

NICE Maternal and Child Nutrition programme

Review 4: The effectiveness of public health interventions to promote safe and healthy milk feeding practices in babies

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A review prepared for NICE by:
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1. Introduction to the review

1.1. Aims of the review

This review aimed to answer five key questions relating to public health interventions promoting safe and healthy milk practices in babies from birth to age 6 months. The five key questions/topic areas were:

1. What public health interventions aimed at mothers effectively increase the initiation and duration of breastfeeding normal term babies?
2. What interventions effectively reduce the risks of contamination of equipment used in bottlefeeding, and in the storage and reheating of breast milk? In addition, what interventions reduce the risks associated with the inaccurate reconstitution of formula?
3. What are the most effective methods to express breast milk?
4. What supplemental feeding modes (e.g. cup, spoon, bottle) are most effective?
5. What is the effectiveness of vitamin supplementation in infants who are partly breastfed or exclusively formula fed?

The initial approach was to identify recent relevant systematic reviews published from 1995 and summarise their results and then add the results of any additional RCTs (from 1990) and then finally find any further “corroborative evidence” (including non randomised trials, cohort studies and qualitative studies) related to specific interventions in non-RCT studies in the UK (from 1990).

This review sought to assess in particular studies that considered babies born to low income households therefore where possible data relative to the socio-economic status of study participants was retrieved.

An additional search was carried out in 2007. The search was for current published recommendations which addressed the following two questions: What are the issues involved in routinely monitoring infant growth?; When do infants up to 6 months need additional vitamins if they are breastfed or formula fed? The resulting papers were screened for relevance and efforts were made to retrieve relevant papers until July 2007 but they were not part of the full review process.

1.2. Layout of the review

The Executive Summary (Section 2) provides a short concise summary of the findings. Section 3 provides a background for the review with a separate list of references while Section 4 covers the methodology for the review. The Methodology section includes details of the literature searches, the identification of relevant studies and the quality appraisal of studies.

Details of the findings of the relevant included studies have been given in Section 5 (Results) of this review with a Discussion section in Section 6. Findings are presented under separate headings referring to the five key questions related to public health interventions of the review and also for 14 different types of intervention for key question 1 relating to the initiation and duration of breastfeeding. Key points from the non-randomised UK studies which provided corroborative evidence have been summarised in tables under the relevant type of intervention in Section 5. Section 5 also contains tables addressing sub-questions for the relevant studies which aim to summarise the applicability of the studies and their interventions.

Evidence tables are presented as an accompanying document.

Appendix A and Appendix B provide lists of included and excluded papers, respectively. Appendix B also provides a list of the reasons why individual papers were excluded (including those suggested by stakeholders or the PDG). Appendix C provides a detailed report of the processes, databases, and search terms used in this rapid review.

The NICE criteria and the methodology checklist used in this review are presented in Appendix D.

Details of the Baby Friendly Hospital Initiative are given in Appendix E.

2. Executive Summary

This rapid review examined the effectiveness of public health interventions to promote safe and healthy feeding practices in healthy babies born at term, up to around six months of age. In particular, this review sought to assess studies that considered babies born to low income households. Five key questions/topic areas were addressed:

- What public health interventions aimed at mothers effectively increase the initiation and duration of breastfeeding normal term babies?
- What interventions effectively reduce the risks of contamination of equipment used in bottlefeeding, and in the storage and reheating of breast milk? In addition, what interventions reduce the risks associated with the inaccurate reconstitution of formula?
- What are the most effective methods to express breast milk?
- What supplemental feeding modes (e.g. cup, spoon, bottle) are most effective?
- What is the effectiveness of vitamin supplementation in infants who are partly breastfed or exclusively formula fed?

The literature search was conducted in February/March 2006 and updated in January 2007 using a stepped approach. Initially, a worldwide search was conducted to identify potentially relevant systematic reviews (from 1995 onwards) followed by randomised controlled trials (1990 onwards) and other study types (conducted in the UK and published from 1990 onwards). A total of 6667 citations were independently screened by two reviewers, and full paper copies of 28 systematic reviews, 102 randomised controlled trials and 25 UK studies (of any type) were obtained and also independently assessed. In addition, one forthcoming publication of a SR was identified which met the inclusion criteria. In total, 26 studies (27 publications) met the inclusion criteria (eight SRs and 18 RCTs). In addition, key points from 13 corroborative UK studies were found to be relevant and have been briefly summarised. In addition, as part of the NICE consultation, a number of papers were identified as being of potential interest by members of the Programme Development Group (PDG) group and stakeholders. Four of these papers met the inclusion criteria for the review: one SR, two RCTs and one UK study and were therefore included in the review. The final totals for included papers therefore became 29 studies (30 publications) met the inclusion criteria (nine SRs, and 20 RCTs) and 14 corroborative UK studies.

2.1. Initiation and duration of breastfeeding

Of the twenty two studies (seven SRs and fifteen RCTs) that assessed interventions to improve the initiation and duration of breastfeeding, six (three SRs (Fairbank 2000 (2++), Renfrew 2005 (2++), Britton 2007 (2++)) and three RCTs (Anderson 2005 (1-), Chapman 2004a and b (1-), Muirhead 2006 (1++)) evaluated **peer support or volunteer counselling**. Overall, the systematic reviews demonstrated a positive trend for peer support on the initiation and duration of 'any' and 'exclusive' breastfeeding, although the results were not always statistically significant. The most recent and most comprehensive SR (Britton 2007) found the effect of peer support was greater on 'exclusive' breastfeeding and predominately during the first 3 months postpartum. The three RCTs supported these results although, again, the level of statistical significance of these studies varied. Two of the three RCTs (1-), for which results were not significant, were conducted in the same low income predominately Hispanic population in the US (Anderson 2005 (1-), Chapman 2004a and b (1-)). A recent high quality study (1++) conducted in Scotland found a small but not

significant effect of peer support on improving the duration of breastfeeding (Muirhead 2006). A study of relatively well-educated Canadian women (1++) (Dennis 2002 in Renfrew 2005) that evaluated volunteer counselling using telephone support demonstrated significant improvements in both 'any' and 'exclusive' breastfeeding up to 12 weeks postpartum. These provide a body of 1+ evidence to suggest that peer support improves rates of breastfeeding initiation and duration, although the effects have not been demonstrated to be statistically significant. All of these studies are likely to be applicable to population groups in the UK. It is suggested that further research is needed to assess what type of peer support programme may effectively increase the initiation and duration of exclusive breastfeeding in disadvantaged groups in the UK.

The SR by Renfrew et al (2005) concluded that effective peer support interventions were those that were given very soon after birth to women who did not have to request them whereas the SR by Fairbank et al (2004) concluded that antenatal peer support offered to low-income women intending to breastfeed was effective at increasing levels of breastfeeding initiation and duration.

Three high quality SRs (Fairbank 2000 (2++), Renfrew 2005 (2++), Britton 2007 (2++)) and two RCTs (1++ (Wallace 2006) and 1- (Di Napoli 2004)) evaluated **professional support**. The most recent and comprehensive SR (Britton 2007) included 18 relevant RCTs but four were carried out in low income countries. Professional support gave a significant benefit for 'exclusive' breastfeeding at nearly all time points with the greatest effect at 3 months postpartum whereas for 'any' breastfeeding the effect was only significant at 4 and 9 months postpartum. The two other reviews contained fewer studies but made similar conclusions. Renfrew et al (2005) concluded that structured support from health professionals required additional breastfeeding support to increase breastfeeding duration; was effective at increasing breastfeeding in women who intended to breastfeed as long as the support was given soon after the birth; and increased 'exclusive' breastfeeding among women from relatively advantaged backgrounds but not for women with disadvantaged backgrounds.

The (2++) SR by Britton et al (2007) found that for all interventions involving either peer or professional support, postnatal breastfeeding support alone appeared to be more effective in reducing the cessation of 'any' breastfeeding up to 6 months than studies incorporating an antenatal element, and face-to-face support was more effective than telephone support.

Four moderate/good quality RCTs in Renfrew et al (2005) and three recent RCTs (Bonuck 2005 (1+), Su 2007 (1+), Dias de Oliveira 2006 (1-)) evaluated interventions delivered by **trained, skilled, knowledgeable breastfeeding specialists**. Five of these studies demonstrated that breastfeeding specialists successfully increased the duration of 'any' or 'exclusive' breastfeeding – at least in the short-term. The unsuccessful intervention was very brief with just one 30 min session in the maternity ward in a Baby Friendly hospital in Brazil (Dias de Oliveira 2006 (1-)) but included women who had previously breastfed successfully. The intervention for the RCT by Bonuck et al (2005) was much more intensive with both antenatal and postnatal components and significantly increased breastfeeding duration rates up to 20 weeks. The recent RCT by Su et al. (2007) in Singapore compared two brief interventions given by lactation consultants: antenatal breastfeeding education and postnatal support as single interventions for women who intended to breastfeed. Postnatal support was marginally more effective than antenatal education. (The SR (2+) by Guise et al (2003) was also relevant but made conclusions for all types of support not specifically that of lactation consultants.)

There was evidence from four studies in two SRs (Fairbank 2000 (2++), Renfrew 2005 (2++)), and two RCTs (Labarere 2005 (1++), Wallace 2006 (1++)) that **post registration or update training for health professionals** to increase knowledge or skills in breastfeeding as part of multi-faceted interventions or training specifically to deliver an intervention may be effective in increasing breastfeeding initiation or duration. The French study (Labarere 2005) provided level 1++ evidence that an outpatient consultation with a trained primary care physician/paediatrician within two weeks of hospital discharge significantly improved exclusive breastfeeding at four weeks and extended the duration of breastfeeding. This intervention could be replicated in the UK. In addition, two (not graded for quality) before-after studies in Renfrew et al (2005) that evaluated a breastfeeding training programme for hospital health professionals found a significant increase in breastfeeding duration rates. There was limited evidence that UNICEF Baby Friendly Initiative training for health professionals significantly increases breastfeeding rates in areas where initial breastfeeding rates are low (Cattaneo and Buzzetti 2001 (before-after study) in Renfrew 2005, Tappin 2006 (UK cross-sectional study)).

Six SRs (Tedstone 1998 (2-), Fairbank 2000 (2++), Renfrew 2005 (2++), Dyson 2005 (2++), Couto de Oliveira 2001 (2+), Guise 2003 (2+)) and eight RCTs (Labarere 2003 (1++), Labarere 2005 (1++), Forster 2004 (1++), Lavender 2005 (1+), Noel-Weiss 2006 (1+), Su 2007 (1+), Schlickau 2005 (1-), Wolfberg 2005 (1-)) evaluated **breastfeeding education**. The reviews demonstrated that antenatal classroom education and discussion has a positive effect on breastfeeding initiation, and that group education on positioning and attachment has a positive effect on the duration of exclusive breastfeeding. Written information alone or in combination with formal interactive health education has had a limited impact on breastfeeding initiation rates. Only two of the six moderate/good quality RCTs of various education interventions on the initiation and duration of breastfeeding included in this review demonstrated a significant impact although some positive trends were observed. However, six of the ten relevant RCTs included in the SRs had significant outcomes. Three RCTs were of postpartum education interventions all of which were tailored to individual women's needs (Pollard 1998 (1++) in Renfrew 2005 (2++), Labarere 2003 (1++), Labarere 2005 (1++)) (one included in an SR). A recent RCT (1+) compared antenatal breastfeeding education and postnatal support as single interventions for women who intended to breastfeed. Both interventions significantly improved rates of exclusive breastfeeding but only postnatal support had a significant effect on 'any' breastfeeding (Su 2007). It appears that educational interventions are not consistently as effective as other interventions, and that an intervention aimed at partners of women intending to breastfeed merits further research.

Two SRs concluded that one-to-one education sessions were more successful than group sessions when they were aimed at promoting initial breastfeeding with women who had already made a decision to bottle feed, whereas group programmes were more effective for women who planned to breastfeed (Tedstone 1998 (2-), Fairbank 2000 (2++)). The effectiveness of antenatal education sessions in initiating breastfeeding was enhanced by contact with peer counsellors.

An SR (2+) by Couto de Oliveira et al (2001) included studies in both developed and underdeveloped countries and older studies that had not been included in the other reviews. The authors concluded that the most effective interventions in extending duration of breastfeeding combined information, guidance and support and were long term and intensive. During prenatal care, group education was the only effective strategy. During the postnatal period or both periods (antenatal and postnatal), home visits used to identify mother's concerns with breastfeeding, assist with problem

solving and involve family members in breastfeeding support were effective. Individual education sessions were also effective in these periods, as was a combination of 2 or 3 of these strategies in interventions involving both periods. Strategies with no effect had no face-to-face interaction, gave contradicting messages or were small-scale interventions.

Four SRs evaluated **multi-faceted interventions** (Fairbank 2000 (2++), Renfrew 2005 (2++), Couto de Oliveira 2001 (2+), Guise 2003 (2+)). The SR by Renfrew et al (2005) included nine RCTs considered to be 'multi-faceted' and made two conclusions: a combination of antenatal education and limited postnatal telephone support was not effective at increasing the duration of breastfeeding among high income women who intend to breastfeed; and there was evidence that a combination of education and support with incentives might have a positive effect on breastfeeding duration, which would be worthy of replication in UK settings among women on low incomes. The second SR by Couto de Oliveira et al (2001) concluded that the most effective interventions in extending duration of breastfeeding combined information, guidance and support and were long term and intensive and included face-to-face interaction. Conversely, the third SR by Guise et al (2003) included four studies of breastfeeding support with education in developed countries and concluded that there was insufficient data to determine whether a combination of education and support was more effective than education alone.

The Fairbank et al (2000) SR concluded from eleven mainly before-after studies that multifaceted interventions were effective in increasing the initiation, duration and exclusivity of breastfeeding and that the most effective were those that were comprised of a media campaign and/or a peer support programme combined with structural changes to the health service, or with health education activities.

Two studies both gave significant increases in breastfeeding initiation. The intervention in the RCT by Brent et al (1995 (1+)) (included in all four SRs) included antenatal education tailored to individual women's needs, proactive visits in hospital and at home after birth, and ongoing availability of a lactation consultant and resulted in a significant increase in breastfeeding initiation, at two weeks and at two months postpartum, but not at six months postpartum. The other before-after study (2+) (Wright 1997) found in Fairbank et al (2000 (2++)) evaluated the adoption of culturally-specific hospital policy and practices together with a media campaign.

There is a lack of good quality evidence on the impact of **media activity** on breastfeeding initiation and duration.

2.2. Contamination of equipment/storage and heating of breast milk/reconstitution of formula

Two SRs provide evidence that good quality studies on methods of **cleaning and sterilisation** are lacking, and that there is no evidence from the available studies on the relative effectiveness of different cleaning and sterilising techniques (Bernath 2001, Renfrew 2008 (2-)). No studies were identified in the literature search that examined risks associated with **storage and reheating of breast milk**. One SR (Renfrew 2003 (2+)) provided evidence that **reconstitution of formula** from powder may be associated with errors. A 1+ RCT (Lucas 1991 and 1992) in the SR by Renfrew et al (2003) conducted in the UK found that in comparison to ready-made formula, infants fed formula made from powder had increased weight and skinfold thickness. All of these results are directly applicable to UK infants.

2.3. Expression of breast milk

Three studies evaluated methods/techniques to express breast milk. One recent RCT (Fewtrell 2001 (1+)) conducted in mothers of relative high socioeconomic status in the UK found no significant differences in milk volume or fat content obtained using a mini-electric breast pump compared to a manual breast pump. Findings from a 1– RCT (Zinaman 1992) suggest that a bi-lateral electric breast pump available in the US produces prolactin responses similar to natural infant suckling. This electric breast pump produced significantly higher prolactin levels than battery-operated and ‘mechanical’ pumps, or hand expression. In addition, a RCT (1+) (Auerbach 1990) conducted in the US found no difference in the fat content or volume of breast milk produced using either unlimited sequential (single breast) pumping or unlimited simultaneous (double breast) pumping. US pumps available in the US but not easily found in the UK may be bought on-line therefore all three studies are applicable to UK women. Further high quality research is required however comparing different breast pumps that are easily obtained in the UK.

2.4. Supplemental feeding modes

Only one study, an RCT (1-) (Field 1997) was identified that examined supplemental feeding modes in healthy term babies. This study conducted in the US demonstrated that infants bottle fed using a breast-like teat demonstrated more ‘breastfeeding like’ behaviours than infants bottle fed using a standard teat. The breast-like teat evaluated (Healthflow) is available in the UK.

2.5. Evidence Statements

1 Three ++ non-randomised control trials (Caulfield 1998, Schafer 1998, McInnes 1998) included in Fairbank (2000) evaluated peer support programmes. The interventions included training of peer supporters, antenatal and postnatal support (telephone, home visits group or contact at clinic that was initiated by the peer supporter). The studies found a statistically significant increase in the initiation and or duration of breastfeeding among women from low income groups who intended to breastfeed.

2 Seven RCTs in Britton et al (2007) evaluated peer support programmes. Six studies found that lay support resulted in a marked significant reduction in the cessation of exclusive breastfeeding, which appeared to be predominately during the first 3 months. However three of the studies were in countries not considered relevant to NICE reviews and neither of the two contributing UK studies individually gave significant results (Graffy 2004, Morrell 2000). (These two UK studies were of populations containing a mixture of all social classes.) Seven studies showed a similar but less significant reduction in the cessation of any breastfeeding but subgroup analysis did not give a significant effect at any time point. Overall, the effect of incorporating an antenatal element of breastfeeding support into a study was not significant but those studies incorporating postnatal support alone significantly reduced the cessation of any breastfeeding up to 6 months. Six studies using lay support contributed to the analysis and their results were compatible with the conclusion. Similarly, face-to-face support appeared to be more effective than telephone support in preventing the stopping of breastfeeding up to 6 months and all seven studies which used lay support contributed to the analysis.

3 One ++ RCT (Muirhead 2006) evaluated a peer support programme including; peer support training, one antenatal visit, postnatal support (not necessarily within 72

hours) by telephone or home visit and support groups. The study found no significant difference in breastfeeding initiation and duration rates (up to 16 weeks) compared to routine care in a general population in Scotland.

4 Two ++ RCTs (Dennis 2002, Graffy 2004) included in Renfrew et al (2005) evaluated volunteer breastfeeding counsellors. The first found telephone support instigated by the supporter within 48 hours of hospital discharge significantly increased the duration of any and exclusive breastfeeding at 4, 8 and 12 weeks compared to conventional care in relatively well-educated mothers who were breastfeeding at study recruitment. The other study found one antenatal visit at which the offer of postnatal support was made along with a contact card and leaflets had no effect on breastfeeding initiation or duration rates.

5 One ++ RCT (Morrell 2000) in Renfrew et al (2005) evaluated an intervention that included up to ten visits from a trained support worker for up to three hours per day in the first 28 days postnatal, (as well as usual care). The study reported no significant increases in the duration of breastfeeding. Women were recruited from the general UK population.

6 One RCT (Oakley 1990, not individually graded) included in Fairbank et al (2000) evaluated social support from a midwife that included, a minimum of 3 home visits (at 14, 20 and 28 weeks antenatally), plus 2 telephone contacts or brief home visits between these times. Midwives provided a 24-hour on call support service on any topic but they did not provide the standard clinical care. The study found an increase in breastfeeding initiation rates that was not statistically significant.

7 Four RCTs (Porteous 2000 (++) , Pugh 2002 (+), Quinlivan 2003 (++) , (Wrenn 1997 (+), in Renfrew et al (2005) evaluated health professional support. One 1++ randomised control trial (Porteous 2000) included frequent postnatal visits and telephone support from a skilled, knowledgeable midwife and found breastfeeding duration rates increased significantly in women who had planned to breastfeed. One + randomised control trial (Pugh 2002) evaluated intra-partum visits in hospital and postnatal home visits with telephone support from a community nurse and peer counsellor to be effective in increasing the duration of exclusive breastfeeding amongst minority women on low-income. One + randomised control trial (Wrenn 1997) evaluated structured support from a health professional (one intra-partum and postnatal visit, and one phone call) and found no significant increases in breastfeeding rates at 6 weeks in women from the US armed forces. An Australian ++ RCT (Quinlivan 2003) evaluated a series of structured postnatal home visits for teenage mothers starting at one week postnatal that included amongst other things discussions on infant feeding by a midwife in addition to routine hospital services. No increases in any breastfeeding rates were demonstrated.

8 Eighteen RCTs in Britton et al (2007) evaluated professional support programmes and found them to be effective overall. Twelve studies found that professional support gave a significant reduction in the cessation of 'exclusive' breastfeeding at all time points except 4 months, for which it was marginally significant. The effect was greatest in the first 3 months. The overall reduction in the cessation of 'any' breastfeeding found in the 16 relevant studies was not found to be significant but subgroup analysis found it was significant at 4 and 9 months and only two studies had an antenatal element. Face-to-face support appeared to be more effective than telephone support in preventing the stopping of 'any' breastfeeding up to 6 months. Four studies were set in low income countries not considered to be relevant to NICE reviews.

9 A ++ RCT in the UK (Wallace 2006) assessed 'hands-off' care by a trained midwife at the first postnatal feed compared to routine care by a qualified midwife, with a main aim of giving verbal only advice on positioning and attachment. The trained midwives had attended a 4 hour workshop. There was no significant effect on breastfeeding initiation or duration, or cessation of any or exclusive breastfeeding at 6 or 17 weeks. However, the intervention was very brief and other comparable studies have assessed levels of breastfeeding earlier.

10 One + US based RCT (Bonuck 2005) evaluated the effect of a lactation consultant conducting two educational antenatal visits, weekly antenatal telephone contacts, a hospital intra-partum contact and postnatal home visits compared with standard care in women on low-incomes who were primarily Hispanic and black. The study found the intervention significantly increased breastfeeding duration rates up to 20 weeks.

11 A + RCT (Su 2007) of antenatal breastfeeding education and postnatal lactation support in women who intended to breastfeed, as single interventions based in a hospital in Singapore found both significantly improved rates of exclusive breastfeeding up to 6 months after delivery. Participants were chiefly Chinese or Malay. The postnatal support consisted of two one-on-one lactation consultant visits in hospital and was marginally more effective than the antenatal breastfeeding education, which consisted of a single 30 minute session, including a 16 minute video which showed correct positioning, latching on, breast care and common problems, and with an opportunity to talk with a lactation consultant for 15 min. (Only postnatal support had a significant effect on rate of any breastfeeding and then only at 6 weeks after delivery.)

12 Four randomised control trials (Duffy 1997 (+), Brent 1995 (+), Redman 1995 (++) and Serafino-Cross and Donovan 1992 (+)) in Renfrew et al (2005) included trained skilled, knowledgeable health professionals delivering breastfeeding interventions, three trials during pregnancy.. Of these, one + randomised control trial (Duffy 1997) found a group antenatal education specifically on positioning and attachment significantly increased exclusive breastfeeding rates at 6 weeks among low-income women who intended to breastfeed. A + randomised control trial (Serafino-Cross and Donovan 1992) included 2-4 (10-15 minutes) individual antenatal sessions, training of health professionals and early frequent postnatal support that continued throughout the first year in a population of mostly white women on low-income. It found a significant increase in the breastfeeding initiation and duration rates up to 2 months post partum. A ++ RCT (Redman 1995) included group antenatal education at 24-28 weeks, support in hospital, postnatal contact at 2-3 weeks and 3 months and found no difference in exclusive breastfeeding duration rates in women intending to breastfeed. One+ randomised control trial (Brent 1995) included 5-8 home visits lasting up to an hour during the first 2 months with telephone support. Visits were concentrated in the first 2 weeks. The study found significant increase in breastfeeding duration rates at 2 months postnatal.

13 One ++ RCT (Labarere 2003) evaluated a single, 30-minute, one-to-one discussion and leaflet on 'breastfeeding and employment' by a midwife or intern. The intervention did not significantly increase exclusive, or any, breastfeeding at 17 weeks postpartum. This study was conducted in France on a relatively affluent group of women.

14 One ++ RCT (Fredrickson 1995) in Renfrew et al (2005) evaluated a single discussion at WIC registration (mean 12 minutes) and discharge packs at delivery.

The study found breastfeeding duration was highest among mothers who had planned to breastfeed but had low breastfeeding knowledge.

15 A US based +/- RCT (Kistin 1990) comparing an antenatal, breastfeeding session (50-80 minutes, led by the researchers) with a single one-to-one breastfeeding session (15-30 minutes) and standard care found significantly higher breastfeeding initiation rates in both intervention groups among US black women on low-incomes.

16 One ++ RCT (Serwint 1996) included in Renfrew (2005) evaluated a didactic one-to-one, antenatal discussion among a population of African-American women on low incomes with a paediatrician (who had received specific training) at a scheduled hospital visit. The advantages of breastfeeding were included in material covered. The study found no significant increase in breastfeeding initiation or duration rates.

17 A + systematic review by Couto de Oliveira et al (2001) included studies in both developed and underdeveloped countries and older studies that had not been included in the other reviews. The main conclusions were: the most effective interventions in extending duration of breastfeeding combined information, guidance and support and were long term and intensive. During prenatal care, group education was the only effective strategy. During the postnatal period or both periods (antenatal and postnatal), home visits used to identify mother's concerns with breastfeeding, assist with problem solving and involve family members in breastfeeding support were effective. Individual education sessions were also effective in these periods, as was a combination of 2 or 3 of these strategies in interventions involving both periods. Strategies with no effect had no face-to-face interaction, gave contradicting messages or were small-scale interventions.

18 A systematic review (+) by Guise et al (2003) included studies of breastfeeding support in developed countries all of which were included in more recent reviews (Britton 2007, Dyson 2005, Renfrew 2007). The main conclusions of the review were: Educational programmes were the most effective intervention and had the greatest effect on both initiation and short-term duration of breastfeeding (up to 3 months). Support programmes conducted by telephone, in person, or both increased both short-term and long-term duration (up to 6 months). Written materials alone did not significantly increase breastfeeding. There was insufficient data to determine whether a combination of education with support was more effective than education alone.

19 One ++ RCT (Forster 2004) evaluated a single, group, antenatal practical breastfeeding session and two group, antenatal, attitudes sessions (that included fathers). The study found no significant increase in exclusive or any breastfeeding at 6 months when compared to women who received standard care. The study population consisted of relatively disadvantaged, low-income Australian women with culturally diverse backgrounds – but the majority of these women (92.5%) planned to breastfeed.

20 One + cluster RCT (Lavender 2005) evaluated a single group antenatal, education session supervised by a lactation consultant and attended by a local midwife (who had received lactation training). The intervention did not increase breastfeeding duration when compared with standard antenatal care from lactation trained midwives.

21 One + RCT (Duffy 1997) included in Renfrew et al (2005) examined a one-hour group, antenatal, breastfeeding session on positioning and attachment given by

a lactation consultant. Most participants were from a low-income group. The study demonstrated significantly higher rates of exclusive breastfeeding at 6 weeks compared to women who received standard antenatal care.

22 One +/- Australian RCT (Rossiter 1994) evaluated a small, informal group antenatal, breastfeeding session in immigrant Vietnamese women on low-incomes. It found significantly higher breastfeeding initiation and duration rates amongst women who received the intervention as opposed to a leaflet alone.

23 A Canadian based + RCT (Noel-Weiss 2006) utilised a single 2.5 hour antenatal breastfeeding workshop designed using Bandura's theory of self-efficacy and adult learning principles at 34+ weeks gestation with optional attendance by fathers. Using actual workshop attendance, the study found a significant increase in exclusive breastfeeding at 8 weeks postpartum compared to standard care but the result was not significant using intention to treat analysis. The study population were relatively well-educated with a reasonable income.

24 One ++ RCT (Pollard 1998) in Renfrew et al (2005) evaluated a postnatal breastfeeding question/answer education session supported by a self-assessment tool (mother's diary of breastfeeding behaviour) in women from mixed-income groups who planned to breastfeed. The intervention was effective in increasing breastfeeding duration rates, when compared to women provided with a notebook that contained information only but only for those that completed the daily breastfeeding log.

25 One ++ RCT (Labarere 2005) evaluated the effect of an outpatient appointment 2 weeks after the birth with a physician/ paediatrician (who had received 5 hrs lactation training) in well-educated women on high incomes. The study found significant increases in exclusive breastfeeding at four weeks and extended overall duration of breastfeeding.

26 One + RCT (Curro 1997 (+)) in Renfrew et al (2005) evaluated an educational intervention that provided written information in the postnatal period. The study found no significant differences in breastfeeding rates at 6 months.

27 One ++ RCT (Redman 1995) in Renfrew et al (2005) compared a package of multiple interventions (including, a single 3 hour group, antenatal, breastfeeding session, postnatal telephone support at 2-3 weeks and 3 months) with an optional home visit and discussion group (participants had no significant differences in demographic variables). No significant differences in breastfeeding duration rates were observed; both groups had a high prevalence of breastfeeding.

28 One + RCT (Rojjanairat 2000) in Renfrew et al (2005) evaluated interventions among women who intended to breastfeed and who planned to return to work within 12 weeks postpartum. The interventions included, a 2-3 hour group, antenatal breastfeeding session (lecture style) given by a lactation consultant, postnatal telephone support at 1, 4 and 6 weeks postnatal. Participants were mostly young, white well-educated women. No significant differences in breastfeeding duration rates were observed; both groups had a high prevalence of breastfeeding.

29 One + RCT (Brent 1995) (included in Renfrew 2005 and Fairbank 2000) and one + before and after study (Wright 1997) included in Fairbank et al (2000) and a ++ RCT (Labarere 2005) suggest that post registration or update training for healthcare professionals to increase knowledge or skills in breastfeeding as part of multi-faceted interventions or training specifically to deliver an intervention can be effective.

30 Two + before-after studies (Ingram 2002, Hartley and O'Connor 1996) in Renfrew et al (2005) evaluated a breastfeeding training programme for hospital health professionals and found a significant increase in breastfeeding duration rates.

31 Two before-after studies (Cattaneo and Buzzetti 2001, Durand 2003; not individually graded) in Renfrew et al (2005) evaluated the UNICEF Baby Friendly Hospital Initiative (BFI) training for health professionals in hospital settings. One study found significant increases in breastfeeding rates at 6 months where initial breastfeeding rates were low. The BFI training did not increase breastfeeding rates at hospital discharge where breastfeeding rates were relatively high. These conclusions are supported by a UK cross-sectional study of BFI-trained health visitors (Tappin 2006).

32 One + RCT (Brent 1995) in Fairbank et al (2000) and Renfrew et al (2005) evaluated education and support, including; individual education that was given to all women in both groups (mostly white on low-incomes), support in the ante-, intra- and postpartum period and into the first year of infancy. This included training of health professionals, daily inpatient visits, telephone call 48hrs after discharge, lactation clinic at 1 week and lactation consultant present at all health clinics up to one year after the birth. Significant increases were found in the initiation and duration of breastfeeding.

33 One + before-after study (Wright 1997) in Fairbank et al (2000) conducted among American Indian women evaluated the adoption of hospital policy and practices which were culture specific together with a media campaign. The latter included the ten steps in the Baby Friendly Hospital Initiative, a peer support programme and a public health campaign. The study found a statistically significant increase in breastfeeding initiation rates.

34 One + before-after study (Friel 1989) in Fairbank et al (2000) evaluated media campaigns (predominantly television commercials) and found limited evidence for an increased knowledge of breastfeeding ($p < 0.05$) but not for an increase in breastfeeding initiation rates.

35 A + systematic review (Renfrew 2003) found the reconstitution of infant formula milk from powder may be associated with errors with a greater tendency to over-concentrate feeds than under concentrate them.

36 One + RCT (Fewtrell 2001) compared a specific brand of mini-electric breast pump with a specific brand of manual breast pump. No significant differences were found in the volume of milk expressed or its fat content.

37 One + RCT (Auerbach 1990) compared pumping each breast sequentially with both breasts simultaneously. Women preferred simultaneous pumping which also produced a greater volume of milk. No significant differences were found in milk fat concentrations.

3. Background

3.1. Infant feeding and health

The feeding of newborn babies makes a critically important contribution to their short, medium and long term health. At no other time in life is a person entirely dependent on one food to provide their entire nutritional needs. As a result, babies are nutritionally very vulnerable in the early months of their lives. It has been recognised for some time both nationally and internationally, that human breastmilk is the food of choice for babies, exclusively up to six months of age, and continuing thereafter for as long as mother and baby wish (e.g. Standing Committee on Nutrition of the British Paediatric Association 1994, American Academy of Pediatrics 1997, EU 2003, WHO 2003).; the World Health Organization recommends mother breastfeed until at least the age of two (WHO 2003).

Much of the evidence base on infant feeding and health outcomes derives from observational studies, with recognized sources of potential bias. However, the important contribution of breastfeeding to public health has been strengthened by recent studies and reviews (e.g. Kramer et al 2001, Kramer and Kakuma 2007, Quigley et al 2006 and 2007, Ip et al 2007). There is good evidence that the use of breast milk substitutes results in increased risks to infant and maternal health in developed as well as developing countries, although the scale of risks differs in different settings. Formula milk does not offer, for example, the enhanced bioavailability of nutrients and the active immunity provided by breastmilk (Michaelson 2000); and contamination and infection can be introduced at several stages in the artificial feeding process (Scientific Panel on Microbiological Hazards 2004). There is also some evidence that breastfeeding may have long term benefits, resulting in lower mean blood pressure and total cholesterol, higher performance in intelligence tests, and reduced risk of overweight/obesity and type 2 diabetes (Horta et al 2007).

A good quality systematic review of health outcomes associated with infant feeding (Ip et al 2007); found the following adverse health outcomes to be associated with feeding breast milk substitutes rather than breastfeeding:

For the baby

Acute otitis media
Non-specific gastroenteritis
Severe lower respiratory tract infections
Atopic dermatitis
Obesity
Type 1 and 2 diabetes
Childhood leukaemia
SIDS
Necrotising enterocolitis
Type 2 diabetes

For the mother

Breast cancer
Ovarian cancer
Postnatal depression

3.2. Infant feeding rates in the UK

Data on infant feeding have been available in England and Wales since 1975, Scotland since 1980, and Northern Ireland since 1995, from the five-yearly national surveys conducted by OPCS/ONS.

Initiation

Surveys indicate that there has been an increase in initiation rates in all UK countries - from 65% in 1985 to 77% in 2005 in England and Wales, from 48% to 70% in Scotland over the same time period, and from 36% in 1990 to 63% in 2005 in Northern Ireland (Table 2.1). While indicating a positive upward trend, it is important to consider that over this time, mothers having babies are now more likely to be older, and young mothers and mothers from areas of high deprivation were under-represented in the 2000 and 2005 surveys (Bolling et al 2007). Data corrected for these sampling issues are therefore also shown in Table 2.1, indicating a more gradual rate of increase, of two percentage points since 1985 in England and Wales, and nine percentage points in Scotland.

Table 2.1. Initiation of breastfeeding in UK countries, based on quinquennial surveys (Bolling et al 2007): shown as percentage of respondents initiating breastfeeding.

