,049 | (16.5) | 323 | (8.1) | 7,279 | (19.8) | 810 | (21.6) |
| 75+ | 6,188 | (8.0) | 1,224 | (5.9) | 111 | (1.8) | 561 | (8.8) | 31 | (0.8) | 3,811 | (10.3) | 453 | (12.1) |
| Race/Ethnicity† |
| Black | 8,451 | (10.9) | 2,247 | (10.9) | 644 | (10.6) | 827 | (13.0) | 398 | (10.0) | 4,032 | (10.9) | 301 | (8.0) |
| Hispanic | 12,999 | (16.7) | 3,318 | (16.0) | 715 | (11.8) | 1,046 | (16.5) | 592 | (14.8) | 6,527 | (17.7) | 801 | (21.4) |
| Non-Hispanic White | 48,022 | (61.8) | 12,734 | (61.5) | 4,315 | (71.0) | 3,930 | (61.9) | 2,667 | (66.8) | 22,217 | (60.3) | 2,159 | (57.5) |
| Unknown/Other | 8,280 | (10.7) | 2,413 | (11.7) | 408 | (6.7) | 547 | (8.6) | 338 | (8.5) | 4,084 | (11.1) | 491 | (13.1) |
| Most Recent A1c Value |
| <8% | 10,021 | (12.9) | 3,378 | (16.3) | 1,246 | (20.5) | 402 | (6.3) | 864 | (21.6) | 3,630 | (9.9) | 503 | (13.4) |
| 8 to 10% | 10,433 | (13.4) | 3,434 | (16.6) | 635 | (10.4) | 444 | (7.0) | 725 | (18.2) | 4,747 | (12.9) | 445 | (11.9) |
| >10% | 7,184 | (9.2) | 1,779 | (8.6) | 381 | (6.3) | 934 | (14.7) | 431 | (10.8) | 3,380 | (9.2) | 274 | (7.3) |
| Result not available‡ | 50,114 | (64.5) | 12,119 | (58.5) | 3,820 | (62.8) | 4,570 | (72.0) | 1,975 | (49.4) | 25,095 | (68.1) | 2,530 | (67.4) |
| Diagnosis Code for Uncontrolled Diabetes |
| No | 45,644 | (58.7) | 11,723 | (56.6) | 3,479 | (57.2) | 3,262 | (51.4) | 2,167 | (54.2) | 22,604 | (61.3) | 2,411 | (64.3) |
| Yes | 32,100 | (41.3) | 8,986 | (43.4) | 2,603 | (42.8) | 3,088 | (48.6) | 1,828 | (45.8) | 14,252 | (38.7) | 1,341 | (35.7) |
| Obesity Diagnosis Code |
| No | 60,889 | (78.3) | 16,333 | (78.9) | 3,981 | (65.5) | 5,157 | (81.2) | 2,590 | (64.8) | 29,651 | (80.5) | 3,178 | (84.7) |
| Yes | 16,855 | (21.7) | 4,376 | (21.1) | 2,101 | (34.5) | 1,193 | (18.8) | 1,405 | (35.2) | 7,205 | (19.6) | 574 | (15.3) |
| Recent Hospitalization |
| No | 64,908 | (83.5) | 17,793 | (85.9) | 5,272 | (86.7) | 4,676 | (73.6) | 3,761 | (94.1) | 30,259 | (82.1) | 3,151 | (84.0) |
| Yes | 12,836 | (16.5) | 2,916 | (14.1) | 810 | (13.3) | 1,674 | (26.4) | 234 | (5.9) | 6,597 | (17.9) | 601 | (16.0) |
| Recent Healthcare Cost Level |
| Below Median | 37,138 | (47.8) | 8,532 | (41.2) | 2,202 | (36.2) | 3,248 | (51.2) | 1,699 | (42.5) | 19,464 | (52.8) | 1,998 | (53.3) |
| 50th - 75th Percentile | 19,094 | (24.6) | 5,475 | (26.4) | 1,491 | (24.5) | 1,472 | (23.2) | 1,052 | (26.3) | 8,687 | (23.6) | 916 | (24.4) |
| 75th – 95th Percentile | 16,536 | (21.3) | 5,080 | (24.5) | 1,756 | (28.9) | 1,241 | (19.5) | 943 | (23.6) | 6,863 | (18.6) | 655 | (17.5) |
| >75th Percentile | 4,976 | (6.4) | 1,624 | (7.8) | 633 | (10.4) | 389 | (6.1) | 301 | (7.5) | 1,843 | (5.0) | 183 | (4.9) |
| Charlson Comorbidity Score§ |
| 0 (lowest) | 3,732 | (4.8) | 656 | (3.2) | 407 | (6.7) | 430 | (6.8) | 83 | (2.1) | 1,880 | (5.1) | 277 | (7.4) |
| 1 | 42,767 | (55.0) | 11,823 | (57.1) | 3,339 | (54.9) | 3,194 | (50.3) | 2,205 | (55.2) | 20,157 | (54.7) | 2,055 | (54.8) |
| 2 or 3 | 20,213 | (26.0) | 5,306 | (25.6) | 1,641 | (27.0) | 1,729 | (27.2) | 1,130 | (28.3) | 9,498 | (25.8) | 910 | (24.3) |
| 4+ (highest) | 11,032 | (14.2) | 2,924 | (14.1) | 695 | (11.4) | 997 | (15.7) | 577 | (14.4) | 5,326 | (14.5) | 510 | (13.6) |
| Census Region Location |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Northeast | 9,189 | (11.8) | 3,262 | (15.8) | 869 | (14.3) | 643 | (10.1) | 448 | (11.2) | 3,649 | (9.9) | 319 | (8.5) |
| Midwest | 16,793 | (21.6) | 3,614 | (17.5) | 1,268 | (20.9) | 1,514 | (23.8) | 841 | (21.1) | 8,856 | (24.0) | 703 | (18.7) |
| South | 32,528 | (41.8) | 9,261 | (44.7) | 2,930 | (48.2) | 2,500 | (39.4) | 2,120 | (53.1) | 14,355 | (39.0) | 1,365 | (36.4) |
| West | 19,234 | (24.7) | 4,573 | (22.1) | 1,015 | (16.7) | 1,693 | (26.7) | 586 | (14.7) | 9,999 | (27.1) | 1,365 | (36.4) |
| **Prescriber Characteristics** |
| Provider’s Clinical Discipline |
| Endocrinologist | 5,294 | (6.8) | 1,561 | (7.5) | 1,250 | (20.6) | 581 | (9.2) | 379 | (9.5) | 1,382 | (3.8) | 144 | (3.8) |
| Family Medicine | 33,858 | (43.6) | 8,822 | (42.6) | 2,078 | (34.2) | 2,556 | (40.3) | 1,767 | (44.2) | 16,677 | (45.3) | 1,955 | (52.1) |
| Internal Medicine | 24,583 | (31.6) | 6,799 | (32.8) | 1,599 | (26.3) | 1,843 | (29.0) | 1,047 | (26.2) | 12,255 | (33.3) | 1,042 | (27.8) |
| Nurse/PA | 5,893 | (7.6) | 1,595 | (7.7) | 611 | (10.1) | 539 | (8.5) | 431 | (10.8) | 2,477 | (6.7) | 238 | (6.3) |
| Other/Missing | 8,116 | (10.4) | 1,934 | (9.3) | 544 | (8.9) | 831 | (13.1) | 371 | (9.3) | 4,062 | (11) | 373 | (9.9) |
| Percent of All of Provider’s Drug Prescribing that was for T2D Medications |
| Below 25th Percentile | 19,102 | (24.6) | 5,270 | (25.5) | 1,053 | (17.3) | 1,674 | (26.4) | 871 | (21.8) | 9,336 | (25.3) | 893 | (23.8) |
| 25th - 50th Percentile | 20,050 | (25.8) | 5,492 | (26.5) | 1,257 | (20.7) | 1,423 | (22.4) | 1,020 | (25.5) | 9,881 | (26.8) | 978 | (26.1) |
| 50th - 75th Percentile | 19,187 | (24.7) | 5,003 | (24.2) | 1,222 | (20.1) | 1,404 | (22.1) | 973 | (24.4) | 9,616 | (26.1) | 970 | (25.9) |
| >75th Percentile | 19,405 | (25.0) | 4,943 | (23.9) | 2,550 | (41.9) | 1,849 | (29.1) | 1,131 | (28.3) | 8,024 | (21.8) | 911 | (24.3) |
| Provider’s Recent Prescribing Behavior║ |
| %Diabetes Prescribing that were DPP4s |
| No patients | 34,861 | (44.7) | 6,702 | (32.4) | 2,300 | (37.8) | 3,336 | (52.5) | 1,494 | (37.4) | 19,181 | (52.0) | 1,668 | (44.5) |
| 1-17.6% of patients | 23,393 | (30.0) | 5,718 | (27.6) | 2,203 | (36.2) | 1,859 | (29.3) | 1,296 | (32.4) | 11,053 | (30.0) | 1,264 | (33.7) |
| 17.6%+ of patients | 19,670 | (25.2) | 8,289 | (40.0) | 1,579 | (26.0) | 1,155 | (18.2) | 1,205 | (30.2) | 6,622 | (18.0) | 820 | (21.9) |
| %Diabetes Prescribing that were GLP1s |
| No patients | 55,713 | (71.7) | 14,184 | (68.5) | 2,511 | (41.3) | 4,544 | (71.6) | 2,370 | (59.3) | 29,319 | (79.6) | 2,785 | (74.2) |
| One or more patients | 22,031 | (28.3) | 6,525 | (31.5) | 3,571 | (58.7) | 1,806 | (28.4) | 1,625 | (40.7) | 7,537 | (20.4) | 967 | (25.8) |
| %Diabetes Prescribing that were INS/Bs |
| No patients | 28,713 | (36.9) | 7,727 | (37.3) | 1,839 | (30.2) | 2,231 | (35.1) | 1,393 | (34.9) | 14,099 | (38.3) | 1,424 | (38.0) |
| 1-25% of patients | 28,208 | (36.3) | 7,714 | (37.2) | 2,179 | (35.8) | 1,911 | (30.1) | 1,500 | (37.5) | 13,347 | (36.2) | 1,557 | (41.5) |
| 25%+ of patients | 20,823 | (26.8) | 5,268 | (25.4) |  2,064 | (33.9) | 2,208 | (34.8) | 1,102 | (27.6) | 9,410 | (25.5) | 7,71 | (20.5) |
| %Diabetes Prescribing that were SGLT2s |
| No patients | 70,235 | (90.3) | 18,810 | (90.8) | 5,249 | (86.3) | 5,829 | (91.8) | 1,964 | (49.2) | 34,882 | (94.6) | 3,501 | (93.3) |
| One or more patients | 7,509 | (9.7) | 1,899 | (9.2) | 833 | (13.7) | 521 | (8.2) | 2,031 | (50.8) | 1,974 | (5.4) | 251 | (6.7) |
| %Diabetes Prescribing that were SFUs |
| No patients | 21,815 | (28.1) | 6,113 | (29.5) | 1,933 | (31.8) | 2,191 | (34.5) | 1,268 | (31.7) | 9,260 | (25.1) | 1,050 | (28.0) |
| 1-38% of patients | 36,450 | (46.9) | 10,748 | (51.9) | 3,442 | (56.6) | 2,872 | (45.2) | 2,216 | (55.5) | 15,228 | (41.3) | 1,944 | (51.8) |
| 38%+ of patients | 19,479 | (25.1) | 3,848 | (18.6) | 707 | (11.6) | 1287 | (20.3) | 511 | (12.8) | 12,368 | (33.6) | 758 | (20.2) |
| %Diabetes Prescribing that were TZDs |
| No patients | 45,435 | (58.4) | 11,810 | (57.0) | 3,343 | (55.0) | 3,949 | (62.2) | 2,522 | (63.1) | 22,510 | (61.1) | 1,301 | (34.7) |
| 1-10% of patients | 12,770 | (16.4) | 3,449 | (16.7) | 1,269 | (20.9) | 1,019 | (16.0) | 703 | (17.6) | 5,905 | (16.0) | 425 | (11.3) |
| 10%+ of patients | 19,539 | (25.1) | 5,450 | (26.3) | 1,470 | (24.2) | 1,382 | (21.8) | 770 | (19.3) | 8,441 | (22.9) | 2,026 | (54.0) |
| **Insurance and Health Plan Characteristics** |
| Insurance Category |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Commercial | 66,168 | (85.1) | 18,464 | (89.2) | 5,786 | (95.1) | 5,255 | (82.8) | 3,912 | (97.9) | 29,839 | (81.0) | 2,915 | (77.7) |
| Medicare | 11,576 | (14.9) | 2,245 | (10.8) | 296 | (4.9) | 1,095 | (17.2) | 83 | (2.1) | 7,017 | (19.0) | 837 | (22.3) |
| Health Plan Structure |
| Indemnity Plan | 809 | (1.0) | 176 | (0.9) | 27 | (0.4) | 82 | (1.3) | 25 | (0.6) | 453 | (1.2) | 44 | (1.2) |
| Preferred Provider Org | 1,594 | (2.1) | 404 | (2.0) | 133 | (2.2) | 132 | (2.1) | 78 | (2.0) | 763 | (2.1) | 84 | (2.2) |
| Exclusive Provider Org | 6,740 | (8.7) | 1,862 | (9.0) | 596 | (9.8) | 517 | (8.1) | 414 | (10.4) | 3,041 | (8.3) | 314 | (8.4) |
| Point of Service Plan | 44,089 | (56.7) | 12,111 | (58.5) | 4,001 | (65.8) | 3,542 | (55.8) | 2,784 | (69.7) | 19,759 | (53.6) | 1,896 | (50.5) |
| Health Maintenance Org | 21,753 | (28.0) | 5,229 | (25.3) | 1,052 | (17.3) | 1,873 | (29.5) | 573 | (14.3) | 11,724 | (31.8) | 1,302 | (34.7) |
| Other | 2,752 | (3.5) | 928 | (4.5) | 273 | (4.5) | 204 | (3.2) | 121 | (3.0) | 1,117 | (3.0) | 112 | (3.0) |
| Percent of Total Costs that were the Responsibility of the Patient (Median Value for All Members of the Same Health Plan) |
| Missing Copay Amount | 8,249 | (10.6) | 2,359 | (11.4) | 697 | (11.5) | 650 | (10.2) | 278 | (7.0) | 3,866 | (10.5) | 399 | (10.6) |
| Qrtle1 (0-6.1% of Cost) | 17,368 | (22.3) | 3,914 | (18.9) | 1,204 | (19.8) | 1,597 | (25.2) | 1,118 | (28.0) | 8,739 | (23.7) | 798 | (21.3) |
| Qrt2 (6.1-8.6% of Cost) | 17,384 | (22.4) | 4,560 | (22.0) | 1,340 | (22.0) | 1,391 | (21.9) | 1,098 | (27.5) | 8,178 | (22.2) | 817 | (21.8) |
| Qrt3 (8.6-11.6% of Cost) | 17,368 | (22.3) | 4,898 | (23.7) | 1,497 | (24.6) | 1,371 | (21.6) | 806 | (20.2) | 7,976 | (21.6) | 821 | (21.9) |
| Qrt4 (>11.6% of Cost) | 17,376 | (22.4) | 4,976 | (24.0) | 1,344 | (22.1) | 1,341 | (21.1) | 695 | (17.4) | 8,097 | (22.0) | 917 | (24.4) |

