Supplementary file 1 - Search strategy per database

Medline: Initial Search - 373 Records // Update - 24 Records	**Embase: Initial Search - 426 Records // Update - 47 Records**
1. Meta-Analysis as Topic/	1. exp Meta Analysis/
2. meta analy$.tw.	2. ((meta adj analy$) or metaanalys$).tw.
3. metaanaly$.tw.	3. (systematic adj (review$1 or overview$1)).tw.
4. Meta-Analysis/	**4. or/1-3**
5. (systematic adj (review$1 or overview$1)).tw.	5. cancerlit.ab.
6. exp Review Literature as Topic/	6. cochrane.ab.
7. or/1-6	7. embase.ab. or medline.ab.
8. cochrane.ab.	8. (psychlit or psyclit).ab.
9. embase.ab. or medline.ab.	9. (psychinfo or psycinfo).ab.
10. (psychlit or psyclit).ab.	10. (cinahl or cinhal).ab.
11. (psychinfo or psycinfo).ab.	11. science citation index.ab.
12. (cinahl or cinhal).ab.	12. bids.ab.
13. science citation index.ab.	**13. or/5-12**
14. bids.ab.	14. reference lists.ab.
15. cancerlit.ab.	15. bibliograph$.ab.
16. or/8-15	16. hand-search$.ab.
17. reference list$.ab.	17. manual search$.ab.
18. bibliograph$.ab.	18. relevant journals.ab. or relevant articles.ab. or relevant studies.ab.
19. hand-search$.ab.	**19. or/14-18**
20. relevant journals.ab. or relevant articles.ab. or relevant studies.ab.	20. data extraction.ab.
21. manual search$.ab.	21. selection criteria.ab. or inclusion criteria.ab.
22. or/17-21	22. 20 or 21
23. selection criteria.ab. or inclusion criteria.ab.	23. review.pt.
24. data extraction.ab.	**24. 22 and 23**
25. 23 or 24	25. letter.pt.
26. Review/	26. editorial.pt.
27. 25 and 26	27. animal/
28. Comment/	28. human/
29. Letter/	**29. 27 not (27 and 28)**
30. Editorial/	**30. or/25-26,29**
31. animal/	**31. 4 or 13 or 19 or 24**
32. human/	**32. 31 not 30**
33. **31 not (31 and 32)**	

34. **or/28-30,33** **35. 7 or 16 or 22 or 27** 36. **35 NOT 34** autobiography.pt. or bibliography.pt. or case reports.pt. or congresses.pt. or clinical conference.pt. study protocol.ti. or systematic review protocol.ti. **39. or/37-38** **40. 36 NOT 39** Infant, Premature/ or infant premature.ti,ab. or premature birth/ or premature birth.ti,ab. or preterm.ti,ab. or perinatal.ti,ab. or neonatal.ti,ab. 42. Infant, Low Birth Weight/ or birth weight.ti,ab. or birthweight.ti,ab. 43. **or/41-42** exp infant care/ or Intensive Care, Neonatal/ or Intensive Care Units, Neonatal/ or Perinatal Care/ (neonatal or perinatal or newborn or infant$).ti,ab. AND (care or hospital$ or unit).ti,ab. 46. nicu.ti,ab. or (neonatal and icu).ti,ab. 47. **or/44-46** 48. (region$).ti,ab. or (central$).ti,ab. or area.ti,ab. or urban.ti,ab. or rural.ti,ab. 49. Volume$.ti,ab. or size.ti,ab. or level.ti,ab. or type.ti.ab or caseload.ti,ab. or case load.ti,ab. 50. **or/48-49** 51. hospital mortality/ or infant mortality/ or mortality.ti,ab. **52. 40 AND 43 AND 47 AND 50 AND 51**	abstract report.pt. or books.pt. or chapter.pt. or conference abstract.pt. or conference paper.pt. or note.pt. study protocol.ti. or systematic review protocol.ti. **35. or/33-34** **36. 32 NOT 35** prematurity/ or infant premature.ti,ab. or premature birth.ti,ab. or preterm.ti,ab. or perinatal.ti,ab. or neonatal.ti,ab. 38. low birth weight/ or birth weight.ti,ab. or birthweight.ti,ab. **39. or/37-38** infant care/ or newborn intensive care/ or neonatal intensive care unit/ or Perinatal Care/ (neonatal or perinatal or newborn or infant$).ti,ab. AND (care or hospital$ or unit).ti,ab. 42. nicu.ti,ab. or (neonatal and icu).ti,ab. **43. or/40-42** 44. (region$).ti,ab. or (central$).ti,ab. or area.ti,ab. or urban.ti,ab. or rural.ti,ab. Volume$.ti,ab. or size.ti,ab. or level.ti,ab. or type.ti.ab. or caseload.ti,ab. or case load.ti,ab. **46. or/44-45** 47. hospital mortality/ or infant mortality/ or mortality.ti,ab. **48. 36 AND 39 AND 43 AND 46 AND 47**

