



Inequalities in Infant Mortality Project Evidence Map Report 4

Technical guide to the infant mortality evidence map: systematic reviews of interventions targeting major potentially modifiable risk factors for infant mortality

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Overview

'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 assessing the effectiveness of interventions to reduce key potentially modifiable risk factors for infant mortality.

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

Other reports in this series can be found at <http://www.npeu.ox.ac.uk/infant-mortality>.

1 Aim

To map the systematic review-level evidence on interventions targeting selected potentially modifiable risk factors for infant mortality: smoking in pregnancy, infant risk factors for SIDS/SUDI and obesity and weight gain before, during and after pregnancy.

The specific risk factors considered were:

- Smoking in pregnancy
- Infant risk factors for SIDS/SUDI
 - exposure to environmental tobacco smoke
 - non-supine sleeping position
 - adverse sleeping environment, e.g. bed-sharing (particularly if parents smoke, have been drinking alcohol or have taken drugs), 'rooming alone'
- Obesity and overweight, but restricted to interventions targeting preconception weight loss, avoidance of excessive weight gain during pregnancy and weight reduction after pregnancy

A secondary aim was to identify recent evidence-based reports, reviews and guidelines on these topics published in the 'grey literature'.

2 Methods

2.1 Criteria for considering systematic reviews for inclusion

Systematic reviews had to meet the following inclusion and exclusion criteria as guided by the aim of the evidence map.

2.1.1 Types of studies

We included:

- published systematic reviews that evaluated the effectiveness of an intervention

2.1.2 Types of participants

Study participants eligible for inclusion depended on the risk factor under consideration. They included:

- pregnant women who smoked or were ex-smokers
- infants up to the age of 12 months and individuals in contact with infants, most commonly parents and family members
- obese and overweight women pre-pregnancy

- obese and overweight pregnant women
- obese and overweight women in the postpartum period

2.1.3 Types of outcome measure

Systematic reviews that considered the following outcomes of interest were eligible:

- smoking cessation and relapse prevention
- measures of behavioural changes relating to risk factors for SIDS/SUDI
- weight loss
- appropriate weight gain during pregnancy

2.1.4 Language

Only English language publications were included.

2.1.5 Time period

Systematic reviews published between 1990 and April 2009 were included.

2.1.6 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).

2.2 Methods for identification of systematic reviews

2.2.1 Bibliographic databases

The following bibliographic databases were searched for systematic reviews published between January 1990 and April 2009:

- Medline (searched via the OvidSP interface) on 19 May 2009
- Embase (searched via the OvidSP interface) on 19 May 2009
- Cinahl (searched via the EBSCO interface) on 1–2 June 2009

A published systematic review filter (Montori et al., 2005) was used which strikes a balance between sensitivity and specificity. This Medline filter was adapted for use in the Cinahl and Embase searches. All searches were limited on language (English language only), topic (humans) and publication year (1990 – 2009). Separate search strategies were developed for each of the risk factors. We considered other systematic reviews in the area and, where appropriate, adapted relevant search strategies for our evidence map. Details of the Medline search strategies are available in Annex A.

Smoking in pregnancy search strategy

The search strategy for the smoking in pregnancy interventions used Mesh terms and keywords for the terms smoking, pregnancy, prenatal care and smoking cessation. The search strategy used in the Cochrane review by Lumley et al.³ provided some guidance with the development of our search.

Infant risk factors for SIDS/SUDI search strategy

The search strategies used for the SIDS interventions were individually tailored to each of the infant risk factors for SIDS/SUDI. The search strategy looking for interventions to reduce exposure to environmental tobacco smoke used Mesh terms to capture smoking,

respiratory tract disease, infant welfare, smoking cessation programmes together with terms to describe family members. Likewise the search strategy for interventions to promote supine sleeping position used terms such as supine, prone and “back to sleep”. Interventions aiming to prevent an adverse sleeping environment for infants incorporated search terms relating to bed sharing and the sleeping location of infants, e.g. “rooming alone”.

