Evidence-based medicine

實證醫學競賽

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參賽編號 1

臨床情境

一位 68 歲糖尿病第二型合併慢性腎病（腎絲球濾過率約 45 mL/min/1.73m2）的男性病人，因有蛋白尿（每日蛋白排>0.5g）且血壓控制不佳，現正使用 ACE 抑制劑（如氯沙坦）控制血壓。主治醫師考慮在此病人加入一項新的腎保護藥物（例如 SGLT2 抑制劑）來降低進一步惡化為末期腎病或需洗腎的風險。

醫療團隊關心的問題

- 藥物療效與腎臟保護效果
- 用藥安全性與副作用監測
- 健保給付與成本效益

病人關心的問題

- 能否避免洗腎？生活品質如何？
- 藥物副作用會不會很不舒服？
- 藥費負擔與長期治療的經濟壓力

背景知識

- **CKD**: kidney damage **or** decreased kidney function **for three or more months**
- **Complications:** cardiovascular disease, infection, malignancy, and mortality

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背景知識

Chronic kidney disease classification based upon glomerular filtration rate and albuminuria

GFR stages	GFR (mL/min/1.73 m^2)	Terms
G1	≥90	Normal or high
G2	60 to 89	Mildly decreased
G3a	45 to 59	Mildly to moderately decreased
G3b	30 to 44	Moderately to severely decreased
G4	15 to 29	Severely decreased
G5	<15	Kidney failure (add D if treated by dialysis)
Albuminuria stages	**AER (mg/day)**	**Terms**
A1	<30	Normal to mildly increased (may be subdivided for risk prediction)
A2	30 to 300	Moderately increased
A3	>300	Severely increased (may be subdivided into nephrotic and nonnephrotic for differential diagnosis, management, and risk prediction)

The cause of CKD is also included in the KDIGO revised classification but is not included in this table.

Indications for dialysis

-Pericarditis or pleuritis (urgent indication).

-Progressive uremic encephalopathy or neuropathy (urgent indication).

-A clinically significant bleeding diathesis attributable to uremia (urgent indication).

-Fluid overload refractory to diuretics.

-Hypertension poorly responsive to antihypertensive medications.

-Persistent metabolic disturbances that are refractory to medical therapy.

-Persistent nausea and vomiting.

-Evidence of malnutrition.

-Decreased attentiveness and cognitive tasking (relative indication).

-Depression, persistent pruritus, or the restless leg syndrome (relative indications).

5A-1
Ask
提出問題

根據臨床問題形成第一個PICO

P	Type 2 Diabetes Mellitus , Chronic Kidney Disease with ACE Inhibitors (ACEI) or ARBs
I	Adding an SGLT2 Inhibitor
C	ACEI
O	Kidney failure, Dialysis, Mortality

治療型問題

☑治療/預防型問題 □診斷型問題 □預後型問題 □傷害/病因型問題

根據臨床問題形成第二個PICO

P	Type 2 Diabetes Mellitus , Chronic Kidney Disease with ACE Inhibitors (ACEI) or ARBs
I	Adding an SGLT2 Inhibitor
C	ACEI
O	All-cause mortality , Serious Adverse Events

治療型問題

□治療/預防型問題 □診斷型問題 □預後型問題 □傷害/病因型問題

5A-2
Acquire
搜尋資料

檢索策略

	keyword / free text	MeSH terms	中文
P	Type 2 diabetes chronic kidney disease	"Diabetes Mellitus, Type 2" [MeSH Terms] "renal insufficiency, chronic" [MeSH Terms]	第二型糖尿病 慢性腎臟疾病
I	SGLT2i	Sodium- glucose co- transporter- 2 inhibitors "[MeSH Terms]	血管收縮素轉化酶抑制劑
C	ACEI	"Angiotensin-Converting Enzyme Inhibitors"[MeSH Terms]	對照組 安慰劑
O	Survival Mortalily Adverse event	"Dialysis" [MeSH Terms] "survival"[MeSH Terms]	透析 死亡率

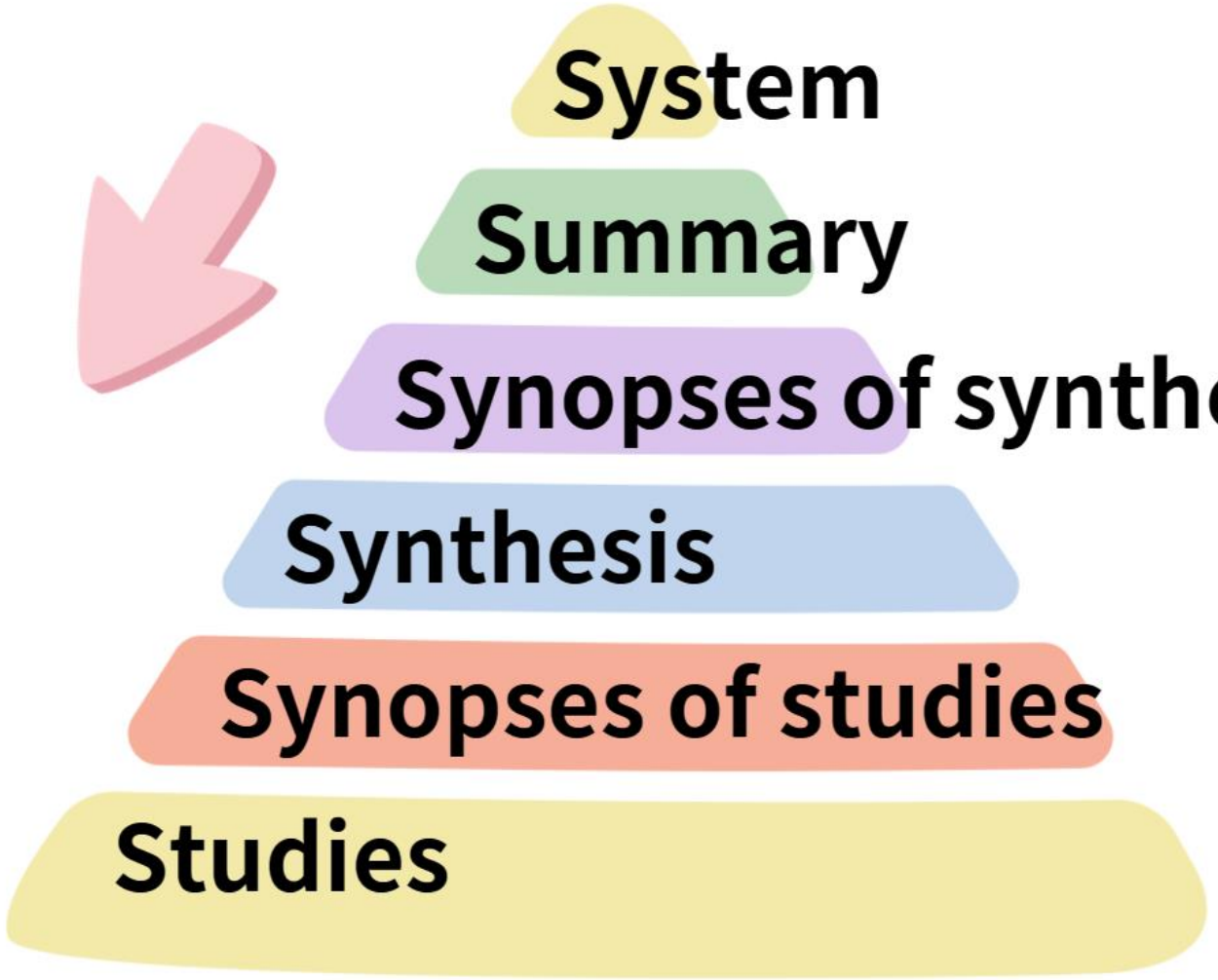
檢索策略

首選Level1：SR of RCT

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards**	Case-control studies, or "poor or non-independent reference standard**	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial*	Case-series or case-control studies, or poor quality prognostic cohort study**	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or *n*-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study**	Case-series, case-control studies, or historically controlled studies**	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, *n*-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or *n*-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non -randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

資料庫



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搜尋策略


臨床問題
Systematic Review 、Meta-Analysis[Major]
Randomized Controlled Trial/Cohort Study
限定5年內、free full text
English、中文（台灣本土文獻）
Meet Our 『PICO』

搜尋

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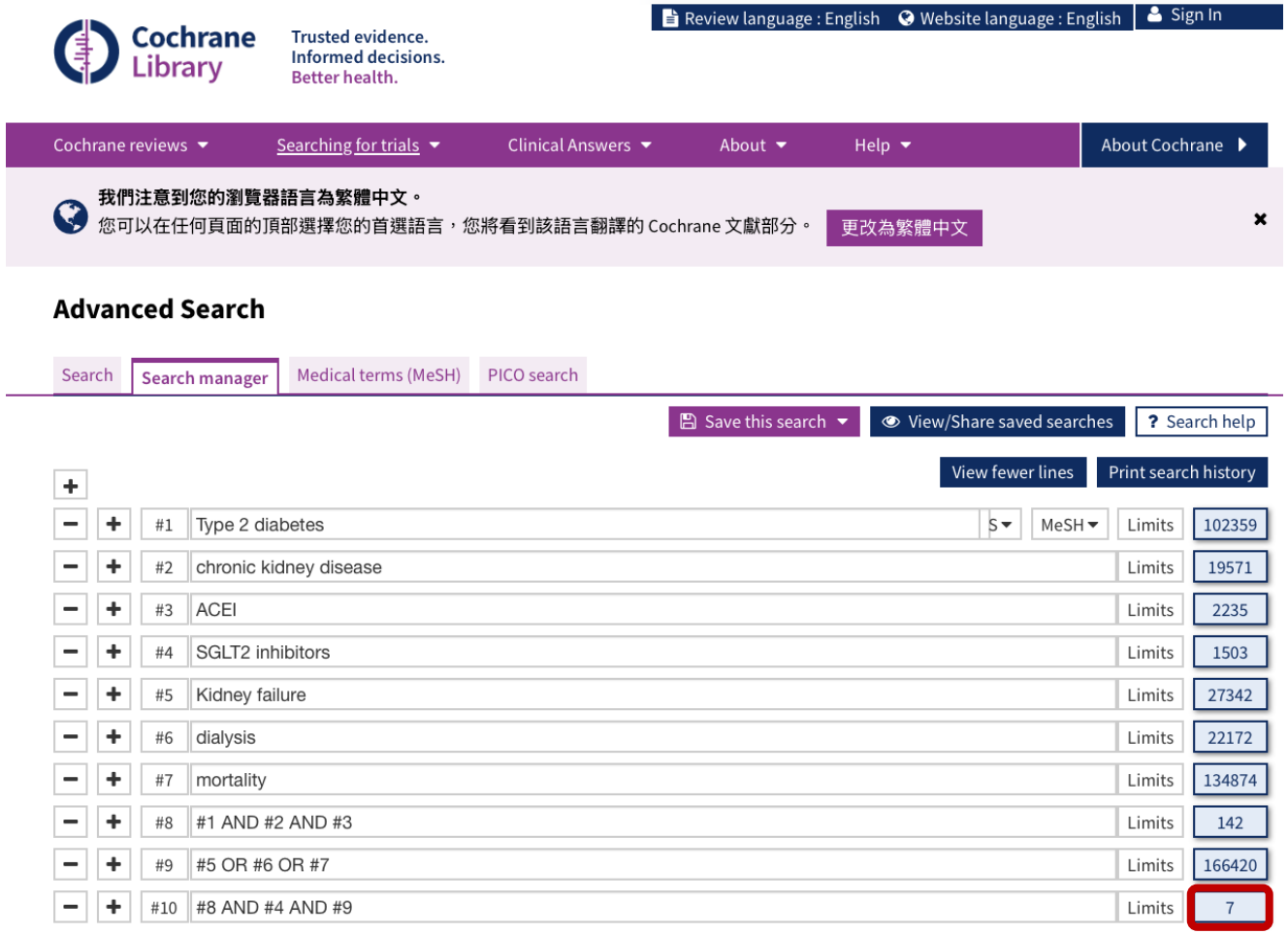

輸入關鍵字
『Type 2 diabetes with chronic kidney on ACEI、SGLT2 inhibitors、Kidney failure、Dialysis、Mortality』
適當使用布林運算『AND』、『OR』
不限語言類型地區

搜尋

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Cochrane Database of Systematic Reviews
Issue 12 of 12, December 2025

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Order by Relevancy Resul

1 **Immunosuppressive therapy for IgA nephropathy in children**

Areefa Alladin, Deirdre Hahn, Elisabeth M Hodson, Pietro Ravani, Kenneth Pfister, Robert R Quinn, Susan M Samuel

Free access Intervention Review 12 June 2024

Show PICOs Show preview

2 **Altered dietary salt intake for preventing diabetic kidney disease and its progression**

Elisabeth M Hodson, Tess E Cooper

Free access Intervention Review 16 January 2023 New search

Show PICOs Show preview

搜尋 PubMed

Search	Actions	Details	Query	Results	Time
#15	•••	>	Search: **((((Type 2 Diabetes Mellitus) AND (Chronic Kidney Disease)) AND (ACE Inhibitors (ACEI))) OR (SGLT2 Inhibitor))** Filters: **Free full text, Meta-Analysis, Systematic Review, from 2024 - 2025**	206	21:27:54
#13	•••	>	Search: **((((T ... AND (ACE ... years, Free**		
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#5	•••	>	Search: **Ren**		
#4	•••	>	Search: **SGL**		
#			Search: **ACE**		
#			Search: **Chr**		
#			Search: **Typ**		

