

SUPPLEMENTAL MATERIAL

SUPPLEMENTAL TABLES

Supplemental Table 1. Inclusion and Exclusion Criteria Diagnosis Codes

Concept code	Concept name	Vocabulary
<i>Inclusion Criteria</i>		
Type 2 diabetes		
250.x0	Diabetes, type II or unspecified type, not stated as uncontrolled	ICD-9
250.x2	Diabetes, type II or unspecified type, uncontrolled	ICD-9
E11.x	Type 2 diabetes mellitus	ICD-10
Cerebrovascular disease		
430	Subarachnoid hemorrhage	ICD-9
431	Intracerebral hemorrhage	ICD-9
432.x	Other and unspecified intracranial hemorrhage	ICD-9
433.x	Occlusion and stenosis of precerebral arteries	ICD-9
434.x	Occlusion of cerebral arteries	ICD-9
435.x	Transient cerebral ischemia	ICD-9
436	Acute, but ill-defined, cerebrovascular disease	ICD-9
437.x	Other and ill-defined cerebrovascular disease	ICD-9
438.x	Late effects of cerebrovascular disease	ICD-9
I60.x-I69.x	Cerebrovascular diseases	ICD-10
G45.x	Transient cerebral ischemic attacks and related syndromes	ICD-10
Coronary artery disease		
410.x-414.x	Ischemic heart disease	ICD-9
I20.x	Angia pectoris	ICD-10
I21.x	ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction	ICD-10
I22.x	Subsequent ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction	ICD-10
I23.x	Certain current complications following ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction (within the 28 day period)	ICD-10
I24.0	Acute coronary thrombosis not resulting in myocardial infarction	ICD-10
I25.x	Chronic ischemic heart disease	ICD-10

Heart failure

428.x	Heart failure	ICD-9
150.x	Heart failure	ICD-10

Peripheral artery disease

440.2x	Atherosclerosis of native arteries of the extremities	ICD-9
443.81	Peripheral angiopathy in diseases classified elsewhere	ICD-9
443.89	Other specified peripheral vascular diseases	ICD-9
443.9	Peripheral vascular disease, unspecified	ICD-9
447.1	Stricture of artery	ICD-9
447.2	Rupture of artery	ICD-9
447.6	Arteritis, unspecified	ICD-9
447.8	Other specified disorders of arteries and arterioles	ICD-9
447.9	Unspecified disorders of arteries and arterioles	ICD-9
459.2	Compression of vein	ICD-9
459.3x	Chronic venous hypertension (idiopathic)	ICD-9
459.8x	Other specified diseases of the circulatory system	ICD-9
459.9	Unspecified circulatory system disorder	ICD-9
I70.2x	Atherosclerosis of native arteries of the extremities	ICD-10
I73.89	Other specified peripheral vascular diseases	ICD-10
I73.9	Peripheral vascular disease, unspecified	ICD-10
I77.1	Stricture of artery	ICD-10
I77.2	Rupture of artery	ICD-10
I77.6	Arteritis, unspecified	ICD-10
I77.8	Other specified disorders of arteries and arterioles	ICD-10
I77.9	Disorders of arteries and arterioles, unspecified	ICD-10
I79.8	Other disorders of arteries, arterioles and capillaries in diseases classified elsewhere	ICD-10
I87.1	Compression of vein	ICD-10
I87.3x	Chronic venous hypertension (idiopathic)	ICD-10
I99.8	Other disorder of the circulatory system	ICD-10
I99.9	Unspecified disorder of the circulatory system	ICD-10

Concept code	Concept name	Vocabulary
Exclusion Criteria		
Type 1 diabetes		
250.x1	Diabetes, type I [juvenile type], not stated as uncontrolled	ICD-9
250.x3	Diabetes, type I [juvenile type], uncontrolled	ICD-9
E10.x	Type 1 diabetes mellitus	ICD-10
Secondary diabetes		
249.x	Secondary diabetes mellitus	ICD-9
E08.x	Diabetes mellitus due to underlying condition	ICD-10
E09.x	Drug or chemical induced diabetes mellitus	ICD-10
E13.x	Other specified diabetes mellitus	ICD-10

Abbreviations: ICD-9, *International Classification of Disease, Ninth Revision*; ICD-10, *International Classification of Disease, Tenth Revision*.

