SUPPLEMENTAL MATERIAL

Supplemental Table 1. Search Strategy

Search date: May 1, 2020 and update in September 2020

Data source	Search terms
PubMed	(‘Sodium-Glucose Transporter 2 Inhibitors’[MeSH] OR ‘Sodium Glucose co-transporter*’ OR ‘Sodium-dependent glucose cotransporter*’ OR ‘Sodium Glucose transporter*’ OR SGLT2 OR SGLT-2 OR ‘SGLT 2*’ OR empagliflozin OR dapagliflozin OR canagliflozin OR sotagliflozin OR luseogliflozin OR ipragliflozin OR remogliflozin OR sergliflozin OR ertugliflozin OR tofogliflozin OR ‘Dipeptidyl-Peptidase IV Inhibitors’ [MeSH] OR ‘Dipeptidyl-Peptidase IV Inhibitor*’ OR ‘Dipeptidyl peptidase 4 inhibitor*’ OR ‘DPP-4 inhibitor*’ OR Gliptins OR DPP-4i OR sitagliptin OR vildagliptin OR saxagliptin OR linagliptin OR gemigliptin OR teneligliptin OR alogliptin OR trelagliptin OR evogliptin OR gosogliptin OR dutogliptin OR omarigliptin OR ‘Glucagon-Like Peptide-1 Receptor’[Mesh] OR ‘Glucagon-like peptide 1 receptor agonist*’ OR ‘GLP-1 receptor agonist*’ OR ‘GLP-1 agonist*‘ OR ‘GLP-1RA’ OR exenatide OR liraglutide OR lixisenatide OR albiglutide OR dulaglutide OR semaglutide) AND (‘Diabetes Mellitus, Type 2’[Mesh] OR ‘Type 2 diabetes’ OR T2DM OR T2D) AND ("Randomized Controlled Trial"[Publication Type] OR random* OR RCT* OR placebo OR trial*) AND (Cardiovascular OR renal OR CVOT*) AND (English and human)/limit
CENTRAL	TITLE-ABSTRACT- KEYWORDS ((‘Sodium-Glucose Transporter 2 Inhibitor*’ OR ‘Sodium Glucose co-transporter*’ OR ‘Sodium-dependent glucose cotransporter*’ OR ‘Sodium Glucose transporter*’ OR SGLT2 OR SGLT-2 OR ‘SGLT 2*’ OR empagliflozin OR dapagliflozin OR canagliflozin OR sotagliflozin OR luseogliflozin OR ipragliflozin OR remogliflozin OR sergliflozin OR ertugliflozin OR tofogliflozin OR ‘Dipeptidyl-Peptidase IV Inhibitor*’ OR ‘Dipeptidyl peptidase 4 inhibitor*’ OR ‘DPP-4 inhibitor*’ OR Gliptins OR DPP-4i OR sitagliptin OR vildagliptin OR saxagliptin OR linagliptin OR gemigliptin OR teneligliptin OR alogliptin OR trelagliptin OR evogliptin OR gosogliptin OR dutogliptin OR omarigliptin OR ‘Glucagon-like peptide 1 receptor agonist*’ OR ‘GLP-1 receptor agonist*’ OR ‘GLP-1 agonist*‘ OR ‘GLP-1RA’ OR exenatide OR liraglutide OR lixisenatide OR albiglutide OR dulaglutide OR semaglutide) AND (‘Type 2 diabetes’ OR T2DM OR T2D) AND (random* OR RCT* OR placebo OR trial*) AND (Cardiovascular OR Renal OR CVOT*))
Embase	TITLE-ABSTRACT-INDEX TERM

((‘Sodium-Glucose Transporter 2 Inhibitor*’ OR ‘Sodium Glucose co-transporter*’ OR ‘Sodium-dependent glucose cotransporter*’ OR ‘Sodium Glucose transporter*’ OR SGLT2 OR SGLT-2 OR ‘SGLT 2*’ OR empagliflozin OR dapagliflozin OR canagliflozin OR sotagliflozin OR luseogliflozin OR ipragliflozin OR remogliflozin OR sergliflozin OR ertugliflozin OR tofogliflozin OR ‘Dipeptidyl-Peptidase IV Inhibitor*’ OR ‘Dipeptidyl peptidase 4 inhibitor*’ OR ‘DPP-4 inhibitor*’ OR Gliptins OR DPP-4i OR sitagliptin OR vildagliptin OR saxagliptin OR linagliptin OR gemigliptin OR teneligliptin OR alogliptin OR trelagliptin OR evogliptin OR gosogliptin OR dutogliptin OR omarigliptin OR ‘Glucagon-like peptide 1 receptor agonist*’ OR ‘GLP-1 receptor agonist*’ OR ‘GLP-1 agonist*‘ OR ‘GLP-1RA’ OR exenatide OR liraglutide OR lixisenatide OR albiglutide OR dulaglutide OR semaglutide)

