

Supplemental material

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Supplemental Table 1. Definitions of inclusion and exclusion criteria.

Inclusion/exclusion criteria	Codes	Assessment period	Care Setting	Position
Diabetes type 2	ICD-9 DX: 250.*0, 250.*2 ICD-10 DX: E11.***	[-365, 0]	Inpatient, Outpatient, Carrier Claims	Any
Diabetes type 1	ICD-9 DX: 250.*1, 250.*3 ICD-10 DX: E10.***	[-365, 0]	Inpatient, Outpatient, Carrier Claims	Any
Secondary or gestational diabetes	ICD-9 DX: 249.**, 648.8* ICD-10 DX: E08.***, E09.***, O24.4*, O99.81*	[-365, 0]	Inpatient, Outpatient, Carrier Claims	Any
End stage kidney disease	ICD-9 DX: 585.5, 585.6, 996.81, V42.0, V45.1*, V56.**, V56.32 ICD-10 DX: N18.5, N18.6, R88.0, T82.41, T82.42, T82.49, T85.611, T85.621, T85.631, T86.1*, Y84.1, Z48.22, Z49.**, Z91.15, Z94.0, Z99.2 ICD-9 PX: 39.95, 54.98, 55.6* ICD-10 PX: 0TY00Zx, 0TY10Zx, 3E1M39Z, 5A1Dx0Z CPT-4/HCPCS (Inpatient care setting only): 50360, 50365, 90920, 90921, 90924, 90925, 90935, 90937, 90939, 90940, 90945, 90947, 90957, 90958, 90959, 90960, 90961, 90962, 90965, 90966, 90969, 90970, 90989, 90993, 90999, 90997, 99512, 99559, 99512, G0257, G0314, G0315, G0316, G0317, G0318, G0319, G0322, G0323, G0326, G0327, S9335, S9339	[-365, 0]	Inpatient, Outpatient, Carrier Claims	Any
Nursing home admission	CPT-4/HCPCS: 99301-99303, 99311-99313, 99315, 99316, 99379, 99380 Provider category: 0013-0018, 3009 Discharge status: 03, 64, 83, 92 Facility type code: 2 NCH claim type code: 20, 30	[-365, 0]	Inpatient, Outpatient, Carrier Claims	Any
Pancreatitis	ICD 9 DX: 577.0, 577.1 ICD 10 DX: K85.*, K86.0, K86.1	[-365, 0]	Inpatient, Outpatient, Carrier Claims	Any
Cirrhosis	ICD-9 DX: 571.2, 571.5, 571.6 ICD-10 DX: K70.11, K70.2, K70.3x, K70.4x, K74.*	[-365, 0]	Inpatient, Outpatient, Carrier Claims	Any
Acute hepatitis	ICD-9 DX: 070.20, 070.21, 070.30, 070.31, 070.41, 070.51, 571.1 ICD-10 DX: B16.0, B16.1, B16.2, B16.9, B17.0, B17.10, B17.11, B17.2, B17.8, B17.9, K71.2	[-365, 0]	Inpatient, Outpatient, Carrier Claims	Any
Multiple endocrine neoplasia type 2	ICD-9 DX: 258.02, 258.03 ICD-10 DX: E31.22, E31.23	[-365, 0]	Inpatient, Outpatient, Carrier Claims	Any
Organ transplant	ICD-9 DX: 996.8*, E878.0, V42.** (except V42.2*-V42.5*), V58.44	[-365, 0]	Inpatient, Outpatient,	Any

	<p>ICD-10 DX: T86.*** (except T86.82*, T86.84*), Y83.0, Z48.2*, Z94.** (except Z94.5-Z94.7)</p> <p>ICD-9 PX: 33.5x, 33.6x, 37.51, 41.0x, 46.97, 50.5x, 52.8x, 55.6x</p> <p>ICD-10 PX: 02YA***, 0BYC***, 0DY8***, 0DYE***, 0FSG***, 0FY***, 0TS00ZZ, 0TS10ZZ, 0TY****,</p> <p>30230AZ, 30230G*, 30230X*, 30230Y*, 30233AZ, 30233G*, 30233X*, 30233Y*, 30240AZ, 30240G*, 30240X*, 30240Y*, 30243AZ, 30243G*, 30243X*, 30243Y*, 30250G*, 30250X*, 30250Y*, 30253G*, 30253X*, 30253Y*, 30260G*, 30260X*, 30260Y*, 30263G*, 30263X*, 30263Y*, 3E03005, 3E030U*, 3E03305, 3E033U*, 3E04005, 3E04305, 3E05005, 3E05305, 3E06005, 3E06305, 3E0J3U*, 3E0J7U*, 3E0J8U*</p> <p>CPT-4: 32851-32854, 33935, 33945, 38240, 38241, 44135, 44136, 47135, 47136, 48554, 48556, 50360, 50365, 50370, 50380</p>		Carrier Claims OR Prescription Claims	
Number of SGLT2i	<p>Excludes anyone taking more than 1 SGLT2i medication:</p> <p>Prescription claims:</p> <p>NDC Generic :</p> <p>EMPAGLIFLOZIN, EMPAGLIFLOZIN/LINAGLIPTIN, EMPAGLIFLOZIN/LINAGLIPTIN/METFORMIN HCL, EMPAGLIFLOZIN/METFORMIN HCL, CANAGLIFLOZIN, CANAGLIFLOZIN/METFORMIN HCL, DAPAGLIFLOZIN PROPANEDIOL, DAPAGLIFLOZIN PROPANEDIOL/METFORMIN HCL, DAPAGLIFLOZIN PROPANEDIOL/SAXAGLIPTIN HCL, ERTUGLIFLOZIN PIDOLATE, ERTUGLIFLOZIN PIDOLATE/METFORMIN HCL, ERTUGLIFLOZIN PIDOLATE/SITAGLIPTIN PHOSPHATE</p>	[0, 0]	Prescription Claims	Generic
Number of GLP-1RA	<p>Excludes anyone taking more than 1 GLP-1RA medication:</p> <p>Prescription claims:</p> <p>NDC Generic : ALBIGLUTIDE, DULAGLUTIDE, EXENATIDE, EXENATIDE MICROSPHERES, LIRAGLUTIDE, INSULIN DEGLUDEC/LIRAGLUTIDE, LIXISENATIDE, INSULIN GLARGINE, HUMAN RECOMBINANT ANALOG/LIXISENATIDE, SEMAGLUTIDE</p>	[0, 0]	Prescription Claims	Generic
Number of DPP-4i	<p>Excludes anyone taking more than 1 DPP4i medication:</p> <p>Prescription claims:</p> <p>NDC Generic: ALOGLIPTIN BENZOATE, ALOGLIPTIN BENZOATE/METFORMIN HCL, ALOGLIPTIN BENZOATE/PIOGLITAZONE HCL, EMPAGLIFLOZIN/LINAGLIPTIN, EMPAGLIFLOZIN/LINAGLIPTIN/METFORMIN HCL, LINAGLIPTIN, LINAGLIPTIN/METFORMIN HCL, DAPAGLIFLOZIN PROPANEDIOL/SAXAGLIPTIN HCL, SAXAGLIPTIN HCL, SAXAGLIPTIN HCL/METFORMIN HCL, ERTUGLIFLOZIN PIDOLATE/SITAGLIPTIN PHOSPHATE, SITAGLIPTIN PHOSPHATE, SITAGLIPTIN PHOSPHATE/METFORMIN HCL, SITAGLIPTIN PHOSPHATE/SIMVASTATIN</p> <p>BRAND : SAXENDA</p>	[0, 0]	Prescription Claims	Generic or Brand
Hyperkalemia	<p>ICD-9 DX: 276.7</p> <p>ICD-10 DX: E87.5</p>	[-90, 0]	Inpatient, Outpatient,	Any

			Carrier Claims	
Potassium binders	Prescription Claims: SODIUM ZIRCONIUM CYCLOSILICATE, SODIUM POLYSTYRENE SULFONATE/SORBITOL SOLUTION, PATIROMER CALCIUM SORBITEX, SODIUM POLYSTYRENE SULFONATE	[-90, 0]	Prescription Claims	Generic

Supplemental Table 2. Hyperkalemia outcome definitions.

Outcome	Codes	Care Setting	Position
Primary outcome: Hyperkalemia in inpatient or outpatient setting	ICD-9 DX: 276.7 ICD-10 DX: E87.5	Inpatient, Outpatient, Carrier Claims	Any
Secondary outcome: Serum potassium \geq 5.5 mmol/L	LOINC Codes: 2823-3, 32713-0, 39789-3, 6298-4, 77142-8, 12812-4, 12813-2, 42569-4 Potassium lab result number is greater than or equal to 5.5	Inpatient, Lab results	Any
Secondary outcome: Hyperkalemia in inpatient or ED setting	ICD-9 DX: 276.7 ICD-10 DX: E87.5 Type of Service: FAC_OP.ER, PROF.ER AND ICD-9 DX: 276.7 Type of Service: FAC_OP.ER, PROF.ER AND ICD-10 DX: E87.5	Inpatient, Emergency	Any
Sensitivity analysis outcome: Hyperkalemia in inpatient or outpatient setting or initiation of potassium binder during follow-up	ICD-9 DX: 276.7 ICD-10 DX: E87.5 Prescription Claims: SODIUM ZIRCONIUM CYCLOSILICATE, SODIUM POLYSTYRENE SULFONATE/SORBITOL SOLUTION, PATIROMER CALCIUM SORBITEX, SODIUM POLYSTYRENE SULFONATE	Inpatient, Outpatient, Prescription Claims	Any, Generic

Supplemental Table 3. Full list of baseline characteristics in patients with type 2 diabetes, stratified by SGLT-2i vs. DPP-4i initiation in the pooled cohort, before and after 1:1 propensity score matching.

Covariates	Before matching			After propensity score matching		
	Exposure - SGLT-2i	Comparator - DPP-4i	St. Diff	Exposure - SGLT2i	Comparator - DPP-4i	St. Diff
Number of patients	531,329	963,270		389,454	389,454	
Demographics						
Age; mean (sd)	61.5 (9.6)	67.8 (9.7)	0.66	62.7 (9.5)	62.6 (9.5)	-0.01
Male; n (%)	292,560 (55.1%)	470,713 (48.9%)	-0.12	209,774 (53.9%)	209,725 (53.9%)	0.00
Female; n (%)	238,771 (44.9%)	492,562 (51.1%)	0.12	179,682 (46.1%)	179,732 (46.1%)	0.00
Race/ethnicity ¹ ; n (%)						
White	235,123 (70.4%)	492,253 (69.8%)	0.14	174,543 (70.6%)	174,447 (70.6%)	0.00
Black	35,861 (10.7%)	83,855 (11.9%)	0.08	26,576 (10.8%)	26,595 (10.8%)	0.00
Asian	12,392 (3.7%)	36,314 (5.2%)	0.09	10,047 (4.1%)	10,077 (4.1%)	0.00
Hispanic	34,351 (10.3%)	60,465 (8.6%)	-0.01	24,361 (9.9%)	24,491 (9.9%)	0.00
Other	16,416 (4.9%)	32,203 (4.6%)	0.01	11,830 (4.8%)	11,747 (4.8%)	0.00
Calendar time; n (%)						
2013	12,478 (2.3%)	125,088 (13.0%)	0.41	11,691 (3.0%)	9,589 (2.5%)	-0.03
2014	53,364 (10.0%)	170,402 (17.7%)	0.22	44,538 (11.4%)	42,960 (11.0%)	-0.01
2015	68,462 (12.9%)	150,047 (15.6%)	0.08	56,740 (14.6%)	57,589 (14.8%)	0.01
2016	58,167 (10.9%)	131,592 (13.7%)	0.09	49,706 (12.8%)	50,532 (13.0%)	0.01
2017	65,264 (12.3%)	120,979 (12.6%)	0.01	54,215 (13.9%)	55,559 (14.3%)	0.01
2018	64,156 (12.1%)	106,800 (11.1%)	-0.03	51,916 (13.3%)	52,971 (13.6%)	0.01
2019	94,140 (17.7%)	97,874 (10.2%)	-0.22	66,094 (17.0%)	66,707 (17.1%)	0.00
2020	57,600 (10.8%)	36,116 (3.7%)	-0.28	31,224 (8.0%)	31,114 (8.0%)	0.00
2021	43,723 (8.2%)	19,840 (2.1%)	-0.28	18,642 (4.8%)	18,070 (4.6%)	-0.01
2022	13,975 (2.6%)	4,532 (0.5%)	-0.17	4,688 (1.2%)	4,363 (1.1%)	-0.01
Region [*] ; n (%)						
Northeast	72,532 (13.7%)	166,854 (17.3%)	0.10	56,611 (14.5%)	56,239 (14.4%)	0.00
South	268,556 (50.5%)	435,985 (45.3%)	-0.10	193,347 (49.6%)	193,899 (49.8%)	0.00
Midwest	106,925 (20.1%)	197,489 (20.5%)	0.01	77,908 (20.0%)	77,859 (20.0%)	0.00
West	83,316 (15.7%)	162,942 (16.9%)	0.03	61,588 (15.8%)	61,457 (15.8%)	0.00
Medicare Advantage; n (%)	3,103 (0.6%)	4,685 (0.5%)	-0.01	2,230 (0.6%)	2,184 (0.6%)	0.00
Combined comorbidity score; mean (sd)‡	1.2 (1.9)	1.5 (2.3)	0.14	1.1 (2.0)	1.1 (1.9)	-0.01
Frailty score; mean (sd)†	0.15 (0.04)	0.18 (0.05)	0.66	0.16 (0.05)	0.16 (0.05)	0.00
Frailty score squared; mean (sd)†	0.03 (0.02)	0.03 (0.03)	0.00	0.03 (0.02)	0.03 (0.02)	0.00
Frailty score categories; n (%)						
0.00 - 0.14	284,246 (53.5%)	394,060 (40.9%)	-0.25	203,850 (52.3%)	204,567 (52.5%)	0.00
0.15 - 0.24	221,777 (41.7%)	466,706 (48.5%)	0.14	164,964 (42.4%)	164,292 (42.2%)	0.00
>= 0.25	25,306 (4.8%)	102,504 (10.6%)	0.22	20,640 (5.3%)	20,595 (5.3%)	0.00
Lifestyle factors; n (%)						
Overweight	42,653 (8.0%)	71,081 (7.4%)	-0.02	31,327 (8.0%)	31,780 (8.2%)	0.01
Obesity	207,419 (39.0%)	259,141 (26.9%)	-0.26	135,814 (34.9%)	135,810 (34.9%)	0.00
Obese (BMI 30-35 kg/m ²)	82,382 (15.5%)	103,609 (10.8%)	-0.14	54,258 (13.9%)	55,809 (14.3%)	0.01
Severe obese (BMI>35 kg/m ²)	84,583 (15.9%)	89,176 (9.3%)	-0.20	52,073 (13.4%)	50,258 (12.9%)	-0.01
Smoking	93,394 (17.6%)	169,654 (17.6%)	0.00	67,228 (17.3%)	67,405 (17.3%)	0.00