\* p<0.001 for every patient, prescriber, and health plan characteristic included in the table, using a Chi-square test for categorical data comparing T2D medication classes

† Race and ethnicity are not routinely collected in health plan administrative data sources but have been imputed by the data vendor from regional and other individual characteristics

‡ Lab values are not routinely available in health plan administrative data sources unless submitted by the laboratory vendor as part of their contract with the health payer; for these data, 38% of submitted laboratory claims nationally included a result.

§ Reflects the number of chronic disease diagnoses demonstrated in the claims record; higher numbers reflect higher comorbidity

║Constructed by calculating the percentage of all T2D prescriptions written by the same provider in the past 6 months that were in each drug class; calculated individually for each patient for the period 6 months prior to their index date; providers with no prior T2D prescriptions were assigned a value of zero for all drug classes; for each T2D drug class for which the 75th percentile of providers had zero past prescriptions (i.e. SGLT2’s and GLP1’s), a 2-category classification was used (i.e. no patients; any patients); for each remaining T2D drug class, approximately half or less of providers had zero prior prescriptions, and a 3-category scheme was used in which providers with prior prescriptions were divided at the 75th percentile of prior prescribing (i.e. no patients; those with 1 or more and up to the 75th percentile of providers; and those above the 75th percentile)

**Supplemental Table 3b: Full Array of** **Unadjusted Patient, Prescriber, and Health Plan Characteristics (with Row Percentages) for each Second-Line Diabetes Medication Group\***