AND (‘Type 2 diabetes’ OR T2DM OR T2D)

AND (random* OR RCT* OR placebo OR trial*)

AND (Cardiovascular OR Renal OR CVOT*))

AND (English and human)/limit

Supplemental Table 2. Terms used to identify the patients with acute kidney injury based on the Medical Dictionary for Regulatory Activities (MedDRA)

	Terms
Acute kidney injury	Acute nonoliguric renal failure Acute oliguric renal failure Acute on chronic renal failure Acute prerenal failure Acute pyelonephritis with lesion of renal medullary necrosis Acute pyelonephritis without lesion of renal medullary necrosis Acute renal failure Acute renal failure following labor and delivery Acute renal failure following labor and delivery, postpartum condition or complication Acute renal failure following labor and delivery, unspecified as to episode of care Acute renal failure following labour and delivery Acute renal failure with delivery, with mention of postpartum complication Acute renal failure with lesion of renal cortical necrosis Acute renal failure with lesion of renal medullary (papillary) necrosis Acute renal failure with lesion of tubular necrosis Acute renal failure, unspecified Acute renal insufficiency Nephritis and nephropathy, not spec as acute or chronic, with lesion of renal medullary necrosis Nephritis and nephropathy, not specified as acute or chronic, with lesion of renal cortical necrosis Rejection acute renal Renal failure acute Renal failure acute hypotensive Renal failure acute ischaemic Renal failure acute ischemic Renal failure acute on chronic Renal failure acute uratic Renal shutdown acute Renal tubular disorder acute Renal tubular necrosis acute Acute glomerulonephritis with other pathological lesion in kidney Acute glomerulonephritis with other specified pathological lesion in kidney Acute glomerulonephritis with unspecified pathological lesion in kidney Acute kidney failure Acute kidney infection Acute kidney injury Acute renal failure with other specified pathological lesion in kidney Failure kidney acute Kidney failure acute Kidney infection acute Kidney infection acute NOS Nephritis and nephropathy, not spec as acute or chronic, with oth spec pathol lesion in kidney Nephritis and nephropathy, not spec as acute or chronic, with unspec pathol lesion in kidney Stage 1 acute kidney injury Stage 2 acute kidney injury Stage 3 acute kidney injury

Supplemental Table 3. Baseline information and difference between groups in change from baseline to the last-follow-up

Study	Baseline HbA1c (%)	Baseline BMI (kg/m^2)	Baseline body weight (kg)	Baseline SBP (mmHg)	Baseline DBP (mmHg)	Baseline eGFR (mL/min/ 1.73 m^2)	Difference between groups in HbA1c change from baseline to the last follow-up (%)	Difference between groups in body weight change from baseline to the last follow-up (kg)	Difference between groups in SBP change from baseline to the last follow-up (mmHg)	Difference between groups in DBP change from baseline to the last follow-up (mmHg)	Difference between groups in eGFR change from baseline to the last follow-up (mL/min/ 1.73 m^2)
Scirica 2013 (14)	8	31.2	87.9	NR	NR	72.6	-0.2	-0.1	NR	NR	NR
White 2013 (15)	8	28.7	80.1	NR	NR	71.2	-0.36	0.06	NR	NR	NR
Green 2015 (16)	7.2	30.2	NR	135	77.2	74.9	-0.29	NR	NR	NR	NR
Gantz 2017 (17)	8	31.3	89.3	NR	NR	86.2	-0.3	-0.08	NR	NR	-2.43
Rosenstock 2019 (18)	7.9	31.3	NR	140.5	77.8	54.7	-0.36	0	0	0	NR
Rosenstock 2019 (19)	7.2	30.1	NR	136	79	76.7	0	-1.54	0	0	NR
Pfeffer 2015 (20)	7.6	30.1	84.9	129	NR	76	-0.27	-0.7	-0.8	NR	NR
Marso 2016 (21)	8.7	32.5	91.7	135.9	77.1	NR	-0.4	-2.3	-1.2	-0.6	NR
Marso 2016 (22)	8.7	32.8	92.1	135.6	77	NR	-0.85	-3.61	-1.93	-1.47	NR
Holman 2017(23)	8	31.8	NR	NR	NR	76.3	-0.53	-1.27	-1.57	0.25	NR
Hernandez 2018 (24)	8.7	32.3	NR	134.7	76.8	79	-0.52	-0.83	-0.67	NR	-0.43
Gerstein 2019 (25)	7.3	32.3	NR	137.2	78.5	75	-0.61	-1.46	-1.7	0.12	NR
Husain 2019 (26)	8.2	32.3	90.9	136	76	74	-0.7	-3.4	-2.6	0.7	NR