Supplemental Table 2. Procedure and Diagnosis Codes for HHF, Stroke, MI, and BKA

Concept code	Concept name	Vocabulary
HHF		
428.x	Heart failure	ICD-9
150.x	Heart failure	ICD-10
Stroke		
433.x1	Occlusion and stenosis of precerebral arteries- carotid artery	ICD-9
434.x1	Occlusion of cerebral arteries- cerebral embolism	ICD-9
436	Acute but ill-defined cerebrovascular disease	ICD-9
I63.x	Cerebral infarction	ICD-10
I67.8x	Other specified cerebrovascular disease	ICD-10
430	Subarachnoid hemorrhage	ICD-9
431	Intracerebral hemorrhage	ICD-9
I60.x	Nontraumatic subarachnoid hemorrhage	ICD-10
I61.x	Nontraumatic intracerebral hemorrhage	ICD-10
MI		
410.x	Acute myocardial infarction	ICD-9
I21.x	ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction	ICD-10
BKA		
27880	Amputation, leg, through tibia and fibula	CPT-4
27881	Amputation, leg, through tibia and fibula; with immediate fitting technique including application of first cast	CPT-4
27882	Amputation, leg, through tibia and fibula; open, circular (guillotine)	CPT-4
27886	Amputation, leg, through tibia and fibula; re-amputation	CPT-4
27888	Amputation, ankle, through malleoli of tibia and fibula (eg, Syme, Pirogoff type procedures), with plastic closure and resection of nerves	CPT-4
28800	Amputation, foot; midtarsal (eg, Chopart type procedure)	CPT-4
28805	Amputation, foot; transmetatarsal	CPT-4
28810	Amputation, metatarsal, with toe, single	CPT-4
28820	Amputation, toe; metatarsophalangeal joint	CPT-4
28825	Amputation, toe; interphalangeal joint	CPT-4
84.11	Amputation of toe	ICD-9
84.12	Amputation through foot	ICD-9
84.13	Disarticulation of ankle	ICD-9
84.14	Amputation of ankle through malleoli of tibia and fibula	ICD-9
84.15	Other amputation below knee	ICD-9
84.16	Disarticulation of knee	ICD-9

Abbreviations: HHF, hospitalization for heart failure; MI, myocardial infarction; BKA, below-knee lower extremity amputation; CPT-4, *Current Procedural Terminology, 4th Edition*; ICD-9, *International Classification of Disease, Ninth Revision*; ICD-10, *International Classification of Disease, Tenth Revision*.

Supplemental Table 3. Number and Rate of Cardiovascular Outcomes and Mortality by Treatment in the Propensity-Matched ITT Cohort*

Outcome	Canagliflozin (n = 7,333)	Dapagliflozin (n = 1,955)	Empagliflozin (n = 3,341)	DPP-4 inhibitor (n = 3,806)	GLP-1 receptor agonist (n = 2,083)	TZD (n = 766)	SU (n = 2,747)	Insulin (n = 3,057)	Other (n = 310)
Composite of ACM and HHF, n	275	49	39	149	74	42	121	231	16
Follow-up, y	14,997.6	3,465.7	2,563.3	5,717.4	3,650.1	1,271.4	4,086.2	5,689.3	581.3
Incidence rate per 100 person-years	1.83	1.41	1.52	2.61	2.03	3.30	2.96	4.06	2.75
ACM, n	214	30	28	107	51	32	91	184	13
Follow-up, y	15,073.0	3,483.6	2,571.7	5,768.5	3,683.7	1,283.0	4,125.3	5,764.8	587.6
Incidence rate per 100 person-years	1.42	0.86	1.09	1.85	1.38	2.49	2.21	3.19	2.21
HHF, n	77	20	11	52	30	11	33	62	4
Follow-up, y	14,997.6	3,465.7	2,563.3	5,717.4	3,650.1	1,271.4	4,086.2	5,689.3	581.3
Incidence rate per 100 person-years	0.51	0.58	0.43	0.91	0.82	0.87	0.81	1.09	0.69
MACE, n	363	71	49	165	89	53	137	260	16
Follow-up, y	14,886.3	3,440.0	2,559.3	5,699.8	3,639.2	1,256.4	4,077.5	5,649.3	584.6
Incidence rate per 100 person-years	2.44	2.06	1.91	2.89	2.45	4.22	3.36	4.60	2.74
Nonfatal stroke, n	79	18	11	31	22	10	25	36	2
Follow-up, y	14,985.2	3,466.8	2,566.8	5,739.8	3,663.2	1,273.6	4,106.3	5,714.1	585.9
Incidence rate per 100 person-years	0.53	0.52	0.43	0.54	0.60	0.79	0.61	0.63	0.34
Nonfatal MI, n	85	24	12	36	20	15	30	48	1
Follow-up, y	14,974.1	3,456.7	2,564.3	5,728.6	3,659.7	1,264.6	4,096.0	5,698.3	586.3
Incidence rate per 100 person-years	0.57	0.69	0.47	0.63	0.55	1.19	0.73	0.84	0.17
Composite of MACE and HHF, n	419	88	60	198	111	61	161	303	19

Follow-up, y	14,832.3	3,423.3	2,552.2	5,662.5	3,608.3	1,249.3	4,049.3	5,604.0	579.3
Incidence rate per 100 person-years	2.82	2.57	2.35	3.50	3.08	4.88	3.98	5.41	3.28

Propensity matched using an exposure propensity score. Abbreviations: BKA, below-knee lower extremity amputation; ITT, intent-to-treat; DPP-4, dipeptidyl peptidase 4; GLP-1, glucagon-like peptide-1; TZD, thiazolidinedione; SU, sulfonylurea; ACM, all-cause mortality; HHF, hospitalization for heart failure; MACE, major adverse cardiovascular event; MI, myocardial infarction. *Patients within the non-SGLT2i cohort were able to simultaneously initiate medications across multiple non-SGLT2i medication classes; therefore, a single patient could contribute to >1 non-SGLT2i medication class cohort.