Alcohol abuse or dependence	5,240 (1.0%)	10,118 (1.1%)	0.01	3,890 (1.0%)	3,837 (1.0%)	0.00
Drug abuse or dependence	8,819 (1.7%)	14,972 (1.6%)	-0.01	6,207 (1.6%)	6,243 (1.6%)	0.00
Diabetes-related conditions; n (%)						
Diabetic nephropathy	65,906 (12.4%)	133,403 (13.8%)	0.04	44,852 (11.5%)	44,602 (11.5%)	0.00
Diabetic retinopathy	51,245 (9.6%)	92,084 (9.6%)	0.00	34,775 (8.9%)	34,610 (8.9%)	0.00
Diabetes with other ophthalmic manifestations	36,049 (6.8%)	97,893 (10.2%)	0.12	27,771 (7.1%)	27,676 (7.1%)	0.00
Diabetic neuropathy	106,722 (20.1%)	189,647 (19.7%)	-0.01	73,165 (18.8%)	72,803 (18.7%)	0.00
Diabetes with peripheral circulatory disorders	6,448 (1.2%)	31,920 (3.3%)	0.14	5,554 (1.4%)	5,366 (1.4%)	0.00
Diabetic foot	11,295 (2.1%)	24,161 (2.5%)	0.03	7,916 (2.0%)	7,880 (2.0%)	0.00
Infection of lower extremities (cellulitis or osteomyelitis)	21,083 (4.0%)	45,965 (4.8%)	0.04	15,318 (3.9%)	15,281 (3.9%)	0.00
Lower-limb amputations	2,335 (0.4%)	4,489 (0.5%)	0.01	1,551 (0.4%)	1,549 (0.4%)	0.00
Erectile Dysfunction	26,917 (5.1%)	37,941 (3.9%)	-0.06	18,261 (4.7%)	18,340 (4.7%)	0.00
Hypoglycemia	58,654 (11.0%)	85,057 (8.8%)	-0.07	37,841 (9.7%)	37,954 (9.7%)	0.00
Hyperglycemia	219,115 (41.2%)	280,011 (29.1%)	-0.26	145,183 (37.3%)	146,046 (37.5%)	0.00
Diabetic ketoacidosis	1,264 (0.2%)	3,055 (0.3%)	0.02	899 (0.2%)	895 (0.2%)	0.00
Hyperosmolar hyperglycemic nonketotic syndrome	4,072 (0.8%)	6,978 (0.7%)	-0.01	2,894 (0.7%)	2,871 (0.7%)	0.00
Diabetes with other complications	46,784 (8.8%)	71,311 (7.4%)	-0.05	31,842 (8.2%)	31,735 (8.1%)	0.00
Diabetes mellitus without mention of complications	475,125 (89.4%)	903,441 (93.8%)	0.16	353,305 (90.7%)	353,417 (90.7%)	0.00
Diabetes treatment; n (%)						
Number of anti-DM medications on day of entry to cohort; mean (sd)	2.30 (0.89)	2.13 (0.77)	-0.20	2.20 (0.83)	2.20 (0.78)	0.00
Diabetes drugs on day of cohort entry						
Metformin	426,098 (80.2%)	742,386 (77.1%)	-0.08	315,259 (80.9%)	316,007 (81.1%)	0.01
Sulfonylureas	192,846 (36.3%)	409,922 (42.6%)	0.13	148,938 (38.2%)	149,790 (38.5%)	0.01
Thiazolidinediones	47,747 (9.0%)	75,541 (7.8%)	-0.04	32,876 (8.4%)	32,698 (8.4%)	0.00
GLP-1RA	118,262 (22.3%)	39,930 (4.1%)	-0.56	38,561 (9.9%)	35,525 (9.1%)	-0.03
Insulin	140,132 (26.4%)	139,187 (14.4%)	-0.30	77,967 (20.0%)	76,981 (19.8%)	-0.01
No use of anti-DM medications in prior 365 days	44,888 (8.4%)	131,782 (13.7%)	0.17	40,033 (10.3%)	39,483 (10.1%)	-0.01
Past use of metformin	343,976 (64.7%)	601,379 (62.4%)	-0.05	254,447 (65.3%)	261,062 (67.0%)	0.04
Past use of sulfonylureas	142,588 (26.8%)	312,930 (32.5%)	0.13	111,485 (28.6%)	114,144 (29.3%)	0.02
Past use of thiazolidinediones	32,965 (6.2%)	50,092 (5.2%)	-0.04	22,657 (5.8%)	22,475 (5.8%)	0.00
Past use of GLP-1RA	78,771 (14.8%)	16,748 (1.7%)	-0.49	24,901 (6.4%)	15,065 (3.9%)	-0.11
Past use of insulin	103,305 (19.4%)	98,698 (10.2%)	-0.26	57,037 (14.6%)	54,719 (14.1%)	-0.01
Long term use of insulin	75,972 (14.3%)	76,363 (7.9%)	-0.20	40,626 (10.4%)	40,298 (10.3%)	0.00
Miscellaneous anti-DM medications	8,743 (1.6%)	20,116 (2.1%)	0.04	6,547 (1.7%)	6,627 (1.7%)	0.00
Comorbid conditions; n (%)						
Hypertension	416,853 (78.5%)	790,874 (82.1%)	0.09	304,807 (78.3%)	304,512 (78.2%)	0.00
Hyperlipidemia	419,954 (79.0%)	770,934 (80.0%)	0.02	304,587 (78.2%)	304,319 (78.1%)	0.00
Cardiovascular disease	161,835 (30.5%)	363,460 (37.7%)	0.15	118,619 (30.5%)	117,292 (30.1%)	-0.01
Hypokalemia	11,628 (2.2%)	30,186 (3.1%)	0.06	8,566 (2.2%)	8,595 (2.2%)	0.00
Hyperkalemia	5,427 (1.0%)	15,529 (1.6%)	0.05	4,048 (1.0%)	3,997 (1.0%)	0.00
Acute myocardial infarction	10,717 (2.0%)	20,489 (2.1%)	0.01	7,046 (1.8%)	6,919 (1.8%)	0.00
Myocardial infarction sequelae	19,931 (3.8%)	40,387 (4.2%)	0.02	13,739 (3.5%)	13,665 (3.5%)	0.00
Stable angina	26,968 (5.1%)	47,526 (4.9%)	-0.01	18,502 (4.8%)	18,380 (4.7%)	0.00
Unstable angina	12,379 (2.3%)	23,768 (2.5%)	0.01	8,421 (2.2%)	8,343 (2.1%)	-0.01
Coronary atherosclerosis	110,141 (20.7%)	236,281 (24.5%)	0.09	79,582 (20.4%)	78,651 (20.2%)	0.00
Coronary procedure	10,787 (2.0%)	17,498 (1.8%)	-0.01	6,951 (1.8%)	6,940 (1.8%)	0.00

History of coronary procedure	38,266 (7.2%)	77,343 (8.0%)	0.03	26,875 (6.9%)	26,795 (6.9%)	0.00
Congestive heart failure	43,993 (8.3%)	108,445 (11.3%)	0.10	30,258 (7.8%)	29,856 (7.7%)	0.00
Cardiomyopathy	18,110 (3.4%)	37,005 (3.8%)	0.02	11,877 (3.0%)	11,657 (3.0%)	0.00
Atrial fibrillation	38,600 (7.3%)	99,942 (10.4%)	0.11	28,818 (7.4%)	28,444 (7.3%)	0.00
Cardiac conduction disorders	20,750 (3.9%)	48,057 (5.0%)	0.05	14,758 (3.8%)	14,572 (3.7%)	-0.01
Other cardiac dysrhythmia	52,184 (9.8%)	122,458 (12.7%)	0.09	38,136 (9.8%)	37,685 (9.7%)	0.00
Valve disorders	43,819 (8.2%)	110,627 (11.5%)	0.11	32,718 (8.4%)	32,539 (8.4%)	0.00
Other cardiovascular disease	57,244 (10.8%)	110,905 (11.5%)	0.02	40,432 (10.4%)	40,166 (10.3%)	0.00
Ischemic stroke	34,975 (6.6%)	95,254 (9.9%)	0.12	27,158 (7.0%)	26,909 (6.9%)	0.00
Transient ischemic attack	8,227 (1.5%)	24,058 (2.5%)	0.07	6,464 (1.7%)	6,387 (1.6%)	-0.01
Other cerebrovascular conditions	22,931 (4.3%)	68,025 (7.1%)	0.12	17,829 (4.6%)	17,736 (4.6%)	0.00
Peripheral arterial disease	40,098 (7.5%)	110,451 (11.5%)	0.14	30,878 (7.9%)	30,640 (7.9%)	0.00
Acute Kidney Injury	13,150 (2.5%)	51,596 (5.4%)	0.15	10,108 (2.6%)	9,964 (2.6%)	0.00
CKD	52,477 (9.9%)	179,569 (18.6%)	0.25	41,222 (10.6%)	40,647 (10.4%)	-0.01
CKD Stage 1-2	18,061 (3.4%)	39,434 (4.1%)	0.04	13,104 (3.4%)	13,049 (3.4%)	0.00
CKD Stage 3-4	30,232 (5.7%)	127,393 (13.2%)	0.26	25,285 (6.5%)	24,807 (6.4%)	0.00
CKD Stage 3	28,633 (5.4%)	120,642 (12.5%)	0.25	24,176 (6.2%)	23,726 (6.1%)	0.00
CKD Stage 4	3,015 (0.6%)	20,755 (2.2%)	0.14	2,395 (0.6%)	2,335 (0.6%)	0.00
CKD unspecified	16,639 (3.1%)	72,388 (7.5%)	0.20	13,109 (3.4%)	12,837 (3.3%)	-0.01
Hypertensive nephropathy	29,497 (5.6%)	93,281 (9.7%)	0.15	21,631 (5.6%)	21,458 (5.5%)	0.00
Miscellaneous kidney disease	34,382 (6.5%)	110,304 (11.5%)	0.18	27,182 (7.0%)	26,753 (6.9%)	0.00
Urinary tract infection	52,721 (9.9%)	153,298 (15.9%)	0.18	42,122 (10.8%)	42,205 (10.8%)	0.00
Kidney and urinary stone	21,076 (4.0%)	42,089 (4.4%)	0.02	15,667 (4.0%)	15,692 (4.0%)	0.00
Disorders of electrolyte	26,907 (5.1%)	73,771 (7.7%)	0.11	20,002 (5.1%)	19,875 (5.1%)	0.00
Disorders of fluid balance	14,158 (2.7%)	42,869 (4.5%)	0.10	10,775 (2.8%)	10,505 (2.7%)	-0.01
Edema	44,819 (8.4%)	107,259 (11.1%)	0.09	33,149 (8.5%)	32,958 (8.5%)	0.00
COPD	42,584 (8.0%)	111,250 (11.5%)	0.12	33,037 (8.5%)	32,937 (8.5%)	0.00
Asthma	41,991 (7.9%)	80,460 (8.4%)	0.02	30,521 (7.8%)	30,566 (7.8%)	0.00
Obstructive sleep apnea	100,443 (18.9%)	127,801 (13.3%)	-0.15	64,969 (16.7%)	64,851 (16.7%)	0.00
Pneumonia	18,003 (3.4%)	47,783 (5.0%)	0.08	13,507 (3.5%)	13,301 (3.4%)	-0.01
Osteoarthritis	103,513 (19.5%)	216,960 (22.5%)	0.07	77,830 (20.0%)	77,803 (20.0%)	0.00
Osteoporosis without fractures	18,668 (3.5%)	63,639 (6.6%)	0.14	15,531 (4.0%)	15,531 (4.0%)	0.00
Fractures	7,406 (1.4%)	17,479 (1.8%)	0.03	5,631 (1.4%)	5,648 (1.5%)	0.01
Falls	16,866 (3.2%)	41,710 (4.3%)	0.06	12,869 (3.3%)	12,815 (3.3%)	0.00
NASH/NAFLD	31,463 (5.9%)	42,931 (4.5%)	-0.06	21,484 (5.5%)	21,450 (5.5%)	0.00
Liver disease	13,624 (2.6%)	30,637 (3.2%)	0.04	10,304 (2.6%)	10,224 (2.6%)	0.00
Depression	74,447 (14.0%)	134,430 (14.0%)	0.00	52,814 (13.6%)	52,710 (13.5%)	0.00
Anxiety and sleep disorders	100,058 (18.8%)	172,514 (17.9%)	-0.02	70,850 (18.2%)	70,863 (18.2%)	0.00
Cancer	35,753 (6.7%)	98,759 (10.3%)	0.13	28,660 (7.4%)	28,339 (7.3%)	0.00
Other medication use; n (%)						
No. of distinct medications; mean (sd)	12.53 (6.06)	12.40 (6.03)	-0.02	12.11 (5.90)	12.09 (5.98)	0.00
No. of distinct brand medications; mean (sd)	2.89 (1.92)	2.71 (1.94)	-0.09	2.65 (1.82)	2.63 (1.82)	-0.01
ACE inhibitors or angiotensin II receptor blockers	387,618 (73.0%)	704,257 (73.1%)	0.00	281,918 (72.4%)	281,578 (72.3%)	0.00
Beta blockers	188,644 (35.5%)	390,483 (40.5%)	0.10	137,684 (35.4%)	136,690 (35.1%)	-0.01
Calcium channel blockers	142,339 (26.8%)	308,447 (32.0%)	0.11	106,730 (27.4%)	106,158 (27.3%)	0.00
Nitrates and other antianginal agents	32,293 (6.1%)	71,888 (7.5%)	0.06	23,195 (6.0%)	22,797 (5.9%)	0.00

