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Inequalities in Infant Mortality Project Evidence Map Report 2

**Technical guide to the infant mortality evidence
map: systematic reviews of interventions
targeting infant mortality**

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Overview of the evidence map

'Evidence Mapping' is an approach used to systematically identify and describe the literature in a particular research area.

This technical report provides a description of the methods used to generate the infant mortality 'Evidence Map' of published systematic reviews relating to the effectiveness of health service and public health interventions targeting infant mortality and its three main causes: preterm birth, major congenital anomalies and sudden infant death syndrome/ sudden unexpected deaths in infancy (SIDS/SUDI).

Results (the 'Evidence Map') are described in detail in a separate user's guide to the evidence (Hollowell et al., 2009).

- Other reports in this series (including the user's guide), and access to an online, searchable version of the Evidence Map described in this report, can be found at: <http://www.npeu.ox.ac.uk/infant-mortality>.

1 Background

An evidence map of systematic reviews of interventions targeting infant mortality and related causes was initially developed to inform the selection of topics for review within the Inequalities in Infant Mortality project. This work was undertaken in 2008 as a preliminary scoping of the evidence base on interventions designed to reduce infant mortality. A decision was subsequently made to update and extend this work and to make the map available as a tool for policy makers, public health practitioners and others needing to identify relevant systematic review-level evidence relating to interventions to reduce infant mortality. Because the map has been constructed systematically, it also provides a tool to identify gaps in the evidence.

The map was updated in April 2009 and extended to include evidence relating to interventions targeting selected major risk factors for infant mortality. The infant mortality evidence map, therefore, falls into two parts:

- Part 1 relates to systematic reviews of interventions targeting infant mortality and related causes
- Part 2 relates to the evidence on interventions targeting selected major risk factors for infant mortality

This report relates to part 1 of the evidence map.

2 Aim

To systematically map published systematic reviews of effectiveness of interventions to reduce infant mortality and the main contributory causes: preterm birth, congenital anomalies and SIDS/SUDI.

3 Methods

3.1 Criteria for considering studies for this evidence map

3.1.1 Types of studies

We included published systematic reviews that evaluated the primary research relating to the effectiveness of an intervention.

To qualify as a systematic review we required that the report specified the databases searched, applied explicit or implicit exclusion/inclusion criteria, and reported on all studies meeting the review inclusion criteria.

3.1.2 Types of participants

We did not formally restrict the population for inclusion but the studies had to evaluate an intervention in a relevant population, e.g. pregnant and non-pregnant women, neonates and infants up to 1 year of age, the fetus, health-care workers.

3.1.3 Types of outcome measure

The outcomes of interest were:

- any measure of neonatal or infant mortality
- preterm birth
- congenital anomalies - lethal or carrying a high risk of mortality
- SIDS/SUDI

We excluded:

- Reviews reporting only stillbirths and/or perinatal mortality
- Reviews where an outcome of interest was not evaluated as a measure of effectiveness, e.g. was evaluated as a potential adverse effect of the intervention

Systematic reviews were considered eligible if one of the outcomes of interest was evaluated irrespective of whether any relevant studies were found reporting this outcome.

3.1.4 Language

Only English language publications were included.

3.1.5 Time period

Only systematic reviews published between January 1990 and December 2008 were included, with the exception of Cochrane reviews which were included from 1990 to January 2009.

3.1.6 Geographical areas

In order to focus on interventions which might be relevant to the NHS, we wished to include only interventions relevant in high income countries with relatively low infant mortality rates and well developed healthcare systems. We therefore excluded systematic reviews that considered only studies conducted in countries outside the Organisation for Economic Co-Operation and Development (OECD), or in Mexico and Turkey (both of which have markedly higher infant mortality than the rest of the OECD).

3.2 Methods for identification of systematic reviews

Search strategies were developed using a combination of text terms and MESH headings for infant mortality, preterm birth, SIDS and congenital anomalies. Searches of the Cochrane Database of Systematic Reviews included additional more general terms relating to pregnancy outcome to increase sensitivity. A published systematic review filter (Montori et al., 2005) which strikes the balance between sensitivity and specificity was used. This Medline filter was adapted for use in the Cochrane Database of Systematic Reviews, Cinahl and Embase. All searches were limited on language (English language only), topic (humans) and publication year (Medline, Embase and Cinahl: 1990 - 2008; Cochrane Database of Systematic Reviews 1990 - January 2009 (Issue 1)). The searches were carried out during April 2009. The Medline the Cochrane search strategies are given in Annex A.

3.3 Screening

The citation records identified by the bibliographic searches were loaded into Eppi-Reviewer software (Thomas, 2006). These were then screened on title and abstract by one reviewer using the exclusion criteria shown in Table 1. The full-text of all remaining articles was retrieved and screened using the same exclusion criteria. The opinion of a second reviewer was sought if there were any uncertainties.