ARTICLE TYPE

- [ ] Books and Documents
- [ ] Clinical Trial
- [x] Meta-Analysis
- [x] Randomized Controlled Trial
- [ ] Review
- [x] Systematic Review

PUBLICATION DATE

- ( ) 1 year
- (•) 5 years
- ( ) 10 years
- ( ) Custom Range

TEXT AVAILABILITY

- [ ] Abstract
- [ ] Free full text
- [x] Full text

輸入關鍵字

『Type2 DM、Chronic kidney disease、ACEI、SGLT2I』

適當使用布林運算『AND』、『OR』

限定適當文章類型

『Meta-Analysis』文章

『Systematic Reviews』 文章

『Randomized controlled Trial』文章

限定搜尋範圍

限定『5年』 文章

限定『Full text』全文可供評讀

搜尋 PubMed

Search	Actions	Details	Query	Results	Time
#15	•••	⌄	Search: **((((Type 2 Diabetes Mellitus) AND (Chronic Kidney Disease)) AND (ACE Inhibitors (ACEI))) OR (SGLT2 Inhibitor))** Filters: **Free full text, Meta-Analysis, Systematic Review, from 2024 - 2025** ((("diabetes mellitus, type 2"[MeSH Terms] OR "type 2 diabetes mellitus"[All Fields]) AND ("renal insufficiency, chronic"[MeSH Terms] OR ("renal"[All Fields] AND "insufficiency"[All Fields] AND "chronic"[All Fields]) OR "chronic renal insufficiency"[All Fields] OR ("chronic"[All Fields] AND "kidney"[All Fields] AND "disease"[All Fields]) OR "chronic kidney disease"[All Fields]) AND (("angiotensin converting enzyme inhibitors"[Pharmacological Action] OR "angiotensin converting enzyme inhibitors"[Supplementary Concept] OR "angiotensin converting enzyme inhibitors"[All Fields] OR "ace inhibitors"[All Fields] OR "angiotensin converting enzyme inhibitors"[MeSH Terms] OR ("angiotensin converting"[All Fields] AND "enzyme"[All Fields] AND "inhibitors"[All Fields]) OR ("ace"[All Fields] AND "inhibitors"[All Fields])) AND "ACEI"[All Fields])) OR ("sodium glucose transporter 2 inhibitors"[Pharmacological Action] OR "sodium glucose transporter 2 inhibitors"[Supplementary Concept] OR "sodium glucose transporter 2 inhibitors"[All Fields] OR "sglt2 inhibitor"[All Fields] OR "sodium glucose transporter 2 inhibitors"[MeSH Terms] OR ("sglt2"[All Fields] AND "inhibitor"[All Fields]))) AND ((ffrft[Filter]) AND (meta-analysis[Filter] OR systematicreview[Filter]) AND (2024:2025[pdat]))	206	21:27:54

SR作為filters
篩選level 1文獻

P AND I AND C

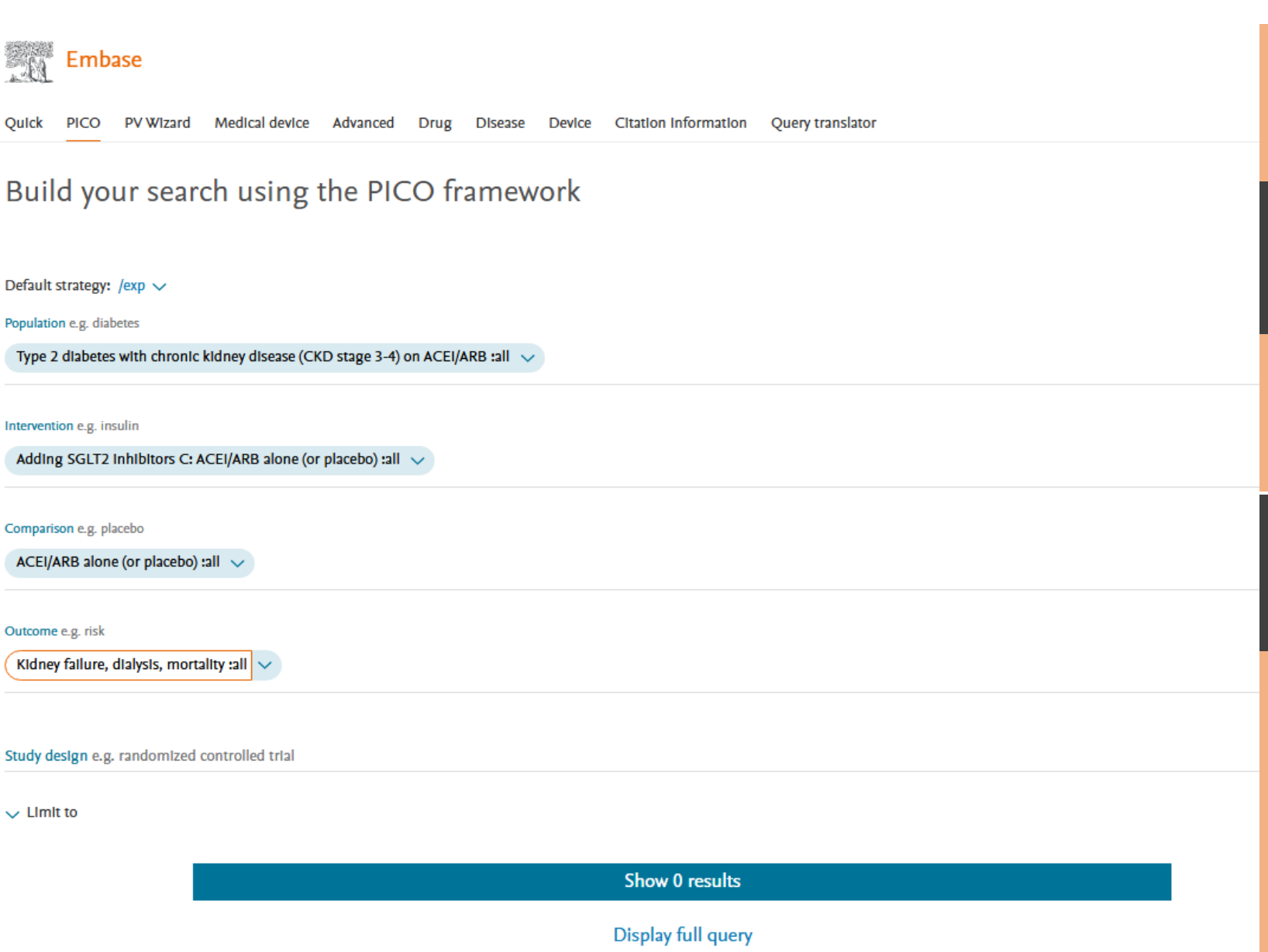
SR作為filters
篩選level 1文獻

P AND I

確認advanced
search正確

使用MeSH terms

搜尋 Embase



搜尋策略使用/br
搜尋all fields

比對emtree term
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搜尋 Embase

History | Save | Delete | Print view | Export | Email | Combine > | using And Or | Collapse

#1 'type 2 diabetes with chronic kidney disease (ckd stage 3-4) on acei/arb' AND 'adding sglt2 inhibitors c: acei/arb alone (or placebo)' AND 'acei/arb alone (or placebo)' AND 'kidney failure, dialysis, mortality' 0

0 results for search #1 | Set email alert | Set RSS feed | Search details | Index miner

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0 search results.

- Check your syntax and/or spelling
- Expand your search with additional synonyms
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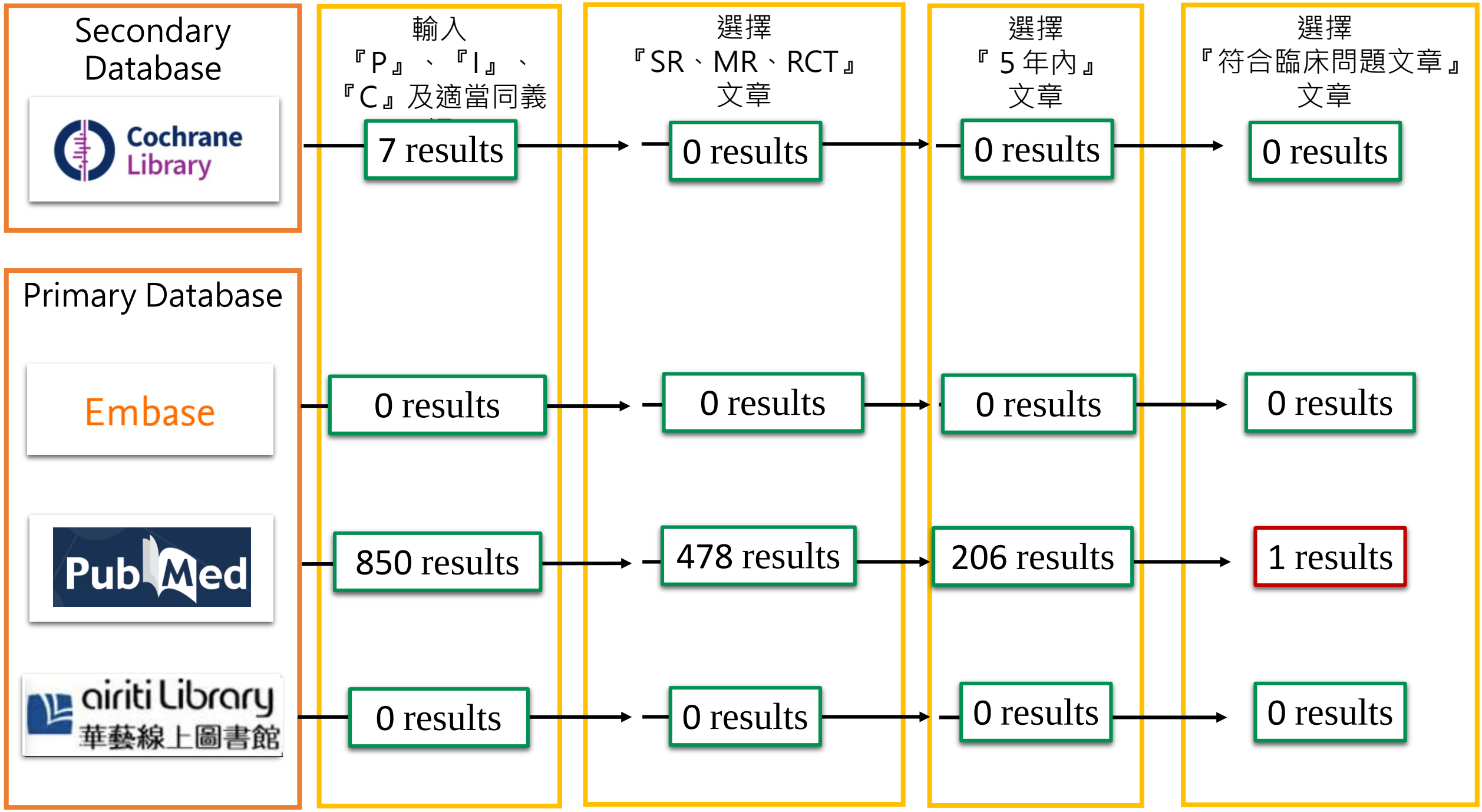
輸入關鍵字

『糖尿病、慢性腎病、ACE抑制劑、SGLT2抑制劑、末期腎病、洗腎』

適當使用布林運算『AND』、『OR』

不限語言類型地區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選擇『符合臨床問題文章』文章
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0 results
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0 results

選擇文獻

文獻標題[年份]	研究設計	樣本數	搜尋時間	情境
Sodium- glucose co- transporter- 2 inhibitors in patients with chronic kidney disease with or without type 2 diabetes: systematic review and meta- analysis	SR of RCTs	13 Trials	3 hr	P ● I ● C ● O ●

選擇最佳文獻

> BMJ Med. 2024 Oct 1;3(1):e001009. doi: 10.1136/bmjmed-2024-001009. eCollection 2024.

Sodium-glucose co-transporter-2 inhibitors in patients with chronic kidney disease with or without type 2 diabetes: systematic review and meta-analysis

Xinyu Zou [1], Qingyang Shi [1 2], Per Olav Vandvik [3], Yunhe Mao [4], Arnav Agarwal [5 6], Belen Ponte [7], Xiaoxi Zeng [8], Gordon Guyatt [5], Qinbo Yang [8], Xianghang Luo [9], Chang Xu [10], Ping Fu [8], Haoming Tian [1], Thomas Agoritsas [5 11 12], Sheyu Li [1]

Affiliations + expand

PMID: 39574422 PMCID: PMC11579537 DOI: 10.1136/bmjmed-2024-001009

- ✓ 最佳研究設計SR of RCT
- ✓ 較新的發表年份
- ✓ 最符合臨床情境PICO

5A-3 Appraise 評讀文獻

評讀工具

CASP
Critical Appraisal Skills Programme

www.casp-uk.net
info@casp-uk.net
Summertown Pavilion, Middle Way Oxford OX2 7LG

CASP Checklist: 10 questions to help you make sense of a Systematic Review

How to use this appraisal tool: Three broad issues need to be considered when appraising a systematic review study:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

✓ 針對效度直觀分析
✓ 針對結果直觀分析
✓ 共10個問題探討各面向

Validity：1.此系統性回顧是否問了一個清楚、明確的臨床問題？

ABSTRACT

OBJECTIVE To examine cardiovascular and kidney benefits and harms of sodium-glucose co-transporter-2 (SGLT-2) inhibitors stratified by risk in adults with chronic kidney disease regardless of diabetes status.