|  | **Total** | **DPP4** | **GLP1** | **INS/B** | **SGLT2** | **SFU** | **TZD** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **N (ROW %)** | 77,744 | (100.0) | 20,709 | (26.6) | 6,082 | (7.8) | 6,350 | (8.2) | 3,995 | (5.1) | 36,856 | (47.4) | 3,752 | (4.8) |
| Fill Year |
| 2011 | 18,324 | (100.0) | 4,355 | (23.8) | 1,334 | (7.3) | 1,672 | (9.1) | 0 | (0.0) | 9,409 | (51.3) | 1,552 | (8.5) |
| 2012 | 17,065 | (100.0) | 5,275 | (30.9) | 1,355 | (7.9) | 1,335 | (7.8) | 0 | (0.0) | 8,495 | (49.8) | 600 | (3.5) |
| 2013 | 14,274 | (100.0) | 4,278 | (30.0) | 1,197 | (8.4) | 1,132 | (7.9) | 250 | (1.8) | 6,892 | (48.3) | 523 | (3.7) |
| 2014 | 14,686 | (100.0) | 3,910 | (26.6) | 1,103 | (7.5) | 1,176 | (8.0) | 1,553 | (10.6) | 6,417 | (43.7) | 526 | (3.6) |
| 2015 | 13,403 | (100.0) | 2,891 | (21.6) | 1,093 | (8.2) | 1,035 | (7.7) | 2,192 | (16.4) | 5,643 | (42.1) | 551 | (4.1) |
| **Individual Patient Characteristics** |
| Gender |
| Women | 33,539 | (100.0) | 8,924 | (26.6) | 3,634 | (10.8) | 2,817 | (8.4) | 1,756 | (5.2) | 14,978 | (44.7) | 1,427 | (4.3) |
| Men | 44,205 | (100.0) | 11,785 | (26.7) | 2,448 | (5.5) | 3,533 | (8.0) | 2,239 | (5.1) | 21,878 | (49.5) | 2,325 | (5.3) |
| Age Category |
| 18-34 | 2,006 | (100.0) | 451 | (22.5) | 287 | (14.3) | 249 | (12.4) | 139 | (6.9) | 818 | (40.8) | 64 | (3.2) |
| 35-44 | 8,381 | (100.0) | 2,201 | (26.3) | 950 | (11.3) | 764 | (9.1) | 594 | (7.1) | 3,538 | (42.2) | 336 | (4.0) |
| 45-54 | 20,657 | (100.0) | 5,716 | (27.7) | 1,956 | (9.5) | 1,621 | (7.8) | 1,406 | (6.8) | 9,092 | (44.0) | 860 | (4.2) |
| 55-64 | 26,752 | (100.0) | 7,493 | (28.0) | 2,101 | (7.9) | 2,106 | (7.9) | 1,502 | (5.6) | 12,317 | (46.0) | 1,229 | (4.6) |
| 65-74 | 13,761 | (100.0) | 3,622 | (26.3) | 677 | (4.9) | 1,049 | (7.6) | 323 | (2.3) | 7,279 | (52.9) | 810 | (5.9) |
| 75+ | 6,188 | (100.0) | 1,224 | (19.8) | 111 | (1.8) | 561 | (9.1) | 31 | (0.5) | 3,811 | (61.6) | 453 | (7.3) |
| Race/Ethnicity† |
| Black | 8,451 | (100.0) | 2,247 | (26.6) | 644 | (7.6) | 827 | (9.8) | 398 | (4.7) | 4,032 | (47.7) | 301 | (3.6) |
| Hispanic | 12,999 | (100.0) | 3,318 | (25.5) | 715 | (5.5) | 1,046 | (8.0) | 592 | (4.6) | 6,527 | (50.2) | 801 | (6.2) |
| Non-Hispanic White | 8,280 | (100.0) | 2,413 | (29.1) | 408 | (4.9) | 547 | (6.6) | 338 | (4.1) | 4,084 | (49.3) | 491 | (5.9) |
| Unknown/Other | 48,022 | (100.0) | 12,734 | (26.5) | 4,315 | (9.0) | 3,930 | (8.2) | 2,667 | (5.6) | 22,217 | (46.3) | 2,159 | (4.5) |
| Most Recent A1c Value |
| <8% | 10,021 | (100.0) | 3,378 | (33.7) | 1,246 | (12.4) | 402 | (4.0) | 864 | (8.6) | 3,630 | (36.2) | 503 | (5.0) |
| 8 to 10% | 10,433 | (100.0) | 3,434 | (32.9) | 635 | (6.1) | 444 | (4.3) | 725 | (6.9) | 4,747 | (45.5) | 445 | (4.3) |
| >10% | 7,184 | (100.0) | 1,779 | (24.8) | 381 | (5.3) | 934 | (13.0) | 431 | (6.0) | 3,380 | (47.0) | 274 | (3.8) |
| Result not available‡ | 50,114 | (100.0) | 12,119 | (24.2) | 3,820 | (7.6) | 4,570 | (9.1) | 1,975 | (3.9) | 25,095 | (50.1) | 2,530 | (5.0) |
| Diagnosis Code for Uncontrolled Diabetes |
| No | 45,644 | (100.0) | 11,723 | (25.7) | 3,479 | (7.6) | 3,262 | (7.1) | 2,167 | (4.7) | 22,604 | (49.5) | 2,411 | (5.3) |
| Yes | 32,100 | (100.0) | 8,986 | (28.0) | 2,603 | (8.1) | 3,088 | (9.6) | 1,828 | (5.7) | 14,252 | (44.4) | 1,341 | (4.2) |
| Diagnosis Code for Obesity |
| No | 60,889 | (100.0) | 16,333 | (26.8) | 3,981 | (6.5) | 5,157 | (8.5) | 2,590 | (4.3) | 29,651 | (48.7) | 3,178 | (5.2) |
| Yes | 16,855 | (100.0) | 4,376 | (26.0) | 2,101 | (12.5) | 1,193 | (7.1) | 1,405 | (8.3) | 7,205 | (42.7) | 574 | (3.4) |
| Recent Hospitalization |
| No | 64,908 | (100.0) | 17,793 | (27.4) | 5,272 | (8.1) | 4,676 | (7.2) | 3,761 | (5.8) | 30,259 | (46.6) | 3,151 | (4.9) |
| Yes | 12,836 | (100.0) | 2,916 | (22.7) | 810 | (6.3) | 1,674 | (13) | 234 | (1.8) | 6,597 | (51.4) | 601 | (4.7) |
| Recent Healthcare Cost Level |
| Below Median | 37,138 | (100.0) | 8,532 | (23.0) | 2,202 | (5.9) | 3,248 | (8.7) | 1,699 | (4.6) | 19,464 | (52.4) | 1,998 | (5.4) |
| 50th - 75th Percentile | 19,094 | (100.0) | 5,475 | (28.7) | 1,491 | (7.8) | 1,472 | (7.7) | 1,052 | (5.5) | 8,687 | (45.5) | 916 | (4.8) |
| 75th – 95th Percentile | 16,536 | (100.0) | 5,080 | (30.7) | 1,756 | (10.6) | 1,241 | (7.5) | 943 | (5.7) | 6,863 | (41.5) | 655 | (4.0) |
| >75th Percentile | 4,976 | (100.0) | 1,624 | (32.6) | 633 | (12.7) | 389 | (7.8) | 301 | (6.0) | 1,843 | (37.0) | 183 | (3.7) |
| Charlson Comorbidity Score§ |
| 0 (lowest) | 3,732 | (100.0) | 656 | (17.6) | 407 | (10.9) | 430 | (11.5) | 83 | (2.2) | 1,880 | (50.4) | 277 | (7.4) |
| 1 | 42,767 | (100.0) | 11,823 | (27.6) | 3,339 | (7.8) | 3,194 | (7.5) | 2,205 | (5.2) | 20,157 | (47.1) | 2,055 | (4.8) |
| 2 or 3 | 20,213 | (100.0) | 5,306 | (26.3) | 1,641 | (8.1) | 1,729 | (8.6) | 1,130 | (5.6) | 9,498 | (47.0) | 910 | (4.5) |
| 4+ (highest) | 11,032 | (100.0) | 2,924 | (26.5) | 695 | (6.3) | 997 | (9.0) | 577 | (5.2) | 5,326 | (48.3) | 510 | (4.6) |
| Census Region Location |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Northeast | 9,189 | (100.0) | 3,262 | (35.5) | 869 | (9.5) | 643 | (7.0) | 448 | (4.9) | 3,649 | (39.7) | 319 | (3.5) |
| Midwest | 16,793 | (100.0) | 3,614 | (21.5) | 1,268 | (7.6) | 1,514 | (9.0) | 841 | (5.0) | 8,856 | (52.7) | 703 | (4.2) |
| South | 32,528 | (100.0) | 9,261 | (28.5) | 2,930 | (9.0) | 2,500 | (7.7) | 2,120 | (6.5) | 14,355 | (44.1) | 1,365 | (4.2) |
| West | 19,234 | (100.0) | 4,573 | (23.8) | 1,015 | (5.3) | 1,693 | (8.8) | 586 | (3.0) | 9,999 | (52.0) | 1,365 | (7.1) |
| **Prescriber Characteristics** |
| Provider’s Clinical Discipline |
| Endocrinologist | 5,294 | (100.0) | 1,561 | (29.5) | 1,250 | (23.6) | 581 | (11) | 379 | (7.2) | 1,382 | (26.1) | 144 | (2.7) |