Thiazide and thiazide-like diuretics	73,784 (13.9%)	140,737 (14.6%)	0.02	53,456 (13.7%)	53,297 (13.7%)	0.00
Loop diuretics	64,499 (12.1%)	156,002 (16.2%)	0.12	46,067 (11.8%)	45,439 (11.7%)	0.00
Mineralocorticoid receptor antagonists	22,806 (4.3%)	37,536 (3.9%)	-0.02	14,276 (3.7%)	14,108 (3.6%)	-0.01
Other potassium-sparing diuretics and antihypertensive medications	22,514 (4.2%)	73,789 (7.7%)	0.15	18,747 (4.8%)	18,752 (4.8%)	0.00
Digoxin	6,853 (1.3%)	23,240 (2.4%)	0.08	5,446 (1.4%)	5,263 (1.4%)	0.00
Antiarrhythmics	8,140 (1.5%)	20,215 (2.1%)	0.05	5,797 (1.5%)	5,878 (1.5%)	0.00
Anticoagulants	36,342 (6.8%)	84,606 (8.8%)	0.07	26,476 (6.8%)	26,452 (6.8%)	0.00
Antiplatelet agents	54,812 (10.3%)	112,132 (11.6%)	0.04	39,170 (10.1%)	38,620 (9.9%)	-0.01
Statins	385,751 (72.6%)	688,296 (71.5%)	-0.02	277,161 (71.2%)	276,857 (71.1%)	0.00
PCSK9 inhibitors and other-lipid lowering agents	85,042 (16.0%)	150,256 (15.6%)	-0.01	59,731 (15.3%)	59,687 (15.3%)	0.00
COPD & asthma medications	90,746 (17.1%)	174,863 (18.2%)	0.03	66,866 (17.2%)	66,829 (17.2%)	0.00
Oral corticosteroids	92,069 (17.3%)	167,086 (17.3%)	0.00	67,319 (17.3%)	67,333 (17.3%)	0.00
Antiosteoporosis agents	12,619 (2.4%)	45,412 (4.7%)	0.12	10,674 (2.7%)	10,602 (2.7%)	0.00
NSAIDs	144,473 (27.2%)	246,709 (25.6%)	-0.04	104,854 (26.9%)	105,155 (27.0%)	0.00
Opioids	162,011 (30.5%)	319,040 (33.1%)	0.06	120,217 (30.9%)	120,095 (30.8%)	0.00
Gabapentinoids	79,519 (15.0%)	147,234 (15.3%)	0.01	56,525 (14.5%)	56,587 (14.5%)	0.00
Antibiotics targeting urinary tract infection	101,783 (19.2%)	231,563 (24.0%)	0.12	78,017 (20.0%)	78,064 (20.0%)	0.00
Antidepressants	147,166 (27.7%)	252,203 (26.2%)	-0.03	103,734 (26.6%)	103,485 (26.6%)	0.00
Anxiolytics/hypnotics	40,783 (7.7%)	74,526 (7.7%)	0.00	29,253 (7.5%)	29,337 (7.5%)	0.00
Benzodiazepines	63,910 (12.0%)	127,430 (13.2%)	0.04	47,550 (12.2%)	47,573 (12.2%)	0.00
Antipsychotics	12,961 (2.4%)	28,447 (3.0%)	0.04	9,311 (2.4%)	9,297 (2.4%)	0.00
Antiparkinsonian medications	14,013 (2.6%)	28,619 (3.0%)	0.02	10,124 (2.6%)	10,082 (2.6%)	0.00
Dementia medications	5,930 (1.1%)	33,237 (3.5%)	0.16	5,248 (1.3%)	5,212 (1.3%)	0.00
Potassium binders	299 (0.1%)	1,395 (0.1%)	0.00	248 (0.1%)	230 (0.1%)	0.00
Potassium supplements	37,866 (7.1%)	90,964 (9.4%)	0.08	28,010 (7.2%)	27,929 (7.2%)	0.00
Angiotensin receptor-neprilysin inhibitor	4,672 (0.9%)	1,903 (0.2%)	-0.09	1,485 (0.4%)	1,409 (0.4%)	0.00
Measures of healthcare utilization; n (%)						
Internist visit within prior 31-365 days; n (%)	455,482 (85.7%)	827,156 (85.9%)	0.01	333,182 (85.6%)	333,343 (85.6%)	0.00
Internist visit within prior 30 days; n (%)	344,810 (64.9%)	658,254 (68.3%)	0.07	261,666 (67.2%)	262,575 (67.4%)	0.00
No. of internist visits; mean (sd)	14.60 (19.38)	15.45 (19.65)	0.04	14.56 (18.90)	14.56 (19.34)	0.00
Endocrinologist within prior 31-365 days; n (%)	83,170 (15.7%)	88,553 (9.2%)	-0.20	44,682 (11.5%)	43,912 (11.3%)	-0.01
Endocrinologist within prior 30 days; n (%)	74,793 (14.1%)	74,986 (7.8%)	-0.20	38,488 (9.9%)	37,862 (9.7%)	-0.01
No. of endocrinologist visits; mean (sd)	1.61 (5.91)	0.90 (4.42)	-0.14	1.14 (4.99)	1.11 (4.99)	-0.01
Cardiologist visit within prior 31-365 days; n (%)	161,546 (30.4%)	337,837 (35.1%)	0.10	117,705 (30.2%)	116,815 (30.0%)	0.00
Cardiologist visit within prior 30 days; n (%)	52,029 (9.8%)	114,323 (11.9%)	0.07	36,864 (9.5%)	36,273 (9.3%)	-0.01
No. of cardiologist visits; mean (sd)	2.43 (6.43)	3.04 (7.43)	0.09	2.38 (6.39)	2.35 (6.19)	0.00
Nephrologist within prior 31-365 days; n (%)	17,855 (3.4%)	61,270 (6.4%)	0.14	13,364 (3.4%)	13,278 (3.4%)	0.00
Nephrologist within prior 30 days; n (%)	5,954 (1.1%)	22,831 (2.4%)	0.10	4,202 (1.1%)	4,054 (1.0%)	-0.01
No. of nephrologist visits; mean (sd)	0.18 (2.06)	0.38 (2.62)	0.08	0.18 (2.23)	0.18 (1.65)	0.00
No. of electrocardiograms; mean (sd)	1.04 (2.09)	1.26 (2.31)	0.10	1.03 (2.05)	1.02 (1.99)	0.00
No. of cardiac angiographies or echocardiographies; mean (sd)	0.67 (2.61)	0.65 (2.09)	-0.01	0.59 (2.22)	0.59 (2.26)	0.00
Cardiovascular stress test; n (%)	54,007 (10.2%)	104,404 (10.8%)	0.02	39,161 (10.1%)	38,873 (10.0%)	0.00
No. of HbA1c tests ordered; mean (sd)	2.53 (1.46)	2.38 (1.42)	-0.10	2.44 (1.41)	2.45 (1.43)	0.01
No. of glucose test ordered; mean (sd)	0.83 (2.02)	0.84 (3.43)	0.00	0.77 (2.01)	0.76 (1.82)	-0.01
No. of microalbuminuria tests ordered; mean (sd)	0.96 (1.06)	0.87 (1.05)	-0.09	0.90 (1.03)	0.90 (1.03)	0.00
No. of metabolic or creatinine tests ordered; mean (sd)	2.72 (2.53)	3.01 (2.77)	0.11	2.69 (2.52)	2.69 (2.47)	0.00

No. of lipid tests ordered; mean (sd)	1.95 (1.74)	1.88 (1.68)	-0.04	1.91 (1.70)	1.92 (1.74)	0.01
No. of hospitalizations; mean (sd)	0.12 (0.44)	0.20 (0.60)	0.15	0.12 (0.45)	0.12 (0.43)	0.00
Hospitalization within prior 365 days; n (%)	29,158 (7.7%)	45,734 (9.9%)	0.08	19,199 (7.4%)	19,697 (7.6%)	0.01
Hospitalization within prior 31-365 days; n (%)	24,638 (6.5%)	34,432 (7.5%)	0.04	15,934 (6.2%)	15,865 (6.2%)	0.00
Hospitalization within prior 30 days; n (%)	5,554 (1.5%)	14,022 (3.0%)	0.10	3,977 (1.5%)	4,521 (1.8%)	0.02
Length of stay within prior 365 days; mean (sd)	0.54 (2.83)	1.11 (4.92)	0.14	0.57 (2.93)	0.57 (2.87)	0.00
Length of stay within prior 31-365 days; mean (sd)	0.46 (2.62)	0.78 (4.12)	0.09	0.47 (2.67)	0.48 (2.69)	0.00
Length of stay within prior 30 days; mean (sd)	0.08 (0.83)	0.33 (2.04)	0.16	0.09 (0.91)	0.09 (0.80)	0.00
No. of emergency department visits; mean (sd)	0.37 (1.17)	0.60 (1.59)	0.16	0.40 (1.25)	0.40 (1.15)	0.00
Vitamin D test order; n (%)	147,439 (27.7%)	278,389 (28.9%)	0.03	106,754 (27.4%)	106,557 (27.4%)	0.00
Serum potassium test order; n (%)	12,535 (2.4%)	27,895 (2.9%)	0.03	9,266 (2.4%)	9,238 (2.4%)	0.00
Laboratory results[§], mean (sd)						
HbA1c, %	9.0 (2.4)	8.8 (2.4)	-0.06	8.9 (2.4)	9.0 (2.4)	0.01
Missing	420,960 (79.2%)	841,191 (87.3%)	0.22	319,227 (82.0%)	317,755 (81.6%)	-0.01
eGFR, ml/min/1.73m ²	80 (23)	76 (24)	-0.18	80 (23)	79 (23)	-0.05
Missing	418,667 (78.8%)	835,277 (86.7%)	0.21	317,094 (81.4%)	315,273 (81.0%)	-0.01
Urinary albumin-to-creatinine ratio, mg/g	102 (465)	104 (508)	0.00	97 (468)	99 (496)	0.00
Missing	478,126 (90.0%)	907,342 (94.2%)	0.16	357,098 (91.7%)	355,688 (91.3%)	-0.01
Total cholesterol, mg/dL	184 (59)	185 (60)	0.02	186 (60)	187 (59)	0.01
Missing	431,040 (81.1%)	850,089 (88.3%)	0.20	324,914 (83.4%)	323,006 (82.9%)	-0.01
LDL cholesterol, mg/dL	102 (46)	103 (47)	0.03	103 (47)	105 (47)	0.03
Missing	432,626 (81.4%)	851,089 (88.4%)	0.20	326,189 (83.8%)	323,787 (83.1%)	-0.02
HDL cholesterol, mg/dL	47 (19)	48 (19)	0.04	48 (19)	48 (19)	0.02
Missing	432,763 (81.4%)	851,037 (88.3%)	0.19	325,941 (83.7%)	323,699 (83.1%)	-0.02
Triglycerides, mg/dL	211 (166)	198 (152)	-0.08	210 (164)	204 (157)	-0.04
Missing	431,863 (81.3%)	850,788 (88.3%)	0.20	325,368 (83.5%)	323,425 (83.0%)	-0.01
Creatinine, mg/dL	1.00 (0.48)	1.04 (0.51)	0.08	0.99 (0.46)	1.01 (0.48)	0.04
Missing	418,667 (78.8%)	835,277 (86.7%)	0.21	317,094 (81.4%)	315,273 (81.0%)	-0.01
Glucose, mg/dL	196 (95.6)	193 (95)	-0.04	195 (95)	197 (97)	0.02
Missing	421,628 (79.4%)	839,414 (87.1%)	0.21	319,012 (81.9%)	317,258 (81.5%)	-0.01
Potassium, mmol/L	4.4 (0.4)	4.4 (0.4)	0.03	4.4 (0.4)	4.4 (0.4)	0.00
Missing	420,413 (79.1%)	837,089 (86.9%)	0.21	318,251 (81.7%)	316,349 (81.2%)	-0.01

ACE = angiotensin-converting enzyme; CDM = Optum's de-identified Clinformatics® Data Mart Database; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; DPP-4i = dipeptidyl peptidase-4 inhibitor; eGFR = estimated glomerular filtration rate; GLP-1RA = glucagon-like peptide-1 receptor agonist; HbA1c = hemoglobin A1c; HDL = high-density lipoprotein; LDL = low-density lipoprotein; n = number of patients; NASH = non-alcoholic steatohepatitis; NAFLD = non-alcoholic fatty liver disease; No. = number of; NSAIDs = Nonsteroidal anti-inflammatory drug; PCSK9 = Proprotein convertase subtilisin/kexin type 9; SGLT2i = sodium-glucose cotransporter-2 inhibitor; sd = standard deviation; SMD = standardized mean difference.

‡ Only available in CDM and Medicare databases. Percentages are relative to sample size of CDM and Medicare databases so total adds up to 100%.

* Northeast (Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont); South (Alabama; Arkansas; Delaware; Florida; Georgia; Kentucky; Louisiana; Maryland; Mississippi; North Carolina; Oklahoma; South Carolina; Tennessee; Texas; Virginia; Washington, DC; West Virginia); Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin); West (Alaska, Arizona, California, Colorado, Hawai'i, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, Wyoming).

† Based on: Gagne JJ, Glynn RJ, Avorn J, Levin R, Schneeweiss S. A combined comorbidity score predicted mortality in elderly patients better than existing scores. *J Clin Epidemiol.* 2011;64(7):749-59.

‡ Based on: Kim DH, Schneeweiss S, Glynn RJ, Lipsitz LA, Rockwood K, Avorn J. Measuring Frailty in Medicare Data: Development and Validation of a Claims-Based Frailty Index. *J Gerontol A Biol Sci Med Sci.* 2018;73(7):980-7

§ Pooled across CDM and MarketScan databases

|| Calculated with the CKD-EPI 2021 creatinine-based equation

Supplemental Table 4. Full list of baseline characteristics in patients with type 2 diabetes, stratified by GLP-1RA vs. DPP-4i initiation in the pooled cohort, before and after 1:1 propensity score matching.

Covariates	Before matching			After propensity score matching		
	Exposure - GLP-1RA	Comparator - DPP-4i	St. Diff	Exposure - GLP-1RA	Comparator - DPP-4i	St. Diff
Number of patients	519,012	999,728		364,910	364,910	
Demographics						
Age; mean (sd)	60.7 (9.8)	67.5 (9.7)	0.70	62.3 (9.5)	62.2 (9.5)	-0.01
Male; n (%)	242,066 (46.6%)	494,425 (49.5%)	0.06	175,506 (48.1%)	175,496 (48.1%)	0.00
Female; n (%)	276,948 (53.4%)	505,307 (50.5%)	-0.06	189,404 (51.9%)	189,415 (51.9%)	0.00
Race/ethnicity [‡] ; n (%)						
White	242,155 (71.9%)	503,778 (69.5%)	0.07	169,932 (72.2%)	170,330 (72.3%)	0.00
Black	39,749 (11.8%)	85,818 (11.8%)	0.03	27,134 (11.5%)	26,972 (11.5%)	0.00
Asian	7,222 (2.1%)	38,101 (5.3%)	0.15	6,022 (2.6%)	5,734 (2.4%)	-0.01
Hispanic	32,268 (9.6%)	63,252 (8.7%)	0.00	21,824 (9.3%)	21,886 (9.3%)	0.00
Other	15,239 (4.5%)	33,597 (4.6%)	0.03	10,588 (4.5%)	10,578 (4.5%)	0.00
Calendar time; n (%)						
2013	26,613 (5.1%)	121,055 (12.1%)	0.25	24,789 (6.8%)	24,152 (6.6%)	-0.01
2014	37,414 (7.2%)	167,974 (16.8%)	0.30	34,446 (9.4%)	33,579 (9.2%)	-0.01
2015	44,723 (8.6%)	154,571 (15.5%)	0.21	39,425 (10.8%)	39,057 (10.7%)	0.00
2016	51,310 (9.9%)	138,958 (13.9%)	0.12	43,577 (11.9%)	43,833 (12.0%)	0.00
2017	62,316 (12.0%)	128,758 (12.9%)	0.03	49,656 (13.6%)	50,104 (13.7%)	0.00
2018	76,958 (14.8%)	114,357 (11.4%)	-0.10	55,628 (15.2%)	56,153 (15.4%)	0.01
2019	98,317 (18.9%)	106,325 (10.6%)	-0.24	62,765 (17.2%)	63,242 (17.3%)	0.00
2020	63,269 (12.2%)	40,217 (4.0%)	-0.30	31,906 (8.7%)	32,066 (8.8%)	0.00
2021	45,612 (8.8%)	22,256 (2.2%)	-0.29	18,260 (5.0%)	18,243 (5.0%)	0.00
2022	12,480 (2.4%)	5,257 (0.5%)	-0.16	4,458 (1.2%)	4,481 (1.2%)	0.00
Region [*] ; n (%)						
Northeast	65,521 (12.6%)	172,729 (17.3%)	0.13	49,698 (13.6%)	48,791 (13.4%)	-0.01
South	259,930 (50.1%)	456,794 (45.7%)	-0.09	180,872 (49.6%)	181,708 (49.8%)	0.00
Midwest	113,389 (21.8%)	202,411 (20.2%)	-0.04	77,165 (21.1%)	77,261 (21.2%)	0.00
West	80,172 (15.4%)	167,794 (16.8%)	0.04	57,175 (15.7%)	57,150 (15.7%)	0.00
Medicare Advantage; n (%)	2,927 (0.6%)	4,885 (0.5%)	-0.01	2,065 (0.6%)	1,934 (0.5%)	-0.01
Combined comorbidity score; mean (sd) [‡]	1.4 (2.0)	1.4 (2.3)	0.03	1.3 (2.0)	1.3 (2.0)	0.00
Frailty score; mean (sd) [†]	0.16 (0.05)	0.17 (0.05)	0.20	0.16 (0.05)	0.16 (0.05)	0.00
Frailty score squared; mean (sd) [†]	0.03 (0.02)	0.03 (0.03)	0.00	0.03 (0.02)	0.03 (0.02)	0.00
Frailty score categories; n (%)						
0.00 - 0.14	252,226 (48.6%)	419,026 (41.9%)	-0.13	176,427 (48.3%)	176,974 (48.5%)	0.00
0.15 - 0.24	232,631 (44.8%)	478,194 (47.8%)	0.06	163,239 (44.7%)	162,415 (44.5%)	0.00
>= 0.25	34,155 (6.6%)	102,508 (10.3%)	0.13	25,244 (6.9%)	25,521 (7.0%)	0.00
Lifestyle factors; n (%)						
Overweight	37,171 (7.2%)	75,839 (7.6%)	0.02	27,440 (7.5%)	27,754 (7.6%)	0.00
Obesity	253,498 (48.8%)	268,712 (26.9%)	-0.46	151,390 (41.5%)	152,188 (41.7%)	0.00
Obese (BMI 30-35 kg/m ²)	91,175 (17.6%)	109,241 (10.9%)	-0.19	53,870 (14.8%)	62,070 (17.0%)	0.06
Severe obese (BMI>35 kg/m ²)	120,696 (23.3%)	91,171 (9.1%)	-0.39	67,362 (18.5%)	57,496 (15.8%)	-0.07
Smoking	100,110 (19.3%)	174,717 (17.5%)	-0.05	67,006 (18.4%)	67,246 (18.4%)	0.00