DESIGN Systematic review and meta-analysis.

DATA SOURCES Ovid Medline, Embase, and Cochrane Central from database inception to 15 June 2024.

ELIGIBILITY CRITERIA FOR SELECTING STUDIES Randomised controlled trials that compared SGLT-2 inhibitors with placebo or standard care with no SGLT-2 inhibitors in adults with chronic kidney disease with a follow-up duration of ≥12 weeks were eligible. Secondary analyses based on subpopulations from randomised controlled trials and publications not in English language were excluded.

DATA SYNTHESIS Random effects meta-analyses were conducted, with effect estimates presented as risk ratios with 95% confidence intervals (CIs). Absolute treatment effects were estimated over a five year duration for individuals with varied risks of cardiovascular and kidney complications based

P

I

C

O

評讀結果

P： Chronic kidney disease, diabetes

I ：SGLT-2 inhibitors

C： no SGLT-2 inhibitors

O：Kidney failure, Dialysis, mortality, cardiovascular

Validity：2.作者是否尋找適當研究型態的文獻?

RESULTS Evidence from 13 randomised controlled trials (29 614 patients) informed treatment effect estimates. In relative terms, SGLT-2 inhibitors reduced all cause death (risk ratio 0.85 (95% CI 0.74 to 0.98)), cardiovascular death (0.84 (0.74 to 0.96)), kidney failure (0.68 (0.60 to 0.77)), non-fatal stroke (0.73 (0.57 to 0.94)), non-fatal myocardial infarction (0.75 (0.60 to 0.93)), and admission to hospital for heart failure (0.68 (0.60 to 0.78)). No credible subgroup effects were found from diabetes status, heart failure status, estimated glomerular filtration rate, urinary albumin-to-creatinine ratio, and follow-up duration. Absolute effect estimates across these outcomes over a fiveyear period varied across risk groups based on baseline risks

評讀結果

- 收錄符合問題的**RCT**
- 清楚定義了**納入條件**
- 清楚定義**排除條件**
- 納入**RCT及non RCT**

Validity：3.你認為所有重要且相關的研究都被納入?

Search strategy

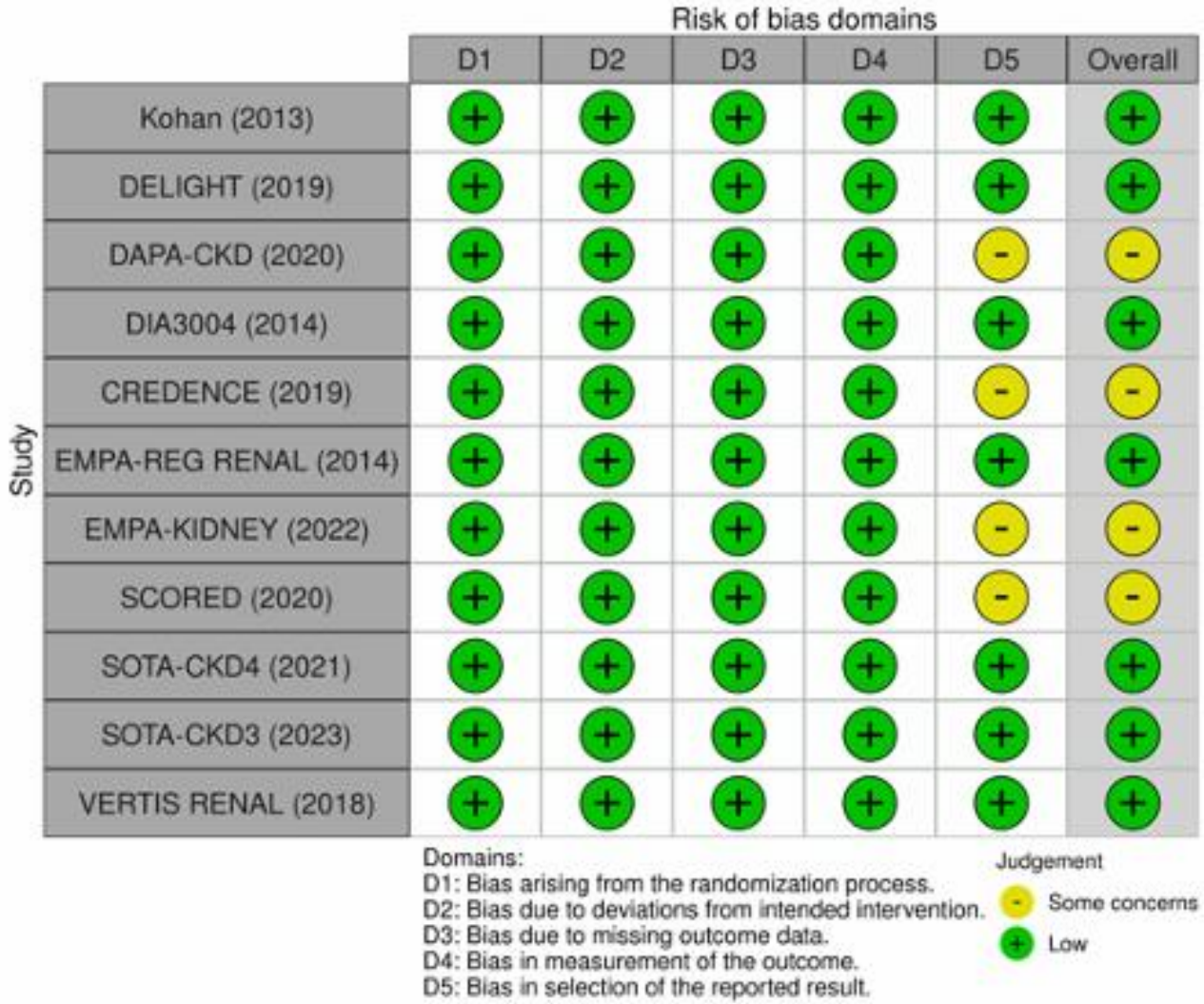
We searched OVID Medline, Embase, and Cochrane Central Register of Controlled Trials for eligible randomised controlled trials and publications in English language from database inception to 15 June 2024. A supplementary search was conducted using ClinicalTrials.gov to identify ongoing or unpublished registered trials. The full search strategy is available in online supplemental appendix 1.

評讀結果

- 搜尋各種資料庫
- Prisma protocol 清楚說明納入排除理由
- 搜尋不限年代、語言、國家、種族
- 從參考資料再搜尋
- 與專家聯繫
- 包含已/未發表文獻
- 搜尋非英文文獻