Supplemental Table 4. Number and Rate of Cardiovascular Outcomes and Mortality by Treatment in the Propensity-Matched On-Treatment Cohort*

Outcome	Canagliflozin (n = 7,333)	Dapagliflozin (n = 1,955)	Empagliflozin (n = 3,341)	DPP-4 inhibitor (n = 3,806)	GLP-1 receptor agonist (n = 2,083)	TZD (n = 766)	SU (n = 2,747)	Insulin (n = 3,057)	Other (n = 310)
Composite of ACM and HHF, n	89	22	21	95	31	16	61	121	7
Follow-up, y	8,218.4	2,016.7	1,896.8	3,664.5	2,042.4	735.4	2,318.7	3,359.2	223.0
Incidence rate per 100 person-years	1.08	1.09	1.11	2.59	1.52	2.18	2.63	3.60	3.14
ACM, n	72	13	14	64	16	12	45	92	4
Follow-up, y	8,228.1	2,022.2	1,899.9	3,688.2	2,048.4	735.6	2,333.6	3,380.7	223.4
Incidence rate per 100 person-years	0.88	0.64	0.74	1.74	0.78	1.63	1.93	2.72	1.79
HHF, n	20	9	7	36	16	4	17	34	3
Follow-up, y	8,218.4	2,016.7	1,896.8	3,664.5	2,042.4	735.4	2,318.7	3,359.2	223.0
Incidence rate per 100 person-years	0.24	0.45	0.37	0.98	0.78	0.54	0.73	1.01	1.35
MACE, n	144	35	29	98	39	26	72	139	6
Follow-up, y	8,168.3	2,003.2	1,892.9	3,651.2	2,033.3	729.2	2,310.3	3,326.7	222.8
Incidence rate per 100 person-years	1.76	1.75	1.53	2.68	1.92	3.57	3.12	4.18	2.69
Nonfatal stroke, n	39	6	7	19	14	6	10	24	2
Follow-up, y	8,198.2	2,016.3	1,896.9	3,673.1	2,040.4	732.9	2,325.9	3,355.8	222.8
Incidence rate per 100 person-years	0.48	0.30	0.37	0.52	0.69	0.82	0.43	0.72	0.90
Nonfatal MI, n	35	16	9	22	10	9	22	25	0
Follow-up, y	8,198.1	2,009.1	1,895.9	3,666.3	2,041.3	731.9	2,318.1	3,351.7	223.4
Incidence rate per 100 person-years	0.43	0.80	0.47	0.60	0.49	1.23	0.95	0.75	–
Composite of MACE and HHF, n	161	44	36	125	54	30	85	165	9
Follow-up, y	8,158.6	1,997.6	1,889.8	3,630.1	2,027.4	729.0	2,298.1	3,306.6	222.3
Incidence rate per 100 person-years	1.97	2.20	1.90	3.44	2.66	4.12	3.70	4.99	4.05

Propensity matched using an exposure propensity score. Abbreviations: BKA, below-knee lower extremity amputation; DPP-4, dipeptidyl peptidase 4; GLP-1, glucagon-like peptide-1; TZD, thiazolidinedione; SU, sulfonylurea; ACM, all-cause mortality; HHF, hospitalization for heart failure; MACE, major adverse cardiovascular event; MI, myocardial infarction. *Patients within the non-SGLT2i cohort were able to simultaneously initiate medications across multiple non-SGLT2i medication classes; therefore, a single patient could contribute to >1 non-SGLT2i medication class cohort.

Supplemental Table 5. Number and Rate of BKA Outcomes by SGLT2i Medication and Non-SGLT2i Matches in the Propensity-Matched Cohort*

