

Supplementary table 1. Reporting guideline for overviews of reviews of healthcare interventions (PRIOR) checklist

Section	Topic	Item	Location reported
TITLE			
	Title	1 Identify the report as an overview of reviews.	Pg 1
ABSTRACT			
	Abstract	2 Provide a comprehensive and accurate summary of the purpose, methods, and results of the overview of reviews.	Pg 1
INTRODUCTION			
	Rationale	3 Describe the rationale for conducting the overview of reviews in the context of existing knowledge.	Pg 2-3
	Objectives	4 Provide an explicit statement of the objective(s) or question(s) addressed by the overview of reviews.	Pg 2-3
METHODS			
	Eligibility criteria	5a Specify the inclusion and exclusion criteria for the overview of reviews. If supplemental primary studies were included, this should be stated, with a rationale.	Pg 3
		5b Specify the definition of 'systematic review' as used in the inclusion criteria for the overview of reviews.	NA
	Information sources	6 Specify all databases, registers, websites, organizations, reference lists, and other sources searched or consulted to identify systematic reviews and supplemental primary studies (if included). Specify the date when each source was last searched or consulted.	Pg 3, Supp 1
	Search strategy	7 Present the full search strategies for all databases, registers and websites, such that they could be reproduced. Describe any search filters and limits applied.	Supp 1
	Selection process	8a Describe the methods used to decide whether a systematic review or supplemental primary study (if included) met the inclusion criteria of the overview of reviews.	Pg 3-4
		8b Describe how overlap in the populations, interventions, comparators, and/or outcomes of systematic reviews was identified and managed during study selection.	NA
		9a Describe the methods used to collect data from reports.	Pg 4
	Data collection process	9b If applicable, describe the methods used to identify and manage primary study overlap at the level of the comparison and outcome during data collection. For each outcome, specify the method used to illustrate and/or quantify the degree of primary study overlap across systematic reviews.	NA
		9c If applicable, specify the methods used to manage discrepant data across systematic reviews during data collection.	NA
	Data items	10 List and define all variables and outcomes for which data were sought. Describe any assumptions made and/or measures taken to identify and clarify missing or unclear information.	Pg 4
	Risk of bias assessment	11a Describe the methods used to <u>assess</u> risk of bias or methodological quality of the included systematic reviews.	Pg 45
		11b Describe the methods used to <u>collect</u> data on (from the systematic reviews) and/or <u>assess</u> the risk of bias of the primary studies included in the systematic reviews. Provide a justification for instances where flawed, incomplete, or missing assessments are identified but not re-assessed.	Pg 5
		11c Describe the methods used to <u>assess</u> the risk of bias of supplemental primary studies (if included).	NA
		12a Describe the methods used to summarize or synthesize results and provide a rationale for the choice(s).	Pg 5
	Synthesis methods	12b Describe any methods used to explore possible causes of heterogeneity among results.	Pg 5
		12c Describe any sensitivity analyses conducted to assess the robustness of the synthesized results.	NA

SectionTopic	Item	Location reported
Reporting bias assessment	13 Describe the methods used to <u>collect</u> data on (from the systematic reviews) and/or <u>assess</u> the risk of bias due to missing results in a summary or synthesis (arising from reporting biases at the levels of the systematic reviews, primary studies, and supplemental primary studies, if included).	Pg 3-5, supp 1
Certainty assessment	14 Describe the methods used to <u>collect</u> data on (from the systematic reviews) and/or <u>assess</u> certainty (or confidence) in the body of evidence for an outcome.	Pg 5
RESULTS		
Systematic review and supplemental primary study selection	15a Describe the results of the search and selection process, including the number of records screened, assessed for eligibility, and included in the overview of reviews, ideally with a flow diagram.	Fig 1, Pg 7
	15b Provide a list of studies that might appear to meet the inclusion criteria, but were excluded, with the main reason for exclusion.	Pg 7, Supp 1
Characteristics of systematic reviews and supplemental primary studies	16 Cite each included systematic review and supplemental primary study (if included) and present its characteristics.	Pg 7-8, Supp 1
Primary study overlap	17 Describe the extent of primary study overlap across the included systematic reviews.	NA
	18a Present assessments of risk of bias or methodological quality for each included systematic review.	Pg 7-8, Supp 1
Risk of bias in systematic reviews, primary studies, and supplemental primary studies	18b Present assessments (<u>collected</u> from systematic reviews or <u>assessed</u> anew) of the risk of bias of the primary studies included in the systematic reviews.	Pg 12, Supp 2
	18c Present assessments of the risk of bias of supplemental primary studies (if included).	NA
	19a For all outcomes, summarize the evidence from the systematic reviews and supplemental primary studies (if included). If meta-analyses were done, present for each the summary estimate and its precision and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Pg 7-11, Supp 2
Summary or synthesis of results	19b If meta-analyses were done, present results of all investigations of possible causes of heterogeneity.	Pg 7-11, Supp 2
	19c If meta-analyses were done, present results of all sensitivity analyses conducted to assess the robustness of synthesized results.	NA
Reporting biases	20 Present assessments (<u>collected</u> from systematic reviews and/or <u>assessed</u> anew) of the risk of bias due to missing primary studies, analyses, or results in a summary or synthesis (arising from reporting biases at the levels of the systematic reviews, primary studies, and supplemental primary studies, if included) for each summary or synthesis assessed.	Pg 7-12, Supp 1-2
Certainty of evidence	21 Present assessments (<u>collected</u> or <u>assessed</u> anew) of certainty (or confidence) in the body of evidence for each outcome.	Pg 7-11, Supp 2
DISCUSSION		
	22a Summarize the main findings, including any discrepancies in findings across the included systematic reviews and supplemental primary studies (if included).	Pg 12-14
	22b Provide a general interpretation of the results in the context of other evidence.	Pg 14-15
Discussion	22c Discuss any limitations of the evidence from systematic reviews, their primary studies, and supplemental primary studies (if included) included in the overview of reviews. Discuss any limitations of the overview of reviews methods used.	Pg 15-16
	22d Discuss implications for practice, policy, and future research (both systematic reviews and primary research). Consider the relevance of the findings to the end users of the overview of reviews, e.g., healthcare providers, policymakers, patients, among others.	Pg 15-16

SectionTopic	Item	Location reported	
OTHER INFORMATION			
	23a	Provide registration information for the overview of reviews, including register name and registration number, or state that the overview of reviews was not registered.	Pg 2
Registration and protocol	23b	Indicate where the overview of reviews protocol can be accessed, or state that a protocol was not prepared.	Pg 2
	23c	Describe and explain any amendments to information provided at registration or in the protocol. Indicate the stage of the overview of reviews at which amendments were made.	NA
Support	24	Describe sources of financial or non-financial support for the overview of reviews, and the role of the funders or sponsors in the overview of reviews.	Pg 21
Competing interests	25	Declare any competing interests of the overview of reviews' authors.	Pg 21
	26a	Provide contact information for the corresponding author.	Pg 1
Author information	26b	Describe the contributions of individual authors and identify the guarantor of the overview of reviews.	Pg 21
Availability of data and other materials	27	Report which of the following are available, where they can be found, and under which conditions they may be accessed: template data collection forms; data collected from included systematic reviews and supplemental primary studies; analytic code; any other materials used in the overview of reviews.	Pg 21

Supplementary Methods (Statistical details)

This section provides the full formulae, decision rules, statistical assumptions, and thresholds applied in converting effect sizes (eOR), computing prediction intervals, assessing small-study effects and excess-significance bias, and applying evidence grading for observational meta-analyses and GRADE for RCTs.

Transformation of effect sizes

To make the results of the pooled analyses comparable, effect sizes were transformed into equivalent odds ratio (eOR) to provide a common effect size with a unique scale¹. This method is frequently employed in epidemiological research to facilitate direct comparisons by harmonizing various effect measures². The eOR was deemed equivalent to the original metric (e.g., HR, RR, OR) for binary outcomes, as previously demonstrated by studies³⁻⁵, and the outcomes of interest are rare (event rate < 10%). In this case, an equivalent odds ratio > 1 indicates higher odds (negative effect, clinically harmful associations), while an equivalent odds ratio < 1 indicates lower odds (positive effect, clinically useful associations) of an outcome.

Heterogeneity

The I² metric of inconsistency was employed to evaluate the heterogeneity between studies in a pooled analysis⁶. The I² indicates the proportion of the total variation across studies that is attributable to variance in true effects rather than chance. Substantial or considerable heterogeneity was indicated by I² values exceeding 50% or 75%, respectively⁶⁻⁷.

Prediction intervals

In a random-effects analysis, both the average effect size and the distribution of true effects around the average are considered. Confidence intervals indicate the accuracy of the mean estimate, narrowing to zero width with an infinite number of studies, while prediction intervals account for both true dispersion and error, offering a range of expected true effect sizes in future studies. A 95% prediction interval was calculated for the pooled effect estimates to further assess the heterogeneity between studies⁸.

Small study effects

Small study effects were evaluated using Egger's regression asymmetry test. A p-value from Egger's test below 0.1 was deemed suggestive of bias, applicable only when the pooled analysis included a minimum of 10 studies⁹. This refers to whether smaller studies produced greater risk estimates compared to larger studies, perhaps indicating publication bias, chance, or genuine heterogeneity¹⁰.

Excess significance bias

The excess significance test was used to see whether the observed number of studies with statistically significant findings ($P < 0.05$) differed from the predicted number¹¹. The true effect size in each pooled analysis is unknown, but it may be assumed that it is equal to the greatest study in each pooled analysis¹². The greatest study was characterized by the least standard error. The chi-square test was employed to report the P-value, with $P < 0.1$ indicating an excess significant bias³⁴.

Credibility of each pooled analysis of observational studies

The credibility of each pooled analysis of observational studies was classified into five categories: convincing (class I), highly suggestive (class II), suggestive (class III), weak (class IV), and non-significant association (class V) (Table 2 in S1 Appendix). In conclusion, the credibility of the evidence from the pooled analysis of observational studies was assigned a score based on the P value of the association, the number of events that develop the outcome of interest, heterogeneity, the prediction interval, excess significance bias, the small study effect, and the statistical significance of the largest study in the pooled analysis^{4, 13-16}. S1 Appendix (Table 2) provides a comprehensive overview of the evidence classification criteria.

Certainty of each pooled analysis of randomised controlled trials

The GRADE (Grading of Recommendations, Assessment, Development and Evaluations) framework was used to classify the certainty of the evidence in each unique pooled analysis of RCTs as high, moderate, low, or very low^{4,17,18}. GRADE is a transparent system that is frequently employed to develop and synthesise evidence, provide a set of explicit criteria in various domains to evaluate the quality of evidence, and offer practical recommendations in the clinic⁴⁰. The risk of bias, indirectness of evidence, imprecision, inconsistency of results across studies, and publication bias were all considered in determining the level of evidence, as per the GRADE guidelines (Table 3 in S1 Appendix).

