Item S1: The Search Strategy of the Appropriateness of Percutaneous Coronary Interventions: A Systematic Review and Meta-analysis

Cochrane

ID

#1   MeSH descriptor: [Patient Selection] explode all trees

#2   MeSH descriptor: [Myocardial Revascularization] explode all trees and with qualifier(s): [methods - MT, standards - ST, trends - TD, statistics & numerical data - SN]

#3   MeSH descriptor: [Percutaneous Coronary Intervention] explode all trees and with qualifier(s): [methods - MT, standards - ST, statistics & numerical data - SN]

#4   MeSH descriptor: [Coronary Artery Disease] explode all trees and with qualifier(s): [surgery - SU, therapy - TH]

#5   MeSH descriptor: [Process Assessment, Health Care] explode all trees

#6   appropriateness or appropriate use or inappropriate use or abuse or appropriate use criteria or AUC

#7   #1 or #5 or #6

#8   #2 or #3 or #4

#9   #7 and #8

Embase

No.   Query Results

#16. #12 AND #15

#15. #7 OR #14

#14. 'appropriate use criteria':ti,ab,kw OR 'appropriateness':ti,ab,kw OR 'appropriate use':ti,ab,kw

#13. #8 AND #12

#12. #3 OR #11

#11. 'heart muscle revascularization'/exp

#10. #3 AND #7

#9.   #3 AND #8

#8.   #5 OR #7

#7.   'patient selection'/exp

#6.   #3 AND #5

#5.   'appropriate use criteria':ti,ab,kw OR 'appropriateness':ti,ab,kw

#4.   #2 AND #3

#3.   'percutaneous coronary intervention'/exp

#2.   'appropriate use criteria':ti,ab,kw

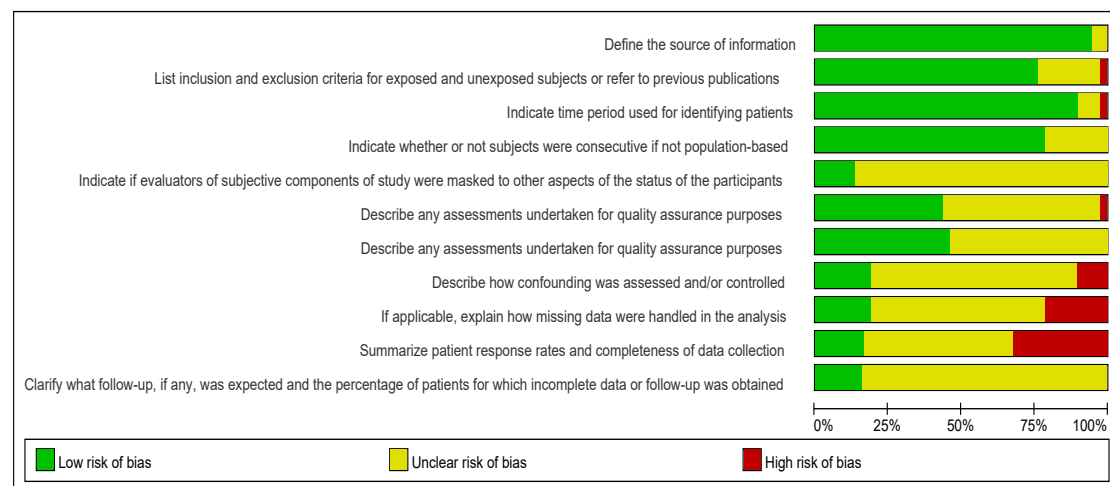#1.   'appropriate use criteria'/exp OR 'appropriate use criteria'

PubMed

(("Myocardial Revascularization/trends"[Mesh] OR "Myocardial Revascularization/methods"[Mesh] OR "Myocardial Revascularization/standards"[Mesh] OR "Myocardial Revascularization/statistics and numerical data"[Mesh] OR "Myocardial Revascularization/therapy"[Mesh] OR "Percutaneous Coronary Intervention/methods"[Mesh] OR "Percutaneous Coronary Intervention/standards"[Mesh] OR "Percutaneous Coronary Intervention/statistics and numerical data"[Mesh] OR "Percutaneous Coronary Intervention/therapy"[Mesh] OR "Coronary Artery Disease/surgery"[Mesh] OR "Coronary Artery Disease/therapy"[Mesh]) AND ("Patient Selection"[Mesh] OR "Process Assessment, Health Care"[Mesh] OR "appropriateness" OR "appropriate use" OR "inappropriate use" OR abuse OR "appropriate use criteria" OR "AUC") NOT ("Substance-Related Disorders"[Mesh]))