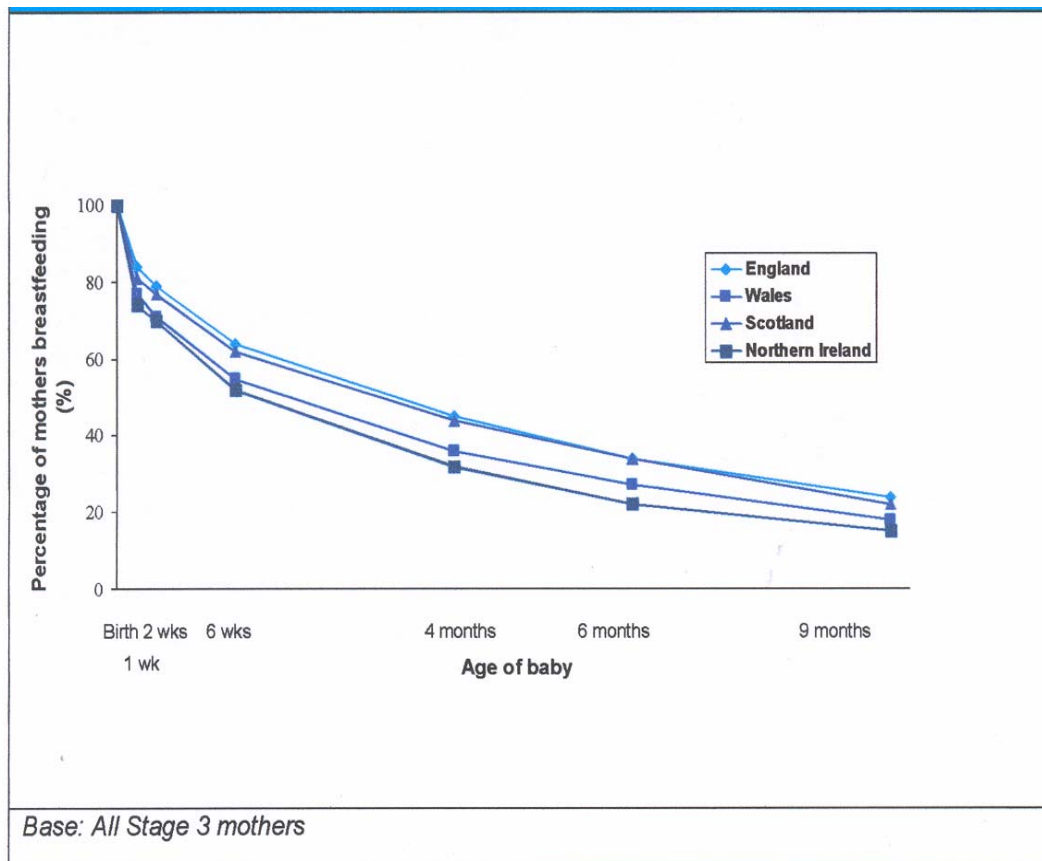
Figures in brackets indicate percentages when rates are standardised for the age and educational level of the sample.

Country	1985	1990	1995	2000	2005
England and Wales	65	64	68	71 (62)	77 (67)
Scotland	48	50	55	63 (54)	70 (57)
Northern Ireland	-	36	45	54 (47)	63 (51)

Duration

Figure 1 (below) shows that there is a rapid decline in breastfeeding rates following birth across the UK - dropping from 76% to 72% breastfeeding two days after birth, to 67% at four days, 63% at one week, and declining to 48% at six weeks (Bolling et al 2007). There has been a small improvement in the six week figures since previous surveys, when the six-week figures in 1995 and 2000 were 44% and 42% respectively.

Figure 1: Duration of breastfeeding among mothers who breastfed initially by country (Bolling et al 2007).



Of those who do continue to breastfeed, supplementation is likely to start early, and to continue; by six weeks after birth, 79% of all babies in the UK will be receiving formula milk regularly or occasionally. No babies were recorded as being exclusively breastfed at six months in the UK, and only 3% were exclusively breastfed at five months.

The median rate of breastfeeding in the UK is around one month, contrasting with rates across Europe of five months or over (Nicoll et al 2002). UK figures are much more comparable to rates in the US than to our closest European neighbours (Ross Laboratories 2003).

3.3. Factors associated with infant feeding

There is a clear socio-economic disparity in rates of breast and formula feeding. As shown in Table 2.2, women from lower socio-economic groups are more likely to start formula feeding, and to discontinue breastfeeding prematurely when they do start.

Table 2.2. Prevalence of breastfeeding in the UK at ages up to 9 months by mother's socio-economic classification (Bolling et al 2007).

	Managerial and professional	Intermediate	Routine and manual	Never worked	Unclassified	All mothers
Birth	88	77	66	64	69	76
1 week	79	62	51	50	58	63
6 weeks	65	46	32	38	50	48
9 months	24	17	11	19	25	18

The group least likely to breastfeed in England are young white women. Mothers most likely to breastfeed are from managerial and professional occupations, have higher educational levels, are over 30, and are from a minority ethnic group (Bolling et al 2007). Although breastfeeding remains the norm in several minority ethnic groups, exclusive breastfeeding remains rare, and rates in general have seen some decline (Thomas and Avery 1997, Griffiths et al 2005).

Reasons for starting or stopping breastfeeding

The most common reasons given for premature discontinuation include maternal report of insufficient milk, painful feeding, and the baby not feeding well (Bolling et al 2007). Each of these factors can, for the most part, be prevented or rapidly treated. Each can also be affected by broad socio-cultural issues and a general lack of knowledge and understanding about breastfeeding among health professionals and the wider society. For example, feeling that the baby is not having enough milk can result from the baby crying for reasons other than hunger; from the mother being highly anxious about her ability to breastfeed; from partners, family, friends and neighbours passing comment on the weight or behaviour of the baby; and from health professionals becoming concerned about the baby's weekly weight gain. Painful nipples and breasts, and problems with the baby taking the breast, can result from the mother not having been supported adequately in learning about positioning and attachment. All of these problems can also result from the mother having difficulty feeding with confidence when outside the home and sometimes even when inside her own home. These issues are most likely to affect young, first time, unpartnered mothers, and especially those from communities where breastfeeding has not been the norm for several generations.

Psycho-social factors may also play an important part in the decision to start, and to continue, breastfeeding. Various factors, including concern with body shape, EPDS score (assessing risk of postnatal depression), and anxiety scores, are linked with initiation and duration of breastfeeding (Chambers and McInnes 2006, Renfrew et al 2005).

One major challenge in addressing these multifaceted problems is that health professionals in all relevant disciplines in the UK may not have received appropriate training to promote, support and protect breastfeeding (Smale et al 2006). A recent national learning needs assessment identified marked deficits in all settings and all disciplines (McFadden et al 2006, Wallace and Kosmala 2006a and b, Dykes 2006, Abbott et al 2006, Renfrew et al 2006).

3.4. Minimising risks for babies not fed exclusively from the breast

It is important to ensure that women who formula feed, either exclusively or partially, are given adequate information to enable them to minimise the risks. This includes

the need for independent information on the nutrient composition of formula milk, and ways of cleaning and sterilising equipment.

Potentially avoidable problems of formula feeding can result from the vessel used to feed (most commonly, a plastic bottle and teat which are difficult to clean adequately and which may introduce environmental contaminants (Brede et al 2003); and the potential for further hazards to be introduced in the home, resulting perhaps from inadequate preparation, refrigeration or reheating, water contamination or the loss of a clean water supply (WHA 2005, Scientific Panel on Microbiological Hazards 2004). Some of these latter problems can also occur when expressing and feeding expressed breast milk. These problems may be more difficult for parents from low income families to address, simply as a result of overcrowding, lack of facilities in the kitchen, and financial constraints on buying sterilising products.

Mothers who choose to bottle feed may receive little information and support from the health services (Cairney and Alder 2001).

Guidance was issued by the Food Standards Agency in February 2006 on the cleaning of equipment, and preparation and storage of formula milk in the home www.dh.gov.uk/prod_consum_dh/idcplg?ldcService=GET_FILE&dID=116100&Rendition=Web (accessed 18th July 2007). This was based on a European report (Scientific Panel on Microbiological Hazards 2004) prepared as a result of concern about salmonella and *Enterobacter sakazakii*, both of which are rare but which have lethal consequences. It may be that such strategies will also help to prevent contamination with more common pathogens. The European report is based on theoretical assessment of strategies that are likely to work; studies to inform strategies that will help carers in the home avoid additional risks to the baby are limited.

3.5. The UK policy context

A target was set in the DH Priorities and Planning Framework 2003-2006 for England, to 'deliver an increase of two percentage points per year in breastfeeding initiation rates, focussing especially on women from disadvantaged groups (DH 2003a and b). A duration target was not set, however a new PSA Delivery Agreement by the UK Government in order to highlight the need to support breastfeeding now requires breastfeeding duration to be measured at 6-8 weeks (PSA Delivery Agreement 2007).

In line with the WHO (2003), a further policy goal was announced in May 2004, supporting exclusive breastfeeding to six months, replacing previous advice to introduce solids at 4 to 6 months. It was stated that:

"The Government is fully committed to the promotion of breastfeeding, which is accepted as the best form of nutrition for infants to ensure a good start in life. Breastmilk provides all the nutrients a baby needs. Exclusive breastfeeding is recommended for the first six months of an infant's life. Six months is the recommended age for the introduction of solid foods for infants. Breastfeeding (and/or breastmilk substitutes, if used) should continue beyond the first six months along with appropriate types and amounts of solid foods. Mothers who are unable to, or choose not to, follow these recommendations should be supported to optimise their infants' nutrition".

Breastfeeding has received support in the National Service Framework for Children and Maternity Services (DH 2004b), Every Child Matters (DfES 2004) and The White Paper 'Choosing Health'

3.6. References for Background

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4. Methodology

This review was conducted using current NICE methodology for the development of public health programme guidance (see http://www.nice.org.uk/aboutnice/howwework/developingnicepublichealthguidance/developing_nice_public_health_guidance.jsp).

4.1. Literature Search

Julie Glanville and Dave Fox, from the Centre for Reviews and Dissemination, University of York conducted the searches for this rapid review in February/March 2006, with input from the MCN-CC review team. The search was then updated in January 2007.

All of the searches were conducted using a stepped approach to identify relevant systematic reviews (SRs), randomised controlled trials (RCTs) and non-randomised studies (including non randomised controlled trials, before and after studies, cohort studies, qualitative studies and surveys). A worldwide search of a number of databases was conducted to identify relevant systematic reviews (from 1995 onwards). Secondly, a worldwide search for randomised controlled trials (RCTs) was conducted (from 1990 onwards). Finally, a third search included any type of study – but this search focused on studies from the UK published from 1990 onwards, which contained relevant interventions and could provide corroborative evidence; these are referred to as ‘corroborative studies’ throughout this report.

Studies not published in English were excluded from the review. A detailed report of the processes, databases, and search terms used are presented in Appendix C.

As part of the NICE public health guidance process (NICE, 2004) a stakeholder consultation on the draft summary of evidence was undertaken. This closed on 3rd May 2007. As part of this consultation, stakeholders were invited to submit evidence of relevance to this guidance. Either reference titles, abstracts or papers for the stakeholder papers were screened by both the MCN-CC review team and NICE from June to August 2007. All papers found to be potentially relevant were obtained and screened by the MCN-CC team and those that met the inclusion criteria were included in the review.

In addition a forthcoming paper by the Mother and Infant Research Unit, York, was identified which met the inclusion criteria (Renfrew 2008).

4.2. Selection of Studies for Inclusion

4.2.1. *Participants*

To be included in the review, the studies had to examine interventions to promote safe and healthy milk feeding practices in babies born at term, and up to the age of six months. The babies could be exclusively breastfed, partially breastfed, or exclusively formula fed. Low birth weight babies (<2.5kg) were excluded from the rapid review.

Where data was available, the review considered the following population subgroups in particular:

- Mothers and babies from lower socioeconomic groups
- Mothers and babies living in areas of deprivation including inner city areas
- Black and minority ethnic groups
- Mothers aged under 18

- Unsupported mothers
- Mothers from groups who are likely to be nutritionally vulnerable, including those who are homeless, travellers, refugees or asylum seekers, disabled women, prisoners.

Studies of mothers with multiple births were included. Interventions promoting the initiation and duration of breastfeeding in populations which included pregnant women were included where relevant.

To be included in the review, the studies had to be conducted in developed countries. The list of countries meeting the criterion of 'developed' was the same as that used by Renfrew et al (2005), which was adapted from the World Development Report 2001 (World Bank 2001). The list included the following countries:

Australia	France	Japan	Spain
Austria	Germany	Luxembourg	Sweden
Belgium	Greece	Netherlands	Switzerland
Canada	Iceland	New Zealand	United Kingdom
Denmark	Ireland	Norway	United States
Finland	Italy	Portugal	

However the SRs which were included as relevant for this review frequently contained studies in countries that were not included in this list of developed countries and two relatively recent RCTs in Brazil (Dias de Oliveira 2006) and Singapore (Su 2007) identified by stakeholders as relevant were also included in this review.

4.2.2. *Interventions*

The review included all public health type interventions that aimed to promote the initiation and duration of breastfeeding. The review also included:

- interventions that aimed to evaluate the cleaning and sterilisation of bottles, teats, breast pumps, or to evaluate methods of storage of feeds in the fridge or freezer.
- studies on the effectiveness of methods used to reheat formula and expressed breast milk.
- studies evaluating methods of breast milk expression such as hand pumps, electrical pumps and double pumpss.
- studies evaluating methods of milk feeding, including bottle feeding, cup feeding and spoon feeding..
- studies that examined the effectiveness of vitamin (e.g. vitamin A, vitamin C, vitamin E) and/or mineral supplementation (e.g. iron, selenium).

Studies of vitamin D were excluded as this issue was being covered by a separate review.

4.2.3. *Outcomes*

Outcomes considered included:

- Rates of initiation of breastfeeding
- Mean duration of breastfeeding
- Reducing risks for contamination of formula/breast milk
- Morbidity in the baby (i.e. infection, gastroenteritis)
- Improving the quantity of breast milk expression
- Ease of breast milk expression
- Nutrient status of the child, for example iron status

- Harm (including an assessment of whether increased initiation of breastfeeding has any adverse effects on mean duration)

4.2.4. *Relevant studies within systematic reviews*

The individual studies within identified systematic reviews were examined wherever possible and data retrieved on the details of specific interventions.

A pragmatic approach was taken due to insufficient time to retrieve and extract data from all the relevant studies included in SRs. To a large extent this review is still based on the relevant data provided by the SRs for individual studies. Whether individual reviews were unpicked largely depended on the area being considered. Reviews relating to question 1 were generally unpicked where the studies included largely met the inclusion criteria for this review (e.g. in terms of type of intervention and breastfeeding period (0-6 months of age)).

The majority of the SRs relevant to Key question 1 contained large numbers of relevant studies (>30 studies). The relevant studies contained within the SRs included studies other than RCTs, such as quasi-experimental trials, before-after studies and cohort studies. It should be noted that some of the individual studies within the SRs were published before 1990 and therefore outside our inclusion criteria (and indeed non were included in the final evidence statements).

A limited number of studies were found which addressed the four other key questions of this review. The included SRs were not unpicked in order to address these additional questions.

Where the overall conclusions of the SRs were relevant they have been added to the narrative text.

Screening process

Two reviewers independently screened all titles and abstracts identified in the literature search. Full paper copies of obtained studies were independently assessed for inclusion by two reviewers. Any disagreements regarding whether or not a paper met the inclusion criteria was achieved by consulting a third reviewer. The MCN-CC review team and NICE screened PDG and stakeholder-submitted papers- a list of excluded studies with reasons for exclusion is presented in Appendix B.

4.3. Quality Appraisal

All of the studies that met the inclusion criteria were critically appraised by two reviewers in accordance with criteria described in NICE (2006). A study was graded using a code '++', '+' or '-', based on the extent to which the potential sources of bias had been minimised. If there was any discrepancy in a grade given to a study by the two reviewers, the opinion of a third reviewer was sought. The NICE criteria and the methodology checklist used in this review are presented in Appendix D. It is noted that these grades reflect the quality of the author's reporting of their study.

Included corroborative UK studies (e.g. non intervention studies, cohort studies or qualitative studies) were not graded for quality.

For the relevant individual studies contained within SRs, the quality grading given by the author of the SR has been quoted and not the NICE quality grade, as we did not have direct access to all the individual studies. Details of the quality assessment method used in the SRs have been given within the text and within the Evidence Tables.

4.4. Study categorisation

For each of the five research questions, the included studies are presented by type of intervention.

4.5. Assessing applicability

Each included study was assessed to determine its applicability to UK settings. Notes on applicability are presented in the data extraction tables.

4.6. Synthesis

Due to heterogeneity of design among the studies, a narrative synthesis was conducted. After discussion between members of NICE and the MCN-CC review team it was decided that the narrative review would categorise the individual studies included in SRs and in the separate RCTs into 14 groups by type of intervention, which were not mutually exclusive. The 14 different types of public health intervention to increase the initiation and duration of breastfeeding included: Peer support programmes; Volunteer Counsellors; Postnatal Support Workers; Professional Support; Lactation Consultant/Breastfeeding Advisor/Breastfeeding Consultant (Trained, skilled and knowledgeable); Individual breastfeeding education in the antenatal period; Group breastfeeding education in the antenatal period; Postnatal breastfeeding education; Breastfeeding literature; Antenatal education and professional telephone support; Professional training; Professional training (Baby Friendly Hospital Initiative); Multi-faceted interventions; and Media programmes.

5. Results

The searches for SRs, RCTs and UK corroborative studies identified 598, 4682 and 1387 citations respectively, totalling 6667 citations. Full paper copies of 28 SRs, 102 RCTs and 25 UK corroborative studies were obtained. In addition, one forthcoming publication of a SR by the Mother and Infant Research Unit, York, was identified which met the inclusion criteria. In total, 25 studies (26 publications) met the inclusion criteria (seven SRs, and 18 RCTs). In addition, 13 corroborative UK studies were included. These studies were not data extracted, but their key points are summarised in tables below. Full references of the included studies are listed in Appendix A.

In addition, a number of papers were identified as being of potential interest by the PDG and stakeholders. Of the 18 papers which were identified as potentially relevant five met the inclusion criteria for this review: two SRs (Couto de Oliveira 2001, Guise 2003), two RCTs (Su 2007, Schlikau and Wilson 2005) and one UK corroborative study (Tappin 2006). Those which merited consideration but which did not meet the inclusion criteria and were finally excluded are listed in a table at the end of Appendix B.

The final totals for included papers therefore became 29 studies (30 publications) of which nine were SRs, and 20 individual RCTs) and 14 corroborative UK based studies.

All papers that merited consideration but did not meet the inclusion criteria are presented in Appendix B – with reasons for exclusion.

Overview of identified references

Breastfeeding initiation and duration references

Twenty two studies (seven SRs and fifteen RCTs) assessed interventions to improve the initiation and duration of breastfeeding.

In addition, corroborative evidence from four UK studies for interventions to improve the initiation and duration of breastfeeding was identified for Peer support (Dykes 2003, Dykes 2005, Hoddinott 2006); Postnatal breastfeeding education (Dykes 2003); and Professional training within the Baby Friendly Initiative (Tappin 2006).

<i>Reference</i>	<i>Methodology checklist rating</i>
Peer support programmes	
Fairbank L, S. O'Meara, et al. (2000) "A systematic review to evaluate the effectiveness of interventions to promote the initiation of breastfeeding." <u>Health Technology Assessment</u> 4 25:1-171.	2++
Renfrew, M.J., L. Dyson, et al. (2005) "Effectiveness of health interventions to promote the duration of breastfeeding: systematic review." London: <u>National Institute for Health and Clinical Excellence</u> ..	2++
Britton, C., F.M. McCormick, et al. (2007) "Support for breastfeeding mothers" <u>Cochrane Database of Systematic Reviews</u> 2007, Issue 1. Chichester, UK: John Wiley & Sons, Ltd.	2++
Muirhead, P.E., G. Butcher, et al. (2006). "The effect of a programme of organised and supervised peer support on the initiation and duration of breastfeeding: a randomised trial." <u>British Journal of General Practice</u> . 56(524):191-7.	1++
Chapman, D. J., G. Damio, et al. (2004a). "Effectiveness of breastfeeding peer counseling in a low-income, predominantly Latina population: a randomized controlled trial." <u>Archives of Pediatrics &</u>	1-

Adolescent Medicine 158(9): 897-902.	
Chapman, D., G. Damio, et al. (2004b). "Association of degree and timing of exposure to breastfeeding peer counseling services with breastfeeding duration." <u>Advances in Experimental Medicine & Biology</u> 554: 303-6.	1-
Anderson, A. K., G. Damio, et al. (2005). "A randomized trial assessing the efficacy of peer counseling on exclusive breastfeeding in a predominantly Latina low-income community." <u>Archives of Pediatrics & Adolescent Medicine</u> 159(9): 836-41.	1-
Volunteer Counsellors	
Renfrew, M.J., L. Dyson, et al. (2005) "Effectiveness of health interventions to promote the duration of breastfeeding: systematic review." London: <u>National Institute for Health and Clinical Excellence</u> .	2++
Postnatal Support Workers	
Renfrew, M.J., L. Dyson, et al. (2005) "Effectiveness of health interventions to promote the duration of breastfeeding: systematic review." London: <u>National Institute for Health and Clinical Excellence</u> .	2++
Professional support	
Fairbank L, S. O'Meara, et al. (2000) "A systematic review to evaluate the effectiveness of interventions to promote the initiation of breastfeeding." <u>Health Technology Assessment</u> 4 25:1-171.	2++
Renfrew, M.J., L. Dyson, et al. (2005) "Effectiveness of health interventions to promote the duration of breastfeeding: systematic review." London: <u>National Institute for Health and Clinical Excellence</u> .	2++
Britton C., F.M. McCormick, et al. Support for breastfeeding mothers. <u>Cochrane Database of Systematic Reviews</u> 2007, Issue 1. Chichester, UK: John Wiley & Sons, Ltd.	2++
Wallace L.M, O.M. Dunn, et al. (2006) "A randomised-controlled trial in England of a postnatal midwifery intervention on breast-feeding duration." <u>Midwifery</u> 22: 262-273.	1++
Di Napoli, A., D. Di Lallo, et al. (2004). "Home breastfeeding support by health professionals: findings of a randomized controlled trial in a population of Italian women." <u>Acta Paediatrica</u> 93(8): 1108-14.	1-
Lactation Consultant/Breastfeeding Advisor/Breastfeeding Consultant	
Renfrew, M.J., L. Dyson, et al. (2005) "Effectiveness of health interventions to promote the duration of breastfeeding: systematic review." London: <u>National Institute for Health and Clinical Excellence</u>	2++
Guise, J.-M., V. Palda, et al. (2003) "The effectiveness of primary care-based interventions to promote breastfeeding: systematic evidence review and meta-analysis for the US Preventive Services Task Force." <u>Annals of Family Medicine</u> 1(2): 70-80.	2+
Bonuck, K. A., M. Trombley, et al. (2005). "Randomized, controlled trial of a prenatal and postnatal lactation consultant intervention on duration and intensity of breastfeeding up to 12 months." <u>Pediatrics</u> 116(6): 1413-26.	1+
Su L.-L., Y.-S. Chong, et al. (2007) "Antenatal education and postnatal support strategies for improving rates of exclusive breastfeeding: randomised controlled trial." <u>British Medical Journal</u> published online 1 Aug 2007	1+
Dias de Oliveira L., E.R.J. Giugliani, et al. (2006). "Effect of intervention to improve breastfeeding technique on the frequency of exclusive breastfeeding and lactation-related problems." <u>Journal of Human Lactation</u> 22(3): 315-321.	1-
Breastfeeding education	
Fairbank L, S. O'Meara, et al. (2000) "A systematic review to evaluate the effectiveness of interventions to promote the initiation of breastfeeding." <u>Health Technology Assessment</u> 4 25:1-171.	2++
Renfrew, M.J., L. Dyson, et al. (2005) "Effectiveness of health interventions to promote the duration of breastfeeding: systematic review." London: <u>National Institute for Health and Clinical Excellence</u> .	2++
Dyson, L., F.M. McCormick, et al (2005). "Interventions for promoting the initiation of breastfeeding." <u>The Cochrane Database of Systematic Reviews</u> Issue 2. Chichester, UK: John Wiley & Sons, Ltd.	2++
Couto de Oliveira, M.I., L.A. Bastos Camacho, et al. (2001). "Extending breastfeeding duration through primary care: a systematic review of prenatal and postnatal interventions." <u>Journal of Human Lactation</u> 17(4): 326-43.	2+
Guise, J.-M., V. Palda, et al. (2003) "The effectiveness of primary care-based interventions to promote breastfeeding: systematic evidence review and meta-analysis for the US Preventive Services Task Force." <u>Annals of Family Medicine</u> 1(2): 70-80.	2+
Tedstone A., N. Duncce, et al. (1998). "Effectiveness of interventions to promote healthy feeding in	2-

infants under one year of age: a review." London: Health Education Authority.	
Forster, D., H. McLachlan, et al. (2004). "Two mid-pregnancy interventions to increase the initiation and duration of breastfeeding: A randomized controlled trial." <u>Birth</u> 31(3): 176-182.	1++
Labarere, J., V. Bellin, et al. (2003). "Assessment of a structured in-hospital educational intervention addressing breastfeeding: a prospective randomised open trial." <u>BJOG: An International Journal of Obstetrics & Gynaecology</u> 110(9): 847-52.	1++
Labarere, J., N. Gelbert-Baudino, et al. (2005). "Efficacy of breastfeeding support provided by trained clinicians during an early, routine, preventive visit: A prospective, randomized, open trial of 226 mother-infant pairs." <u>Pediatrics</u> 115(2): e139-e146.	1++
Lavender, T., L. Baker, et al. (2005). "Breastfeeding expectations versus reality: a cluster randomised controlled trial." <u>BJOG: An International Journal of Obstetrics & Gynaecology</u> 112(8): 1047-53.	1+
Noel-Weiss, J., A. Rupp, et al. (2006). "Randomised controlled trial to determine effects of prenatal breastfeeding workshop on maternal breastfeeding self-efficacy and breastfeeding duration." <u>Journal of Obstetric, Gynecologic, and Neonatal Nursing</u> , 35: 616-624.	1+
Su L.-L., Y.-S. Chong, et al. (2007) "Antenatal education and postnatal support strategies for improving rates of exclusive breastfeeding: randomised controlled trial." <u>British Medical Journal</u> published online 1 Aug 2007	1+
Schlickau, J. and M. Wilson, (2005) "Development and testing of a prenatal breastfeeding education intervention for Hispanic women." <u>The Journal of Perinatal Education</u> 14(4): 24-35.	1-
Wolfberg, A. J., K. B. Michels, et al. (2004). "Dads as breastfeeding advocates: results from a randomized controlled trial of an educational intervention." <u>American Journal of Obstetrics & Gynecology</u> 191(3): 708-12.	1-
Professional training	
Fairbank L, S. O'Meara, et al. (2000) "A systematic review to evaluate the effectiveness of interventions to promote the initiation of breastfeeding." <u>Health Technology Assessment</u> 4 25:1-171.	2++
Renfrew, M.J., L. Dyson, et al. (2005) "Effectiveness of health interventions to promote the duration of breastfeeding: systematic review." London: <u>National Institute for Health and Clinical Excellence</u> .	2++
Labarere, J., N. Gelbert-Baudino, et al. (2005). "Efficacy of breastfeeding support provided by trained clinicians during an early, routine, preventive visit: A prospective, randomized, open trial of 226 mother-infant pairs." <u>Pediatrics</u> 115(2): e139-e146.	1++
Wallace L.M., O.M. Dunn, et al. (2006) "A randomised-controlled trial in England of a postnatal midwifery intervention on breast-feeding duration." <u>Midwifery</u> 22: 262-273.	1++
Multi-faceted interventions	
Fairbank L, S. O'Meara, et al. (2000) "A systematic review to evaluate the effectiveness of interventions to promote the initiation of breastfeeding." <u>Health Technology Assessment</u> 4 25:1-171.	2++
Renfrew, M.J., L. Dyson, et al. (2005) "Effectiveness of health interventions to promote the duration of breastfeeding: systematic review." London: <u>National Institute for Health and Clinical Excellence</u> .	2++
Couto de Oliveira, M.I., L.A. Bastos Camacho, et al. (2001). "Extending breastfeeding duration through primary care: a systematic review of prenatal and postnatal interventions." <u>Journal of Human Lactation</u> 17(4): 326-43.	2+
Guise, J.-M., V. Palda, et al. (2003) "The effectiveness of primary care-based interventions to promote breastfeeding: systematic evidence review and meta-analysis for the US Preventive Services Task Force." <u>Annals of Family Medicine</u> 1(2): 70-80.	2+
Media programmes	
Fairbank L, S. O'Meara, et al. (2000) "A systematic review to evaluate the effectiveness of interventions to promote the initiation of breastfeeding." <u>Health Technology Assessment</u> 4 25:1-171.	2++

Contamination of equipment/storage and heating of breast milk/reconstitution of formula references

Two SRs (Bernath 2001, Renfrew 2008) were relevant to interventions which reduced the risks of contamination of equipment used in bottlefeeding and there was corroborative evidence from three UK studies (Atkinson 2001, Rowan 1998a, Shetty 2006). No studies addressed the storage and reheating of breast milk but there was corroborative evidence from five UK studies (Ali 2004, Hands 2003, Rowan 1997, Rowan 1998b, Wright 1998) and one SR (Renfrew 2003) was relevant to interventions which reduced the risks associated with the inaccurate reconstitution of formula.

<i>Reference</i>	<i>Methodology checklist rating</i>
V. Bernath (2001). "Cross infection associated with shared infant feeding equipment". Monash: Centre for Clinical Effectiveness.	2-Well conducted search strategy
Renfrew M.J., M. McLoughlin, et al. (2008) "Cleaning and 'sterilisation' of infant feeding equipment: a systematic review." Public Health Nutrition Abstract available online 26Feb2008 at) http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=1766984&fulltextType=RA&fileId=S1368980008001791 < http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=1766984&fulltextType=RA&fileId=S1368980008001791 >	2-
Renfrew M.J., P. Ansell, et al. (2003). "Formula feed preparation: helping reduce the risks; a systematic review." <i>Archives of Disease in Childhood</i> 88(10): 855-858.	2+

Expression of breast milk references

Three RCTs assessed interventions addressing the most effective methods to express breast milk. No corroborative evidence was identified.

<i>Reference</i>	<i>Methodology checklist rating</i>
Fewtrell, M., P. Lucas, et al. (2001). "Randomized study comparing the efficacy of a novel manual breast pump with a mini-electric breast pump in mothers of term infants." <i>Journal of Human Lactation</i> 17(2): 126-31.	1+
Zinaman, M. J., V. Hughes, et al. (1992). "Acute prolactin and oxytocin responses and milk yield to infant suckling and artificial methods of expression in lactating women." <i>Pediatrics</i> 89(3): 437-40.	1-
K.G. Auerbach (1990). "Sequential and simultaneous breast pumping: a comparison." <i>International Journal of Nursing Studies</i> 27(3): 257-65.	1+

Supplemental feeding modes references

Only one RCT was identified of the effectiveness of supplemental feeding modes and there was additional corroborative evidence from two UK studies (Brown 1998, Cloherty 2005).

<i>Reference</i>	<i>Methodology checklist rating</i>
Field, T. M., S. Schanberg, et al. (1997). "Bottlefeeding with a breast-like nipple." <i>Early Child Development and Care</i> 132: 57-63.	1-

No studies were identified addressing the effectiveness of vitamin supplementation in infants who are partly breastfed or exclusively formula fed.

5.1. Key question 1: What public health interventions aimed at mothers effectively increase the initiation and duration of breastfeeding normal term babies?

5.1.1. Peer support programmes

Peer support programmes may vary considerably in design and delivery. Peer support programmes, volunteer counsellors and postnatal support workers have been presented separately as described by the study. Peer support programmes are also included in the evaluation of multi-faceted interventions. The peer support programmes presented have been developed by the healthcare service. It is important to consider that the effectiveness of such programmes may vary according to the ethnicity, age and culture of women recruited in the study, and acceptability to the population group.

This review identified three good quality SRs (2++) (Fairbank 2000, Renfrew 2005, Britton 2007) and three additional RCTs (Anderson 2005, Chapman 2004a and b, Muirhead 2006) that evaluated peer support programmes to improve the initiation or duration of breastfeeding. Fairbank et al (2000) included four non-randomised controlled trials on peer support programmes: Caulfield et al (1998)++, Schafer et al (1998)++, Kistin et al (1994)- and McInnes (1998)++. They concluded that peer support offered antenatally to women on low-incomes who intended to breastfeed was effective at increasing the rate of both breastfeeding initiation and duration.

The SR by Renfrew et al (2005) included three RCTs in their review under the category of peer supporters/counsellors (Dennis 2002 (1++), Mongeon and Allard 1995 (1-), Graffy 2004 (1++)). Two of these papers (those of at least moderate quality) are described under different section headings in this rapid review (see 'Volunteer Counsellors'). Based on the results of their SR, Renfrew et al (2005) concluded that effective peer support interventions were those that were given very soon after birth to women who did not have to request the support in order to receive it.

The third SR by Britton et al (2007) (not unpicked for individual grading) included nine trials of lay support (Chapman 2004, Dennis 2002, Graffy 2004, Haider 2000, Jenner 1988, Leite 1998, Mongeon and Allard 1995, Morrell 2000, Morrow 1999) and concluded (from the six studies where exclusive breastfeeding was reported) that lay support resulted in a marked reduction in the cessation of exclusive breastfeeding (RR 0.72, 95% CI 0.57, 0.90), which on subgroup analysis appeared to be mainly within the first 3 months. Three of the six studies contributing to the subgroup analysis, which individually had a significant effect, were in Bangladesh (Haider 2000), Brazil (Leite 1998) and Mexico (Morrow 1999). One study (Jenner 1988) included only working class women, while the remaining two UK studies neither of which individually contributed a significant result were in an even mixture of all social classes (Graffy 2004, Morrell 2000). The overall conclusion for the seven studies on any breastfeeding was similar but less significant: lay support resulted in a reduction in the cessation of any breastfeeding (RR 0.86, 95% CI 0.76, 0.98) but subgroup analysis did not give a significant effect at any time point. There were no obvious reasons for the relative success of some studies compared to others. In fact the study with the greatest effect used intensive telephone support but was of affluent well-educated Canadian women (Dennis 2002).

The two UK studies included in the analysis did not contribute a significant result. Overall in the review, the effect of incorporating an antenatal element of breastfeeding support into a study was not significant but those 20 studies incorporating postnatal support alone were significant (RR 0.89, 95% CI 0.84, 0.96) for reducing the cessation of any breastfeeding at last study assessment up to 6 months. However, the effect estimates were similar and the difference between the two effects was not significant. Six studies using lay support contributed to the analysis and their results were compatible with the conclusion. Similarly, face-to-face support appeared to be more effective than telephone support generally in the review in preventing the stopping of breastfeeding up to 6 months (RR 0.85, 95% CI 0.79, 0.92) and all the seven studies which used lay support contributed to the analysis.

In addition, the following three RCTs provide evidence to complement the SRs: One 1++ study (Muirhead 2006) examined the effectiveness of peer support on the rates of 'any' and 'exclusive' breastfeeding up to eight weeks. Two hundred and twenty five women in Ayrshire, Scotland were randomised to receive education and support from trained peer supporters in the antenatal and postnatal periods or to the control arm with standard care including home visits from the community midwife for 10 days, visits from the health visitor after the 10th day, and breastfeeding support groups and workshops. The intervention allowed for peer support until 16 weeks after hospital discharge. No information on the socio-economic status of the women was reported. The loss to follow-up was minimal (2.2%). Thirteen women in the intervention group did not receive peer support. There were no baseline differences in those who received and did not receive support; all participants were entered into the analysis. At six weeks, 'any breastfeeding' occurred in 31.3% of women in the intervention group and 29.2% in the control group (95% CI -10.0 -14.0). Exclusive breastfeeding at six weeks was 24.1% in the intervention group and 21.2% in the control group (95% CI -8.1 - 13.8). Corresponding figures for 'any breastfeeding' at 16 weeks were 23.2% and 17.7% (95%CI -5.0-16.0) and 1.8% and 0% for 'exclusive breastfeeding' (95% CI -0.7-4.2). None of the comparisons were statistically significant. Cumulative breastfeeding survival (Kaplan-Meier) was higher in the intervention group for all participants ($p=0.5$), for women who intended to breastfeed ($p=0.4$) and for those who started to breastfeed ($p=0.4$). First time mothers appeared to benefit from the intervention.