Table 1. Exclusion criteria applied during abstract/full-text screening

	Exclusion criteria
General	<ul style="list-style-type: none"> • Not a systematic review of primary research • Not in English
Population	<ul style="list-style-type: none"> • Not involving a relevant population • Not evaluated in relevant high-income country (OECD excluding Mexico and Turkey)
Intervention	<ul style="list-style-type: none"> • No intervention
Outcomes not relevant	Review does not consider/report* any of the following: <ul style="list-style-type: none"> • infant mortality • preterm birth • congenital anomaly • SIDS/SUDI
Not a relevant congenital anomaly	Not: <ul style="list-style-type: none"> • a lethal congenital anomaly; or • a congenital anomaly with high risk of mortality
Outcome not an effectiveness measure	<ul style="list-style-type: none"> • Reported outcome not a measure of effectiveness, e.g. safety outcome where the intervention itself could potentially result in death, preterm birth, congenital anomaly or SIDS/SUDI

* Based either on the pre-defined outcomes evaluated (i.e. those specified as outcomes of interest in the methods section of the systematic review) or on the outcomes reported (i.e. in the results section of the systematic review)

3.4 Data Extraction

A data extraction and coding form was developed and loaded into the Eppi-Reviewer software. The following data were extracted from the full-text article and coded by a single reviewer:

- The primary focus of the intervention
- The recipient of the intervention
- The outcomes evaluated/reported (infant mortality, preterm birth, congenital anomalies, SIDS/SUDI only)

The reviewer also checked and coded whether the review was listed in the Database of Abstracts of Reviews of Effects (DARE).

Following data entry, a second reviewer ran a range of internal consistency checks. Apparent inconsistencies were checked and discussed and records amended if required.

Web links to Cochrane or Pubmed and DARE were inserted in August/September 2009 and were current at that time.

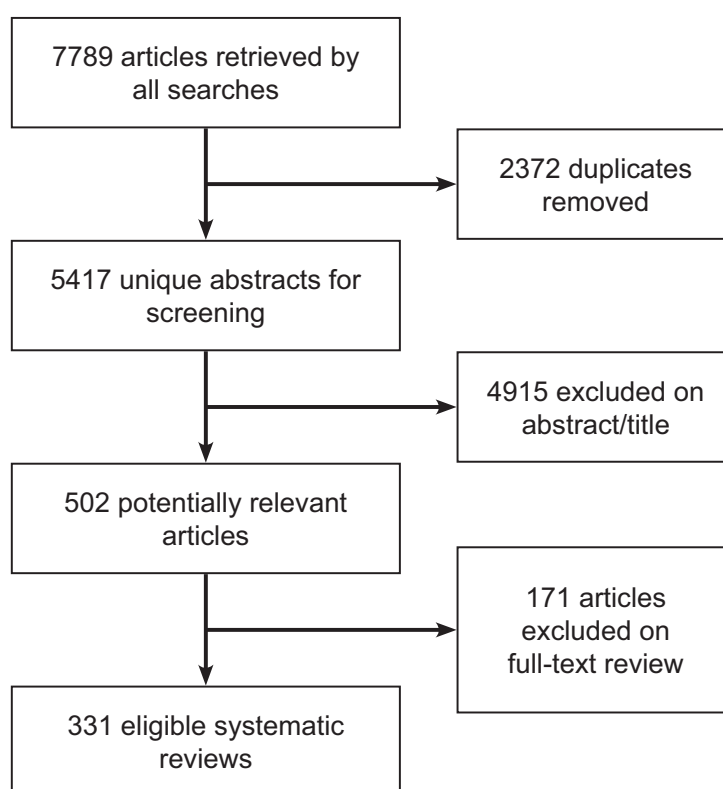
- The Evidence Map database, which contains citation records, coded data and Web links, can be accessed and searched from a link at: <http://www.npeu.ox.ac.uk/infant-mortality>.

4 Results

4.1 Results of the bibliographic database search

The searches of the electronic databases identified 7789 citations of which 2372 were duplicates, resulting in 5417 unique citations (see Figure 1). Screening of these 5417 abstracts resulted in 4915 being excluded on title/abstract alone and a further 171 excluded after full text screening, leaving 331 systematic reviews eligible for inclusion in the map.

Figure 1. Flowchart of included studies



The majority of articles were excluded because they were either not systematic reviews or because the review did not evaluate an intervention. Reasons for exclusion are summarised in Table 2.