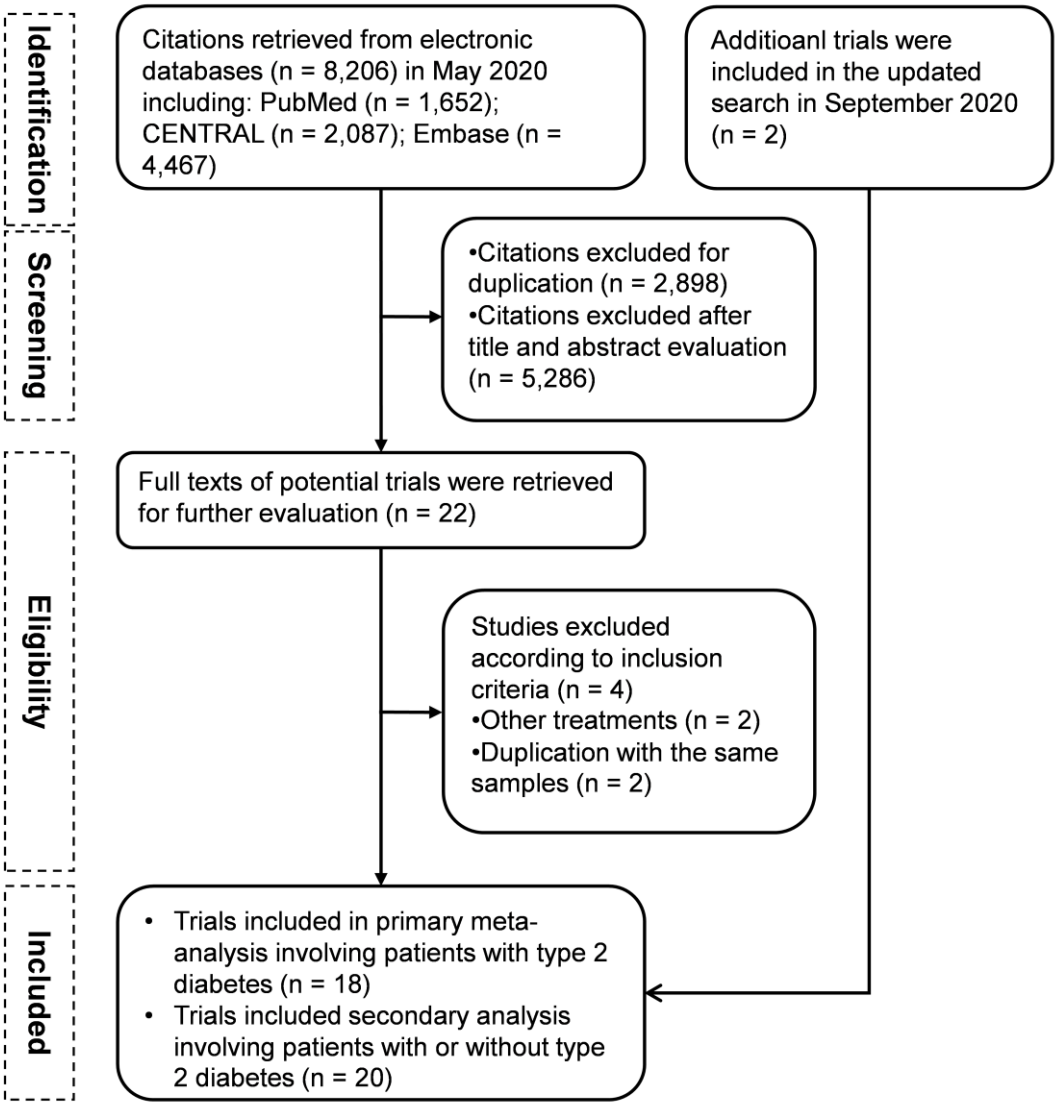
Zinman 2015(27)	8.1	30.6	86.4	135.5	76.7	74.1	-0.12	-0.8	-2	0.2	-0.6
Neal 2017 (28)	8.2	32	NR	136.6	77.7	76.5	-0.58	-1.6	-3.93	-1.39	NR
Wiviott 2018 (29)	8.3	32	91	135	77	85.2	-0.42	-1.8	-2.7	-0.7	NR
Perkovic 2019 (30)	8.3	31.3	NR	140	78.3	56.2	-0.11	-0.88	-2.38	-1.44	2.74
Cannon 2020 (31)	8.2	32.0	NR	133.3	76.6	75.9	-0.5	-2.2	-2.9	NR	NR
McMurray 2019 (32)	NR	28.2	NR	121.8	NR	65.7	-0.24	-0.87	-1.27	NR	NR
Heerspink 2020 (33)	NR	29.5	81.7	137	77.5	43.1	NR	NR	NR	NR	2.68