| Family Medicine | 33,858 | (100.0) | 8,822 | (26.1) | 2,078 | (6.1) | 2,556 | (7.5) | 1,767 | (5.2) | 16,677 | (49.3) | 1,955 | (5.8) |
| Internal Medicine | 24,583 | (100.0) | 6,799 | (27.7) | 1,599 | (6.5) | 1,843 | (7.5) | 1,047 | (4.3) | 12,255 | (49.9) | 1,042 | (4.2) |
| Nurse/PA | 5,893 | (100.0) | 1,595 | (27.1) | 611 | (10.4) | 539 | (9.1) | 431 | (7.3) | 2,477 | (42.0) | 238 | (4.0) |
| Other/Missing | 8,116 | (100.0) | 1,934 | (23.8) | 544 | (6.7) | 831 | (10.2) | 371 | (4.6) | 4,062 | (50.0) | 373 | (4.6) |
| Percent of All of Provider’s Drug Prescribing that was for T2D Medications |
| Below 25th Percentile | 19,102 | (100.0) | 5,270 | (27.6) | 1,053 | (5.5) | 1,674 | (8.8) | 871 | (4.6) | 9,336 | (48.9) | 893 | (4.7) |
| 25th - 50th Percentile | 20,050 | (100.0) | 5,492 | (27.4) | 1,257 | (6.3) | 1,423 | (7.1) | 1,020 | (5.1) | 9,881 | (49.3) | 978 | (4.9) |
| 50th - 75th Percentile | 19,187 | (100.0) | 5,003 | (26.1) | 1,222 | (6.4) | 1,404 | (7.3) | 973 | (5.1) | 9,616 | (50.1) | 970 | (5.1) |
| >75th Percentile | 19,405 | (100.0) | 4,943 | (25.5) | 2,550 | (13.1) | 1,849 | (9.5) | 1,131 | (5.8) | 8,024 | (41.4) | 911 | (4.7) |
| Provider’s Recent Prescribing Behavior║ |
| %Diabetes Prescribing that were DPP4s |
| No patients | 34,861 | (100.0) | 6,702 | (19.2) | 2,300 | (6.6) | 3,336 | (9.6) | 1,494 | (4.3) | 19,181 | (55.0) | 1,668 | (4.8) |
| 1-17.6% of patients | 23,393 | (100.0) | 5,718 | (24.4) | 2,203 | (9.4) | 1,859 | (7.9) | 1,296 | (5.5) | 11,053 | (47.2) | 1,264 | (5.4) |
| 17.6%+ of patients | 19,670 | (100.0) | 8,289 | (42.1) | 1579 | (8.0) | 1155 | (5.9) | 1205 | (6.1) | 6,622 | (33.7) | 820 | (4.2) |
| %Diabetes Prescribing that were GLP1s |
| No patients | 55,713 | (100.0) | 14,184 | (25.5) | 2,511 | (4.5) | 4,544 | (8.2) | 2,370 | (4.3) | 29,319 | (52.6) | 2,785 | (5.0) |
| One or more patients | 22,031 | (100.0) | 6,525 | (29.6) | 3,571 | (16.2) | 1,806 | (8.2) | 1,625 | (7.4) | 7,537 | (34.2) | 967 | (4.4) |
| %Diabetes Prescribing that were INS/Bs |
| No patients | 28,713 | (100.0) | 7,727 | (26.9) | 1,839 | (6.4) | 2,231 | (7.8) | 1,393 | (4.9) | 14,099 | (49.1) | 1,424 | (5.0) |
| 1-25% of patients | 28,208 | (100.0) | 7,714 | (27.3) | 2,179 | (7.7) | 1,911 | (6.8) | 1,500 | (5.3) | 13,347 | (47.3) | 1,557 | (5.5) |
| 25%+ of patients | 20,823 | (100.0) | 5268 | (25.3) |  2,064  | (9.9) | 2208 | (10.6) | 1102 | (5.3) | 9,410 | (45.2) | 771 | (3.7) |
| %Diabetes Prescribing that were SGLT2s |
| No patients | 70,235 | (100.0) | 18,810 | (26.8) | 5,249 | (7.5) | 5,829 | (8.3) | 1,964 | (2.8) | 34,882 | (49.7) | 3,501 | (5.0) |
| One or more patients | 7,509 | (100.0) | 1,899 | (25.3) | 833 | (11.1) | 521 | (6.9) | 2,031 | (27.0) | 1,974 | (26.3) | 251 | (3.3) |
| %Diabetes Prescribing that were SFUs |
| No patients | 21,815 | (100.0) | 6,113 | (28.0) | 1,933 | (8.9) | 2,191 | (10.0) | 1,268 | (5.8) | 9,260 | (42.4) | 1,050 | (4.8) |
| 1-38% of patients | 36,450 | (100.0) | 10,748 | (29.5) | 3,442 | (9.4) | 2,872 | (7.9) | 2,216 | (6.1) | 15,228 | (41.8) | 1,944 | (5.3) |
| 38%+ of patients | 19,479 | (100.0) | 3,848 | (19.8) | 707 | (3.6) | 1287 | (6.6) | 511 | (2.6) | 12,368 | (63.5) | 758 | (3.9) |
| %Diabetes Prescribing that were TZDs |
| No patients | 45,435 | (100.0) | 11,810 | (26.0) | 3,343 | (7.4) | 3,949 | (8.7) | 2,522 | (5.6) | 22,510 | (49.5) | 1,301 | (2.9) |
| 1-10% of patients | 12,770 | (100.0) | 3,449 | (27.0) | 1,269 | (9.9) | 1,019 | (8.0) | 703 | (5.5) | 5,905 | (46.2) | 425 | (3.3) |
| 10%+ of patients | 19,539 | (100.0) | 5,450 | (27.9) | 1,470 | (7.5) | 1,382 | (7.1) | 770 | (3.9) | 8,441 | (43.2) | 2,026 | (10.4) |
| **Insurance and Health Plan Characteristics** |
| Insurance Category |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Commercial | 66,168 | (100.0) | 18,464 | (27.9) | 5,786 | (8.7) | 5,255 | (7.9) | 3,912 | (5.9) | 29,839 | (45.1) | 2,915 | (4.4) |
| Medicare | 11,576 | (100.0) | 2,245 | (19.4) | 296 | (2.6) | 1,095 | (9.5) | 83 | (0.7) | 7,017 | (60.6) | 837 | (7.2) |
| Health Plan Structure |
| Indemnity Plan | 809 | (100.0) | 176 | (21.8) | 27 | (3.3) | 82 | (10.1) | 25 | (3.1) | 453 | (56.0) | 44 | (5.4) |
| Preferred Provider Org | 1,594 | (100.0) | 404 | (25.3) | 133 | (8.3) | 132 | (8.3) | 78 | (4.9) | 763 | (47.9) | 84 | (5.3) |
| Exclusive Provider Org | 44,089 | (100.0) | 12,111 | (27.5) | 4,001 | (9.1) | 3,542 | (8.0) | 2,784 | (6.3) | 19,759 | (44.8) | 1,896 | (4.3) |
| Point of Service Plan | 6,740 | (100.0) | 1,862 | (27.6) | 596 | (8.8) | 517 | (7.7) | 414 | (6.1) | 3,041 | (45.1) | 314 | (4.7) |
| Health Maintenance Org | 21,753 | (100.0) | 5,229 | (24.0) | 1,052 | (4.8) | 1,873 | (8.6) | 573 | (2.6) | 11,724 | (53.9) | 1,302 | (6.0) |
| Other | 2,752 | (100.0) | 928 | (33.7) | 273 | (9.9) | 204 | (7.4) | 121 | (4.4) | 1,117 | (40.6) | 112 | (4.1) |
| Percent of Total Costs that were the Responsibility of the Patient (Median Value for All Members of the Same Health Plan) |
| Missing Copay Amount | 8,249 | (100.0) | 2,359 | (28.6) | 697 | (8.4) | 650 | (7.9) | 278 | (3.4) | 3,866 | (46.9) | 399 | (4.8) |
| Qrtle1 (0-6.1% of Cost) | 17,368 | (100.0) | 3,914 | (22.5) | 1,204 | (6.9) | 1,597 | (9.2) | 1,118 | (6.4) | 8,739 | (50.3) | 798 | (4.6) |
| Qrt2 (6.1-8.6% of Cost) | 17,384 | (100.0) | 4,560 | (26.2) | 1,340 | (7.7) | 1,391 | (8.0) | 1,098 | (6.3) | 8,178 | (47.0) | 817 | (4.7) |
| Qrt3 (8.6-11.6% of Cost) | 17,368 | (100.0) | 4,898 | (28.2) | 1,497 | (8.6) | 1,371 | (7.9) | 806 | (4.6) | 7,976 | (45.9) | 821 | (4.7) |
| Qrt4 (>11.6% of Cost) | 17,376 | (100.0) | 4,976 | (28.6) | 1,344 | (7.7) | 1,341 | (7.7) | 695 | (4.0) | 8,097 | (46.6) | 917 | (5.3) |