Alcohol abuse or dependence	4,929 (0.9%)	10,454 (1.0%)	0.01	3,458 (0.9%)	3,445 (0.9%)	0.00
Drug abuse or dependence	10,527 (2.0%)	15,405 (1.5%)	-0.04	6,680 (1.8%)	6,742 (1.8%)	0.00
Diabetes-related conditions; n (%)						
Diabetic nephropathy	78,379 (15.1%)	135,479 (13.6%)	-0.04	51,426 (14.1%)	51,345 (14.1%)	0.00
Diabetic retinopathy	55,732 (10.7%)	94,320 (9.4%)	-0.04	35,787 (9.8%)	35,378 (9.7%)	0.00
Diabetes with other ophthalmic manifestations	33,988 (6.5%)	99,198 (9.9%)	0.12	26,121 (7.2%)	26,124 (7.2%)	0.00
Diabetic neuropathy	120,607 (23.2%)	194,838 (19.5%)	-0.09	77,527 (21.2%)	77,020 (21.1%)	0.00
Diabetes with peripheral circulatory disorders	6,210 (1.2%)	31,626 (3.2%)	0.14	5,600 (1.5%)	5,535 (1.5%)	0.00
Diabetic foot	14,175 (2.7%)	24,664 (2.5%)	-0.01	8,936 (2.4%)	8,820 (2.4%)	0.00
Infection of lower extremities (cellulitis or osteomyelitis)	24,297 (4.7%)	47,177 (4.7%)	0.00	16,348 (4.5%)	16,371 (4.5%)	0.00
Lower-limb amputations	3,232 (0.6%)	4,585 (0.5%)	-0.01	1,908 (0.5%)	1,891 (0.5%)	0.00
Erectile Dysfunction	23,763 (4.6%)	40,104 (4.0%)	-0.03	16,207 (4.4%)	16,240 (4.5%)	0.00
Hypoglycemia	62,639 (12.1%)	88,849 (8.9%)	-0.10	38,539 (10.6%)	38,397 (10.5%)	0.00
Hyperglycemia	240,398 (46.3%)	300,169 (30.0%)	-0.34	147,510 (40.4%)	147,495 (40.4%)	0.00
Diabetic ketoacidosis	1,605 (0.3%)	3,107 (0.3%)	0.00	979 (0.3%)	995 (0.3%)	0.00
Hyperosmolar hyperglycemic nonketotic syndrome	4,455 (0.9%)	7,283 (0.7%)	-0.02	2,901 (0.8%)	2,905 (0.8%)	0.00
Diabetes with other complications	51,783 (10.0%)	74,562 (7.5%)	-0.09	32,787 (9.0%)	32,765 (9.0%)	0.00
Diabetes mellitus without mention of complications	460,295 (88.7%)	934,837 (93.5%)	0.17	329,674 (90.3%)	329,666 (90.3%)	0.00
Diabetes treatment; n (%)						
Number of anti-DM medications on day of entry to cohort; mean (sd)	2.27 (0.91)	2.17 (0.80)	-0.12	2.24 (0.90)	2.24 (0.84)	0.00
Diabetes drugs on day of cohort entry						
Metformin	383,295 (73.9%)	774,486 (77.5%)	0.08	278,632 (76.4%)	279,537 (76.6%)	0.00
Sulfonylureas	177,076 (34.1%)	424,664 (42.5%)	0.17	136,649 (37.4%)	137,785 (37.8%)	0.01
Thiazolidinediones	43,984 (8.5%)	78,893 (7.9%)	-0.02	31,244 (8.6%)	31,537 (8.6%)	0.00
SGLT2i	89,528 (17.2%)	74,489 (7.5%)	-0.30	51,830 (14.2%)	51,994 (14.2%)	0.00
Insulin	185,215 (35.7%)	139,356 (13.9%)	-0.52	96,000 (26.3%)	94,123 (25.8%)	-0.01
No use of anti-DM medications in prior 365 days	47,121 (9.1%)	134,277 (13.4%)	0.14	36,981 (10.1%)	35,997 (9.9%)	-0.01
Past use of metformin	294,769 (56.8%)	627,553 (62.8%)	0.12	216,862 (59.4%)	224,862 (61.6%)	0.05
Past use of sulfonylureas	128,183 (24.7%)	323,713 (32.4%)	0.17	101,149 (27.7%)	101,815 (27.9%)	0.00
Past use of thiazolidinediones	30,295 (5.8%)	52,418 (5.2%)	-0.03	22,040 (6.0%)	20,700 (5.7%)	-0.01
Past use of SGLT2i	60,379 (11.6%)	50,686 (5.1%)	-0.24	35,217 (9.7%)	35,086 (9.6%)	0.00
Past use of insulin	140,136 (27.0%)	98,660 (9.9%)	-0.45	72,990 (20.0%)	66,420 (18.2%)	-0.05
Long term use of insulin	108,247 (20.9%)	76,395 (7.6%)	-0.39	51,202 (14.0%)	49,155 (13.5%)	-0.01
Miscellaneous anti-DM medications	8,344 (1.6%)	20,608 (2.1%)	0.04	6,296 (1.7%)	6,367 (1.7%)	0.00
Comorbid conditions; n (%)						
Hypertension	408,690 (78.7%)	818,298 (81.9%)	0.08	288,327 (79.0%)	288,447 (79.0%)	0.00
Hyperlipidemia	402,582 (77.6%)	799,668 (80.0%)	0.06	283,838 (77.8%)	283,746 (77.8%)	0.00
Cardiovascular disease	153,340 (29.5%)	371,663 (37.2%)	0.16	111,001 (30.4%)	110,719 (30.3%)	0.00
Hypokalemia	12,844 (2.5%)	30,608 (3.1%)	0.04	8,975 (2.5%)	9,015 (2.5%)	0.00
Hyperkalemia	6,513 (1.3%)	15,656 (1.6%)	0.03	4,637 (1.3%)	4,622 (1.3%)	0.00
Acute myocardial infarction	8,393 (1.6%)	21,021 (2.1%)	0.04	5,773 (1.6%)	5,787 (1.6%)	0.00
Myocardial infarction sequelae	18,022 (3.5%)	41,322 (4.1%)	0.03	12,679 (3.5%)	12,641 (3.5%)	0.00
Stable angina	24,039 (4.6%)	49,021 (4.9%)	0.01	16,539 (4.5%)	16,456 (4.5%)	0.00
Unstable angina	10,899 (2.1%)	24,401 (2.4%)	0.02	7,556 (2.1%)	7,521 (2.1%)	0.00
Coronary atherosclerosis	99,339 (19.1%)	241,659 (24.2%)	0.12	72,154 (19.8%)	71,756 (19.7%)	0.00
Coronary procedure	7,948 (1.5%)	18,048 (1.8%)	0.02	5,533 (1.5%)	5,439 (1.5%)	0.00

History of coronary procedure	33,819 (6.5%)	79,104 (7.9%)	0.05	23,896 (6.5%)	23,929 (6.6%)	0.00
Congestive heart failure	43,195 (8.3%)	109,607 (11.0%)	0.09	30,446 (8.3%)	30,430 (8.3%)	0.00
Cardiomyopathy	15,009 (2.9%)	37,648 (3.8%)	0.05	10,615 (2.9%)	10,699 (2.9%)	0.00
Atrial fibrillation	36,228 (7.0%)	101,591 (10.2%)	0.11	26,880 (7.4%)	26,898 (7.4%)	0.00
Cardiac conduction disorders	19,410 (3.7%)	48,992 (4.9%)	0.06	13,861 (3.8%)	13,789 (3.8%)	0.00
Other cardiac dysrhythmia	51,117 (9.8%)	125,097 (12.5%)	0.09	36,159 (9.9%)	36,125 (9.9%)	0.00
Valve disorders	40,161 (7.7%)	112,719 (11.3%)	0.12	30,123 (8.3%)	30,053 (8.2%)	0.00
Other cardiovascular disease	56,762 (10.9%)	114,185 (11.4%)	0.02	38,909 (10.7%)	38,840 (10.6%)	0.00
Ischemic stroke	33,304 (6.4%)	96,949 (9.7%)	0.12	25,207 (6.9%)	25,176 (6.9%)	0.00
Transient ischemic attack	7,959 (1.5%)	24,518 (2.5%)	0.07	6,085 (1.7%)	6,071 (1.7%)	0.00
Other cerebrovascular conditions	24,054 (4.6%)	69,117 (6.9%)	0.10	17,916 (4.9%)	17,775 (4.9%)	0.00
Peripheral arterial disease	41,094 (7.9%)	112,504 (11.3%)	0.12	30,505 (8.4%)	30,299 (8.3%)	0.00
Acute Kidney Injury	17,467 (3.4%)	51,672 (5.2%)	0.09	12,602 (3.5%)	12,640 (3.5%)	0.00
CKD	71,349 (13.7%)	179,684 (18.0%)	0.12	52,220 (14.3%)	52,247 (14.3%)	0.00
CKD Stage 1-2	19,013 (3.7%)	40,245 (4.0%)	0.02	13,342 (3.7%)	13,305 (3.6%)	-0.01
CKD Stage 3-4	49,066 (9.5%)	126,509 (12.7%)	0.10	36,350 (10.0%)	36,448 (10.0%)	0.00
CKD Stage 3	46,742 (9.0%)	119,813 (12.0%)	0.10	34,678 (9.5%)	34,729 (9.5%)	0.00
CKD Stage 4	7,149 (1.4%)	20,334 (2.0%)	0.05	5,308 (1.5%)	5,334 (1.5%)	0.00
CKD unspecified	24,435 (4.7%)	71,878 (7.2%)	0.11	18,283 (5.0%)	18,340 (5.0%)	0.00
Hypertensive nephropathy	39,075 (7.5%)	93,116 (9.3%)	0.06	27,531 (7.5%)	27,570 (7.6%)	0.00
Miscellaneous kidney disease	40,581 (7.8%)	111,130 (11.1%)	0.11	30,570 (8.4%)	30,700 (8.4%)	0.00
Urinary tract infection	63,498 (12.2%)	156,079 (15.6%)	0.10	46,481 (12.7%)	46,685 (12.8%)	0.00
Kidney and urinary stone	21,570 (4.2%)	42,953 (4.3%)	0.00	15,247 (4.2%)	15,409 (4.2%)	0.00
Disorders of electrolyte	29,772 (5.7%)	74,752 (7.5%)	0.07	20,908 (5.7%)	20,974 (5.7%)	0.00
Disorders of fluid balance	16,371 (3.2%)	43,451 (4.3%)	0.06	11,608 (3.2%)	11,505 (3.2%)	0.00
Edema	54,255 (10.5%)	108,454 (10.8%)	0.01	36,815 (10.1%)	36,721 (10.1%)	0.00
COPD	46,567 (9.0%)	113,012 (11.3%)	0.08	33,845 (9.3%)	33,811 (9.3%)	0.00
Asthma	49,900 (9.6%)	82,193 (8.2%)	-0.05	32,708 (9.0%)	32,818 (9.0%)	0.00
Obstructive sleep apnea	119,821 (23.1%)	130,847 (13.1%)	-0.26	71,370 (19.6%)	71,505 (19.6%)	0.00
Pneumonia	20,017 (3.9%)	48,503 (4.9%)	0.05	13,978 (3.8%)	13,922 (3.8%)	0.00
Osteoarthritis	115,791 (22.3%)	222,644 (22.3%)	0.00	80,471 (22.1%)	80,692 (22.1%)	0.00
Osteoporosis without fractures	19,070 (3.7%)	64,766 (6.5%)	0.13	15,212 (4.2%)	15,296 (4.2%)	0.00
Fractures	8,657 (1.7%)	17,850 (1.8%)	0.01	6,041 (1.7%)	6,002 (1.6%)	-0.01
Falls	19,870 (3.8%)	42,610 (4.3%)	0.03	13,835 (3.8%)	13,733 (3.8%)	0.00
NASH/NAFLD	34,021 (6.6%)	44,533 (4.5%)	-0.09	21,397 (5.9%)	21,558 (5.9%)	0.00
Liver disease	12,974 (2.5%)	31,519 (3.2%)	0.04	9,424 (2.6%)	9,515 (2.6%)	0.00
Depression	94,647 (18.2%)	137,194 (13.7%)	-0.12	59,404 (16.3%)	59,399 (16.3%)	0.00
Anxiety and sleep disorders	117,883 (22.7%)	177,871 (17.8%)	-0.12	74,890 (20.5%)	74,941 (20.5%)	0.00
Cancer	34,146 (6.6%)	100,703 (10.1%)	0.13	26,446 (7.2%)	26,578 (7.3%)	0.00
Other medication use; n (%)						
No. of distinct medications; mean (sd)	13.44 (6.32)	12.32 (5.98)	-0.18	12.90 (6.00)	12.90 (6.27)	0.00
No. of distinct brand medications; mean (sd)	3.03 (1.90)	2.69 (1.89)	-0.18	2.83 (1.84)	2.82 (1.88)	-0.01
ACE inhibitors or angiotensin II receptor blockers	372,265 (71.7%)	729,362 (73.0%)	0.03	263,230 (72.1%)	262,922 (72.1%)	0.00
Beta blockers	183,588 (35.4%)	400,395 (40.1%)	0.10	130,890 (35.9%)	130,648 (35.8%)	0.00
Calcium channel blockers	138,813 (26.7%)	316,557 (31.7%)	0.11	100,578 (27.6%)	100,012 (27.4%)	0.00
Nitrates and other antianginal agents	30,551 (5.9%)	73,135 (7.3%)	0.06	21,742 (6.0%)	21,569 (5.9%)	0.00