Supplementary table 2. The evidence classification criteria for pooled analysis from observational studies

Classification	Criteria
Convincing evidence (Class I)	More than 1,000 cases
	Significant summary associations ($P < 1 \times 10^{-6}$) per random-effects calculations
	No evidence of small-study effects
	No evidence of excess of significance bias
	Prediction interval not including the null value
Highly suggestive evidence (Class II)	Largest study nominally significant ($P < 0.05$)
	No large heterogeneity (i.e., $I^2 < 50\%$)
	More than 1,000 cases
Suggestive evidence (Class III)	Significant summary associations ($P < 1 \times 10^{-6}$) per random-effects calculations
	Largest study nominally significant ($P < 0.05$)
Weak evidence (Class IV)	More than 1,000 cases
	Significant summary associations ($P < 1 \times 10^{-3}$) per random-effects calculations
Non-significant association (Class V)	All other associations with $P \leq 0.05$
	All associations with $P > 0.05$

Supplementary table 3. The evidence classification criteria for pooled analysis from randomised controlled trials using the GRADE framework

Criteria	
Imprecision	No downgrade if sample size >200 One downgrade if sample size 100-199 Two downgrades if sample size 1-99
Inconsistency	No downgrade if $I^2 < 75\%$ One downgrade if $I^2 > 75\%$ Two downgrades if $I^2 > 90\%$
Risk of bias	No downgrade if > 75% RCTs had low risk of bias One downgrade if < 75% RCTs had low risk of bias Two downgrades if < 50% RCTs have low risk of bias Downgraded one or two levels if one or more of the following conditions were met:
Indirectness	Pooled analyses combined clinical and non-clinical populations, or an antihypertensive medication class was used alongside another antihypertensive medication class, or when combining active, inactive, and placebo control groups.
Publication bias	No downgrade if the p-value of Egger's test is more than 0.1 (for pooled analyses with more than 10 studies) or there is no evidence of publication bias based on the funnel plot. One downgrade if the p-value of Egger's test is less than 0.1 (pooled analyses must have at least 10 studies) or there is evidence of publication bias based on the funnel plot.
Upgrade	Upgrade one level with a large effect size for pooled analyses. (i.e., eOR <0.5 or >2.0, based on direct evidence with no plausible or possible confounders). Upgrade two levels with a very large effect size for pooled analyses (i.e., eOR <0.2 or >5.0, based on direct evidence without risk of bias or imprecision).
GRADE	High 0 downgrade Moderate 1 or 2 downgrades Low 3 or 4 downgrades Very low 5 or 6 downgrades

Supplementary table 4. Studies excluded after full-text assessment with reason for exclusion

Study	Article Title	Year	Author	Reason for Exclude
1	Safety of the calcium antagonist lacidipine evaluated from a phase III-IV trial database	1996	Lindholm, L. H. et al. [19]	It's not Meta-analysis.
2	Effects of calcium antagonists on the risks of coronary heart disease, cancer and bleeding	1997	HOC, A. [20]	It's not Meta-analysis.
3	Calcium channel blockers for hypertension: Dissecting the evidence for adverse effects	1997	Opie, L. H. [21]	It's not Meta-analysis.
4	Risk of serious adverse events in hypertensive patients receiving isradipine: a meta-analysis	1997	Ross, S. D. et al. [22]	Incidence/Mortality/Survival not evaluated.
5	Diuretic therapy and the risk for renal cell carcinoma	2000	Schmieder, R. E. et al. [23]	It's not Meta-analysis.

Study	Article Title	Year	Author	Reason for Exclude
6	Are calcium channel blockers first-line drugs for the treatment of hypertension and cardiovascular disease?	2007	de la Sierra, A. et al. [24]	It's not Meta-analysis
7	Dihydropyridine calcium channel antagonists in the management of hypertension	2007	Epstein, B. J. et al. [25]	It's not Meta-analysis.
8	Antihypertensive drugs and cancer	2008	Dalfó i Baqué, A. et al. [26]	Duplicate
9	Medical interventions for treating anthracycline-induced symptomatic and asymptomatic cardiotoxicity during and after treatment for childhood cancer	2009	Sieswerda, E. et al. [27]	It's not Meta-analysis.
10	Effect of ACE Inhibitors on the Incidence of Cancer: Meta-Analysis of Randomized Controlled Trials	2010	Mishra, P. et al. [28]	Duplicate
11	5- α -Reductase inhibitors for prostate cancer chemoprevention: an updated Cochrane systematic review	2010	Wilt, T. J. et al. [29]	It's not Meta-analysis.
12	The risk of cancer associated with angiotensin-II receptor blockers	2011	Bhaskaran, K. et al. [30]	It's not Meta-analysis.
13	Is there a link between angiotensin receptor blockers and cancer?	2011	Enseleit, F. [31]	It's not Meta-analysis.
14	New meta-analysis shows no cancer risk with angiotensin-receptor blockers	2011	Mearns, B. M. [32]	It's not Meta-analysis.
15	Cardiovascular medications and risk of cancer	2011	Ocampo, N. V. et al. [33]	It's not Meta-analysis.
16	Risk of cancer associated with the use of angiotensin II-receptor blockers	2011	Olin, J. L. et al. [34]	It's not Meta-analysis.
17	Cancer risk not increased by RAAS blockade - Real world population study in Taiwan	2011	Pai, P. et al. [35]	It's not Meta-analysis.
18	Use of angiotensin receptor blockers and the risk of cancer	2011	Pasternak, B. et al. [36]	It's not Meta-analysis.
19	A meta-analysis on the effectiveness of propranolol for the treatment of infantile airway haemangiomas	2011	Peridis, S. et al. [37]	Incidence/Mortality/Survival not evaluated.
20	Medical interventions for treating anthracycline-induced symptomatic and asymptomatic cardiotoxicity during and after treatment for childhood cancer	2011	Sieswerda, E. et al. [38]	It's not Meta-analysis.
21	Angiotensin receptor blockers and the risk of cancer-a comparative safety study in large linked healthcare databases	2011	Svanström, H. et al. [39]	It's not Meta-analysis.
22	Critical review of cancer risk associated with angiotensin receptor blocker therapy	2011	Wuerzner, G. et al. [40]	It's not Meta-analysis.
23	Long-Term Use of Angiotensin Receptor Blockers and the Risk of Cancer	2012	Azoulay, L. et al. [41]	It's not Meta-analysis.
24	Association of Hypertension and Anti-Hypertensive Therapy with Cancers	2012	Deshmukh, A. et al. [42]	It's not Meta-analysis.
25	Angiotensin-converting enzyme inhibitors and angiotensin receptor blockers in cancer progression and survival: A systematic review	2012	Mc Menamin, Ú C. et al. [43]	It's not Meta-analysis.
26	Propranolol for infantile hemangiomas: A meta-analysis	2012	Marqueling, A. L. et al. [44]	Incidence/Mortality/Survival not evaluated.
27	Which, if any, antihypertensive agents cause cancer?	2012	Singh, A. et al. [45]	It's not Meta-analysis.
28	Angiotensin receptor blockers and tumorigenesis: Something To Be (or Not To Be) concerned about?	2012	Tchaikovski, V. et al. [46]	It's not Meta-analysis.
29	Propranolol is an effective treatment for airway haemangiomas: a critical analysis and meta-analysis of published interventional studies	2012	Vlastarakos, P. V. et al. [47]	Incidence/Mortality/Survival not evaluated.

Study	Article Title	Year	Author	Reason for Exclude
30	Angiotensin-2 type 1 receptors (AT1R) and cancers	2013	Dolley-Hitze, T. et al. [48]	It's not Meta-analysis.
31	A meta-analysis of randomized, controlled trials in metastatic melanoma establishes progression-free survival as a surrogate for overall survival	2013	Flaherty, K. T. et al. [49]	It's not about antihypertensive treatment.
32	Propranolol versus corticosteroids in the treatment of infantile hemangioma: a systematic review and meta-analysis	2013	Izadpanah, A. et al. [50]	Incidence/Mortality/Survival not evaluated.
33	Angiotensin receptor blocker therapy and risk of cancer	2013	Teo, K. K. [51]	It's not Meta-analysis.
34	Novel treatment for infantile hemangiomas	2014	Korownyk, C. et al. [52]	It's not Meta-analysis.
35	The effectiveness of propranolol in treating infantile haemangiomas: a meta-analysis including 35 studies	2014	Lou, Y. et al. [53]	Incidence/Mortality/Survival not evaluated.
36	Calcium Channel Blockers and Risk of Breast Cancer: A Meta-Analysis of 17 Observational Studies	2014	Li, W. et al. [54]	Retracted
37	Propranolol in infantile hemangioma: A review article	2014	Mansouri, P. et al. [55]	It's not Meta-analysis.
38	Cancer death and antihypertensive drug treatment - Response	2014	Swerdel, J. N. et al. [56]	It's not Meta-analysis.
39	NON-SELECTIVE BETA-BLOCKERS MAY REDUCE INCIDENCE OF HEPATOCELLULAR CARCINOMA: A META-ANALYSIS OF RANDOMISED TRIALS	2014	Thiele, M. et al. [57]	Duplicate
40	Beta-blockers for childhood vascular tumors	2015	Bayart, C. B. et al. [58]	It's not Meta-analysis.
41	Angiotensin converting enzyme inhibitors/angiotensin receptor blockers therapy and colorectal cancer: A systematic review and meta-analysis	2015	Dai, Y. N. et al. [59]	Duplicate
42	No evidence for increased prostate cancer risk among calcium channel blockers user	2015	Fan, Y. et al. [60]	It's not Meta-analysis.
43	Propranolol in the Treatment of Infantile Hemangiomas: A Meta-Analysis in Chinese Patients	2015	Li, L. L. et al. [61]	Incidence/Mortality/Survival not evaluated.
44	Effectiveness and Safety of Oral Propranolol versus Other Treatments for Infantile Hemangiomas: A Meta-Analysis	2015	Liu, X. et al. [62]	Incidence/Mortality/Survival not evaluated.
45	Renin-angiotensin system blockade: Its contribution and controversy	2015	Miyajima, A. et al. [63]	It's not Meta-analysis.
46	Local administration of β -blockers for infantile hemangiomas: a systematic review and meta-analysis	2015	Ovadia, S. A. et al. [64]	Incidence/Mortality/Survival not evaluated.
47	β -adrenergic receptors: New target in breast cancer	2015	Wang, T. et al. [65]	It's not Meta-analysis.
48	Clinical impact of selective and nonselective beta-blockers on survival in patients with ovarian cancer	2015	Watkins, J. L. et al. [66]	It's not Meta-analysis.
49	Angiotensin receptor blockers (ARBs) reduce the risk of lung cancer: a systematic review and meta-analysis	2015	Zhang, J. et al. [67]	Duplicate
50	Propranolol use and survival from breast cancer: A pooled analysis of 133,251 breast cancer patients from the European cancer pharmacoepidemiology network	2016	Cardwell, C. et al. [68]	Duplicate