\* p<0.001 for every patient, prescriber, and health plan characteristic included in the table, using a Chi-square test for categorical data comparing T2D medication classes

† Race and ethnicity are not routinely collected in health plan administrative data sources but have been imputed by the data vendor from regional and other individual characteristics

‡ Lab values are not routinely available in health plan administrative data sources unless submitted by the laboratory vendor as part of their contract with the health payer; for these data, 38% of submitted laboratory claims nationally included a result.

§ Reflects the number of chronic disease diagnoses demonstrated in the claims record; higher numbers reflect higher comorbidity

║ Constructed by calculating the percentage of all T2D prescriptions written by the same provider in the past 6 months that were in each drug class; calculated individually for each patient for the period 6 months prior to their index date; providers with no prior T2D prescriptions were assigned a value of zero for all drug classes; for each T2D drug class for which the 75th percentile of providers had zero past prescriptions (i.e. SGLT2’s and GLP1’s), a 2-category classification was used (i.e. no patients; any patients); for each remaining T2D drug class, approximately half or less of providers had zero prior prescriptions, and a 3-category scheme was used in which providers with prior prescriptions were divided at the 75th percentile of prior prescribing (i.e. no patients; those with 1 or more and up to the 75th percentile of providers; and those above the 75th percentile)

**Supplemental Table 4. Full Array of Adjusted Percentages of Patients Receiving Prescriptions for Each Second-line Diabetes Drug Class**