One 1- study Chapman et al (2004a) evaluated the impact of an existing peer counselling programme for a low-income, predominantly Hispanic population in a large city in the USA. Two hundred and nineteen women who intended to breastfeed were randomised to receive breastfeeding education, support and counselling from peer counsellors or the control group with routine breastfeeding education, written information, hands-on assistance in hospital and postnatal access to a telephone helpline. The intervention was designed to give one prenatal visit offering breastfeeding education and assessment with optional viewing of an educational video, daily intra-partum hospital visits involving hands-on assistance and further education, and three postnatal home visits offering one-to-one counselling with optional free breast pump and further access to peer counsellor services on request. The first postnatal visit was designed to be within 24 hours after hospital discharge; however there was no information on the cut-off date for the intervention i.e. 2 or 3 months postnatally. Fifty three percent of the women received at least one prenatal visit, which lasted a mean of 69 minutes, 94% received at least one hospital visit, and 50% received at least one postnatal home visit. The loss to follow-up at six months was 12.7%, with no significant differences between the groups. Peer counselling significantly reduced the number of women not initiating breastfeeding (RR 0.39, 95%CI 0.18-0.86). Although not significant, the authors state that fewer women in the intervention group were not breastfeeding at one and three months postpartum

compared to the control group (RR 0.72, 95% CI 0.50-1.05 and RR 0.78, 95%CI 0.61-1.00, respectively). The impact of the intervention on exclusive breastfeeding was not apparent.

Chapman et al (2004b) reports on process outcomes from Chapman et al (2004a). In the first month, 45% percent of women received postnatal home visits and 51% received telephone contact. In the second month the figures dropped to 8% and 12% respectively. The first quartile of breastfeeding duration among women who received prenatal visits was significantly higher than those who did not receive home visits (1.8 month vs. 0.5 month, $p < 0.05$). Similarly, among participants who received both hospital and postnatal contact breastfeeding duration was higher than for those who did not receive this contact (1.8 month vs. 0.5 month, $p < 0.05$).

One 1- study by Anderson et al (2005) evaluated the effect of peer counselling to promote exclusive breastfeeding in the same population and setting as the earlier study, but at a later date. One hundred and eighty two women who were intending to breastfeed, the majority of whom were Hispanic or Black, were randomised to receive breastfeeding education and counselling from trained peer counsellors during antenatal, intra-partum and post partum visits until three months after the birth of their baby, or randomised to the control group which involved lactation education and support as per the Baby Friendly Hospital Initiative (BFHI) directives, plus lactation consultant services while in hospital, and postnatal access to a 24-hour breastfeeding helpline. The differences between this and the earlier study by Chapman et al (2004) were an increase in the number of prenatal and postnatal visits (from 1 prenatal and 3 postnatal to 3 and 9 respectively). In addition, breastfeeding education was extended to the woman's family. At hospital discharge, fewer women in the intervention group did not initiate breastfeeding (RR 2.48, 95% CI 1.04-5.90). Non-exclusive breastfeeding was higher in the intervention compared to the control group (RR 1.35, 95%CI 0.94-1.93) at hospital discharge, but in the postnatal period, prevalence of non-exclusive breastfeeding rates were consistently higher in the control group; at three months it was 73% in the intervention group compared to 97.2% in the control group (RR 1.33, 95% CI 1.14-1.56).

Summaries of evidence

Three ++ non-randomised control trials included in Fairbank et al (2000) evaluated peer support programmes. The interventions included training of peer supporters, antenatal and postnatal support (telephone, home visits, group or contact at clinic that was initiated by the peer supporter. The studies found a statistically significant increase in the initiation and or duration of breastfeeding among women from low-income groups who intended to breastfeed (Caulfield 1998, Schafer 1998, McInnes 1998).

Seven RCTs in Britton et al (2007) evaluated peer support programmes. Six studies found that lay support resulted in a marked significant reduction in the cessation of exclusive breastfeeding, which appeared to be predominately during the first 3 months. However three of the studies were in countries not considered relevant to NICE reviews and neither of the two contributing UK studies individually gave significant results (Graffy 2004, Morrell 2000). (These two UK studies were of populations containing a mixture of all social classes.) Seven studies showed a similar but less significant reduction in the cessation of any breastfeeding but subgroup analysis did not give a significant effect at any time point. Overall, the effect of incorporating an antenatal element of breastfeeding support into a study was not significant but those studies incorporating postnatal support alone significantly

reduced the cessation of any breastfeeding up to 6 months. Six studies using lay support contributed to the analysis and their results were compatible with the conclusion. Similarly, face-to-face support appeared to be more effective than telephone support in preventing the stopping of breastfeeding up to 6 months and all seven studies which used lay support contributed to the analysis.

One 1++ RCT evaluated a peer support programme including; peer support training, one antenatal visit, postnatal support (not necessarily within 72 hours) by telephone or home visit and support groups. The study found no significant difference in breastfeeding initiation and duration rates (up to 16 weeks) compared to routine care in a general population in Scotland (Muirhead 2006).

Table 5.1 Sub-questions for studies on peer support

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/ setting or intensity/ duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
Muirhead 2006	Not clear from paper	Not clear from paper	This intervention was running in a BFHI accredited hospital. There was no peer support contact during the hospital stay. Peer support not offered if woman was not breastfeeding at hospital discharge (we do not have length of stay information)	The women were satisfied with the peer support given and some appreciated the limited antenatal contact provided.	No	Not applicable – not effective
Chapman 2004 a 2004 b	An intervention of this nature appears to depend on staff availability, therefore, number of	Not clear from paper	The duration of breastfeeding varied with number of home visits	Not reported	No	Cost of providing a service such as this in the UK setting, the time spent training, monitoring and

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/ setting or intensity/ duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
	contacts with participants.					administering; may be barriers at the peer support-health service interface
Anderson 2005	Intensive peer counselling with more peer-supporter-woman contact when compared to Chapman 2004	Preference for English as means of communication in control group – not clear how this effects the results	Not clear from paper	Not reported	No	As above

Table 5.2 Corroborative evidence of peer support in the UK

Reference	Key points for practice development in UK settings
Dykes 2005	<p>Included evaluation studies of 26 peer support projects funded by the DH as part of the Infant Feeding Initiative (1999). Practice points associated with successful peer support:</p> <ul style="list-style-type: none"> • Needs assessment of local culture • Building on existing infrastructure and linking to existing services • Early and comprehensive planning by project co-coordinators through effective communication with all possible stakeholders • Appropriate selection, training and support of peer supporters • Recognition of difficulties at the peer-professional interface, appropriate management • Strong publicity strategy • Careful planning of referral strategies and access points • Comprehensive evaluation and monitoring – and allowances for changes based on result of evaluation • Obtaining and maintaining funding
Dykes 2003	<p>Included 29 projects of support centres where women could come for support, of which 18 were set up in association with peer support programme. Key points associated with success (other than those listed in Dykes, 2005):</p> <ul style="list-style-type: none"> • Availability of a healthcare professional back-up • Careful consideration of the name given to a support centre • Weekly opening of centre (at least) • Centre open for antenatal and postnatal women

Hoddinott 2006	<ul style="list-style-type: none"> • Group-based and one-to-one coaching for pregnant women and breastfeeding mothers can effectively increase breastfeeding initiation and duration • Participatory involvement with women and with frontline healthcare professionals • Completeness of data collection • Areas with low breastfeeding rates are likely to have the largest benefit; whereas areas with the highest breastfeeding rates may show a drop in breastfeeding • More effective in midwife-led community units • Scottish women preferred group-based coaching assuming that there was less likelihood of a negative experience than with one-to-one coaching to breastfeed.
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5.1.2. *Volunteer Counsellors*

The SR by Renfrew et al (2005) included two studies that evaluated volunteer breastfeeding counsellors (Dennis 2002, Graffy 2004). In both studies counsellors from the local voluntary organisation were evaluated. The 1++ trial by Dennis et al (2002) provides evidence that postnatal telephone support instigated by the supporter within 48 hours postnatally to relatively well-educated mothers, was effective in increasing 'any' and 'exclusive' breastfeeding up to three months. The 1++ study by Graffy et al (2004) demonstrated that volunteer support offered to high income women was not effective at promoting breastfeeding duration; however it is noted that the offer was made in the antenatal but not in the postnatal period, and that women were expected to ask for help from volunteers after they went home.

Summary of evidence

Two 1++ RCTs included in the Renfrew et al (2005) SR evaluated volunteer breastfeeding counsellors. The first found telephone support instigated by the supporter within 48 hours of hospital discharge significantly increased the duration of any and exclusive breastfeeding at 4, 8 and 12 weeks compared to conventional care in relatively well-educated mothers who were breastfeeding at study recruitment (Dennis 2000). The other study reported that one antenatal visit at which the offer of postnatal support was made along with a contact card and leaflets had no effect on breastfeeding initiation or duration rates (Dennis 2002, Graffy 2004).

5.1.3. *Postnatal Support Workers*

The SR by Renfrew et al (2005) included two RCTs that evaluated additional postnatal support to women regardless of their infant feeding intention (Mongeon and Allard 1995, Morrell 2000). One 1++ study (Morrell 2000) evaluated an intervention involving up to 10 visits by a trained worker for up to 3 hours per day during the first 28 days after birth; the worker provided practical and emotional support, including reinforcing midwifery advice on infant feeding. Women were recruited from the general UK population. No differences were found in the percentages of women breastfeeding at 6 months in the intervention group in comparison to the control group. The study by Mongeon and Allard (1995) was considered to be of relatively poor quality, and is therefore not described.

Summary of evidence

One 1++ randomised control trial in Renfrew et al (2005) evaluated an intervention that included up to ten visits from a trained support worker for up to three hours per day in the first 28 days postnatal (as well as usual care). The study reported no significant increases in the duration of breastfeeding. Women were recruited from the general UK population (Morrell 2000).

5.1.4. Professional support

Healthcare professional appraisal/ support in infant feeding can be defined as support and appraisal provided by a healthcare professional from within the health care system. Two randomised controlled trials of healthcare professional support met the inclusion criteria (Di Napoli 2004, Wallace 2006) in addition to the SRs by Fairbank et al (2000), Renfrew et al (2005) and Britton et al (2007).

Fairbank et al (2000) included one relevant RCT (Oakley 1990). This UK study (not graded) evaluated the effectiveness of social support from healthcare professionals on breastfeeding initiation. It targeted low-income women with a high risk of having a low birth weight baby. They found that home visits, telephone calls and access to a helpline during the 2nd and 3rd trimester from a midwife did not significantly increase rates of breastfeeding initiation, although there was some improvement in comparison to the control group. It was noted, however, that women welcomed the social support from the midwife.

Renfrew et al (2005) included five RCTs that evaluated healthcare professional support (Porteous 2000 (1++), Pugh 2002 (1+), Pugh and Milligan 1998 (1-), Wrenn 1997 (1+), Quinlivan et al 2003 (1++)). One small (n=52) RCT (Porteous 2000) evaluated intensive, regular postnatal support (including daily hospital visits, telephone call within 72 hours, a home visit within the first week postnatally, a phone number/pager to contact the midwife, and weekly phone calls for four weeks with further home visits if required) with a trained midwife. At 4 weeks, there was a significant increase in 'any' or 'exclusive' breastfeeding in women in the intervention group compared to those in the control group. It is noted that the participants were women who were breastfeeding at recruitment. Another study (1+) (Pugh 2002) found that breastfeeding-specific support from peers and professionals working together increased breastfeeding rates among women who planned to breastfeed, so long as it was pro-actively offered to new mothers soon after birth. The results from two other studies (Wrenn 1997, Quinlivan 2003) demonstrated that planned, structured support from health professionals that did not include additional breastfeeding support was not effective at increasing breastfeeding duration rates. The study by Pugh and Milligan (1998) was of relatively poor quality and is therefore not described.

Britton et al (2007) included eighteen RCTs (not unpicked for individual grading) comparing professional support with usual care (Albernaz 2003, Di Napoli 2004, Frank 1987, Froozani 1999, Gagnon 2002, Grossman 1990, Jones and West 1985, Kools 2005, Kramer 2001, Lynch 1986, McDonald 2003, Moore 1985, Pinelli 2001, Porteous 2000, Quinlivan 2003, Santiago 2003, Sjolín 1979, Wrenn 1997) and concluded that professional support was effective overall. Four of the studies were set in low income countries (Albernaz 2003 (Brazil), Froozani 1999 (Iran), Kramer 2001 (Belarus), Santiago 2003 (Brazil)). The overall results for this intervention from this SR may therefore not be generalisable to UK service settings. The benefit derived from professional support achieved statistical significance for 'exclusive' (12 studies) (RR 0.91, 95% CI 0.84-0.98) but not for 'any' breastfeeding (16 studies) (RR 0.94, 95% CI 0.87-1.01). Professional support had a significant beneficial effect on exclusive breastfeeding at all time points but 4 months when it was marginally significant. The effect appeared to be greater in the first 3 months (RR before 4-6 weeks 0.69, 95% CI 0.51-0.92; RR before 2 months 0.76, 95% CI 0.61-0.94; RR before 3 months 0.84, 95% CI 0.72-0.99). Professional support only significantly prevented early cessation of 'any' breastfeeding at 4 and 9 months (RR 0.78, 95% CI 0.67-0.91 and RR 0.87, 95% CI 0.78-0.97, respectively) but not at other time points (4-6 weeks and 2, 3, 6 and 12 months). The one included UK study (1-) (Jones and

West 1985) in a mixed socio-economic population using a lactation nurse gave a significant positive effect for 'any' breastfeeding up to 6 months. Analysis for early cessation of 'any' breastfeeding and those studies with lay support plus those studies with professional support found interventions were more successful with face-to-face interventions compared to telephone contact (RR 0.85, 95% CI 0.79-0.92). All the studies which used professional support contributed to the analysis and their results for 'any' breastfeeding were compatible with the conclusion. Overall in the review, the effect of incorporating an antenatal element of breastfeeding support into a study was not significant but those 20 studies incorporating postnatal support alone were significant (RR 0.89, 95% CI 0.84-0.96) for reducing the cessation of any breastfeeding at last study assessment up to 6 months. However, the effect estimates for studies containing an antenatal element and those which only used postnatal support were similar and the difference between the two effects was not significant. The relevant 16 studies using professional support contributed to the analysis and their results were compatible with the conclusion. However, only two of the 16 studies had an antenatal component (Kools 2005, McDonald 2003).

In addition to these SRs, one RCT (1-) (Di Napoli 2004) evaluated the effectiveness of breastfeeding counselling and support by a midwife on the initiation and duration of breastfeeding. Six hundred and five pregnant women living in Rome who intended to breastfeed, had telephone access, and who had healthy term babies were randomised after completing a questionnaire with a trained interviewer one day before discharge from hospital. Women in the control group appeared to be older but they did not differ by previous breastfeeding experience. A midwife who had attended the UNICEF 18-hour intensive training course on breastfeeding techniques and management delivered the intervention. The midwife made a 30-minute home visit within seven days of discharge, and this was followed by telephone counselling (no further details were provided). Once every two weeks over the next six months, a trained interviewer administered a questionnaire by phone. The control group had no specific intervention. There was complete follow-up for 45.9%, partial follow-up for 43.6% and no follow-up for 10.4% subjects. Of the 303 subjects assigned to the intervention group, 44 (14.5%) refused the intervention. There were no significant differences between the intervention and control groups in duration of breastfeeding after controlling for confounding factors. For those in the intervention group who refused the home visit, there was a significant increased risk of discontinuing breastfeeding at 4 months and 6 months (HR 1.52, 95% CI 1.0-2.17 and HR 1.61, 95% CI 1.13-2.31, respectively).

A further RCT (1++) in 8 wards in 4 hospitals in the English Midlands (Wallace 2006) determined whether postnatal 'hands off' care given by midwives at the first postnatal feed would improve breastfeeding duration. Three hundred and seventy primiparous mothers who intended to breastfeed were randomised to verbal only advice on positioning and attachment given by trained midwives compared to routine care by a qualified midwife. The 4 hour training workshop for the midwives also included advice on initiating breastfeeding; a physiological explanation of milk synthesis, supply and removal; and advocated uninterrupted feed times, baby-led duration and the mother sitting upright and supported. Follow-up was 91% at 6 weeks and 92% at 17 weeks. There were no significant beneficial effects on breastfeeding initiation, duration, exclusive or any breastfeeding at the two time points. At 6 weeks, 76% of mothers in the experimental group had stopped exclusive breastfeeding versus 77% mothers in the control group and at 17 weeks for both groups the percentage was 96%. For stopping any breastfeeding at 6 weeks the relative percentages were 35% versus 32% and at 17 weeks, 63% versus 60%. The authors suggested that certain aspects of the intervention may already have been present within routine UK practice.

Summaries of evidence

One RCT included in Fairbank et al (2000) (2++) evaluated social support from a midwife that included, a minimum of 3 home visits (at 14, 20 and 28 weeks antenatally), plus 2 telephone contacts or brief home visits between these times. Midwives provided a 24-hour on call support service on any topic but they did not provide the standard clinical care. The study reported an increase in breastfeeding initiation rates, but they were not statistically significant (Oakley 1990, not graded for quality).

Four RCTs in Renfrew et al (2005) evaluated health professional support: One 1++ RCT included frequent postnatal visits and telephone support from a skilled, knowledgeable midwife and found breastfeeding duration rates increased significantly in women who planned to breastfeed (Porteus 2000). One 1+ RCT that evaluated intra-partum visits in hospital and postnatal home visits with telephone support from a community nurse and peer counsellor observed an increase in the duration of exclusive breastfeeding amongst minority women from low-income households (but the results of statistical tests were not reported) (Pugh 2002).

One 1+ RCT in Renfrew et al (2005) evaluated structured support from a health professional (one intra-partum and one postnatal visit, and one phone call) and found no significant increases in breastfeeding rates at 6 weeks in women from the US armed forces (Wrenn 1997). An Australian 1++ RCT in Renfrew et al evaluated a series of structured postnatal home visits for teenage mothers starting at one week postnatal that included amongst other things discussions on infant feeding by a midwife in addition to routine hospital services. No increases in any breastfeeding rates were demonstrated (Quinlivan 2003).

Eighteen RCTs in Britton et al (2007) evaluated professional support programmes and found them to be effective overall. Twelve studies found that professional support gave a significant reduction in the cessation of 'exclusive' breastfeeding at all time points but 4 months, for which it was marginally significant. The effect was greatest in the first 3 months. The overall reduction in the cessation of 'any' breastfeeding found in the 16 relevant studies was not found to be significant but subgroup analysis found it was significant at 4 and 9 months. Four studies were set in low income countries not considered to be relevant to NICE reviews. The one included UK study (1-) gave a significant positive effect for 'any' breastfeeding up to 6 months (Jones and West 1985). Overall, the effect of incorporating an antenatal element of breastfeeding support into a study was not significant but those studies incorporating postnatal support alone significantly reduced the cessation of 'any' breastfeeding up to 6 months. Sixteen studies using professional support contributed to the analysis and their results were compatible with the conclusion. However, only two studies had an antenatal element. Similarly, face-to-face support appeared to be more effective than telephone support in preventing the stopping of 'any' breastfeeding up to 6 months and all the studies which used professional support contributed to the analysis.

The intervention for an RCT (1++) in the UK (Wallace 2006) was 'hands-off' care by a trained midwife at the first postnatal feed compared to routine care by a qualified midwife, with a main aim of giving verbal only advice on positioning and attachment. The trained midwives had attended a 4 hour workshop. There was no significant effect on breastfeeding initiation or duration, or cessation of any or exclusive

breastfeeding at 6 or 17 weeks. (However, the intervention was very brief and other comparable studies have assessed levels of breastfeeding earlier.)

Table 5.3 Sub-questions for studies on professional support

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/setting or intensity/duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
Di Napoli 2004	Not clear	Not clear	Authors state that more intensive contact may have been more successful	Not reported	No	Not applicable – not effective
Wallace 2006	Additional 'hands-off' advice was only given once by a trained midwife at the first postnatal feed.	Older women were more likely to breastfeed	Women with a spontaneous vaginal delivery were more likely to breastfeed	Not reported	No	Not applicable – not effective

5.1.5. *Lactation Consultant/Breastfeeding Advisor/Breastfeeding Consultant (trained, skilled and knowledgeable about breastfeeding)*

Interventions involving healthcare professionals vary considerably in design and delivery. Some studies evaluated the effectiveness of lactation consultants on breastfeeding outcome (e.g. Bonuck 2005). More frequently, interventions were delivered by a breastfeeding consultant, breastfeeding advisor or a trained, skilled, knowledgeable person in breastfeeding. This was achieved in some instances by the researcher delivering the intervention (e.g. Duffy 1997). Two SRs (Renfrew 2005 (2++), Guise 2003 (2+)) and three individual RCTs were relevant (Bonuck 2005, Su 2007, Dias de Oliveira 2006).

Four moderate/good quality RCTs in Renfrew et al (2005) evaluated interventions delivered by trained, skilled, knowledgeable breastfeeding specialists. One 1+ study clearly demonstrated that an antenatal group teaching session on positioning and attachment given by the researcher, a breastfeeding expert, was effective at increasing the duration of exclusive breastfeeding at six weeks postpartum among women on low incomes (Duffy 1997). Another 1+ study evaluated a comprehensive approach that included early support and ongoing availability of a lactation consultant in the postnatal period among women who intended to breastfeed (Brent 1995). This intervention achieved significant increases in the number of women breastfeeding in hospital and at two weeks and two months, but not at six months postpartum. A further 1++ RCT evaluated antenatal education and structured postnatal contact by a lactation consultant, but no difference in breastfeeding duration rates were observed

(Redman 1995). A 1+ study evaluated more concentrated postnatal support by a lactation consultant and found a significant increase in breastfeeding duration rates in the intervention group at two months post-partum (Serafino-Cross and Donovan 1992).

The 2+ SR by Guise et al (2003) included seven RCTs (not unpicked for individual grading) of breastfeeding support either by telephone or in-person clinic, hospital or home visits by lactation consultants, nurses or peer counsellors (Brent 1995 (fair), Frank 1987 (poor), Jones and West 1985 (poor), Oakley and Rajan 1990 (fair), Pugh and Milligan 1998 (fair), Sciacca 1995 (poor), Serafino-Cross and Donovan 1992 (fair)). Quality was assessed using the current criteria of the US Preventive Services Task Force as poor, fair or good. The studies in this SR were all included in the more recent SRs identified (Britton 2007, Renfrew 2005, Dyson 2005) and meta-analyses for this SR did not discriminate between different types of support. The support included prearranged appointments, unscheduled visits or telephone calls for problems and was often personalised for individual mother's needs. The interventions in three studies were exclusively antenatal; three studies exclusively postnatal; and two studies both antenatal and postnatal. Overall, support alone increased short-term (up to 3 months) and long-term duration (up to 6 months) (difference 0.11, 95% CI 0.03, 0.19 and difference 0.08, 95% CI 0.02, 0.16, respectively) but had no significant effect on breastfeeding initiation (difference 0.06, 95% CI -0.02, 0.15).

In addition to the two SRs, a 1+ study evaluated the effectiveness of a lactation consultant on the intensity of breastfeeding at 52 weeks (Bonuck 2005). Three hundred and eighty women in the US were randomised to receive two prenatal home visits with breastfeeding education and assessment, prenatal weekly telephone visits, hospital visits and postnatal home visits offering continued practical support and help with establishing social support in family/school/workplace/clinic with the offer of a nursing bra and breast pump, or to the control arm with only standard care, access to a WIC breastfeeding co-ordinator but no access to the lactation consultant. Women were recruited from health centres serving low-income, primarily Hispanic and/or black women. The loss to follow-up at 12 months was 20%; there were however, no differences between the initial and final sample. The intervention group was more likely to be breastfeeding through to week 20 (53% vs. 39.3%). Exclusive breastfeeding rates were low in both groups, and no between-group differences for exclusive breastfeeding were found. Breastfeeding intensity¹ was lower in the intervention group at 13 weeks (OR 1.90, 95% CI 1.13-3.20) and 52 weeks (OR 5.25, 95% CI 2.44-11.29), indicating more breastfeeding as a result of the intervention.

A 1+ RCT of four hundred and fifty healthy pregnant women, who intended to breastfeed, attending antenatal clinics at a Singapore hospital compared the effect of two interventions: a single 30 minute session of antenatal breastfeeding education; and a postnatal lactation support programme with two one-on-one lactation consultant visits in hospital (the first within the first 3 days and the second during the first postnatal clinic visit) (Su 2007). The 30 minute sessions included hands-on instruction on latching on, positioning, etc. The interventions were compared with routine care which included poorly attended antenatal classes, which did not address infant feeding. The loss to follow-up at 6 months was 18%. Those in the lactation support group were significantly more likely to be exclusively breastfeeding at 2 and 4 weeks, and 3 and 6 months than routine care but for 'any' breastfeeding the effect was only significant at 6 weeks. The RR for postnatal lactation support and exclusive

¹ Breastfeeding intensity measured the proportion of breast feeding to formula feeding. A higher score denoted a higher proportion of formula feeding.

breastfeeding at 6 months was 2.12, 95% CI 1.03-4.37, $p < 0.05$, and for 'any' breastfeeding at 6 weeks, 1.19, 95% CI 1.05-1.36, $p < 0.03$. The positive effect was marginally greater than that found for the antenatal education group but only significantly so for 'any' breastfeeding at 6 weeks. However, 50% of the women had breastfed previously and cultural differences may have affected the success of the interventions since the majority of the subjects were Chinese or Malay.

Another RCT (1-) used one 30 min session performed by two nurses in the maternity ward, one of whom was a lactation consultant, with no more than two mother-infant pairs, to reinforce the routine orientation on breastfeeding technique given to mothers (Dias de Oliveira 2006). Topics covered included latching on, positioning and manual milk expression. Circa two hundred and twenty one women were randomised. For the women who already had a previous child (53%), 59% had breastfed their previous children for ≥ 6 months. The Baby Friendly hospital served mainly a low socioeconomic population in Brazil. There were no significant differences in frequency of exclusive breastfeeding or lactation-related problems at either 7 or 30 days postpartum. Loss to follow-up was 5%. The results of this study should not be generalised for several reasons including the location, the minimal intervention and the relatively high level of mothers in the study who had previously successfully breastfed.

Summaries of evidence

Four RCTs in Renfrew et al (2005) SR evaluated interventions by trained skilled, knowledgeable health professionals. Of these, one 1+ RCT reported that antenatal education specifically on positioning and attachment significantly increased exclusive breastfeeding rates at 6 weeks among low-income women who intended to breastfeed (Duffy 1997). Another 1+ RCT evaluated 2-4 (10-15 minutes) individual antenatal sessions, training of health professionals and early frequent postnatal support that continued throughout the first year in a population of mostly white women on low-income. The researchers found a significant increase in breastfeeding initiation and duration rates up to 2 months postpartum (Brent 1995). A 1++ RCT evaluated group antenatal education at 24-28 weeks, support in hospital, postnatal contact at 2-3 weeks and 3 months. No difference in exclusive breastfeeding duration rates in women intending to breastfeed were observed (Redman 1995). One 1+ RCT evaluated 5-8 home visits lasting up to an hour during the first 2 months with telephone support. Visits were concentrated in the first 2 weeks. The study reported significant increases in breastfeeding duration rates at 2 months postpartum (Serafino-Cross and Donovan 1992).

One RCT (1+) evaluated an intervention involving two educational antenatal visits with a lactation consultant, weekly antenatal telephone contacts, a hospital intrapartum contact and postnatal home visits in comparison with standard care. The participants were women on low-incomes who were primarily Hispanic and black living in the US. The intervention significantly increased breastfeeding duration rates up to 20 weeks (Bonuck 2005).

An RCT (1+) of antenatal breastfeeding education and postnatal lactation support in women who intended to breastfeed, as single interventions based in a hospital in Singapore, who were mainly Chinese and Malay, found both significantly improved rates of exclusive breastfeeding up to 6 months after delivery (Su 2007). The postnatal support consisted of two one-on-one lactation consultant visits in hospital (the first within the first 3 days and the second during the first postnatal clinic visit) and was marginally more effective than antenatal education. (Only postnatal support

had a significant effect on rate of any breastfeeding and then only at 6 weeks after delivery.)

A 2+ SR (Guisse 2003) included seven RCTs of breastfeeding support either by telephone or in-person clinic, hospital or home visits by lactation consultants, nurses or peer counsellors. (The studies in this SR were all included in the more recent SRs included in this NICE review (Britton 2007, Renfrew 2005, Dyson 2005).) Support included prearranged appointments, unscheduled visits or telephone calls for problems and was often personalized for individual mother's needs. Interventions with antenatal, postnatal and both antenatal and postnatal support were included. Overall, support alone increased short-term (up to 3 months) and long-term duration (up to 6 months) (difference 0.11, 95% CI 0.03, 0.19 and difference 0.08, 95% CI 0.02, 0.16, respectively) but had no significant effect on breastfeeding initiation (difference 0.06, 95% CI -0.02, 0.15).

Table 5.4 Sub-questions for studies involving Lactation Consultants/Breastfeeding Advisors/Breastfeeding Consultants (trained, skilled and knowledgeable about breastfeeding)

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/ setting or intensity/ duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
Bonuck 2005	Authors state that the frequency of contact, the duration of each contact and the continuity of care influenced the success of the intervention	The intervention was more effective for US born women who culturally have low breastfeeding rates, compared to foreign born women who have high breastfeeding rates. This was not about race or ethnicity, it was about culture.	No	Not reported	No	Replicable in the UK. Points to note are a) cost (this is a costly intervention - \$266 per woman at 2003 rates in the US; b) the consultant was outside the health system; it would probably work better if the consultant was within the healthcare system
Dias de Oliveira 2006	The intervention was very brief – just 30 min in the maternity ward. Since the hospital was a	Not reported 53% of women had already had children, and of these 59% had previously	The short duration of the intervention probably reduced it's impact	Not reported	No	Not applicable – not effective. Also baseline breastfeeding levels in this low socioeconomic

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/ setting or intensity/ duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
	Baby Friendly hospital, it appeared that there was a comprehensive pre and postnatal programme already in place to encourage breastfeeding	successfully breastfed for ≥ 6 m. The study was in a low socioeconomic population in Brazil				population of Brazil appear to be relatively high.
Su 2007	The intervention required 2 x 30 min sessions with a lactation consultant in hospital after the birth and at the first postnatal clinic appointment. It was compared with a single 30 min antenatal education session. Although routine care included antenatal classes, they did not address infant feeding and were poorly attended.	Not reported The study was in Singapore and chiefly in Chinese and Malay women. 50% of the women had breastfed previously No socioeconomic details are given of the participants.	Not known Two postnatal sessions with a lactation consultant at the hospital/clinic are probably reasonably cost effective.	Not reported	No	Replicable in the UK and would be relatively easy to perform.

5.1.6. *Individual breastfeeding education in the antenatal period*

Breastfeeding education interventions are those that provide factual or technical information about breastfeeding to a specific target group in a hospital or a community setting or given one-to-one.

Three SRs (Tedstone 1998 (2-), Fairbank 2000 (2++), Renfrew 2005 (2++)) evaluated individual breastfeeding education in the antenatal period. One RCT included in two of the SRs (graded 1- by Renfrew 2005, and 1+ by Fairbank 2000) targeted black American women on low incomes of whom approximately one third planned to breastfeed (Kistin 1990). This three-armed trial compared one group education session on the benefits and potential problems of breastfeeding to a

similar session delivered one-to-one, with standard clinic care. The one-to-one session was found to have a significant increase in duration rates in hospital and at two weeks postpartum, but not at six and twelve weeks when compared to the control group. Analysis by feeding intention suggests that the strength of individual sessions appears to be in changing women's minds or in getting them to initially consider breastfeeding (Renfrew 2005).

Renfrew et al (2005) also included a 1++ RCT that evaluated the effectiveness of providing breastfeeding antenatal education and non-formula hospital discharge packs to low-income women at a WIC clinic in the US (Fredrickson 1995). The intervention included a single discussion at WIC registration (mean 12 minutes) and discharge packs at delivery. Renfrew et al (2005) concluded that this trial demonstrates the potential effectiveness of a tailored, individual teaching and knowledge-based intervention to increase breastfeeding duration among women on low-incomes who intend to breastfeed. Another 1++ RCT included in Renfrew et al. (2005) demonstrated that a formal paediatric visit in the antenatal period did not increase breastfeeding duration rates among black American women on low incomes (Serwint 1996).

The SR by Tedstone et al (1998) (2-) concluded that one-to-one education sessions were more successful than group sessions when they aimed to promote initial breastfeeding in women who had already made a decision to bottle feed. The effectiveness of prenatal education sessions in initiating breastfeeding was enhanced by contact with peer counsellors.

Similarly, in Fairbank et al (2000) (2++) , the systematic reviewers concluded that one-to-one educational programmes were more effective for women who planned to bottle feed, whereas group programmes were more effective for women who planned to breastfeed. This evidence is based on studies of low income black Americans.

Summaries of evidence

One 1++ RCT in Renfrew et al (2005) found that, with a tailored individual teaching and knowledge-based intervention for low income women (a single discussion at WIC registration (mean 12 minutes) and discharge packs at delivery), breastfeeding duration was highest among mothers who had planned to breastfeed but had low breastfeeding knowledge (Fredrickson 1995).

Another RCT 1+/- (in Renfrew 2005 and Fairbank 2000) compared at least one group antenatal breastfeeding session (50-80 minutes, lead by the researchers) with a single one-to-one breastfeeding session (15-30 minutes) and standard care. The study found significantly higher breastfeeding initiation rates in both intervention groups among US black women on low-incomes (Kistin 1990).

Another RCT 1++ in Renfrew et al (2005) evaluated a didactic one-to-one antenatal discussion among a population of African-American women on low incomes with a paediatrician (who had received specific training) at a scheduled hospital visit. The advantages of breastfeeding were included in material covered. The study found no significant increase in breastfeeding initiation or duration rates (Serwint 1996).

5.1.7. Group breastfeeding education in the antenatal period

Breastfeeding education interventions are those that provide factual or technical information about breastfeeding to a specific target group either in a hospital or a

community setting, or given one-to-one. It varies across studies in terms of methods content and duration. Breastfeeding education may be a stand-alone or a one off session or may be included in a health education programme.

Three studies included in the Renfrew et al (2005) SR, two studies in Fairbank et al (2000), and five studies in Dyson et al (2005) evaluated group antenatal sessions on the duration of breastfeeding. A fourth SR (2+) by Couto de Oliveira et al (2001) included studies in both developed and underdeveloped countries and older studies that had not been included in the other reviews. Only the main conclusions of this review are therefore discussed. Couto de Oliveira et al. concluded that during prenatal care, group education was the only effective strategy for extending the duration of breastfeeding.

One RCT (Kistin,1990) (graded 1- Renfrew 2005, and 1+ by Fairbank 2000) reported that group education sessions demonstrated a statistically significant increase in duration rates of breastfeeding compared to the control group - in hospital and at twelve weeks postpartum but not at two and six months. There were, however, no statistically significant differences between group and individual education (the second intervention).

A 1+ RCT (Duffy 1997) in Renfrew et al (2005) demonstrated that an antenatal group teaching session on positioning and attachment was effective at increasing the duration of exclusive breastfeeding at six weeks postpartum among women on low incomes ($p < 0.001$).

A RCT (Rossiter 1994) (graded 1- by Renfrew 2005 and 1+ by Fairbank 2000) evaluated a culture-specific group education programme to promote breastfeeding among Vietnamese women in Australia. In comparison to women who received only a leaflet, group sessions effectively increased knowledge, attitudes, intended and actual behaviour about breastfeeding at birth and four weeks postpartum, but not at six months postpartum. Fairbank et al (2000) concluded that group health education can be effective among women from different ethnic and low-income groups in westernised countries.