Study	Article Title	Year	Author	Reason for Exclude
51	Pharmacologic Interventions for Infantile Hemangioma: A Meta-analysis	2016	Chinnadurai, S. et al. [69]	Incidence/Mortality/Survival not evaluated.
52	Hypertension and angiotensin system inhibitors in patients with metastatic renal cell carcinoma	2016	Derosa, L. et al. [70]	It's not Meta-analysis.
53	The use of propranolol in the treatment of subglottic hemangiomas: A literature review and meta-analysis	2016	Hardison, S. et al. [71]	Incidence/Mortality/Survival not evaluated.
54	The Use of Telmisartan and the Incidence of Cancer	2016	Tascilar, K. et al. [72]	It's not Meta-analysis.
55	Beta blockers and cancer prognosis - The role of immortal time bias: A systematic review and meta-analysis	2016	Weberpals, J. et al. [73]	Duplicate
56	The Role of Topical Timolol in the Treatment of Infantile Hemangiomas: A Systematic Review and Meta-analysis	2017	Khan, M. et al. [74]	Incidence/Mortality/Survival not evaluated.
57	Use of non-selective β -blockers is associated with decreased tumor proliferative indices in early-stage breast cancer	2017	Montoya, A. et al. [75]	It's not Meta-analysis.
58	Blood pressure lowering efficacy of renin inhibitors for primary hypertension	2017	Musini, V. M. et al. [76]	Incidence/Mortality/Survival not evaluated.
59	Hypertension and survival in renal cell carcinoma treated with anti-vegfr agents: A systematic review and meta-analysis	2017	Petrelli, F. et al. [77]	It's not about antihypertensive treatments.
60	Beta-blockers in dermatology	2017	Prabha, N. et al. [78]	It's not Meta-analysis.
61	Review of the treatment of periocular infantile hemangiomas with beta blockers	2017	Tamez, H. M. et al. [79]	It's not Meta-analysis.
62	Does spironolactone reduce the risk of urinary tract cancers in hypertensive patients?	2017	Teo, K. K. et al. [80]	It's not Meta-analysis.
63	Calcium channel blockers and risk of breast cancer: A meta-analysis of 17 observational studies	2018	Wen Li. et al. [81]	Retracted
64	Effect of antihypertensive drugs on breast cancer risk in female hypertensive patients: Evidence from observational studies	2018	Zhao, Y. et al. [82]	There is a contradiction between the text and the images presented in the article.
65	Effect of topical timolol on response rate and adverse events in infantile hemangioma: a meta-analysis	2018	Zheng, L. et al. [83]	Incidence/Mortality/Survival not evaluated.
66	Preclinical and clinical evidence about the use of betablockers for the treatment of triple negative breast cancer: A systematic review	2019	Spini, A. et al. [84]	It's not Meta-analysis.
67	Efficacy and adverse effects of oral propranolol in infantile hemangioma: a meta-analysis of comparative studies	2019	Yang, H. et al. [85]	Incidence/Mortality/Survival not evaluated.
68	Efficacy and safety of adrenergic beta-antagonist combined with lasers in the treatment of infantile hemangiomas: a meta-analysis	2020	Chen, X. et al. [86]	Incidence/Mortality/Survival not evaluated
69	Antihypertensives and risk of melanoma and keratinocyte carcinoma: A systematic review and meta-analysis	2020	Cohen, O. G. et al. [87]	Duplicate
70	Treatments for infantile Hemangioma: A systematic review and network meta-analysis	2020	Fei, Q. et al. [88]	Incidence/Mortality/Survival not evaluated.
71	The effectiveness and safety of topical β -receptor blocker in treating superficial infantile haemangiomas: A meta-analysis including 20 studies	2020	Lin, Z. et al. [89]	Incidence/Mortality/Survival not evaluated.
72	Atenolol vs. Propranolol for the treatment of infantile haemangiomas: A systematic review and meta analysis	2020	Liu, Z. et al. [90]	Incidence/Mortality/Survival not evaluated.

Study	Article Title	Year	Author	Reason for Exclude
73	Hydrochlorothiazide and squamous cell carcinoma	2020	O'Neill, B. et al. [91]	It's not Meta-analysis.
74	Efficacy of Combined Topical Timolol and Oral Propranolol for Treating Infantile Hemangioma: A Meta-Analysis of Randomized Controlled Trials	2020	Qiao, J. et al. [92]	Incidence/Mortality/Survival not evaluated.
75	Cancer mortality in trials of heart failure with reduced ejection fraction: A systematic review and meta-analysis	2020	Tini, G. et al. [93]	It's not about antihypertensive treatments.
76	The efficacy and safety of treatments for infantile hemangiomas: a Bayesian network meta-analysis	2020	Yang, H. et al. [94]	It's not Meta-analysis.
77	Antihypertensive treatment and risk of cancer: an individual participant data meta-analysis	2021	Copland, E. et al. [95]	Duplicate
78	Modest Association of Long-Term ACE Inhibitor Treatment With Lung Cancer: The Promise and Pitfalls of Epidemiological Drug-Safety Analyses	2021	Fairman, K. A. et al. [96]	It's not Meta-analysis.
79	Effects of hypertension on cancer survival: A meta-analysis	2021	Petrelli, F. et al. [97]	It's not about antihypertensive treatments.
80	The Efficacy and Safety of Topical β -Blockers in Treating Infantile Hemangiomas: A Meta-Analysis Including 11 Randomized Controlled Trials	2021	Wang, X. et al. [98]	Incidence/Mortality/Survival not evaluated.
81	Propranolol vs. Steroids in the treatment of infantile hemangiomas: A meta-analysis	2021	You, Y. et al. [99]	Incidence/Mortality/Survival not evaluated.
82	Selective vs non-selective alpha-blockade prior to adrenalectomy for pheochromocytoma: systematic review and meta-analysis	2021	Zawadzka, K. et al. [100]	Incidence/Mortality/Survival not evaluated.
83	Associations of thiazide use with skin cancers: A systematic review and meta-analysis	2022	Chen, Y. H. et al. [101]	Duplicated
84	Hydrochlorothiazide: An update on a common drug which increases skin cancer in immunocompetent patients	2022	Cox, C. et al. [102]	It's not Meta-analysis.
85	INDIVIDUAL ANTIHYPERTENSIVE MEDICATION AND SKIN CANCER RISK: A SYSTEMATIC REVIEW AND META-ANALYSIS	2022	Heisel, A. et al. [103]	Duplicate
86	Meta-analysis of the efficacy and safety of oral atenolol versus oral propranolol in the treatment of infantile hemangioma	2022	Jianmin, Z. et al. [104]	Incidence/Mortality/Survival not evaluated.
87	Antihypertensive Therapy and Incidence of Cancer	2022	Loosen, S. H. et al. [105]	It's not Meta-analysis.
88	Lung Cancer Increased Risk with Long Term Use of Angiotensin Converting Enzyme Inhibitors: A Systematic Review	2022	Omer, O. I. A. et al. [106]	It's not Meta-analysis.
89	Thiazide diuretics and risk of colorectal cancer	2022	Rouette, J. et al. [107]	It's not Meta-analysis.
90	Oral Atenolol versus Propranolol in the Treatment of Infantile Hemangioma: A Systematic Review and Meta-Analysis	2022	Pattanshetti, S. A. et al. [108]	Incidence/Mortality/Survival not evaluated.
91	Chemopreventive Effects of Concomitant or Individual Use of Statins, Aspirin, Metformin, and Angiotensin Drugs: A Study Using Claims Data of 23 Million Individuals	2022	Wang, C. H. et al. [109]	It's not Meta-analysis.
92	The use of specific antihypertensive medication and skin cancer risk: A systematic review of the literature and meta-analysis	2023	Heisel, A. G. U. et al. [110]	Duplicate
93	Thiazide diuretics alone or combined with potassium-sparing diuretics to treat	2023	Martins, V. M. et al. [111]	Incidence/Mortality/Survival not evaluated.

Study	Article Title	Year	Author	Reason for Exclude
94	hypertension: a systematic review and network meta-analysis of randomized controlled trials Renin-Angiotensin-Aldosterone System Inhibitors and Development of Gynecologic Cancers: A 23 Million Individual Population-Based Study	2023	Nguyen, N. T. H. et al. [112]	It's not Meta-analysis.
95	ACE inhibitors and the risk of lung cancer—is there causality?	2023	Strauss, M. H. et al. [113]	It's not Meta-analysis.
96	Cardiovascular/anti-inflammatory drugs repurposed for treating or preventing cancer: A systematic review and meta-analysis of randomized trials	2024	Benjamin, D. J. et al. [114]	Incidence/Mortality/Survival not evaluated.
97	Targeted agents in patients with progressive glioblastoma—A systematic meta-analysis of randomized clinical trials	2024	Ippen, F. M. et al. [115]	It's not about antihypertensive treatments.

Supplementary Table 5. characteristics of included meta-analyses of observational studies

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality	
Grossman, E. et al. 2001 [116]	57										
			4389/10955	RCC	Diuretics	Incidence	OR	1.54 (1.41, 1.68)	P < 0.05	NR	CL
			802/1226229	RCC	Diuretics	Incidence	RR	2.00 (1.55, 2.59)	P < 0.05	NR	
			802/1226229	RCC	Diuretics	CSM	RR	2.43 (2.13, 2.78)	P < 0.05	NR	
			802/1226229	RCC	Diuretics	CSM	RR	1.29 (0.42, 3.97)	P > 0.05	NR	
9087/24646	Overall	CCBs	Incidence	OR	1.04 (0.91, 1.19)	P > 0.05	NR				
Corrao, G. et al. 2007 [117]	16	6884/NR								CL	
				RCC	Diuretics	Incidence	OR	1.61 (1.34, 1.94)	P < 0.05		R
				RCC	Diuretics	Incidence	OR	1.33 (1.06, 1.67)	P < 0.05		R
				RCC	Diuretics	Incidence	OR	1.43 (1.12, 1.83)	P < 0.05		R
				RCC	β blockers	Incidence	OR	1.57 (1.34, 1.85)	P < 0.05		R
				RCC	ACEIs	Incidence	OR	1.90 (1.42, 2.54)	P < 0.05		R
Yoon, C. et al. 2011 [118] Alexandre, L. et al. 2012 [119]	28 4	29197/3,759,560 NR/9,412								CL	
			Overall	ACEIs	Incidence	RR	1.00 (0.93, 1.07)	P > 0.05	R		
Chen, Q. et al. 2014 [120] Choi, C. H. et al. 2014 [121]	11 12	NR/NR								CL	
				Esophageal AC	CCBs	Incidence	RR	0.74 (0.54, 1.03)	P > 0.05		R
				Esophageal SCC	CCBs	Incidence	RR	1.05 (0.68, 1.62)	P > 0.05		R
				Gastric cardia AC	CCBs	Incidence	RR	0.72 (0.49, 1.03)	P > 0.05		R
Chen, Q. et al. 2014 [120] Choi, C. H. et al. 2014 [121]	11 12	NR/NR								L	
				Breast	CCBs	Incidence	OR	1.11 (0.93, 1.33)	P > 0.05		R
Childers, W. K. et al. 2015 [122]	7	6717/20,898 595/4878 NR/12,427								CL	
				Overall	β blockers	OS	HR	0.79 (0.67, 0.93)	P < 0.05		R
				Overall	β blockers	DFS	HR	0.69 (0.53, 0.91)	P < 0.05		R
Childers, W. K. et al. 2015 [122]	7	NR/12,427								CL	
				Breast	β blockers	CSM	HR	0.50 (0.32, 0.80)	P < 0.05		R
				Breast	β blockers	ACM	HR	1.02 (0.75, 1.37)	P > 0.05		R
Dai, Y. N. et al. 2015 [123]	11	NR/NR								L	
				Colorectal	ACEIs	Incidence	RR	0.87 (0.81, 0.93)	P < 0.05		F
				Colorectal	ACEIs or ARBs	CSM	RR	0.81 (0.60, 1.09)	P > 0.05		R
Lu, H. et al. 2015 [124]	4	NR/16825							CL		