|  | **DPP4** | **GLP1** | **INS/B** | **SGLT2** | **SFU** | **TZD** |
| --- | --- | --- | --- | --- | --- | --- |
|  | % | 95% CI | % | 95% CI | % | 95% CI | % | 95% CI | % | 95% CI | % | 95% CI |
| **Overall** | 26.6 | 26.5 - 26.7 | 7.8 | 7.7 - 7.9 | 8.2 | 8.1 - 8.2 | 5.1 | 5.1 - 5.2 | 47.4 | 47.3 - 47.5 | 4.8 | 4.8 - 4.9 |
| Fill Year |
| 2011 | 26.7 | 25.6 - 27.7 | 9.0 | 8.3 - 9.7 | 8.9 | 8.1 - 9.6 | 0.0 | 0.0 - 0.5 | 48.7 | 47.5 - 49.9 | 6.8 | 6.2 - 7.4 |
| 2012 | 31.6 | 30.5 - 32.6 | 8.6 | 8.0 - 9.3 | 7.7 | 7.0 - 8.4 | 0.0 | 0.0 - 0.5 | 48.6 | 47.4 - 49.8 | 3.6 | 3.0 - 4.1 |
| 2013 | 28.7 | 27.7 - 29.7 | 8.0 | 7.4 - 8.6 | 8.2 | 7.5 - 8.9 | 2.0 | 1.4 - 2.5 | 49.0 | 47.8 - 50.2 | 4.2 | 3.6 - 4.7 |
| 2014 | 25.8 | 24.9 - 26.8 | 7.0 | 6.5 - 7.6 | 8.4 | 7.8 - 9.1 | 8.2 | 7.6 - 8.8 | 46.3 | 45.2 - 47.5 | 4.1 | 3.6 - 4.7 |
| 2015 | 22.1 | 21.0 - 23.1 | 7.5 | 6.9 - 8.1 | 8.3 | 7.6 - 9.0 | 10.5 | 9.9 - 11.0 | 46.8 | 45.6 - 48.0 | 4.8 | 4.3 - 5.4 |
| **Individual Patient Characteristics** |
| Gender |  |  |  |  |  |  |  |  |  |  |  |  |
| Women | 26.7 | 26.1 - 27.3 | 10.1 | 9.7 - 10.5 | 8.4 | 8.0 - 8.8 | 5.2 | 4.9 - 5.5 | 45.3 | 44.6 - 46.0 | 4.3 | 4.0 - 4.6 |
| Men | 26.7 | 26.1 - 27.3 | 5.9 | 5.6 - 6.3 | 8.0 | 7.6 - 8.4 | 5.1 | 4.8 - 5.4 | 49.0 | 48.4 - 49.7 | 5.3 | 5.0 - 5.6 |
| Age |  |  |  |  |  |  |  |  |  |  |  |  |
| 18-34 | 23.9 | 21.4 - 26.4 | 11.8 | 10.3 - 13.3 | 12.4 | 10.7 - 14.1 | 4.9 | 3.7 - 6.0 | 43.0 | 40.3 - 45.8 | 4.0 | 2.8 - 5.2 |
| 35-44 | 25.9 | 23.8 - 27.9 | 10.6 | 9.3 - 12.0 | 9.8 | 8.3 - 11.4 | 5.3 | 4.5 - 6.2 | 43.9 | 41.5 - 46.2 | 4.5 | 3.5 - 5.5 |
| 45-54 | 26.7 | 24.7 - 28.6 | 9.1 | 7.7 - 10.4 | 8.6 | 7.1 - 10.1 | 5.4 | 4.7 - 6.2 | 45.6 | 43.5 - 47.8 | 4.6 | 3.7 - 5.6 |
| 55-64 | 26.6 | 24.7 - 28.6 | 7.3 | 6.0 - 8.6 | 8.4 | 6.9 - 9.9 | 5.2 | 4.4 - 5.9 | 47.5 | 45.3 - 49.7 | 5.0 | 4.0 - 6.0 |
| 65-74 | 27.8 | 25.8 - 29.9 | 5.6 | 4.2 - 6.9 | 7.0 | 5.5 - 8.6 | 4.5 | 3.6 - 5.4 | 50.1 | 47.8 - 52.4 | 5.0 | 4.0 - 6.0 |
| 75+ | 28.0 | 25.5 - 30.5 | 3.4 | 1.9 - 4.9 | 6.6 | 4.9 - 8.3 | 2.3 | 1.2 - 3.5 | 54.5 | 51.8 - 57.3 | 5.2 | 4.0 - 6.3 |
| Race/Ethnicity† |
| Black | 25.6 | 24.6 - 26.6 | 6.5 | 5.9 - 7.0 | 9.7 | 9.0 - 10.4 | 4.5 | 4.0 - 4.9 | 49.5 | 48.4 - 50.7 | 4.2 | 3.7 - 4.7 |
| Hispanic | 26.3 | 25.1 - 27.5 | 6.1 | 5.4 - 6.7 | 7.7 | 6.9 - 8.5 | 4.5 | 4.0 - 5.1 | 49.8 | 48.5 - 51.1 | 5.6 | 5.0 - 6.2 |
| Non-Hispanic White | 29.0 | 27.7 - 30.4 | 5.7 | 5.0 - 6.4 | 6.7 | 5.8 - 7.5 | 4.9 | 4.3 - 5.5 | 48.4 | 46.9 - 49.9 | 5.3 | 4.7 - 6.0 |
| Unknown/Other | 26.5 | 25.5 - 27.5 | 8.9 | 8.3 - 9.4 | 8.3 | 7.6 - 9.0 | 5.4 | 5.0 - 5.9 | 46.3 | 45.2 - 47.4 | 4.6 | 4.1 - 5.1 |
| Most Recent A1c Value |
| <8% | 31.3 | 29.3 - 33.3 | 10.4 | 9.2 - 11.6 | 4.5 | 3.1 - 5.8 | 6.1 | 5.3 - 7.0 | 41.9 | 39.7 - 44.2 | 5.7 | 4.6 - 6.7 |
| 8 to 10% | 31.2 | 29.2 - 33.2 | 6.4 | 5.3 - 7.5 | 4.6 | 3.2 - 5.9 | 5.3 | 4.5 - 6.1 | 47.8 | 45.6 - 50.0 | 4.7 | 3.7 - 5.7 |
| >10% | 23.8 | 21.7 - 25.8 | 5.6 | 4.4 - 6.7 | 13.0 | 11.3 - 14.7 | 4.6 | 3.7 - 5.4 | 48.9 | 46.5 - 51.3 | 4.2 | 3.1 - 5.2 |
| A1c result not available | 25.2 | 24.2 - 26.2 | 7.9 | 7.3 - 8.5 | 8.9 | 8 - 9.7 | 4.9 | 4.5 - 5.4 | 48.3 | 47.1 - 49.5 | 4.8 | 4.3 - 5.3 |
| Diagnosis Code for Uncontrolled Diabetes |
| No | 26.1 | 25.4 - 26.7 | 8.0 | 7.6 - 8.4 | 7.1 | 6.7 - 7.5 | 5.1 | 4.8 - 5.4 | 48.6 | 47.9 - 49.3 | 5.1 | 4.7 - 5.4 |
| Yes | 27.5 | 26.8 - 28.1 | 7.6 | 7.2 - 8.0 | 9.7 | 9.3 - 10.1 | 5.1 | 4.8 - 5.4 | 45.7 | 45.0 - 46.4 | 4.5 | 4.2 - 4.8 |
| Diagnostic Code for Obesity |  |  |  |  |  |  |  |  |  |  |  |  |
| No | 27.0 | 26.3 - 27.7 | 6.9 | 6.4 - 7.4 | 8.6 | 8.1 - 9.0 | 4.8 | 4.5 - 5.2 | 47.8 | 46.9 - 48.6 | 5.0 | 4.6 - 5.3 |
| Yes | 25.7 | 25.0 - 26.5 | 10.8 | 10.3 - 11.3 | 6.9 | 6.4 - 7.3 | 5.9 | 5.5 - 6.2 | 46.5 | 45.6 - 47.3 | 4.3 | 3.9 - 4.7 |
| Recent Hospitalization |  |  |  |  |  |  |  |  |  |  |  |  |
| No | 27.3 | 26.5 - 28.1 | 8.0 | 7.5 - 8.5 | 7.3 | 6.6 - 7.9 | 5.3 | 4.8 - 5.7 | 47.3 | 46.3 - 48.2 | 4.9 | 4.6 - 5.3 |
| Yes | 23.7 | 22.8 - 24.5 | 7.1 | 6.6 - 7.6 | 12.6 | 12 - 13.2 | 3.6 | 3.2 - 4.1 | 48.7 | 47.7 - 49.6 | 4.4 | 4.0 - 4.7 |
| Recent Healthcare Cost Level |
| Below Median | 24.6 | 23.3 - 26.0 | 6.6 | 5.8 - 7.4 | 8.4 | 7.5 - 9.2 | 4.8 | 4.1 - 5.5 | 50.5 | 49.0 - 52.0 | 5.1 | 4.5 - 5.8 |
| 50th - 75th Percentile | 28.1 | 26.7 - 29.5 | 7.7 | 6.9 - 8.5 | 8.0 | 7.1 - 8.9 | 5.3 | 4.6 - 6.0 | 46.0 | 44.5 - 47.5 | 4.9 | 4.2 - 5.6 |
| 75th – 95th Percentile | 28.6 | 27.3 - 30.0 | 9.6 | 8.8 - 10.5 | 8.0 | 7.1 - 8.9 | 5.5 | 4.8 - 6.2 | 44.0 | 42.5 - 45.5 | 4.3 | 3.6 - 5.0 |
| >95th Percentile | 29.6 | 28.3 - 31.0 | 10.2 | 9.4 - 11.1 | 8.3 | 7.4 - 9.1 | 6.0 | 5.3 - 6.7 | 41.5 | 40.1 - 43.0 | 4.3 | 3.6 - 4.9 |
| Charlson Comorbidity Score\* |  |  |  |  |  |  |  |  |  |  |
| 0 (lowest) | 20.4 | 18.8 - 22.0 | 12.1 | 10.9 - 13.3 | 12.3 | 11 - 13.5 | 3.4 | 2.7 - 4.2 | 46.3 | 44.4 - 48.1 | 5.5 | 4.7 - 6.3 |
| 1 | 27.4 | 24.4 - 30.4 | 7.8 | 5.5 - 10.1 | 7.5 | 5.2 - 9.9 | 5.3 | 3.8 - 6.8 | 47.2 | 43.7 - 50.6 | 4.8 | 3.3 - 6.2 |
| 2 or 3 | 25.9 | 22.8 - 29.0 | 7.8 | 5.4 - 10.1 | 8.5 | 6.0 - 10.9 | 5.2 | 3.6 - 6.7 | 47.9 | 44.4 - 51.5 | 4.8 | 3.3 - 6.3 |
| 4+ (highest) | 27.0 | 23.7 - 30.2 | 6.6 | 4.2 - 9.0 | 8.7 | 6.2 - 11.2 | 4.8 | 3.2 - 6.4 | 48.0 | 44.3 - 51.7 | 4.9 | 3.3 - 6.5 |
| Census Region Location |  |  |  |  |  |  |  |  |  |  |  |  |
| Northeast | 31.6 | 30.4 - 32.9 | 8.0 | 7.3 - 8.8 | 7.4 | 6.6 - 8.1 | 5.0 | 4.4 - 5.6 | 44.0 | 42.6 - 45.3 | 4.0 | 3.4 - 4.6 |
| Midwest | 23.6 | 22.4 - 24.9 | 7.4 | 6.7 - 8.1 | 8.5 | 7.8 - 9.2 | 4.8 | 4.2 - 5.4 | 51.1 | 49.8 - 52.4 | 4.5 | 3.9 - 5.1 |
| South | 26.8 | 25.7 - 28.0 | 8.1 | 7.4 - 8.7 | 7.9 | 7.2 - 8.6 | 5.6 | 5.0 - 6.1 | 47.4 | 46.2 - 48.6 | 4.3 | 3.7 - 4.8 |
| West | 26.4 | 25.2 - 27.7 | 7.7 | 6.9 - 8.4 | 8.8 | 8.0 - 9.5 | 4.5 | 3.9 - 5.1 | 46.3 | 45.0 - 47.7 | 6.3 | 5.7 - 6.9 |
| **Prescriber Characteristics** |
| Clinical Discipline |  |  |  |  |  |  |  |  |  |  |  |  |
| Endocrinology | 28.1 | 26.4 - 29.8 | 10.6 | 9.6 - 11.5 | 10.1 | 8.9 - 11.3 | 4.6 | 3.9 - 5.3 | 43.2 | 41.2 - 45.2 | 3.5 | 2.7 - 4.3 |