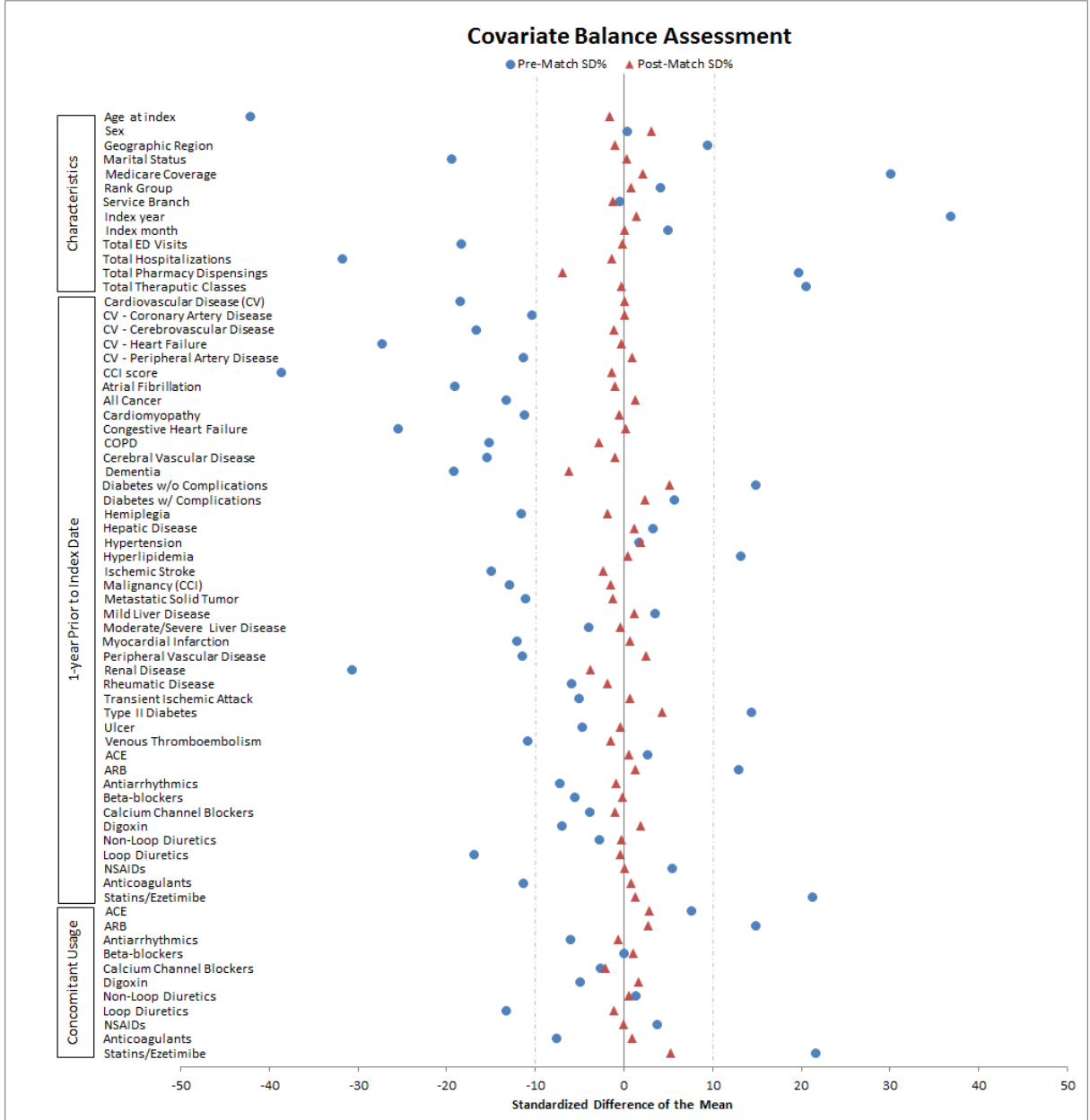
Analytic Approach	Canagliflozin matched cohort		Dapagliflozin matched cohort		Empagliflozin matched cohort	
	Canagliflozin	Non-SGLT2i	Dapagliflozin	Non-SGLT2i	Empagliflozin	Non-SGLT2i
	(n=7,333)	(n=7,333)	(n=1,955)	(n=1,955)	(n=3,341)	(n=3,341)
Intent-to-treat[†], n	29	9	3	4	3	5
Follow-up, y	15,045.7	12,247.0	3,478.2	3,290.8	2,567.9	5,445.0
Incidence rate per 100 person-years	0.19	0.07	0.09	0.12	0.12	0.09
On- treatment[†], n	12	4	2	2	3	3
Follow-up, y	8,217.9	7,122.9	2,020.3	1,931.0	1,898.4	3,193.5
Incidence rate per 100 person-years	0.15	0.06	0.10	0.10	0.16	0.09

Propensity matched using an exposure propensity score. Abbreviations: BKA, below-knee lower extremity amputation; SGLT2i, sodium glucose co-transporter 2 inhibitor. *The propensity model was developed based on available clinical characteristics of the entire study cohort. While each patient may have his/her own matched pair (based on propensity score), the specific sub-cohorts (e.g., canagliflozin vs. matched set; dapagliflozin vs. matched set, and empagliflozin vs. matched set) may not be equally balanced on all major confounding factors, particularly in relation to BKA. [†]Patients with prior BKA (n = 9) and their respective match were removed from analyses.