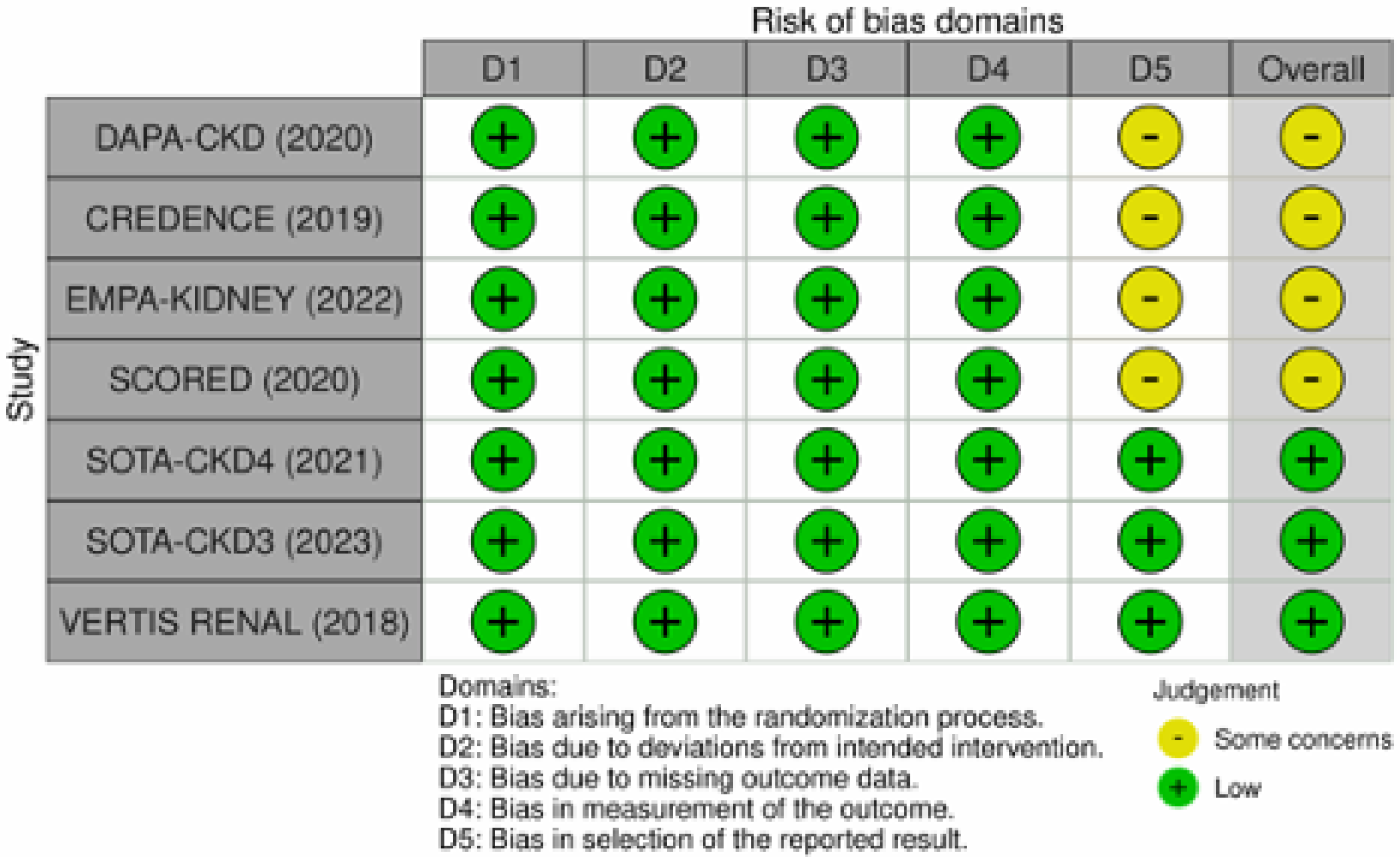
Validity：4.作者是否評估所納入研究文獻的品質？

7.1 All-cause death



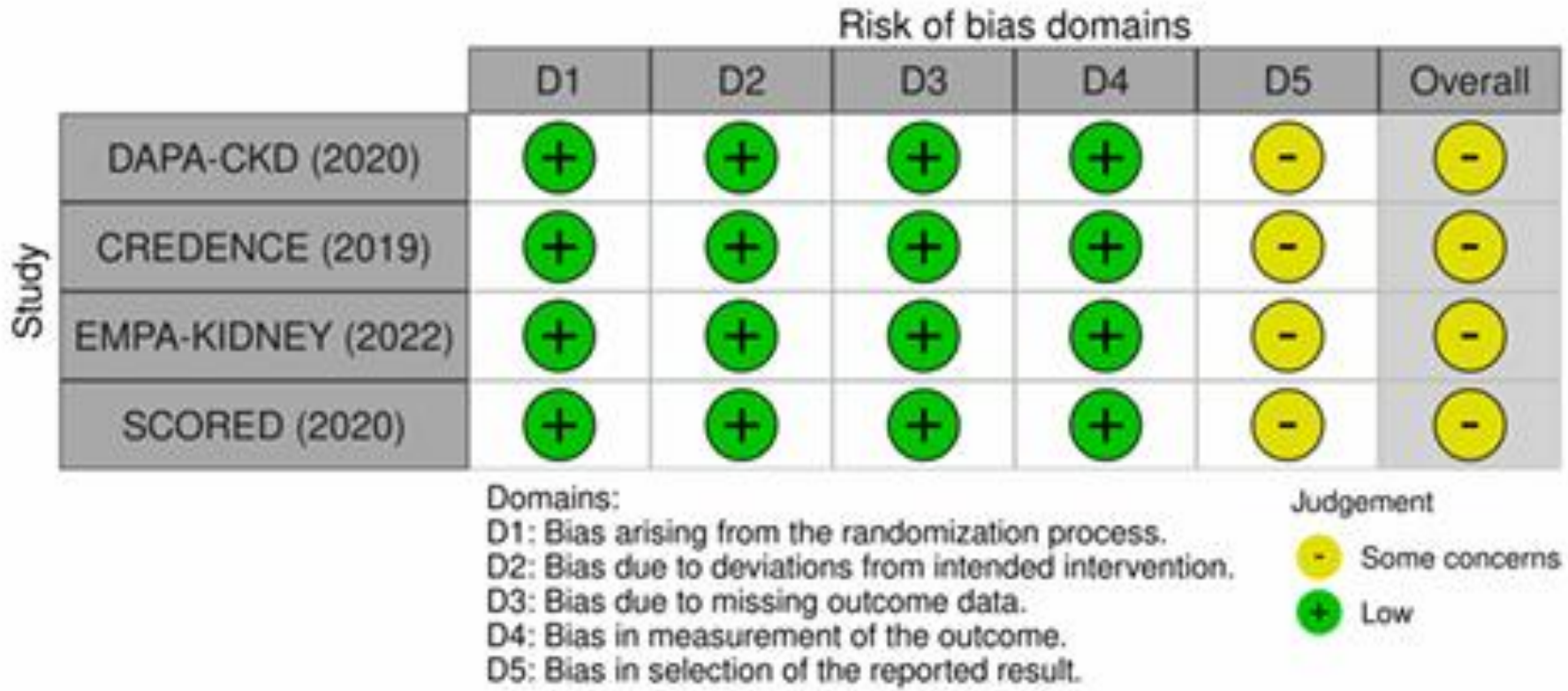
Validity：4.作者是否評估所納入研究文獻的品質？

7.2 Cardiovascular death



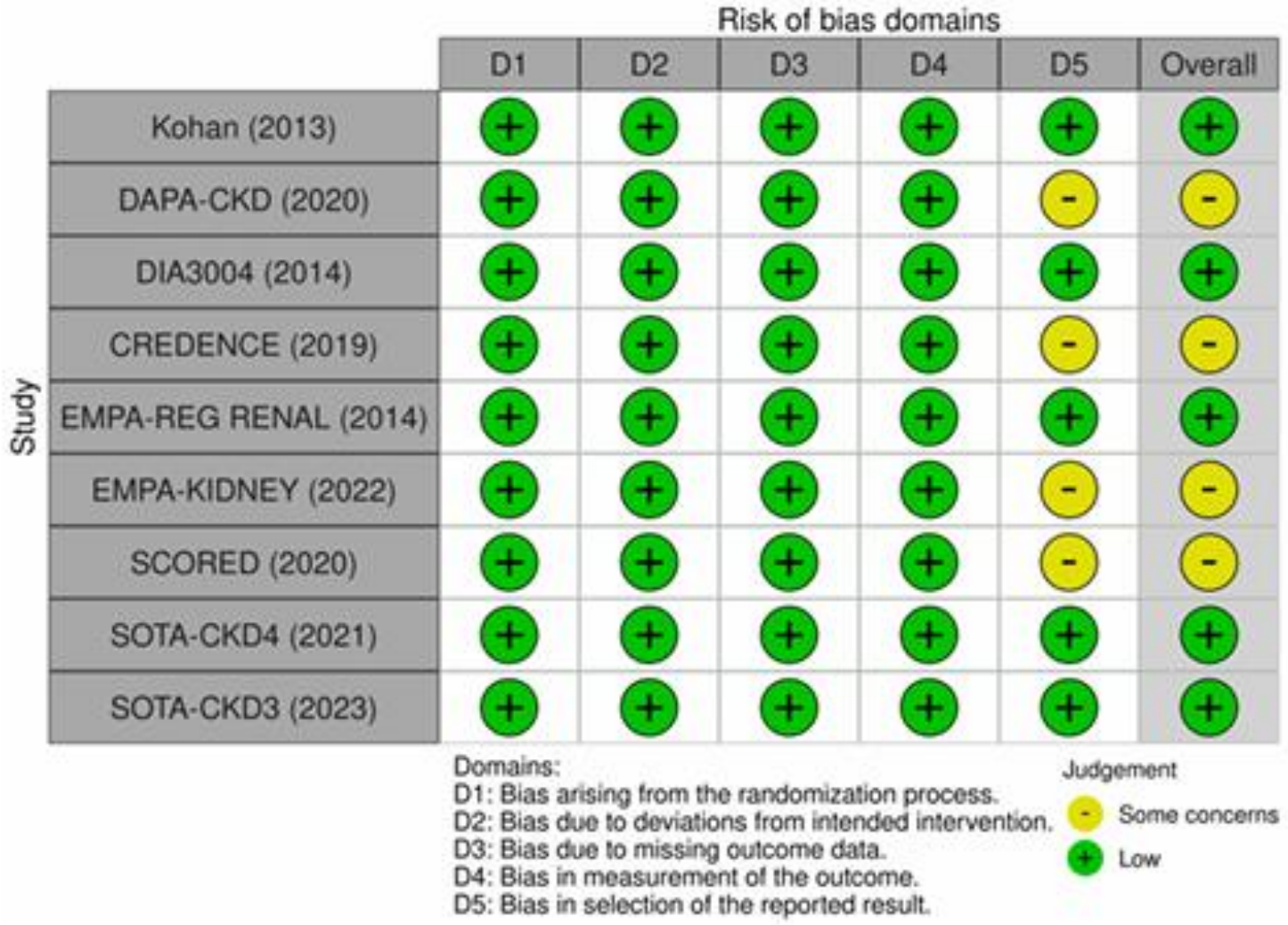
Validity：4.作者是否評估所納入研究文獻的品質？

7.3 Kidney-related death



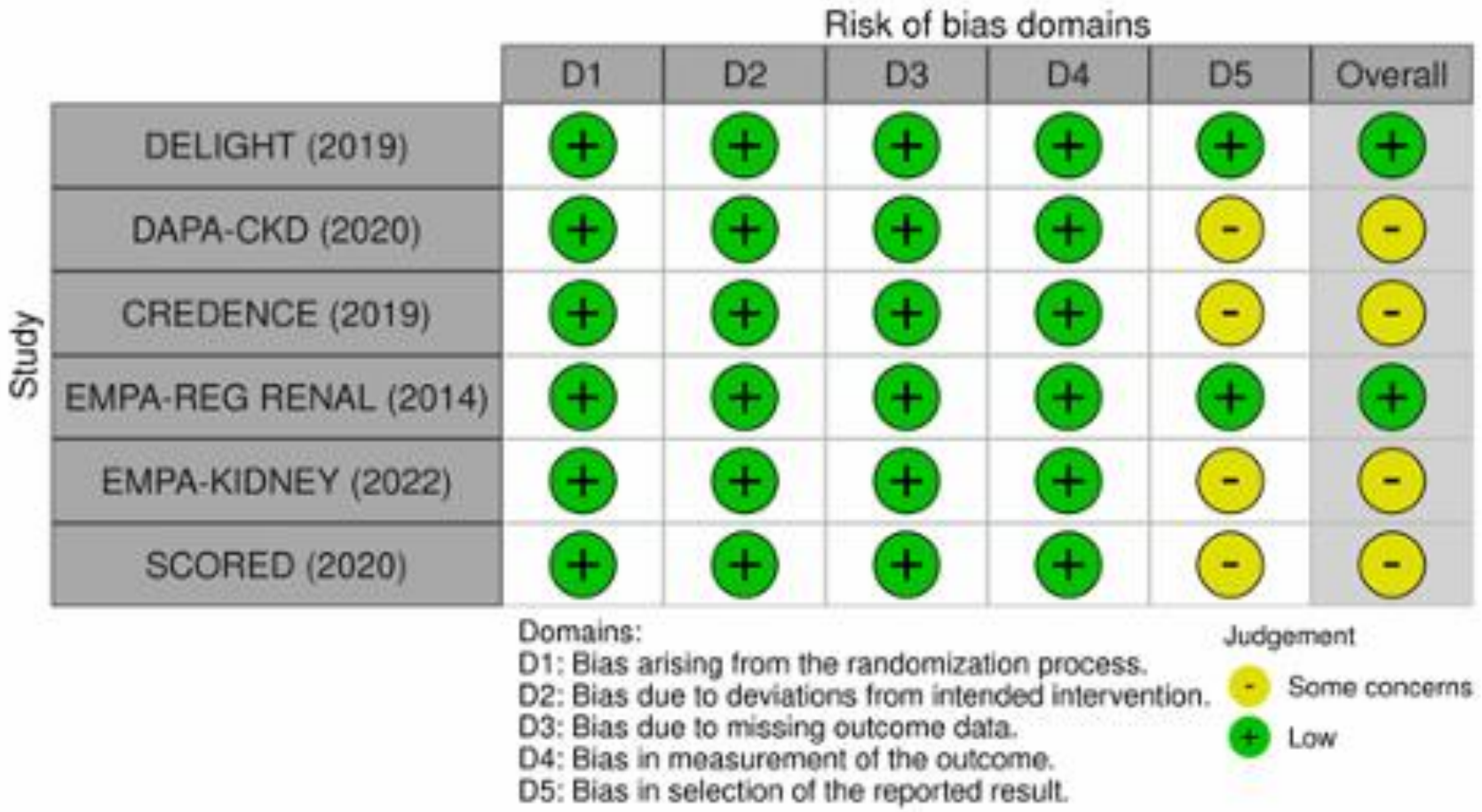
Validity：4.作者是否評估所納入研究文獻的品質？

7.4 Kidney failure



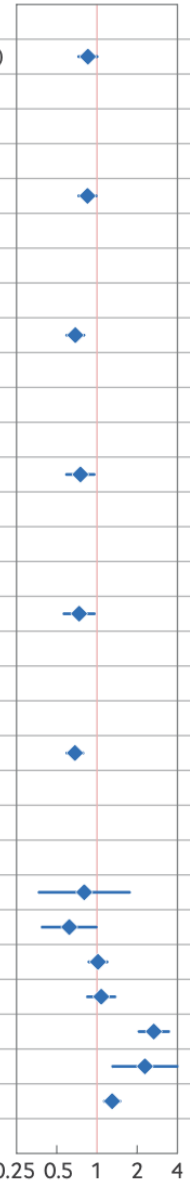
Validity：4.作者是否評估所納入研究文獻的品質？

7.12 Ketoacidosis



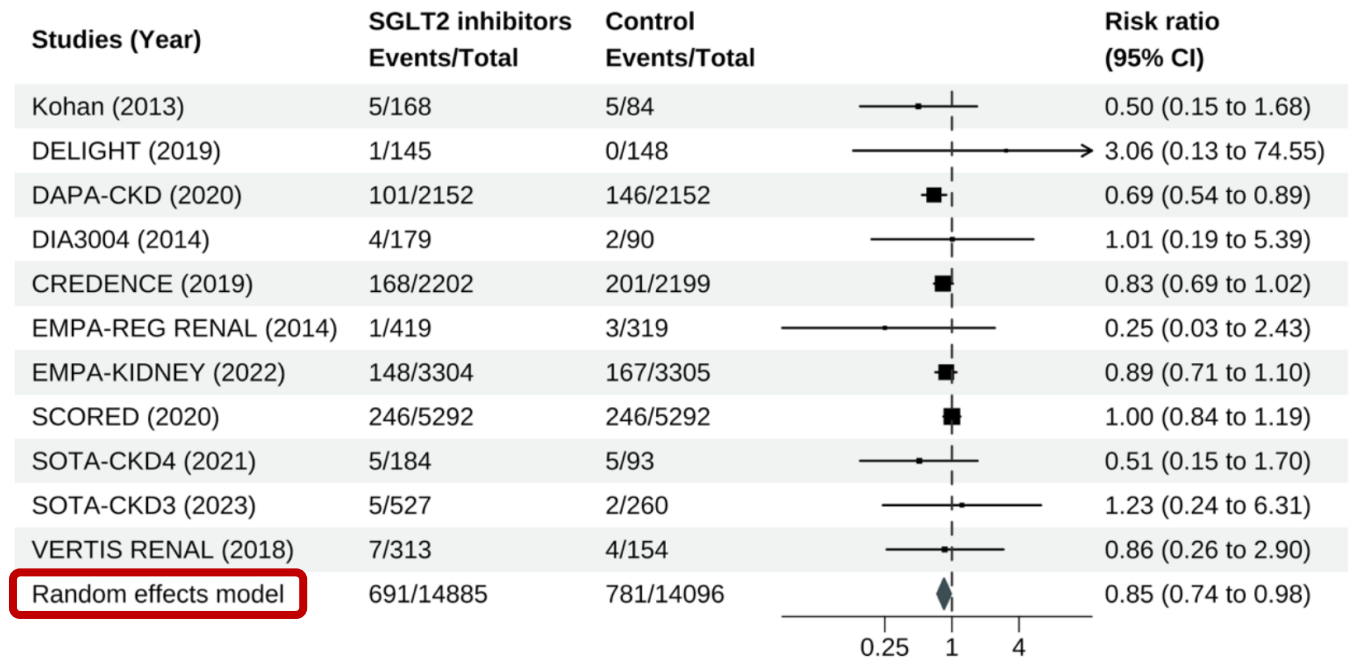
Validity：4.作者是否評估所納入研究文獻的品質？

Outcomes	Studies (n/N)	Risk ratio (95% CI)	Risk ratio (95% CI)	Risk categories	Baseline risk* (per 1000)	Anticipated risk difference over 5 years (95% CI)	Certainty rating	Certainty of evidence
All cause death	11 (1472/289 981)		0.85 (0.74 to 0.98)	Low	44	7 fewer per 1000 (11 fewer to 1 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				Moderate	84	13 fewer per 1000 (22 fewer to 2 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				High	159	24 fewer per 1000 (41 fewer to 3 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				Very high	323	48 fewer per 1000 (84 fewer to 6 fewer)	□□□□□□	High ⊕⊕⊕⊕
Cardiovascular death	7 (859/27 429)		0.84 (0.74 to 0.96)	Low	11	2 fewer per 1000 (3 fewer to 0 fewer)	□□□□□□	High ⊕⊕⊕⊕
				Moderate	20	3 fewer per 1000 (5 fewer to 1 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				High	37	6 fewer per 1000 (10 fewer to 1 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				Very high	64	10 fewer per 1000 (17 fewer to 3 fewer)	□□□■□□	Moderate ⊕⊕⊕○
Kidney failure	9 (990/28 221)		0.68 (0.60 to 0.77)	Low	1	0 fewer per 1000 (0 fewer to 0 fewer)	□□□□□□	High ⊕⊕⊕⊕
				Moderate	1	0 fewer per 1000 (0 fewer to 0 fewer)	□□□□□□	High ⊕⊕⊕⊕
				High	9	3 fewer per 1000 (4 fewer to 2 fewer)	□□□□□□	High ⊕⊕⊕⊕
				Very high	181	58 fewer per 1000 (72 fewer to 42 fewer)	□□□□□□	High ⊕⊕⊕⊕
Non-fatal myocardial infarction	4 (323/16 049)		0.75 (0.60 to 0.93)	Low	61	15 fewer per 1000 (24 fewer to 4 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				Moderate	73	18 fewer per 1000 (29 fewer to 5 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				High	85	21 fewer per 1000 (34 fewer to 6 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				Very high	127	32 fewer per 1000 (51 fewer to 9 fewer)	□□□■□□	Moderate ⊕⊕⊕○
Non-fatal stroke	4 (237/16 049)		0.73 (0.57 to 0.94)	Low	38	10 fewer per 1000 (16 fewer to 2 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				Moderate	49	13 fewer per 1000 (21 fewer to 3 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				High	78	21 fewer per 1000 (34 fewer to 5 fewer)	□□□■□□	Moderate ⊕⊕⊕○
				Very high	93	25 fewer per 1000 (40 fewer to 6 fewer)	□□□■□□	Moderate ⊕⊕⊕○
Hospital admission for heart failure	6 (915/26 962)		0.68 (0.60 to 0.78)	Low	14	4 fewer per 1000 (6 fewer to 3 fewer)	□□□□□□	High ⊕⊕⊕⊕
				Moderate	27	9 fewer per 1000 (11 fewer to 6 fewer)	□□□□□□	High ⊕⊕⊕⊕
				High	40	13 fewer per 1000 (16 fewer to 9 fewer)	□□□□□□	High ⊕⊕⊕⊕
				Very high	79	25 fewer per 1000 (32 fewer to 17 fewer)	□□□■□□	Moderate ⊕⊕⊕○