Obesity and weight control before, during and after pregnancy search strategy

The search strategy for obesity/overweight interventions was constructed to capture interventions before, during and after pregnancy. It included the Mesh terms and keywords relevant for pregnancy and obesity such as pregnancy, post natal, weight loss as well as Mesh terms and keywords used to describe the possible interventions for weight loss such as exercise and diet programmes.

2.2.2 Other online searchable resources

Additional searches of the following specialist databases and websites were carried out to identify any additional systematic reviews not uncovered by bibliographic database searches:

- The National Institute for Health and Clinical Excellence (NICE)
- The Cochrane Library databases
- The Health Development Agency (HDA)
- Health Technology Assessment database
- Department of Health (England, Wales and Scotland)
- Royal Colleges and other UK professional bodies:
 - Royal College of Obstetrics & Gynaecology (UK)
 - British Medical Association (BMA)
 - Royal College of Midwives (UK)
 - Faculty of Public Health
- BMJ clinical evidence
- NIHR library – specialist databases
- Foundation for the study of infant deaths (FIDS)
- Action on Smoking and Health (ASH)
- British Nursing Index
- Database of Promoting Health Effectiveness Reviews (DoPHER)
- Agency for Healthcare Research and Quality (USA)
- Effective Public Health Practice Project, Ontario Ministry of Health (Canada)
- National Guideline Clearing House

These searches were also used to identify published evidence-based reports, reviews and guidelines relevant to the topics covered in the evidence map.

2.3 Screening

Titles and abstracts were screened 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 • Not in English
Population	<ul style="list-style-type: none"> • Not a relevant population • Not evaluated in relevant high-income country (OECD excluding Mexico and Turkey)
Intervention	<ul style="list-style-type: none"> • No intervention
Intervention not relevant	<p>Intervention does not aim to prevent or reduce any of the following:</p> <ul style="list-style-type: none"> • Smoking or smoking relapse • Exposure to second hand smoke • 'Sleeping related' SIDS risk factors • Overweight/obesity
Outcome not evaluated in a relevant population	<p>Outcome not evaluated in a relevant population:</p> <ul style="list-style-type: none"> • 'Smoking outcome': pregnant women, mothers and other groups in frequent contact with infants • Second-hand smoke exposure and other SIDS risk factors: infants • Weight outcome: preconceptional, pregnant and postnatal women
Outcome not relevant	<p>The review does not evaluate the effect on a relevant outcome:</p> <ul style="list-style-type: none"> • Measure of smoking cessation/relapse • Environmental tobacco smoke exposure • 'Maternal' weight • Infant sleeping position or location

Recent evidence-based reports, reviews and guidelines identified in the grey literature were included as supplementary material where reviewers considered that they added to the systematic review level evidence or where they addressed gaps in existing evidence. Supplementary reports published from 2000 onwards were included.