Supplementary File 2 - Methods and necessary definitions using AMSTAR 2

"High confidence" is given when at most one non-critical weakness and no critical flaw is present. "Moderate confidence" is given when more than one non-critical weakness but no critical flaw is present. Both ratings ensure ("high confidence") respectively tend to ensure ("moderate confidence") an accurate and comprehensive summary of evidence.

"Low confidence" and "Critically low confidence" are given when one respectively more than one critical flaw is present. Both ratings may ("low confidence") respectively do not ensure ("critically low confidence") an accurate and comprehensive summary of evidence.

Critical weaknesses are determined by seven items, which focus on

- a prospectively registered protocol (item 2),
- an adequate literature search (item 4),
- a justification for exclusions (item 7),
- appropriate methods for conducting a meta-analysis (item 11),
- an assessment of presence and possible impact of publication bias (item 15),
- a risk of bias-assessment of included studies (item 9) and its
- consideration when interpreting the results of the review (item 13).

'Critical flaws' have to be predefined by the users of the AMSTAR 2-Guideline.[19]

The authors of this overview of SRs defined two critical flaws:

1) the extracted results of the primary studies and/ or the quality assessment itself were incomprehensible due to a lack of detailed information.

2) the review lacked a brief methodical description (item 2), search strategy (item 4) and justified exclusions (item 7). If these contents have not been reported, it is impossible to critically appraise the selection and review process.

Supplementary file 3 – Inclusion Criteria of every Review

Ref.	Population	Intervention/ Exposition and definition		Comparison/	Outcome	Study type
Rashidian et al. [19]	term and preterm birth	perinatal regionalization program	formal levels of care and a referral arrangement between hospitals in a specified region or territory;	historical or concurrent control groups, comprised of usual care services (i.e. no perinatal regionalization	patient or process outcomes: perinatal, maternal and/or neonatal mortality and morbidity, birth weight, still birth, and place of delivery	(cluster) randomized controlled trials, controlled before after (CBA) studies, before after studies without concurrent controls, controlled after only studies, and interrupted time series (ITS)
Neogi et al. [20]	term and preterm birth	Regionalization of perinatal care	Regionalization: development, within a geographic area, of a coordinated, cooperative system of maternal and perinatal healthcare in which, by mutual agreements between hospitals and physicians and based upon population needs, the degree of complexity of maternal and perinatal care each hospital is capable of providing is identified so as to accomplish the following Level II/ I Units Secondary (level II) units provide a useful link in the health system to promote regionalization. Evidence supports that if these units are developed, they may considerably provide good perinatal care and contribute to reductions in NMR. In a regionnalized system, the policy is to transfer almost all preterm babies to higher referral units (level III).	not born in level III centers	neonatal- and perinatal mortality	observational and interventional studies
		other miscellaneous factors	size and volume of the unit (size and volume of units and admissions)	units, ranging from <1500 birth/ year for term born and < 100 for VLBW	neonatal- and perinatal mortality	
Lasswell et al. [21]	liveborn VLBW (≤1500g) or VPT (≤32wk GA) infants born ≥ 1976	perinatal regionalization	level I hospitals provided basic, uncomplicated neonatal care; level II hospitals cared for moderately ill infants; and level III hospitals were those equipped to handle serious neonatal illnesses and abnormalities, including very low-birthweight (VLBW) infants (1500 g).	births at facilities with a lower designated level of care, regardless of subsequent transfer	neonatal mortality (death day 0-28) or predischarge/ in-hospital mortality (death of continuously hospitalized infant before discharge)	randomized controlled trial, prospective cohort, retrospective cohort, and case-control study designs