Kidney related death	4 (36/25 898)		0.80 (0.37 to 1.72)	Across risk categories	4	1 fewer per 1000 (3 fewer to 3 more)	□□■□□□	Moderate ⊕⊕⊕○
Acute kidney injury requiring dialysis	2 (84/8701)		0.62 (0.40 to 0.95)	Across risk categories	23	9 fewer per 1000 (14 fewer to 1 fewer)	□□■□□□	Moderate ⊕⊕⊕○
Bone fracture	12 (846/29 276)		1.02 (0.89 to 1.17)	Across risk categories	91	2 more per 1000 (10 fewer to 15 more)	□□■□□□	Moderate ⊕⊕⊕○
Lower limb amputation	8 (330/27 550)		1.07 (0.86 to 1.33)	Across risk categories	29	2 more per 1000 (4 fewer to 10 more)	□□■■□□	Low ⊕⊕○○
Gential infection	13 (327/29 597)		2.66 (2.07 to 3.42)	Across risk categories	16	27 more per 1000 (17 more to 39 more)	□□■□□□	Moderate ⊕⊕⊕○
Ketoacidosis	6 (67/26 912)		2.27 (1.30 to 3.95)	Across risk categories	3	4 more per 1000 (1 more to 9 more)	□□■□□□	Moderate ⊕⊕⊕○
Symptomatic hypovolaemia	13 (1256/29 597)		1.29 (1.15 to 1.44)	Across risk categories	111	32 more per 1000 (17 more to 49 more)	□□■□□□	Moderate ⊕⊕⊕○



Validity：5.作者將研究結果進行合併，這樣的合併是否合理?

8.1 Forest plot of all-cause death



Studies (Year)	SGLT2 inhibitors Events/Total	Control Events/Total	Risk ratio (95% CI)
Kohan (2013)	5/168	5/84	0.50 (0.15 to 1.68)
DELIGHT (2019)	1/145	0/148	3.06 (0.13 to 74.55)
DAPA-CKD (2020)	101/2152	146/2152	0.69 (0.54 to 0.89)
DIA3004 (2014)	4/179	2/90	1.01 (0.19 to 5.39)
CREDENCE (2019)	168/2202	201/2199	0.83 (0.69 to 1.02)
EMPA-REG RENAL (2014)	1/419	3/319	0.25 (0.03 to 2.43)
EMPA-KIDNEY (2022)	148/3304	167/3305	0.89 (0.71 to 1.10)
SCORED (2020)	246/5292	246/5292	1.00 (0.84 to 1.19)
SOTA-CKD4 (2021)	5/184	5/93	0.51 (0.15 to 1.70)
SOTA-CKD3 (2023)	5/527	2/260	1.23 (0.24 to 6.31)
VERTIS RENAL (2018)	7/313	4/154	0.86 (0.26 to 2.90)
Random effects model	691/14885	781/14096	0.85 (0.74 to 0.98)

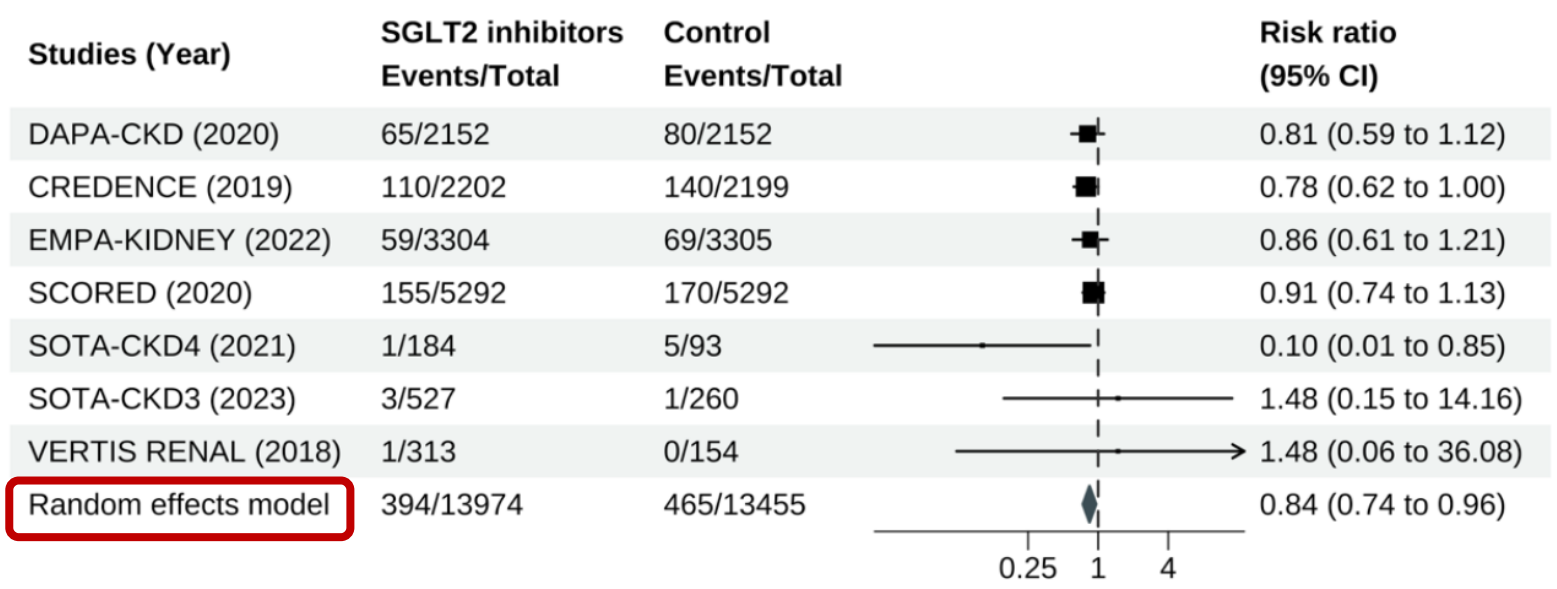
Outcomes/Subgroups	Risk ratio (95% CI)	No. of studies	n/N	P for interaction	Heterogeneity, I^2 (%) (P value)
All-cause death				0.77	0 (0.45)
With type 2 diabetes	0.85 (0.75 to 0.97)	11	1331/24014		0 (0.65)
Without type 2 diabetes	0.77 (0.38 to 1.57)	2	141/4967		76 (0.04)

評讀結果

- 有DM異質性：I^2:0%、p=0.65
- 沒有DM異質性：I^2:76%、p=0.04
- 採用Random model
- 次族群分析
- 敏感性測試

Validity：5.作者將研究結果進行合併，這樣的合併是否合理?

8.2 Forest plot of cardiovascular death



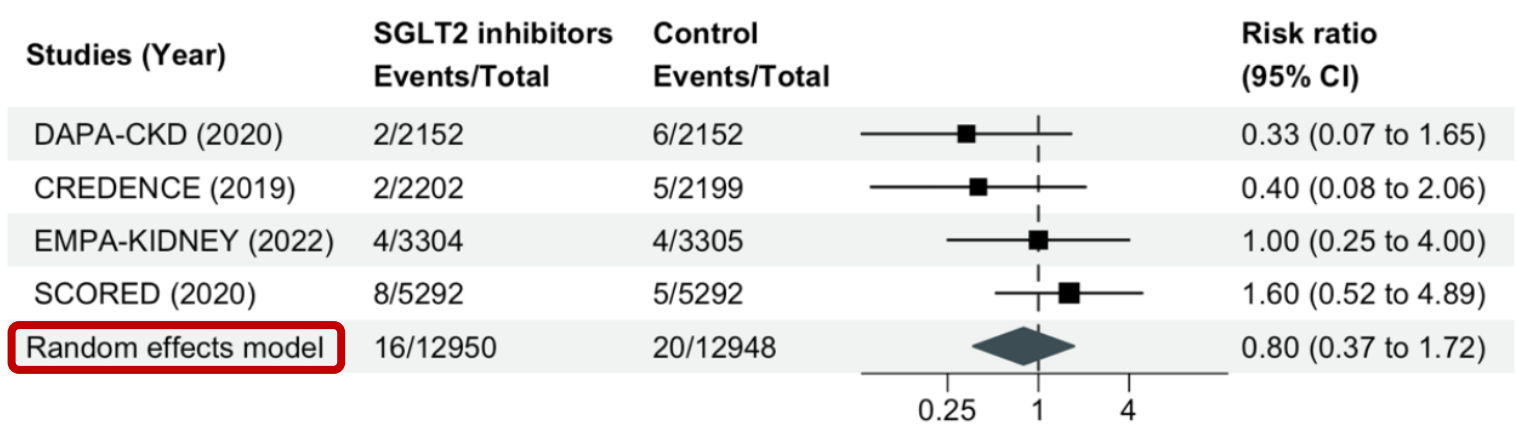
Outcomes/Subgroups	Risk ratio (95% CI)	No. of studies	n/N	P for interaction	Heterogeneity, I^2 (%) (P value)
Cardiovascular death				0.64	6 (0.38)
With type 2 diabetes	0.83 (0.72 to 0.95)	7	808/22462		0 (0.47)
Without type 2 diabetes	1.02 (0.43 to 2.41)	2	51/4967		57 (0.13)

評讀結果

- 有DM異質性：I^2:0% 、p=0.47
- 沒有DM異質性：I^2:57% 、p=0.13
- 採用-Random model
- 次族群分析
- 敏感性測試

Validity：5.作者將研究結果進行合併，這樣的合併是否合理?

8.3 Forest plot of kidney-related death



Outcomes/Subgroups	Risk ratio (95% CI)	No. of studies	n/N	P for interaction	Heterogeneity, I^2 (%) (P value)
Kidney-related death				0.39	8 (0.35)
With type 2 diabetes	0.81 (0.31 to 2.13)	3	26/17891		17 (0.30)
Without type 2 diabetes	0.20 (0.01 to 4.18)	1	2/1398		/

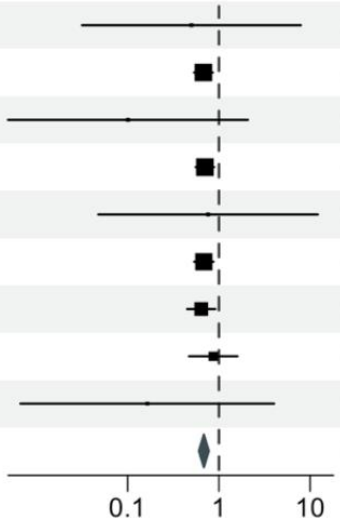
評讀結果

- 有DM異質性（heterogeneity）：I^2:17%、p=0.30
- 沒有DM異質性（heterogeneity）：/
- 採用-Random model
- 次族群分析
- 敏感性測試

Validity：5.作者將研究結果進行合併，這樣的合併是否合理?