HbA1c, glycated haemoglobin; BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; **eGFR,** estimated glomerular filtration rate; NR, not reported.

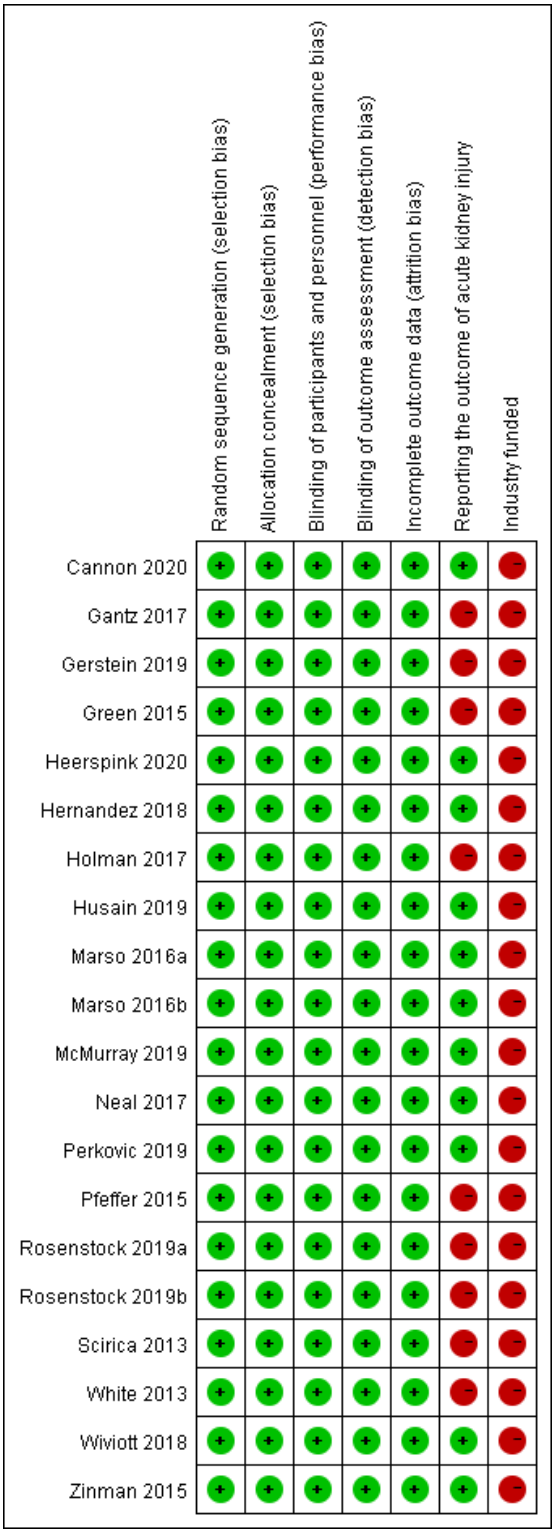
Supplemental Table 4. The data source and definition of the acute kidney injury