Supplementary file 4 - Amstar 2 - Rating (long Version)

	Rashidian et al. [19]	Neogi et al. [20]	Lasswell et al. [21]
1: Did the research questions and inclusion criteria for the review include the components of PICO?	**NO**	**NO**	**YES**
1.1: Population	n	y	y
1.2: Intervention	y	y	y
1.3: Comparator group	y	n	y
1.4: Outcome	y	y	y
1.5: Timeframe for follow-up	n	n	n
2: Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?	***partial YES***	***NO***	***partial YES***
2.1: review question(s)	*y*	*y*	*y*
2.2: search strategy	*y*	*y*	*y*
2.3: inclusion/exclusion criteria	*y*	*y*	*y*
2.4: risk of bias assessment	*y*	*n*	*y*
2.5: a meta-analysis/synthesis plan, if appropriate, and	*n*	*n*	*y*
2.6: a plan for investigating causes of heterogeneity	*n*	*n*	*y*
2.7: justification for any deviations from the protocol	*n*	*n*	*n*
3: Did the review authors explain their selection of the study designs for inclusion in the review?	**NO**	**NO**	**NO**
3.1: Explanation for including only RCTs	n	n	n
3.2: OR Explanation for including only NRSI	n	n	n
3.3: OR Explanation for including both RCTs and NRSI	n	n	n
4: Did the review authors use a comprehensive literature search strategy?	***partial YES***	***NO***	***partial YES***
4.1: searched at least 2 databases (relevant to research question)	*y*	*y*	*y*
4.2: provided key word and/or search strategy	*y*	*y*	*y*
4.3 justified publication restrictions (eg, language)	*y*	*n*	*y*
4.4: searched the reference lists/bibliographies of included studies	*n*	*n*	*y*
4.5: searched trial/study registries	*n*	*n*	*n*
4.6: included/consulted content experts in the field	*n*	*n*	*y*
4.7: where relevant, searched for grey literature	*n*	*y*	*n*
4.8: conducted search within 24 months of completion of the review	*y*	*y*	*y*
5: Did the review authors perform study selection in duplicate?	**YES**	**YES**	**NO**
5.1: at least two reviewers independently agreed on selection of eligible studies and achieved consensus on which studies to include	y	y	n
5.2: OR two reviewers selected a sample of eligible studies and achieved good agreement (at least 80 per cent), with the remainder selected by one reviewer	n	n	n
6: Did the review authors perform data extraction in duplicate?	***YES***	***NO***	***YES***
6.1: at least two reviewers achieved consensus on which data to extract from included studies	*y*	*n*	*y*