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality	
Yang, Y. et al. 2015 [125]	10	252559/5039597	Prostate	β blockers	CSM	HR	0.85 (0.77, 0.94)	P < 0.05	R		
			Prostate	β blockers	ACM	HR	0.97 (0.90, 1.04)	P > 0.05	R		
			Overall	ARBs	Incidence	OR	0.87 (0.75, 1.01)	P > 0.05	R	L	
Zhang, W. et al. 2015 [126]	8	NR/298000	Lung	ARBs	Incidence	OR	0.81 (0.69, 0.94)	P < 0.05	R	CL	
Cardwell, C. R. et al. 2016 [127]	8	25472/133251	Breast	β blockers	ACM	HR	1.09 (0.93, 1.28)	P > 0.05	R	CL	
Mao, Y. et al. 2016 [128]	9	NR/20267	Prostate	ACEIs or ARBs	Incidence	RR	0.92 (0.87, 0.98)	P < 0.05	R	L	
Raimondi, S. et al. 2016 [129]	11	NR/46265								CL	
Shen, J. et al. 2016 [130]	31	NR/3957725	Breast	β blockers	CSS	HR	0.44 (0.26, 0.73)	P < 0.05	R		
			Breast	β blockers	OS	HR	0.93 (0.71, 1.20)	P > 0.05	R		
			Breast	β blockers	DFS	HR	0.71 (0.49, 1.03)	P > 0.05	R		
			Breast	ACEIs or ARBs	CSS	HR	1.00 (0.69, 1.43)	P > 0.05	R		
			Breast	ACEIs or ARBs	OS	HR	1.10 (0.89, 1.37)	P > 0.05	R		
			Breast	ACEIs or ARBs	DFS	HR	1.09 (0.85, 1.40)	P > 0.05	R		
			Overall	ARBs	Incidence	RR	0.86 (0.77, 0.95)	P < 0.05	R		
Overall	ACEIs	Incidence	RR	0.84 (0.72, 0.99)	P < 0.05	R					
Overall	ACEIs or ARBs	CSM	RR	0.71 (0.55, 0.93)	P < 0.05	R					
Sun, H. et al. 2016 [131]	11	NR/NR	Overall	CCBs	OS	HR	1.07 (0.91, 1.25)	P > 0.05	R	L	
Weberpals, J. et al. 2016 [132]	30	NR/88026								L	
Ye, X. et al. 2016 [133]	24	NR/711479	Overall	β blockers	OS	HR	0.88 (0.79, 0.97)	P < 0.05	R		
			Overall	β blockers	CSS	HR	0.75 (0.64, 0.88)	P < 0.05	R		
Zhong, S. et al. 2016 [134]	24	NR/76538	Breast	CCBs	Incidence	RR	1.03 (1.01, 1.05)	P < 0.05	R	CL	
Kim, H. Y. et al. 2017 [135]	6	NR/18118									CL
			Breast	β blockers	ACM	OR	0.87 (0.50, 1.52)	P > 0.05	R		
			Overall	β blockers	ACM	HR	1.04 (0.95, 1.13)	P > 0.05	R		
			Overall	β blockers	ACM	HR	0.89 (0.81, 0.98)	P < 0.05	R		
			Overall	β blockers	CSM	HR	0.91 (0.84, 1.00)	P > 0.05	R		
Overall	β blockers	CSM	HR	0.89 (0.79, 0.99)	P < 0.05	R					

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality
Li, X. Y. et al. 2017 [136]	7	1925/13782 NR/2436	Breast	β blockers	CSM	OR	0.93 (0.82, 1.06)	P > 0.05	F	CL
			Overall	ACEIs or ARBs	OS	HR	0.80 (0.69, 0.92)	P < 0.05	F	
			Overall	ACEIs or ARBs	PFS	HR	0.79 (0.66, 0.94)	P < 0.05	R	
Loeb, S. et al. 2017 [137]	4	41874/866049	Melanoma	PDE5Is	Incidence	RR	1.12 (1.02, 1.23)	P < 0.05	R	CL
			BCC	PDE5Is	Incidence	RR	1.16 (1.13, 1.20)	P < 0.05	R	
			Overall	ACEIs or ARBs	OS	HR	0.75 (0.57, 0.99)	P < 0.05	R	
Ni, H. et al. 2017 [138]	21	NR/3116266	Breast	β blockers	Incidence	RR	1.02 (0.96, 1.09)	P > 0.05	R	L
			Breast	CCBs	Incidence	RR	1.07 (0.99, 1.16)	P > 0.05	R	
			Breast	ACEIs or ARBs	Incidence	RR	0.99 (0.93, 1.05)	P > 0.05	R	
			Breast	Diuretics	Incidence	RR	1.05 (0.99, 1.12)	P > 0.05	R	
			Overall	ACEIs or ARBs	DFS OR RFS	HR	0.60 (0.41, 0.87)	P < 0.05	R	
Qian, Y. F. et al. 2017 [139] Song, T. et al. 2017 [140]	8 11	NR/1994880 NR/14113	Breast	ARBs	Incidence	OR	0.93 (0.81, 1.06)	P > 0.05	R	CL
			Overall	ACEIs or ARBs	OS	HR	0.75 (0.57, 0.99)	P < 0.05	R	CL
Sun, H. et al. 2017 [141]	55	NR/NR	Overall	ACEIs or ARBs	PFS	HR	0.74 (0.66, 0.84)	P < 0.05	R	L
			Overall	ACEIs or ARBs	DFS	HR	0.80 (0.67, 0.95)	P < 0.05	R	
			Overall	ACEIs or ARBs	CSS	HR	0.82 (0.63, 1.07)	P > 0.05	R	
			Overall	ARBs	OS	HR	0.80 (0.67, 0.95)	P < 0.05	R	
			Overall	ACEIs	OS	HR	0.94 (0.85, 1.04)	P > 0.05	R	
			Overall	ACEIs or ARBs	OS	HR	0.75 (0.57, 0.99)	P < 0.05	R	
Wang, J. et al. 2017 [142]	5	15979/1188414	Melanoma	PDE5Is	Incidence	RR	1.12 (1.03, 1.21)	P < 0.05	R	CL
			BCC	PDE5Is	Incidence	RR	1.14 (1.09, 1.19)	P < 0.05	R	
			Overall	ACEIs or ARBs	OS	HR	0.75 (0.57, 0.99)	P < 0.05	R	
Wright, C. M. et al. 2017 [143]	29	NR/ > 1.4 million	Breast	CCBs	Incidence	OR, RR	1.09 (1.03, 1.15)	P < 0.05	R	H
			Breast	CCBs	Incidence	HR	0.99 (0.94, 1.03)	P > 0.05	R	
			Overall	ACEIs or ARBs	OS	HR	0.75 (0.57, 0.99)	P < 0.05	R	
Cao, L. et al. 2018 [144]	21	NR/NR	Overall	ACEIs or ARBs	OS	HR	0.75 (0.57, 0.99)	P < 0.05	R	CL

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality
Gandini, S. et al. 2018 [145]	19	77622/NR	Prostate	ACEIs	Incidence	RR	1.07 (0.96, 1.20)	P > 0.05	R	L
			Prostate	ARBs	Incidence	RR	1.09 (0.97, 1.21)	P > 0.05	R	
			Prostate	CCBs	Incidence	RR	1.08 (1.00, 1.16)	P < 0.05	R	
			Prostate	β blockers	Incidence	RR	0.91 (0.81, 1.02)	P > 0.05	R	
			Prostate	Diuretics	Incidence	RR	1.09 (0.95, 1.25)	P > 0.05	R	
			Skin	Diuretics	Incidence	OR	1.31 (0.93, 1.83)	P > 0.05	R	
			Skin	ACEIs	Incidence	OR	1.10 (0.83, 1.45)	P > 0.05	R	
			Skin	ARBs	Incidence	OR	1.41 (0.51, 3.91)	P > 0.05	R	
			Skin	CCBs	Incidence	OR	1.14 (1.07, 1.21)	P < 0.05	R	
			Skin	β blockers	Incidence	OR	1.05 (0.99, 1.13)	P > 0.05	R	
Han, X. et al. 2018 [146]	6	16,053/1,534,615	Melanoma	PDE5Is	Incidence	RR	1.12 (1.03, 1.22)	P < 0.05	R	L
Na, Z. et al. 2018 [147]	36	NR/319006								L
Rotshild, V. et al. 2018 [148]	10	NR/114,758	Overall	β blockers	OS	HR	0.94 (0.87, 1.03)	P > 0.05	R	H
			Overall	β blockers	ACM	HR	0.99 (0.94, 1.05)	P > 0.05	R	
			Overall	β blockers	CSS	HR	0.78 (0.65, 0.95)	P < 0.05	R	
			Overall	β blockers	DFS	HR	0.59 (0.30, 1.17)	P > 0.05	R	
			Overall	β blockers	PFS	HR	0.90 (0.79, 1.02)	P > 0.05	R	
			Overall	β blockers	RFS	HR	0.99 (0.76, 1.28)	P > 0.05	R	
			Lung	CCBs	Incidence	RR	1.15 (1.01, 1.32)	P < 0.05	R	
Tang, H. et al. 2018 [149]	10	NR/NR								L
Tang, H. et al. 2018 [149]	10	NR/NR	BCC	Diuretics	Incidence	OR	1.10 (1.01, 1.20)	P < 0.05	R	L
			BCC	ACEIs	Incidence	OR	1.50 (0.70, 3.22)	P > 0.05	R	
			BCC	ARBs	Incidence	OR	1.75 (0.68, 4.49)	P > 0.05	R	
			BCC	ACEIs or ARBs	Incidence	OR	0.53 (0.39, 0.71)	P < 0.05	R	
			BCC	β blockers	Incidence	OR	1.09 (1.04, 1.15)	P < 0.05	R	
			BCC	CCBs	Incidence	OR	1.15 (1.09, 1.21)	P < 0.05	R	
			SCC	Diuretics	Incidence	OR	1.40 (1.19, 1.66)	P < 0.05	R	
			SCC	ACEIs	Incidence	OR	1.42 (0.81, 2.50)	P > 0.05	R	
			SCC	ARBs	Incidence	OR	1.54 (0.82, 2.90)	P > 0.05	R	
			SCC	ACEIs or ARBs	Incidence	OR	0.58 (0.42, 0.80)	P < 0.05	R	