Thiazide and thiazide-like diuretics	79,057 (15.2%)	143,624 (14.4%)	-0.02	53,755 (14.7%)	53,560 (14.7%)	0.00
Loop diuretics	75,755 (14.6%)	156,904 (15.7%)	0.03	51,757 (14.2%)	51,596 (14.1%)	0.00
Mineralocorticoid receptor antagonists	23,813 (4.6%)	38,051 (3.8%)	-0.04	14,902 (4.1%)	14,821 (4.1%)	0.00
Other potassium-sparing diuretics and antihypertensive medications	25,873 (5.0%)	74,341 (7.4%)	0.10	20,345 (5.6%)	20,476 (5.6%)	0.00
Digoxin	5,666 (1.1%)	23,574 (2.4%)	0.10	4,608 (1.3%)	4,541 (1.2%)	-0.01
Antiarrhythmics	7,528 (1.5%)	20,533 (2.1%)	0.05	5,540 (1.5%)	5,608 (1.5%)	0.00
Anticoagulants	35,756 (6.9%)	86,096 (8.6%)	0.06	25,522 (7.0%)	25,527 (7.0%)	0.00
Antiplatelet agents	49,068 (9.5%)	115,231 (11.5%)	0.07	35,038 (9.6%)	34,732 (9.5%)	0.00
Statins	365,978 (70.5%)	714,515 (71.5%)	0.02	257,353 (70.5%)	257,159 (70.5%)	0.00
PCSK9 inhibitors and other-lipid lowering agents	77,507 (14.9%)	155,487 (15.6%)	0.02	54,908 (15.0%)	55,144 (15.1%)	0.00
COPD & asthma medications	100,945 (19.4%)	179,114 (17.9%)	-0.04	68,826 (18.9%)	69,000 (18.9%)	0.00
Oral corticosteroids	100,234 (19.3%)	172,835 (17.3%)	-0.05	67,764 (18.6%)	68,160 (18.7%)	0.00
Antiosteoporosis agents	12,018 (2.3%)	46,253 (4.6%)	0.13	9,924 (2.7%)	9,788 (2.7%)	0.00
NSAIDs	149,766 (28.9%)	257,025 (25.7%)	-0.07	101,878 (27.9%)	102,350 (28.0%)	0.00
Opioids	177,270 (34.2%)	327,129 (32.7%)	-0.03	123,540 (33.9%)	124,044 (34.0%)	0.00
Gabapentinoids	95,194 (18.3%)	150,921 (15.1%)	-0.09	61,516 (16.9%)	61,566 (16.9%)	0.00
Antibiotics targeting urinary tract infection	111,102 (21.4%)	237,242 (23.7%)	0.06	80,012 (21.9%)	80,347 (22.0%)	0.00
Antidepressants	176,962 (34.1%)	257,994 (25.8%)	-0.18	113,255 (31.0%)	113,394 (31.1%)	0.00
Anxiolytics/hypnotics	46,834 (9.0%)	76,331 (7.6%)	-0.05	30,547 (8.4%)	30,577 (8.4%)	0.00
Benzodiazepines	71,112 (13.7%)	130,799 (13.1%)	-0.02	48,970 (13.4%)	49,321 (13.5%)	0.00
Antipsychotics	16,302 (3.1%)	29,048 (2.9%)	-0.01	10,496 (2.9%)	10,451 (2.9%)	0.00
Antiparkinsonian medications	17,006 (3.3%)	28,987 (2.9%)	-0.02	11,347 (3.1%)	11,422 (3.1%)	0.00
Dementia medications	6,193 (1.2%)	33,586 (3.4%)	0.15	5,304 (1.5%)	5,195 (1.4%)	-0.01
Potassium binders	470 (0.1%)	1,385 (0.1%)	0.00	364 (0.1%)	357 (0.1%)	0.00
Potassium supplements	41,993 (8.1%)	92,042 (9.2%)	0.04	29,695 (8.1%)	29,744 (8.2%)	0.00
Angiotensin receptor-neprilysin inhibitor	1,958 (0.4%)	2,048 (0.2%)	-0.04	1,098 (0.3%)	1,113 (0.3%)	0.00
Measures of healthcare utilization; n (%)						
Internist visit within prior 31-365 days; n (%)	446,494 (86.0%)	858,127 (85.8%)	-0.01	312,929 (85.8%)	313,040 (85.8%)	0.00
Internist visit within prior 30 days; n (%)	328,484 (63.3%)	681,682 (68.2%)	0.10	238,792 (65.4%)	239,168 (65.5%)	0.00
No. of internist visits; mean (sd)	15.01 (19.87)	15.40 (19.51)	0.02	14.94 (19.41)	14.99 (19.59)	0.00
Endocrinologist within prior 31-365 days; n (%)	90,013 (17.3%)	91,156 (9.1%)	-0.24	48,798 (13.4%)	48,023 (13.2%)	-0.01
Endocrinologist within prior 30 days; n (%)	88,236 (17.0%)	78,552 (7.9%)	-0.28	45,042 (12.3%)	43,983 (12.1%)	-0.01
No. of endocrinologist visits; mean (sd)	1.77 (6.19)	0.89 (4.42)	-0.16	1.35 (5.48)	1.32 (5.39)	-0.01
Cardiologist visit within prior 31-365 days; n (%)	160,416 (30.9%)	346,083 (34.6%)	0.08	112,982 (31.0%)	112,682 (30.9%)	0.00
Cardiologist visit within prior 30 days; n (%)	42,323 (8.2%)	116,580 (11.7%)	0.12	31,106 (8.5%)	31,045 (8.5%)	0.00
No. of cardiologist visits; mean (sd)	2.28 (6.04)	2.98 (7.34)	0.10	2.34 (6.27)	2.33 (6.14)	0.00
Nephrologist within prior 31-365 days; n (%)	26,693 (5.1%)	60,584 (6.1%)	0.04	19,099 (5.2%)	19,193 (5.3%)	0.00
Nephrologist within prior 30 days; n (%)	6,859 (1.3%)	22,627 (2.3%)	0.08	5,185 (1.4%)	5,312 (1.5%)	0.01
No. of nephrologist visits; mean (sd)	0.27 (2.04)	0.36 (2.55)	0.04	0.28 (2.13)	0.28 (2.13)	0.00
No. of electrocardiograms; mean (sd)	1.04 (2.06)	1.24 (2.29)	0.09	1.05 (2.09)	1.04 (1.97)	0.00
No. of cardiac angiographies or echocardiographies; mean (sd)	0.59 (2.16)	0.64 (2.10)	0.02	0.57 (2.02)	0.57 (2.06)	0.00
Cardiovascular stress test; n (%)	51,625 (9.9%)	107,068 (10.7%)	0.03	36,794 (10.1%)	36,625 (10.0%)	0.00
No. of HbA1c tests ordered; mean (sd)	2.56 (1.48)	2.38 (1.42)	-0.12	2.49 (1.44)	2.50 (1.45)	0.01
No. of glucose test ordered; mean (sd)	0.93 (4.46)	0.82 (3.22)	-0.03	0.86 (3.98)	0.87 (3.94)	0.00
No. of microalbuminuria tests ordered; mean (sd)	0.96 (1.08)	0.87 (1.04)	-0.08	0.93 (1.07)	0.94 (1.06)	0.01
No. of metabolic or creatinine tests ordered; mean (sd)	2.83 (2.65)	2.99 (2.76)	0.06	2.81 (2.65)	2.82 (2.56)	0.00

No. of lipid tests ordered; mean (sd)	1.89 (1.71)	1.89 (1.69)	0.00	1.89 (1.73)	1.90 (1.69)	0.01
No. of hospitalizations; mean (sd)	0.13 (0.47)	0.20 (0.58)	0.13	0.13 (0.48)	0.13 (0.46)	0.00
Hospitalization within prior 365 days; n (%)	29,416 (8.0%)	47,210 (9.6%)	0.06	18,142 (7.6%)	18,819 (7.9%)	0.01
Hospitalization within prior 31-365 days; n (%)	26,275 (7.1%)	35,672 (7.3%)	0.01	15,746 (6.6%)	15,853 (6.6%)	0.00
Hospitalization within prior 30 days; n (%)	3,843 (1.0%)	14,295 (2.9%)	0.14	2,959 (1.2%)	3,516 (1.5%)	0.03
Length of stay within prior 365 days; mean (sd)	0.61 (3.07)	1.08 (4.88)	0.12	0.63 (3.29)	0.64 (2.91)	0.00
Length of stay within prior 31-365 days; mean (sd)	0.54 (2.91)	0.76 (4.09)	0.06	0.56 (3.10)	0.56 (2.76)	0.00
Length of stay within prior 30 days; mean (sd)	0.06 (0.69)	0.32 (2.01)	0.17	0.08 (0.79)	0.08 (0.74)	0.00
No. of emergency department visits; mean (sd)	0.44 (1.33)	0.59 (1.57)	0.10	0.46 (1.41)	0.46 (1.27)	0.00
Vitamin D test order; n (%)	155,639 (30.0%)	287,735 (28.8%)	-0.03	107,797 (29.5%)	105,404 (28.9%)	-0.01
Serum potassium test order; n (%)	14,086 (2.7%)	28,288 (2.8%)	0.01	9,808 (2.7%)	9,841 (2.7%)	0.00
Laboratory results[§], mean (sd)						
HbA1c, %	9.0 (2.5)	8.9 (2.4)	-0.06	8.9 (2.5)	9.0 (2.4)	0.02
Missing	412,305 (79.4%)	869,652 (87.0%)	0.20	301,189 (82.5%)	298,079 (81.7%)	-0.02
eGFR, ml/min/1.73m ²	79 (24)	76 (24)	-0.13	79 (24)	79 (24)	-0.02
Missing	410,012 (79.0%)	863,453 (86.4%)	0.20	299,459 (82.1%)	295,434 (81.0%)	-0.03
Urinary albumin-to-creatinine ratio, mg/g	111 (459)	100 (488)	-0.02	102 (431)	102 (493)	0.00
Missing	468,353 (90.2%)	939,833 (94.0%)	0.14	335,335 (91.9%)	333,231 (91.3%)	-0.02
Total cholesterol, mg/dL	187 (59)	186 (60)	-0.02	186 (59)	188 (59)	0.02
Missing	422,884 (81.5%)	878,941 (87.9%)	0.18	306,819 (84.1%)	303,173 (83.1%)	-0.03
LDL cholesterol, mg/dL	104 (47)	104 (47)	-0.01	104 (47)	105 (47)	0.03
Missing	424,138 (81.7%)	880,236 (88.0%)	0.18	307,661 (84.3%)	304,002 (83.3%)	-0.03
HDL cholesterol, mg/dL	48 (19)	48 (19)	0.02	48 (19)	48 (19)	0.02
Missing	424,596 (81.8%)	880,003 (88.0%)	0.17	307,768 (84.3%)	303,890 (83.3%)	-0.03
Triglycerides, mg/dL	211 (168)	200 (155)	-0.07	209 (165)	207 (162)	-0.01
Missing	423,999 (81.7%)	879,645 (88.0%)	0.18	307,487 (84.3%)	303,529 (83.2%)	-0.03
Creatinine, mg/dL	1.01 (0.54)	1.04 (0.50)	0.06	1.01 (0.50)	1.01 (0.50)	0.00
Missing	410,012 (79.0%)	863,453 (86.4%)	0.20	299,459 (82.1%)	295,434 (81.0%)	-0.03
Glucose, mg/dL	195 (100)	193 (94)	-0.02	193 (97)	197 (98)	0.04
Missing	412,712 (79.5%)	867,721 (86.8%)	0.20	301,153 (82.5%)	297,347 (81.5%)	-0.03
Potassium, mmol/L	4.4 (0.4)	4.4 (0.4)	0.03	4.4 (0.4)	4.4 (0.4)	-0.03
Missing	411,559 (79.3%)	865,441 (86.6%)	0.20	300,435 (82.3%)	296,393 (81.2%)	-0.03

ACE = angiotensin-converting enzyme; CDM = Optum's de-identified Clinformatics® Data Mart Database; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; DPP-4i = dipeptidyl peptidase-4 inhibitor; eGFR = estimated glomerular filtration rate; GLP-1RA = glucagon-like peptide-1 receptor agonist; HbA1c = hemoglobin A1c; HDL = high-density lipoprotein; LDL = low-density lipoprotein; n = number of patients; NASH = non-alcoholic steatohepatitis; NAFLD = non-alcoholic fatty liver disease; No. = number of; NSAIDs = Nonsteroidal anti-inflammatory drug; PCSK9 = Proprotein convertase subtilisin/kexin type 9; SGLT2i = sodium-glucose cotransporter-2 inhibitor; sd = standard deviation; SMD = standardized mean difference.

‡ Only available in CDM and Medicare databases. Percentages are relative to sample size of CDM and Medicare databases so total adds up to 100%.

* Northeast (Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont); South (Alabama; Arkansas; Delaware; Florida; Georgia; Kentucky; Louisiana; Maryland; Mississippi; North Carolina; Oklahoma; South Carolina; Tennessee; Texas; Virginia; Washington, DC; West Virginia); Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin); West (Alaska, Arizona, California, Colorado, Hawai'i, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, Wyoming).

† Based on: Gagne JJ, Glynn RJ, Avorn J, Levin R, Schneeweiss S. A combined comorbidity score predicted mortality in elderly patients better than existing scores. *J Clin Epidemiol.* 2011;64(7):749-59.

‡ Based on: Kim DH, Schneeweiss S, Glynn RJ, Lipsitz LA, Rockwood K, Avorn J. Measuring Frailty in Medicare Data: Development and Validation of a Claims-Based Frailty Index. *J Gerontol A Biol Sci Med Sci.* 2018;73(7):980-7

§ Pooled across CDM and MarketScan databases

|| Calculated with the CKD-EPI 2021 creatinine-based equation

Supplemental Table 5. Full list of baseline characteristics in patients with type 2 diabetes, stratified by SGLT-2i vs. GLP-1RA initiation in the pooled cohort, before and after 1:1 propensity score matching.

Covariates	Before matching			After propensity score matching		
	Exposure - SGLT-2i	Comparator - GLP1-RA	St. Diff	Exposure - SGLT-2i	Comparator - GLP1-RA	St. Diff
Number of patients	647,008	585,422		436,730	436,730	
Demographics						
Age; mean (sd)	62.8 (9.5)	61.9 (9.7)	-0.09	62.0 (9.6)	62.1 (9.6)	0.01
Male; n (%)	361,127 (55.8%)	270,247 (46.2%)	-0.19	218,999 (50.1%)	219,612 (50.3%)	0.00
Female; n (%)	285,883 (44.2%)	315,178 (53.8%)	0.19	217,733 (49.9%)	217,120 (49.7%)	0.00
Race/ethnicity [‡] ; n (%)						
White	284,965 (69.1%)	280,947 (72.4%)	0.08	202,025 (71.7%)	201,210 (71.4%)	0.00
Black	43,254 (10.5%)	45,023 (11.6%)	0.04	31,322 (11.1%)	31,444 (11.2%)	0.00
Asian	21,037 (5.1%)	9,475 (2.4%)	-0.11	7,985 (2.8%)	8,445 (3.0%)	0.01
Hispanic	41,948 (10.2%)	35,256 (9.1%)	-0.02	27,183 (9.7%)	27,333 (9.7%)	0.00
Other	21,027 (5.1%)	17,280 (4.5%)	-0.01	13,169 (4.7%)	13,252 (4.7%)	0.00
Calendar time; n (%)						
2013	16,448 (2.5%)	41,452 (7.1%)	0.22	16,174 (3.7%)	17,202 (3.9%)	0.01
2014	72,057 (11.1%)	52,639 (9.0%)	-0.07	44,856 (10.3%)	44,556 (10.2%)	0.00
2015	94,784 (14.6%)	54,996 (9.4%)	-0.16	48,503 (11.1%)	49,220 (11.3%)	0.01
2016	79,767 (12.3%)	60,341 (10.3%)	-0.06	49,719 (11.4%)	49,742 (11.4%)	0.00
2017	84,214 (13.0%)	70,891 (12.1%)	-0.03	55,667 (12.7%)	55,453 (12.7%)	0.00
2018	78,099 (12.1%)	85,605 (14.6%)	0.07	60,067 (13.8%)	59,458 (13.6%)	-0.01
2019	108,212 (16.7%)	105,024 (17.9%)	0.03	77,601 (17.8%)	77,032 (17.6%)	-0.01
2020	57,464 (8.9%)	60,389 (10.3%)	0.05	44,387 (10.2%)	44,241 (10.1%)	0.00
2021	42,651 (6.6%)	42,807 (7.3%)	0.03	31,065 (7.1%)	31,131 (7.1%)	0.00
2022	13,312 (2.1%)	11,278 (1.9%)	-0.01	8,691 (2.0%)	8,695 (2.0%)	0.00
Region [*] ; n (%)						
Northeast	100,166 (15.5%)	79,523 (13.6%)	-0.05	61,287 (14.0%)	61,836 (14.2%)	0.01
South	320,161 (49.5%)	285,173 (48.7%)	-0.02	216,051 (49.5%)	215,733 (49.4%)	0.00
Midwest	123,992 (19.2%)	128,419 (21.9%)	0.07	91,125 (20.9%)	90,714 (20.8%)	0.00
West	102,689 (15.9%)	92,307 (15.8%)	0.00	68,267 (15.6%)	68,447 (15.7%)	0.00
Medicare Advantage; n (%)	3,850 (0.6%)	3,312 (0.6%)	0.00	2,508 (0.6%)	2,472 (0.6%)	0.00
Combined comorbidity score; mean (sd) [‡]	1.1 (1.9)	1.4 (2.0)	0.15	1.2 (2.0)	1.2 (1.9)	0.00
Frailty score; mean (sd) [†]	0.16 (0.04)	0.17 (0.05)	0.22	0.16 (0.05)	0.16 (0.05)	0.00
Frailty score squared; mean (sd) [†]	0.03 (0.02)	0.03 (0.02)	0.00	0.03 (0.02)	0.03 (0.02)	0.00
Frailty score categories; n (%)						
0.00 - 0.14	342,718 (53.0%)	270,738 (46.2%)	-0.14	219,322 (50.2%)	218,943 (50.1%)	0.00
0.15 - 0.24	271,388 (41.9%)	271,009 (46.3%)	0.09	192,003 (44.0%)	192,296 (44.0%)	0.00
>= 0.25	32,902 (5.1%)	43,675 (7.5%)	0.10	25,405 (5.8%)	25,491 (5.8%)	0.00
Lifestyle factors; n (%)						
Overweight	54,635 (8.4%)	41,608 (7.1%)	-0.05	33,149 (7.6%)	33,489 (7.7%)	0.00
Obesity	220,298 (34.0%)	273,402 (46.7%)	0.26	181,823 (41.6%)	180,173 (41.3%)	-0.01
Obese (BMI 30-35 kg/m ²)	91,712 (14.2%)	97,951 (16.7%)	0.07	74,488 (17.1%)	66,209 (15.2%)	-0.05
Severe obese (BMI>35 kg/m ²)	81,211 (12.6%)	127,023 (21.7%)	0.24	70,359 (16.1%)	79,314 (18.2%)	0.06
Smoking	108,482 (16.8%)	111,812 (19.1%)	0.06	77,906 (17.8%)	77,891 (17.8%)	0.00