| Family Practice | 26.6 | 25.1 - 28.2 | 7.2 | 6.4 - 8.1 | 7.8 | 6.8 - 8.9 | 5.5 | 4.9 - 6.1 | 47.2 | 45.4 - 49.0 | 5.5 | 4.9 - 6.2 |
| General/Internal | 27.1 | 25.5 - 28.6 | 7.4 | 6.6 - 8.3 | 7.8 | 6.8 - 8.8 | 5.1 | 4.5 - 5.7 | 48.5 | 46.7 - 50.2 | 4.2 | 3.6 - 4.9 |
| Nurse/PA | 28.7 | 26.9 - 30.6 | 9.3 | 8.2 - 10.3 | 8.3 | 7.1 - 9.5 | 6.2 | 5.4 - 6.9 | 43.1 | 41.0 - 45.1 | 4.5 | 3.7 - 5.3 |
| Other/Missing | 24.2 | 22.5 - 25.9 | 6.6 | 5.6 - 7.5 | 9.4 | 8.3 - 10.6 | 3.9 | 3.2 - 4.6 | 51.3 | 49.3 - 53.3 | 4.6 | 3.9 - 5.4 |
| Proportion of Patients for which T2D Drugs were Prescribed§ |
| Quartile 1 (lowest) | 27.7 | 26.8 - 28.7 | 5.7 | 5.1 - 6.3 | 8.2 | 7.6 - 8.8 | 4.6 | 4.2 - 5.1 | 49.1 | 48.0 - 50.1 | 4.7 | 4.2 - 5.1 |
| Quartile 2 | 27.3 | 26.4 - 28.2 | 7.4 | 6.8 - 7.9 | 7.6 | 7.1 - 8.2 | 5.3 | 4.8 - 5.7 | 47.9 | 46.9 - 48.8 | 4.6 | 4.2 - 5.0 |
| Quartile 3 | 26.7 | 25.8 - 27.7 | 7.9 | 7.3 - 8.4 | 7.9 | 7.3 - 8.5 | 5.4 | 5.0 - 5.9 | 47.3 | 46.3 - 48.3 | 4.8 | 4.3 - 5.2 |
| Quartile 4 (highest) | 25.1 | 24.2 - 26.1 | 9.9 | 9.3 - 10.5 | 8.9 | 8.3 - 9.6 | 5.3 | 4.9 - 5.8 | 45.3 | 44.2 - 46.4 | 5.4 | 4.9 - 5.9 |
| Provider’s Recent Prescribing Behavior║ |
| %Diabetes Prescribing that were DPP4s |
| No patients | 18.6 | 17.7 - 19.4 | 8.1 | 7.6 - 8.6 | 9.2 | 8.7 - 9.8 | 5.1 | 4.7 - 5.4 | 53.9 | 53.0 - 54.8 | 5.1 | 4.7 - 5.5 |
| 1-17.6% of patients | 26.8 | 25.1 - 28.5 | 7.9 | 6.9 - 9.0 | 7.8 | 6.7 - 8.9 | 5.2 | 4.4 - 6.0 | 47.4 | 45.5 - 49.3 | 5.0 | 4.2 - 5.8 |
| 17.6%+ of patients | 41.1 | 39.4 - 42.8 | 7.4 | 6.4 - 8.5 | 6.6 | 5.5 - 7.6 | 5.2 | 4.5 - 6.0 | 35.5 | 33.7 - 37.3 | 4.2 | 3.4 - 4.9 |
| %Diabetes Prescribing that were GLP1s |
| No patients | 26.3 | 25.5 - 27.1 | 4.8 | 4.2 - 5.4 | 8.1 | 7.6 - 8.7 | 5.1 | 4.7 - 5.4 | 50.7 | 49.8 - 51.6 | 5.0 | 4.6 - 5.4 |
| One or more patients | 28.1 | 26.5 - 29.6 | 14.7 | 13.5 - 15.9 | 8.5 | 7.5 - 9.6 | 5.4 | 4.7 - 6.1 | 38.8 | 37.1 - 40.6 | 4.5 | 3.8 - 5.3 |
| %Diabetes Prescribing that were INS/Bs |
| No patients | 27.7 | 26.8 - 28.5 | 8.0 | 7.4 - 8.5 | 7.0 | 6.4 - 7.5 | 5.5 | 5.0 - 5.9 | 46.5 | 45.5 - 47.4 | 5.4 | 5.0 - 5.9 |
| 1-25% of patients | 26.4 | 24.7 - 28.1 | 7.9 | 6.8 - 9.0 | 7.8 | 6.7 - 8.9 | 4.9 | 4.1 - 5.8 | 48.2 | 46.3 - 50.1 | 4.8 | 3.9 - 5.7 |
| 25%+ of patients | 25.5 | 23.7 - 27.2 | 7.5 | 6.5 - 8.6 | 10.3 | 9.2 - 11.4 | 5.0 | 4.2 - 5.8 | 47.6 | 45.7 - 49.5 | 4.0 | 3.2 - 4.9 |
| %Diabetes Prescribing that were SGLT2s |
| No patients | 26.9 | 25.7 - 28.2 | 8.0 | 7.4 - 8.7 | 8.2 | 7.4 - 9.1 | 3.3 | 2.7 - 3.9 | 48.6 | 47.2 - 50.0 | 4.9 | 4.2 - 5.6 |
| One or more patients | 28.2 | 26.9 - 29.4 | 7.8 | 7.1 - 8.4 | 8.6 | 7.8 - 9.5 | 11.8 | 11.2 - 12.4 | 38.5 | 37.1 - 39.8 | 5.1 | 4.4 - 5.8 |
| %Diabetes Prescribing that were SFUs |
| No patients | 30.9 | 30.0 - 31.9 | 10.6 | 10.0 - 11.2 | 9.4 | 8.9 - 10.0 | 6.0 | 5.5 - 6.4 | 36.8 | 35.8 - 37.8 | 6.3 | 5.8 - 6.8 |
| 1-38% of patients | 27.5 | 25.7 - 29.4 | 7.6 | 6.4 - 8.8 | 7.9 | 6.7 - 9.1 | 5.2 | 4.3 - 6.0 | 46.7 | 44.8 - 48.7 | 5.1 | 4.1 - 6.1 |
| 38%+ of patients | 20.2 | 18.3 - 22.0 | 4.9 | 3.7 - 6.1 | 7.0 | 5.8 - 8.2 | 3.7 | 2.8 - 4.6 | 60.9 | 58.9 - 62.8 | 3.3 | 2.3 - 4.3 |
| %Diabetes Prescribing that were TZDs |
| No patients | 26.5 | 25.7 - 27.3 | 7.9 | 7.4 - 8.4 | 8.4 | 7.9 - 8.9 | 5.3 | 4.9 - 5.7 | 49.1 | 48.3 - 50 | 2.7 | 0.0 - 3.3 |
| 1-10% of patients | 26.5 | 24.7 - 28.2 | 7.6 | 6.6 - 8.7 | 8.0 | 6.9 - 9.2 | 4.4 | 3.6 - 5.3 | 49.3 | 47.4 - 51.3 | 4.1 | 3.1 - 5.1 |
| 10%+ of patients | 26.9 | 25.3 - 28.5 | 7.8 | 6.8 - 8.8 | 7.6 | 6.6 - 8.6 | 5.4 | 4.5 - 6.2 | 42.2 | 40.4 - 43.9 | 10.1 | 9.1 - 11.2 |
| Census Region Where Healthcare was Received |  |  |  |  |  |  |
| Northeast | 31.6 | 30.4 - 32.9 | 8.0 | 7.3 - 8.8 | 7.4 | 6.6 - 8.1 | 5.0 | 4.4 - 5.6 | 44.0 | 42.6 - 45.3 | 4.0 | 3.4 - 4.6 |
| Midwest | 23.6 | 22.4 - 24.9 | 7.4 | 6.7 - 8.1 | 8.5 | 7.8 - 9.2 | 4.8 | 4.2 - 5.4 | 51.1 | 49.8 - 52.4 | 4.5 | 3.9 - 5.1 |
| South | 26.8 | 25.7 - 28.0 | 8.1 | 7.4 - 8.7 | 7.9 | 7.2 - 8.6 | 5.6 | 5.0 - 6.1 | 47.4 | 46.2 - 48.6 | 4.3 | 3.7 - 4.8 |
| West | 26.4 | 25.2 - 27.7 | 7.7 | 6.9 - 8.4 | 8.8 | 8.0 - 9.5 | 4.5 | 3.9 - 5.1 | 46.3 | 45.0 - 47.7 | 6.3 | 5.7 - 6.9 |
| **Insurance and Health Plan Characteristics** |
| Insurance Category |  |  |  |  |  |  |  |  |  |  |  |  |
| Commercial | 27.4 | 26.0 - 28.8 | 8.0 | 7.1 - 8.9 | 7.8 | 6.7 - 8.9 | 5.2 | 4.5 - 6.0 | 46.8 | 45.2 - 48.4 | 4.8 | 4.1 - 5.5 |
| Medicare | 22.8 | 21.4 - 24.2 | 6.2 | 5.3 - 7.1 | 10.9 | 9.8 - 12.0 | 2.9 | 2.2 - 3.6 | 52.0 | 50.3 - 53.6 | 5.3 | 4.5 - 6.0 |
| Health Plan Structure |  |  |  |  |  |  |  |  |  |  |  |  |
| Indemnity Plan | 24.0 | 20.7 - 27.2 | 6.8 | 4.4 - 9.3 | 9.8 | 7.6 - 12.1 | 6.3 | 4.0 - 8.5 | 48.1 | 44.5 - 51.8 | 5.0 | 3.4 - 6.5 |
| Preferred Provider Org | 25.3 | 23.0 - 27.5 | 8.1 | 6.8 - 9.5 | 8.1 | 6.6 - 9.6 | 5.4 | 4.2 - 6.5 | 47.4 | 44.8 - 49.9 | 5.7 | 4.5 - 7.0 |
| Exclusive Provider Org | 25.2 | 22.9 - 27.4 | 7.4 | 6.1 - 8.8 | 8.3 | 6.8 - 9.8 | 4.8 | 3.7 - 6.0 | 49.0 | 46.5 - 51.6 | 5.2 | 3.9 - 6.5 |
| Point of Service Plan | 26.9 | 25.8 - 28.0 | 8.1 | 7.5 - 8.7 | 8.1 | 7.4 - 8.9 | 5.3 | 4.9 - 5.8 | 46.8 | 45.6 - 48.0 | 4.8 | 4.2 - 5.4 |
| Health Maintenance Org | 26.8 | 25.5 - 28.1 | 7.2 | 6.5 - 7.9 | 8.2 | 7.3 - 9.1 | 4.5 | 3.9 - 5.0 | 48.5 | 47.1 - 50.0 | 4.8 | 4.1 - 5.5 |
| Richness of Health Plan Benefits based upon Out of Pocket Costs as Percent of Total Costs for all Enrollees in the Same Plan§ |
| Qrtle1 (0-6.1% of Costs) | 24.3 | 23.2 - 25.5 | 7.4 | 6.7 - 8.1 | 9.1 | 8.4 - 9.8 | 5.1 | 4.5 - 5.7 | 49.2 | 48.0 - 50.5 | 4.9 | 4.3 - 5.4 |
| Qrtle2 (6.1-8.6% of Costs) | 28.1 | 27.2 - 29.0 | 7.4 | 6.9 - 8.0 | 7.1 | 6.5 - 7.7 | 5.7 | 5.3 - 6.1 | 46.2 | 45.2 - 47.2 | 5.5 | 5.1 - 5.9 |
| Qrtle3 (8.6-11.6% of Costs) | 28.3 | 27.4 - 29.3 | 7.4 | 6.8 - 7.9 | 7.1 | 6.5 - 7.7 | 5.8 | 5.4 - 6.2 | 45.9 | 44.9 - 46.9 | 5.5 | 5.1 - 6.0 |
| Qrtle4 (>11.6% of Costs) | 26.9 | 26.0 - 27.8 | 7.7 | 7.1 - 8.3 | 7.9 | 7.3 - 8.5 | 5.5 | 5.0 - 5.9 | 46.9 | 45.8 - 47.9 | 5.2 | 4.7 - 5.6 |
| Missing Copay Amount | 28.0 | 26.8 - 29.1 | 8.3 | 7.6 - 9.0 | 7.7 | 7.0 - 8.4 | 5.3 | 4.7 - 5.9 | 46.0 | 44.7 - 47.2 | 4.8 | 4.2 - 5.3 |