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality	
Coelho, M. et al. 2020 [159] Li, C. et al. 2020 [160]	7	NR/7448	Colorectal	ACEIs or ARBs	CSM	RR	0.80 (0.66, 0.98)	P < 0.05	R	H	
			Colorectal	ARBs	Incidence	OR	0.86 (0.73, 0.98)	P < 0.05	R		
			Colorectal	ACEIs	Incidence	OR	0.81 (0.70, 0.92)	P < 0.05	R		
	17	NR/75,074	Lung	β blockers	OS	HR	1.00 (0.91, 1.10)	P > 0.05	R		L
			Breast	β blockers	CSM	RR	0.83 (0.65, 1.06)	P > 0.05	R		
			Breast	β blockers	ACM	RR	1.01 (0.91, 1.11)	P > 0.05	R		
Lu, Y. P. et al. 2020 [161]	8	NR/7,479,852	Breast	β blockers	CSM	RR	0.83 (0.65, 1.06)	P > 0.05	R	L	
			Breast	β blockers	ACM	RR	1.01 (0.91, 1.11)	P > 0.05	R		
			Skin	PDE5Is	Incidence	OR	1.13 (1.09, 1.17)	P < 0.05	R		
			Melanoma	PDE5Is	Incidence	OR	1.13 (1.05, 1.21)	P < 0.05	R		
			BCC	PDE5Is	Incidence	OR	1.16 (1.13, 1.19)	P < 0.05	R		
Majidi, A. et al. 2020 [162] Naghizadeh, N. et al. 2020 [163]	11	NR/NR	SCC	PDE5Is	Incidence	OR	1.07 (1.01, 1.13)	P < 0.05	R	M	
			Ovarian	β blockers	Incidence	HR	0.97 (0.84, 1.11)	P > 0.05	R		
	13	NR/NR	Breast	ACEIs	OS	HR	1.03 (0.82, 1.29)	P > 0.05	R		
			Breast	ARBs	OS	HR	1.01 (0.87, 1.15)	P > 0.05	R		
Wu, Y. et al. 2020 [164]	11	NR/NR	Breast	ARBs	OS	HR	1.01 (0.87, 1.15)	P > 0.05	R	CL	
			Prostate	α blockers	Incidence	RR	1.08 (0.93, 1.25)	P > 0.05	R		
			Prostate	α blockers	CSM	RR	1.14 (0.95, 1.38)	P > 0.05	R		
			Prostate	α blockers	ACM	RR	1.04 (0.94, 1.15)	P > 0.05	R		
Xie, Y. et al. 2020 [165]	31	NR/3,352,264	Breast	β blockers	OS	HR	1.01 (0.87, 1.15)	P > 0.05	R	L	
			Bladder	ACEIs	Incidence	RR	1.04 (1.00, 1.08)	P < 0.05	R		
			Bladder	ARBs	Incidence	RR	1.07 (1.03, 1.11)	P < 0.05	R		
			Bladder	CCBs	Incidence	RR	1.16 (0.91, 1.47)	P > 0.05	R		
			Bladder	Diuretics	Incidence	RR	1.16 (0.93, 1.46)	P > 0.05	R		
			Kidney	ACEIs	Incidence	RR	1.08 (0.94, 1.25)	P > 0.05	R		
			RCC	ACEIs	Incidence	RR	1.48 (0.97, 2.28)	P > 0.05	R		
			Kidney	ARBs	Incidence	RR	1.29 (1.22, 1.37)	P < 0.05	R		
			Kidney	β blockers	Incidence	RR	1.46 (1.02, 2.10)	P < 0.05	R		
			RCC	β blockers	Incidence	RR	1.31 (1.01, 1.69)	P < 0.05	R		

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality
			Colorectal	Diuretics	Incidence	RR	1.04 (0.86, 1.27)	P > 0.05	R	
			Colorectal	β blockers	OS	HR	0.90 (0.73, 1.10)	P > 0.05	R	
			Colorectal	ACEIs or ARBs	OS	HR	0.90 (0.81, 1.01)	P > 0.05	R	
			Colorectal	CCBs	OS	HR	0.99 (0.90, 1.09)	P > 0.05	R	
			Colorectal	Diuretics	OS	HR	1.27 (1.14, 1.40)	P < 0.05	R	
			Colorectal	ACEIs or ARBs	PFS	HR	0.83 (0.72, 0.95)	P < 0.05	R	
			Colorectal	β blockers	PFS	HR	0.91 (0.74, 1.12)	P > 0.05	R	
			Colorectal	CCBs	PFS	HR	0.80 (0.58, 1.10)	P > 0.05	R	
Dong-Mei, L. et al. 2021 [172]	7	NR/NR								CL
			Overall	ACEIs or ARBs	Incidence	OR	0.99 (0.98, 1.01)	P > 0.05	F	
			Overall	ACEIs	Incidence	OR	0.90 (0.82, 0.99)	P < 0.05	F	
Harewood, R. et al. 2021 [173]	1	NR/NR	Colon	ACEIs or ARBs	Incidence	HR	0.83 (0.51, 1.35)	P > 0.05	-	NA
Lei, Z. et al. 2021 [174]	10	NR/30870	Lung	β blockers	OS	HR	1.02 (0.98, 1.06)	P > 0.05	R	L
Wen, Z. Y. et al. 2021 [175]	11	NR/20,274								M
			Ovarian	β blockers	ACM	HR	1.08 (0.92, 1.27)	P > 0.05	R	
			Ovarian	β blockers	CSM	HR	1.22 (0.89, 1.67)	P > 0.05	R	
			Ovarian	β blockers	PFS	HR	0.88 (0.75, 1.05)	P > 0.05	R	
Wiranata, S. et al. 2021 [176]	13	185,626/885,590								CL
			Breast	Diuretics	Incidence	OR	1.07 (0.99, 1.16)	P > 0.05	R	
			Breast	CCBs	Incidence	OR	1.08 (0.99, 1.18)	P > 0.05	R	
			Breast	β blockers	Incidence	OR	1.11 (0.98, 1.26)	P > 0.05	R	
			Breast	ACEIs	Incidence	OR	1.27 (0.64, 2.50)	P > 0.05	R	
			Breast	ARBs	Incidence	OR	1.47 (1.02, 2.11)	P < 0.05	R	
Xie, Y. et al. 2021 [177]	57	NR/3997026								L
			Breast	β blockers	Incidence	RR	1.20 (1.09, 1.32)	P < 0.05	R	
			Breast	CCBs	Incidence	RR	1.06 (1.03, 1.08)	P < 0.05	R	
			Breast	Diuretics	Incidence	RR	1.06 (1.01, 1.11)	P < 0.05	R	
			Breast	ACEIs	Incidence	RR	0.99 (0.93, 1.04)	P > 0.05	R	
			Breast	ARBs	Incidence	RR	0.98 (0.81, 1.19)	P > 0.05	R	
			Breast	ACEIs or ARBs	Incidence	RR	1.02 (0.91, 1.13)	P > 0.05	R	

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality
Zhang, Y. et al. 2021 [178]	4	NR/NR	Breast	β blockers	CSM	HR	0.99 (0.88, 1.12)	P > 0.05	R	L
			Breast	CCBs	CSM	HR	1.04 (0.95, 1.13)	P > 0.05	R	
			Breast	Diuretics	CSM	HR	1.18 (1.04, 1.33)	P < 0.05	R	
			Breast	ACEIs or ARBs	CSM	HR	0.98 (0.87, 1.11)	P > 0.05	R	
			Breast	β blockers	OS	HR	1.05 (0.94, 1.19)	P > 0.05	R	
			Breast	CCBs	OS	HR	1.42 (0.85, 2.37)	P > 0.05	R	
			Breast	ACEIs or ARBs	OS	HR	0.93 (0.77, 1.12)	P > 0.05	R	
			Breast	β blockers	CSS	HR	0.57 (0.28, 1.14)	P > 0.05	R	
			Breast	ACEIs or ARBs	CSS	HR	0.88 (0.65, 1.17)	P > 0.05	R	
Bommareddy, K. et al. 2022 [179]	7	NR/4528332	Overall	β blockers	OS	HR	0.87 (0.71, 1.08)	P > 0.05	F	H
			Overall	β blockers	PFS	HR	0.91 (0.66, 1.26)	P > 0.05	R	
			Bladder	Diuretics	Incidence	RR	0.89 (0.74, 1.06)	P > 0.05	R	
			Breast	Diuretics	Incidence	RR	1.04 (0.87, 1.23)	P > 0.05	R	
			Gastric	Diuretics	Incidence	RR	1.02 (0.82, 1.27)	P > 0.05	R	
			Kidney	Diuretics	Incidence	RR	0.96 (0.86, 1.06)	P > 0.05	R	
			Oesophagical	Diuretics	Incidence	RR	1.09 (0.91, 1.31)	P > 0.05	R	
			Ovarian	Diuretics	Incidence	RR	1.69 (1.02, 2.78)	P < 0.05	R	
de Macedo Andrade, A. C. et al. 2022 [180]	5	NR/NR	Prostate	Diuretics	Incidence	RR	0.79 (0.71, 0.88)	P < 0.05	R	L
			SCC (in any region of the body)	Diuretics	Incidence	OR	1.76 (1.68, 1.85)	P < 0.05	R	
			SCC (only in the head and neck region)	Diuretics	Incidence	OR	1.80 (1.71, 1.89)	P < 0.05	R	
Jiang, W. et al. 2022 [181]	12	NR/120,549	Pancreatic	ACEIs or ARBs	OS	HR	0.89 (0.70, 1.14)	P > 0.05	R	L
			Pancreatic	CCBs	OS	HR	0.69 (0.47, 0.99)	P < 0.05	R	
			Pancreatic	β blockers	OS	HR	0.95 (0.84, 1.07)	P > 0.05	R	
			Pancreatic	Diuretics	OS	HR	1.08 (0.91, 1.29)	P > 0.05	F	
Kennedy, O. J. et al. 2022 [182]	9	NR/6350							CL	

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality
Lee, S. H. et al. 2022 [183] Løfling, L. L. et al. 2022 [184]	7 (hospital)	NR/162547	Overall	β blockers	OS	HR	0.99 (0.83, 1.18)	P > 0.05	R	CL
			Overall	β blockers	PFS	HR	0.97 (0.89, 1.05)	P > 0.05	R	
			Overall	ACEIs or ARBs	Incidence	HR	0.86 (0.81, 0.91)	P < 0.05	R	
	9	NR/NR	Breast	β blockers	PFS/RFS (Luminal)	HR	1.08 (0.81, 1.46)	P > 0.05	R	
			Breast	β blockers	PFS/RFS (TNBC)	HR	0.58 (0.38, 0.89)	P < 0.05	R	
			Breast	β blockers	CSS (Luminal)	HR	1.04 (0.93, 1.16)	P > 0.05	R	
			Breast	β blockers	CSS (HER2+)	HR	1.16 (0.77, 1.75)	P > 0.05	R	
			Breast	β blockers	CSS (TNBC)	HR	0.74 (0.55, 1.00)	P > 0.05	R	
			Mehrdad, S. A. et al. 2022 [185]	6	NR/NR	Gastric	ARBs	Incidence	RR	
Nochaiwong, S. et al. 2022 [186]	30	NR/10,129,196 NR/19,780,476 NR/16,387,862 NR/5,668,737 NR/161,491 NR/4,763,703	Gastric	ACEIs	Incidence	RR	1.11 (0.93, 1.32)	P > 0.05	R	H
			Melanoma	Diuretics	Incidence	OR	1.10 (1.04, 1.15)	P < 0.05	R	
			BCC	Diuretics	Incidence	OR	1.05 (1.02, 1.09)	P < 0.05	R	
			SCC	Diuretics	Incidence	OR	1.35 (1.22, 1.48)	P < 0.05	R	
			NMSC	Diuretics	Incidence	OR	1.08 (1.03, 1.12)	P < 0.05	R	
			Lip	Diuretics	Incidence	OR	1.92 (1.52, 2.42)	P < 0.05	R	
			MCC	Diuretics	Incidence	OR	0.98 (0.57, 1.65)	P > 0.05	R	
			Qi, J. et al. 2022 [187]	13	NR/NR	Colorectal	Diuretics	Incidence	OR	
Colorectal	ACEIs	Incidence				RR	1.05 (0.91, 1.23)	P > 0.05	R	
Colorectal	ARBs	Incidence				RR	0.94 (0.80, 1.11)	P > 0.05	R	
Colorectal	β blockers	Incidence				RR	1.00 (0.92, 1.08)	P > 0.05	R	
Colorectal	CCBs	Incidence				RR	1.02 (0.88, 1.18)	P > 0.05	R	
Colorectal	Diuretics	Incidence				RR	1.02 (0.90, 1.17)	P > 0.05	R	
Shao, S. C. et al. 2022 [188]	18	NR/17,848,313	Colorectal	Diuretics	Incidence	RR	1.02 (0.90, 1.17)	P > 0.05	R	H
			BCC	Diuretics	Incidence	OR	1.07 (1.05, 1.09)	P < 0.05	R	
			SCC	Diuretics	Incidence	OR	1.32 (1.06, 1.65)	P < 0.05	R	
			NMSC	Diuretics	Incidence	OR	1.09 (1.03, 1.15)	P < 0.05	R	
			BCC	Diuretics	Incidence	HR	0.99 (0.96, 1.03)	P > 0.05	R	