8.4 Forest plot of kidney failure

Studies (Year)	SGLT2 inhibitors Events/Total	Control Events/Total	Risk ratio (95% CI)
Kohan (2013)	1/168	1/84	0.50 (0.03 to 7.90)
DAPA-CKD (2020)	109/2152	161/2152	0.68 (0.53 to 0.86)
DIA3004 (2014)	0/179	2/90	0.10 (0.005 to 2.08)
CREDENCE (2019)	116/2202	165/2199	0.70 (0.56 to 0.88)
EMPA-REG RENAL (2014)	1/419	1/319	0.76 (0.05 to 12.13)
EMPA-KIDNEY (2022)	108/3304	158/3305	0.68 (0.54 to 0.87)
SCORED (2020)	50/5292	78/5292	0.64 (0.45 to 0.91)
SOTA-CKD4 (2021)	24/184	14/93	0.87 (0.47 to 1.59)
SOTA-CKD3 (2023)	0/527	1/260	0.16 (0.01 to 4.03)
Random effects model	409/14427	581/13794	0.68 (0.60 to 0.77)



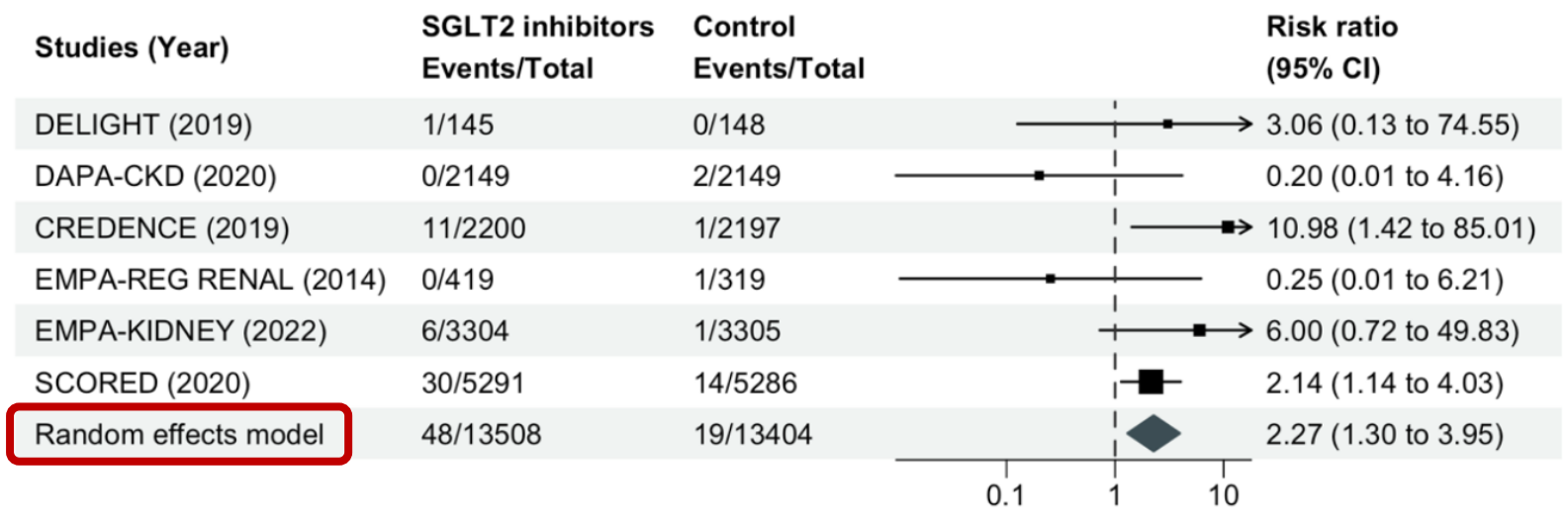
Outcomes/Subgroups	Risk ratio (95% CI)	No. of studies	n/N	P for interaction	Heterogeneity, I^2 (%) (P value)
Kidney failure*				0.55	0 (0.91)
With type 2 diabetes	0.68 (0.59 to 0.78)	9	830/12670		0 (0.90)
Without type 2 diabetes	0.74 (0.58 to 0.93)	2	272/4967		0 (0.34)

評讀結果

- 有DM異質性（heterogeneity）：I^2:0% 、p=0.90
- 沒有DM異質性（heterogeneity）：I^2:0% 、p=0.34
- 採用-Random model
- 次族群分析
- 敏感性測試

Validity：5.作者將研究結果進行合併，這樣的合併是否合理?

8.12 Forest plot of ketoacidosis



Outcomes/Subgroups	Risk ratio (95% CI)	No. of studies	n/N	P for interaction	Heterogeneity, I^2 (%) (P value)
Ketoacidosis				0.86	16 (0.31)
With type 2 diabetes	2.24 (1.28 to 3.89)	6	66/21948		30 (0.21)
Without type 2 diabetes	3.02 (0.12 to 74.05)	2	1/4964		/

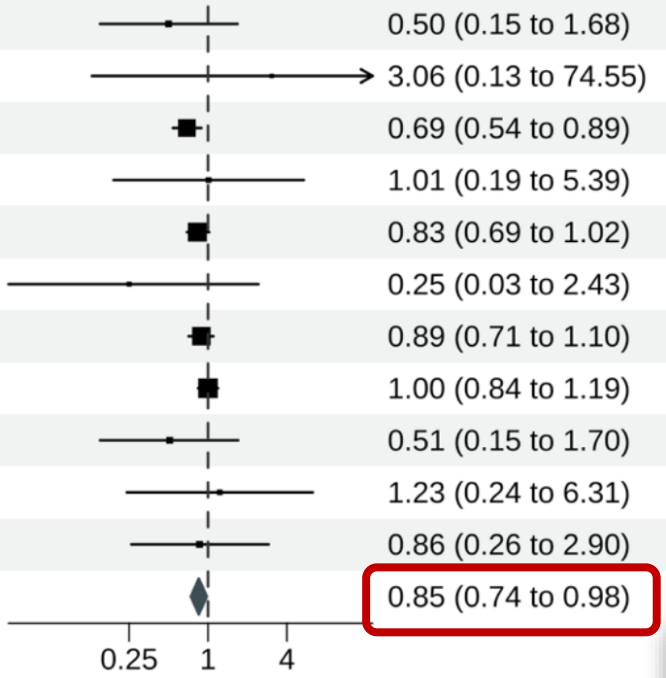
評讀結果

- 有DM異質性（heterogeneity）：I2:30%、p=0.21
- 沒有DM異質性（heterogeneity）：/
- 採用-Random model
- 次族群分析
- 敏感性測試

Importance：6.這篇系統性文獻回顧的整體結果為何？

8.1 Forest plot of all-cause death

Studies (Year)	SGLT2 inhibitors Events/Total	Control Events/Total	Risk ratio (95% CI)
Kohan (2013)	5/168	5/84	0.50 (0.15 to 1.68)
DELIGHT (2019)	1/145	0/148	3.06 (0.13 to 74.55)
DAPA-CKD (2020)	101/2152	146/2152	0.69 (0.54 to 0.89)
DIA3004 (2014)	4/179	2/90	1.01 (0.19 to 5.39)
CREDENCE (2019)	168/2202	201/2199	0.83 (0.69 to 1.02)
EMPA-REG RENAL (2014)	1/419	3/319	0.25 (0.03 to 2.43)
EMPA-KIDNEY (2022)	148/3304	167/3305	0.89 (0.71 to 1.10)
SCORED (2020)	246/5292	246/5292	1.00 (0.84 to 1.19)
SOTA-CKD4 (2021)	5/184	5/93	0.51 (0.15 to 1.70)
SOTA-CKD3 (2023)	5/527	2/260	1.23 (0.24 to 6.31)
VERTIS RENAL (2018)	7/313	4/154	0.86 (0.26 to 2.90)
Random effects model	691/14885	781/14096	0.85 (0.74 to 0.98)



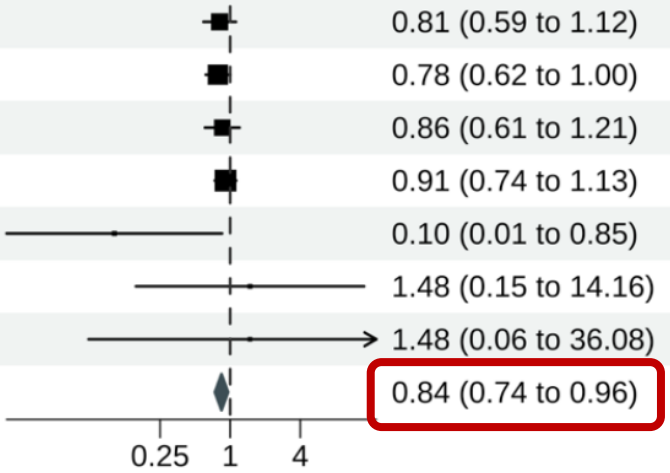
評讀結果

- Risk ratio：0.85
- 95% CI：0.74-0.98

Importance：6.這篇系統性文獻回顧的整體結果為何？

8.2 Forest plot of cardiovascular death

Studies (Year)	SGLT2 inhibitors Events/Total	Control Events/Total	Risk ratio (95% CI)
DAPA-CKD (2020)	65/2152	80/2152	0.81 (0.59 to 1.12)
CREDENCE (2019)	110/2202	140/2199	0.78 (0.62 to 1.00)
EMPA-KIDNEY (2022)	59/3304	69/3305	0.86 (0.61 to 1.21)
SCORED (2020)	155/5292	170/5292	0.91 (0.74 to 1.13)
SOTA-CKD4 (2021)	1/184	5/93	0.10 (0.01 to 0.85)
SOTA-CKD3 (2023)	3/527	1/260	1.48 (0.15 to 14.16)
VERTIS RENAL (2018)	1/313	0/154	1.48 (0.06 to 36.08)
Random effects model	394/13974	465/13455	0.84 (0.74 to 0.96)



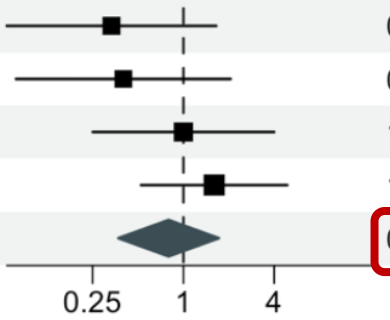
評讀結果

- Risk ratio：0.84
- 95% CI：0.74-0.96

Importance：6.這篇系統性文獻回顧的整體結果為何？

8.3 Forest plot of kidney-related death

Studies (Year)	SGLT2 inhibitors Events/Total	Control Events/Total	Risk ratio (95% CI)
DAPA-CKD (2020)	2/2152	6/2152	0.33 (0.07 to 1.65)
CREDENCE (2019)	2/2202	5/2199	0.40 (0.08 to 2.06)
EMPA-KIDNEY (2022)	4/3304	4/3305	1.00 (0.25 to 4.00)
SCORED (2020)	8/5292	5/5292	1.60 (0.52 to 4.89)
Random effects model	16/12950	20/12948	0.80 (0.37 to 1.72)



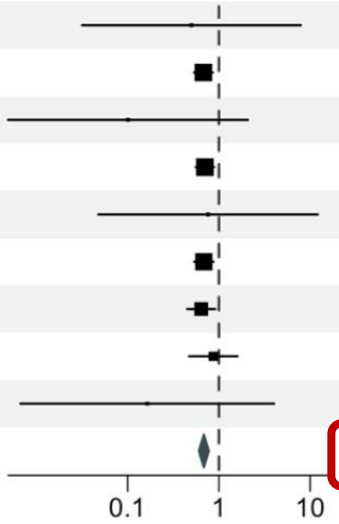
評讀結果

- Risk ratio：0.80
- 95% CI：0.37-1.72

Importance：6.這篇系統性文獻回顧的整體結果為何？

8.4 Forest plot of kidney failure

Studies (Year)	SGLT2 inhibitors Events/Total	Control Events/Total	Risk ratio (95% CI)
Kohan (2013)	1/168	1/84	0.50 (0.03 to 7.90)
DAPA-CKD (2020)	109/2152	161/2152	0.68 (0.53 to 0.86)
DIA3004 (2014)	0/179	2/90	0.10 (0.005 to 2.08)
CREDENCE (2019)	116/2202	165/2199	0.70 (0.56 to 0.88)
EMPA-REG RENAL (2014)	1/419	1/319	0.76 (0.05 to 12.13)
EMPA-KIDNEY (2022)	108/3304	158/3305	0.68 (0.54 to 0.87)
SCORED (2020)	50/5292	78/5292	0.64 (0.45 to 0.91)
SOTA-CKD4 (2021)	24/184	14/93	0.87 (0.47 to 1.59)
SOTA-CKD3 (2023)	0/527	1/260	0.16 (0.01 to 4.03)
Random effects model	409/14427	581/13794	0.68 (0.60 to 0.77)



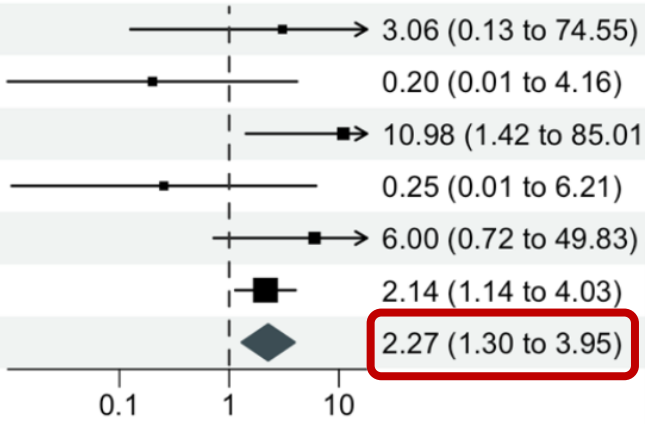
評讀結果

- Risk ratio：0.68
- 95% CI：0.60-0.77

Importance：6.這篇系統性文獻回顧的整體結果為何？

8.12 Forest plot of ketoacidosis

Studies (Year)	SGLT2 inhibitors Events/Total	Control Events/Total	Risk ratio (95% CI)
DELIGHT (2019)	1/145	0/148	3.06 (0.13 to 74.55)
DAPA-CKD (2020)	0/2149	2/2149	0.20 (0.01 to 4.16)
CREDENCE (2019)	11/2200	1/2197	10.98 (1.42 to 85.01)
EMPA-REG RENAL (2014)	0/419	1/319	0.25 (0.01 to 6.21)
EMPA-KIDNEY (2022)	6/3304	1/3305	6.00 (0.72 to 49.83)
SCORED (2020)	30/5291	14/5286	2.14 (1.14 to 4.03)
Random effects model	48/13508	19/13404	2.27 (1.30 to 3.95)