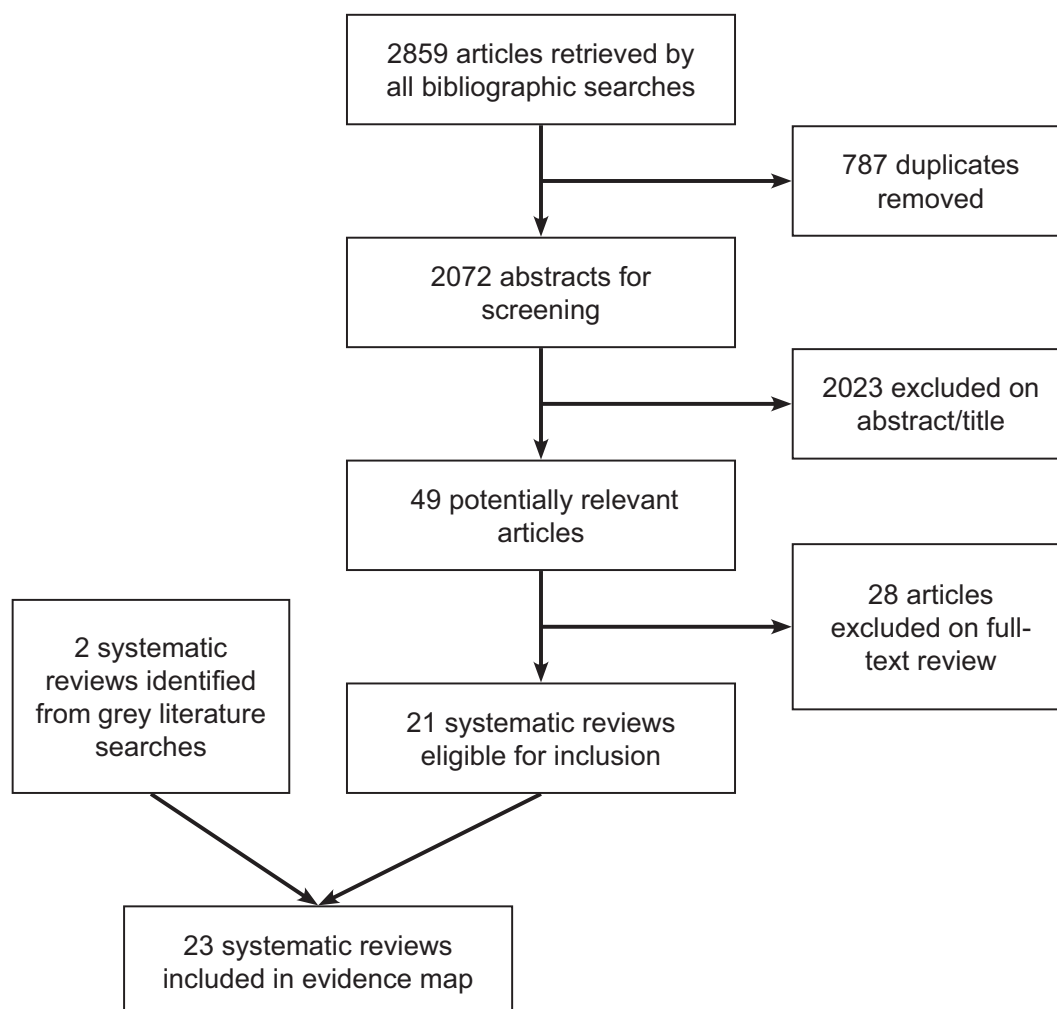
Because of the diversity of the material covered we did not perform a structured data extraction; instead a narrative description of each systematic review was prepared.

3 Results

3.1 Results of the searches

The search of the bibliographic databases identified 2859 citations, of which 787 were duplicates, resulting in 2072 unique citations (see Figure 1). Screening of these 2072 abstracts resulted in 2023 being excluded on title/abstract alone and a further 28 excluded after full text screening, leaving 21 included systematic reviews identified via bibliographic searches. A further two systematic reviews were identified via searches of the grey literature, bringing the total number of included systematic reviews to 23.

Figure 1. Flowchart of included systematic reviews



Reasons for exclusion are summarised in Table 2.

Table 2. Reasons for exclusion

Reason for exclusion	Frequency	(%)
Not a systematic review	749	36.5
Not in English	25	1.2
Population not relevant	104	5.1
Not evaluated in relevant high-income country	40	2.0
No intervention	473	23.1
Intervention not relevant	537	26.1
Outcome not evaluated in relevant population	55	2.7
Outcome not relevant	57	2.8
Other - withdrawn/superseded Cochrane review	11	0.5
Total excluded publications	2051	100%

The majority of systematic reviews were found for interventions targeting smoking during pregnancy and the postpartum period. The breakdown of systematic reviews found per risk factor is shown in Table 3.

Table 3. Eligible systematic reviews found for each risk factor

Risk factor	No. of eligible systematic reviews
Smoking in pregnancy and in the postpartum period (smoking cessation in pregnancy, relapse prevention in pregnancy and in the postpartum period)	14
Risk factors for SIDS/SUDI* (environmental tobacco smoke, sleeping position, adverse sleeping environment)	4
Obesity and overweight (preconception weight loss, weight gain during pregnancy, weight loss in the postpartum period)	5
Total	23

* Relevant reviews also included under smoking in pregnancy and the postnatal period

A total of 12 supplementary evidence-based reports, reviews and guidelines were identified from the grey literature: 9 published reports and three further forthcoming NICE public health guidance reports on relevant topics.