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality
			SCC	Diuretics	Incidence	HR	1.61 (0.97, 2.67)	P > 0.05	R	
			Melanoma	Diuretics	Incidence	OR	1.11 (1.02, 1.20)	P < 0.05	R	
			Melanoma	Diuretics	Incidence	HR	1.03 (0.93, 1.14)	P > 0.05	R	
			BCC	Diuretics	Incidence	OR	1.07 (0.91, 1.26)	P > 0.05	R	
			SCC	Diuretics	Incidence	OR	1.26 (0.78, 2.02)	P > 0.05	R	
			BCC	Diuretics	Incidence	HR	1.06 (1.04, 1.08)	P < 0.05	R	
			SCC	Diuretics	Incidence	HR	1.10 (1.04, 1.17)	P < 0.05	R	
			Melanoma	Diuretics	Incidence	OR	1.10 (0.92, 1.33)	P > 0.05	R	
			Melanoma	Diuretics	Incidence	HR	1.12 (0.89, 1.42)	P > 0.05	R	
			BCC	Diuretics	Incidence	OR	1.01 (0.96, 1.06)	P > 0.05	R	
			SCC	Diuretics	Incidence	OR	0.98 (0.87, 1.09)	P > 0.05	R	
			Melanoma	Diuretics	Incidence	OR	1.30 (0.91, 1.87)	P > 0.05	R	
Shin, K. et al. 2022 [189]	31	NR/NR	Overall	ACEIs or ARBs	Incidence	RR	1.02 (0.99, 1.05)	P > 0.05	R	M
Yan, X. et al. 2022 [190]	11	NR/10,156								L
			Overall	β blockers	OS	HR	0.97 (0.85, 1.11)	P > 0.05	R	
			Overall	β blockers	PFS	HR	0.98 (0.90, 1.06)	P > 0.05	R	
Chang, H. et al. 2023 [191]	3	NR/5148	HCC	β blockers	OS	HR	0.69 (0.54, 0.88)	P < 0.05	R	CL
Cullinane, C. et al. 2023 [192]	5	NR/977119	Colorectal	PDE5Is	Incidence	HR	0.85 (0.78, 0.93)	P < 0.05	R	M
Heisel, A. G. U. et al. 2023 [193]	42	NR/16,670,045								M
			NMSC	ACEIs or ARBs	Incidence	OR	0.98 (0.71, 1.34)	P > 0.05	R	
			NMSC	β blockers	Incidence	OR	1.02 (0.95, 1.09)	P > 0.05	R	
			NMSC	CCBs	Incidence	OR	1.06 (1.04, 1.09)	P < 0.05	R	
			NMSC	Diuretics	Incidence	OR	1.27 (1.09, 1.47)	P < 0.05	R	
			BCC	ACEIs or ARBs	Incidence	OR	0.91 (0.44, 1.88)	P > 0.05	R	
			BCC	β blockers	Incidence	OR	1.12 (0.94, 1.33)	P > 0.05	R	
			BCC	CCBs	Incidence	OR	1.07 (1.05, 1.10)	P < 0.05	R	
			BCC	Diuretics	Incidence	OR	1.11 (1.00, 1.23)	P < 0.05	R	
			SCC	ACEIs or ARBs	Incidence	OR	0.93 (0.59, 1.46)	P > 0.05	R	
			SCC	β blockers	Incidence	OR	0.89 (0.71, 1.12)	P > 0.05	R	

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality
Rahimi, R. et al. 2023 [194]	13	NR/335339	SCC	CCBs	Incidence	OR	1.00 (0.94, 1.07)	P > 0.05	R	L
			SCC	Diuretics	Incidence	OR	1.33 (1.11, 1.61)	P < 0.05	R	
			Lip	ACEIs or ARBs	Incidence	OR	1.57 (0.95, 2.60)	P > 0.05	R	
			Lip	β blockers	Incidence	OR	1.52 (0.67, 3.49)	P > 0.05	R	
			Lip	Diuretics	Incidence	OR	2.22 (1.63, 3.03)	P < 0.05	R	
			Melanoma	ACEIs or ARBs	Incidence	OR	1.15 (0.82, 1.61)	P > 0.05	R	
			Melanoma	β blockers	Incidence	OR	1.35 (0.98, 1.87)	P > 0.05	R	
			Melanoma	CCBs	Incidence	OR	1.32 (0.87, 1.99)	P > 0.05	R	
			Melanoma	Diuretics	Incidence	OR	1.01 (0.88, 1.15)	P > 0.05	R	
			Pancreatic	ARBs	Incidence	OR	0.94 (0.77, 1.14)	P > 0.05	R	
			Pancreatic	ACEIs	Incidence	OR	0.96 (0.84, 1.09)	P > 0.05	R	
			Pancreatic	ACEIs or ARBs	Incidence	OR	0.97 (0.87, 1.09)	P > 0.05	R	
			Pancreatic	ARBs	CSM	OR	0.81 (0.66, 0.98)	P < 0.05	R	
Pancreatic	ACEIs	CSM	OR	0.89 (0.80, 0.99)	P < 0.05	R				
Pancreatic	ACEIs or ARBs	CSM	OR	0.83 (0.70, 0.97)	P < 0.05	R				
Rotshild, V. et al. 2023 [195]	18	48630/542425	Prostate	CCBs	Incidence	RR	1.05 (1.01, 1.10)	P < 0.05	R	M
Saeedi, N. et al. 2023 [196]	6	NR/2,364								CL
			RCC	ACEIs or ARBs	OS	HR	0.62 (0.48, 0.80)	P < 0.05	R	
			RCC	ACEIs or ARBs	PFS	HR	0.69 (0.58, 0.83)	P < 0.05	R	
Shen, J. et al. 2023 [197]	12	NR/11739								M
			Overall	ACEIs or ARBs	OS	HR	0.85 (0.75, 0.96)	P < 0.05	R	
			Overall	ACEIs or ARBs	PFS	HR	0.91 (0.76, 1.09)	P > 0.05	R	
Wang, Z. et al. 2023 [198]	28	NR/6,301,712	Lung	ARBs	Incidence	RR	0.85 (0.76, 0.95)	P < 0.05	R	L
Wu, Z. et al. 2023 [199]	11	96764/13061226	Lung	ACEIs	Incidence	OR	1.19 (1.05, 1.36)	P < 0.05	R	M
Yang, J. et al. 2023 [200]	43	NR/NR								L
			Breast	β blockers	Incidence	RR	1.17 (1.06, 1.29)	P < 0.05	R	
			Breast	β blockers	OS	RR	1.13 (1.08, 1.17)	P < 0.05	F	
			Breast	β blockers	CSM	RR	1.01 (0.95, 1.08)	P > 0.05	R	
			Breast	β blockers	PFS	RR	0.93 (0.62, 1.31)	P > 0.05	R	

First author	K	n/N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality
Cohen, O. G. et al. 2024 [201]	42	NR/43,210,409	Breast	β blockers	DFS	RR	0.78 (0.51, 1.18)	P > 0.05	F	CL
			BCC	CCBs	Incidence	RR	1.17 (1.11, 1.22)	P < 0.05	R	
			BCC	Diuretics	Incidence	RR	1.06 (1.03, 1.10)	P < 0.05	R	
			SCC	CCBs	Incidence	RR	1.08 (1.01, 1.14)	P < 0.05	R	
			SCC	Diuretics	Incidence	RR	1.29 (1.17, 1.43)	P < 0.05	R	
			SCC	Diuretics	Incidence	RR	1.36 (1.15, 1.61)	P < 0.05	R	
			Melanoma	ACEIs	Incidence	RR	1.09 (1.03, 1.14)	P < 0.05	R	
			Melanoma	CCBs	Incidence	RR	1.08 (1.03, 1.12)	P < 0.05	R	
Scott, O. W. et al. 2024 [202]	19	NR/253,082	Breast	β blockers	CSM	HR	0.90 (0.78, 1.04)	P > 0.05	R	CL
Wang, X. et al. 2024 [204]	15	NR/NR	Prostate	β blockers	CSM	HR	0.97 (0.86, 1.10)	P > 0.05	R	CL
			Prostate	β blockers	OS	HR	1.02 (0.94, 1.10)	P > 0.05	R	
			Colorectal	ACEIs	Incidence	RR	0.87 (0.69, 1.10)	P > 0.05	R	
			Colorectal	ARBs	Incidence	RR	0.89 (0.82, 0.96)	P < 0.05	F	
Yu, J. et al. 2024 [205]	13	NR/17544	Colorectal	ARBs	CSS	HR	0.83 (0.52, 1.33)	P > 0.05	R	M
			Overall	ACEIs or ARBs	OS	HR	0.74 (0.62, 0.88)	P < 0.05	R	
			Overall	ACEIs or ARBs	PFS	HR	0.77 (0.62, 0.96)	P < 0.05	R	

K, number of studies; n, number of cases; N, total number of participants; EST, effect size type; ES, effect size; CI, confidence interval; EM, effect model; quality, AMSTAR 2; NR, not reported; OR, odds ratio; RR, risk ratio; HR, hazard ratio; R, random; F, fixed; CL, critically low; L, low; M, moderate; H, high; ARBs, angiotensin receptor blockers; ACEIs, angiotensin converting enzyme inhibitors; CCBs, calcium channel blockers; PDE5Is, phosphodiesterase 5 inhibitors; CSM, cancer-specific mortality; ACM, all-cause mortality; OS, overall survival; DFS, disease free survival; CSS, cancer-specific survival; PFS, progression-free survival; RFS, recurrence-free survival; RCC, renal cell carcinoma; AC, adenocarcinoma; SCC, squamous cell carcinoma; BCC, basal cell carcinoma; HCC, hepatocellular carcinoma; DSM, digestive system malignancies; NMSC, non-melanoma skin cancer; MCC, merkel cell carcinoma

Supplementary Table 6. Characteristics of included meta-analyses of randomised controlled trials

First author	K	N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality
Dong, E. W. et al. 1997 [206]	39	11201								CL
			Overall	CCBs	Incidence and CSM	OR	1.20 (0.60, 2.42)	P > 0.05	R	
			Overall	CCBs	Incidence and CSM	OR	0.73 (0.39, 1.39)	P > 0.05	R	