Alcohol abuse or dependence	6,264 (1.0%)	5,325 (0.9%)	-0.01	4,037 (0.9%)	4,079 (0.9%)	0.00
Drug abuse or dependence	9,744 (1.5%)	11,502 (2.0%)	0.04	7,456 (1.7%)	7,503 (1.7%)	0.00
Diabetes-related conditions; n (%)						
Diabetic nephropathy	76,486 (11.8%)	95,570 (16.3%)	0.13	57,905 (13.3%)	58,320 (13.4%)	0.00
Diabetic retinopathy	60,924 (9.4%)	64,201 (11.0%)	0.05	42,897 (9.8%)	43,186 (9.9%)	0.00
Diabetes with other ophthalmic manifestations	47,797 (7.4%)	43,138 (7.4%)	0.00	30,844 (7.1%)	31,007 (7.1%)	0.00
Diabetic neuropathy	124,118 (19.2%)	138,328 (23.6%)	0.11	91,832 (21.0%)	92,506 (21.2%)	0.00
Diabetes with peripheral circulatory disorders	9,919 (1.5%)	9,127 (1.6%)	0.01	6,262 (1.4%)	6,388 (1.5%)	0.01
Diabetic foot	12,730 (2.0%)	15,903 (2.7%)	0.05	9,768 (2.2%)	9,899 (2.3%)	0.01
Infection of lower extremities (cellulitis or osteomyelitis)	25,037 (3.9%)	27,891 (4.8%)	0.04	18,507 (4.2%)	18,546 (4.2%)	0.00
Lower-limb amputations	2,462 (0.4%)	3,510 (0.6%)	0.03	1,969 (0.5%)	1,991 (0.5%)	0.00
Erectile Dysfunction	32,098 (5.0%)	25,816 (4.4%)	-0.03	20,317 (4.7%)	20,530 (4.7%)	0.00
Hypoglycemia	65,691 (10.2%)	67,673 (11.6%)	0.04	46,861 (10.7%)	47,085 (10.8%)	0.00
Hyperglycemia	247,710 (38.3%)	256,523 (43.8%)	0.11	182,640 (41.8%)	182,071 (41.7%)	0.00
Diabetic ketoacidosis	1,508 (0.2%)	1,743 (0.3%)	0.02	1,086 (0.2%)	1,111 (0.3%)	0.02
Hyperosmolar hyperglycemic nonketotic syndrome	4,746 (0.7%)	5,044 (0.9%)	0.02	3,417 (0.8%)	3,428 (0.8%)	0.00
Diabetes with other complications	53,733 (8.3%)	57,932 (9.9%)	0.06	39,233 (9.0%)	39,460 (9.0%)	0.00
Diabetes mellitus without mention of complications	586,301 (90.6%)	526,669 (90.0%)	-0.02	392,721 (89.9%)	392,854 (90.0%)	0.00
Diabetes treatment; n (%)						
Number of anti-DM medications on day of entry to cohort; mean (sd)	2.44 (0.94)	2.34 (0.95)	-0.11	2.37 (0.94)	2.37 (0.96)	0.00
Diabetes drugs on day of cohort entry						
Metformin	528,334 (81.7%)	432,328 (73.8%)	-0.19	342,059 (78.3%)	341,792 (78.3%)	0.00
Sulfonylureas	263,696 (40.8%)	226,188 (38.6%)	-0.04	173,718 (39.8%)	173,516 (39.7%)	0.00
Thiazolidinediones	60,788 (9.4%)	52,741 (9.0%)	-0.01	40,368 (9.2%)	40,288 (9.2%)	0.00
DPP4i	228,114 (35.3%)	154,072 (26.3%)	-0.20	126,648 (29.0%)	127,553 (29.2%)	0.00
Insulin	127,848 (19.8%)	201,659 (34.4%)	0.33	114,963 (26.3%)	115,746 (26.5%)	0.00
No use of anti-DM medications in prior 365 days	47,098 (7.3%)	46,545 (8.0%)	0.03	34,615 (7.9%)	33,849 (7.8%)	0.00
Past use of metformin	424,689 (65.6%)	330,710 (56.5%)	-0.19	268,298 (61.4%)	267,044 (61.1%)	-0.01
Past use of sulfonylureas	197,970 (30.6%)	165,816 (28.3%)	-0.05	126,714 (29.0%)	130,573 (29.9%)	0.02
Past use of thiazolidinediones	41,489 (6.4%)	35,794 (6.1%)	-0.01	26,480 (6.1%)	28,210 (6.5%)	0.02
Past use of DPP4i	167,441 (25.9%)	94,638 (16.2%)	-0.24	89,633 (20.5%)	80,170 (18.4%)	-0.05
Past use of insulin	93,124 (14.4%)	153,288 (26.2%)	0.30	83,277 (19.1%)	89,051 (20.4%)	0.03
Long term use of insulin	65,942 (10.2%)	114,737 (19.6%)	0.27	60,185 (13.8%)	61,063 (14.0%)	0.01
Miscellaneous anti-DM medications	14,099 (2.2%)	12,707 (2.2%)	0.00	9,185 (2.1%)	9,188 (2.1%)	0.00
Comorbid conditions; n (%)						
Hypertension	511,813 (79.1%)	468,154 (80.0%)	0.02	345,667 (79.1%)	346,112 (79.3%)	0.00
Hyperlipidemia	516,022 (79.8%)	459,030 (78.4%)	-0.03	342,881 (78.5%)	343,544 (78.7%)	0.00
Cardiovascular disease	202,546 (31.3%)	181,612 (31.0%)	-0.01	131,728 (30.2%)	131,703 (30.2%)	0.00
Hypokalemia	13,340 (2.1%)	14,577 (2.5%)	0.03	9,614 (2.2%)	9,614 (2.2%)	0.00
Hyperkalemia	6,997 (1.1%)	8,529 (1.5%)	0.04	5,099 (1.2%)	5,209 (1.2%)	0.00
Acute myocardial infarction	12,414 (1.9%)	9,327 (1.6%)	-0.02	7,064 (1.6%)	7,163 (1.6%)	0.00
Myocardial infarction sequelae	23,464 (3.6%)	20,538 (3.5%)	-0.01	14,837 (3.4%)	14,822 (3.4%)	0.00
Stable angina	32,883 (5.1%)	27,309 (4.7%)	-0.02	20,298 (4.6%)	20,394 (4.7%)	0.00
Unstable angina	14,605 (2.3%)	12,214 (2.1%)	-0.01	9,056 (2.1%)	9,013 (2.1%)	0.00
Coronary atherosclerosis	136,649 (21.1%)	117,352 (20.0%)	-0.03	86,149 (19.7%)	86,497 (19.8%)	0.00
Coronary procedure	12,505 (1.9%)	8,675 (1.5%)	-0.03	6,903 (1.6%)	6,949 (1.6%)	0.00

History of coronary procedure	45,911 (7.1%)	39,217 (6.7%)	-0.02	28,648 (6.6%)	28,645 (6.6%)	0.00
Congestive heart failure	52,505 (8.1%)	51,635 (8.8%)	0.03	34,535 (7.9%)	34,862 (8.0%)	0.00
Cardiomyopathy	21,310 (3.3%)	17,380 (3.0%)	-0.02	12,753 (2.9%)	12,828 (2.9%)	0.00
Atrial fibrillation	47,840 (7.4%)	43,861 (7.5%)	0.00	31,381 (7.2%)	31,448 (7.2%)	0.00
Cardiac conduction disorders	24,996 (3.9%)	22,920 (3.9%)	0.00	16,315 (3.7%)	16,296 (3.7%)	0.00
Other cardiac dysrhythmia	63,185 (9.8%)	59,547 (10.2%)	0.01	42,199 (9.7%)	42,299 (9.7%)	0.00
Valve disorders	55,963 (8.6%)	48,638 (8.3%)	-0.01	35,434 (8.1%)	35,467 (8.1%)	0.00
Other cardiovascular disease	68,364 (10.6%)	65,332 (11.2%)	0.02	45,869 (10.5%)	45,973 (10.5%)	0.00
Ischemic stroke	45,721 (7.1%)	40,703 (7.0%)	0.00	29,450 (6.7%)	29,512 (6.8%)	0.00
Transient ischemic attack	10,679 (1.7%)	9,735 (1.7%)	0.00	7,084 (1.6%)	7,031 (1.6%)	0.00
Other cerebrovascular conditions	28,953 (4.5%)	28,987 (5.0%)	0.02	19,890 (4.6%)	19,905 (4.6%)	0.00
Peripheral arterial disease	53,151 (8.2%)	50,813 (8.7%)	0.02	35,457 (8.1%)	35,803 (8.2%)	0.00
Acute Kidney Injury	15,648 (2.4%)	22,261 (3.8%)	0.08	12,198 (2.8%)	12,370 (2.8%)	0.00
CKD	65,778 (10.2%)	94,599 (16.2%)	0.18	52,839 (12.1%)	53,521 (12.3%)	0.01
CKD Stage 1-2	22,235 (3.4%)	23,061 (3.9%)	0.03	15,712 (3.6%)	15,798 (3.6%)	0.00
CKD Stage 3-4	38,413 (5.9%)	68,029 (11.6%)	0.20	33,695 (7.7%)	34,374 (7.9%)	0.01
CKD Stage 3	36,558 (5.7%)	64,806 (11.1%)	0.20	32,183 (7.4%)	32,875 (7.5%)	0.00
CKD Stage 4	3,747 (0.6%)	10,568 (1.8%)	0.11	3,364 (0.8%)	3,610 (0.8%)	0.00
CKD unspecified	20,955 (3.2%)	33,423 (5.7%)	0.12	17,172 (3.9%)	17,468 (4.0%)	0.01
Hypertensive nephropathy	35,305 (5.5%)	50,733 (8.7%)	0.12	27,469 (6.3%)	27,845 (6.4%)	0.00
Miscellaneous kidney disease	43,703 (6.8%)	52,132 (8.9%)	0.08	32,661 (7.5%)	32,671 (7.5%)	0.00
Urinary tract infection	67,324 (10.4%)	77,377 (13.2%)	0.09	50,605 (11.6%)	50,746 (11.6%)	0.00
Kidney and urinary stone	25,666 (4.0%)	26,256 (4.5%)	0.02	18,267 (4.2%)	18,248 (4.2%)	0.00
Disorders of electrolyte	32,694 (5.1%)	35,626 (6.1%)	0.04	23,157 (5.3%)	23,383 (5.4%)	0.00
Disorders of fluid balance	17,125 (2.6%)	19,126 (3.3%)	0.04	12,234 (2.8%)	12,398 (2.8%)	0.00
Edema	53,604 (8.3%)	64,296 (11.0%)	0.09	40,721 (9.3%)	40,777 (9.3%)	0.00
COPD	53,063 (8.2%)	55,341 (9.5%)	0.05	37,492 (8.6%)	37,682 (8.6%)	0.00
Asthma	48,642 (7.5%)	56,513 (9.7%)	0.08	37,284 (8.5%)	37,133 (8.5%)	0.00
Obstructive sleep apnea	104,821 (16.2%)	130,314 (22.3%)	0.16	84,713 (19.4%)	84,271 (19.3%)	0.00
Pneumonia	21,543 (3.3%)	23,467 (4.0%)	0.04	15,707 (3.6%)	15,693 (3.6%)	0.00
Osteoarthritis	126,962 (19.6%)	134,769 (23.0%)	0.08	92,977 (21.3%)	93,031 (21.3%)	0.00
Osteoporosis without fractures	27,077 (4.2%)	24,415 (4.2%)	0.00	17,630 (4.0%)	17,756 (4.1%)	0.01
Fractures	8,956 (1.4%)	9,987 (1.7%)	0.02	6,712 (1.5%)	6,633 (1.5%)	0.00
Falls	20,672 (3.2%)	23,184 (4.0%)	0.04	15,375 (3.5%)	15,296 (3.5%)	0.00
NASH/NAFLD	36,166 (5.6%)	37,816 (6.5%)	0.04	26,937 (6.2%)	26,870 (6.2%)	0.00
Liver disease	17,581 (2.7%)	15,259 (2.6%)	-0.01	11,329 (2.6%)	11,401 (2.6%)	0.00
Depression	82,686 (12.8%)	105,328 (18.0%)	0.14	67,148 (15.4%)	67,119 (15.4%)	0.00
Anxiety and sleep disorders	113,756 (17.6%)	129,979 (22.2%)	0.12	87,632 (20.1%)	87,181 (20.0%)	0.00
Cancer	46,655 (7.2%)	42,093 (7.2%)	0.00	30,697 (7.0%)	30,774 (7.0%)	0.00
Other medication use; n (%)						
No. of distinct medications; mean (sd)	12.33 (5.91)	13.70 (6.35)	0.22	12.92 (6.15)	12.94 (5.95)	0.00
No. of distinct brand medications; mean (sd)	2.93 (1.91)	3.18 (2.01)	0.13	2.98 (1.94)	3.00 (1.92)	0.01
ACE inhibitors or angiotensin II receptor blockers	476,087 (73.6%)	427,710 (73.1%)	-0.01	319,598 (73.2%)	319,716 (73.2%)	0.00
Beta blockers	231,849 (35.8%)	216,189 (36.9%)	0.02	155,722 (35.7%)	156,071 (35.7%)	0.00
Calcium channel blockers	178,825 (27.6%)	164,844 (28.2%)	0.01	120,189 (27.5%)	120,647 (27.6%)	0.00
Nitrates and other antianginal agents	39,777 (6.1%)	36,413 (6.2%)	0.00	25,640 (5.9%)	25,874 (5.9%)	0.00