3.2 Summary of main findings

Twenty-three systematic reviews met our inclusion criteria and were included in the evidence map.

- The majority of systematic reviews related to interventions for smoking cessation and relapse prevention during and after pregnancy (14 systematic reviews).
- The systematic review-level evidence relating to interventions to reduce SIDS/SUDI was limited to interventions targeting maternal smoking (see above) and infant exposure to second-hand smoke (four systematic reviews); no systematic reviews were found evaluating interventions to modify infant sleeping position or adverse sleeping environments.
- Systematic reviews evaluating interventions to reduce obesity and overweight mainly related to the postnatal period (three systematic reviews); one systematic review looked at the prevention of excessive weight gain during pregnancy and another evaluated the effect of dietary interventions on pregnancy weight gain.

We identified 12 relevant recent evidence-based reports, reviews and guidelines (including three forthcoming NICE public health guidance reports): six related to smoking during pregnancy, three related to infant risk factors for SIDS, and three related to obesity and overweight before, during and after pregnancy.

Detailed results are reported in 'Interventions targeting major potentially modifiable risk factors for infant mortality: a user's guide to the systematic review evidence' (Allen et al., 2009).

Acknowledgement

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References

1. Allen, F., Gray, R., Oakley, L., Kurinczuk, J. J., Brocklehurst, P. and Hollowell, J. (2009). Inequalities in Infant Mortality Project Evidence Map Report 3. The effectiveness of interventions targeting major potentially modifiable risk factors for infant mortality: a user's guide to the systematic review evidence. Oxford: National Perinatal Epidemiology Unit. <http://www.npeu.ox.ac.uk/infant-mortality>
2. Lumley, J., Oliver, S. S., Chamberlain, C. and Oakley, L. (2004). Interventions for promoting smoking cessation during pregnancy. Cochrane Database of Systematic Reviews, (Issue 4), CD001055.
3. Montori, V., Wilczynski, N., Morgan, D. and Haynes, R. (2005). Optimal search strategies for retrieving systematic reviews from Medline: analytical survey. BMJ 330(68).

Annex A: Medline search Strategies

Smoking as a risk factor

1. pregnancy.mp. or exp Pregnancy/ or exp Pregnancy, Unwanted/
2. exp Prenatal Care/
3. exp Prenatal Exposure Delayed Effects/
4. exp Tobacco/ or exp "Tobacco Use Cessation"/
5. exp Smoking/ or exp Smoking Cessation/
6. 1 or 2 or 3
7. 4 or 5
8. 6 and 7
9. search.ti,ab.
10. medline.ti,ab.
11. "cochrane database of systematic reviews".jn.
12. meta-analysis.pt.
13. systematic.mp. and review.ti,ab.
14. or/9-13
15. 8 and 14
16. limit 15 to (english language and humans and yr="1990 - 2009")

Obesity as a risk factor

1. exp pregnancy/ or exp pregnant women/
2. exp mothers/
3. exp maternal welfare/
4. (preconception or preconceptional or pregnan* or postpartum or post-partum or postpartal or post-partal or lactating women or nursing women or breastfeeding or breast-feeding).ti,ab.
5. or/1-4
6. exp Obesity/ or exp Obesity, Morbid/
7. (obese or obesity).ti,ab.
8. exp Body Mass Index/
9. skinfold thickness/ or adiposity/
10. exp Waist Circumference/ or exp Anthropometry/
11. or/6-10
12. weight loss/ or weight change/
13. (weight adj3 (loss or reduction or change or maintenance)).ti,ab.
14. exp Weight Gain/
15. exp Body Weight/
16. or/12-15
17. exp sports/
18. exp exercise/
19. exp physical exertion/
20. exp walking/
21. physical activity.mp. or Motor Activity/
22. exp Physical Fitness/
23. (dieting or low calorie or diet\$).mp.
24. exp Diet, Reducing/
25. energy intake.mp.
26. healthy eating.mp.
27. ((diet\$ or slimming) adj (club\$ or group)).mp