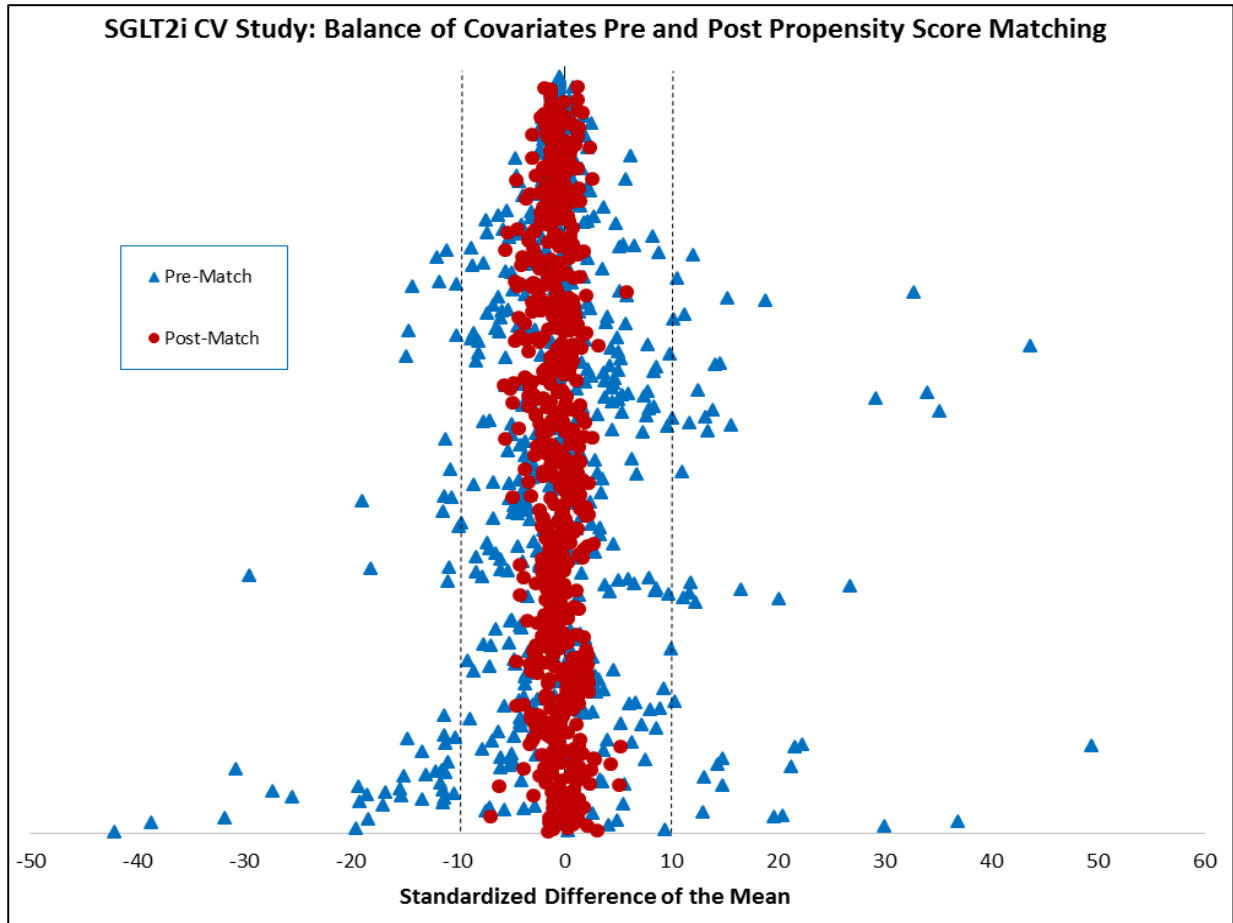
SUPPLEMENTAL FIGURES AND FIGURE LEGENDS

Supplemental Figure 1. Covariate balance of (A) selected and (B) total baseline characteristics.

A.

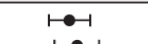

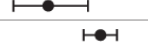
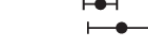
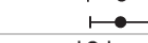

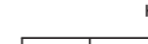
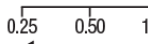



B.



Abbreviations: ED, emergency department; SD, standardized difference; CV, cardiovascular; CVD, cardiovascular disease; CCI, Charlson comorbidity index; COPD, chronic obstructive pulmonary disease; ACE, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; NSAID, nonsteroidal anti-inflammatory drug.