Dyson et al (2005) (2++) included five studies of educational interventions (Brent 1995 (1+), Coombs 1998 (1-), Hill 1987 (1+), Ryser 2004 (1+), Serwint 1996 (1-)) and found that educational interventions targeting low-income women resulted in a statistically significant increase in the number of women initiating breastfeeding (RR 1.53, 95% CI 1.25-1.88). All classes were prenatal and included time for discussion. Only two interventions significantly increased breastfeeding initiation (Brent 1995, Ryser 2004) and they were more intensive than the other three interventions and both included one-to-one and not group antenatal education.

The 2+ SR by Guise et al 2003 included 12 RCTs (not unpicked for individual grading) in developed countries of the impact of individual or group education on initiation or duration of breastfeeding (Brent 1995 (fair), Curro 1997 (good), Duffy 1997 (fair), Hill 1987 (fair), Kistin 1990 (fair), McEnery and Rao 1986 (poor), Pugh and Milligan 1998 (fair), Reifsnider and Eckhart 1997 (poor), Redman 1995 (fair), Rossiter 1994 (poor), Sciacca 1995 (poor), Wiles 1984 (poor)). Quality was assessed using the current criteria of the US Preventive Services Task Force as poor, fair or good. The studies in this SR were all included in the more recent SRs identified (Britton 2007, Renfrew 2005, Dyson 2005) and meta-analyses for this SR did not discriminate between different types of educational interventions. Programmes were usually conducted antenatally by lactation specialists or nurses. There was no

relationship between length of session (mostly 30-90 minutes) and effectiveness or whether sessions were individual or in groups. Overall, programmes with an educational component increased breastfeeding initiation (difference 0.23, 95% CI 0.12, 0.34) and short-term duration (up to 3 months) (difference 0.39, 95% CI 0.27, 0.50) but had no significant effect on long-term duration (up to 6 months) (difference 0.04, 95% CI -0.06, 0.16). Educational programmes were more effective when the initial breastfeeding rate was lower than 50%.

In addition to these SRs, six RCTs were identified in the literature search and from contact with experts:

One 1++ RCT compared the effectiveness of two education interventions on the duration of 'any' and 'exclusive' breastfeeding (Forster 2004). Nine hundred and eighty one relatively disadvantaged women living in Australia were randomised to a 1.5 hour class on practical aspects of breastfeeding, or to two one hour classes exploring family and community attitudes towards, and experiences of, breastfeeding, or to the control arm with standard care. Classes for both interventions took place in interactive small groups when women were in mid-pregnancy. The classes were well received by those who attended. Losses to follow-up at six months were 9.1%, 10.3% and 8.5% in the practical skills group, the attitudes group and for standard care, respectively. Women from all three groups accessed breastfeeding information the hospital's routine information, with more women in the standard care group accessing this information compared to the two intervention groups. Neither intervention increased breastfeeding initiation and duration compared with standard care. Initiation rates were 97% for the practical skills group; 95% for the attitudes group; and 96% for standard care. At six months 'any breastfeeding' rates were 55%, 50% and 54%, respectively; and for exclusive breastfeeding rates were 36%, 34% and 35%.

A 1+ cluster RCT evaluated the effectiveness of an antenatal breastfeeding education intervention on individual expectations of breastfeeding duration (Lavender 2005). One thousand three hundred and twelve women in England were randomised through clusters to receive a single educational support afternoon session in the antenatal period along with their local community midwife, or to the control arm with standard care, which included breastfeeding advice from attending midwives and information on hospital parent education classes. The sessions were co-ordinated by a qualified infant-feeding co-ordinator. There were no between group differences in the proportion of women who attained their expected duration of breastfeeding (OR 1.2, 95% CI 0.89-1.6, $p < 0.2$). There were no differences in breastfeeding rates at discharge (OR 1.2, 95% CI 0.8, 1.7, $p < 0.3$), or rates of exclusive breastfeeding at 4 months (OR 1.1, 95% CI 0.6-1.8, $p < 0.8$).

Another 1+ RCT used a 2.5 hour prenatal breastfeeding workshop at 34+ weeks gestation in addition to standard care to determine the effect on breastfeeding duration and self-efficacy (Noel-Weiss 2006). One hundred and one Canadian women were randomised to receive the workshop, which was designed using Bandura's theory of self-efficacy and adult learning principles. The workshop used life-like dolls, videos and discussions in a comfortable atmosphere and partners were encouraged to attend. The facilitator was not specified but presumed to be a nurse or lactation consultant and group sizes were 2-8 women. Subjects were recruited using a poster and pamphlet campaign. Subjects tended to be well-educated, with a reasonable income, in a committed relationship with a supportive partner, with a mean age of 30 years and 87% decided to breastfeed before becoming pregnant. Using an intention to treat analysis at 8 weeks postpartum there were no significant differences for exclusive breastfeeding (72% for the workshop group versus 58% for

standard care, OR 1.7, 95% CI 0.73-4.07) or for any breastfeeding between the groups. However, only 68% attended the prenatal classes. Using actual workshop attendance, the workshop group were found to have significantly higher levels of breastfeeding at 8 weeks (80% for the workshop group versus 53% for standard care, OR 3.2, 95% CI 1.26-7.94).

A 1+ RCT of four hundred and fifty healthy pregnant women, who intended to breastfeed, attending antenatal clinics at a Singapore hospital compared the effect of two interventions: a single 30 minute session of antenatal breastfeeding education, including a 16 min video introducing the benefits of breastfeeding, correct positioning, latching on, breast care and common problems, with an opportunity to talk with a lactation consultant for 15 min; and a postnatal lactation support programme with two one-on-one lactation consultant visits in hospital after the birth and at the first postnatal clinic (Su 2007). Participants in both interventions were also given printed guides. The interventions were compared with routine care which included poorly attended antenatal classes, which did not address infant feeding. The loss to follow-up at 6 months was 18%. Those in the antenatal education group were significantly more likely to be exclusively breastfeeding at 6 weeks, 3 months and 6 months than routine care but there was no significant relationship for 'any' breastfeeding. The RR for antenatal education and exclusive breastfeeding at 6 months was 2.16, 95% CI 1.05-4.43, $p < 0.05$. The positive effect was marginally greater for postnatal lactation support than that found for the antenatal education group but only significantly so for 'any' breastfeeding at 6 weeks. However, 50% of the women had breastfed previously and cultural differences may have affected the success of the interventions.

A small scale 1- RCT of a prenatal breastfeeding education pilot study for Hispanic women in the USA used a two-level intervention (Schlikau 2005). The thirty participants were low risk primigravid Hispanic women in their third trimester at an antenatal clinic. All the intervention subjects ($n=20$) received a 1 hour education session during a clinic visit concentrating on the benefits of breastfeeding (economic, nutritional and convenient), to emphasis early and consistent breastfeeding practice, and used a doll to demonstrate correct positioning and breastfeeding discretely. Half the intervention subjects were given a further level 2 education session at a later antenatal clinic modelled on the traditional Hispanic concept of "la cuarentana" for 40 days after childbirth, where the baby was exclusively breastfed for 40 days (avoiding the use of bottles, pacifiers or supplements) i.e. baby quarantine. A checklist was used to reinforce the regime, which included asking the postpartum nurse and lactation consultant for advice while in hospital. The controls received usual care – minimal advice to breastfeed at the first prenatal session. Loss to follow-up was 17% at 6-7 weeks. Both interventions increased breastfeeding duration at 6-7 weeks and the level 2 intervention (baby quarantine) appeared to be the most successful but neither result was significant.

One 1- RCT assessed the effectiveness of an educational intervention designed to encourage fathers to advocate breastfeeding and to support his partner if she chose to breastfeed (Wolfberg 2005). Five hundred and sixty seven US women were contacted, but only 59 completed the study; it is not clear how many were randomised to intervention and control arms. The intervention consisted of informal, interactive non-didactic breastfeeding classes for expectant fathers who were encouraged to talk about their beliefs, concerns and values about breastfeeding, including misconceptions about interference with relationships. The classes approached issues such as the cosmetic impact on a woman's breast; and experimented with the message that 'men can be advocates by facilitating their partner's decision to breastfeed'. The men were encouraged to support each other in

their commitment as advocates. Control group classes focussed on baby care and safety. Breastfeeding initiation was 74% in the intervention group and 41% in the control group ($p < 0.02$). By 6 weeks breastfeeding rates had dropped to 35% and 19% respectively ($p < 0.13$).

Summaries of evidence

One SR (2+) included studies in both developed and underdeveloped countries and older studies that had not been included in the other reviews and concluded that during prenatal care, group education was the only effective strategy for extending the duration of breastfeeding (Couto de Oliveira 2001).

A 2+ SR by Guise et al 2003 included 12 RCTs in developed countries of the impact of individual or group education on initiation or duration of breastfeeding. (The studies in this SR were all included in the more recent SRs included in this NICE review (Britton 2007, Renfrew 2005, Dyson 2005).) Programmes were usually conducted antenatally by lactation specialists or nurses. There was no relationship between length of session (mostly 30-90 minutes) and effectiveness or whether sessions were individual or in groups. Overall, programmes with an educational component increased breastfeeding initiation (difference 0.23, 95% CI 0.12, 0.34) and short-term duration (up to 3 months) (difference 0.39, 95% CI 0.27, 0.50) but had no significant effect on long-term duration (up to 6 months) (difference 0.04, 95% CI -0.06, 0.16). Educational programmes were more effective when the initial breastfeeding rate was lower than 50%.

Three RCTs included in Renfrew et al (2005) evaluated group breastfeeding education in the antenatal period: One 1+ study examined a one-hour group antenatal breastfeeding session on positioning and attachment given by a lactation consultant. Most participants were from a low-income group. The study demonstrated significantly higher rates of exclusive breastfeeding at 6 weeks compared to women who received standard antenatal care (Duffy 1997). One 1+/- Australian RCT evaluated small informal group antenatal breastfeeding sessions (three) in immigrant Vietnamese women on low-incomes. It found significantly higher breastfeeding initiation and duration rates amongst women who received the intervention as opposed to a leaflet alone (Rossiter 1994). One 1+/- RCT found that group education sessions demonstrated a statistically significant increase in duration rates of breastfeeding compared to the control group up to twelve weeks postpartum but not at two and six months (Kistin 1990).

One 1++ RCT evaluated a single group antenatal practical breastfeeding session and two group attitudes sessions (that included fathers). The study found no significant increase in exclusive or any breastfeeding at 6 months when compared to women who received standard care. The study population consisted of relatively disadvantaged, low-income Australian women with culturally diverse backgrounds – but the majority of these women (92.5%) planned to breastfeed (Forster et al 2004). One 1+ cluster RCT evaluated a single group antenatal, education session supervised by a lactation consultant and attended by a local midwife (who had received lactation training). The intervention did not increase breastfeeding duration when compared with standard antenatal care from lactation trained midwives (Lavender 2005).

A 1+ RCT utilised a single 2.5 hour antenatal breastfeeding workshop designed using Bandura's theory of self-efficacy and adult learning principles at 34+ weeks gestation with optional attendance by fathers (Noel-Weiss 2006). Using actual workshop

attendance, the study found a significant increase in exclusive breastfeeding at 8 weeks postpartum compared to standard care but the result was not significant using intention to treat analysis. The study population were relatively well-educated Canadians with a reasonable income.

An RCT (1+) of antenatal breastfeeding education and postnatal lactation support in women who intended to breastfeed, as single interventions based in a hospital in Singapore found both significantly improved rates of exclusive breastfeeding up to 6 months after delivery (Su 2007). Participants were chiefly Chinese or Malay. The postnatal support consisted of two one-on-one lactation consultant visits in hospital and was marginally more effective than the antenatal breastfeeding education, which consisted of a single 30 minute session, including a 16 min video which showed correct positioning, latching on, breast care and common problems, and with an opportunity to talk with a lactation consultant for 15 min. (Only postnatal support had a significant effect on rate of any breastfeeding and then only at 6 weeks after delivery.)

Table 5.5 Sub-questions on group breastfeeding education in the antenatal period

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/ setting or intensity/ duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
Forster 2004	Not clear	Not clear Breastfeeding rates are high in the country and in the region	It was a BFHI accredited hospital	Participants enthusiastic about classes.	No	Not applicable – not effective
Lavender 2005	Not clear	Not clear	The study hospital was in one of the UK's most deprived wards with breastfeeding rates lower than the national average (mean deprivation score 20). 92% white.	Support essential from professionals in a continuous and timely manner; support from family and society also crucial to breastfeeding. Women liked the drop-in centres in the study hospital	Not applicable	Not applicable – not effective
Noel-Weiss 2006	The workshop used Bandura's theory of self-efficacy and adult learning principles, also life-like dolls and videos.	Not clear 87% of women in the study intended to breastfeed. The women were relatively affluent and well-educated	The single 2.5 hour workshop was carried out in comfortable surroundings and partners could attend.	The women appeared to be more confident about breastfeeding after the workshop.	No	Canadian women already have a higher level of initiating breastfeeding (85%) than in the UK. Participants

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/ setting or intensity/ duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
	The first feed was earlier in the group which had attended the workshop – presumed to be a mediating variable.					were self-selected. The analysis was only significant on attendance at the workshop basis not when analysis was intention to treat.
Schlikau and Wilson 2005	The level 2 more intensive intervention used the traditional Hispanic concept of “la cuarentana” for 40 days after the birth to reinforce exclusive breastfeeding for the first 40 days. The level 2 group were also given a checklist to encourage them to ask for help if they experienced problems. Additionally, the economic, nutritional and convenience advantages of breastfeeding were stressed to both intervention groups.	All the participants were Hispanic women and the intervention was designed to specifically appeal to them.	The more intensive intervention (baby quarantine) appeared to be more successful but the result was not significant.	Not known	No	The interventions did not give a significant result but it was a small pilot study. The interventions were designed for Hispanic women to fit into their traditional culture so, similarly, a culturally appropriate approach could be used in certain areas of the UK.
Su 2007	The intervention was very brief – just a single 30 min antenatal education session. A comparison was made with a second postnatal	Not reported The study was in Singapore chiefly among Chinese and Malay women. 50% of the women had breastfed previously No socioeconomic details are given of	Not known The short duration of the intervention may have reduced its impact	Not reported	No	Replicable in the UK and easy to perform.

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/ setting or intensity/ duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
	lactation consultant intervention (2 x 30 min sessions in hospital after the birth and at the first postnatal clinic appointment) Although routine care included antenatal classes, they did not address infant feeding and were poorly attended.	the participants.				
Wolfberg 2004	Not clear; drop out rates high	Not clear	Not clear	Men were reluctant to attend classes without their partners.	Not clear	Not applicable – not effective

5.1.8. *Postnatal breastfeeding education*

Three RCTs were identified that evaluated postnatal education (one of which was included in a SR). All three studies were tailored to women's individual needs (Pollard 1998, Labarere 2003, Labarere 2005). The 1++ study in Renfrew et al (2005) found that mothers who completed a daily breastfeeding log in the intervention were likely to breastfeed three times longer than mothers not completing the intervention (Pollard, 1998). The authors concluded that the self-monitoring intervention guided by social cognitive learning theory received many positive accolades from participants and demonstrated it may improve breastfeeding for older women, with higher-education and for women strongly motivated to succeed.

A 1++ RCT by Labarere et al (2003) examined the effectiveness of a structured one-to-one hospital education intervention at discharge on 'any' and 'exclusive' breastfeeding at 17 weeks. One hundred and six breastfeeding mother-infant dyads in France were randomised to a single 30-minute one-to-one session with a midwife or intern that involved information, discussion and a leaflet with information on how to combine breastfeeding and employment, or to the control arm with usual verbal encouragement to breastfeed. The losses to follow-up in the intervention and control groups were 12.2% and 6.7%, respectively. 'Any breastfeeding' in the intervention group was 34.4% and 40.2% in the control group (RR 0.86, 95% CI 0.52, 1.40), while 'exclusive breastfeeding' was 14.0 % and 14.4 % (RR 0.97, 95% CI 0.42, 2.22). There were no significant differences in the number of women who had returned to work at 17 weeks (35.5% in the intervention group vs. 27.8% in the control group); the mean delay in returning to work (12.9 weeks vs. 12.3 weeks, respectively); or in

the numbers of women who were still breastfeeding when they returned to work (six mothers (6.4%) vs. 10 mothers (10.4%), respectively).

A 1++ study evaluated the effectiveness of a health care professional intervention on breastfeeding duration (Labarere 2005). Two hundred and thirty one new mothers in France who were breastfeeding at hospital discharge were randomised to the intervention, which consisted of a routine, preventive outpatient consultation with a breastfeeding trained primary care physician within two weeks of hospital discharge. The control arm included the usual verbal encouragement for breastfeeding from maternity services staff, paediatrician assessment for successful breastfeeding in hospital on day of discharge, a telephone help line and routine clinic visits each month from month one to month six, along with 10 weeks of paid maternity leave. Just under 80% mothers in the intervention group attended the early postnatal consultation; 7% mothers in the control group also received the intervention. Mothers in the intervention group were more likely to report exclusive breastfeeding at four weeks (83.9% vs. 71.9%; HR 1.40, 95%CI 1.01-1.34) and longer duration of breastfeeding (18 weeks vs. 13 weeks; HR 1.40, 95% CI 1.03-1.92).

Summaries of evidence

One 1++ RCT in Renfrew et al (2005) evaluated a postnatal breastfeeding question/answer education session supported by a self-assessment tool (mothers diary of breastfeeding behaviour) in women from mixed-income groups who planned to breastfeed. The intervention was effective in increasing breastfeeding duration rates only in women who adhered to the protocol and completed the self-monitoring forms (Pollard 1998).

One 1++ RCT evaluated a single, 30-minute, one-to-one discussion and leaflet on 'breastfeeding and employment' by a midwife or intern. The intervention did not significantly increase exclusive or any breastfeeding at 17 weeks postpartum or increase the number of women still breastfeeding when they returned to work. This study was conducted in France on a relatively affluent group of women (Labarere 2003).

One 1++ RCT evaluated the effectiveness of an outpatient appointment two weeks after the birth with a physician/ paediatrician (who had received 5 hrs lactation training) in well-educated women on high incomes. The study found significant increases in exclusive breastfeeding at four weeks and extended overall duration of breastfeeding (Labarere 2005).

Table 5.6 Sub-questions for studies on postnatal breastfeeding education

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/setting or intensity/duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
Labarere 2003	Set in France where maternity benefits and employment law are different. Used breastfeeding mothers.	Not clear	Intervention and control arms in same ward therefore contamination bias?	Not reported	Not applicable	Not applicable – not effective
Labarere 2005	This was an adjunct to a routine postnatal visit, therefore may have worked well	Low risk population group	Physicians were self-selected for entering the programme	Not clear	No	Requires a similar opportunity – a routine physician visit within a week after hospital discharge

Table 5.7 Corroborative evidence of breastfeeding education interventions in the UK

Reference	Key points for practice
Dykes 2003	<p>Included 17 studies involving provision of ≥ 1 antenatal education session/workshop. Key aspects of successful programmes:</p> <ul style="list-style-type: none"> • Local needs assessment • Workshop type education packages are likely to increase both initiation and duration of breastfeeding • Offering women opportunities to see and become familiar with the practicalities of breastfeeding including positioning and attachment is important in areas where formula feeding is the norm • Develop an educational package to include exploration of breastfeeding difficulties from psycho-social, physiological and practical aspects • Ensure language is appropriate • Provide additional resources such as written materials/video on loan • Adequate publicity through health care facilities aimed at targeted group • Ensure several individuals capable of running the programme and ensure that they have the designated time to do so • Select a venue likely to attract women such as during a midwifery satellite unit • Encourage women to invite significant others if they so wish

- | |
|--|
| <ul style="list-style-type: none"> • Evaluate views of attendees as well as non-attendees • Educational sessions at home may be preferred by some minority ethnic groups |
|--|

5.1.9. *Breastfeeding literature*

Three studies in Renfrew et al (2005) evaluated educational interventions that provided written information in either the ante- or postnatal periods (Curro 1997 (1+), Hauk and Dimmock 1994 (1-), Loh 1997 (1-)). None of these studies achieved statistically significant increases in the duration of breastfeeding among women on low or high incomes.

Fairbank et al (2000) and Renfrew et al (2005) concluded that breastfeeding literature alone among the general population is not effective in promoting breastfeeding among women of different income and ethnic groups in the UK, Republic of Ireland and the USA. Breastfeeding literature and formal education among low-income groups in the USA were not effective at promoting initiation of breastfeeding. However, evidence was based on studies with small sample sizes.

Seven RCTs in the 2+ SR by Guise et al. (2003) (not unpicked for individual grading) investigated the use of written materials, either alone or in combination with other interventions (education, support or both) (Curro 1997 (good), Frank 1987 (poor), Hill 1987 (fair), Kaplowitz and Olson 1983 (poor), Loh 1997 (poor), Redman 1995 (fair), Rossiter 1994 (poor)). Quality was assessed using the current criteria of the US Preventive Services Task Force as poor, fair or good. Written materials alone (3 studies: Curro 1997, Kaplowitz and Olson 1983, Loh 1997) did not increase breastfeeding rates – the pooled estimate for written materials plus education was comparable to that for education alone. For three studies of short-term duration, education plus written materials (difference 0.10, 95% CI -0.01, 0.21) was less effective than education alone (risk difference from logit model 0.39, 95% CI 0.27, 0.50)

Summaries of evidence

One RCT (1+ in Fairbank 2000, and 1- in Renfrew 2005) evaluated giving a fact sheet on breastfeeding followed by a questionnaire (3 minutes) in late pregnancy to women in Ireland (Loh 1997). The study found no significant differences in both initiation and rates of breastfeeding at 4 weeks postpartum. Another Italian RCT (1+) included in Renfrew et al (2005) compared a 10 minute, one-to-one, breastfeeding discussion and booklet with a 10-minute one-to-one, breastfeeding session without a booklet at 10-20 days postnatal during a paediatric visit (Curro 1997). The study found no significant differences in breastfeeding rates at 6 months.

Seven RCTs in a 2+ SR (Guise 2003) investigated the use of written materials, either alone or in combination with other interventions. Written materials alone (3 studies: Curro 1997, Kaplowitz and Olson 1983, Loh 1997) did not increase breastfeeding rates – the pooled estimate for written materials plus education was comparable to that for education alone.

5.1.10. *Antenatal education and professional telephone support*

In Renfrew et al (2005), five RCTs evaluated interventions that combined breastfeeding education and postnatal telephone support delivered by health professionals (Grossman 1990 (1-), Brent 1995 (1+), Redman 1995 (1++), Schy 1996 (1-), Rojjanasrirat 2000 (1+)). Three were conducted among women on higher incomes who intended to breastfeed (Redman 1995 (1++), Schy 1996 (1-),

Rojjanasrirat 2000 (1+)). Telephone support (a telephone call 48 hours after discharge by the lactation consultant) formed a minor part of the multifaceted intervention in the study by Brent et al (1995), which led to a significant increase in initiation and breastfeeding at 2 weeks and 2 months postpartum. None of the remaining four RCTs demonstrated a statistically significant increase in the duration of breastfeeding as a result of the intervention.

Renfrew et al (2005) concluded that antenatal education combined with limited postnatal telephone support is not effective in high-income women or women who intend to breastfeed.

Summaries of evidence

One 1++ RCT in Renfrew et al (2005) compared a package of multiple interventions (including, a single 3 hour group, antenatal, breastfeeding session, postnatal telephone support at 2-3 weeks and 3 months) with an optional home visit and discussion group (Redman 1995). No significant differences in breastfeeding duration rates were observed; both groups had a high prevalence of breastfeeding.

Another 1+ RCT in Renfrew et al (2005) evaluated interventions among women who intended to breastfeed and who planned to return to work within 12 weeks postpartum (Rojjanairat 2000). The interventions included a 2-3 hour group, antenatal breastfeeding session (lecture style) given by a lactation consultant and postnatal telephone support at 1, 4 and 6 weeks postnatal. Participants were mostly young, white well-educated women. No significant differences in breastfeeding duration rates were observed; both groups had a high prevalence of breastfeeding.

5.1.11. Professional training

Support from an appropriately skilled knowledgeable practitioner may have a positive effect on both women's initiation and experience of breastfeeding. There is variation in the amount and scope of pre and post graduate /registration education available to healthcare professionals who support breastfeeding women in the UK. Training varies in terms of content, delivery and length. Two good quality SRs (Fairbank 2000 (2++), Renfrew 2005 (2++)) and 2 good quality RCTs (Labarere 2005 (1++), Wallace 2006 (1++)) contributed relevant data.

A number of studies have assessed breastfeeding education training for healthcare professionals to increase knowledge or skills in breastfeeding as part of multi-faceted interventions or training specifically to deliver an intervention (Wright 1997 (before-after +) in Fairbank 2000; Brent 1995 (1+) in Fairbank 2000 and Renfrew 2005; Labarere 2005 (1++)).

Nine before-after studies were identified in Renfrew et al (2005) that focused on breastfeeding education of health professionals or those working in the health care setting (Hartley and O'Connor 1996 (+), Ingram 2002 (+) and 7 studies not graded: Cattaneo and Buzzetti 2001, Durand 2003, Gainotti and Pagani 1980, Grant 2000, Manitoba Paediatric Society 1982, Matilla-Mont and Rios-Jimenez 1999, Stokoe 1994). Of these, two 2+ before-after studies (Ingram 2002, Hartley and O'Connor 1996) evaluated different breastfeeding educational training programmes and breastfeeding rates in women from disadvantaged backgrounds.

Hartley and O'Connor (1996) in Renfrew et al (2005) included medical, nursing and secretarial staff. The authors describe the training as a didactic approach to the

provision of information about breastfeeding. Rates of breastfeeding at 24 hours postnatal increased from 15% to 31% following the education programme ($p < 0.03$). At 2 weeks postpartum, an increase was still apparent (13% vs. 21%) but not significant.

Ingram et al (2002) in Renfrew et al (2005) evaluated hospital midwives teaching a mother about positioning and attachment using a 'hands-off' approach. Data collected at 2 weeks postpartum reflected significant differences in exclusive and any breastfeeding, but at 6 weeks postpartum no significant differences were detected. The authors concluded that teaching breastfeeding using a 'hand-off' approach by midwives can be cascaded from a trainer to midwives to women following an approach that seems relatively inexpensive in resource requirements, including staff time.

An RCT (1++) in the English Midlands (Wallace 2006) also used a 'hands-off' approach where trained midwives (4 hours training workshop) gave postnatal 'hands off' care at the first postnatal feed. Three hundred and seventy primiparous mothers who intended to breastfeed were randomised to verbal only advice on positioning and attachment given by trained midwives compared to routine care by a qualified midwife. The training workshop for the midwives also included advice on initiating breastfeeding; a physiological explanation of milk synthesis, supply and removal; and advocated uninterrupted feed times, baby-led duration and the mother sitting upright and supported. Follow-up was 91% at 6 weeks and 92% at 17 weeks. There were no significant beneficial effects on breastfeeding initiation, duration, exclusive or any breastfeeding at the two time points. The authors suggested that certain aspects of the intervention may already have been present within routine UK practice.

In addition to data from Renfrew et al (2005), a 1++ RCT demonstrated that a single outpatient consultation with appraisal and support from a specially trained primary care physician/paediatrician within two weeks of birth resulted in a significant impact on exclusive breastfeeding at four weeks and longer duration of breastfeeding (Labarere 2005). The participants in this study were relatively affluent women. Professional support offered once by a trained primary care physician in an outpatient setting appears to work more effectively than telephone counselling following a home visit by a midwife.

Summaries of applicability of evidence

Post registration or update training for healthcare professionals to increase knowledge or skills in breastfeeding as part of multi-faceted interventions or training specifically to deliver an intervention can be effective (Brent 1995 (RCT 1+) and Wright 1997 (before-after 2+) both in Fairbank 2000 (2++)) (Labarere 2005 (1++)).

Two 2+ before-after studies in Renfrew et al (2005) (2++) evaluated a breastfeeding training programme for hospital health professionals and found a significant increase in breastfeeding duration rates (Ingram 2002, Hartley and O'Connor 1996). One of the studies used a 'hands-off' approach (Ingram 2002).

A RCT (1++) in the UK (Wallace 2006) also used a 'hands-off' approach but found no significant beneficial effect on breastfeeding initiation, duration, exclusive or any breastfeeding at 6 and 17 weeks for mothers whose midwives had attended a 4 hour workshop. However, the intervention was very brief and other comparable studies have assessed levels of breastfeeding earlier.

A 1++ RCT evaluated the effectiveness of an outpatient appointment two weeks after the birth with a physician/ paediatrician (who had received 5 hrs lactation training) in well-educated women on high incomes. The study found significant increases in exclusive breastfeeding at four weeks and extended overall duration of breastfeeding (Labarere 2005).

Table 5.8 Sub-questions for studies on professional training

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/ professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/ setting or intensity/ duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
Labarere 2005	This was an adjunct to a routine postnatal visit, therefore may have worked well	Low risk population group	Physicians were self-selected for entering the programme	Not clear	No	Requires a similar opportunity – a routine physician visit within a week after hospital discharge
Wallace 2006	Not clear	Older women were more likely to breastfeed	Women with a spontaneous vaginal delivery were more likely to breastfeed	Not reported	No	Not applicable – not effective

5.1.12. *Professional training (Baby Friendly Hospital Initiative)*

Renfrew et al (2005) identified two before-after studies that evaluated UNICEF Baby Friendly Hospital Initiative (BFI) training. One study (not graded) reported an increase in health professionals' knowledge and the number of mothers exclusively breastfeeding at discharge from hospital, full breastfeeding at 3 months and any breastfeeding at 6 months postnatally ($p < 0.05$) (Cattaneo and Buzzetti 2001). While another study (not graded) found no difference in the proportion of women breastfeeding at 12 weeks; however, positive changes were observed after the educational intervention in healthcare professionals' practice (Durand 2003).

Summaries of evidence

Two (not graded) before-after studies in Renfrew et al (2005) evaluated the UNICEF Baby Friendly Hospital Initiative (BFI) training for health professionals in hospital settings. One study found significant increases in breastfeeding rates at 6 months where initial breastfeeding rates were low (Cattaneo and Buzzetti 2001). The BFI training did not increase breastfeeding rates at hospital discharge where breastfeeding rates were relatively high (Durand 2003). These conclusions are supported by a UK cross-sectional study of BFI-trained health visitors (Tappin 2006).

Table 5.9 Corroborative evidence of professional training (Baby Friendly Hospital Initiative) in the UK

Reference	Key points for practice
Tappin 2006	<p>Records of children visited by health visitors in Glasgow in 2000, a city with a high level of deprivation and low breast-feeding rates, found that 39% were breastfed at their first visit (median age 13 days) and 30% continued to breastfeed at the second visit (median age 35 days). This was a cross-sectional study.</p> <ul style="list-style-type: none"> • If the health visitor had not had any BFI training over the previous 2 years, the breastfed children were significantly more likely to be formula-fed at the second visit. • Health visitors should be trained specifically to support breastfeeding postnatally. • Health visitors who have had BFI training over the previous 2 years can have a significant effect on breastfeeding duration. • Postnatal home visits from health visitors who have recently had BFI training can significantly increase breastfeeding duration.

5.1.13. *Multi-faceted interventions*

The SR by Renfrew et al (2005) included nine RCTs considered to be ‘multi-faceted’ (more than one component) (Brent 1995 (1+), Campbell 1996 (1-), Finch and Daniel 2000 (1-), Fredrickson 1995 (1++), Grossman 1990 (1-), Redman 1995 (1++), Rojjanasrirat 2000 (1+), Schy 1996 (1-), Sciacca 1995 (1-)). The results of most of these studies have already been described above with the exception of two poor quality studies (Campbell 1996, Finch and Daniel 2000). Only three of the RCTs had positive outcomes (Brent 1995, Rojjanasrirat 2000, Sciacca 1995). Two of the RCTs were delivered to women on low-incomes (Brent 1995, Redman 1995). It is of interest that the RCT 1+ by Brent et al (1995) (also in Fairbank 2000) included antenatal education tailored to individual women’s needs (regardless of intention to breast feed or feed infant formula milk), proactive visits in hospital and at home after birth, and ongoing availability of a lactation consultant. The antenatal education consisted of 2-4 individual 10-15 minute sessions with a lactation consultant, where the content was based on the participants needs and interests. It also included breastfeeding education of health care staff caring for mothers and babies. This intervention resulted in a statistically significant increase in the numbers of women breastfeeding in hospital, at two weeks and two months postpartum, but not at six months postpartum. Renfrew et al made two conclusions: a combination of antenatal education and limited postnatal telephone support was not effective at increasing the duration of breastfeeding among high income women who intend to breastfeed; and there was evidence that a combination of education and support with incentives might have a positive effect on breastfeeding duration

The Fairbank et al (2000) SR included eleven studies (10 before-after studies and one non-RCT) that appeared to demonstrate that multifaceted interventions were effective in increasing the initiation, duration and exclusivity of breastfeeding (Kirk 1980 (+), Wright 1997 (+) and 9 non graded: Rodriguez-G 1990 (non-RCT), Hartley 1996, Lal 1992, Manitoba Pediatric Society 1982, McDivitt 1993, Rea 1990, Sloper 1975, Valdes 1993, Vandale-T 1992). The interventions most effective were those that were comprised of a media campaign and/or a peer support programme combined with structural changes to the health service, or with health education activities. A before-after study that evaluated interventions in both hospital and community settings that included culture-specific health education materials targeting American Indian pregnant women and new mothers found a significant positive effect on initiation rates ($p < 0.0001$) compared to the control group (Wright 1997 (2+)).

A third SR (2+) by Couto de Oliveira et al (2001) included studies in both developed and underdeveloped countries and older studies that had not been included in the other reviews (not unpicked for individual grading). Only the main conclusions of this review are therefore discussed: The most effective interventions in extending duration of breastfeeding combined information, guidance and support and were long term and intensive. During prenatal care, group education was the only effective strategy.

During the postnatal period or both periods (antenatal and postnatal), home visits used to identify mother's concerns with breastfeeding, assist with problem solving and involve family members in breastfeeding support were effective. Individual education sessions were also effective in these periods, as was a combination of 2 or 3 of these strategies in interventions involving both periods. Strategies with no effect had no face-to-face interaction, gave contradicting messages or were small-scale interventions.

The 2+ SR by Guise et al (2003) of studies in developed countries (not unpicked for individual grading) included four RCTs (Brent 1995 (fair), Pugh and Milligan 1998 (fair), Redman 1995 (fair), Sciacca 1995 (poor)) which combined breastfeeding support with education. Quality was assessed using the current criteria of the US Preventive Services Task Force as poor, fair or good. For each RCT support was via in-person contact through either clinic or home visits. Compared to support alone, education with support produced a significantly higher rate of breastfeeding initiation (a significant difference of 0.21, 95% CI 0.07, 0.35, compared to a non significant difference of 0.06, 95% CI -0.02, 0.15) and a higher rate of short-term (up to 3 months) duration (a difference of 0.37, 95% CI 0.17, 0.58, compared to 0.11, 95% CI 0.30, 0.19) but no difference in long-term (up to 6 months) duration. However, the combination of education and support was not substantially different from that of education alone.

Summaries of evidence

One 1+ RCT included in Fairbank et al (2000) and Renfrew et al (2005) evaluated education and support. The intervention included individual education given to all women in both groups (mostly white on low-incomes), and support in the ante-, intra- and postpartum period and into the first year of infancy. This included training of health professionals, daily inpatient visits, telephone call 48hrs after discharge, a lactation clinic at one week and the availability of a lactation consultant at all health clinics up to one year after the birth. Significant increases were found in the initiation and duration of breastfeeding up to two months postpartum (Brent 1995).