Table 2. Reasons for exclusion

Reason for exclusion	Frequency	(%)
Not a systematic review of primary research	1117	22.0
Not in English	6	0.1
Population not relevant	953	18.7
Not evaluated in relevant high-income country	105	2.1
No intervention	1713	33.7
Outcomes not relevant	919	18.1

Reason for exclusion	Frequency	(%)
Not a relevant congenital anomaly	32	0.6
Outcome not an effectiveness measure	39	0.8
Withdrawn/superseded review	201	3.9
Unable to obtain full text article	1	0.0
Total excluded publications	5086	100%

4.2 Summary of main findings

Three hundred and thirty-one systematic reviews were included in the evidence map. Around half of the reviews related to interventions targeting the neonate or infant; and around half related to interventions targeting pregnant women; a small number of reviews related to interventions targeting other groups (healthcare workers, peri-conceptual women, the fetus, family members).

Detailed results, including a full list of the 331 included systematic reviews, are reported in the infant mortality evidence map user's guide (Hollowell et al., 2009).

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References

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- Montori, V., Wilczynski, N., Morgan, D. and Haynes, R. (2005). Optimal search strategies for retrieving systematic reviews from Medline: analytical survey. *BMJ* 330(68). doi:10.1136/bmj.38336.804167.47.
- Thomas, J. (2006). Information systems for conducting systematic reviews: a case study. Sixth International Campbell Colloquium. Los Angeles, 22-24 February. Poster available at <http://eppi.ioe.ac.uk/cms/>

Annex A: Search Strategies

Medline search strategy

1. exp Infant Mortality/
2. exp Perinatal Mortality/
3. ((infant\$ or perinat\$ or neonat\$ or postneonat\$) adj2 (death\$ or mortalit\$ or surviv\$)).ti,ab.
4. ((newborn\$ or infant\$ or perinat\$ or neonat\$ or postneonat\$) adj2 (death\$ or dead or died or mortalit\$ or surviv\$)).ti,ab.
5. or/1-4
6. exp Infant, Premature/
7. exp obstetric labor, premature/ or exp premature birth/
8. ((preterm or prematur\$) adj2 (labour\$ or labor\$ or birth\$ or deliver\$ or infant\$)).ti,ab.
9. (prematurity or preterm).ti,ab.
10. or/6-9
11. exp Sudden Infant Death/
12. "sudden unexpected death in infancy".mp.
13. "sudden unexplained death in infancy".mp.
14. crib death\$.ti,ab.
15. (SIDS or SUDI).mp.
16. "sudden infant death syndrome".ti,ab.
17. or/11-16
18. exp Congenital Abnormalities/
19. exp abnormalities, drug-induced/ or exp abnormalities, multiple/ or exp abnormalities, radiation-induced/ or exp cardiovascular abnormalities/ or exp chromosome disorders/ or exp digeorge syndrome/ or exp digestive system abnormalities/ or exp eye abnormalities/ or exp lymphatic abnormalities/ or exp monsters/ or exp musculoskeletal abnormalities/ or exp nervous system malformations/ or exp respiratory system abnormalities/ or exp situs inversus/ or exp skin abnormalities/ or exp stomatognathic system abnormalities/ or exp thyroid dysgenesis/ or exp urogenital abnormalities/
20. ((birth or congenital) adj2 (defect\$ or deform\$ or abnorm\$ or anomal\$ or malform\$)).ti,ab.
21. or/18-20
22. 5 or 10 or 17 or 21
23. limit 22 to yr="1990-2008"
24. limit 23 to english language
25. limit 24 to humans
26. limit 25 to abstracts
27. (case reports or comment or editorial or letter or news).pt.
28. 26 not 27
29. search.ti,ab.
30. medline.ti,ab.
31. "cochrane database of systematic reviews".jn.
32. meta-analysis.pt.
33. systematic.mp. and review.ti,ab.
34. or/29-33

Cochrane search strategy

1. MeSH descriptor Infant Mortality explode all trees
2. MeSH descriptor Perinatal Mortality explode all trees
3. (newborn* or infant* or perinat* or neonat* or postneonat*) NEAR/2 (death* or dead or died or mortalit* or surviv*):ti,ab
4. MeSH descriptor Premature Birth explode all trees
5. MeSH descriptor Obstetric Labor, Premature explode all trees
6. (preterm or prematur*) NEAR/2 (labour* or labor* or birth* or deliver* or infant*):ti,ab
7. MeSH descriptor Sudden Infant Death explode all trees
8. "cot death":ti,ab
9. "crib death":ti,ab
10. (SIDS or SUDI):ti,ab
11. "Sudden infant death syndrome":ti,ab
12. MeSH descriptor Congenital Abnormalities explode all trees
13. (birth or congenital) NEAR/2 (defect* or deform* or abnorm* or anomal* or malform*):ti,ab
14. (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13)
15. MeSH descriptor Pregnancy Outcome explode all trees
16. ((#15) AND NOT #14)
17. (#16), from 1990 to 2009

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This report and other Inequalities in Infant Mortality Project reports are available at:

www.npeu.ox.ac.uk/infant-mortality