Sinomed (Using Chinese)

"Coronary revascularization"[Common fields: intelligent] AND "appropriateness "[Common fields: intelligent]
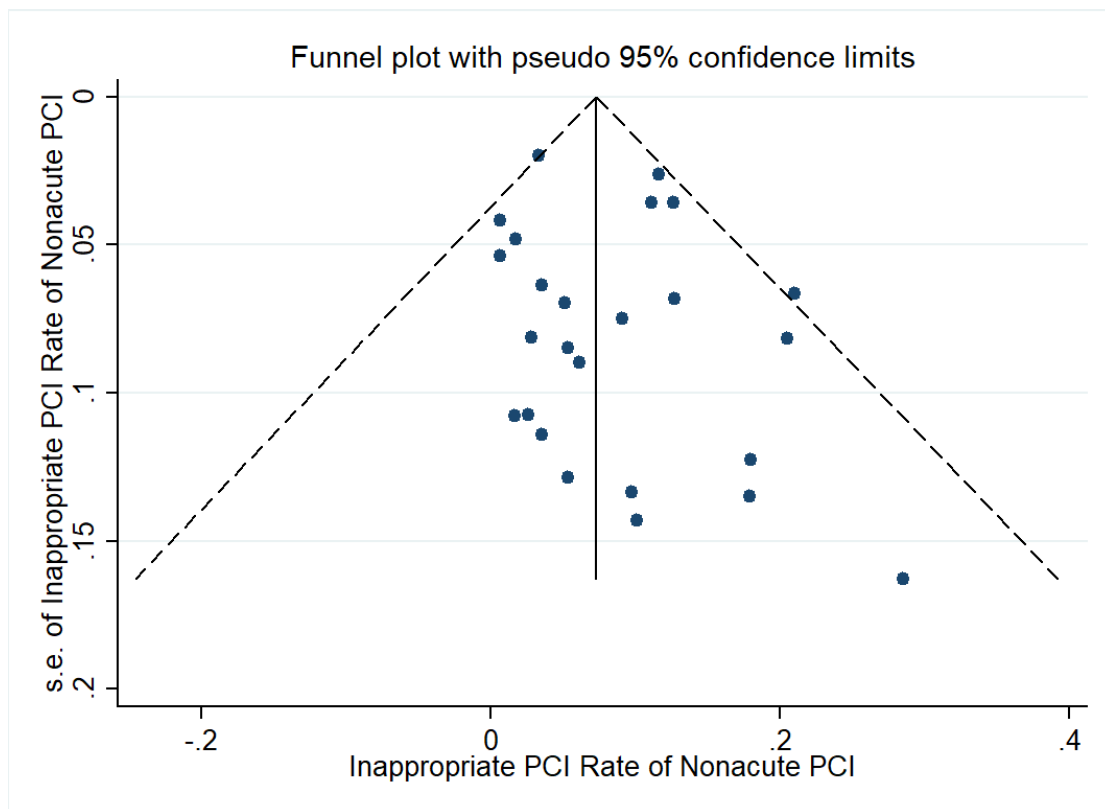
Supplementary Figure