One 2+ before-after study in Fairbank et al (2000) conducted among American Indian women evaluated the adoption of hospital policy and practices which were culture-specific together with a media campaign. The latter included the ten steps in the Baby Friendly Hospital Initiative, a peer support programme and a public health campaign. The study found a statistically significant increase in breastfeeding initiation rates (Wright 1997).

An SR (2+) by Couto de Oliveira et al (2001) included studies in both developed and underdeveloped countries and older studies that had not been included in the other reviews. The main conclusions were: the most effective interventions in extending duration of breastfeeding combined information, guidance and support and were long term and intensive. During prenatal care, group education was the only effective strategy.

During the postnatal period or both periods (antenatal and postnatal), home visits used to identify mother's concerns with breastfeeding, assist with problem solving and involve family members in breastfeeding support were effective. Individual education sessions were also effective in these periods, as was a combination of 2 or 3 of these strategies in interventions involving both periods. Strategies with no effect had no face-to-face interaction, gave contradicting messages or were small-scale interventions.

An SR (2+) by Guise et al (2003) of studies in developed countries included four RCTs which combined breastfeeding support with education. For each RCT support was via in-person contact through either clinic or home visits. Compared to support alone, education with support produced a significantly higher rate of breastfeeding initiation (a significant difference of 0.21, 95% CI 0.07, 0.35, compared to a non significant difference of 0.06, 95% CI -0.02, 0.15) and a higher rate of short-term (up to 3 months) duration but no difference in long-term (up to 6 months) duration. However, the combination of education and support was not substantially different from that of education alone.

5.1.14. *Media programmes*

There is a lack of good quality evidence on the impact of media activity on breastfeeding initiation and duration. Fairbank et al (2000) included two before-after studies, both of which included measured attitudes towards breastfeeding in relation to media campaigns (Coles 1978 (-), Friel 1989 (+)). The limited evidence available suggests that a media campaign as a stand-alone intervention, and particularly television commercials, may improve knowledge of breastfeeding ($p < 0.05$), but not attitude (Friel 1989).

Summaries of evidence

A 2+ before-after study in Fairbank et al (2000) evaluated media campaigns (predominately television commercials) and found they improved knowledge of breastfeeding ($p < 0.05$) but not attitude (Friel 1989).

There is limited evidence to determine the effectiveness of media programmes on the initiation of breastfeeding.

5.2. Key question 2: What interventions effectively reduce the risks of contamination of equipment used in bottlefeeding, and in the storage and reheating of breast milk? In addition, what interventions reduce the risks associated with the reconstitution of infant formula?

5.2.1. Cleaning and sterilizing feeding equipment

Two SRs were identified that addressed contamination or cleaning and sterilisation of infant feeding equipment (Bernath 2001 (2-), Renfrew 2008 (2-)). No relevant RCTs were identified. One SR (Bernath 2001 (search appears well conducted)) aimed to compare the effectiveness of sterilisation with disinfection of shared feeding equipment on rates of cross infection in mothers and infants, but no studies were included in this review. The other 2- SR (Renfrew 2008) (not unpicked for individual grading) aimed to evaluate ways of reducing infections from the use of infant feeding equipment in the home. This review included eight studies: five conducted in the UK and three were conducted in the USA (most published between 1962 and 1987 and one published in 1998). None of the included studies were randomised controlled trials, and all were deemed to be of relatively poor quality. One UK observational study in Renfrew et al (2008) found women in social classes 4 and 5 were less likely to sterilise bottles correctly. The authors concluded that the current evidence provides no information on the relative effectiveness of cleaning and sterilisation methods currently used.

5.2.2. Storage and reheating of breast milk

No relevant RCTs on storage and reheating of breast milk were identified in the literature search. Therefore, the Programme Development Group (PDG) sought 'expert' testimony. This report on the Handling and Storage of Expressed Breast Milk from the Food Standards Agency is available separately.

5.2.3. Reconstitution of infant formula

One 2+ SR (Renfrew 2003) examined the risks associated with errors in reconstituting formula. Five studies were included in this review, only one of which was a randomised control trial ((1-) Lucas 1991, Lucas 1992). This RCT compared the energy content of ready-to-feed and powdered formula. The authors reported that the results from these studies were difficult to interpret due to methodological problems and small sample sizes. All studies, however, found errors in reconstitution with a tendency to over-concentrate feeds, although under-concentration also occurred. The 1- RCT by Lucas et al (1991 and 1992) in Renfrew et al (2003) conducted in the UK found that in comparison to ready-made formula, infants fed formula made from powder had increased weight and skinfold thickness.

Summaries of evidence

Two SRs demonstrate that good quality studies on methods of cleaning and sterilization are lacking, and that there is no evidence from the available studies on the relative effectiveness of different cleaning and sterilising techniques (Bernath 2001, Renfrew 2008 (2-)). No studies were identified that examined risks associated with storage and reheating of breast milk.

A 2+ SR found the reconstitution of infant formula milk from powder may be associated with errors with a greater tendency to over-concentrate feeds than under concentrate them (Renfrew 2003).

Table 5.10 Corroborative evidence from UK studies of contamination of feeding equipment

Reference	Key points for practice development in UK settings
Rowan 1998a	<ul style="list-style-type: none"> Commonly used cleaning and disinfection procedures are not effective in eliminating the contamination of infant feeding bottles with enterotoxigenic <i>Bacillus cereus</i>; one commercial chemical and two commercial thermal disinfection procedures were effective when the level of contamination was $<10^5$ ml⁻¹. However the chemical disinfection method failed to completely eliminate enterotoxigenic <i>B. cereus</i> at potentially hazardous levels $\geq 10^5$ organisms ml⁻¹ that may be encountered under 'storage-abuse' conditions in the home
Atkinson 2001	<ul style="list-style-type: none"> Washing breastmilk collection kits in hot water and detergent followed by dry storage is a safe and easy and cost-effective method of achieving 'clinical' cleanliness of kits Hypochlorite solution disinfectant does not attain sterilisation Mothers who are encouraged to take responsibility for cleaning and storing their own collection sets have increased maternal confidence and a reduced risk of contamination No harmful effects are noted
Shetty 2006	<ul style="list-style-type: none"> Draws attention to UK Association for milk banking (UKAMB) developed guidelines for the collection, storage and handling of breastmilk for a mother's own baby – collecting kits should not be disinfected; the use of steam sterilizers are not recommended; collection kits should be washed, rinsed and returned to the hospital sterile services for autoclaving after every use Autoclaving is an expensive option Used appropriately hypochlorite solution is adequate for disinfection

Table 5.11 Corroborative evidence from UK studies of storage and re-heating of breastmilk/ formula milk

Reference	Key points for practice development in UK settings
Rowan 1997	<ul style="list-style-type: none"> Re-constituted infant formulas should be consumed within 4 hours of preparation Storage during this period should be in a properly maintained refrigerator Left-over feeds should never be re-used or topped-up Feeding bottles and teats should be thoroughly cleaned and sterilized before re-use Parents, carers and healthcare workers should be informed about storage and re-heating of infant formula
Rowan 1998b	<ul style="list-style-type: none"> Brief storage of re-constituted milk-based infant formula at the recommended refrigeration temperature of 4^o C will allow it to remain safe for consumption

Wright 1998	<ul style="list-style-type: none"> To prevent the donation of consistently contaminated milk, there needs to be more active communication between the milk bank staff and donor
Hands 2003	<p>This paper summarises current guidelines available to mothers on the storage and expression and breastmilk. It does not use systematic review methodology, but nevertheless, presents a useful overview.</p> <ul style="list-style-type: none"> The authors reported that both research-based and simplified guidelines were inconsistent and confusing, varying from 'use almost immediately' to 24 hours at room temperature, 24 hours to eight days in the fridge, and 3 to 12 months in the freezer. "Untreated breast milk, particularly colostrum, can inhibit the growth of harmful bacteria when stored at room temperature. When milk is kept at cool room temperatures (19 to 22°C) and just below room temperature (15°C), there is evidence to suggest it may be kept for 10 and 24 hours respectively." "Research suggests that anti-bacterial properties in fresh breast milk, combined with storage at 4°C, can inhibit bacterial growth for up to 8 days." "In milk stored above 4°C, significant bacterial growth appears to be inhibited for about three days." (These results were based on the maximum time milk was studied, rather than when bacterial levels became unacceptable) Separate and clear guidance is needed for refrigerated storage above and below 4°C. "There is evidence to suggest that contaminated milk is safer stored at 4°C for eight days than frozen; and that previously frozen breast milk should be kept for as short a time as possible before use." "An acceptable limited for bacterial contamination and growth in EBM needs to be established."
Ali 2004	<ul style="list-style-type: none"> Microwave heating of milk (formula or expressed breast milk) in bottles is not recommended because it increases the risk of burns Bottle warmers with or without concealed heating elements are recommended for warming bottle feeds This information to be passed on to parents through HVs, GPs and midwives

5.3. Key Question 3: What are the most effective methods to express breast milk?

Three studies evaluated methods/techniques to express breast milk. Two of the studies compared types of breast pumps (Fewtrell 2001, Zinaman 1992), and the other compared sequential versus simultaneous breast pumping (Auerbach 1990).

One 1+ RCT (Fewtrell 2001) conducted in mothers of relative high socioeconomic status in the UK found no significant differences in milk volume or fat content obtained using a mini-electric breast pump compared to a manual breast pump.

Findings from a 1- RCT (Zinaman 1992) suggest that a bi-lateral electric breast pump available in the US produces prolactin responses similar to natural infant suckling. This electric breast pump produced significantly higher prolactin levels ($p < 0.05$) than battery-operated and 'mechanical' pumps, or hand expression.

In addition, a 1+ RCT (Auerbach 1990) conducted in the US found no difference in the fat content or volume of breast milk produced using either unlimited sequential (single breast) pumping or unlimited simultaneous (double breast) pumping.

Overall, the studies on breast milk expression did not report enough information to determine if effectiveness varied by gender, age, ethnicity etc. Not surprisingly, it has been consistently demonstrated that double pumping produces the greatest volume of milk. There was, however, contradictory evidence regarding which type of pumping was preferred by the women included in the studies. In one trial, the women

preferred a double pump - due to the larger volumes of milk obtained in less time, whereas in another study, the double pump was rated as the most uncomfortable to use. In yet another study, the manual pump was preferred over an electric pump (both types were used for sequential pumping). Only one of the studies evaluated whether the time since the last breastfeed affected the amount of and fat content of the milk expressed (Fewtrell 2001). In this study, the authors reported that there were no significant differences within the individual mothers in the time since last feed prior to expression. It is noted that the studies were conducted on: infants ranging from 28 to 42 days of age (Zinaman 1992); infants approximately 8 weeks of age (Fewtrell 2001); and infants 5 to 35 weeks of age (Auerbrach 1990).

Summaries of evidence
One 1+ RCT compared a specific brand of mini-electric breast pump with a specific brand of manual breast pump. No significant differences were found in the volume of milk expressed or its fat content (Fewtrell 2001).
One 1+ RCT compared pumping each breast sequentially with both breasts simultaneously. Women preferred simultaneous pumping which also produced a greater volume of milk. No significant differences were found in milk fat concentrations (Auerbach 1990).

Table 5.12 Sub-questions for studies on methods to express breast milk

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/setting or intensity/duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
Fewtrell 2001	There was no difference in the effectiveness of the two methods of pumping (mini-electric vs. manual).	Not stated	No – both methods were tested for 20 minutes.	Mothers awarded significantly higher scores for the manual pump than electric pump for the categories of “comfort”, “pleasant to use” and “overall opinion of pump”.	No	There was no significant difference within individual mothers in the time since last feed prior to using either type of pump. 60% of the women had used a breast pump before (the type was unspecified).
Zinaman 1992	The ‘White River Electric’ double pump produced	Not stated	The breast pump type that produced the greatest mean	The breast pump that gave the prolactin	No	Only one of the three pumps evaluated was

	<p>significantly greater mean prolactin levels than the other two pumps or hand expression.</p> <p>It is not clear how the amount of time spent pumping may have influenced effectiveness.</p>		<p>milk volume and serum prolactin levels involved pumping both breasts simultaneously.</p>	<p>responses closest to infant suckling was rated as one of the more uncomfortable to use.</p> <p>The authors note that further research is needed.</p>		<p>readily available in the UK (Medela Manuelectric).</p>
Auerbrach 1990	<p>Unlimited simultaneous pumping produces larger volumes of milk than unlimited sequential pumping, but the difference was not significant. There were no significant difference in milk volumes between 5 min simultaneous and unlimited sequential pumping.</p>	<p>Maternal age, parity and ethnic group were unrelated to the volume of milk produced. Within specific age groupings, mothers with infants >8 weeks obtained the most milk only when using the unlimited simultaneous pumping pattern.</p>	<p>Five minute sequential pumping yielded the smallest amount of milk, followed by timed simultaneous breast pumping. The most milk was obtained by unlimited simultaneous pumping.</p>	<p>The women mostly preferred the double pump system – largely due to the larger volumes of milk obtained in less time.</p>	No	<p>Time since the last breastfeed may affect amount of milk and fat content.</p> <p>The authors state that experience of pumping prior to study entry was unrelated to milk volumes obtained.</p> <p>These results apply to Medela breast pumps.</p>

5.4. Key Question 4: What supplemental feeding modes (e.g. cup, spoon, bottle) are most effective?

Only one 1- RCT (Field 1997) was identified that examined supplemental feeding modes in healthy term babies. This study conducted in the US examined infant behaviours and vagal tone changes in 40 one-month old infants fed from a bottle using a breast-like teat compared to infants bottle-fed using a standard teat. The mothers had a mean age of 23.8 years, were of relatively low socioeconomic status, and were predominately African-American. The results (based on one 20 minute bottlefeeding session) demonstrated that infants who fed on the breast-like teat spent significantly less time asleep, more time actively awake and less time fussing or crying ($p < 0.05$ for all). There was no difference between the percentages of time the infants were quietly or actively awake. The authors also assessed vagal tone as this measure of heart rate (associated with respiration) is lower during breastfeeding and higher after breastfeeding in comparison to bottlefeeding. The authors also demonstrated a significant decrease in vagal tone during feeding, and a significant increase after feeding in infants using the breast-like teat compared to infants feeding with the standard teat ($p < 0.05$ for both).

Table 5.13 Sub-questions for the study on supplemental feeding modes

Reference	How does the structure and content of the intervention influence effectiveness?	Does effectiveness vary by gender, age, ethnicity, religious practices or social/professional group of those receiving or delivering the intervention?	Does effectiveness vary with site/setting or intensity/duration of the intervention?	What are the views of those receiving and delivering the intervention?	Is there evidence of unintended or harmful effects?	Are there barriers to replication of effective interventions?
Field 1997	During a 20 minute bottle feed, infants fed using the breast-like teat spent less time asleep, more time awake and active, and less time fussing and crying than infants bottle fed using a standard teat.	Mothers were reported to be of low SES. No sub-group comparisons were made.	The authors did not find any significant differences between infants who had been fed using the breast-like teat previously (familiar group) compared to those who had never fed using this type of teat (novelty group).	The authors state that using the breast-like teat may provide a smoother transition and more effective supplemental feeding for breastfed infants of working mothers.	No	No

Table 5.14 Corroborative evidence from UK studies of supplemental feeding modes

Reference	Key points for practice development in UK settings
Brown 1998	<ul style="list-style-type: none"> Prospective work should be undertaken to examine the most appropriate method of supplementation for term babies.
Cloherly 2005	<ul style="list-style-type: none"> This ethnographic study demonstrated an urgent need to determine which is the best method (cup-versus-bottle) of giving supplementary feeds.

5.5. Key Question 5: What is the effectiveness of vitamin supplementation in infants who are partly breastfed or exclusively formula fed?

Three studies were identified that examined either iron or zinc supplementation on the growth status and/or visual acuity in infants (Dewey, 2002; Friel 2003; Walravens 1992). However, as all of these studies included infants greater than six months of age, they were not included in this review.

6. Discussion

A relatively large body of evidence was identified for Key question 1, public health interventions to increase the initiation and duration of breastfeeding. It is unlikely that any one intervention will fit every circumstance and population group in England. Overall, the studies which addressed the other key questions included in this rapid review were poorly reported and there is a general lack of evidence in the literature on the issues under investigation.

6.1. Studies on public health interventions to increase the initiation and duration of breastfeeding

Twenty two studies (seven SRs and fifteen RCTs) assessed interventions to improve the initiation and duration of breastfeeding. Individual studies included in the SRs and the separate RCTs were categorised into 14 groups by type of intervention, which were not mutually exclusive in order to specifically identify the most successful interventions. The following conclusions concentrate on six types of intervention.

6.1.1. *Peer support programmes*

This review identified three good quality SRs (Fairbank 2000, Renfrew 2005, Britton 2007) and three RCTs (Muirhead 2006 (1++), Chapman 2004a and b (1-), Anderson 2005 (1-)) that evaluated peer support programmes on the initiation or duration of breastfeeding. Overall, these systematic reviews demonstrate a positive trend for peer support on the initiation and duration of 'any' and 'exclusive' breastfeeding although the results were not always statistically significant.. Renfrew et al (2005) concluded that effective peer support interventions were those that were given very soon after birth to women who did not have to request the support in order to receive it. It is suggested that further research is needed to assess what type of peer support programme may effectively increase the initiation and duration of exclusive breastfeeding in disadvantaged groups in the UK.

6.1.2. *Professional support*

The same three good quality (2++) SRs (Fairbank 2000, Renfrew 2005, Britton 2007) evaluated healthcare professional appraisal and support and two additional RCTs (Di Napoli 2004 (1-), Wallace 2006 (1++)). The three SRs demonstrate that generally, professional support improves breastfeeding initiation rates and prevents early cessation of 'any' and 'exclusive' breastfeeding. As in the case of peer support, there was a trend towards an increase in breastfeeding duration.

Britton et al (2007) included eighteen trials comparing professional support with usual care and concluded that professional support was effective overall but only achieved statistical significance for 'exclusive' but not for 'any' breastfeeding. Four of these studies were set in low-income countries. The overall results from these studies may not therefore be generalisable to UK service settings.

6.1.3. *Breastfeeding education*

It appears that educational interventions do not consistently appear to be as effective as other interventions. Interventions aimed at partners of women intending to breastfeed merit further research.

There was a lack of evidence on interventions aimed at partners of women intending to breastfeed.

6.1.4. *Professional training*

Although a number of high quality systematic reviews were identified, many of the studies included in the SRs were non-randomised trials or before-after studies. This was particularly the case in relation to professional training, where two good quality SRs (Fairbank 2000, Renfrew 2005) and two RCTs (Labarere 2005 (1++), Wallace 2006 (1++)) examined the effectiveness of professional training on breastfeeding outcomes.

6.1.5. *Multi-faceted interventions*

Four SRs included studies that evaluated multifaceted interventions (Couto de Oliveira 2001 (2+), Fairbank 2000 (2++), Guise 2003 (2+), Renfrew 2005 (2++)). Whether an intervention for a particular study was classified as multi-faceted in each review depended on the individual authors of the reviews' interpretation of the term. The review by Couto de Oliveira et al (2001) included studies in underdeveloped countries and older studies that were not included in the other reviews. Only Fairbank et al (2000) identified relevant before-after studies in addition to RCTs for this intervention. Only two RCTs of moderate/good quality, which took place in developed countries, and which had positive outcomes for breastfeeding duration or initiation were identified in all four SRs (Brent 1995 (1+), Rojjanasrirat 2000 (1+)). Brent et al (1995) was included in all four SRs and may have had a predominant effect on the relevant conclusions.

6.1.6. *Media programmes*

There was a lack of good quality evidence on the impact of media activity on initiation and duration rates of breastfeeding. A before-after study in the SR (2++) by Fairbank et al (2000) suggested that a media campaign and particularly television commercials may improve knowledge of breastfeeding.

6.1.7. *Conclusions*

No studies were identified to address the wider socio-political influences on breastfeeding such as employment conditions, marketing of breastmilk substitutes, education for schoolchildren, and facilitating breastfeeding in public places. These aspects were considered to be fundamentally important by participants in a national consultation (Dyson 2006). Similarly, the organisation of the health services has not been addressed in recent studies (see Renfrew 2005). No studies were identified to add to the evidence base on BFI in hospital and community settings (Dyson 2006, Renfrew 2005).

6.2. Contamination of equipment/storage and heating of breast milk/reconstitution of formula

There is an almost total lack of evidence on ways of minimising risks to babies who are fed breast milk substitutes, or expressed breast milk. In relation to the preparation to be used; one study suggests that ready to feed formula is less likely to result in over concentration of feed (Renfrew 2003 (2+)). However, ready to feed formula is prohibitively expensive and if recommended for the population at large, problems such as dilution and underfeeding may occur. Alternative ways of enhancing the appropriate use of powdered milk, such as the use of standard sized scoops, improved information and education for carers, and the use of pre-measured sachets, have not been examined. One Scottish study found that mothers who chose

to bottle feed received virtually no information about ways of doing this as safely as possible (Cairney and Alder 2001). No studies of parents' views of effective ways of preparing formula feeds in the home have been identified.

Similar issues exist for ways of cleaning and sterilising infant feeding equipment, whether for expressed breast milk or for formula feeding. A wide range of methods are in common use, including steam and chemical sterilisation, microwave ovens, dishwashers, and washing with hot water and detergent. Several of these are both complicated and expensive. Although it has been shown that using some method of cleaning and sterilising is associated with reduced gastrointestinal disease in the baby (Quigley 2006), there is no evidence to inform the best techniques to use, and effective ways of enhancing compliance. It may, for example, be better to strengthen the fundamental hygiene message of handwashing and thorough cleaning and drying, than to advocate the use of complicated and expensive equipment in the home. Evidence is urgently required to test different approaches, and the views of parents, especially those from low-income backgrounds, will be an essential component of such studies.

6.3. Expression of breast milk

Three RCTs were included in the rapid review that examined the effectiveness of methods used to express breast milk. Two of the studies compared types of breast pumps (Fewtrell 2001 (1+), Zinaman 1992 (1-)), and the other compared sequential versus simultaneous breast pumping (Auerbach 1990 (1+)). One of the studies demonstrated the effectiveness of a double pump compared to electric, manual or hand expression (Zinaman 1992). In contrast, a well-conducted UK study (Fewtrell 2001) demonstrated equal efficacy between a mini-electric breast pump and a manual pump (it is noted that the study was funded by a grant by the manufacturers of the manual breast pump). As it is not possible to directly compare the results of these studies, further research is needed to directly compare a double pump available in the UK with both the mini-electric breast pump and a manual pump on milk volume and fat content. Until such a study exists, it is not possible to recommend what type of breast pump available to women in the UK is most effective using the current evidence base.

6.4. Supplemental feeding modes

Good quality evidence on the effectiveness of supplemental feeding modes in healthy term babies is lacking. One 1- RCT was identified in the literature, but provides little informative data (Field 1997). Two RCTs included in Renfrew et al (2005) were also identified (Howard 2003, Schubiger 1997). The only conclusion that could be drawn was that cup feeding may have better breastfeeding duration outcomes than bottlefeeding for babies delivered by caesarean section. The characteristics of the babies who need supplements during the neonatal period, and the conditions under which a cup or bottle and teat may be most preferable, need to be further explored before recommendations can be made.

Appendix A – Included Studies

Anderson, A. K., G. Damio, et al. (2005). "A randomized trial assessing the efficacy of peer counseling on exclusive breastfeeding in a predominantly Latina low-income community." Archives of Pediatrics & Adolescent Medicine **159**(9): 836-41.

K.G. Auerbach (1990). "Sequential and simultaneous breast pumping: a comparison." International Journal of Nursing Studies **27**(3): 257-65.

V. Bernath (2001). "Cross infection associated with shared infant feeding equipment". Monash: Centre for Clinical Effectiveness.

Bonuck, K. A., M. Trombley, et al. (2005). "Randomized, controlled trial of a prenatal and postnatal lactation consultant intervention on duration and intensity of breastfeeding up to 12 months." Pediatrics **116**(6): 1413-26.

Britton, C. and F.M. McCormick, et al. (2007) "Support for breastfeeding mothers" Cochrane Database of Systematic Reviews 2007, Issue 1. Chichester, UK: John Wiley & Sons, Ltd.

Chapman, D. J., G. Damio, et al. (2004a). "Effectiveness of breastfeeding peer counseling in a low-income, predominantly Latina population: a randomized controlled trial." Archives of Pediatrics & Adolescent Medicine **158**(9): 897-902.

Chapman, D., G. Damio, et al. (2004b). "Association of degree and timing of exposure to breastfeeding peer counseling services with breastfeeding duration." Advances in Experimental Medicine & Biology **554**: 303-6

Couto de Oliveira, M.I., L.A. Bastos Camacho, et al. (2001). "Extending breastfeeding duration through primary care: a systematic review of prenatal and postnatal interventions." Journal of Human Lactation **17**(4): 326-43

Di Napoli, A., D. Di Lallo, et al. (2004). "Home breastfeeding support by health professionals: findings of a randomized controlled trial in a population of Italian women." Acta Paediatrica **93**(8): 1108-14.

Dias de Oliveira L., E.R.J. Giugliani, et al. (2006). "Effect of intervention to improve breastfeeding technique on the frequency of exclusive breastfeeding and lactation-related problems." Journal of Human Lactation **22**(3): 315-321.

Dyson L, F.M. McCormick, et al (2005). "Interventions for promoting the initiation of breastfeeding." The Cochrane Database of Systematic Reviews Issue 2. Chichester, UK: John Wiley & Sons, Ltd.

Fairbank L, S. O'Meara, et al. (2000) "A systematic review to evaluate the effectiveness of interventions to promote the initiation of breastfeeding." Health Technology Assessment **4** **25**:1-171.

Fewtrell, M., P. Lucas, et al. (2001). "Randomized study comparing the efficacy of a novel manual breast pump with a mini-electric breast pump in mothers of term infants." Journal of Human Lactation **17**(2): 126-31.

Field, T. M., S. Schanberg, et al. (1997). "Bottlefeeding with a breast-like nipple." Early Child Development and Care **132**: 57-63.

Forster, D., H. McLachlan, et al. (2004). "Two mid-pregnancy interventions to increase the initiation and duration of breastfeeding: A randomized controlled trial." Birth **31**(3): 176-182.

Guise J.-M., V. Palda, et al. (2003) "The effectiveness of primary care-based interventions to promote breastfeeding: systematic evidence review and meta-analysis for the US Preventive Services Task Force." Annals of Family Medicine **1**(2): 70-80.

Labarere, J., V. Bellin, et al. (2003). "Assessment of a structured in-hospital educational intervention addressing breastfeeding: a prospective randomised open trial." BJOG: An International Journal of Obstetrics & Gynaecology **110**(9): 847-52.

Labarere, J., N. Gelbert-Baudino, et al. (2005). "Efficacy of breastfeeding support provided by trained clinicians during an early, routine, preventive visit: A prospective, randomized, open trial of 226 mother-infant pairs." Pediatrics **115**(2): e139-e146.

Lavender, T., L. Baker, et al. (2005). "Breastfeeding expectations versus reality: a cluster randomised controlled trial." BJOG: An International Journal of Obstetrics & Gynaecology **112**(8): 1047-53.

Muirhead, P.E., G. Butcher, et al. (2006). "The effect of a programme of organised and supervised peer support on the initiation and duration of breastfeeding: a randomised trial." British Journal of General Practice. **56**(524):191-7.

Noel-Weiss, J., A. Rupp, et al. (2006). "Randomised controlled trial to determine effects of prenatal breastfeeding workshop on maternal breastfeeding self-efficacy and breastfeeding duration." Journal of Obstetric, Gynecologic, and Neonatal Nursing. **35**: 616-624.

Renfrew M.J., P. Ansell, et al. (2003). "Formula feed preparation: helping reduce the risks; a systematic review." Archives of Disease in Childhood **88**(10): 855-858.

Renfrew, M.J., L. Dyson, et al. (2005) "Effectiveness of health interventions to promote the duration of breastfeeding: systematic review." London: National Institute for Health and Clinical Excellence.

Renfrew M.J., M. McLoughlin, et al. (2008) "Cleaning and sterilisation of infant feeding equipment: a systematic review." Abstract available online at <http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=1766984&fulltextType=RA&fileId=S1368980008001791>
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Valdes, V., A. Perez, et al. (1993). "The impact of a hospital and clinic-based breastfeeding promotion programme in a middle class urban environment". Journal of Tropical Pediatrics, **39**, 142-151.

Vandale-Toney, S., H. Reyes-Vázquez, et al. (1992). "Programa de promoción de la lactancia materna en el Hospital General de México: un estudio evaluativo". Salud Publica de Mexico, **34**, 25-35.

Vaughan, V., R. Dienst, et al. (1962). "A study of techniques of preparation of formulas for infant feeding". The Journal of Paediatrics **61** : 547-555.

Vega-Franco, L., V. Gordillo, et al. (1985). "Educacion prenatal para la lactancia al seno." Boletin Medico del Hospital Infantil de Mexico **42**: 470-5.

Verma, M., J. Chhatwal, et al. (1995). "Antenatal period: an educational opportunity". Indian Pediatrics, **32**(2), 171-7.

Waldenstrom, U. and C.A. Nilsson (1994) "No effect of birth centre care on either duration or experience of breast feeding, but more complications: findings from a randomised controlled trial". Midwifery **10**(1): 8-17.

Watters, N. and B. Sparrow (1990). "Combined care: as good as they say?" Canadian Nurse, **86**(2), 28-32.

Watters, N.E. and C.M. Kristiansen (1995). "Two evaluations of combined mother-infant versus separate postnatal nursing care". Research in Nursing & Health, **18**(1), 17-26.

Westphal, M.F., J.A. Taddei, et al. (1995). "Breastfeeding training for health professionals and resultant institutional changes". Bulletin of the World Health Organisation, **73**, 461-8.

L.S. Wiles (1984). "The effect of prenatal breastfeeding education on breastfeeding success and maternal perception of the infant". JOGN Nurs (Journal of Obstetric, Gynecologic and Neonatal Nursing), **13**(4), 253-7.

Winikoff, B., D. Myers, et al. (1987). "Overcoming obstacles to breast-feeding in a large municipal hospital: applications of lessons learned". Pediatrics, **80**(3), 423-433.

Winterburn, S., and M. Jiwa (2003). "Maternal grandmothers and support for breastfeeding." Journal of Community Nursing **17**(12): 4-9.

S.S. Wrenn (1997). "Effects of a model-based intervention on breastfeeding attrition." DAI V58(12). Health Sciences. San Antonio, University of Texas.

Wright, A.L., A. Naylor, et al. (1997). "Using Cultural Knowledge in Health Promotion: Breastfeeding among the Navajo". Health Education & Behavior, **24**(5), 625.

Other references

National Institute for Health and Clinical Excellence (2006). "Methods for development of NICE public health guidance." London: National Institute for Health and Clinical Excellence.

Renfrew, M.J., L. Dyson, et al. (2005). "The effectiveness of health interventions to promote the duration of breastfeeding: systematic review." National Institute for Health and Clinical Excellence, London.

World Bank (2001) World Development Report. Oxford: Oxford University Press.