Thiazide and thiazide-like diuretics	85,723 (13.2%)	91,055 (15.6%)	0.07	63,538 (14.5%)	63,547 (14.6%)	0.00
Loop diuretics	74,739 (11.6%)	90,799 (15.5%)	0.11	56,323 (12.9%)	56,592 (13.0%)	0.00
Mineralocorticoid receptor antagonists	24,687 (3.8%)	26,886 (4.6%)	0.04	17,491 (4.0%)	17,622 (4.0%)	0.00
Other potassium-sparing diuretics and antihypertensive medications	29,652 (4.6%)	33,014 (5.6%)	0.05	21,795 (5.0%)	21,720 (5.0%)	0.00
Digoxin	9,269 (1.4%)	7,367 (1.3%)	-0.01	5,535 (1.3%)	5,557 (1.3%)	0.00
Antiarrhythmics	9,787 (1.5%)	9,024 (1.5%)	0.00	6,420 (1.5%)	6,424 (1.5%)	0.00
Anticoagulants	43,869 (6.8%)	42,486 (7.3%)	0.02	29,630 (6.8%)	29,736 (6.8%)	0.00
Antiplatelet agents	68,462 (10.6%)	57,394 (9.8%)	-0.03	42,626 (9.8%)	42,905 (9.8%)	0.00
Statins	474,311 (73.3%)	419,304 (71.6%)	-0.04	314,054 (71.9%)	314,785 (72.1%)	0.00
PCSK9 inhibitors and other-lipid lowering agents	107,009 (16.5%)	91,916 (15.7%)	-0.02	68,532 (15.7%)	68,911 (15.8%)	0.00
COPD & asthma medications	108,574 (16.8%)	117,076 (20.0%)	0.08	80,363 (18.4%)	80,249 (18.4%)	0.00
Oral corticosteroids	107,933 (16.7%)	111,454 (19.0%)	0.06	78,588 (18.0%)	78,321 (17.9%)	0.00
Antiosteoporosis agents	19,427 (3.0%)	15,950 (2.7%)	-0.02	11,875 (2.7%)	11,894 (2.7%)	0.00
NSAIDs	175,519 (27.1%)	166,877 (28.5%)	0.03	122,580 (28.1%)	122,366 (28.0%)	0.00
Opioids	192,557 (29.8%)	202,180 (34.5%)	0.10	139,972 (32.1%)	140,140 (32.1%)	0.00
Gabapentinoids	92,583 (14.3%)	107,904 (18.4%)	0.11	70,857 (16.2%)	70,894 (16.2%)	0.00
Antibiotics targeting urinary tract infection	125,701 (19.4%)	129,852 (22.2%)	0.07	90,293 (20.7%)	90,232 (20.7%)	0.00
Antidepressants	164,456 (25.4%)	197,373 (33.7%)	0.18	130,800 (29.9%)	130,342 (29.8%)	0.00
Anxiolytics/hypnotics	47,951 (7.4%)	52,853 (9.0%)	0.06	35,538 (8.1%)	35,579 (8.1%)	0.00
Benzodiazepines	75,571 (11.7%)	80,288 (13.7%)	0.06	55,779 (12.8%)	55,825 (12.8%)	0.00
Antipsychotics	14,843 (2.3%)	18,290 (3.1%)	0.05	11,710 (2.7%)	11,626 (2.7%)	0.00
Antiparkinsonian medications	16,364 (2.5%)	19,728 (3.4%)	0.05	12,620 (2.9%)	12,786 (2.9%)	0.00
Dementia medications	9,670 (1.5%)	8,846 (1.5%)	0.00	6,271 (1.4%)	6,252 (1.4%)	0.00
Potassium binders	454 (0.1%)	706 (0.1%)	0.00	358 (0.1%)	353 (0.1%)	0.00
Potassium supplements	44,764 (6.9%)	49,433 (8.4%)	0.06	33,029 (7.6%)	33,069 (7.6%)	0.00
Angiotensin receptor-neprilysin inhibitor	4,888 (0.8%)	1,877 (0.3%)	-0.07	1,592 (0.4%)	1,678 (0.4%)	0.00
Measures of healthcare utilization; n (%)						
Internist visit within prior 31-365 days; n (%)	558,081 (86.3%)	506,888 (86.6%)	0.01	376,195 (86.1%)	376,504 (86.2%)	0.00
Internist visit within prior 30 days; n (%)	432,905 (66.9%)	375,654 (64.2%)	-0.06	286,238 (65.5%)	286,265 (65.5%)	0.00
No. of internist visits; mean (sd)	14.86 (19.24)	15.32 (20.02)	0.02	14.94 (19.18)	14.96 (19.47)	0.00
Endocrinologist within prior 31-365 days; n (%)	80,537 (12.4%)	97,475 (16.7%)	0.12	62,230 (14.2%)	62,779 (14.4%)	0.01
Endocrinologist within prior 30 days; n (%)	73,802 (11.4%)	97,592 (16.7%)	0.15	59,815 (13.7%)	60,318 (13.8%)	0.00
No. of endocrinologist visits; mean (sd)	1.27 (5.32)	1.68 (5.93)	0.07	1.45 (5.51)	1.46 (5.69)	0.00
Cardiologist visit within prior 31-365 days; n (%)	197,957 (30.6%)	187,685 (32.1%)	0.03	133,403 (30.5%)	133,884 (30.7%)	0.00
Cardiologist visit within prior 30 days; n (%)	63,320 (9.8%)	49,484 (8.5%)	-0.05	37,711 (8.6%)	37,854 (8.7%)	0.00
No. of cardiologist visits; mean (sd)	2.46 (6.48)	2.40 (6.33)	-0.01	2.31 (6.03)	2.32 (6.29)	0.00
Nephrologist within prior 31-365 days; n (%)	21,440 (3.3%)	36,655 (6.3%)	0.14	17,705 (4.1%)	18,135 (4.2%)	0.01
Nephrologist within prior 30 days; n (%)	6,899 (1.1%)	9,634 (1.6%)	0.04	5,070 (1.2%)	5,245 (1.2%)	0.00
No. of nephrologist visits; mean (sd)	0.17 (2.04)	0.33 (2.36)	0.07	0.21 (2.30)	0.22 (1.90)	0.00
No. of electrocardiograms; mean (sd)	1.04 (2.06)	1.07 (2.07)	0.01	1.02 (1.98)	1.03 (2.06)	0.00
No. of cardiac angiographies or echocardiographies; mean (sd)	0.64 (2.47)	0.59 (2.07)	-0.02	0.58 (2.15)	0.58 (2.12)	0.00
Cardiovascular stress test; n (%)	66,168 (10.2%)	60,364 (10.3%)	0.00	43,690 (10.0%)	43,952 (10.1%)	0.00
No. of HbA1c tests ordered; mean (sd)	2.52 (1.44)	2.59 (1.48)	0.05	2.54 (1.45)	2.55 (1.46)	0.01
No. of glucose test ordered; mean (sd)	0.80 (1.97)	0.96 (4.75)	0.04	0.83 (1.97)	0.84 (2.44)	0.00
No. of microalbuminuria tests ordered; mean (sd)	0.95 (1.06)	0.98 (1.10)	0.03	0.95 (1.06)	0.95 (1.07)	0.00
No. of metabolic or creatinine tests ordered; mean (sd)	2.72 (2.47)	2.91 (2.68)	0.07	2.76 (2.48)	2.77 (2.57)	0.00

No. of lipid tests ordered; mean (sd)	1.98 (1.75)	1.91 (1.71)	-0.04	1.93 (1.66)	1.94 (1.75)	0.01
No. of hospitalizations; mean (sd)	0.12 (0.44)	0.14 (0.48)	0.04	0.12 (0.44)	0.12 (0.45)	0.00
Hospitalization within prior 365 days; n (%)	31,904 (7.4%)	31,351 (8.0%)	0.02	21,812 (7.4%)	21,698 (7.3%)	0.00
Hospitalization within prior 31-365 days; n (%)	27,038 (6.2%)	28,089 (7.2%)	0.04	19,105 (6.5%)	19,098 (6.5%)	0.00
Hospitalization within prior 30 days; n (%)	5,977 (1.4%)	3,998 (1.0%)	-0.04	3,302 (1.1%)	3,157 (1.1%)	0.00
Length of stay within prior 365 days; mean (sd)	0.55 (2.92)	0.63 (3.11)	0.03	0.56 (2.85)	0.56 (3.05)	0.00
Length of stay within prior 31-365 days; mean (sd)	0.46 (2.70)	0.57 (2.94)	0.04	0.49 (2.68)	0.50 (2.85)	0.00
Length of stay within prior 30 days; mean (sd)	0.08 (0.82)	0.06 (0.70)	-0.03	0.07 (0.71)	0.07 (0.73)	0.00
No. of emergency department visits; mean (sd)	0.38 (1.19)	0.47 (1.37)	0.07	0.41 (1.23)	0.41 (1.27)	0.00
Vitamin D test order; n (%)	179,972 (27.8%)	178,049 (30.4%)	0.06	124,020 (28.4%)	127,095 (29.1%)	0.02
Serum potassium test order; n (%)	14,770 (2.3%)	16,511 (2.8%)	0.03	10,873 (2.5%)	10,923 (2.5%)	0.00
Laboratory results[§], mean (sd)						
HbA1c, %	9.0 (2.4)	9.0 (2.5)	0.02	9.0 (2.4)	9.0 (2.5)	0.00
Missing	523,207 (80.9%)	474,600 (81.1%)	0.01	351,476 (80.5%)	353,881 (81.0%)	0.01
eGFR, ml/min/1.73m ²	80 (23)	78 (25)	-0.06	80 (23)	79 (24)	-0.04
Missing	520,397 (80.4%)	471,859 (80.6%)	0.01	349,175 (80.0%)	352,314 (80.7%)	0.02
Urinary albumin-to-creatinine ratio, mg/g	98 (445)	116 (476)	0.04	104 (464)	105 (449)	0.00
Missing	587,863 (90.9%)	532,739 (91.0%)	0.00	396,081 (90.7%)	397,090 (90.9%)	0.01
Total cholesterol, mg/dL	184 (59)	185 (59)	0.02	185 (60s)	184 (59)	-0.02
Missing	533,624 (82.5%)	485,529 (82.9%)	0.01	359,005 (82.2%)	361,606 (82.8%)	0.02
LDL cholesterol, mg/dL	102 (47)	103 (46)	0.01	103 (47)	103 (46)	-0.02
Missing	535,412 (82.8%)	486,549 (83.1%)	0.01	360,216 (82.5%)	362,406 (83.0%)	0.01
HDL cholesterol, mg/dL	48 (19)	48 (19)	0.01	48 (19)	48 (19)	-0.01
Missing	535,310 (82.7%)	487,139 (83.2%)	0.01	360,268 (82.5%)	362,762 (83.1%)	0.02
Triglycerides, mg/dL	208 (166)	208 (163)	0.00	210 (168)	208 (164)	-0.01
Missing	534,352 (82.6%)	486,645 (83.1%)	0.01	359,516 (82.3%)	362,428 (83.0%)	0.02
Creatinine, mg/dL	1.00 (0.46)	1.02 (0.54)	0.04	0.99 (0.47)	1.01 (0.51)	0.04
Missing	520,397 (80.4%)	471,859 (80.6%)	0.01	349,175 (80.0%)	352,314 (80.7%)	0.02
Glucose, mg/dL	197 (94)	197 (99)	0.00	198 (95)	197 (98)	-0.01
Missing	523,801 (81.0%)	474,907 (81.1%)	0.00	351,494 (80.5%)	354,502 (81.2%)	0.02
Potassium, mmol/L	4.4 (0.4)	4.4 (0.4)	-0.03	4.4 (0.4)	4.4 (0.4)	0.03
Missing	522,419 (80.7%)	473,467 (80.9%)	0.01	350,488 (80.3%)	353,534 (81.0%)	0.02

ACE = angiotensin-converting enzyme; CDM = Optum's de-identified Clinformatics® Data Mart Database; CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disease; DPP-4i = dipeptidyl peptidase-4 inhibitor; eGFR = estimated glomerular filtration rate; GLP-1RA = glucagon-like peptide-1 receptor agonist; HbA1c = hemoglobin A1c; HDL = high-density lipoprotein; LDL = low-density lipoprotein; n = number of patients; NASH = non-alcoholic steatohepatitis; NAFLD = non-alcoholic fatty liver disease; No. = number of; NSAIDs = Nonsteroidal anti-inflammatory drug; PCSK9 = Proprotein convertase subtilisin/kexin type 9; SGLT2i = sodium-glucose cotransporter-2 inhibitor; sd = standard deviation; SMD = standardized mean difference.

‡ Only available in CDM and Medicare databases. Percentages are relative to sample size of CDM and Medicare databases so total adds up to 100%.

* Northeast (Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont); South (Alabama; Arkansas; Delaware; Florida; Georgia; Kentucky; Louisiana; Maryland; Mississippi; North Carolina; Oklahoma; South Carolina; Tennessee; Texas; Virginia; Washington, DC; West Virginia); Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin); West (Alaska, Arizona, California, Colorado, Hawai'i, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, Wyoming).

† Based on: Gagne JJ, Glynn RJ, Avorn J, Levin R, Schneeweiss S. A combined comorbidity score predicted mortality in elderly patients better than existing scores. *J Clin Epidemiol.* 2011;64(7):749-59.

‡ Based on: Kim DH, Schneeweiss S, Glynn RJ, Lipsitz LA, Rockwood K, Avorn J. Measuring Frailty in Medicare Data: Development and Validation of a Claims-Based Frailty Index. *J Gerontol A Biol Sci Med Sci.* 2018;73(7):980-7

§ Pooled across CDM and MarketScan databases

|| Calculated with the CKD-EPI 2021 creatinine-based equation

Supplemental Table 6. Individual SGLT-2i, GLP-1RA and DPP-4i agents included in the analysis after 1:1 propensity score matching.

	SGLT-2i vs. DPP-4i		GLP-1RA vs. DPP-4i		SGLT-2i vs. GLP-1RA	
	SGLT-2i	DPP-4i	GLP-1RA	DPP-4i	SGLT-2i	GLP-1RA
Canagliflozin	150,685 (38.7%)	-	-	-	152,915 (35.0%)	-
Dapagliflozin	79,234 (20.3%)	-	-	-	85,008 (19.5%)	-
Empagliflozin	158,651 (40.7%)	-	-	-	197,312 (45.2%)	-
Ertugliflozin	884 (0.2%)	-	-	-	1,495 (0.3%)	-
Liraglutide	-	-	135,798 (37.2%)	-	-	149,928 (34.3%)
Exenatide	-	-	57,330 (15.7%)	-	-	66,151 (15.1%)
Dulaglutide	-	-	116,011 (31.8%)	-	-	144,558 (33.1%)
Albiglutide	-	-	6,724 (1.8%)	-	-	7,931 (1.8%)
Lixisenatide	-	-	1,692 (0.5%)	-	-	2,515 (0.6%)
Semaglutide	-	-	47,356 (13.0%)	-	-	65,651 (15.0%)
Linagliptin	-	73,420 (18.85%)	-	81,774 (22.4%)	-	-
Saxagliptin	-	29,905 (7.68%)	-	27,924 (7.7%)	-	-
Alogliptin	-	6,500 (1.67%)	-	5,757 (1.6%)	-	-
Sitagliptin	-	279,629 (71.80%)	-	249,455 (68.4%)	-	-

DPP-4i = dipeptidyl peptidase-4 inhibitor; GLP-1RA = glucagon-like peptide-1 receptor agonist; SGLT2i = sodium-glucose cotransporter-2 inhibitor.

Supplemental Table 7. Follow-up and censoring reasons after 1:1 propensity score matching for (A) SGLT-2i vs. DPP-4i, (B) GLP-1RA vs. DPP-4i and (C) SGLT-2i vs. GLP-1RA.

A. SGLT-2i vs. DPP-4i	Overall population N = 778,908	SGLT-2i N = 389,454	DPP-4i N = 389,454
Follow-up, mean (sd), days	267 (313)	272 (322)	262 (303)
Follow-up, median (25 th , 75 th , IQR), days	147 (69, 328, 259)	148 (64, 335, 271)	145 (74, 321, 247)
Censoring reasons (%)			
Treatment discontinuation	492,802 (63.3)	245,031 (62.9)	247,771 (63.6)
End of study	117,308 (15.1)	61,940 (15.9)	55,368 (14.2)
Treatment switching	46,405 (6.0)	20,112 (5.2)	26,293 (6.8)
Disenrollment	105,740 (13.6)	55,382 (14.22)	50,358 (12.9)
Hyperkalemia outcome	12,444 (1.6)	5,351 (1.4)	7,093 (1.8)
Mortality	4,209 (0.5)	1,638 (0.4)	2,571 (0.7)
Number of patients with ≥1 year follow-up on treatment (%)	172,463 (22.1)	88,591 (22.7)	83,872 (21.5)
Number of patients with ≥2 year follow-up on treatment (%)	61,556 (7.9)	32,410 (8.3)	29,146 (7.5)

B. GLP-1RA vs. DPP-4i	Overall population N = 729,820	GLP-1RA N = 364,910	DPP-4i N = 364,910
Follow-up, mean (sd), days	252 (299)	239 (290)	265 (308)
Follow-up, median (25 th , 75 th , IQR), days	134 (58, 306, 248)	146 (74, 326, 252)	121 (58, 286, 228)
Censoring reasons (%)			
Treatment discontinuation	480,331 (65.81)	250,998 (68.8)	229,333 (62.9)
End of study	109,312 (15.0)	54,258 (14.9)	55,054 (15.1)
Treatment switching	29,942 (4.1)	7,744 (2.1)	22,198 (6.1)
Disenrollment	93,175 (12.8)	45,122 (12.4)	48,053 (13.2)
Hyperkalemia outcome	12,845 (1.8)	5,296 (1.5)	7,549 (2.1)
Mortality	4,215 (0.6)	1,492 (0.4)	2,723 (0.8)
Number of patients with ≥1 year follow-up on treatment (%)	149,138 (20.4)	69,227 (19.0)	79,911 (21.9)
Number of patients with ≥2 year follow-up on treatment (%)	51,677 (7.1)	24,177 (6.6)	27,500 (7.5)

C. SGLT-2i vs. GLP-1RA	Overall population N = 873,460	SGLT-2i N = 436,730	GLP-1RA N = 436,730
Follow-up, mean (sd), days	245 (291)	250 (294)	240 (288)
Follow-up, median (25 th , 75 th , IQR), days	130 (58, 299, 241)	136 (58, 307, 249)	125 (58, 291, 233)
Censoring reasons (%)			
Treatment discontinuation	539,318 (61.8)	260,880 (59.7)	278,438 (63.8)
End of study	146,433 (16.8)	75,741 (17.3)	70,692 (16.2)
Treatment switching	61,941 (7.1)	33,635 (7.7)	28,306 (6.5)
Disenrollment	110,003 (12.6)	58,535 (13.4)	51,468 (11.8)
Hyperkalemia outcome	12,276 (1.4)	6,107 (1.4)	6,169 (1.4)
Mortality	3,489 (0.4)	1,832 (0.4)	1,657 (0.4)
Number of patients with ≥1 year follow-up on treatment (%)	162,763 (18.6)	83,824 (19.2)	78,939 (18.1)
Number of patients with ≥2 year follow-up on treatment (%)	55,507 (6.4)	28,618 (6.6)	26,889 (6.2)

DPP-4i = dipeptidyl peptidase-4 inhibitor; GLP-1RA = glucagon-like peptide-1 receptor agonist; SD = standard deviation; IQR = interquartile range; SGLT-2i = sodium-glucose cotransporter 2 inhibitor.