Study	Data source of outcome	Definition of acute kidney injury
Scirica 2013 (14)	Clinicaltrials.gov	Acute prerenal failure Renal failure acute
White 2013 (15)	Clinicaltrials.gov	Acute prerenal failure Renal failure acute
Green 2015 (16)	Clinicaltrials.gov	Renal failure acute
Gantz 2017 (17)	Clinicaltrials.gov	Acute kidney injury
Rosenstock 2019 (18)	Clinicaltrials.gov	Acute kidney injury Acute prerenal failure
Rosenstock 2019 (19)	Clinicaltrials.gov	Acute kidney injury
Pfeffer 2015 (20)	Clinicaltrials.gov	Renal failure acute
Marso 2016 (21)	Publication	Acute kidney injury
Marso 2016 (22)	Publication	Acute renal failure
Holman 2017(23)	Clinicaltrials.gov	Acute kidney injury
Hernandez 2018 (24)	Publication	Acute kidney injury
Gerstein 2019 (25)	Clinicaltrials.gov	Acute kidney injury
Husain 2019 (26)	Publication	Acute kidney injury
Zinman 2015(27)	Publication	Acute kidney injury
Neal 2017 (28)	Clinicaltrials.gov/Publication	Acute Kidney Injury
Wiviott 2018 (29)	Publication	Acute kidney injury
Perkovic 2019(30)	Publication	Acute kidney injury
Cannon 2020 (31)	Publication	Acute Renal Failure, narrow standard MedDRA query and a sponsor
McMurray 2019(32)	Publication	Serious acute kidney injury
Heerspink 2020 (33)	Publication	Serious acute kidney injury

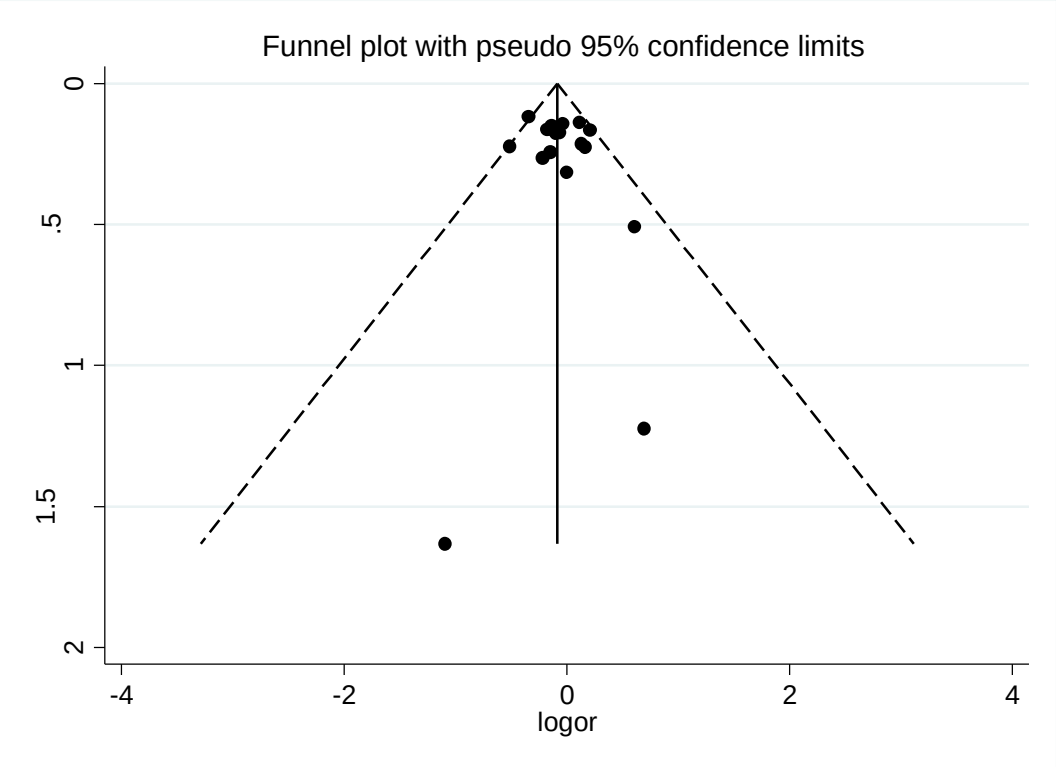
Supplemental Figure 1. The flowchart of study selection