Appendix B – Excluded Studies

Renfrew (2005) review: “The effectiveness of public health interventions to promote the duration of breastfeeding”

SR - systematic review

Systematic Reviews (n=22)	Reason for Exclusion
Blyth, R., W. Smyth, et al. (2004). “Antenatal nipple care for increasing the duration of breastfeeding”. <u>The Cochrane Database of Systematic Reviews</u> : Protocols Issue 1. Chichester, UK: John Wiley & Sons, Ltd.	Protocol only
Bronner, Y., T. Barber, et al. (2001). “Breastfeeding peer counseling: rationale for the National WIC Survey”. <u>Journal of Human Lactation</u> 17(2): 135-9	Not a SR
Coren, E., J. Patterson, et al. (2003). “Home-based support for socially disadvantaged mothers”. <u>The Cochrane Database of Systematic Reviews</u> : Protocols Issue 1. Chichester, UK: John Wiley & Sons, Ltd.	Protocol only
Creedy, D., C.L. Dennis (2003). “Telephone support for women during pregnancy and the first month postpartum”. <u>The Cochrane Database of Systematic Reviews</u> : Protocols Issue 2. Chichester, UK: John Wiley & Sons, Ltd.	Protocol only
C. Dennis (2002). “Breastfeeding initiation and duration: a 1990-2000 literature review”. <u>JOGNN - Journal of Obstetric, Gynecologic, & Neonatal Nursing</u> 31(1): 12-32	Not a SR
Dyson, L., F. McCormick, et al. (2005) “Interventions for promoting the initiation of breastfeeding”. <u>The Cochrane Database of Systematic Reviews</u> : Reviews Issue 2. Chichester, UK: John Wiley & Sons, Ltd.	Included for update/comparison only
Elkan, R., D. Kendrick, et al. (2000). “The effectiveness of domiciliary health visiting: a systematic review of international studies and a selective review of the British literature”. <u>Health Technology Assessment</u> 4(13).	Excluded from Renfrew 2005 (individual papers in review were excluded from Renfrew 2005)
Flint, A., K. New, et al. (2005). “Cup feeding versus other forms of supplemental enteral feeding for newborn infants unable to fully breastfeed”. <u>The Cochrane Database of Systematic Reviews</u> : Protocols Issue 1. Chichester, UK: John Wiley & Sons, Ltd.	Protocol only
A.J. Gagnon (2000). Individual or group antenatal education for childbirth/parenthood”. <u>The Cochrane Database of Systematic Reviews</u> : Reviews Issue 4. Chichester, UK: John Wiley & Sons, Ltd.	Education programmes directed exclusively to increasing breastfeeding success were excluded from the review
Gagnon, A.J., L. Barkun (2003). “Postnatal parental education for improving family health”. <u>The Cochrane Database of</u>	Protocol only

<u>Systematic Reviews: Protocols Issue 1. Chichester, UK: John Wiley & Sons, Ltd.</u>	
Health Promotion Research (1996). "Promotion of breastfeeding maintenance". <i>Bristol: University of Bristol: 1-11</i>	This review pre-dates Refrew 2005
Horvath, A., B. Koletzko, et al. (2005). The effect of supplemental fluids or feedings during the first days of life on the success and duration of breastfeeding: A systematic review of randomized controlled trials". <i>Archives of Pediatrics & Adolescent Medicine</i> 159 (6): pp 597-598	Not a SR (Comment)
Lewin, S.A., J. Dick, et al. (2005). "Lay health workers in primary and community health care". <u>The Cochrane Database of Systematic Reviews: Reviews Issue 1. Chichester, UK: John Wiley & Sons, Ltd.</u>	Individual studies that assess breastfeeding do not meet inclusion criteria
Martins, S., S. Logan, et al. (2001). "Iron supplementation for improving psychomotor development and cognitive function in infants under the age of one". <u>The Cochrane Database of Systematic Reviews: Protocols Issue 2. Chichester, UK: John Wiley & Sons, Ltd.</u>	Protocol only
Palda, V.A., J.M. Guise, et al. (2003). "Interventions to promote breastfeeding: updated recommendations from the Canadian Task Force on Preventive Health Care".	Pre-2005 (update of Guise 2003)
Raj, V.K., S.B. Plichta (1998). "The role of social support in breastfeeding promotion: a literature review. (Review) (49 refs)". <i>Journal of Human Lactation</i> 14 (1): 41-5	Not a SR (essay)
Reviews NHS Centre for Reviews and Dissemination, et al. (2000). "Promoting the initiation of breastfeeding". <u>Effective Health Care Bulletin</u> July 2000, 6 (2)	Bulletin based on Fairbank 2000
Sikorski, J., M.J. Renfrew, et al. (2002) "Support for breastfeeding mothers". <u>The Cochrane Database of Systematic Reviews: Reviews Issue 1. Chichester, UK: John Wiley & Sons, Ltd.</u>	Included for update/comparison only
Szajewska, H., A. Horvath, et al. (2006). "Effects of brief exposure to water, breast-milk substitutes, or other liquids on the success and duration of breastfeeding: A systematic review". <i>Acta Paediatrica</i> 95 (2): 145-152.	This review included only one study which was also included in Renfrew 2005
Ullah, S. and P. Griffiths (2003). "Does the use of pacifiers shorten breastfeeding duration in infants? (25 ref)". <u>British Journal of the Community Nurse</u> (10): 458-63	The papers included in this review do not meet the inclusion criteria
Wambach, K.A. and C. Cole (2000). "Breastfeeding and adolescents". <u>JOGNN - Journal of Obstetric, Gynecologic, & Neonatal Nursing</u> 29 (3): 282-94	Does not effectiveness of an intervention
Winzenberg, T.M., G. Jones, et al. (2005) "Calcium supplementation for improving bone mineral density in children". <u>The Cochrane Database of Systematic Reviews: Protocols 2005 Issue 1. Chichester, UK: John Wiley & Sons, Ltd.</u>	Protocol only

Randomised Controlled Trials (n=80)	Reason for Exclusion
Arlotti, J. P., B. H. Cottrell, et al. (1998). "Breastfeeding among low-income women with and without peer support." <u>Journal of Community Health Nursing</u> 15 (3): 163-78.	Excluded from Renfrew 2005
Ball, H.L., M.P. Ward-Platt, et al. (2006). "Randomised trial of infant sleep location on the postnatal ward." <u>Archives of Disease in Childhood</u> 91 (12): 1005-1010.	Excluded - no relevant intervention
Bartington, S., L.J. Griffiths, et al. (2006). "Are breastfeeding rates higher amongst mothers delivering in Baby Friendly accredited maternity units in the UK?" <u>International Journal of Epidemiology</u> 35 (5): 1178-1186.	Excluded - not an RCT – no intervention
Bartu, A., J. Sharp, et al. (2006). Postnatal home visiting for illicit drug-using mothers and their infants: A randomised controlled trial. <u>Australian & New Zealand Journal of Obstetrics and Gynaecology</u> 46 (5); 419-426.	Excluded – subjects were drug-using mothers
Black, M. M., E. H. Siegel, et al. (2001). "Home and videotape intervention delays early complementary feeding among adolescent mothers." <u>Pediatrics</u> 107 (5): E67.	Excluded from Renfrew 2005
Bliss, M. C., J. Wilkie, et al. (1997). "The effect of discharge pack formula and breast pumps on breastfeeding duration and choice of infant feeding method.[see comment]." <u>Birth</u> 24 (2): 90-7.	In Renfrew 2005
Bosnjak, A. P., M. Batinica, et al. (2004). "The effect of baby friendly hospital initiative and postnatal support on breastfeeding rates--Croatian experience." <u>Collegium Antropologicum</u> 28 (1): 235-43.	Excluded – not a RCT/country
Braun, M. L. G., E. R. J. Giugliani, et al. (2003). "Evaluation of the Impact of the Baby-Friendly Hospital Initiative on Rates of Breastfeeding." <u>American Journal of Public Health</u> 93 (8): 1277-1279.	Excluded – not a RCT
Burt, S., M. Whitmore, et al. (2006). "The development and delivery of a practice-based breastfeeding education package for general practitioners in the UK." <u>Maternal and Child Nutrition</u> 2 (2): 91-102.	Excluded – not an RCT – no relevant outcomes
Chapman, D. J., S. Young, et al. (2001). "Impact of breast pumping on lactogenesis stage II after cesarean delivery: a randomized clinical trial." <u>Pediatrics</u> 107 (6): E94.	In Renfrew 2005
S. Cleghorn (2006). "Do health visitors advise mothers about vitamin supplements for their infants in line with government recommendations to help prevent rickets?" <u>Journal of Human Nutrition and Dietetics</u> 19 (3): 203-208.	Excluded – not an RCT, no intervention, knowledge only
Collins, C. T., P. Ryan, et al. (2004). "Effect of bottles, cups, and dummies on breast feeding in preterm infants: a randomised controlled trial." <u>British Medical Journal</u> 329 (7459): 193-8.	Excluded – pre-term babies
Coombs, D. W., K. Reynolds, et al. (1998). "A self-help program to increase breastfeeding among low-income women." <u>Journal of Nutrition Education</u> 30 (4): 203-9.	In Renfrew 2005
Coutinho, S. B., P. I. de Lira, et al. (2005). "Comparison of the effect of two systems for the promotion of exclusive breastfeeding." <u>Lancet</u> 366 (9491): 1094-100.	Excluded – not a RCT/country
Cronenwett, L., T. Stukel, et al. (1992). "Single daily bottle use in the early weeks postpartum and breastfeeding outcomes." <u>Pediatrics</u> 90 (5): 760-6.	Excluded from Renfrew 2005

Daghio, M. M., M. D. Vezzani, et al. (2003). "Impact of an educational intervention on breastfeeding." <u>Birth</u> 30 (3): 214-215.	Excluded – not a RCT
Delvin, E. E., B. L. Salle, et al. (2000). "Vitamin A and E supplementation in breast-fed newborns." <u>Journal of Pediatric Gastroenterology & Nutrition</u> 31 (5): 562-5.	Pseudo-randomised
C. Dennis (2002). "Breastfeeding peer support: maternal and volunteer perceptions from a randomized controlled trial." <u>Birth</u> 29 (3): 169-76.	In DOLPHIN SR
Dennis, C. L., E. Hodnett, et al. (2002). "The effect of peer support on breast-feeding duration among primiparous women: a randomized controlled trial.[see comment]." <u>CMAJ Canadian Medical Association Journal</u> 166 (1): 21-8.	In Renfrew 2005
Dennis, C. L., E. Hodnett, et al. (2002). "Telephone-based peer support increased the duration of breast feeding in primiparous mothers." <u>Evidence Based Medicine</u> 7 (5): 156.	In Renfrew 2005
Dewey, K. G., M. Domellöf, et al. (2002). "Iron supplementation affects growth and morbidity of breast-fed infants: results of a randomized trial in Sweden and Honduras." <u>The Journal of Nutrition</u> 132 (11): 3249-55.	Includes infants >6 months – to be considered in 6-24 month rapid review
Dollberg, S., Botzer, E., et al. (2006) "Immediate nipple pain relief after frenotomy in breast-fed infants with ankyloglossia: a randomised prospective study" <u>Journal of Pediatric Surgery</u> 41 (9): 1598-1600.	Excluded – not normal infants
Domellof, M., K. Dewey, et al. (2005). "Iron supplements reduce erythrocyte copper-zinc superoxide dismutase activity in term, breastfed infants." <u>Acta Paediatrica</u> 94 (11): 1578-1582.	Excluded - outcomes
Dungy, C. I., J. Christensen-Szalanski, et al. (1992). "Effect of discharge samples on duration of breast-feeding." <u>Pediatrics</u> 90 (2 Pt 1): 233-7.	Excluded from Renfrew 2005
Dungy, C. I., M. E. Losch, et al. (1997). "Hospital infant formula discharge packages. Do they affect the duration of breast-feeding?" <u>Archives of Pediatrics & Adolescent Medicine</u> 151 (7): 724-9.	In Renfrew 2005
Ermis, B., F. Demirel, et al. (2002). "Effects of three different iron supplementations in term healthy infants after 5 months of life." <u>Journal of Tropical Pediatrics</u> 48 (5): 280-284.	Excluded – country of study
Forster, D., H. McLachlan, et al. (2003). "ABFAB. Attachment to the breast and family attitudes to breastfeeding. The effect of breastfeeding education in the middle of pregnancy on the initiation and duration of breastfeeding: A randomised controlled trial [ISRCTN21556494]." <u>BMC Pregnancy & Childbirth</u> 3 (29).	Excluded – protocol only
Friel, J. K., K. Aziz, et al. (2003). "A double-masked, randomized control trial of iron supplementation in early infancy in healthy term breast-fed infants." <u>Journal of Pediatrics</u> 143 (5): 582-6.	Includes infants >6 months – to be considered in 6-24 month rapid review
Gagnon, A. J., G. Dougherty, et al. (2002). "Randomized trial of postpartum care after hospital discharge." <u>Pediatrics</u> 109 (6): 1074-80.	In Renfrew 2005

R.S. Gibson (2000). "Zinc supplementation for infants." <u>Lancet</u> 355 (9220): 2008-2009.	Excluded – not a RCT
Gomes, C.F., Trezza, et al. (2006). "One-to-one or group-based peer support for breastfeeding? Women's perceptions of a breastfeeding peer coaching intervention." <u>Jornal de Pediatria</u> 82 (2): 103-109.	Excluded – not an RCT – not relevant (country)
Gilks, J. and M. Watkinson (2004). "Improving breast feeding rates in preterm babies: cup feeding versus bottle feeding." <u>Journal of Neonatal Nursing</u> 10 (4): 118-20.	Excluded – preterm babies
Graffy, J., J. Taylor, et al. (2004). "Randomised controlled trial of support from volunteer counsellors for mothers considering breast feeding." <u>British Medical Journal</u> 328 (7430): 26-29.	In Renfrew 2005
Gross, S. M., L. E. Caulfield, et al. (1998). "Counseling and motivational videotapes increase duration of breast-feeding in African-American WIC participants who initiate breast-feeding." <u>Journal of the American Dietetic Association</u> 98 (2): 143-8.	Excluded from Renfrew 2005
Gunn, J., J. Lumley, et al. (1998). "Does an early postnatal check-up improve maternal health: results from a randomised trial in Australian general practice." <u>British Journal of Obstetrics & Gynaecology</u> 105 (9): 991-7.	In Renfrew 2005
Hay, A. E. and C. M. A. Campbell (2004). "Volunteer counsellors for supporting breast feeding... Graffy J, Taylor J, Williams A et al. Randomised controlled trial of support from volunteer counsellors for mothers considering breast feeding. <u>BMJ</u> 2004;328:26. (3 January)." <u>British Medical Journal</u> 328 (7435).	Excluded – not a RCT (letter)
Henderson, A., G. Stamp, et al. (2001). "Postpartum positioning and attachment education for increasing breastfeeding: a randomized trial." <u>Birth</u> 28 (4): 236-42.	In Renfrew 2005
Hill, P. D., J. C. Aldag, et al. (1996). "The effect of sequential and simultaneous breast pumping on milk volume and prolactin levels: a pilot study." <u>Journal of Human Lactation</u> 12 (3): 193-9.	Excluded – mothers of preterm babies
Hoddinott, P., A. J. Lee, et al. (2006). "Effectiveness of a Breastfeeding Peer Coaching Intervention in Rural Scotland." <u>Birth</u> 33 (1): 27-36.	Excluded - not a RCT (included as UK corroborative)
E. Hodnett (1999). "Efficacy of home-based peer counseling to promote exclusive breast-feeding: a randomized controlled trial." <u>Journal of Pediatrics</u> 135 (5): 649-50.	Abstract only (original study excluded from Renfrew 2005)
Howard, C., F. Howard, et al. (2000). "Office prenatal formula advertising and its effect on breast-feeding patterns." <u>Obstetrics and Gynecology</u> 95 (2): 296-303.	Excluded from Renfrew 2005
Howard, C. R., F. M. Howard, et al. (1999). "The effects of early pacifier use on breastfeeding duration." <u>Pediatrics</u> 103 (3): E33.	In Renfrew 2005
Howard, C. R., F. M. Howard, et al. (2003). "Randomized clinical trial of pacifier use and bottle-feeding or cupfeeding and their effect on breastfeeding." <u>Pediatrics</u> 111 (3): 511-8.	In Renfrew 2005
Howard, C. R., F. M. Howard, et al. (2001). "Complementary feeding methods for breastfed babies. A randomized trial of cup versus bottle	CRD

and the effect on breastfeeding success." <u>Pediatric Research</u> 49 (4): 161A.	
Kind, C., G. Schubiger, et al. (2000). "Provision of supplementary fluids to breast fed infants and later breast feeding success." <u>Advances in Experimental Medicine & Biology</u> 478 : 347-54.	In Renfrew 2005
Kools, E. J., C. Thijs, et al. (2005). "A breast-feeding promotion and support program a randomized trial in The Netherlands." <u>Preventive Medicine</u> 40 (1): 60-70.	Excluded – Low birthweight babies included
Leite, A. J., R. F. Puccini, et al. (2005). "Effectiveness of home-based peer counselling to promote breastfeeding in the northeast of Brazil: a randomized clinical trial." <u>Acta paediatrica (Oslo, Norway : 1992)</u> 94 (6): 741-6.	Excluded – country of study
B. Lozoff (2003). "Do breast-fed babies benefit from iron before 6 months?" <u>Journal of Pediatrics</u> 143 (5): 554-556.	Excluded – not a RCT
Lucas, A., S. Lockton, et al. Randomised trial of a ready-to-feed compared with powdered formula. <u>Archives of Disease in Childhood</u> 1992;67(7): 935-9.	Excluded by NICE
P.J. Martens (2000). "Does breastfeeding education affect nursing staff beliefs, exclusive breastfeeding rates, and Baby-Friendly Hospital Initiative compliance? The experience of a small, rural Canadian hospital." <u>Journal of Human Lactation</u> 16 (4): 309-18.	Excluded – not a RCT
McKeever, P., B. Stevens, et al. (2002). "Home versus hospital breastfeeding support for newborns: a randomized controlled trial." <u>Birth</u> 29 (4): 258-65.	Excluded from Renfrew 2005
Mimouni, F. B., M. Inbar, et al. (2002). "Bacterial contamination during routine formula preparation." <u>AJIC: American Journal of Infection Control</u> 30 (1): 44-45.	Excluded – not a RCT
A.K. Mitra (2004). "Breast feeding support from volunteer counsellors does not increase rates of breast feeding." <u>Evidence-Based Healthcare</u> 8 (4): 202-204.	Excluded – not a RCT
Morais, T. B., D. M. Sigulem, et al. (2005). "Bacterial contamination and nutrient content of home-prepared milk feeding bottles of infants attending a public outpatient clinic." <u>Journal of Tropical Pediatrics</u> 51 (2): 87-92	Excluded – country of study
Morrell, C. J., H. Spiby, et al. (2000). "Costs and benefits of community postnatal support workers: a randomised controlled trial." <u>Health Technology Assessment</u> 4 (6): 86.	In Renfrew 2005
Morrell, C. J., H. Spiby, et al. (2000). "Costs and effectiveness of community postnatal support workers: randomised controlled trial.[see comment]." <u>British Medical Journal</u> 321 (7261): 593-8.	In Renfrew 2005
Morrow, A. L., M. L. Guerrero, et al. (1999). "Efficacy of home-based peer counselling to promote exclusive breastfeeding: a randomised controlled trial.[see comment]." <u>Lancet</u> 353 (9160): 1226-31.	Excluded- country of study
Nagpal, J., H. P. Sachdev, et al. (2004). "A randomized placebo-controlled trial of iron supplementation in breastfed young infants initiated on complementary feeding: effect on haematological status." <u>Journal of Health, Population, and Nutrition</u> 22 (2): 203-11.	Excluded – country of study
Penny, M. E., H. M. Creed-Kanashiro, et al. (2005). "Effectiveness of an educational intervention delivered through the health services to improve nutrition in young children: a cluster-randomised controlled trial." <u>Lancet</u> 365 (9474): 1863-72.	Excluded- country of study

Pisacane, A., G. I. Continisio, et al. (2005). "A controlled trial of the father's role in breastfeeding promotion." <u>Pediatrics</u> 116 (4): e494-8.	Excluded – not a RCT
Pittard, I. W., K. M. Geddes, et al. (1991). "Bacterial contamination of human milk: Container type and method of expression." <u>American Journal of Perinatology</u> 8 (1): 25-27.	Excluded – clinical/hospital setting
Pobocik, R. S., J. C. Benavente, et al. (2000). "Effect of a breastfeeding education and support program on breastfeeding initiation and duration in a culturally diverse group of adolescents." <u>Journal of Nutrition Education</u> 32 (3): 139-45.	Excluded from Renfrew 2005
Porteous, R., K. Kaufman, et al. (2000). "The effect of individualized professional support on duration of breastfeeding: a randomized controlled trial." <u>Journal of Human Lactation</u> 16 (4): 303-8.	In Renfrew 2005
Pugh, L. C., R. A. Milligan, et al. (2002). "Breastfeeding duration, costs, and benefits of a support program for low-income breastfeeding women." <u>Birth</u> 29 (2): 95-100.	In Renfrew 2005
Quinlivan, J. A., H. Box, et al. (2003). "Postnatal home visits in teenage mothers: a randomised controlled trial." <u>Lancet</u> 361 (9361): 893-900	In Renfrew 2005
Reifsnider, E. and D. Eckhart (1997). "Prenatal breastfeeding education: its effect on breastfeeding among WIC participants." <u>Journal of Human Lactation: official journal of the International Lactation Consultant Association</u> 13 (2): 121-5.	Excluded from Renfrew 2005
Schafer, E., M. K. Vogel, et al. (1998). "Volunteer peer counselors increase breastfeeding duration among rural low-income women." <u>Birth</u> 25 (2): 101-6.	Excluded – not a RCT
Schubiger, G., U. Schwarz, et al. (1997). "UNICEF/WHO baby-friendly hospital initiative: Does the use of bottles and pacifiers in the neonatal nursery prevent successful breastfeeding?" <u>European Journal of Pediatrics</u> 156 (11): 874-877.	In Renfrew 2005
Shaw, E. and J. Kaczorowski (1999). "The effect of a peer counseling program on breastfeeding initiation and longevity in a low-income rural population." <u>Journal of Human Lactation</u> 15 (1): 19-25.	Excluded from Renfrew 2005
K. Simmer (2002). "Telephone-based peer support increased the duration of breastfeeding in primiparous mothers." <u>ACP Journal Club</u> 137 (2).	Excluded – not a RCT
Snell, B. J., M. Krantz, et al. (1992). "The association of formula samples given at hospital discharge with the early duration of breastfeeding." <u>Journal of Human Lactation</u> 8 (2): 67-72.	Excluded from Renfrew 2005
Steel O'Connor, K. O., D. L. Mowat, et al. (2003). "A randomized trial of two public health nurse follow-up programs after early obstetrical discharge: an examination of breastfeeding rates, maternal confidence and utilization and costs of health services." <u>Canadian Journal of Public Health Revue Canadienne de Sante Publique</u> 94 (2): 98-103.	In Renfrew 2005
Stevens, B.D., Guerriere, D., et al. (2006) "Economics of home vs. hospital breastfeeding support for newborns." <u>Journal of Advanced Nursing</u> 53 (2): 233-243.	Excluded – all outcomes are costs
Volpe, E. M. and M. Bear (2000). "Enhancing breastfeeding initiation in adolescent mothers through the Breastfeeding Educated and Supported Teen (BEST) Club." <u>Journal of Human Lactation</u> 16 (3): 196-200.	Excluded – not an RCT
Walker, M. L. (2002). "Telephone based peer support increased	In Renfrew

duration of breast feeding in primiparous mothers." <u>Evidence Based Nursing</u> 5 (3).	2005
Walravens, P. A., A. Chakar, et al. (1992). "Zinc supplements in breastfed infants." <u>Lancet</u> 340 (8821): 683-685.	Includes infants >6 months – to be considered in 6-24 month rapid review
Wambach, K. A. and C. Cole (2000). "Breastfeeding and adolescents." <u>JOGNN - Journal of Obstetric, Gynecologic, & Neonatal Nursing</u> 29 (3): 282-94.	Excluded from Renfrew 2005
Winterburn, S. and R. Fraser (2000). "Does the duration of postnatal stay influence breast-feeding rates at one month in women giving birth for the first time? A randomized control trial." <u>Journal of Advanced Nursing</u> 32 (5): 1152-7.	In Renfrew 2005
Winterburn, S., M. Jiwa, et al. "Maternal grandmothers and support for breastfeeding." <u>Journal of Community Nursing</u> 2003 Dec; 17 (12): 4.	CRD
Yurdakok, K., F. Temiz, et al. (2004). "Efficacy of Daily and Weekly Iron Supplementation on Iron Status in Exclusively Breast-Fed Infants." <u>Journal of Pediatric Hematology/Oncology</u> 26 (5): 284-288.	Excluded – country of study

Excluded studies which were originally identified as relevant by stakeholders

As part of the NICE consultation process, some papers were identified as being relevant by members of the PDG group or stakeholders. Those which merited consideration but were finally excluded are listed here. Some references which did not meet the inclusion criteria for the review contained additional information of interest. References, brief descriptions and comments on these additional papers appear in the table below the table of excluded stakeholder papers. The 13 papers include: Battersby 2002, Battersby 2007, Heinig 2006, Jensen 2005, Lauritzen 2005, Lauritzen 2006, McInnes 2000, Pugin 1996, Reid 1997, Rishel 2005, San Giovanni 2000, Shealy 2005, Weimer 1998

Reference	Reason for Exclusion
S. Battersby (2002). "The Breastfeeding is Best Supporters Project: An evaluation of the merged Breastfeeding Peer Support Programmes" http://www.sheffield.ac.uk/surestart/pubIns.html .	There were problems with data collection. A very poor quality before-after study with limited data available on the specific intervention.
S. Battersby (2007). "An evaluation of La Leche League, Great Britain, Breastfeeding Peer Counsellor Programme". Unfinished draft for NICE only. Final draft to be supplied 20 September 2007	There were problems with data collection. A very poor quality before-after evaluation with limited or missing data
Heinig, M.J., K.H. Brown, et al. (2006). "Zinc supplementation does not affect growth, morbidity, or motor development of US term breastfed infants at 4-10 months of age" <u>American Journal of Clinical Nutrition</u> 84 : 594-601.	Infants in this RCT were fully breastfed not partly breastfed or exclusively

	formula fed
Jensen, C.L., R.J. Voigt, et al. (2005). "Effects of maternal docosahexaenoic acid intake on visual function and neurodevelopment in breastfed term infants". <u>American Journal of Clinical Nutrition</u> 82 : 125-132.	RCT - intervention supplementation in the breastfeeding mother and the outcomes in infant
Lauritzen, L., M.H. Jorgenson, et al. (2005). "Maternal fish oil supplementation in lactation: effect on developmental outcome in breast-fed infants". <u>Reproduction Nutrition Development</u> 45 : 535-547.	RCT – intervention in breastfeeding mother – outcomes in child
Lauritzen, L., et al. (2006). "Maternal fish oil supplementation in lactation and growth during the first 2.5 years of life". <u>Pediatric Research</u> 58 (2): 235-242	RCT – intervention in breastfeeding mother – outcomes in child
McInnes, R.J., J.G. Love, et al. (2000). "Evaluation of a community-based intervention to increase breastfeeding prevalence". <u>Journal of Public Health Medicine</u> 22 (2): 138-145	Paper is included in Fairbank SR
Pugin, E., V. Valdes, et al. (1996). "Does Prenatal Breastfeeding Skills Group Education Increase the Effectiveness of a Comprehensive Breastfeeding Promotion Program?" <u>Journal of Human Lactation</u> , 12 (1), 15.	Before-after study in Chile – not an RCT
Reid M. and H. Adamson (1997). "Opportunities for and barriers to good nutritional health in women of childbearing age, pregnant women, infants under 1 and children aged 1 to 5". Health Education Authority (series of reviews)	Narrative review with many of the studies before 1990. The authors'

	interpretation of 'interventions' is not strictly correct
Rishel, P.E.N. and P. Sweeney (2005). "Comparison of breastfeeding rates among women delivering infants in military treatment facilities with and without lactation consultants". <u>Military Medicine</u> 170 (5): 435-438	Retrospective study in the US – not a RCT
San Giovanni, J.P., C.S. Berkey, et al. (2000). "Dietary essential fatty acids, long chain polyunsaturated fatty acids, and visual resolution acuity in healthy fullterm infants: a systematic review". <u>Early Human Development</u> 57 : 165-188	SR related to dietary DHA intake not supplementation in infants
Shealy, K.R., R. Li, et al. (2005). "The CDC guide to breastfeeding interventions". US Department of Health and Human Services, Centers for Disease Control and Prevention, Atlanta, Georgia, USA	Not a SR Limited details of studies
J.P. Weimer (1998). "Breastfeeding promotion research: The ES/WIC nutrition education initiative and economic considerations". Economic Research Service, US Department of Agriculture. Agriculture Information Bulletin No. 744	Not a RCT

Details of excluded PDG and stakeholder papers

Reference	Description	Comment																											
<p>S., Battersby (2002). "The Breastfeeding is Best Supporters Project: An evaluation of the merged Breastfeeding Peer Support Programmes". http://www.sheffield.ac.uk/surestart/publns.html</p>	<p><i>Aim:</i> to evaluate the success of two merged breastfeeding peer support programmes in Sheffield which primarily aimed to encourage initiation and sustaining of breastfeeding and secondarily to develop a network of role models and support for breastfeeding mothers.</p> <p><i>Participants:</i> mothers in two low income areas of Sheffield (Southey Green and the Foxhill and Parsons Cross Sure Start areas), where breastfeeding levels are much lower than in the more affluent areas of the city.</p> <p><i>Intervention:</i> the DoH funded 2 initiatives in 1999-2000: 'Simply the Breast' in the Foxhill and Parsons Cross Sure Start area and 'Worldly Wise' in Southey Green (Northern General Hospital) both concluded that a programme of support using breastfeeding peer supporters should be set up and combined to produce the Breastfeeding is Best Supporters project (BIBS) (2001-2002. The project was organised by 2 midwives. 7 support workers organised support groups and public events, gave workshops at antenatal clinics and made postnatal visits. The stress was on increasing their time spent on workshops and decreasing time spent on postnatal visits from 2001 to 2002 for the BIBS project. A multi-faceted intervention</p> <p><i>Findings:</i> Data for the Sure Start area were available from a Health Visitor audit in 1998 and from the Sure Start database in 2002.</p> <p>Overall in both areas breastfeeding support groups increased from 2 to 6 from 1998 to 2002. In 2002, 23 women breastfed their infants and then undertook the La Leche League breastfeeding peer support programme</p> <p><u>Percentage breastfeeding in Sure Start area</u></p> <table border="1"> <thead> <tr> <th></th> <th>1998</th> <th>2002</th> </tr> </thead> <tbody> <tr> <td>N</td> <td></td> <td>210,</td> </tr> <tr> <td>Loss to follow-up</td> <td></td> <td>7.1%</td> </tr> <tr> <td>Initiation of bf</td> <td>22%</td> <td>49.1%</td> </tr> <tr> <td>At 4 w</td> <td></td> <td>31.5%</td> </tr> <tr> <td>At 6 w</td> <td>10%</td> <td></td> </tr> <tr> <td>At 3 m</td> <td></td> <td>18.6%</td> </tr> <tr> <td>At 4 m</td> <td>2.5%</td> <td></td> </tr> <tr> <td>At 6 m</td> <td></td> <td>11.0%</td> </tr> </tbody> </table>		1998	2002	N		210,	Loss to follow-up		7.1%	Initiation of bf	22%	49.1%	At 4 w		31.5%	At 6 w	10%		At 3 m		18.6%	At 4 m	2.5%		At 6 m		11.0%	<p>There were problems with data collection. A very poor quality before-after study with limited data available on the specific intervention.</p>
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	<p><i>Conclusion:</i> The Foxhill and Parsons Cross Sure Start area showed an increase in both initiation and continuation rate of breastfeeding.</p>																																			
<p>S. Battersby (2007). "An evaluation of La Leche League, Great Britain, Breastfeeding Peer Counsellor Programme". Unfinished draft for NICE only. Final draft to be supplied 20 September 2007</p>	<p><i>Aim:</i> the report concentrates mainly on evaluating the content of the La Leche League Counsellor curriculum using the BFI Ten Steps to Successful Breastfeeding (UNICEF/WHO 1989); La Leche League evaluations of the administrators training course; and finally an audit of peer counsellor's views of their roles. One of the aims was however to collect breastfeeding data.</p> <p><i>Methods:</i> the evaluator requested reports from 42 different Peer Counsellor Projects (PCPs)</p> <p><i>Results:</i> Reports from different PCPs appeared to have different formats and not all collected relevant breastfeeding data for initiation and duration. 12 reports were received: SureStart Ashfield Brest-feeding Scheme 2001; Blackburn West Midwifery Group Practice Evaluation; La Leche PCP Sure Start Fourways 2004-2005; BIBS 12 month survey results (Cudworth, Monk Bretton and Barnsley Town Centre; Mexborough Support Visit; Little Hutton 'Breastmates' meeting 9 January 2006; Breast start Report of activities – Elland Halifax; Peer Breastfeeding Support Machynlleth: Feedback from parents; La Leche League Breastfeeding PCP in Torfaen; SureStart Local Programmes Foxhill and Parsons Cross/ Southey and Shirecliff (Sheffield see above); Statistical Evidence to support continuation of the Infant Feeding Coordinator Post; La Leche PCP in Nottinghamshire</p> <p><u>Breastfeeding initiation data</u> was available from 21 of the 42 programmes 20 of the 21 programme showed an increase in breastfeeding initiation after the programmes had been set up (2000-2005) Average increase in breastfeeding initiation (range): 14% (0-32%)</p> <p><u>Breastfeeding duration data</u> was available from 10 programmes Before and after data were only available from 4 programmes, including the Foxhill and Parsons Cross Sure Start area (for which data is given above)</p> <p><u>Percentage breastfeeding</u></p> <table border="1"> <thead> <tr> <th rowspan="2">Programme</th> <th colspan="2">Ordsall</th> <th colspan="2">Oswestry*</th> <th colspan="2">Torfaen*</th> </tr> <tr> <th>Before</th> <th>After</th> <th>Before</th> <th>After</th> <th>Before</th> <th>After</th> </tr> </thead> <tbody> <tr> <td>Initiation of bf</td> <td>43%</td> <td>55%</td> <td>~54%</td> <td>~67%</td> <td>~41%</td> <td>~46%</td> </tr> <tr> <td>At 1m</td> <td>31%</td> <td>35%</td> <td></td> <td></td> <td>~29%</td> <td>~33%</td> </tr> <tr> <td>At 6 w</td> <td></td> <td></td> <td>~37%</td> <td>~43%</td> <td>~22%</td> <td>~24%</td> </tr> </tbody> </table>	Programme	Ordsall		Oswestry*		Torfaen*		Before	After	Before	After	Before	After	Initiation of bf	43%	55%	~54%	~67%	~41%	~46%	At 1m	31%	35%			~29%	~33%	At 6 w			~37%	~43%	~22%	~24%	<p>The author comments that a national breastfeeding survey in 2007 (Bolling 2007) found that the biggest increase in breastfeeding initiation was within the lower socio-economic groups, which are the groups targeted by most of the PCP schemes.</p> <p>The data available is generally of poor quality.</p>
Programme	Ordsall		Oswestry*		Torfaen*																															
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At 6 m	~13%		~14%		
*Values taken from graphs					
Other PCPs just used breastfeeding statistics for their area as evidence for the success of their schemes					
<u>Percentage breastfeeding in local area</u>					
Programme area	Mexborough			Elland	
Programme	Milky Way Mums			Breast start – Elland Halifax	
	2002-'03	2003-'04	2004-'05	2003-'04	2004-'05
Initiation of bf	37%	40%	30%	36%	55%
On discharge				29%	46%
At 2 w	22%	25%	22%		
At 6 w	10%	18%	19%	16%	22%
<u>Flint</u>					
Data for the whole of Flintshire showed an increase in breastfeeding initiation of 17% from 2004 to 2005 but a small decrease in breastfeeding at 8 weeks of ~2% and at 8 months of ~6%. It was presumed that PCP activity would have contributed to this increase					
<u>Breastfeeding continuation rates</u>					
Before-after data was combined from 7 areas where an infant feeding co-ordinator had been active in 2005 and showed an average increase (range) of 5% (2-14%). The 7 areas were: Caergwrle, Connahs Quay, Flint, Myndd Isa, Pen-y-fforde, Queensferry and Saltney					
A list of problems associated with data collection was given					
<i>Conclusions:</i> Overall the PCP projects for which data was available showed a positive trend for breastfeeding initiation and possibly for 'any' breastfeeding. There was little evidence for an increase in breastfeeding duration. The statistical significance of the results was not given. Although most of the PCP projects for which data were provided appeared to be successful, the methods of gathering data were suspect. Most of the projects were on a small scale. The					

	author commented that there was a need for much more robust data collection methods to establish unequivocally the impact of PCPs on the duration of breastfeeding.	
Heinig, M.J., K.H. Brown, et al. (2006). "Zinc supplementation does not affect growth, morbidity, or motor development of US term breastfed infants at 4-10 months of age". <u>American Journal of Clinical Nutrition</u> 84 : 594-601.	<p><i>Aim:</i> to examine the effect of zinc supplementation on growth, morbidity, or motor development in healthy term breastfed infants at 4-10 months of age.</p> <p><i>Participants:</i> US mothers (n=85) who intended to breastfeed exclusively for ≥10 months recruited during the 1st 3 m after delivery. November 1994 to August 1997 Selection criteria: Healthy term infants ≥2500 g at birth, with no chronic medical condition that would interfere with breastfeeding, complimentary foods not to be introduced before 4 m</p> <p><i>Intervention:</i> double-blind RCT comparing zinc supplementation (n=41) (5 mg/d as zinc sulphate) with placebo (n=44) in breastfed infants at 4-10 months. Growth and indexes of body composition and gross motor development measured at monthly intervals from 3-10 m. Weekly morbidity data collected.</p> <p><i>Findings:</i> Follow-up for 70 infants (82%) No significant differences between the groups for baseline characteristics or attained weight or length at 10 m, growth velocity, gross motor development and morbidity even after adjustment for confounders.</p> <p><i>Conclusion:</i> Dietary zinc was adequate</p>	<p>The sample size was limited to detect differences in growth, development or infection.</p> <p>Previously described differences in growth between breastfed and formula-fed infants do not seem to be related to zinc intake in this population.</p>
Jensen, C.L., R.J. Voigt, et al. (2005). "Effects of maternal docosahexaenoic acid intake on visual function and neurodevelopment in breastfed term infants". <u>American Journal of Clinical Nutrition</u> 82 : 125-132.	<p><i>Aim:</i> to determine the effect of DHA supplementation of breastfeeding mothers on neurodevelopment status and visual function in the recipient infants</p> <p><i>Participants:</i> US pregnant women in Houston, Texas, who planned to breastfeed exclusively for ≥4 m recruited from adverts, flyers in GP's offices and childbirth classes.</p> <p><i>Intervention:</i> double blind RCT. Starting 5 d after delivery 1 capsule/d for 4 m containing a high-DHA algal triacyl glycerol (44% sat fatty acids, 13.6% monounsaturated fatty acids, 0.8% linoleic acid and 41.7% DHA (22:6n-3), providing ~200 mg/day DHA. Con capsule contained 50/50 mixture of soy and corn oils (composition provided). Int n=114; Con n=113</p> <p><i>Findings:</i> At 4 m, milk lipid and infant plasma phospholipid were ~75% and ~35% higher, respectively, in the Int group than the Con group.</p> <p>Neither the neurodevelopmental indexes of the infants at 12 m nor the visual functions at either 4 m or 8 m differed significantly between the groups. At 30 m, there was no sig difference in the Mental Development Index but the Bayley Psychomotor Development Index was significantly</p>	<p>Ethnicity: 77% White; 16% African American; 5.5% Hispanic ; and 1.5% Other</p>