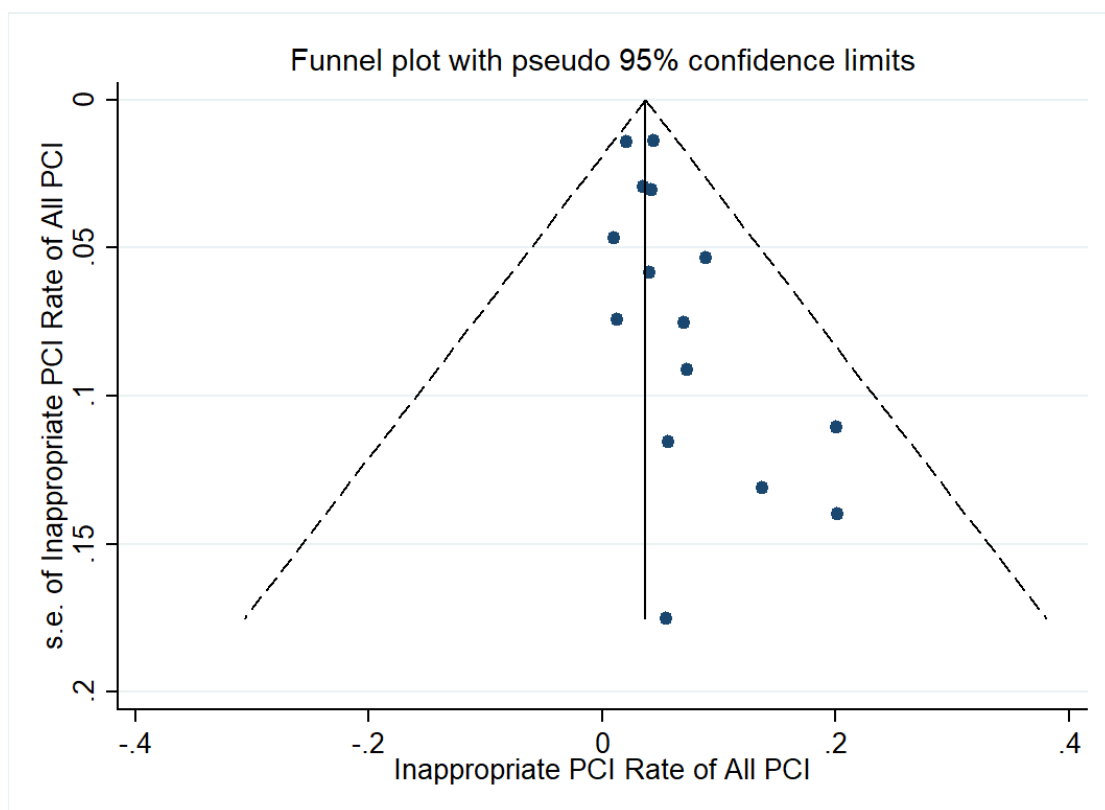Supplementary Figure S 1 Risk of bias graph of the included studies

Supplementary Figure S 2 Risk of bias summary according to AHRQ

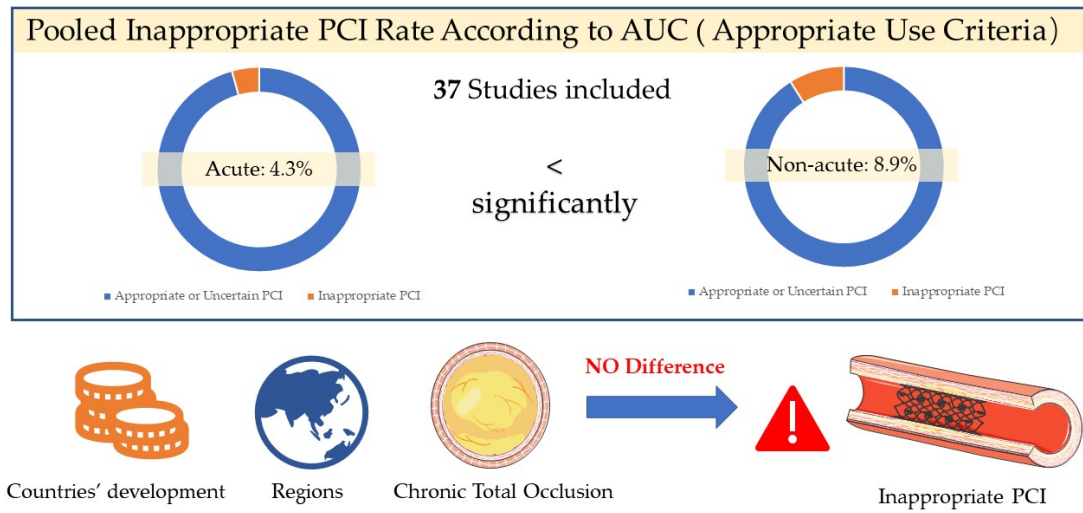|	Define the source of information	List inclusion and exclusion criteria for exposed and unexposed subjects or refer to previous publications	Indicate time period used for identifying patients	Indicate whether or not subjects were consecutive if not population-based	Indicate if evaluators of subjective components of study were masked to other aspects of the status of the participants	Describe any assessments undertaken for quality assurance purposes	Describe any assessments undertaken for quality assurance purposes	Describe how confounding was assessed and/or controlled	If applicable, explain how missing data were handled in the analysis	Summarize patient response rates and completeness of data collection	Clarify what follow-up, if any, was expected and the percentage of patients for which incomplete data or follow-up was obtained
Aijaz 2016	+	+	?	+	?	?	?	?	?	−	?
Barbash 2012	+	+	+	+	?	?	?	?	?	?	?
Bradley 2015	+	+	+	+	?	+	+	?	?	?	+
Brener 2009	+	+	?	+	?	?	?	?	?	−	?
Chan 2011	+	+	+	+	?	+	+	?	−	+	?
Chan 2013	+	+	+	+	?	+	+	+	?	+	?
Chan 2020	+	+	+	+	?	?	?	?	−	+	?
Chen 2016	+	+	+	?	+	?	?	?	?	−	?
Gershlick 2012	+	+	?	?	?	?	?	?	?	?	?
Hannan 2017	+	+	+	+	?	+	?	?	−	+	?
Hess 2019	+	+	+	?	?	?	?	?	?	?	?
Hess 2020	+	−	+	+	?	+	+	?	−	+	?
Hitinder 2018	+	+	+	+	?	+	+	+	?	+	?
Iwasaki 2016	+	?	+	+	?	?	?	?	?	−	?
Jeon 2017	+	+	+	+	?	?	+	?	?	?	?
Kiselev 2014	+	+	+	+	?	?	?	?	?	?	?
Ko 2012	+	+	+	+	?	+	+	+	?	−	+
Kohsaka 2014	+	+	+	+	?	+	+	−	−	?	?
Kohsaka 2015	+	+	+	+	?	+	+	+	−	?	?
Koji 2022	+	+	+	+	?	+	+	+	−	?	?
Leonardi 2017	+	+	+	+	?	+	+	?	−	?	?
Min 2013	+	?	+	+	?	+	?	?	?	?	?
Mulukutla 2013	+	?	+	+	?	+	?	?	?	?	?
Patil 2017	+	+	+	+	?	?	−	?	?	−	?
Puri 2016	+	?	+	?	?	?	?	?	?	−	?
Ranganayakulu 2014	+	?	+	+	?	?	?	?	?	−	?
Sanchez 2014	?	?	+	?	?	+	?	?	?	?	?
Sastroasmoro 2021	+	?	+	?	?	?	?	?	?	?	?
Sattur 2012	?	+	−	?	?	?	?	?	?	−	?
Saxon 2020	+	+	+	+	?	+	+	+	?	?	+
Seixas 2017	+	+	+	+	+	?	+	?	?	?	+
Senguttuvan 2014	+	?	+	+	?	?	?	?	?	−	?
Sood 2016	+	+	+	+	+	?	?	?	+	?	?
StevenM.Bradley 2015	+	+	+	+	?	+	?	?	?	+	+
Waksman 2013	+	+	+	+	?	+	+	−	?	−	+
Wijeysundera 2014	+	+	+	?	?	+	?	?	?	−	?
Zheng 2020	+	+	+	+	?	−	+	+	−	?	?