First author	K	N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality				
Grossman, E. et al. 2001 [116]	57	NR	Overall	CCBs	ACM	OR	1.13 (0.70, 1.82)	P > 0.05	R	CL				
			Overall	CCBs	ACM	OR	0.85 (0.71, 1.00)	P > 0.05	R					
			Overall	β blockers	CSM	OR	1.36 (1.02, 1.82)	P < 0.05	NR					
			Overall	CCBs	Incidence	OR	0.78 (0.60, 1.00)	P > 0.05	NR					
			Overall	ACEIs	Incidence	OR	1.57 (0.97, 2.57)	P > 0.05	NR					
Agusti, A. et al. 2003 [207]	NR	NR	Overall	ACEIs	Incidence	RR	1.07 (0.22, 5.09)	P > 0.05	R	CL				
Coleman, C. I. et al. 2008 [208]	27	126137	Overall	ACEIs	Incidence	OR	0.99 (0.80, 1.24)	P > 0.05	R	CL				
			Overall	ARBs	Incidence	OR	1.12 (0.87, 1.47)	P > 0.05	R					
			Overall	β blockers	Incidence	OR	1.00 (0.78, 1.32)	P > 0.05	R					
			Overall	Diuretics	Incidence	OR	0.94 (0.73, 1.19)	P > 0.05	R					
			Overall	CCBs	Incidence	OR	0.95 (0.79, 1.13)	P > 0.05	R					
			Overall	ARBs	Incidence	RR	1.08 (1.01, 1.15)	P < 0.05	F					
Sipahi, I. et al. 2010 [209]	9	223507	Overall	ARBs	CSM	RR	1.07 (0.97, 1.18)	P > 0.05	F	L				
			Overall	ARBs	ACM	HR	0.99 (0.93, 1.05)	P > 0.05	R					
			Overall	ARBs	Incidence	OR	0.98 (0.93, 1.03)	P > 0.05	F					
			Overall	ARBs	CSM	OR	0.99 (0.91, 1.09)	P > 0.05	F					
Bangalore, S. et al. 2011 [210]	70	324168	Overall	ACEIs	Incidence	OR	0.96 (0.91, 1.01)	P > 0.05	F	L				
			Overall	ACEIs	CSM	OR	0.94 (0.87, 1.02)	P > 0.05	F					
			Overall	β blockers	Incidence	OR	0.94 (0.88, 1.00)	P > 0.05	F					
			Overall	β blockers	CSM	OR	1.02 (0.92, 1.14)	P > 0.05	F					
			Overall	CCBs	Incidence	OR	1.06 (1.01, 1.11)	P < 0.05	F					
			Overall	CCBs	CSM	OR	0.96 (0.87, 1.05)	P > 0.05	F					
			Overall	Diuretics	Incidence	OR	0.97 (0.90, 1.05)	P > 0.05	F					
			Overall	Diuretics	CSM	OR	1.02 (0.92, 1.13)	P > 0.05	F					
			Overall	ACEIs	Incidence	RR	1.01 (0.95, 1.07)	P > 0.05	F					
			Sipahi, I. et al. 2011 [211]	14	61774	Overall	ACEIs	Incidence	RR		1.01 (0.95, 1.07)	P > 0.05	F	CL
						Overall	ACEIs	Incidence	RR		1.01 (0.95, 1.07)	P > 0.05	F	

First author	K	N	Type of cancer	Intervention	Outcome	EST	ES (95% CI)	P value	EM	Quality
			Overall	ACEIs	Incidence	HR	0.99 (0.95, 1.04)	P > 0.05		
			Overall	ARBs	Incidence	HR	0.97 (0.92, 1.01)	P > 0.05		
			Overall	β blockers	Incidence	HR	0.98 (0.89, 1.08)	P > 0.05		
			Overall	CCBs	Incidence	HR	1.06 (1.02, 1.12)	P < 0.05		
			Overall	Diuretics	Incidence	HR	1.01 (0.95, 1.07)	P > 0.05		
			Overall	ACEIs (vs placebo)	Incidence	HR	1.00 (0.88, 1.13)	P > 0.05		
			Overall	ARBs (vs placebo)	Incidence	HR	1.00 (0.92, 1.09)	P > 0.05		
			Overall	β blockers (vs placebo)	Incidence	HR	0.70 (0.60, 0.80)	P < 0.05		
			Overall	CCBs (vs placebo)	Incidence	HR	0.98 (0.82, 1.17)	P > 0.05		
			Overall	Diuretics (vs placebo)	Incidence	HR	1.29 (0.63, 2.65)	P > 0.05		
			Overall	ACEIs	CSM	HR	1.02 (0.93, 1.11)	P > 0.05		
			Overall	ARBs	CSM	HR	0.97 (0.87, 1.09)	P > 0.05		
			Overall	β blockers	CSM	HR	1.02 (0.90, 1.17)	P > 0.05		
			Overall	CCBs	CSM	HR	1.00 (0.91, 1.10)	P > 0.05		
			Overall	Diuretics	CSM	HR	1.14 (1.03, 1.26)	P < 0.05		
			Overall	ACEIs (vs placebo)	CSM	HR	1.09 (0.85, 1.40)	P > 0.05		
			Overall	ARBs (vs placebo)	CSM	HR	0.98 (0.81, 1.19)	P > 0.05		
			Overall	CCBs (vs placebo)	CSM	HR	0.69 (0.39, 1.21)	P > 0.05		
Attar, A. et al. 2022 [222]	11	920	Overall	β blockers	ACM	RR	0.58 (0.34, 1.02)	P > 0.05	F	CL
He, D. et al. 2022 [223]	6	NR	Mostly Breast	β blockers	ACM	RR	1.08 (0.51, 2.27)	P > 0.05	F	CL
Sayed, A. et al. 2022 [224]	19	5502	Overall	ACEIs, ARBs, β blockers and dexrazoxane	ACM	RR	1.03 (0.84, 1.22)	P > 0.05	R	H
Takuathung, M. N. et al. 2022 [225]	11	9540	Overall	ACEIs	Incidence	RR	1.09 (0.79, 1.52)	P > 0.05	R	L
Du, Y. et al. 2023 [226]	4	14,875	Overall	Finerenone	Incidence	OR	0.97 (0.83, 1.14)	P > 0.05	F	H
Wang, Z. et al. 2023 [227]	28	6,301,712	Lung	ARBs	Incidence	RR	0.85 (0.76, 0.95)	P < 0.05	R	L

K, number of studies; N, total number of participants; EST, effect size type; effect size; CI, confidence interval; EM, effect model; quality, AMSTAR 2; NR, not reported; OR, odds ratio; RR, risk ratio; HR, hazard ratio; R, random; F, fixed; CL, critically low; L, low; M, moderate; H, high; ARBs, angiotensin receptor blockers; ACEIs, angiotensin converting enzyme inhibitors; CCBs, calcium channel blockers; CSM, cancer-specific mortality; ACM, all-cause mortality

Supplementary Table 7. Quality assessment of included meta-analyses using AMSTAR 2 quality assessment tool

First author	Outcome	q1	q2	q3	q4	q5	q6	q7	q8	q9	q10	q11	q12	q13	q14	q15	q16	Quality
Dong, E. W. et al. 1997	Incidence, CSM, ACM	2	0	2	0	2	2	2	0	2	0	0	0	0	0	0	2	Critically low
Grossman, E. et al. 2001	Incidence, CSM	2	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	Critically low
Agusti, A. et al. 2003	Incidence	2	0	2	1	2	2	2	0	0	0	2	0	0	2	2	2	Critically low
Corrao, G. et al. 2007	Incidence	0	0	2	0	2	0	2	1	1	0	2	0	0	0	2	2	Critically low
Coleman, C. I. et al. 2008	Incidence	2	0	2	2	2	2	0	2	1	0	2	2	2	2	0	2	Critically low
Sipahi, I. et al. 2010	Incidence, CSM, ACM	2	0	2	2	0	2	2	2	2	0	2	2	2	2	2	2	Low
Bangalore, S. et al. 2011	Incidence, CSM	2	0	2	2	2	2	2	2	2	0	2	2	2	2	2	2	Low
Sipahi, I. et al. 2011	Incidence, CSM	2	0	2	1	0	2	2	2	0	0	0	2	2	2	2	0	Critically low
Teo, K. K. et al. 2011	Incidence, CSM	2	0	2	0	0	0	0	2	2	2	0	2	2	0	0	2	Critically low
Yoon, C. et al. 2011	Incidence	2	0	2	1	2	0	2	2	2	0	2	2	2	2	0	2	Critically low
Alexandre, L. et al. 2012	Incidence	2	0	2	0	2	2	0	2	2	0	2	0	2	2	0	0	Critically low
Monami, M. et al. 2013	Incidence	2	0	2	1	0	2	0	1	0	0	0	0	0	0	2	2	Critically low
Chen, Q. et al. 2014	Incidence	2	0	2	1	2	2	2	2	2	0	2	2	2	2	2	2	Low
Choi, C. H. et al. 2014	OS, DFS	2	0	2	1	0	2	2	2	0	0	2	0	0	2	2	2	Critically low
Childers, W. K. et al. 2015	CSM, ACM	2	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	Critically low
Dai, Y. N. et al. 2015	Incidence, CSM	2	0	2	1	2	2	2	2	2	0	2	2	2	2	2	2	Low
Lu, H. et al. 2015	CSM, ACM	0	0	0	1	0	2	2	2	0	0	2	0	0	2	0	2	Critically low
Yang, Y. et al. 2015	Incidence	2	0	2	2	0	2	2	2	2	0	2	2	2	2	2	2	Low
Zhang, W. et al. 2015	Incidence	0	0	2	1	0	2	0	2	2	0	2	2	2	2	2	2	Critically low
Cardwell, C. R. et al. 2016	ACM	2	0	2	0	0	0	0	1	0	0	2	2	2	2	0	2	Critically low
Mao, Y. et al. 2016	Incidence	2	0	2	1	0	2	2	2	2	0	2	2	2	2	2	2	Low
Raimondi, S. et al. 2016	OS, DFS, CSS	2	0	0	1	2	2	2	2	0	0	0	0	0	2	2	2	Critically low
Shen, J. et al. 2016	Incidence, CSM	0	0	2	1	0	2	2	1	2	0	0	0	0	0	2	2	Critically low
Sun, H. et al. 2016	OS	0	0	2	2	0	2	2	0	2	0	2	2	2	2	2	0	Low
Weberpals, J. et al. 2016	OS, CSS	2	0	0	1	0	2	2	1	2	0	2	2	2	2	2	2	Low
Ye, X. et al. 2016	Incidence	0	0	2	1	2	2	2	0	2	0	0	0	0	2	2	2	Critically low