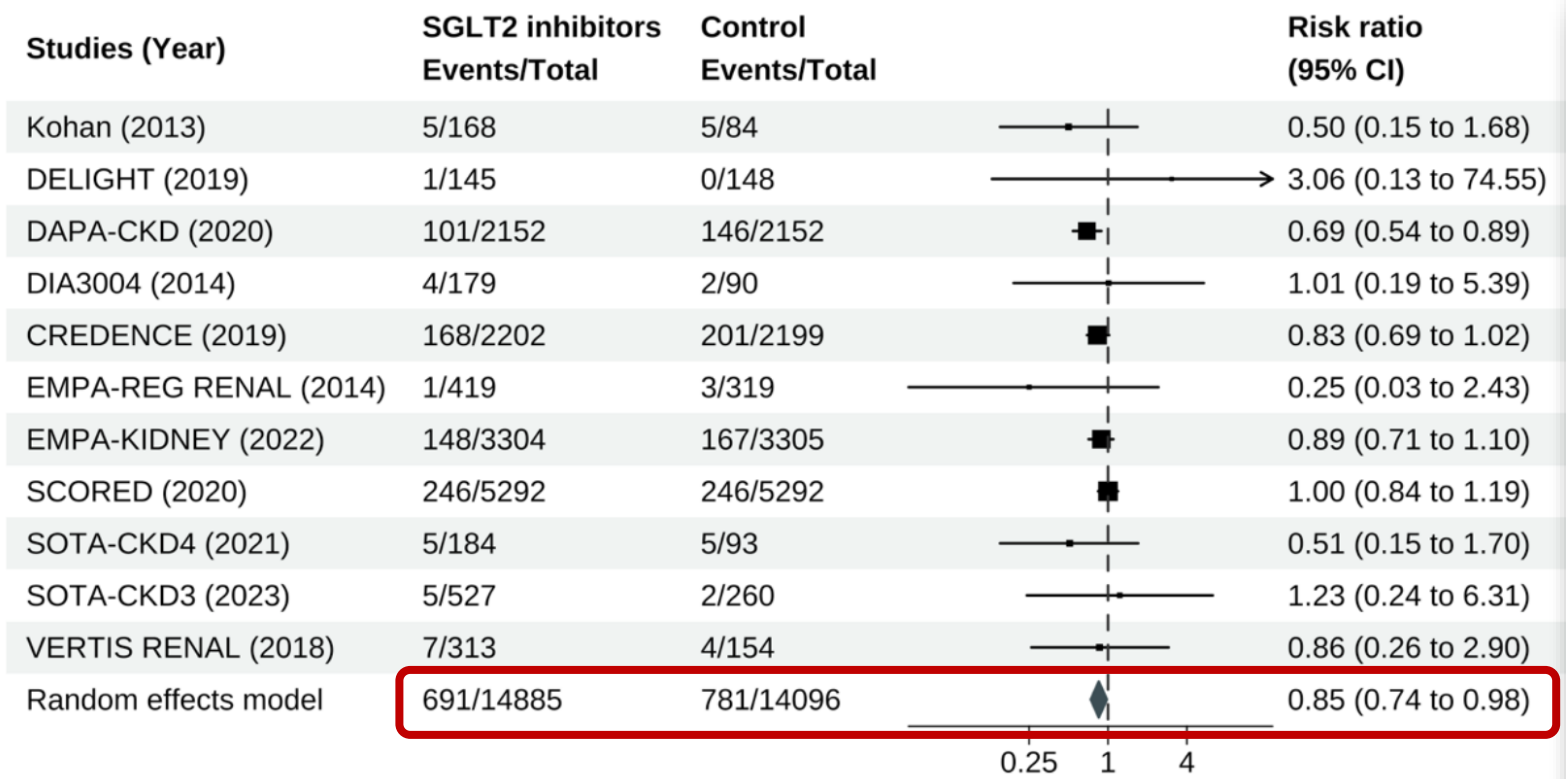


評讀結果

- Risk ratio：2.27
- 95% CI：1.30-3.95
- Adverse：Genital infection、Ketoacidosis

Importance：7.結果精準嗎？

8.1 Forest plot of all-cause death



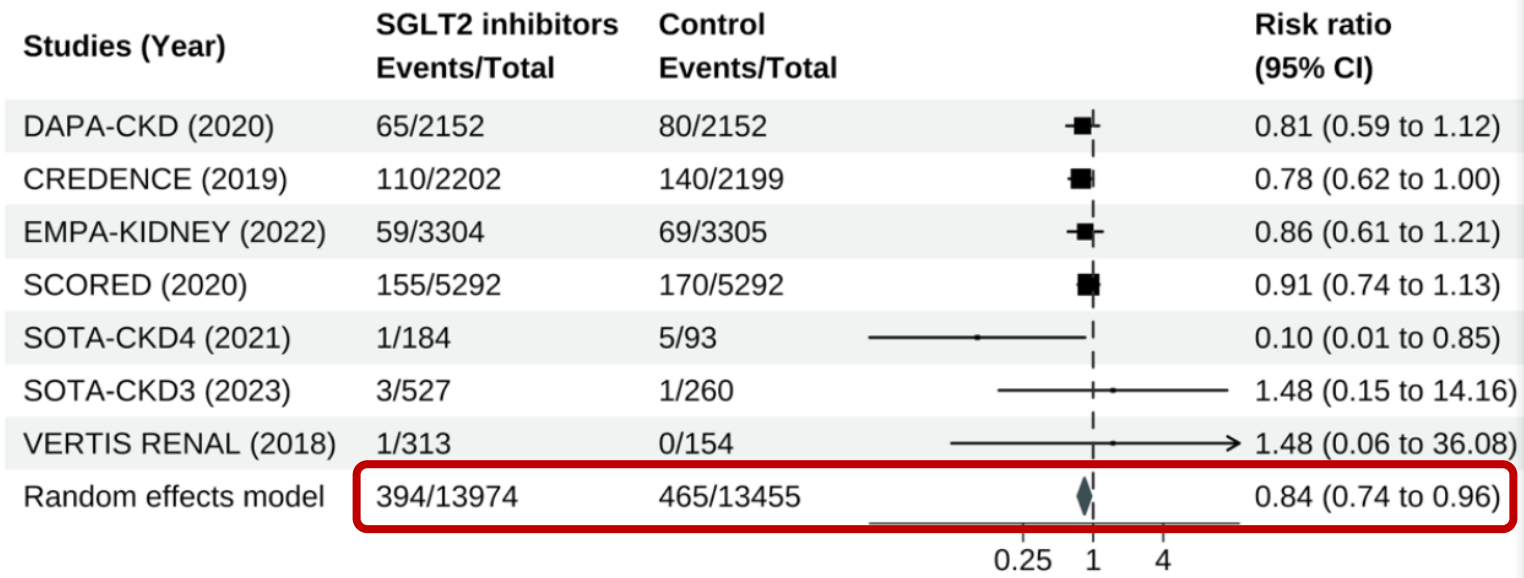
Outcomes/Subgroups	Risk ratio (95% CI)	No. of studies	n/N	P for interaction	Heterogeneity, I^2 (%) (P valu
All-cause death				0.77	0 (0.45)
With type 2 diabetes	0.85 (0.75 to 0.97)	11	1331/24014		0 (0.65)
Without type 2 diabetes	0.77 (0.38 to 1.57)	2	141/4967		76 (0.04)

評讀結果

- Sample size：1472
- 有DM異質性（heterogeneity）：I^2:0%、p=0.65
- 沒有DM異質性（heterogeneity）：I^2:76%、p=0.04

Importance：7.結果精準嗎？

8.2 Forest plot of cardiovascular death



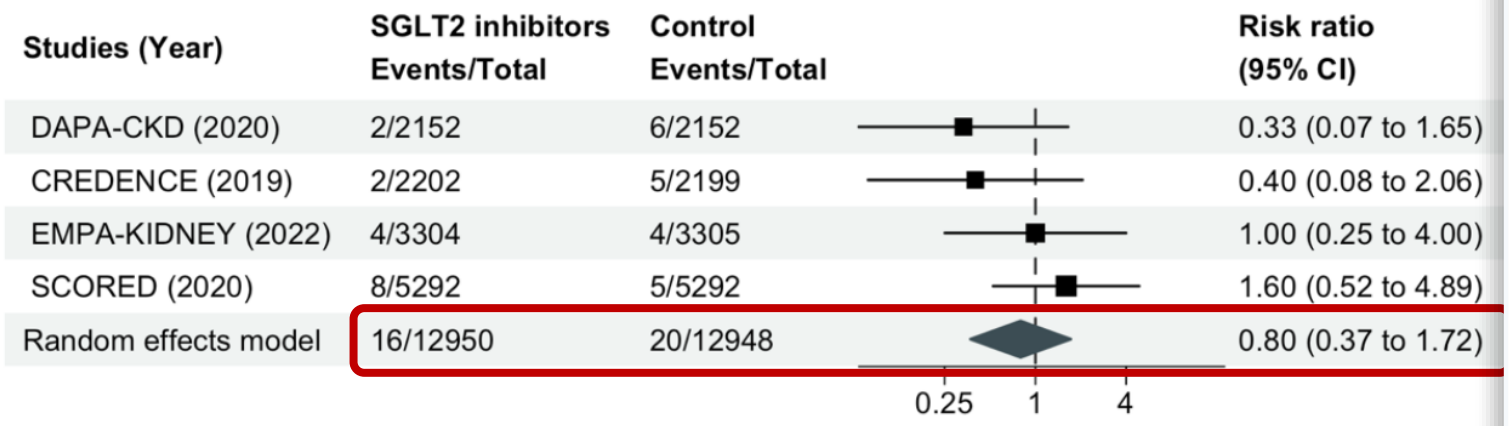
Outcomes/Subgroups	Risk ratio (95% CI)	No. of studies	n/N	P for interaction	Heterogeneity, I^2 (%) (P valu
Cardiovascular death				0.64	6 (0.38)
With type 2 diabetes	0.83 (0.72 to 0.95)	7	808/22462		0 (0.47)
Without type 2 diabetes	1.02 (0.43 to 2.41)	2	51/4967		57 (0.13)

評讀結果

- Sample size：859
- 有DM異質性（heterogeneity）：I^2:0% 、p=0.65
- 沒有DM異質性（heterogeneity）：I^2:76% 、p=0.04

Importance：7.結果精準嗎？

8.3 Forest plot of kidney-related death



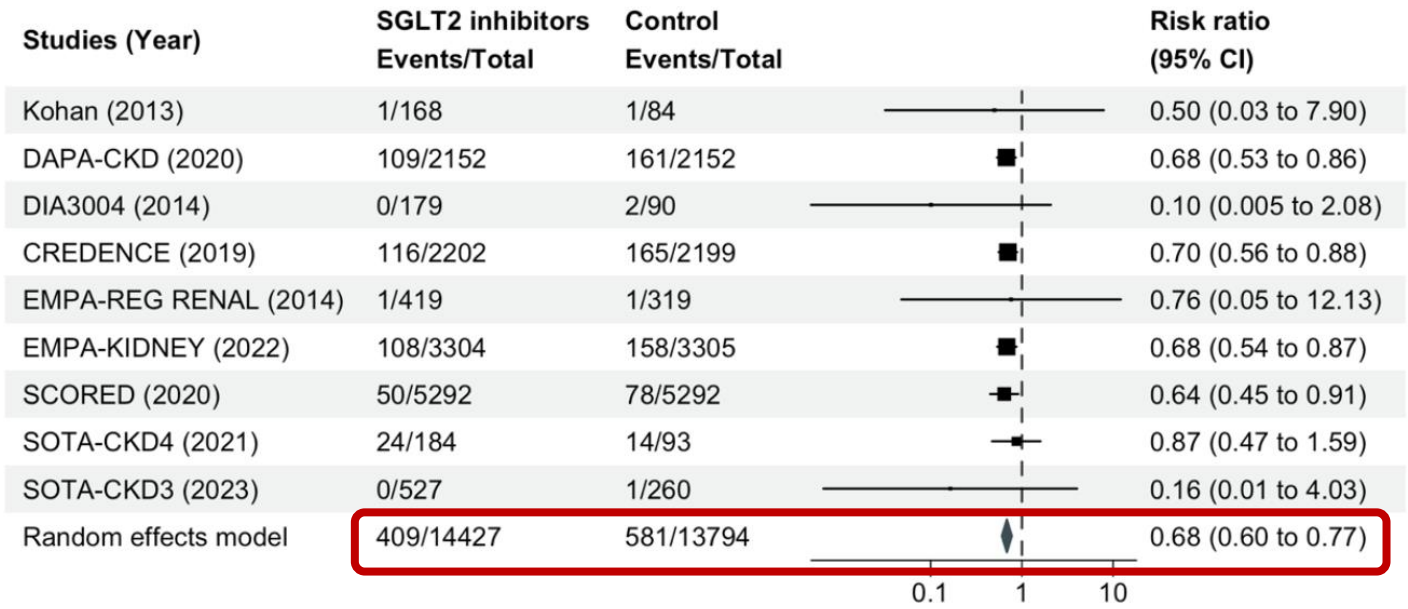
Outcomes/Subgroups	Risk ratio (95% CI)	No. of studies	n/N	P for interaction	Heterogeneity, I^2 (%) (P valu
Kidney-related death				0.39	8 (0.35)
With type 2 diabetes	0.81 (0.31 to 2.13)	3	26/17891		17 (0.30)
Without type 2 diabetes	0.20 (0.01 to 4.18)	1	2/1398		/