	<p>higher in the supplemented group and remained significant (p=0.008) after adjustment for sex, ethnicity, birth weight, duration of breastfeeding, weight and length at 30 m, maternal age, maternal education, maternal IQ and a composite score of the Family Environment Scale. (Most subject losses (22%) occurred before 4 m either because breastfeeding stopped or because foods other than breastmilk were >20% of intake. Later losses to follow-up were due to relocation of subjects. Loss to follow-up at 30 m was 30 %.)</p> <p><i>Conclusion:</i> DHA supplementation of breastfeeding mothers results in higher infant plasma phospholipid DHA during supplementation and a higher Bayley Psychomotor Development Index at 30 m but results in no other significant advantages at or before this age.</p>	
<p>Lauritzen, L., M.H. Jorgenson, et al. (2005). "Maternal fish oil supplementation in lactation: effect on developmental outcome in breast-fed infants". <u>Reproduction Nutrition Development</u> 45: 535-547.</p> <p>Lauritzen, L., et al. (2006). "Maternal fish oil supplementation in lactation and growth</p>	<p><i>Aim:</i> to find the effect of maternal fish oil supplementation on developmental outcome in breastfed infants, particularly visual acuity</p> <p><i>Participants:</i> Pregnant women recruited Danish National Birth Cohort 1999. Uncomplicated normal pregnancy</p> <p><i>Intervention:</i> Maternal supplementation with fish oil (4.5 g/d) (or olive oil) randomised to mothers with a habitual fish intake below population median (<4 mg/d long chain polyunsaturated fatty acids (LCPUFA)) (n=122) for 1st 4 months of lactation (Follow-up 82%)</p> <p><i>Reference group:</i> 53 mothers with habitual fish intake in top quartile (>8 mg/d LCPUFA) (Follow-up 92%)</p> <p><i>Findings:</i> No association in the 3 groups for problem-solving at age 9 months or language at 1 or 2 y or between problem solving and RBC-docosahexa-enoic acid level at 4 months. Passive vocabulary was lower in the fish oil than the olive oil supplemented children at age 1 y (p<0.05) but there were no differences at age 2 y</p> <p><i>Conclusion:</i> There was a small detrimental effect with increased DHA levels in breast milk (via fish oil supplementation) on early language development in breastfed infants.</p> <p><i>Findings:</i> follow-up for infant growth up to age 2.5 y for 59% (Fish oil n=50; Olive oil n=45) and for reference group 55% (high fish intake n=29)</p> <p>Growth (height, length and head circumference) did not differ in the randomised groups up to age 9 m but did differ at 2.5 y. At 2.5 y children in the fish oil group had a larger waist circumference, BMI (p=0.02) and head circumference than those in the olive oil group. The association for BMI remained significant after adjustment for sex, ponderal index at birth and</p>	<p>No apparent advantage for infant development with fish oil supplementation to the breastfeeding mother</p> <p>Outcomes are chiefly for infants at ≥9 months.</p> <p>Up to age 9 months there are no apparent advantages for growth in infants with fish oil</p>

<p>during the first 2.5 years of life". <u>Pediatric Research</u> 58(2): 235-242.</p>	<p>current energy intake <i>Conclusion:</i> LCPUFA intake in lactating mothers may be important for the growth of young children but the effect was only significant for infants aged 2.5 y not at age 9 m. The long term effects are not known.</p>	<p>supplementation to the breastfeeding mother</p>																
<p>McInnes, R.J., J.G. Love, et al. (2000). "Evaluation of a community-based intervention to increase breastfeeding prevalence". <u>Journal of Public Health Medicine</u> 22(2): 138-145.</p>	<p><i>Aim:</i> to determine whether peer counselling in the antenatal and postnatal period would increase the prevalence and duration of breastfeeding among low-income Glasgow women <i>Subjects:</i> women attending antenatal booking clinics in 2 target comparable communities in Glasgow, resident in either the intervention or the control areas (n=995). Both areas had low levels of breastfeeding and were served by separate maternity hospitals. The intervention area was slightly more disadvantaged than the control area. <i>Intervention:</i> Quasi-experimental community-based controlled trial. Personal peer counselling of pregnant women, support of breastfeeding mothers and local awareness-raising activities over 2 y. 7 peer counsellors ('helpers') were trained, who had previously breastfed for ≥3 m and had a child at home aged ≤5 y. Mothers offered ≥4 contacts with helpers – 2 antenatal 2nd and 3rd trimesters) and 2 postnatal. Tel no of helpers given to mothers and information sent if no contact made. Antenatal visits offered regardless of feeding intention but postpartum visits only to those breastfeeding. <i>Findings:</i> 99.4% of Int group subjects (n=474) accepted antenatal visits; 70.5% actually received ≥1 antenatal visit. Of those 105 (22%) initiating breastfeeding in Int group, 80 (76%) received ≥1 postnatal visit, mean 4 (range 1-15). Follow-up for 92% (n=919) at 6 weeks.</p> <table border="1"> <thead> <tr> <th></th> <th>Int</th> <th>Control</th> <th>OR (95% CI)*</th> </tr> </thead> <tbody> <tr> <td>Intended to breastfeed (at booking)</td> <td>18%</td> <td>21%</td> <td></td> </tr> <tr> <td>Initiated breastfeeding 6 weeks postnatal (any breastfeeding)</td> <td>23%</td> <td>20%</td> <td>2.0 (1.2-3.1) p=0.006</td> </tr> <tr> <td></td> <td>10%</td> <td>8%</td> <td>1.8 (1.0-3.4) p=0.07</td> </tr> </tbody> </table> <p>* adjusted for confounders e.g. socioeconomic status <i>Conclusion:</i> The impact of the intervention was not sustained even for a modest 6 weeks breastfeeding postnatally. It would therefore be premature to justify widespread use of peer support programmes to increase the level of breastfeeding in socially disadvantaged communities.</p>		Int	Control	OR (95% CI)*	Intended to breastfeed (at booking)	18%	21%		Initiated breastfeeding 6 weeks postnatal (any breastfeeding)	23%	20%	2.0 (1.2-3.1) p=0.006		10%	8%	1.8 (1.0-3.4) p=0.07	<p>It may be realistic to expect an increase in breastfeeding initiation as a result of peer counselling. Another different intervention may be necessary to increase duration of breastfeeding.</p>
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<p>Pugin, E., V. Valdes, et al. (1996). "Does Prenatal Breastfeeding Skills Group Education Increase the Effectiveness of a Comprehensive Breastfeeding Promotion Program?" <u>Journal of Human Lactation</u>, 12(1), 15.</p>	<p><i>Aim:</i> to assess the effect of a multifaceted comprehensive breastfeeding promotion intervention with 5 parts with and without an additional prenatal breastfeeding skills group educational sessions on breastfeeding patterns and duration. (Secondarily to promote breastfeeding for its health and fertility effects.)</p> <p><i>Participants:</i> Middle to upper class Chilean women who delivered at the Chilean hospital, received their antenatal care at the hospital and intended to breastfeed (n=735).</p> <p><i>Intervention:</i> a study of quasi-experimental design; a before-after study. Controls were women who had delivered at the hospital prior to the intervention and received the usual breastfeeding support (n=313). Main intervention – the Breastfeeding and Lactational Amenorrhea Method (LAM) Promotion Programme (BLPP) with 5 strategies: training the health team in breastfeeding; prenatal clinic activities; hospital activities; an outpatient lactation clinic; and offering LAM as an initial form of family planning (n=422). From the last 123 mother/child pairs recruited to the main Int group, 59 subjects were additionally given prenatal breastfeeding skills group education (PBSGE). PBSGE sessions: 3-5 sessions in groups of 5-6, in 3rd trimester, primiparas and multiparas together, 20 m each session, during prenatal check-ups, by a trained nurse-midwife. Sessions included breastcare, breastfeeding advantages for both mother and child, technique, prevention of problems, anatomy and physiology, rooming-in, immediate contact, use of a doll to practice latching-on and positioning. Active participation in discussions.</p> <p><i>Findings:</i> (Fully breastfeeding: no more than 2 supplemental feeds per week.)</p> <p><u>Percentage fully breastfeeding at 6 months</u></p> <table border="1"> <thead> <tr> <th>Parity</th> <th>Control</th> <th>Main Intervention</th> <th>p</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>27%</td> <td>61%</td> <td>0.0001</td> </tr> <tr> <td>2</td> <td>38%</td> <td>70%</td> <td>0.0001</td> </tr> <tr> <td>≥3</td> <td>32%</td> <td>69%</td> <td>0.0001</td> </tr> <tr> <td>Total</td> <td>32%</td> <td>67%</td> <td>0.0001</td> </tr> </tbody> </table> <p><u>% of intervention group fully breastfeeding at 6 m. with and without PBSGE</u></p> <table border="1"> <thead> <tr> <th>Parity</th> <th>Without PBSGE</th> <th>With PBSGE</th> <th>p</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>27%</td> <td>61%</td> <td>0.0001</td> </tr> <tr> <td>2</td> <td>38%</td> <td>70%</td> <td>0.0001</td> </tr> <tr> <td>≥3</td> <td>32%</td> <td>69%</td> <td>0.0001</td> </tr> <tr> <td>Total</td> <td>32%</td> <td>67%</td> <td>0.0001</td> </tr> </tbody> </table>	Parity	Control	Main Intervention	p	1	27%	61%	0.0001	2	38%	70%	0.0001	≥3	32%	69%	0.0001	Total	32%	67%	0.0001	Parity	Without PBSGE	With PBSGE	p	1	27%	61%	0.0001	2	38%	70%	0.0001	≥3	32%	69%	0.0001	Total	32%	67%	0.0001	<p>The Study was in relatively affluent Chilean women. The study may not be applicable to the UK due to cultural differences.</p>
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Total	65%	80%	0.003															
<p>Reid, M. and H. Adamson (1997). "Opportunities for and barriers to good nutritional health in women of childbearing age, pregnant women, infants under 1 and children aged 1 to 5". Health Education Authority (series of reviews)</p>	<p><i>Aim:</i> narrative SR on barriers to good nutritional health with one section relevant to infants under age 1 <u>Infants up to age 1 year</u> <i>Introduction</i> Infant liquid and solid feeding Few studies focus on solid feeding for infants. Department of Health recommendations for solid feeding are not always followed Few studies report on both liquid and solid feeding and results tend to be qualitative not quantitative.</p> <p><i>Results:</i> reported under 15 headings: <i>Access</i> 2 main decisions taken by mothers: whether to initiate breastfeeding; and whether to continue breastfeeding beyond age 4 m. (White 1992)</p> <p><i>Antenatal decision-making about infant feeding methods</i> Most mothers decide on breast or bottle feeding before becoming pregnant (James 1981, Holt and Wolkind 1983, Hally 1984) but this is not likely to be true for teenage mothers (Maehr 1993). There is evidence that health professionals can influence the decision antenatally (Hally 1984, Salt 1994).</p> <p><i>Hospital practices</i></p>	<p>Many of the studies took place before 1990. The authors' interpretation of 'interventions' is not strictly correct</p>																

	<p>Details of changes in hospital practice which have encouraged breastfeeding given (White 1992).</p> <p>The impact of the Baby Friendly Hospitals Initiative has been evaluated in various studies (e.g. Wright et al. 1996 in the US) but not in the UK (only an audit in a hospital in Fife (Campbell 1995).</p> <p><i>Breastfeeding interventions in hospital</i></p> <p>Interventions – some peer counsellor programmes not clearly evaluated e.g. Wright 1996; others small samples and in culturally distinct groups e.g. Maehr 1993.</p> <p>2 RCTs and 3 rigorous studies:</p> <p><u>Jones and West 1986</u> UK RCT (n=678) (already included in this review) Lactation nurse – significantly more mothers still breastfeeding at 4 weeks with greater benefit in social classes IV and V in early weeks, benefit continued up to 6 months.</p> <p><u>Carty and Bradley 1990</u> Canadian RCT (n=131) Women who had an early discharge (at 12-24 h or 25-48 h) had a higher duration of breastfeeding at one month than those with the normal discharge at 4 days but the increase was not significant.</p> <p><u>Bloom 1982</u> Cross-sectional study in Nova Scotia n=539 (Already included in this review) Intervention in breastfeeding mothers – 3 telephone calls at 1 week intervals + information pamphlet. This group breastfed for one week longer than the ‘controls’.</p> <p><u>Winikoff 1987</u> (already included in this review) Before-after study US hospital in low income area. (n=208) More mothers were interested in breastfeeding than actually breastfed. Low morale about ability to promote breastfeeding in staff. Various interventions (staff in-service training, introduction of a breastfeeding nurse counsellor, educational material and a telephone hot-line for mothers) – not known which ones caused the increase in ‘any’ or ‘exclusive’ breastfeeding compared to a ‘control’ hospital.</p> <p><u>Wright 1996</u> Before-after study in US (n=192) Hospital introduced a range of policies and practices influenced by the BFHI. Found an increase in no of women who breastfed within 1 hour of birth, an increase in the level of help received with breastfeeding, and women were more likely to be breastfeeding at age 4 months if they had been given the name of a support midwife or group.</p> <p>Few studies of high quality with clear cut findings.</p>	
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	<p><i>Descriptive studies of breastfeeding 'interventions' in hospital</i></p> <p><u>Wright and Walker 1983</u> Survey UK (n=617) If first-time mothers breastfed before 12 h they were more likely to continue but not significantly related to duration. Complex association related to social class and education.</p> <p><u>Reiff and Essock-Vitale 1985</u> US cross-sectional study (mothers n=77, staff n=50) of influence of hospital practices on infant feeding choice concluded that 'non-verbal teaching by modelling is more effective than verbal counselling'</p> <p>Studies following BFHI</p> <p><u>Beeken and Waterston 1992</u> UK postal questionnaire to health workers (n=197) and mothers (n=50). 'Good practice' was rooming-in after first night and infrequently giving dextrose, glucose or top-up bottle feeds to breastfed babies. (A significant minority of staff disagreed with positive statements about breastfeeding (47%), disagreed that breastfed babies were healthier (28%) or that milk company adverts should be banned from antenatal clinics (47%.))</p> <p><u>Bruce 1991</u> (staff n=60; mothers n=202) and <u>Bruce and Griffioen 1995</u> (already included in this review) (staff n=65; mothers n=322) – before-after cross-sectional UK surveys of attitudes after introduction of a breast feeding advisor. Conclusion – an increase in the view of staff that the maternity unit should have a policy on baby feeding but the majority of staff still agreed that staff should remain 'neutral'.</p> <p><u>Bergman 1994</u> Swedish survey of potential barriers to breastfeeding in maternity staff (n=133; midwives and nurses) found worries about lack of knowledge and increased workloads/lack of time to provide information on breastfeeding.</p> <p><u>Becker 1992</u> Cross-sectional study in rural Ireland (Hospital staff n=88) Midwives' (n=76) knowledge of breastfeeding was quite poor. Obstetricians (n=9) gave inconsistent advice whereas paediatricians (n=3) were more consistent.</p> <p><i>Work and breastfeeding</i> No relevant intervention studies found.</p> <p><i>Income and infant solid feeding</i> Income has been found to affect the weaning foods given.</p> <p><u>McKillop and Durnin 1982</u> (UK cross-sectional infants aged 3 m to 2 y n=305) found a higher energy intake in female infants in the lowest class group particularly in infants aged <1 y.</p>	
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	<p><i>Sources of professional advice</i></p> <p>Four UK studies included sources of professional advice as part of a larger study and for 2 studies it was the main topic. For most of the studies the health visitor was the most cited source.</p> <p><u>Oakley and Rajan 1993</u> UK questionnaire (n=362) 73% mothers used their own experience; 58% health visitors. A higher proportion of middle class mothers and primagravidae cited the health visitor as their source.</p> <p><u>McIntosh 1986</u> UK interviews of 80 first-time mothers (social classes III, IV and V) 20% mothers preferred professional advice on weaning and adhered to formal recommendations. Of working class mothers, 79% preferred practical (lay) experience (informal advice) rather than 'textbook' professional advice, not helped by health visitors giving advice without explanations.</p> <p><u>Morgan and Stordy 1995</u> UK cross-sectional, questionnaire, 1004 mothers with infants aged 3-12 m For advice about solid foods the health visitor was the most influential after the birth (60%); 36% cited experience with previous infants; and 18% information from books and magazines.</p> <p><u>Fuller and Mackie 1996</u> UK cross-sectional, interview (n=175) 39% health visitor; 14% family member; and 13% books or magazines. (Commercial foods given by clinic were thought to be healthier than those received by post or from magazines.)</p> <p><u>Walker 1995</u> UK cross-sectional, questionnaire First time mothers with babies aged 6-9 m (n=76). Health visitor 83%; mother 75%; friends 74%; books and magazines 72%. (Mothers recognised that they had not followed official recommendation by giving solids earlier than recommended.)</p> <p><u>Chalmers 1991</u> cross-sectional, short telephone survey of staff on consistency of advice from community midwives (n=9) and health visitors (n=31). Community midwives were clearly more consistent.</p> <p>Conclusion: more effective professional interventions should be found.</p> <p>Results under other section headings not relevant to this review were for: Commercial interests; Knowledge, culture and attitudes; Characteristics of breast feeders; Attitudes to feeding; Breastfeeding and embarrassment; Privacy; Breastfeeding in public; Partners' views on feeding method; and Weaning</p>	
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	<p><i>Conclusions:</i> Successful breastfeeding has been little researched. Factors affecting breastfeeding have been reported (e.g. past experience, social class, older mothers). A more qualitative approach is required to enable women to report their own experiences and thus identify the barriers to continued breastfeeding. There have been few rigorous evaluations of the Baby Friendly Hospital Initiative although research has identified it's importance It may be easier to change hospital practices than to change staff views. Having more time to spend with mothers and specific suitable training was suggested Guidelines should be produced on diet for the under-5s at day-care facilities (Department of Health 1994)</p>	
<p>Rishel, P.E.N. and P. Sweeney (2005). "Comparison of breastfeeding rates among women delivering infants in military treatment facilities with and without lactation consultants". <u>Military Medicine</u> 170(5): 435-438.</p>	<p><i>Aim:</i> A retrospective study to examine the impact of lactation consultants on breastfeeding initiation and duration during the 1st 6 m of life. <i>Subjects:</i> US military personnel and their wives <i>Methods and conclusions:</i> Medical charts were reviewed at 3 southern US military medical establishments during 2001 to find which mothers did/did not interact with lactation consultants <i>Results and conclusions:</i> At an airport facility 98% mothers who interacted with a lactation consultant (n=91) initiated breastfeeding compared with 14.4% mothers without interaction (n=48), p<0.001. Women with higher levels of education and those aged ≥27 y had higher levels of breastfeeding initiation and breastfeeding duration. Active duty mothers were significantly more likely to stop breastfeeding at 4 m when compared with non-active duty mothers, p=0.038.</p>	<p>Little information available related to the activities of the lactation consultants.</p>
<p>San Giovanni, J.P., C.S. Berkey, et al. (2000). "Dietary essential fatty acids, long chain polyunsaturated fatty acids, and visual resolution acuity in</p>	<p><i>Aim:</i> a systematic review to examine the nature of discordant results from studies to determine whether dietary DHA leads to better performance on visually-based tasks in healthy fullterm infants. <i>Methods:</i> a search for prospective empirical studies which met certain quality criteria using Medline and Healthstar and other sources to 1999. Acuity differences between groups consuming a source of DHA and groups consuming a DHA-free diet calculated as a common outcome from individual studies. Difference scores were evaluated against a null value of zero and used in meta-analysis to obtain estimates of differences within 7 age categories.</p>	<p>Included studies were either in the US, Canada or Australia</p>

<p>healthy fullterm infants: a systematic review". <u>Early Human Development</u> 57: 165-188.</p>	<p><i>Findings:</i> 12 empirical studies on LCPUFA intake during infancy and visual acuity found The difference in the visual resolution acuity for DHA-supplemented formula-fed groups and DHA-free formula-fed groups was significant at 2 months ($p \leq 0.000001$) and 4 months ($p = 0.04$). There were also acuity differences for electrophysiological-based measures at 4 months ($p = 0.02$).</p> <p><i>Conclusion:</i> Dietary n-3 intake is associated with performance on visual acuity tasks at 2 and 4 m in healthy fullterm infants. It is not known if n-3 intake confers a lasting advantage in the development of visually based processes.</p> <p><i>Included studies:</i> Auestad 1997 (US); Birch 1992 (US); Birch 1993 (US); Birch 1998 (US); Carlson 1996 (US); Courage 1998 (Canada); Innis 1994 (Canada); Innis 1997 (US); Jorgenson 1996 (Scandinavia); Makrides 1993 (Australia); Makrides 1995 (Australia);</p>	
<p>Shealy, K.R., R. Li, et al. (2005). "The CDC guide to breastfeeding interventions". US Department of Health and Human Services, Centers for Disease Control and Prevention, Atlanta, Georgia, USA</p>	<p><i>Aim:</i> to provide a guide to breastfeeding interventions to support and enable different US states to make informed decisions on appropriate interventions to increase breastfeeding initiation duration and exclusive breastfeeding for a given setting and population.</p> <p><i>Methods:</i> included in the guide were interventions reviewed by the Cochrane Collaboration, interventions that had not been formally evaluated but had an established history or a strong rationale, and all major types of intervention known to have been implemented or thought to promote and support breastfeeding.</p> <p><i>Findings and conclusions:</i> Interventions were divided into 2 categories: those with significant evidence of effectiveness and those with limited evidence. Only those with evidence of effectiveness will be described here.</p> <p><u>Maternity care practices:</u> take place during the intrapartum hospital stay and postpartum care Evidence from: Fairbank 2000 (already included in this review) The Baby Friendly Hospital Initiative (BFHI) established by the WHO: evidence for an increase in breastfeeding initiation in a US hospital with BFHI designation (Philipp 2001); relationship found between the number of Baby Friendly steps (included in the Ten Steps to Successful Breastfeeding of the BFHI) and breastfeeding success (DiGirolamo 2001) – mothers experiencing none of the Ten Steps in their hospital stay were 8 times more likely to stop breastfeeding before 6 weeks than those experiencing 5 steps. Professional training Cattaneo and Buzzetti 2001 (in Renfrew 2005 review) Continuous support during labour using trained labour assistants e.g. doulas improves</p>	<p>Very limited details are given of the studies.</p>

	<p>breastfeeding outcomes (Hodnett 2003). Baby Friendly USA co-ordinates all BFHI activities US programme examples, potential action steps and relevant websites are described. <u>Support for breastfeeding in the workplace:</u> various suggestions made Cohen 1994 evaluated 2 corporate lactation programmes including prenatal classes, perinatal counselling and lactation management after return to work. 75% women on programmes breastfed at 6 m compared to national level for full-time employed women of 10%. For the Mutual of Omaha’s programme the average breastfeeding duration was 8.3 m whereas nationally only 29% mothers were still breastfeeding at 6 m (National Healthy Mothers Healthy Babies Coalition 2001/2002). The California Public Health Foundation WIC (Special Supplemental Nutrition Programme for Women, Infants and Children) Agencies programme for employees: includes recognising breastfeeding milestones, training on breastfeeding, monthly prenatal classes, postpartum support groups, a supportive worksite environment (pumping facilities, flexible break times) and a Trained Lactation Coach (an experienced colleague who breastfed her own children after returning to work). 99% of women returning to work after giving birth initiated breastfeeding and 69% of those women breastfed for ≥12 m). Access to breast pumps and support groups were significantly associated with the high duration rates (Whaley 2002). Other US examples of programmes, relevant US legislation and potential action steps and relevant websites are described. <u>Peer support:</u> provided by mothers who are presently breastfeeding or in the past have breastfed, includes individual counselling (via the telephone or in the home, clinic or hospital) and/or informal mother-to-mother support groups. The peer supporters undergo specific training and can be paid or volunteers. Peer support can include psycho-emotional support, encouragement, education or help with solving problems. Evidence from: Fairbank 2000, Kistin 1994 (already included in this review). Sikorski 2003 (Cochrane SR) provided evidence that multifaceted interventions that included peer support increased both initiation and duration of breastfeeding. Chapman 2004c: RCT in US low-income Latina women, where women receiving individual peer counselling were more likely to initiate breastfeeding, and be breastfeeding at 1 and 3 m postpartum than controls receiving routine support Evidence from WIC programmes that paid peer counsellors is more effective than those unpaid</p>	
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	<p>(Cronenwett 1987) and also from Sikorski 2003.</p> <p>Other US examples of programmes are described e.g. La Leche League International, USDA WIC initiatives and the Breastfeeding Heritage and Pride peer counselling programme (a collaboration between Hartford Hospital, the Hispanic Health Council and the University of Connecticut’s Family Nutrition Program). Details of ideal programmes, potential action steps and relevant websites are described.</p> <p><u>Educating mothers:</u> to influence attitudes as well as knowledge and skills, most often during the prenatal and intrapartum periods, taught by someone with expertise or relevant training, typically in an informal small group or one-to-one, may include fathers or other supporters. Evidence from: The effectiveness of primary care-based interventions to promote breastfeeding: a SR for the US Preventive Services Task Force (Guise 2003 – see above) Sikorski 2003 (Cochrane SR) found prenatal education in small groups was effective in increasing initiation of breastfeeding using the results of 20 controlled trials. The guidelines differentiate between the characteristics of prenatal and intrapartum education. US examples of programmes, potential action steps and relevant websites are described.</p> <p><u>Professional support:</u> counselling, encouragement, managing lactation crises; education is a secondary purpose; in person, over the telephone, in a group or one-to-one, in a clinic or a home setting. Lack of support from professionals has been identified as a major barrier to breastfeeding, especially in African American women (Taveras 2004, Caulfield 1998). (Caulfield 1998 – already in this review) Evidence: Guise 2003 – see above Sikorski 2003 (Cochrane SR) found that in person interventions significantly increased breastfeeding duration whereas those using mainly telephone contact did not. The guidelines advocate professional support from lactation consultants. US examples of programmes, potential action steps and relevant websites are described.</p> <p><u>Media and social marketing:</u> marketing initiatives include both promotions and adverts advocating breastfeeding as well as media imagery strengthening the perception of breastfeeding as a normal, accepted activity. Marketing can include professional endorsement or providing items or sponsoring events targeted at specific groups. Evidence: Evidence from: Fairbank 2000 (already included in this review). The national Loving Support Makes Breastfeeding Work campaign in n Mississippi (Khoury</p>	
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	<p>forthcoming publication) including a comprehensive social marketing approach involving interventions to increase public awareness (via the media and other outlets) increased rates of initiation and duration and also improved community support for breastfeeding. US examples of programmes, potential action steps and relevant websites are described.</p> <p>Interventions where effectiveness had not been established included: Countermarketing and the WHO International Code; Professional education; Public acceptance; and Hotlines and other information resources</p>	
<p>J.P. Weimer (1998). "Breastfeeding promotion research: The ES/WIC nutrition education initiative and economic considerations". Economic Research Service, US Department of Agriculture. Agriculture Information Bulletin No. 744</p>	<p><i>Aim:</i> to find the effect of combining two US nutrition programmes for low income families on breastfeeding initiation and duration.</p> <p><i>Sample;</i> 4 US projects in Guam, Iowa, Michigan and North Carolina for the neediest WIC participants.</p> <p><u>Guam</u> - multicultural population (n=574) mean age 17.5 y, women either pregnant or <9 m postpartum.</p> <p><u>Iowa</u> has twice the level of child poverty in the rest of the US. WIC-eligible subjects were either pregnant or postpartum and breastfeeding. (n=207) Control group were WIC participants who did not live in a county where there had been significant breastfeeding promotion activity for 3 y before the study.</p> <p><u>Michigan</u> – 6 counties with low levels of breastfeeding in top quartile of families at or below the US poverty line but with a high level of local commitment to the effort. Pregnant medicaid eligible WIC participants and also breastfeeding women who mostly already had problems. (n=2263) No control group – used Michigan reference data.</p> <p>North Carolina – state with a high infant mortality rate particularly in minority populations and for infants with teenage mothers. WIC participants in 5 counties who intended to breastfeed. Clients contacted in hospital after delivery. (n=2267). Used previous WIC controls from the pilot study.</p> <p><i>Methods:</i> 4 different projects focussing primarily on promoting breastfeeding. The ES/WIC nutrition education initiative combined the strengths of 2 nutritional programmes – the Cooperative Extension System’s Expanded Food and Nutrition Education Program and the Food and Nutrition Service’s Special Supplemental Nutrition Program for Women, Infants and Children (a 3 year initiative). Evaluation of projects by the Economic Research Service.</p>	<p>There are some problems with the control groups for the studies. The Guam study is in a culture in the Western Pacific which may bear no resemblance to the UK.</p>

	<p><u>Guam</u> – breastfeeding education in high schools or WIC clinics. A culturally appropriate 3-lesson set (including a video) within a total set of 8 lessons. (Controls no education, not randomised) Int n=365; Con n=209.</p> <p><u>Iowa</u> – trained volunteers from the community (who had already successfully breastfed themselves) as peer counsellors who had contact with women on a one-to-one basis, in person and by telephone, both before and after delivery, to provide support or information on breastfeeding. The counselling included a short lesson on nutrition and breastfeeding. Information consisted of a series of 5 brochures. Average no of contacts was 4, range 1-16; each session was 1-1.5 h long. Int n=143; Con n=64. Follow-up for Int group was only 50%.</p> <p><u>Michigan</u> – employed peer counsellors with personal experience of breastfeeding to encourage and support WIC clients interested in breastfeeding. Contact at different time points both prepartum and postpartum, most frequent in 1st 2 weeks after the birth. Specific aim – peer counsellor home visit to observe breastfeeding within 48 h of hospital discharge. Average no of contacts 6.3: phone 3.5 and mother’s home 3.1. Visits in hospital before discharge if invited by mother. (Also available, nutrition classes and support groups at WIC clinic. Peer counsellors could refer problems to lactation consultants or other skilled providers if required. Int n=2263. No control group per se. Follow-up 55%.</p> <p><u>North Carolina</u> – focus was to increase breastfeeding duration up to and beyond 2 m. Lay people (paraprofessionals) trained to provide support for breastfeeding mothers. WIC mothers contacted in hospital after delivery, 72 h after hospital discharge and on additional home visits, if required. The most frequent contact was within the 1st 2 weeks postpartum. Paraprofessionals could contact a WIC nutritionist for further advice. Average no of contacts 3-4, range 1-13. Int n=2267. Comparison with WIC clients from an earlier pilot study (n=115).</p> <p><i>Findings:</i></p> <p><u>Guam:</u> higher initiation and longer duration of breastfeeding than a WIC comparison group</p> <p><u>Iowa:</u> higher initiation and longer duration of breastfeeding than for a comparison group of mothers who did not receive counselling</p> <p><u>Michigan:</u> higher initiation and longer duration of breastfeeding than for a reference WIC population in Michigan</p> <p><u>North Carolina:</u> longer duration of breastfeeding than for a comparison group of WIC mothers who did not receive support.</p>	
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	<p><i>Conclusions:</i> <i>Main conclusions:</i> Breastfeeding education before delivery increases breastfeeding initiation in low income women. Breastfeeding support soon after delivery increases breastfeeding duration.</p> <p>The 3 studies in Guam, Iowa, and Michigan showed that prenatal breastfeeding education increased breastfeeding during the 1st 2 weeks postpartum. All 4 studies suggested that early postpartum breastfeeding support is effective in increasing breastfeeding duration in a low income population. The 3 mainland US studies found that well-trained peer counsellors have a positive effect on breastfeeding in low income women. There was evidence that promotion and support of breastfeeding is economically advantageous as well as nutritionally sound.</p>	
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Appendix C – Search Strategy

The following searches were conducted in February/March 2006 by Julie Glanville and Dave Fox the Centre for Reviews and Dissemination, University of York.

The search terms/strategy used to address initiation and duration of breastfeeding were based on those used in Fairbank 2000 and Renfrew 2005.

1. Search for systematic reviews (20/2/06)

The following search terms were used:

CDSR

#1	MeSH descriptor breast feeding explode all trees	688
#2	MeSH descriptor lactation explode all trees	316
#3	MeSH descriptor Milk, Human explode all trees	454
#4	MeSH descriptor infant nutrition this term only	408
#5	MeSH descriptor bottle feeding explode all trees	122
#6	MeSH descriptor infant formula explode all trees	56
#7	MeSH descriptor vitamins explode all trees	6620
#8	MeSH descriptor minerals explode all trees	1563
#9	MeSH descriptor iron explode all trees	970
#10	MeSH descriptor food, fortified explode all trees	625
#11	MeSH descriptor infant, newborn explode all trees	8443
#12	(#1 or #2 or #3 or #4 or #5 or #6)	1515
#13	((#7 or #8 or #9 or #10) and #11)	553
#14	(#12 or #13) 1	905
#15	("breast fed*" in All Text or "breast feed*" in All Text or breastfe* in All Text or breastmilk in All Text or "breast milk" in All Text)	1911
#16	(lactation in All Text or lactating in All Text or "nursing mother*" in All Text or "nursing baby" in All Text or "nursing babies" in All Text or "nursing infant*" in All Text)	4584
#17	("infant feeding" in All Text or "infant formula" in All Text or "baby formula" in All Text or "baby milk" in All Text or "babymilk" in All Text or "formula fed" in All Text or "formula milk" in All Text)	640
#18	((bottle* in All Text or cup* in All Text or spoon* in All Text or dropper* in All Text or container* in All Text) and (contaminat* in All Text or clean* in All Text or steril* in All Text or bacteria in All Text))	260
#19	(additional in All Text near/6 vitamin* in All Text)	98
#20	(supplement* in All Text near/6 vitamin* in All Text)	1971
#21	(fortified in All Text near/6 vitamin* in All Text)	50
#22	(supplement* in All Text near/6 mineral* in All Text)	399
#23	(additional in All Text near/6 mineral* in All Text)	31
#24	(fortif* in All Text near/6 mineral* in All Text)	31
#25	(#15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24)	8616
#26	(#14 or #25)	

DARE admin and HTA database

S Breast(w)fe\$ OR breastfe\$
 s lactat\$ or milk(w)human or infant(w)food or infant(w)feed\$
 s milk(w)ejection or infant(w)nutrition or infant(w)formula
 s (vitamin\$ or mineral\$ or iron)(3w)(milk or supplement\$ or add\$ or fortif\$)
 s breast(w)milk or breastmilk or nursing(w)mother\$
 s Nursing(w)baby or nursing(w)babies or nursing(w)infant\$
 s bottle(w)fe\$ or infant(w)feeding or baby(w)formula\$
 s express\$(w)milk or breast(w)pump\$
 s formula(w)fe\$ or formula(w)milk
 s bottle\$(3w)(sterili\$ or clean\$ or contaminat\$ or bacteria)
 s cup\$(3w)(sterili\$ or clean\$ or contaminat\$ or bacteria)
 s spoon\$(3w)(sterili\$ or clean\$ or contaminat\$ or bacteria)
 s dropper\$(3w)(sterili\$ or clean\$ or contaminat\$ or bacteria)
 s bottle(w)fe\$ or bottlefe\$
 s formula(3w)prepar\$

NRR

#1	BREAST FEEDING single term (MeSH)	
	160	
#2.	LACTATION explode tree 1 (MeSH)	11
#3.	MILK HUMAN single term (MeSH)	33
#4.	INFANT FOOD explode tree 1 (MeSH)	30
#5.	INFANT FORMULA single term (MeSH)	0
#6.	INFANT NUTRITION single term (MeSH)	74
#7.	BOTTLE FEEDING single term (MeSH)	20
#8.	(#1 or #2 or #3 or #4 or #5 or #6 or #7)	
	271	
#9.	VITAMINS explode all trees (MeSH)	
	683	
#10.	MINERALS explode all trees (MeSH)	
	108	
#11.	IRON DIETARY single term (MeSH)	6
#12.	FOOD FORTIFIED single term (MeSH)	73
#13.	INFANT NEWBORN explode all trees (MeSH)	
	1907	
#14.	((#9 or #10 or #11 or #12) and #13)	28
#15.	(#8 or #14)	
	296	
#16.	(breast next fee*)	
	313	
#17.	breastfe*	
	200	
#18.	(breast next fed)	23
#19.	((breast next milk) or breastmilk)	86
#20.	(lactation or lactating)	
	278	
#21.	(nursing next mother*)	8
#22.	(nursing next baby)	1
#23.	(nursing next babies)	0
#24.	(nursing next infant*)	3
#25.	(infant next feeding)	82

#26. (infant next formula)	22
#27. (baby next formula)	0
#28. ((formula next fed) or (formula next milk))	26
#29. (bottle* near steril*)	1
#30. (bottle* near clean*)	1
#31. (bottle* near contaminat*)	0
#32. (bottle* near bacteria*)	2
#33. (bottle* near infect*)	1
#34. (milk* near sterili*)	0
#35. (milk* near clean*)	1
#36. (milk* near contaminat*)	2
#37. (milk* near bacteria)	0
#38. (milk* near infection*)	3
#39. (cup* near sterili*)	0
#40. ((cup* near clean*) or (cup* near contaminat*))	0
#41. ((spoon* near clean*) or (spoon* near contaminat*))	0
#42. ((dropper* near clean*) or (dropper* near contaminat*))	0
#43. ((spoon* near sterili*) or (dropper* near sterili*))	0
#44. ((spoon* near bacteria) or (dropper* near bacteria))	0
#45. ((bottle next fed) or (bottle near feed) or (formula next feed) or (formula near prepar*))	26
#46. (vitmain near supplement*)	0
#47. (vitamin near supplement*)	241
#48. (mineral* near supplement*)	27
#49. (iron* near supplement*)	43
#50. (vitamin* near additional)	4
#51. (mineral* near additional)	1
#52. (vitamin* near fortified)	9
#53. (mineral* near fortified)	0
#54. (#47 or #48 or #49 or #50 or #51 or #52 or #53)	296
#55. (infant* or baby or babies or newborn*)	5369
#56. (#54 and #55)	34
#57. (#16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #38 or #39 or #40 or #41 or #42 or #43 or #44 or #45)	823
#58. (#15 or #56 or #57)	

Sign

Examined list of titles

National Guidelines Clearinghouse

The following text words were used as search terms:

breastfeeding

formula

(milk or bottle or cup) and (baby or babies or infant*)

milk and express*

(sterili* or contaminat* or clean* or bacteria) and (bottle* or cup* or spoon* or dropper*) and (formula or milk)

NCCHTA

Looked at all records in category: children and younger people

NICE

Looked at data under the categories: Gynecology, pregnancy and birth, and Nutritional disorders and weight control

HSTAT

Breastfeeding AND book [hstat]
Lactation AND book [hstat]
Milk AND book [hstat]
Infant food AND book [hstat]
Milk ejection AND book [hstat]
Infant AND nutrition AND book [hstat]
Formula AND book [hstat]
Vitamins AND book [hstat]
Minerals AND book [hstat]
Bottle AND book [hstat]

Refer

Breast feeding
Bottle feeding
Lactation
Baby milk
Infant feeding
Expressed milk
Infant nutrition
Formula

TRIP

Breastfe* or breast fe*
Milk
Formula
Bottle
Express*
(vitamin* or mineral* or iron) and supplement*

2. Search for RCTs (March 2006)

A series of questions were searched, some updating searches conducted in previous reviews, and some representing new searches.