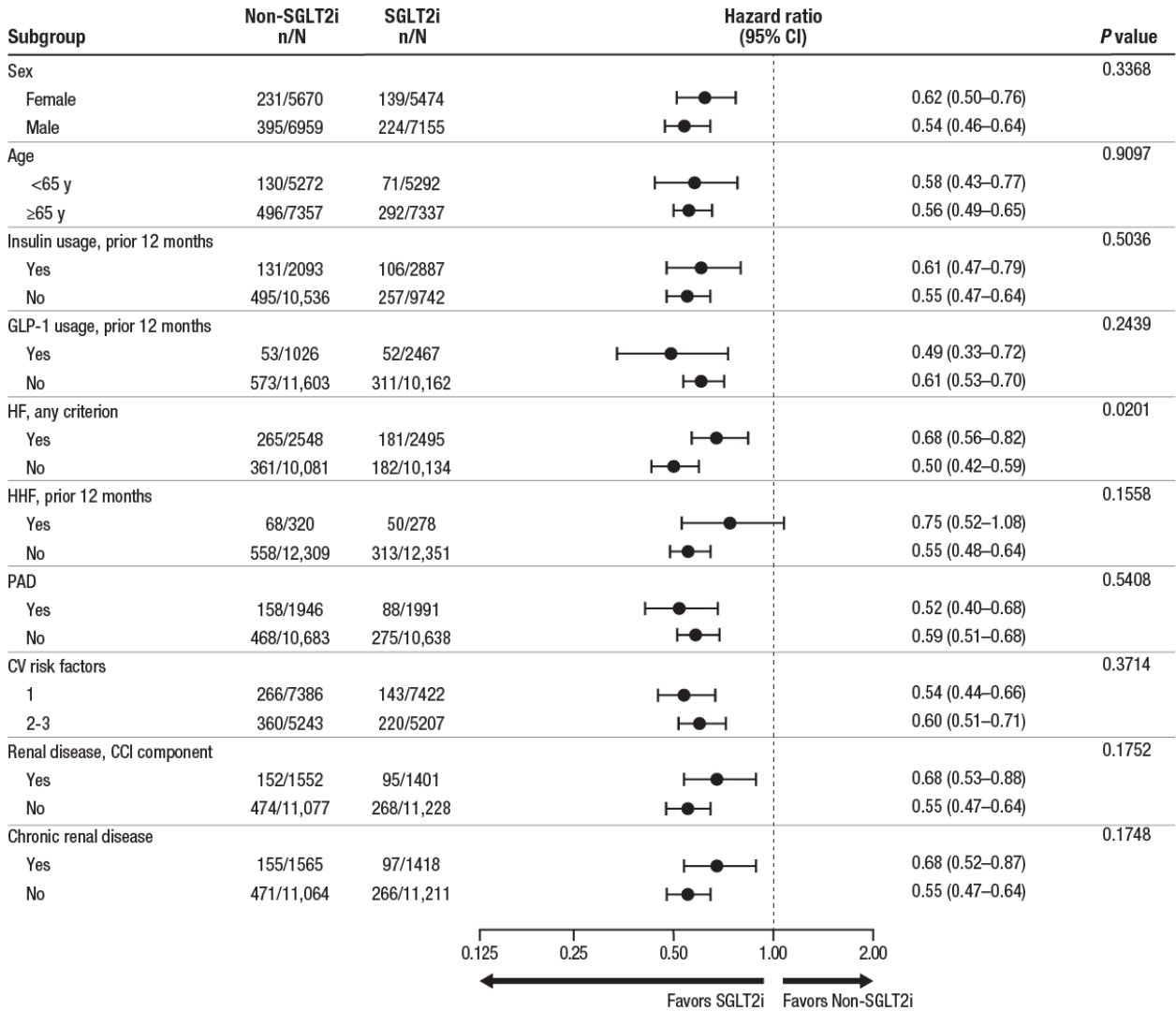
Supplemental Figure 2. Risk of cardiovascular and mortality outcomes for patients in the propensity-matched on-treatment cohort by treatment status.

	Non-SGLT2i (N = 12,629)		SGLT2i (N = 12,629)		Hazard ratio (95% CI)	P value
	Events (n)	Incidence rate per 100 patient-years	Events (n)	Incidence rate per 100 patient-years		
Composite of ACM and HHF	328	2.69	132	1.09		0.41 (0.33–0.50) <0.0001
ACM	231	1.88	99	0.81		0.44 (0.35–0.55) <0.0001
HHF	109	0.89	36	0.30		0.33 (0.23–0.49) <0.0001
MACE	375	3.09	208	1.72		0.56 (0.47–0.66) <0.0001
Nonfatal stroke	74	0.61	52	0.43		0.70 (0.49–0.99) 0.0438
Nonfatal myocardial infarction	86	0.71	60	0.50		0.69 (0.50–0.96) 0.0292
Composite of MACE and HHF	462	3.83	241	2.00		0.52 (0.45–0.61) <0.0001
BKA*	9	0.07	17	0.14		2.01 (0.89–4.53) 0.0949