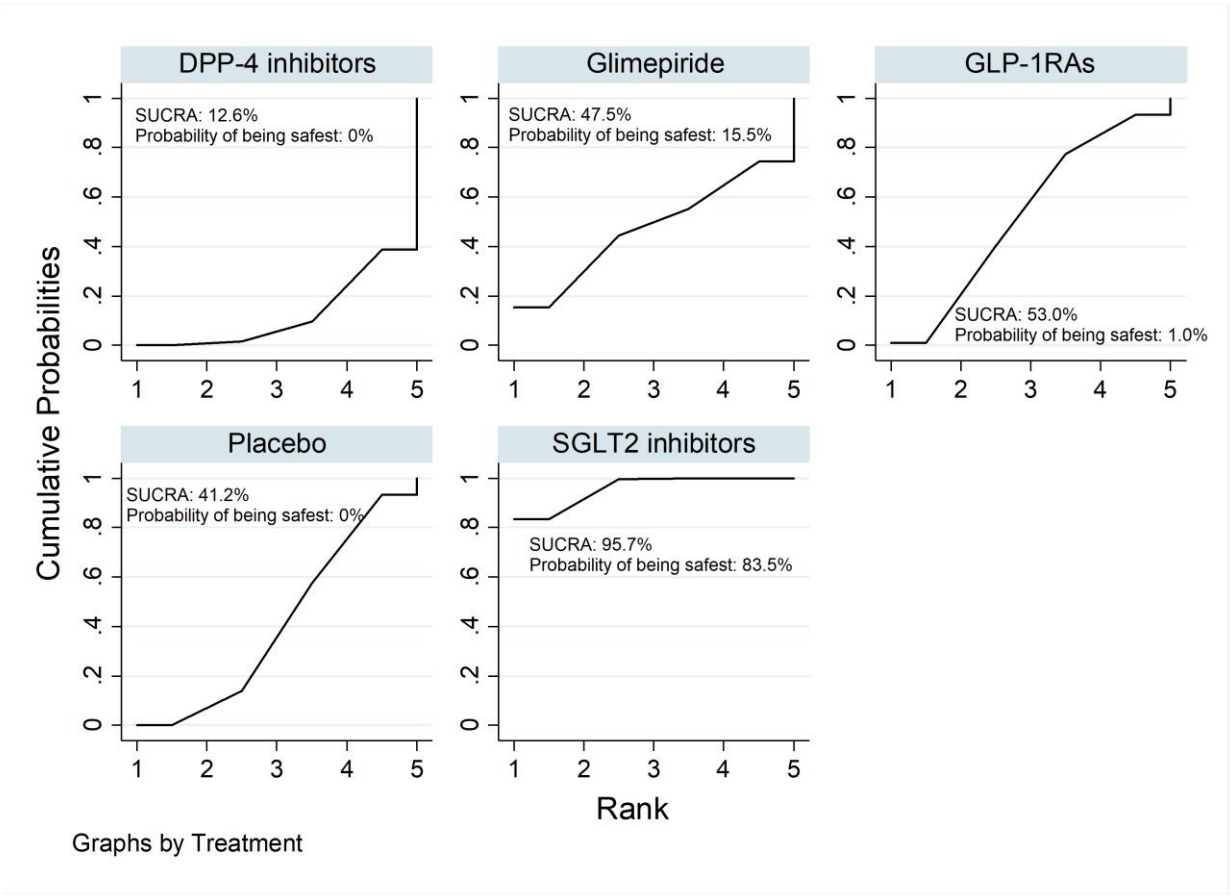
Supplemental Figure 2. Risk of bias assessments for each study based on adjusted Cochrane risk of bias tool. Green means low risk and red means high risk.