\* Generally reflects a count of comorbid conditions (higher numbers reflect greater comorbidity)

† Reflects a prior encounter with an obesity diagnosis code (see Appendix for details)

‡ Reflects a prior encounter for uncontrolled or poorly controlled diabetes (see Appendix for details)

§ For percentage of prescriptions that were for diabetes: lowest quartile = ≤7.7% of patients; highest quartile = ≥11.7% of patients; for percent of patient total costs that were out of pocket costs: lowest quartile = ≤6.1% of total costs; highest quartile = ≥11.7% of total costs

║ Constructed by calculating the percentage of all T2D prescriptions written by the same provider in the past 6 months that were in each drug class; calculated individually for each patient for the period 6 months prior to their index date; providers with no prior T2D prescriptions were assigned a value of zero for all drug classes; for each T2D drug class for which the 75th percentile of providers had zero past prescriptions (i.e. SGLT2’s and GLP1’s), a 2-category classification was used (i.e. no patients; any patients); for each remaining T2D drug class, approximately half or less of providers had zero prior prescriptions, and a 3-category scheme was used in which providers with prior prescriptions were divided at the 75th percentile of prior prescribing (i.e. no patients; those with 1 or more and up to the 75th percentile of providers; and those above the 75th percentile); estimates are adjusted for all other covariates in the table, including each provider’s total volume of T2D drug prescribing