6.2: OR two reviewers extracted data from a sample of eligible studies and achieved good agreement (at least 80 per cent), with the remainder extracted by one reviewer	*n*	*n*	*n*
7: Did the review authors provide a list of excluded studies and justify the exclusions?	**YES**	**NO**	**NO**
7.1: provided a list of all potentially relevant studies that were read in full text form but excluded from the review	y	n	n
7.2: Justified the exclusion from the review of each potentially relevant study	y	n	n
8: Did the review authors describe the included studies in adequate detail?	***YES***	***partial YES***	***partial YES***
8.1: described populations	*y*	*y*	*y*
8.2: described interventions	*y*	*y*	*y*
8.3: described comparators	*y*	*y*	*y*
8.4: described outcomes	*y*	*y*	*y*
8.5: described research designs	*y*	*y*	*y*
8.6: described population in detail	*y*	*y*	*y*
8.7: described intervention and comparator in detail (including doses where relevant)	*y*	*y*	*n*
8.8: described study's setting	*y*	*y*	*y*
8.9: timeframe for follow-up	*y*	*n*	*y*
9: Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?	**Includes only NRSI: Yes**	**not provided: No**	**includes both: No**
9.1: Risk of Bias-Evaluation RCT	- - -	NO	NO
9.1.1: RCT: unconcealed allocation, and	- - -	n	n
9.1.2: RCT: lack of blinding of patients and assessors when assessing outcomes (unnecessary for objective outcomes such as all cause mortality)	- - -	n	n
9.1.3: RCT: allocation sequence that was not truly random	- - -	n	n
9.1.4: RCT: selection of the reported result from among multiple measurements or analyses of a specified outcome	- - -	n	n
9.2 Risk of Bias-Evaluation NRSI	**YES**	**NO**	**NO**
9.2.1: NRSI: from confounding, and	y	n	y
9.2.2: NRSI: from selection bias	y	n	n
9.2.3: NRSI: methods used to ascertain exposures and outcomes, and	y	n	n
9.2.4: NRSI: selection of the reported result from among multiple measurements or analyses of a specified outcome	y	n	n
10: Did the review authors report on the sources of funding for the studies included in the review?	***NO***	***NO***	***NO***
10.1: Must have reported on the sources of funding for individual studies included in the review. Note: Reporting that the reviewers looked for this information but it was not reported by study authors also qualifies	*n*	*n*	*n*
11: meta-analysis performed?	**NO**	**NO**	**YES**
11.1: If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results for RCTs	- - -	- - -	**NO**
11.1: RCT: The authors justified combining the data in a meta-analysis	- - -	- - -	n
11.1.1: RCT: AND they used an appropriate weighted technique to combine study results and adjusted for heterogeneity if present	- - -	- - -	n
11.1.2: RCT: AND investigated the causes of any heterogeneity	- - -	- - -	n
11.2: : If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results for NRSI	- - -	- - -	**NO**
11.2: NRSI: The authors justified combining the data in a meta-analysis	- - -	- - -	y

11.2.1: NRSI: AND they used an appropriate weighted technique to combine study results, adjusting for heterogeneity if present	- - -	- - -	y
11.2.2: NRSI: AND they statistically combined effect estimates from NRSI that were adjusted for confounding, rather than combining raw data, or justified combining raw data when adjusted effect estimates were not available	- - -	- - -	y
11.2.3: NRSI: AND they reported separate summary estimates for RCTs and NRSI separately when both were included in the review	- - -	- - -	n
12: If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?	- - -	- - -	***YES***
12.1: included only low risk of bias RCTs	- - -	- - -	*y*
12.2: OR, if the pooled estimate was based on RCTs and/or NRSI at variable RoB, the authors performed analyses to investigate possible impact of RoB on summary estimates of effect	- - -	- - -	*n*
13: Did the review authors account for RoB in individual studies when interpreting/discussing the results of the review?	**YES**	**NO**	**YES**
13.1: included only low risk of bias RCTs	n	n	n
13.2: OR, if RCTs with moderate or high RoB, or NRSI were included the review provided a discussion of the likely impact of RoB on the results	y	n	y
14: Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?	- - -	- - -	***YES***
14.1: There was no significant heterogeneity in the results	- - -	- - -	*n*
14.2: OR if heterogeneity was present the authors performed an investigation of sources of any heterogeneity in the results and discussed the impact of this on the results of the review	- - -	- - -	*y*
15: If they performed quantitative synthesis, did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?	- - -	- - -	**YES**
15.1: performed graphical or statistical tests for publication bias and discussed the likelihood and magnitude of impact of publication bias	- - -	- - -	y
16: Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?	***YES***	***YES***	***YES***
16.1: The authors reported no competing interests OR	*y*	*y*	*y*
16.2: The authors described their funding sources and how they managed potential conflicts of interest	*y*	*y*	*y*
Summary by authors: complete or partially fulfilled Items (N=16)	9 / 12	3 / 12	11 / 16

Notes: *PICO:* Population, Intervention, Comparison, Outcome, *RCT:* Randomized controlled trial, *NRSI:* Non-randomized studies of interventions, *N/A:* not applicable, *RoB:* Risk of Bias; * items written in italic are critical for an overall confidence rating