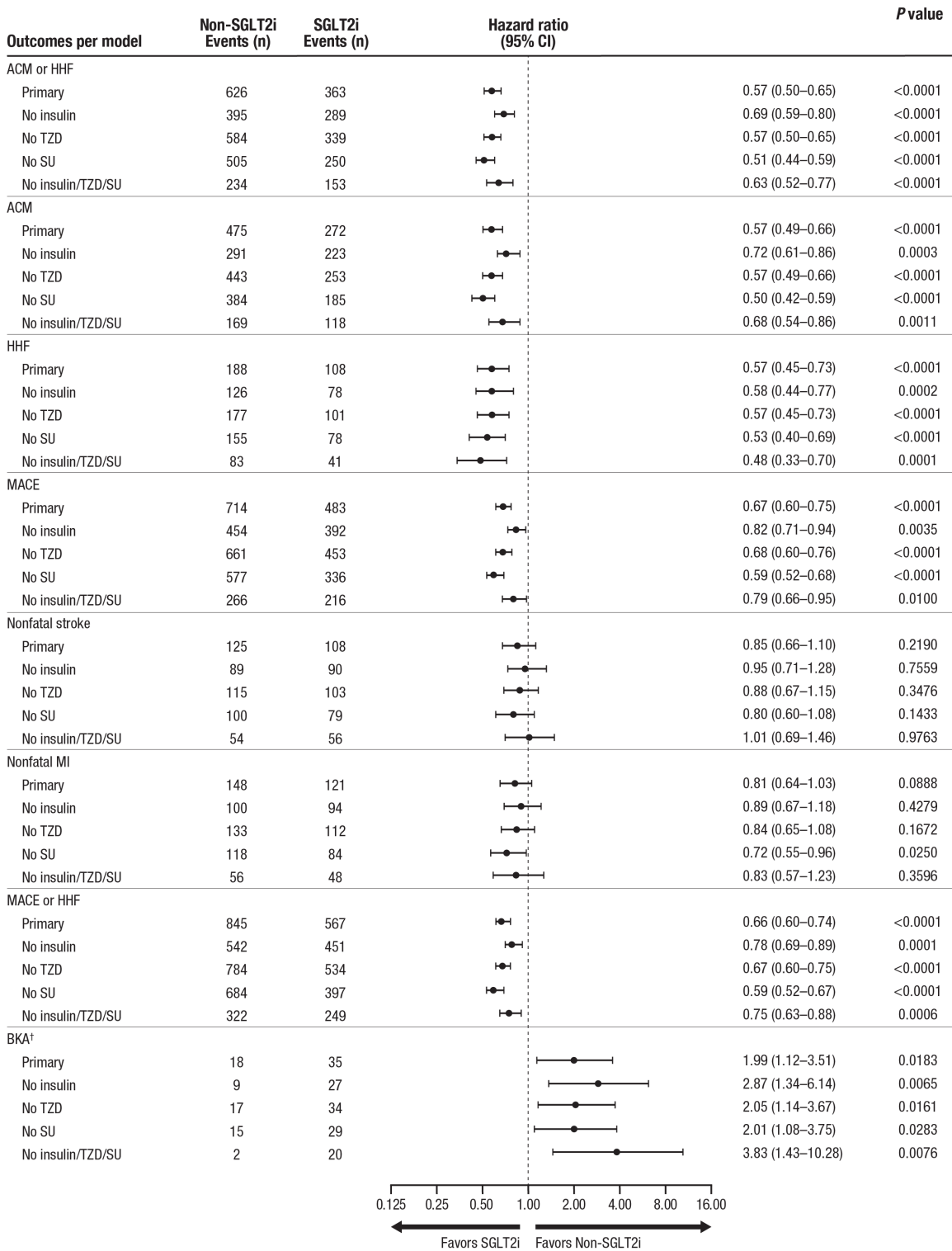
Propensity matched using an exposure propensity score. Abbreviations: SGLT2i, sodium glucose co-transporter 2 inhibitor; CI, confidence interval; HHF, hospitalization for heart failure; MACE, major adverse cardiovascular event; BKA, below-knee lower extremity amputation. *Patients with prior BKA (n = 9) and their respective match were removed from analyses.

Supplemental Figure 3. Risk of the primary outcome in the propensity-matched ITT cohort stratified by treatment status and baseline subgroups.



Propensity matched using an exposure propensity score. Abbreviations: ITT, intent-to-treat; SGLT2i, sodium glucose co-transporter 2 inhibitor; CI, confidence interval; GLP-1, glucagon-like peptide-1; HF, heart failure; HHF, hospitalization for HF; PAD, peripheral artery disease; CV, cardiovascular; CCI, Charlson co-morbidity index.