Supplemental Table 8. Absolute risks and risk differences for the primary outcome at 6-month intervals for SGLT-2i vs. DPP-4i, GLP-1RA vs. DPP-4i and SGLT-2i vs. GLP-1RA after 1:1 propensity score matching.

	Absolute risk SGLT-2i, % (95% CI)	Absolute risk DPP-4i, % (95% CI)	Absolute risk difference, % (95% CI)*
6 months	1.1% (1.0% to 1.1%)	1.3% (1.3% to 1.4%)	-0.2% (-0.3% to -0.2%)
12 months	1.9% (1.8% to 1.9%)	2.5% (2.4% to 2.5%)	-0.6% (-0.7% to -0.5%)
18 months	2.6% (2.5% to 2.7%)	3.6% (3.4% to 3.7%)	-1.0% (-1.1% to -0.8%)
24 months	3.3% (3.2% to 3.4%)	4.6% (4.5% to 4.8%)	-1.3% (-1.5% to -1.1%)
30 months	4.0% (3.9% to 4.2%)	5.8% (5.6% to 6.0%)	-1.8% (-2.1% to -1.6%)
36 months	4.6% (4.4% to 4.7%)	7.0% (6.7% to 7.2%)	-2.4% (-2.7% to -2.1%)

* DPP-4i group taken as reference, i.e., a negative risk difference favors the SGLT-2i group, whereas a positive risk difference favors the DPP-4i group.

	Absolute risk GLP-1RA, % (95% CI)	Absolute risk DPP-4i, % (95% CI)	Absolute risk difference, % (95% CI)*
6 months	1.2% (1.1% to 1.2%)	1.5% (1.5% to 1.6%)	-0.3% (-0.4% to -0.3%)
12 months	2.2% (2.1% to 2.3%)	2.8% (2.7% to 2.9%)	-0.6% (-0.7% to -0.5%)
18 months	3.1% (3.0% to 3.2%)	4.0% (3.9% to 4.1%)	-0.9% (-1.1% to -0.7%)
24 months	4.0% (3.9% to 4.2%)	5.2% (5.0% to 5.3%)	-1.2% (-1.4% to -0.9%)
30 months	4.9% (4.7% to 5.1%)	6.5% (6.3% to 6.7%)	-1.5% (-1.8% to -1.2%)
36 months	5.7% (5.5% to 6.0%)	7.5% (7.2% to 7.8%)	-1.8% (-2.1% to -1.4%)

* DPP-4i group taken as reference, i.e., a negative risk difference favors the GLP-1RA group, whereas a positive risk difference favors the DPP-4i group.

	Absolute risk SGLT-2i, % (95% CI)	Absolute risk GLP-1RA, % (95% CI)	Absolute risk difference, % (95% CI)*
6 months	1.1% (1.1% to 1.2%)	1.1% (1.1% to 1.2%)	0.0% (0.0% to 0.1%)
12 months	2.0% (2.0% to 2.1%)	2.1% (2.1% to 2.2%)	-0.1% (-0.2% to 0.0%)
18 months	2.8% (2.7% to 2.9%)	3.1% (3.0% to 3.2%)	-0.3% (-0.5% to -0.2%)
24 months	3.5% (3.4% to 3.6%)	4.0% (3.9% to 4.2%)	-0.6% (-0.7% to -0.4%)
30 months	4.2% (4.0% to 4.4%)	5.1% (4.9% to 5.3%)	-0.9% (-1.1% to -0.6%)
36 months	4.7% (4.5% to 4.9%)	6.0% (5.7% to 6.2%)	-1.2% (-1.5% to -0.9%)

* GLP-1RA group taken as reference, i.e., a negative risk difference favors the SGLT-2i group, whereas a positive risk difference favors the GLP-1RA group.

Supplemental Table 9. Comparative effectiveness of (A) SGLT-2i versus DPP-4i, (B) GLP-1RA vs. DPP-4i and (C) SGLT-2i vs. GLP-1RA on risk of serum potassium ≥ 5.5 mmol/L (secondary outcome) after 1:1 propensity score matching.

A. SGLT-2i vs. DPP-4i	SGLT-2i	DPP-4i
Sample size, n	30,416	30,416
Total events, n	682	781
Follow-up, PY	21,390	20,939
Incidence rate/1,000PY (95% CI)	31.88 (29.54 to 34.37)	37.30 (34.73 to 40.01)
Rate difference/1,000PY (95% CI)	-5.41 (-8.96 to -1.87)	Ref
HR (95% CI)	0.86 (0.78 to 0.95)	Ref

B. GLP-1RA vs. DPP-4i	GLP-1RA	DPP-4i
Sample size, n	28,184	28,184
Total events, n	527	709
Follow-up, PY	17,899	19,649
Incidence rate/1,000PY (95% CI)	29.44 (26.98 to 32.07)	36.08 (33.48 to 38.84)
Rate difference/1,000PY (95% CI)	-6.64 (-10.30 to -2.98)	Ref
HR (95% CI)	0.82 (0.73 to 0.91)	Ref

C. SGLT-2i vs. GLP-1RA	SGLT-2i	GLP-1RA
Sample size, n	36,065	36,065
Total events, n	700	639
Follow-up, PY	23,544	21,814
Incidence rate/1,000PY (95% CI)	29.73 (27.57 to 32.02)	29.29 (27.07 to 31.66)
Rate difference/1,000PY (95% CI)	0.44 (-2.73 to 3.60)	Ref
HR (95% CI)	1.01 (0.91 to 1.12)	Ref

CI = confidence interval; DPP-4i = dipeptidyl peptidase-4 inhibitor; GLP-1RA = glucagon-like peptide-1 receptor agonist; HR = hazard ratio; PY = person-years; Ref = reference; SGLT-2i = sodium-glucose cotransporter-2 inhibitor.

Supplemental Table 10. Comparative effectiveness of (A) SGLT-2i versus DPP-4i, (B) GLP-1RA vs. DPP-4i and (C) SGLT-2i vs. GLP-1RA on risk of hyperkalemia diagnosis in inpatient or emergency department setting (secondary outcome) after 1:1 propensity score matching.

A. SGLT-2i vs. DPP-4i	SGLT-2i	DPP-4i
Sample size, n	389,454	389,454
Total events, n	657	844
Follow-up, PY	293,154	284,671
Incidence rate/1,000PY (95% CI)	2.24 (2.07 to 2.42)	2.96 (2.77 to 3.17)
Rate difference/1,000PY (95% CI)	-0.72 (-0.99 to -0.46)	Ref
HR (95% CI)	0.77 (0.69 to 0.85)	Ref

B. GLP-1RA vs. DPP-4i	GLP-1RA	DPP-4i
Sample size, n	364,910	364,910
Total events, n	638	1,106
Follow-up, PY	242,282	269,539
Incidence rate/1,000PY (95% CI)	2.63 (2.43 to 2.85)	4.10 (3.87 to 4.35)
Rate difference/1,000PY (95% CI)	-1.47 (-1.79 to -1.15)	Ref
HR (95% CI)	0.65 (0.59 to 0.72)	Ref

C. SGLT-2i vs. GLP-1RA	SGLT-2i	GLP-1RA
Sample size, n	436,730	436,730
Total events, n	741	705
Follow-up, PY	312,063	282,902
Incidence rate/1,000PY (95% CI)	2.37 (2.21 to 2.55)	2.49 (2.31 to 2.68)
Rate difference/1,000PY (95% CI)	-0.12 (-0.37 to 0.13)	Ref
HR (95% CI)	0.96 (0.86 to 1.06)	Ref

CI = confidence interval; DPP-4i = dipeptidyl peptidase-4 inhibitor; GLP-1RA = glucagon-like peptide-1 receptor agonist; HR = hazard ratio; PY = person-years; Ref = reference; SGLT-2i = sodium-glucose cotransporter-2 inhibitor.

Supplemental Table 11. Sensitivity analyses: Incidence rate differences and hazard ratios for (A) SGLT-2i vs. DPP-4i, (B) GLP-1RA vs. DPP-4i and (C) SGLT-2i vs. GLP-1RA after 1:1 propensity score matching.

A. SGLT-2i vs. DPP-4i	Main analysis	60-day grace period	180-day ITT follow-up	365-day ITT follow-up	No history of hyperkalemia or potassium binder use in previous 365 days*
Incidence rate difference/ 1,000PY (95% CI)	-6.88 (-7.65 to -6.11)	-7.40 (-8.08 to -6.72)	-4.04 (-5.07 to -3.00)	-5.00 (-5.77 to -4.23)	-6.08 (-6.82 to -5.34)
Hazard ratio (95% CI)	0.75 (0.73 to 0.78)	0.73 (0.71 to 0.75)	0.85 (0.81 to 0.88)	0.82 (0.79 to 0.84)	0.76 (0.73 to 0.79)

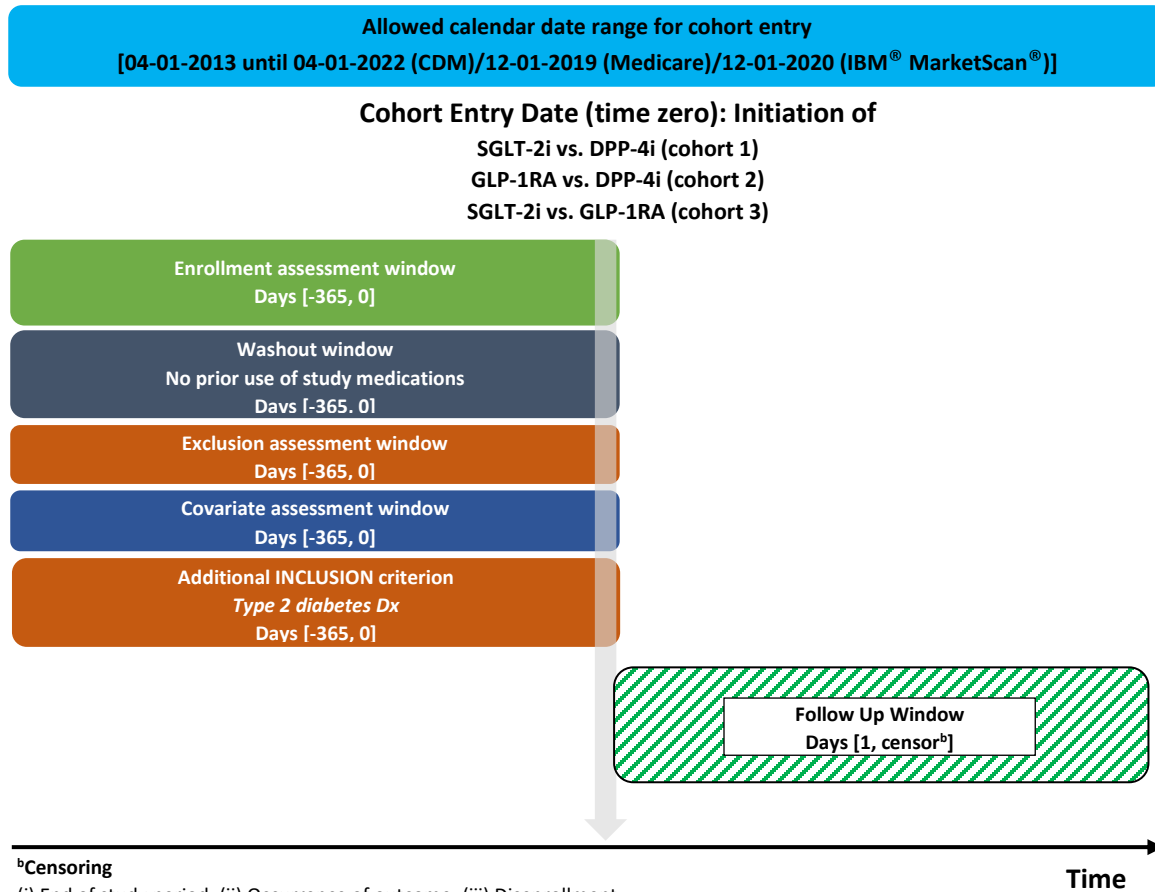
B. GLP-1RA vs. DPP-4i	Main analysis	60-day grace period	180-day ITT follow-up	365-day ITT follow-up	No history of hyperkalemia or potassium binder use in previous 365 days*
Incidence rate difference/ 1,000PY (95% CI)	-6.36 (-7.24 to -5.48)	-6.26 (-7.02 to -5.49)	-4.58 (-5.72 to -3.44)	-3.64 (-4.44 to -2.84)	-5.44 (-6.27 to -4.61)
Hazard ratio (95% CI)	0.79 (0.77 to 0.82)	0.79 (0.76 to 0.82)	0.85 (0.82 to 0.89)	0.87 (0.84 to 0.90)	0.80 (0.77 to 0.83)

C. SGLT-2i vs. GLP-1RA	Main analysis	60-day grace period	180-day ITT follow-up	365-day ITT follow-up	No history of hyperkalemia or potassium binder use in previous 365 days*
Incidence rate difference/ 1,000PY (95% CI)	-2.31 (-3.05 to -1.57)	-2.84 (-3.49 to -2.19)	-0.09 (-1.06 to 0.88)	-1.75 (-2.45 to -1.04)	-2.11 (-2.81 to -1.41)
Hazard ratio (95% CI)	0.92 (0.89 to 0.95)	0.89 (0.86 to 0.91)	1.00 (0.96 to 1.04)	0.92 (0.89 to 0.96)	0.91 (0.88 to 0.94)

CI = confidence interval; DPP-4i = dipeptidyl peptidase-4 inhibitor; GLP-1RA = glucagon-like peptide-1 receptor agonist; ITT = intention-to-treat; PY = person-years; SGLT-2i = sodium-glucose cotransporter 2 inhibitor.

* Outcome for this sensitivity analysis was “hyperkalemia diagnosis in inpatient or outpatient setting or initiation of potassium binder during follow-up”.

Supplemental Figure 1. Overview of study design.



CDM = Optum's de-identified Clinformatics® Data Mart Database; DPP-4i = dipeptidyl peptidase-4 inhibitor; GLP-1RA = glucagon-like peptide-1 receptor agonist; ITT = intention-to-treat; SGLT-2i = sodium-glucose cotransporter 2 inhibitor.