評讀結果

- Sample size：36
- 有DM異質性（heterogeneity）：I^2:17%、p=0.30
- 沒有DM異質性（heterogeneity）：/
- 採用-Random model

Importance：7.結果精準嗎？

8.4 Forest plot of kidney failure



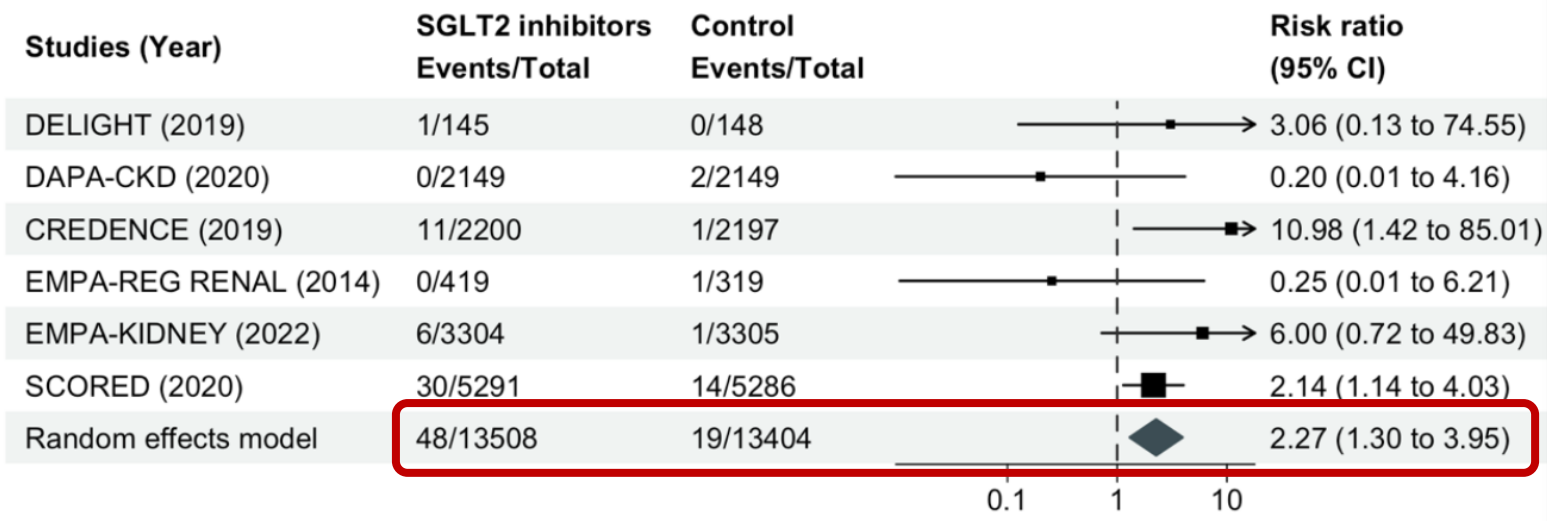
Outcomes/Subgroups	Risk ratio (95% CI)	No. of studies	n/N	P for interaction	Heterogeneity, I^2 (%) (P valu
Kidney failure*				0.55	0 (0.91)
With type 2 diabetes	0.68 (0.59 to 0.78)	9	830/12670		0 (0.90)
Without type 2 diabetes	0.74 (0.58 to 0.93)	2	272/4967		0 (0.34)

評讀結果

- Sample size：990
- 有DM異質性（heterogeneity）：I^2:0% 、p=0.90
- 沒有DM異質性（heterogeneity）：I^2:0% 、p=0.34

Importance：7.結果精準嗎？

8.12 Forest plot of ketoacidosis



Outcomes/Subgroups	Risk ratio (95% CI)	No. of studies	n/N	P for interaction	Heterogeneity, I^2 (%) (P value
Ketoacidosis				0.86	16 (0.31)
With type 2 diabetes	2.24 (1.28 to 3.89)	6	66/21948		30 (0.21)
Without type 2 diabetes	3.02 (0.12 to 74.05)	2	1/4964		/

評讀結果

- Sample size：67
- 有DM異質性（heterogeneity）：I^2:30%、p=0.21
- 沒有DM異質性（heterogeneity）：/

Practicality：8.此研究結果是否可應用到當地的族群？

是否提到亞洲族群 (Asian populations)？

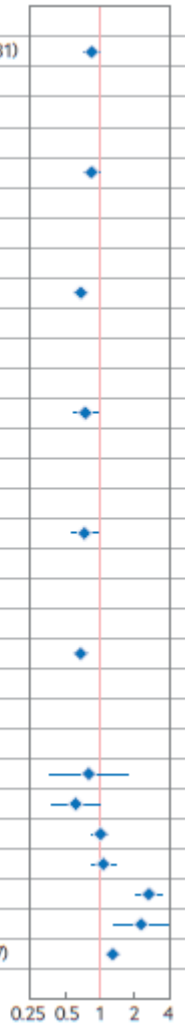
- **沒有針對亞洲族群的獨立分析：** 在這篇系統性回顧與統合分析的主要結果或次群組分析中，**並沒有**特別針對「亞洲族群」進行單獨的數據呈現或分析 。
- **研究對象為全球性：** 納入的臨床試驗（如 DAPA-CKD, CREDENCE, SCORED 等）多為跨國多中心試驗，涵蓋了數十個國家 ，因此受試者中理應包含亞洲人，但本文獻並未具體列出亞洲人的比例或其特定結果。

評讀結果

文件中並未提及使用世界衛生組織 (WHO) 的族群或種族定義。

Practicality：9.是否所有重要的臨床結果都被考量到？

Outcomes	Studies (n/N)	Risk ratio (95% CI)	Risk categories	Baseline risk* (per 1000)
All cause death	11 (1472/289 981)	0.85 (0.74 to 0.98)	Low	44
			Moderate	84
			High	159
			Very high	323
Cardiovascular death	7 (859/27 429)	0.84 (0.74 to 0.96)	Low	11
			Moderate	20
			High	37
			Very high	64
Kidney failure	9 (990/28 221)	0.68 (0.60 to 0.77)	Low	1
			Moderate	1
			High	9
			Very high	181
Non-fatal myocardial infarction	4 (323/16 049)	0.75 (0.60 to 0.93)	Low	61
			Moderate	73
			High	85
			Very high	127
Non-fatal stroke	4 (237/16 049)	0.73 (0.57 to 0.94)	Low	38
			Moderate	49
			High	78
			Very high	93
Hospital admission for heart failure	6 (915/26 962)	0.68 (0.60 to 0.78)	Low	14
			Moderate	27
			High	40
			Very high	79
Kidney related death	4 (36/25 898)	0.80 (0.37 to 1.72)	Across risk categories	4
Acute kidney injury requiring dialysis	2 (84/8701)	0.62 (0.40 to 0.95)	Across risk categories	23
Bone fracture	12 (846/29 276)	1.02 (0.89 to 1.17)	Across risk categories	91
Lower limb amputation	8 (330/27 550)	1.07 (0.86 to 1.33)	Across risk categories	29
Genital infection	13 (327/29 597)	2.66 (2.07 to 3.42)	Across risk categories	16
Ketoacidosis	6 (67/26 912)	2.27 (1.30 to 3.95)	Across risk categories	3
Symptomatic hypovolaemia	13 (1256/29 597)	1.29 (1.15 to 1.44)	Across risk categories	111



評讀結果

- 除了腎臟與死亡率結果外，研究還評估了心衰竭住院 (HHF)、非致命性心肌梗塞/中風等效益
- 重要危害：生殖器感染、DKA、截肢、骨折與AKI

Practicality：10.付出的傷害和花費換得介入措施所產生的益處是否值得？

成本效益

絕對效益 (Absolute Benefits)：
在高風險族群中，每治療 1000 人 5 年，可減少 48 例死亡、58 例腎衰竭 。

危害 (Harms)： 雖然生殖器感染 (RR 2.66) 和酮酸中毒 (RR 2.27) 的相對風險增加，但絕對風險增加幅度較小（每 1000 人 5 年增加 27 例感染、4 例酮酸中毒）。

評讀結果

結論： 對於 CKD 合併糖尿病且已使用 ACEi 的患者，SGLT2 抑制劑能提供顯著的心腎保護，且效益大於潛在的副作用風險。

評定證據等級

Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence

Question	Step 1 (Level 1*)	Step 2 (Level 2*)	Step 3 (Level 3*)	Step 4 (Level 4*)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances**	Local non-random sample**	Case-series**	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-c consis		
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohor		
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or *n*-of-1 trials	Randomized trial or observational study with dramatic effect	Non-r study**	studies, or historically controlled studies**	reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, systematic review of nested case-control studies, *n*-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or *n*-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect			
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non -randomized controlled cohort/follow-up study**	Case-series, case-control, or historically controlled studies**	Mechanism-based reasoning

『治療型』問題

RCT之系統性回顧文章

證據等級為**Level 1**文章

* 經嚴格評讀，無其他需考慮降階理由

No	CASP questions	Yes/No
1	此篇系統性文獻回顧是否問了一個清楚、明確的問題?	Yes
2	作者是否尋找適當研究型態的文獻?	Yes
3	你認為所有重要且相關的研究都被納入?	Yes
4	系統性文獻回顧的作者是否評估所納入研究文獻的品質?	Yes
5	如果作者將研究結果進行合併，這樣的合併是否合理?	Yes
6	這篇系統性文獻回顧的整體結果為何？	Yes
7	結果精準嗎？	Yes
8	此研究結果是否可應用到當地的族群？	Can’t tell
9	是否所有重要的臨床結果都有被考量到？	Yes
10	付出的傷害和花費換得介入措施所產生的益處是否值得？	Yes

5A-4
Apply
臨床應用

臨床應用

第二型糖尿病適應症（最早給付）

•以第二型糖尿病成人為主，通常是在已接受生活型態調整與一線用藥（多為metformin）控制仍不佳時可申請給付，詳細血糖指標與用藥條件需依健保給付規定與藥品審查。

•各SGLT2i（如dapagliflozin、empagliflozin等）皆有糖尿病健保給付，但劑量與是否合併其他適應症需看個別藥品核准與給付表。

慢性腎臟病（CKD）適應症

- 2025年起，慢性腎臟病（非僅糖尿病腎病變）已納入SGLT2i健保給付，須加入「初期慢性腎臟病照護整合方案（Early-CKD）」或「末期腎臟病前期Pre-ESRD照護與衛教計畫」。
- 目前主要條件包括：
  - eGFR約介於 25–60 ml/min/1.73㎡
  - 尿中白蛋白尿/肌酸酐比值（UACR）約 200–5000 mg/g

臨床應用

藥物頻率	**Dapagliflozin, Empagliflozin, Canagliflozin均為QD給藥**
藥物費用	Dapagliflozin（5 mg或10 mg）：29.4至29.9／錠 Empagliflozin（5 mg或10 mg）：15.6至16／錠 Canagliflozin（100 mg）：26.1至29.4／錠

依每日一次用藥頻率計算，月用藥費用約在450至900新台幣區間，視劑量與藥品而異。這些價格均為健保支付價，病患實際負擔視其是否符合給付標準以及自付比例而定。

臨床結果 (Outcome)	5年絕對風險降低 (每1000人)	NNT (需治數)	備註
腎衰竭 (Kidney failure)	減少 58 人	18	效益最顯著
全因死亡 (All-cause death)	減少 48 人	21	
心衰竭住院 (Hospitalization for HF)	減少 32 人	32	
心血管死亡 (CV death)	減少 10 人	100	

成本效益比

COPE=NNT x NNT時間 x 治療所需費用
（付出這個價錢以減少一次事件發生）

藥物價格基準	單人5年藥費 (TWD)	預防一例腎衰竭之總成本 (TWD)
低價位 (16元/日)	29,200	約 50.3 萬元
高價位 (30元/日)	54,750	約 94.4 萬元

預防一例腎衰竭的藥物成本約在 50萬至95萬台幣 之間。考慮到台灣洗腎（透析）每年的健保支出約為 60萬至70萬台幣（且需終身進行），使用SGLT2i在極高風險族群中具有極高的成本效益（Cost-effective），甚至可能具有**節省成本（Cost-saving）**的潛力，因為預防一例腎衰竭的5年總藥費，可能僅相當於該患者進入洗腎後1至1.5年的醫療支出。

5A-5
Audit
執行決策

多方觀點

實證醫學

證據等級：CEBM (level 1)
建議等級：Strong recommendation

病人偏好

病人希望降低洗腎機會跟死亡率

效益衡量

在高風險族群中，每治療 1000 人 5 年，
可減少 48 例死亡、58 例腎衰竭
副作用生殖器感染、DKA

資源費用

預防一例腎衰竭的藥物成本約在 50萬至95萬台幣 之間。考慮到台灣洗腎（透析）每年的健保支出約為 60萬至70萬台幣（且需終身進行），使用SGLT2i在極高風險族群中具有極高的成本效益（Cost-effective）

回答病人問題 - 以去學術化術語方式

您好，經過我們團隊縝密的實證搜尋後，目前現有最佳證據是由系統性回顧文獻支持，SGLT2i每日固定服用且對糖尿病跟慢性腎臟病可以健保給付，對高危險族群有降低洗腎風險跟死亡率且跟洗腎比較消耗健保費用更低，所以建議您每日服用一次治療。另外平常仍須注意飲食控制和養成運動習慣，這樣才更更好穩定血糖。


謝謝各位
評審聆聽