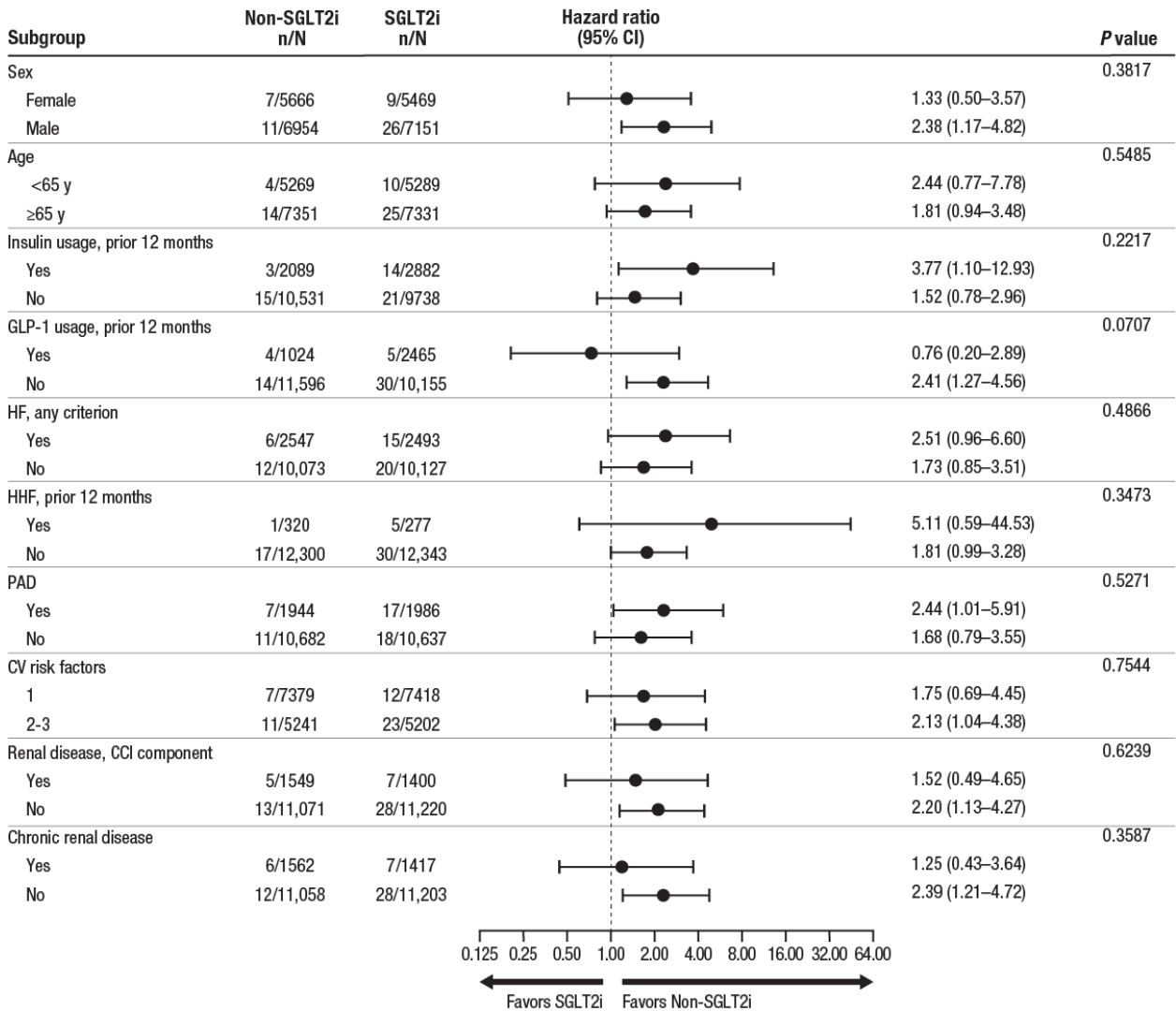
Supplemental Figure 4. Sensitivity analyses of the propensity-matched ITT cohort.*



Propensity matched using an exposure propensity score. Abbreviations: SGLT2i, sodium glucose co-transporter 2 inhibitor; CI, confidence interval; ACM, all-cause mortality; HHF, hospitalization for heart failure; TZD, thiazolidinedione; SU, sulfonylurea; MACE, major adverse cardiovascular event; MI, myocardial infarction; BKA, below-knee lower extremity amputation. *Cohort size: primary = 25,258; no

insulin = 19,144; no TZD = 23,726; no SU = 19,764; no insulin/TZD/SU = 12,182. The cohort sizes for the BKA analysis were slightly smaller because patients with prior amputations were excluded from analysis.
†Patients with prior BKA (n = 9) and their respective match were excluded from analysis.

Supplemental Figure 5. Risk of BKA in the propensity-matched ITT cohort stratified by treatment status and baseline subgroups.



Propensity matched using an exposure propensity score. Abbreviations: BKA, below-knee lower extremity amputation; ITT, intent-to-treat; SGLT2i, sodium glucose co-transporter 2 inhibitor; CI, confidence interval; GLP-1, glucagon-like peptide-1; HF, heart failure; HHF, hospitalization for HF; PAD, peripheral artery disease; CV, cardiovascular; CCI, CCI, Charlson co-morbidity index.