Supplementary Figure S 3 Funnel plot of inappropriate PCI rate of nonacute PCI

Supplementary Figure S 4 Funnel plot of Inappropriate PCI Rate of All PCI

Appropriateness of PCI—A Systematic Review and Meta-analysis

Pooled Inappropriate PCI Rate According to AUC (Appropriate Use Criteria)

37 Studies included

<

significantly

Acute: 4.3%

Non-acute: 8.9%

- Appropriate or Uncertain PCI ■ Inappropriate PCI

- Appropriate or Uncertain PCI ■ Inappropriate PCI

Countries' development   Regions   Chronic Total Occlusion

NO Difference

Inappropriate PCI

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 1
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 2
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Page 2
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 2 & supplementary
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Supplementary
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Page 2
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 3
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 2-3

Section and Topic	Item #	Checklist item	Location where item is reported
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 2-3
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 3 & supplementary
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Page 2
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Page 3-4
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Page 3
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Page 5-6, 8-9
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Page 7-9 & supplementary
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Page 7-9
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Page 7-9
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	supplementary
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	supplementary
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review,	Page 4

Section and Topic	Item #	Checklist item	Location where item is reported
		ideally using a flow diagram.	
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Page 4
Study characteristics	17	Cite each included study and present its characteristics.	Page 5
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	supplementary
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Page 8
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Page 3 & supplementary
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Page 7-8
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Page 7-9
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Page 7-9
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Page 3-9
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Page 3-9
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 10-13

Section and Topic	Item #	Checklist item	Location where item is reported
	23b	Discuss any limitations of the evidence included in the review.	Page 10
	23c	Discuss any limitations of the review processes used.	Page 10
	23d	Discuss implications of the results for practice, policy, and future research.	Page 11-13
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 2
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Supplementary
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Supplementary
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 14
Competing interests	26	Declare any competing interests of review authors.	Page 14
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Supplementary