First author	Outcome	q1	q2	q3	q4	q5	q6	q7	q8	q9	q10	q11	q12	q13	q14	q15	q16	Quality
Zhao, Y. T. et al. 2016	Incidence	2	0	2	2	2	2	1	2	2	0	2	2	2	2	0	2	Critically low
Zhong, S. et al. 2016	CSM, ACM	0	0	2	1	2	2	2	0	2	0	2	0	0	2	2	2	Critically low
Che Roos, N. A. et al. 2017	Incidence, CSM	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	High
Kim, H. Y. et al. 2017	CSM, ACM	0	0	0	1	0	2	1	0	0	0	0	0	0	2	0	2	Critically low
Li, X. Y. et al. 2017	OS, PFS	0	0	0	1	0	2	0	0	0	0	2	0	0	2	2	2	Critically low
Loeb, S. et al. 2017	Incidence	0	0	2	1	0	0	2	0	2	0	2	2	2	2	0	2	Critically low
Ni, H. et al. 2017	Incidence	0	0	2	1	0	2	2	0	2	0	2	2	2	2	2	2	Low
Qian, Y. F. et al. 2017	Incidence	0	0	2	1	0	2	2	0	2	0	2	0	0	2	2	2	Critically low
Song, T. et al. 2017	OS, DFS, RFS	0	0	0	2	2	2	2	0	0	0	2	0	0	2	2	2	Critically low
Sun, H. et al. 2017	OS, DFS, CSS, PFS	0	0	0	1	2	2	2	0	2	0	2	2	2	2	2	2	Low
Wang, J. et al. 2017	Incidence	0	0	2	0	2	0	2	0	2	0	2	2	2	2	0	2	Critically low
Wright, C. M. et al. 2017	Incidence	2	2	2	2	2	2	2	2	2	0	2	2	2	2	2	2	High
Cao, L. et al. 2018	Incidence	2	0	2	1	2	2	2	2	2	0	2	2	2	2	0	2	Critically low
Gandini, S. et al. 2018	Incidence	2	0	2	2	2	2	2	0	2	0	2	2	2	2	2	2	Low
Han, X. et al. 2018	Incidence	0	0	2	1	0	2	2	0	2	0	2	2	2	2	2	2	Low
Na, Z. et al. 2018	ACM, OS, DFS, CSS, PFS, RFS	0	0	2	1	0	0	2	0	2	0	2	2	2	2	2	2	Low
Rotshild, V. et al. 2018	Incidence	2	2	2	1	2	2	2	1	2	0	2	2	2	2	2	2	High
Tang, H. et al. 2018	Incidence	0	0	2	1	2	2	2	0	2	0	2	2	2	2	2	2	Low
Tang, H. et al. 2018 (2)	Incidence	2	0	2	1	2	2	2	2	2	0	2	2	2	2	2	2	Low
Thakur, A. A. et al. 2018	Incidence	0	0	0	0	0	0	2	0	2	0	2	2	2	2	2	2	Critically low
Yap, A. et al. 2018	OS, DFS	0	2	2	2	2	2	2	0	2	0	2	2	2	2	2	2	Moderate
Bandinelli, B. et al. 2019	Incidence	0	0	2	2	2	2	0	0	0	0	2	0	0	2	0	2	Critically low
Datzmann, T. et al. 2019	Incidence, CSM	0	2	2	1	2	0	2	0	2	0	2	2	2	2	2	2	Moderate
Huang, S. et al. 2019	ACM	2	2	2	2	0	2	2	1	2	0	2	0	0	2	2	2	Low
Ma, Y. et al. 2019	ACM	2	0	2	0	2	2	2	1	2	0	2	0	0	2	2	2	Critically low
Shin, D. et al. 2019	Incidence	0	0	2	1	2	0	2	0	2	0	2	2	0	2	2	2	Critically low
Asgharzadeh, F. et al. 2020	OS	0	0	0	0	0	2	2	0	0	0	2	0	0	2	2	2	Critically low
Asgharzadeh, F. et al. 2020 (2)	Incidence	0	0	0	1	0	2	2	0	0	0	0	0	0	0	2	2	Critically low

First author	Outcome	q1	q2	q3	q4	q5	q6	q7	q8	q9	q10	q11	q12	q13	q14	q15	q16	Quality
Chen, X. et al. 2020	Incidence, CSM	0	0	2	1	2	2	2	0	2	0	2	2	2	2	2	2	Low
Coelho, M. et al. 2020	OS	2	2	2	1	2	2	2	2	2	0	2	2	2	2	2	2	High
Li, C. et al. 2020	CSM, ACM	0	0	2	1	0	2	2	0	2	0	2	2	2	2	2	2	Low
Lu, Y. P. et al. 2020	Incidence	2	0	2	1	2	2	2	0	2	0	2	2	2	2	2	2	Low
Majidi, A. et al. 2020	Incidence	0	2	0	1	2	0	2	0	2	0	2	2	2	2	2	2	Moderate
Naghizadeh, N. et al. 2020	OS	0	0	2	1	2	0	2	0	0	0	2	0	0	2	2	0	Critically low
Wu, Y. et al. 2020	Incidence, CSM, ACM	2	0	0	1	0	2	2	1	2	0	2	0	0	2	0	2	Critically low
Xie, Y. et al. 2020	Incidence	0	0	2	1	2	0	2	0	2	0	2	2	2	2	2	2	Low
Yang, H. et al. 2020	Incidence	0	0	2	1	2	2	2	0	2	0	2	2	2	2	2	2	Low
Zhan, T. et al. 2020	ACM	2	0	2	1	0	2	2	1	2	0	2	0	2	2	2	2	Low
Zhou, Q. et al. 2020	OS, DFS, CSS, PFS, RFS	0	0	2	1	0	2	1	0	2	0	2	2	2	2	2	2	Low
Batais, M. et al. 2021	Incidence	2	0	2	1	0	2	1	2	2	0	2	2	2	2	2	2	Low
Bhagavathula, A. S. et al. 2021	Incidence	0	0	2	1	0	2	2	0	2	0	2	2	2	2	2	2	Low
Caparica, R. et al. 2021	CSM, OS, RFS	2	2	0	1	2	0	2	0	2	0	2	2	2	2	2	2	Moderate
Copland, E. et al. 2021	Incidence, CSM	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	High
Deng, Y. et al. 2021	Incidence, OS, PFS	0	0	2	1	2	2	2	0	2	0	2	2	2	2	2	2	Low
Dong-Mei, L. et al. 2021	Incidence	0	0	2	0	0	0	2	0	2	0	2	0	2	2	2	0	Critically low
Lei, Z. et al. 2021	OS	2	0	2	1	0	2	2	0	2	0	2	2	2	2	2	2	Low
Wen, Z. Y. et al. 2021	CSM, ACM, PFS	0	2	2	1	0	2	2	0	2	0	2	2	2	2	2	2	Moderate
Wiranata, S. et al. 2021	Incidence	0	0	2	1	2	2	1	0	2	0	2	0	0	2	2	2	Critically low
Xie, Y. et al. 2021	Incidence, CSM, OS, CSS	2	0	0	1	0	2	2	1	2	0	2	2	2	2	2	2	Low
Zhang, Y. et al. 2021	OS, PFS	2	0	0	1	2	2	2	0	2	0	2	2	2	2	2	2	Low
Attar, A. et al. 2022	ACM	0	0	2	1	0	2	2	0	2	0	2	0	0	2	2	2	Critically low
Bommareddy, K. et al. 2022	Incidence	2	2	2	1	2	2	2	2	2	0	2	2	2	2	2	2	High
de Macedo Andrade, A. C. et al. 2022	Incidence	2	2	2	1	2	0	2	2	2	0	2	2	2	2	0	2	Low
He, D. et al. 2022	ACM	0	0	2	1	0	0	2	0	2	0	2	0	0	2	2	2	Critically low
Jiang, W. et al. 2022	OS	2	2	0	1	2	2	2	0	2	0	2	2	2	2	0	2	Low
Kennedy, O. J. et al. 2022	OS, PFS	0	0	0	1	2	2	2	0	2	0	0	0	0	0	2	2	Critically low

First author	Outcome	q1	q2	q3	q4	q5	q6	q7	q8	q9	q10	q11	q12	q13	q14	q15	q16	Quality
Lee, S. H. et al. 2022	Incidence	2	0	2	0	0	0	0	1	0	0	2	0	0	2	0	2	Critically low
Løffling, L. L. et al. 2022	CSS, PFS, RFS	2	0	0	1	2	2	2	1	2	0	2	2	2	2	2	2	Low
Mehrdad, S. A. et al. 2022	Incidence	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	Critically low
Nochaiwong, S. et al. 2022	Incidence	2	2	2	2	2	2	2	2	2	0	2	2	2	2	2	2	High
Qi, J. et al. 2022	Incidence	2	2	2	1	2	2	2	1	2	0	2	2	2	2	2	2	High
Sayed, A. et al. 2022	ACM	2	2	2	2	2	2	2	1	2	0	2	2	2	2	2	2	High
Shao, S. C. et al. 2022	Incidence	2	2	2	2	2	2	2	1	2	0	2	2	2	2	2	2	High
Shin, K. et al. 2022	Incidence	0	2	2	1	2	0	2	0	2	0	2	2	2	2	2	2	Moderate
Takuathung, M. N. et al. 2022	Incidence	2	2	2	1	2	0	2	2	2	0	2	2	2	2	0	2	Low
Yan, X. et al. 2022	OS, PFS	2	0	2	1	0	0	2	0	2	0	2	2	2	2	2	2	Low
Chang, H. et al. 2023	OS	0	0	0	1	2	2	2	0	2	0	2	2	2	2	0	2	Critically low
Cullinane, C. et al. 2023	Incidence	0	2	2	1	2	2	2	0	2	0	2	2	2	2	2	2	Moderate
Du, Y. et al. 2023	Incidence	2	2	2	1	2	2	2	1	2	0	2	2	2	2	2	2	High
Heisel, A. G. U. et al. 2023	Incidence	0	2	2	1	2	2	2	0	2	0	2	2	2	2	2	2	Moderate
Rahimi, R. et al. 2023	Incidence, CSM	2	0	2	1	0	2	2	0	2	0	2	2	2	2	2	2	Low
Rotshild, V. et al. 2023	Incidence	2	2	2	1	0	2	2	1	2	0	2	2	2	2	2	2	Moderate
Saeedi, N. et al. 2023	OS, PFS	0	0	0	1	2	2	1	0	0	0	0	0	0	0	2	2	Critically low
Shen, J. et al. 2023	OS, PFS	2	2	0	1	2	2	2	1	2	0	2	2	2	2	2	2	Moderate
Wang, Z. et al. 2023	Incidence	2	0	2	1	2	0	2	0	2	0	2	2	2	2	2	2	Low
Wu, Z. et al. 2023	Incidence	2	2	2	1	0	2	2	1	2	0	2	2	2	2	2	2	Moderate
Yang, J. et al. 2023	Incidence, CSM, OS, DFS, PFS	2	0	2	1	2	2	2	0	2	0	2	2	2	2	2	2	Low
Cohen, O. G. et al. 2024	Incidence	0	0	2	1	2	2	2	0	2	0	0	0	0	0	0	2	Critically low
Scott, O. W. et al. 2024	CSM	2	0	2	1	0	0	2	2	0	0	2	2	2	2	2	2	Critically low
Uleri, A. et al. 2024	CSM, OS	2	2	0	1	2	2	2	1	2	0	2	2	2	2	0	2	Low
Wang, X. et al. 2024	Incidence, CSS	2	0	0	0	0	0	2	0	0	0	0	0	0	0	2	2	Critically low
Yu, J. et al. 2024	OS, PFS	2	2	0	1	2	0	2	0	2	0	2	2	2	2	2	2	Moderate

AMSTAR 2, a measurement tool to assess systematic reviews – second edition; q, question; CSM, cancer-specific mortality; ACM, all-cause mortality; OS, overall survival; DFS, disease-free survival; CSS, cancer-specific survival; PFS, progression-free survival; RFS, recurrence-free survival; 0, No; 1, Partial Yes; 2, Yes.

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