28. weightwatcher\$.mp.
29. exp bariatric surgery/
30. exp Anti-Obesity Agents/
31. or/17-30
32. exp Child Health Services/ or exp Prenatal Care/ or exp Maternal Health Services/ or exp preconception care/
33. search.ti,ab.
34. medline.ti,ab.
35. "cochrane database of systematic reviews".jn.
36. meta-analysis.pt.
37. systematic.mp. and review.ti,ab.
38. or/33-37
39. (5 and 31) or (32 and 16) or (5 and 11) or (5 and 16)
40. 38 and 39
41. limit 40 to (english language and humans and yr="1990 - 2009")
42. case reports/
43. (letter or comment or editorial or news).pt.
44. 41 not (42 and 43)
45. 41 and 44

Infant risk factors for SIDS/SUDI

Search 1: SIDS – adverse sleeping environment search

1. (bed sharing or (sharing adj3 bed) or bedshare\$ or (bed adj2 share\$)).ti,ab.
2. (co-sleep\$ or cosleep\$).ti,ab.
3. (cobedding or co-bedding or cobed or co-bed).ti,ab.
4. ((baby or babies or infant\$ or neonat\$) adj3 sleep\$).ti,ab.
5. beds/ or (adult bed\$ or sofa).ti,ab.
6. (sleep\$ adj1 arrangement\$).ti,ab.
7. (separate room\$ or rooming alone or room sharing or room-sharing or sleep\$ location).ti,ab.
8. or/1-7
9. exp Infant, Newborn/ or exp Infant/
10. search.ti,ab.
11. medline.ti,ab.
12. "cochrane database of systematic reviews".jn.
13. meta-analysis.pt.
14. systematic.mp. and review.ti,ab.
15. or/10-14
16. 8 and 9 and 15
17. limit 16 to (english language and humans and yr="1990 - 2009")

Search 2: SIDS – Sleeping position

1. Infant, Newborn/ or exp Infant/ or exp Infant, Newborn, Diseases/
2. supine.mp.
3. exp Supine Position/
4. prone.mp.
5. exp Prone Position/

6. (face adj3 (lying or sleep\$)).mp.
7. (side adj (lying or sleep\$)).mp
8. back to sleep\$.mp.
9. (exp health promotion/ or exp health education/ or public health.mp. or prenatal.mp. or postnatal.mp. or campaign\$.mp. or program\$.mp.) and exp sudden infant death/
10. (sleep\$ adj3 position).ti,ab.
11. or/2-10
12. search.ti,ab.
13. medline.ti,ab.
14. "cochrane database of systematic reviews".jn.
15. meta-analysis.pt.
16. systematic.mp. and review.ti,ab.
17. or/12-16
18. 1 and 11 and 17

Search 3: SIDS – Exposure to second hand smoke

1. exp Smoking/
2. exp Tobacco Smoke Pollution/
3. smok*.ti,ab.
4. (ets or tobacco or nicotine or cotinine or cigarette*).ti,ab.
5. or/1-4
6. exp respiratory tract disease/
7. exp infant welfare/
8. or/6-7
9. exp Smoking Cessation/
10. exp Environmental Medicine/
11. exp Public Health/
12. exp Health Education/
13. exp Health Promotion/
14. exp postnatal care/ or (postnatal or post-natal).ti,ab.
15. exp prenatal care/
16. or/9-15
17. exp Parents/
18. exp Mothers/
19. exp Fathers/
20. exp Family/
21. exp infant/
22. exp Pregnant Women/ or exp pregnancy/
23. (carer\$ or caregiver\$ or parent\$ or famil\$ or partner\$ or mother\$ or father\$ or maternal or paternal).ti,ab.
24. or/17-23
25. search.ti,ab.
26. medline.ti,ab.
27. "cochrane database of systematic reviews".jn.
28. meta-analysis.pt.
29. systematic.mp. and review.ti,ab.
30. or/25-29
31. (24 and 16 and 5 and 30) or (24 and 9 and 8 and 30)
32. limit 31 to (english language and humans and yr="1990 - 2009")

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