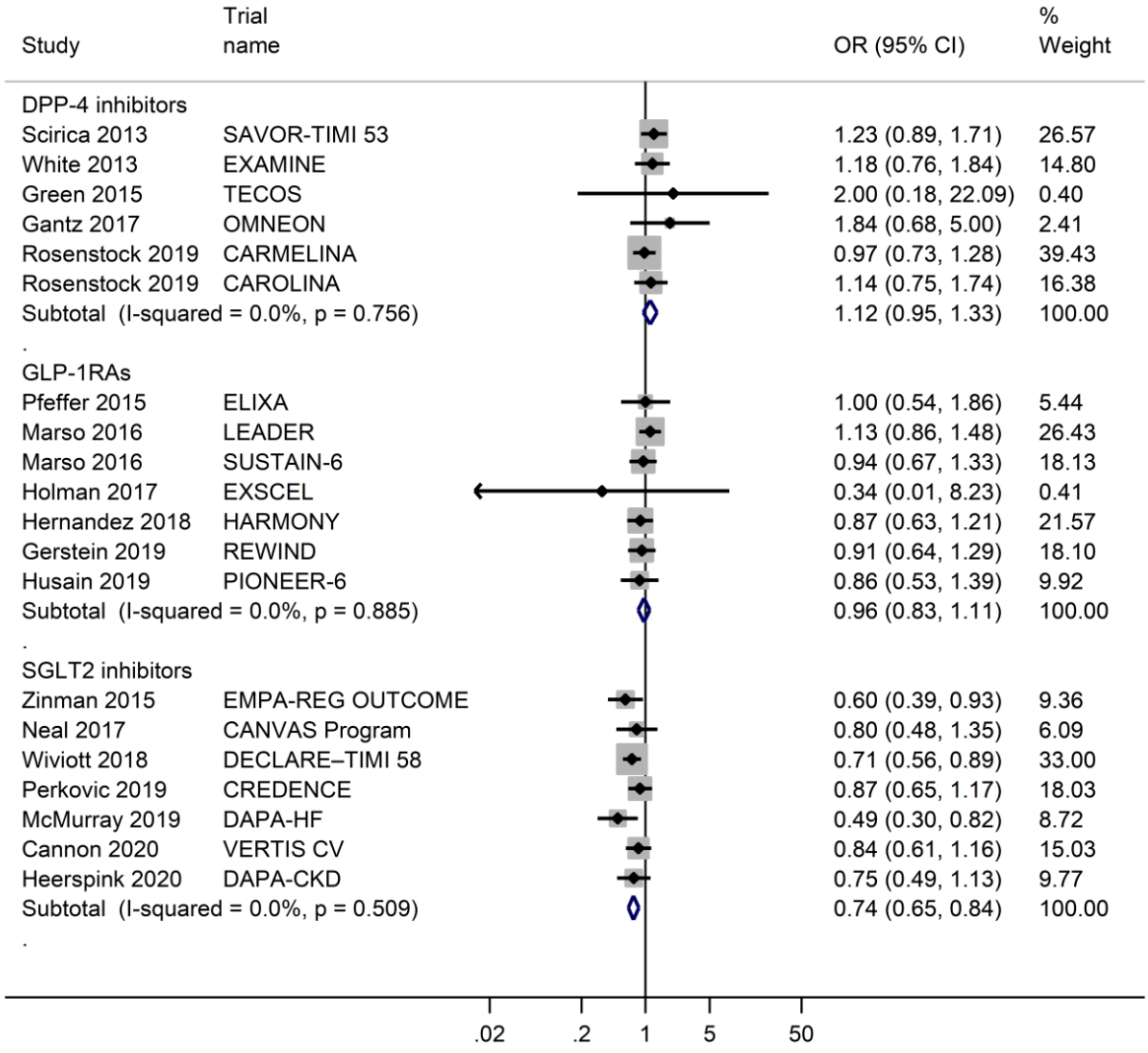
Supplemental Figure 3. The publication bias assessment using funnel-plot in patients with type 2 diabetes



Supplemental Figure 4. SUCRA curve for acute kidney injury in patients with type 2 diabetes



Supplemental Figure 5. Pairwise meta-analysis of the impact of novel glucose-lowering drugs on the risk of acute kidney injury in patients with or without type 2 diabetes. OR, odds ratio; CI, confidence interval; DPP-4 inhibitors, dipeptidyl peptidase-4 inhibitors; GLP-1RAs, glucagon-like peptide-1 receptor agonists; SGLT2 inhibitors, sodium-glucose co-transporter-2 inhibitors.



Supplemental Figure 6. Network meta-analysis of the effects of DPP-4 inhibitors, GLP-1RAs, and SGLT2 inhibitors on risk of acute kidney injury in patients with or without type 2 diabetes. CI, confidence interval. DPP-4 inhibitors, dipeptidyl peptidase-4 inhibitors; GLP-1RAs, glucagon-like peptide-1 receptor agonists; SGLT2 inhibitors, sodium-glucose co-transporter-2 inhibitors.