2.1 Breastfeeding uptake and nutrition.

The search strategies of the Fairbank review and the Renfrew review were combined. With the Renfrew strategy the breastfeeding concepts were ANDed with the Public Health interventions concepts only and other elements of the original search strategy were omitted as irrelevant to the focus of this work. The strategy was;

(a) run in Medline for 1998 onwards, with the addition of an RCT filter and restricted to developed countries, and English language studies

Database: Ovid MEDLINE(R) <1966 to March Week 1 2006>

- 1 breast feeding/ (17068)
- 2 lactation/ (24117)
- 3 milk ejection/ (439)
- 4 milk, human/ (10985)
- 5 (breastfeed\$ or breastfed).tw. (5838)
- 6 (breast feed\$ or breast fed).tw. (9693)
- 7 (breastmilk or breast milk or babymilk or baby milk).tw. (5401)
- 8 (breast adj4 (fed or milk or feed\$)).tw. (13776)
- 9 (baby adj2 milk).tw. (75)
- 10 (lactation or lactating).tw. (23573)
- 11 (nursing adj2 (mother or mothers)).tw. (667)
- 12 (nursing adj2 (baby or babies)).tw. (59)
- 13 (nursing adj2 (infant or infants)).tw. (558)
- 14 infant food/ (7793)
- 15 infant feeding.tw. (1849)
- 16 infant formula.tw. (1232)
- 17 formula milk\$.tw. (215)
- 18 mixed feed\$.tw. (345)
- 19 or/1-18 (63038)
- 20 exp health promotion/ (26658)
- 21 exp health education/ (90751)
- 22 patient education/ (43722)
- 23 health fairs/ (341)
- 24 public health/ (31787)
- 25 Public Health Practice/ (1812)
- 26 public health nursing/ (7596)
- 27 preventive health services/ (7365)
- 28 parental leave/ (291)
- 29 legislation/ (14033)
- 30 attitude of health personnel/ (55051)
- 31 peer group/ (7123)
- 32 self-help groups/ (5466)
- 33 social support/ (25407)
- 34 community networks/ (2244)
- 35 community health aides/ (2023)
- 36 community health services/ (20292)
- 37 community health nursing/ (15087)
- 38 primary health care/ (30649)
- 39 child health services/ (13261)
- 40 infant welfare/ (1262)
- 41 maternal health services/ (6829)
- 42 maternal welfare/ (2984)
- 43 maternal-child nursing/ (1242)
- 44 maternal-child health centers/ (1637)

- 45 infant care/ (5776)
- 46 rooming-in care/ (337)
- 47 prenatal care/ (13007)
- 48 postnatal care/ (2356)
- 49 (community adj2 (worker\$1 or personnel)).tw. (735)
- 50 (health adj2 (worker\$1 or visitor\$1)).tw. (11543)
- 51 nurse midwives/ (5018)
- 52 midwifery/ (9319)
- 53 (midwife\$ or midwives or birth attendant\$1 or family physician\$1).tw. (15928)
- 54 (gp or gps or generalist\$1).tw. (20828)
- 55 nurses/ (21002)
- 56 nurse practitioners/ (10781)
- 57 counseling/ or directive counseling/ (18938)
- 58 house calls/ (1416)
- 59 world health organization/ (17398)
- 60 united nations/ (3759)
- 61 persuasive communication/ (1694)
- 62 mass media/ (5562)
- 63 delivery of health care/ (41633)
- 64 delivery of health care, integrated/ (4442)
- 65 health behavior/ (13480)
- 66 public policy/ (20651)
- 67 health policy/ (29628)
- 68 nutrition policy/ (2521)
- 69 government programs/ (1542)
- 70 government agencies/ (10358)
- 71 national health programs/ (14143)
- 72 social control policies/ (230)
- 73 teaching/ (29516)
- 74 (health adj4 promot\$).tw. (14752)
- 75 (health adj4 educat\$).tw. (22215)
- 76 ((antenatal or postnatal or prenatal or postpartum or post partum) adj2 (class\$ or educat\$ or care or practice\$1)).tw. (6826)
- 77 (campaign\$ or policy or policies).tw. (76074)
- 78 (promoting or promotion or promote\$).tw. (278779)
- 79 (educat\$ or training).tw. (281082)
- 80 (program\$ or programme\$).tw. (287545)
- 81 (intervention\$ or scheme\$).tw. (254672)
- 82 process evaluation\$.tw. (483)
- 83 "process assessment (health care)"/ (1699)
- 84 "outcome and process assessment (health care)"/ (14377)
- 85 (public adj2 health).tw. (55194)
- 86 (public adj2 educat\$).tw. (2940)
- 87 (practice adj2 chang\$).tw. (2504)
- 88 (parental leave or maternity leave or paternity leave).tw. (258)
- 89 ((peer\$1 or lay or professional\$1 or community or agenc\$) adj2 support).tw. (2447)
- 90 ((peer\$1 or lay or community) adj2 (group\$1 or network\$)).tw. (3161)
- 91 (mother adj2 mother adj support).tw. (15)
- 92 ((home or health or followup or follow up) adj visit\$).tw. (8658)
- 93 ((healthcare or care) adj provision).tw. (998)
- 94 rooming in.tw. (330)
- 95 counsel\$.tw. (34676)
- 96 (encourage\$ or motivate\$ or support or supportive or guidance).tw. (381687)
- 97 (legislation or legal).tw. (39869)

- 98 ((maternal or infant) adj4 (health or nursing or welfare or care)).tw. (7684)
- 99 health sector initiatives.tw. (3)
- 100 mother friendly.tw. (8)
- 101 baby friendly.tw. (229)
- 102 la leche league.tw. (25)
- 103 wic.tw. (511)
- 104 sure start.tw. (22)
- 105 welfare food scheme.tw. (3)
- 106 unicef.tw. (581)
- 107 maternity alliance.tw. (1)
- 108 national childbirth trust.tw. (21)
- 109 donor milk.tw. (46)
- 110 milk banks/ (99)
- 111 medical audit/ or nursing audit/ (11500)
- 112 audit\$.tw. (58253)
- 113 quality assurance, health care/ (31059)
- 114 (quality adj2 (assurance or assessment\$1)).tw. (15454)
- 115 guidelines/ or practice guidelines/ or health planning guidelines/ (51029)
- 116 (guideline or practice guideline).pt. or guideline\$1.tw. (84318)
- 117 ((opinion or professional) adj2 leader\$1).tw. (345)
- 118 (project adj2 champion\$1).tw. (10)
- 119 (interactive adj2 educat\$).tw. (234)
- 120 (workshop\$1 or work shop\$1).tw. (13686)
- 121 or/20-120 (1900800)
- 122 19 and 121 (13356)
- 123 clinical trial.pt. (424058)
- 124 (randomized or placebo).ab. (190604)
- 125 clinical trials/ (124904)
- 126 randomly.ab. (97865)
- 127 trial.ti. (58851)
- 128 or/123-127 (597527)
- 129 122 and 128 (1159)
- 130 limit 129 to yr="1998 - 2006" (757)
- 131 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (433095)
- 132 DEVELOPING COUNTRIES/ (45366)
- 133 131 or 132 (449725)
- 134 130 not 133 (584)
- 135 limit 134 to english language (558)

(b) run for 1998 onwards in CENTRAL (without the RCT filter).

The MEDLINE search above was run in CENTRAL.

**(c) translated (including RCT filter) for Cinahl and run for 1998 onwards.
Restricted to developed countries, and English language.**

Database: CINAHL - Cumulative Index to Nursing & Allied Health Literature <1982 to March Week 1 2006>

- 1 exp Breast Feeding/ (5411)
- 2 LACTATION/ (707)
- 3 Milk Expression/ (88)
- 4 Milk, Human/ (1072)
- 5 (breastfeed\$ or breastfed).tw. (3199)
- 6 (breast feed\$ or breast fed).tw. (1325)

- 7 (breastmilk or breast milk or babymilk or baby milk).tw. (756)
- 8 (breast adj4 (fed or milk or feed\$)).tw. (1931)
- 9 (baby adj2 milk).tw. (50)
- 10 (lactation or lactating).tw. (937)
- 11 (milk adj4 (expression or ejection)).tw. (42)
- 12 (nursing adj2 (mother or mothers)).tw. (214)
- 13 (nursing adj2 (baby or babies)).tw. (52)
- 14 (nursing adj2 (infant or infants)).tw. (185)
- 15 exp infant food/ (1041)
- 16 exp infant feeding/ (6404)
- 17 infant formula/ (899)
- 18 infant feeding.tw. (627)
- 19 infant formula.tw. (165)
- 20 mixed feed\$.tw. (17)
- 21 formula milk\$.tw. (56)
- 22 infant food.tw. (4)
- 23 or/1-22 (8755)
- 24 exp health promotion/ (11030)
- 25 exp health education/ (38474)
- 26 patient education/ (20085)
- 27 health fairs/ (221)
- 28 public health/ (6079)
- 29 public health administration/ (1704)
- 30 public health nursing/ (11963)
- 31 Preventive Health Care/ (3296)
- 32 parental leave/ (144)
- 33 legislation/ (6574)
- 34 attitude of health personnel/ (7729)
- 35 Peer Group/ (1175)
- 36 self-help groups/ (3292)
- 37 social support/ (13721)
- 38 community networks/ (354)
- 39 Community Health Workers/ or Home Health Aides/ (960)
- 40 community health services/ (5558)
- 41 community health nursing/ (11963)
- 42 primary health care/ (10943)
- 43 child health services/ (2037)
- 44 Child Welfare/ (2450)
- 45 Maternal Health Services/ (1538)
- 46 Maternal Welfare/ (142)
- 47 Maternal-Child Nursing/ (845)
- 48 maternal-child health centers.tw. (8)
- 49 infant care/ (1070)
- 50 Rooming In/ or family centered care/ (2104)
- 51 prenatal care/ (3622)
- 52 postnatal care/ (1300)
- 53 (community adj2 (worker\$1 or personnel)).tw. (348)
- 54 (health adj2 (worker\$1 or visitor\$1)).tw. (5162)
- 55 nurse midwives/ or midwives/ (2652)
- 56 midwifery/ (5796)
- 57 (midwife\$ or midwives or birth attendant\$1 or family physician\$1).tw. (9926)
- 58 (gp or gps or generalist\$1).tw. (3178)
- 59 nurses/ (22035)
- 60 nurse practitioners/ (6143)
- 61 counseling/ or directive counseling/ (4895)

- 62 house calls/ (1603)
- 63 world health organization/ (2550)
- 64 united nations/ (601)
- 65 (persuasive adj2 communication).tw. (14)
- 66 Communications Media/ (2009)
- 67 Health Care Delivery/ (9691)
- 68 Health Care Delivery, Integrated/ (1103)
- 69 Health Behavior/ (8005)
- 70 Public Policy/ (3364)
- 71 Health Policy/ (10571)
- 72 Nutrition Policy/ (464)
- 73 Government Programs/ (1654)
- 74 Government Agencies/ (2996)
- 75 National Health Programs/ (13397)
- 76 TEACHING/ (791)
- 77 (health adj4 promot\$).tw. (9072)
- 78 (health adj4 educat\$).tw. (9964)
- 79 ((antenatal or postnatal or prenatal or postpartum or post partum) adj2 (class\$ or educat\$ or care or practice\$1)).tw. (2389)
- 80 (campaign\$ or policy or policies).tw. (24459)
- 81 (promoting or promotion or promote\$).tw. (23494)
- 82 (promoting or promotion or promote\$).tw. (23494)
- 83 (educat\$ or training).tw. (93594)
- 84 (program\$ or programme\$).tw. (65725)
- 85 (intervention\$ or scheme\$).tw. (54078)
- 86 process evaluation\$.tw. (296)
- 87 "Process Assessment (Health Care)"/ (1401)
- 88 "outcomes (health care)"/ or outcome assessment/ (12519)
- 89 (public adj2 health).tw. (10914)
- 90 (public adj2 educat\$).tw. (1032)
- 91 (practice adj2 chang\$).tw. (2039)
- 92 (parental leave or maternity leave or paternity leave).tw. (106)
- 93 ((peer\$1 or lay or professional\$1 or community or agenc\$) adj2 support).tw. (2216)
- 94 ((peer\$1 or lay or community) adj2 (group\$1 or network\$)).tw. (1495)
- 95 (mother adj2 mother adj support).tw. (11)
- 96 ((home or health or followup or follow up) adj visit\$).tw. (4016)
- 97 ((healthcare or care) adj provision).tw. (630)
- 98 ((healthcare or care) adj provision).tw. (630)
- 99 rooming in.tw. (75)
- 100 counsel\$.tw. (9453)
- 101 (encourage\$ or motivate\$ or support or supportive or guidance).tw. (59177)
- 102 (legislation or legal).tw. (11763)
- 103 ((maternal or infant) adj4 (health or nursing or welfare or care)).tw. (2732)
- 104 health sector initiatives.tw. (1)
- 105 mother friendly.tw. (20)
- 106 baby friendly.tw. (167)
- 107 la leche league.tw. (16)
- 108 wic.tw. (299)
- 109 sure start.tw. (77)
- 110 welfare food scheme.tw. (8)
- 111 unicef.tw. (151)
- 112 maternity alliance.tw. (16)
- 113 national childbirth trust.tw. (43)
- 114 donor milk.tw. (25)

- 115 Milk Banks/ (76)
- 116 medical audit/ or nursing audit/ (486)
- 117 audit\$.tw. (6597)
- 118 Quality Assurance/ (5382)
- 119 (quality adj2 (assurance or assessment\$1)).tw. (3268)
- 120 guidelines/ or practice guidelines/ or health planning guidelines/ (8728)
- 121 (guideline or practice guideline).pt. or guideline\$1.tw. (19619)
- 122 ((opinion or professional) adj2 leader\$1).tw. (137)
- 123 (project adj2 champion\$1).tw. (2)
- 124 (interactive adj2 educat\$).tw. (131)
- 125 (workshop\$1 or work shop\$1).tw. (2494)
- 126 or/24-125 (404363)
- 127 23 and 126 (4352)
- 128 exp clinical trials/ (35740)
- 129 double-blind studies/ (7110)
- 130 single-blind studies/ (1863)
- 131 triple-blind studies/ (31)
- 132 clinical trial.pt. (16503)
- 133 random assignment/ (12049)
- 134 (randomized or placebo or randomly).ab. (23716)
- 135 trial.ti. (8414)
- 136 or/128-135 (52389)
- 137 127 and 136 (359)
- 138 limit 137 to yr="1998 - 2006" (305)
- 139 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (37242)
- 140 DEVELOPING COUNTRIES/ (2384)
- 141 139 or 140 (39125)
- 142 138 not 141 (266)
- 143 limit 142 to english language (261)

**(d) translated (including RCT filter) for EMBASE and run for 1998 onwards.
Restricted to developed countries, and English language.**

Database: EMBASE <1980 to 2006 Week 09>

- 1 breast feeding/ (11061)
- 2 lactation/ (10519)
- 3 milk production/ (1076)
- 4 milk ejection/ (218)
- 5 (breastfeed\$ or breastfed).tw. (3662)
- 6 (breast feed\$ or breast fed).tw. (7195)
- 7 (breastmilk or breast milk or babymilk or baby milk).tw. (4540)
- 8 (breast adj4 (fed or milk or feed\$)).tw. (10541)
- 9 (baby adj2 milk).tw. (70)
- 10 (lactation or lactating).tw. (12885)
- 11 (nursing adj2 (mother or mothers)).tw. (552)
- 12 (nursing adj2 (baby or babies)).tw. (33)
- 13 (nursing adj2 (infant or infants)).tw. (304)
- 14 exp infant nutrition/ or exp infant feeding/ (20180)
- 15 infant feeding.tw. (1157)
- 16 infant formula.tw. (1019)
- 17 formula milk\$.tw. (219)
- 18 mixed feed\$.tw. (171)
- 19 or/1-18 (36039)
- 20 exp health promotion/ (18837)

- 21 exp health education/ (56205)
- 22 patient education/ (20409)
- 23 public health/ (23905)
- 24 public health service/ (11523)
- 25 preventive health service/ (3100)
- 26 law/ (33722)
- 27 health personnel attitude/ (354)
- 28 self help/ (2597)
- 29 social support/ or family centered care/ or rooming in/ (13975)
- 30 exp community care/ (16392)
- 31 community medicine/ (905)
- 32 primary health care/ (8519)
- 33 child health care/ (8691)
- 34 infant welfare/ (221)
- 35 maternal care/ (4006)
- 36 maternal welfare/ (2197)
- 37 child care/ (8563)
- 38 newborn care/ (3349)
- 39 prenatal care/ (6821)
- 40 postnatal care/ (854)
- 41 (community adj2 (worker\$1 or personnel)).tw. (689)
- 42 (health adj2 (worker\$1 or visitor\$1)).tw. (8296)
- 43 midwife/ (1608)
- 44 (midwife\$ or midwives or birth attendant\$1 or family physician\$1).tw. (7424)
- 45 (gp or gps or generalist\$1).tw. (18836)
- 46 nurse/ (11916)
- 47 nurse practitioner/ (1322)
- 48 counseling/ or directive counseling/ or parent counseling/ (8782)
- 49 world health organization/ (16790)
- 50 united nations/ (1486)
- 51 persuasive communication/ (623)
- 52 mass media/ or mass communication/ (5100)
- 53 health care delivery/ or health education/ (50424)
- 54 health behavior/ (10761)
- 55 policy/ (16130)
- 56 health care policy/ (42636)
- 57 government/ (26653)
- 58 public health/ (23905)
- 59 social control/ (506)
- 60 teaching/ (8973)
- 61 (health adj4 promot\$).tw. (10121)
- 62 (health adj4 educat\$).tw. (13394)
- 63 ((antenatal or postnatal or prenatal or postpartum or post partum) adj2 (class\$ or educat\$ or care or practice\$1)).tw. (5160)
- 64 (campaign\$ or policy or policies).tw. (55573)
- 65 (promoting or promotion or promote\$).tw. (239350)
- 66 (educat\$ or training).tw. (183880)
- 67 (program\$ or programme\$).tw. (215452)
- 68 (intervention\$ or scheme\$).tw. (225124)
- 69 process evaluation\$.tw. (551)
- 70 treatment outcome/ (242906)
- 71 "outcome and process assessment (health care)"/ (242906)
- 72 (public adj2 health).tw. (36465)
- 73 (public adj2 educat\$).tw. (2718)
- 74 (practice adj2 chang\$).tw. (3122)

- 75 (parental leave or maternity leave or paternity leave).tw. (155)
 76 ((peer\$1 or lay or professional\$1 or community or agenc\$) adj2 support).tw. (2586)
 77 ((peer\$1 or lay or community) adj2 (group\$1 or network\$)).tw. (3301)
 78 (mother adj2 mother adj support).tw. (12)
 79 ((home or health or followup or follow up) adj visit\$).tw. (6095)
 80 ((healthcare or care) adj provision).tw. (773)
 81 rooming in.tw. (141)
 82 counsel\$.tw. (28461)
 83 (encourage\$ or motivate\$ or support or supportive or guidance).tw. (324614)
 84 (legislation or legal).tw. (28120)
 85 ((maternal or infant) adj4 (health or nursing or welfare or care)).tw. (5089)
 86 health sector initiatives.tw. (2)
 87 mother friendly.tw. (3)
 88 baby friendly.tw. (103)
 89 la leche league.tw. (14)
 90 wic.tw. (305)
 91 sure start.tw. (14)
 92 welfare food scheme.tw. (2)
 93 unicef.tw. (330)
 94 maternity alliance.tw. (1)
 95 national childbirth trust.tw. (3)
 96 donor milk.tw. (21)
 97 (milk adj banks).tw. (28)
 98 medical audit/ (9521)
 99 audit\$.tw. (47586)
 100 health care quality/ (37707)
 101 (quality adj2 (assurance or assessment\$1)).tw. (14715)
 102 guidelines/ or practice guidelines/ or health planning guidelines/ (84723)
 103 (guideline or practice guideline).pt. or guideline\$1.tw. (66774)
 104 ((opinion or professional) adj2 leader\$1).tw. (289)
 105 (project adj2 champion\$1).tw. (6)
 106 (interactive adj2 educat\$).tw. (184)
 107 (workshop\$1 or work shop\$1).tw. (10329)
 108 or/20-107 (1605871)
 109 19 and 108 (9316)
 110 controlled study/ (2120299)
 111 exp clinical trial/ (379947)
 112 outcomes research/ (54317)
 113 randomized controlled trial/ (103436)
 114 (randomized or placebo or randomly).ab. (250615)
 115 trial.ti. (51695)
 116 or/110-115 (2428478)
 117 109 and 116 (3349)
 118 limit 117 to yr="1998 - 2006" (2547)
 119 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (201674)
 120 DEVELOPING COUNTRIES/ (16658)
 121 119 or 120 (212696)
 122 118 not 121 (2043)
 123 limit 122 to english language (1953)

**(e) translated (including RCT filter) for PsycINFO and run for 1998 onwards.
Restricted to developing countries, and English language.**

Database: PsycINFO <1967 to March Week 2 2006>

- 1 breast feeding/ (934)
- 2 lactation/ (774)
- 3 (milk adj2 (expression or ejection or human)).tw. (99)
- 4 (breastfeed\$ or breastfed).tw. (703)
- 5 (breast feed\$ or breast fed).tw. (841)
- 6 (breastmilk or breast milk or babymilk or baby milk).tw. (167)
- 7 (breast adj4 (fed or milk or feed\$)).tw. (987)
- 8 (baby adj2 milk).tw. (3)
- 9 (lactation or lactating).tw. (1650)
- 10 (nursing adj2 (mother or mothers)).tw. (206)
- 11 (nursing adj2 (baby or babies)).tw. (16)
- 12 (nursing adj2 (infant or infants)).tw. (128)
- 13 (infant adj2 (feed\$ or food\$)).tw. (471)
- 14 (infant adj2 (feed\$ or food\$)).tw. (471)
- 15 (baby adj2 (feed\$ or food\$)).tw. (46)
- 16 infant formula.tw. (17)
- 17 formula milk\$.tw. (12)
- 18 mixed feed\$.tw. (14)
- 19 or/1-18 (3562)
- 20 exp health promotion/ (4481)
- 21 exp health education/ (8429)
- 22 patient education/ (2027)
- 23 public health/ (2261)
- 24 preventive health/ (0)
- 25 exp legislative processes/ (879)
- 26 social support/ (17082)
- 27 primary health care/ (4777)
- 28 prenatal care/ (568)
- 29 (community adj2 (worker\$1 or personnel)).tw. (690)
- 30 (health adj2 (worker\$1 or visitor\$1 or fairs)).tw. (3198)
- 31 midwifery/ (177)
- 32 (midwife\$ or midwives or birth attendant\$1 or family physician\$1).tw. (1705)
- 33 (gp or gps or generalist\$1).tw. (2777)
- 34 nurses/ (7393)
- 35 nurse practitioners.tw. (307)
- 36 counseling/ or directive counseling/ (11140)
- 37 persuasive communication/ (3212)
- 38 mass media/ (3573)
- 39 health behavior/ (7976)
- 40 public policy/ (7590)
- 41 government programs/ (1473)
- 42 government agencies/ (949)
- 43 teaching/ (7476)
- 44 (health adj4 promot\$).tw. (6531)
- 45 (health adj4 educat\$).tw. (9015)
- 46 ((antenatal or postnatal or prenatal or postpartum or post partum) adj2 (class\$ or educat\$ or care or practice\$1)).tw. (1185)
- 47 (campaign\$ or policy or policies).tw. (39825)
- 48 (promoting or promotion or promote\$).tw. (38799)
- 49 (educat\$ or training).tw. (245995)
- 50 (program\$ or programme\$).tw. (154398)

- 51 (intervention\$ or scheme\$).tw. (106833)
 52 (process adj (evaluation\$ or assessment\$)).tw. (929)
 53 (public adj2 health).tw. (8364)
 54 (preventive adj2 health).tw. (1041)
 55 (public adj2 educat\$).tw. (2383)
 56 (practice adj2 chang\$).tw. (1465)
 57 (parental leave or maternity leave or paternity leave).tw. (190)
 58 ((peer\$1 or lay or professional\$1 or community or agenc\$) adj2 support).tw. (4789)
 59 ((peer\$1 or lay or community) adj2 (group\$1 or network\$)).tw. (7335)
 60 (mother adj2 mother adj support).tw. (27)
 61 ((home or house or health or followup or follow up) adj (visit\$ or call\$)).tw. (2221)
 62 ((healthcare or care) adj provision).tw. (400)
 63 rooming in.tw. (68)
 64 counsel\$.tw. (53273)
 65 (encourage\$ or motivate\$ or support or supportive or guidance).tw. (194574)
 66 (legislation or legal).tw. (24130)
 67 ((maternal or infant or child) adj4 (health or nursing or welfare or care)).tw. (14388)
 68 health sector initiatives.tw. (0)
 69 mother friendly.tw. (2)
 70 baby friendly.tw. (3)
 71 la leche league.tw. (9)
 72 wic.tw. (93)
 73 sure start.tw. (15)
 74 welfare food scheme.tw. (0)
 75 unicef.tw. (47)
 76 united nations.tw. (520)
- 77 world health organization.tw. (1273)
 78 maternity alliance.tw. (0)
 79 national childbirth trust.tw. (1)
 80 donor milk.tw. (0)
 81 audit\$.tw. (33019)
 82 (quality adj2 (assurance or assessment\$1)).tw. (2403)
 83 (guideline or practice guideline).pt. or guideline\$1.tw. (20037)
 84 ((opinion or professional) adj2 leader\$1).tw. (266)
 85 (project adj2 champion\$1).tw. (3)
 86 (interactive adj2 educat\$).tw. (138)
 87 (workshop\$1 or work shop\$1).tw. (6151)
 88 or/20-87 (688451)
 89 19 and 88 (1242)
 90 (empirical study or quantitative study).md. (870852)
 91 treatment outcome clinical trial.md. (10261)
 92 experimental design/ (6029)
 93 (randomized or placebo or randomly).ab. (48725)
 94 trial.ti. (6416)
 95 or/90-94 (890932)
 96 89 and 95 (759)
 97 limit 96 to yr="1998 - 2006" (445)
 98 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (26328)
 99 DEVELOPING COUNTRIES/ (1377)
 100 98 or 99 (27694)

- 101 97 not 100 (435)
 102 limit 101 to english language (417)

2.2 Milk storage and reheating

A strategy was drafted and run in Medline, for 1990 onwards, with the addition of an RCT filter and restricted to developed countries, and English language studies. This was translated and run in CENTRAL, CINAHL, PsycINFO and EMBASE for the same period and with the same limits.

Database: Ovid MEDLINE(R) <1966 to March Week 1 2006>

- 1 exp infant nutrition/ (28886)
- 2 infant food/ (7793)
- 3 infant formula/ (399)
- 4 bottle feeding/ (2424)
- 5 milk, human/ (10985)
- 6 milk, ejection/ (439)
- 7 breast feeding/ (17068)
- 8 or/1-7 (39790)
- 9 hygiene/ (7666)
- 10 equipment contamination/ (5935)
- 11 food contamination/ (16294)
- 12 sterilization/ (12836)
- 13 disinfection/ (6217)
- 14 refrigeration/ (1809)
- 15 or/9-14 (46166)
- 16 8 and 15 (783)
- 17 (hygiene adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (57)
- 18 (contaminat\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (853)
- 19 (sterili\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (188)
- 20 (disinfect\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (118)
- 21 (hygiene adj4 (baby or babies or infant or infants)).tw. (55)
- 22 ((refrigerat\$ or fridge or freez\$ or frozen) adj4 (milk or formula or breastmilk)).tw. (262)
- 23 ((store or storage) adj4 (milk or formula or breastmilk)).tw. (283)
- 24 (reconstitut\$ adj4 (milk or formula or breastmilk)).tw. (216)
- 25 (reheat\$ adj4 (milk or formula or breastmilk)).tw. (0)
- 26 (heat adj4 (milk or formula or breastmilk)).tw. (308)
- 27 or/17-26 (2173)
- 28 16 or 27 (2815)
- 29 limit 28 to (english language and yr="1990 - 2006") (1513)
- 30 animals/ not (animals/ and humans/) (2943513)
- 31 29 not 30 (916)
- 32 clinical trial.pt. (424058)
- 33 (randomized or placebo).ab. (190604)
- 34 clinical trials/ (124904)
- 35 randomly.ab. (97865)
- 36 trial.ti. (58851)
- 37 or/32-36 (597527)
- 38 31 and 37 (51)

- 39 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (433095)
- 40 developing countries/ (45366)
- 41 39 or 40 (449725)
- 42 38 not 41 (41)

CENTRAL 2006/1

- #1 MeSH descriptor Infant Nutrition explode all trees in MeSH products 1077
- #2 MeSH descriptor Infant Food, this term only in MeSH products 750
- #3 MeSH descriptor Infant Formula, this term only in MeSH products 56
- #4 MeSH descriptor Bottle Feeding, this term only in MeSH products 122
- #5 MeSH descriptor Milk, Human, this term only in MeSH products 454
- #6 MeSH descriptor Breast Feeding, this term only in MeSH products 687
- #7 (#1 OR #2 OR #3 OR #4 OR #5 OR #6) 1687
- #8 MeSH descriptor Hygiene, this term only in MeSH products 94
- #9 MeSH descriptor Equipment Contamination, this term only in MeSH products 250
- #10 MeSH descriptor Food Contamination, this term only in MeSH products 26
- #11 MeSH descriptor Sterilization, this term only in MeSH products 147
- #12 MeSH descriptor Disinfection, this term only in MeSH products 136
- #13 MeSH descriptor Refrigeration, this term only in MeSH products 8
- #14 (#8 OR #9 OR #10 OR #11 OR #12 OR #13) 588
- #15 (#7 AND #14) 12
- #16 (hygiene near/4 (milk or bottle* or teat* or pump* or breastmilk or formula)) in All Fields in all products 2
- #17 (contaminat* near/4 (milk or bottle* or teat* or pump* or breastmilk or formula)) in All Fields in all products 12
- #18 (sterili* near/4 (milk or bottle* or teat* or pump* or breastmilk or formula)) in All Fields in all products 11
- #19 (disinfect* near/4 (milk or bottle* or teat* or pump* or breastmilk or formula)) in All Fields in all products 5
- #20 (hygiene near/4 (baby or babies or infant or infants)) in All Fields in all products 26
- #21 ((refrigerat* or fridge or freez* or frozen) near/4 (milk or formula or breastmilk)) in All Fields in all products 10
- #22 ((store or storage) near/4 (milk or formula or breastmilk)) in All Fields in all products 4
- #23 (reconstitut* near/4 (milk or formula or breastmilk)) in All Fields in all products 13
- #24 (reheat* near/4 (milk or formula or breastmilk)) in All Fields in all products 0
- #25 (heat near/4 (milk or formula or breastmilk)) in All Fields in all products 12
- #26 (#16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25) 87
- #27 (#15 OR #26) 90
- #28 <nothing>, from 1990 to 2006 in all products 372295
- #29 (#27 AND #28) 67
- #30 animals/ not (animals/ and humans/) in All Fields in all products 469
- #31 (#29 AND NOT #30) 67
- #32 MeSH descriptor Africa explode all trees in MeSH products 1967
- #33 MeSH descriptor Caribbean Region explode all trees in MeSH products 167
- #34 MeSH descriptor Central America explode all trees in MeSH products 116
- #35 MeSH descriptor Latin America explode all trees in MeSH products 42
- #36 MeSH descriptor South America explode all trees in MeSH products 618
- #37 MeSH descriptor Asia explode all trees in MeSH products 4145
- #38 MeSH descriptor Developing Countries explode all trees in MeSH products 395
- #39 (#32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38) 7046
- #40 (#31 AND NOT #39) 56

**Database: CINAHL - Cumulative Index to Nursing & Allied Health Literature
<1982 to March Week 1 2006>**

- 1 exp infant nutrition/ (6162)
- 2 infant food/ (174)
- 3 infant formula/ (899)
- 4 bottle feeding/ (602)
- 5 milk, human/ (1072)
- 6 milk expression/ (88)
- 7 breast feeding/ (5361)
- 8 or/1-7 (7140)
- 9 hygiene/ (623)
- 10 equipment contamination/ (994)
- 11 food contamination/ (815)
- 12 "sterilization and disinfection"/ (2453)
- 13 refrigeration/ (75)
- 14 or/9-13 (4513)
- 15 8 and 14 (79)
- 16 (hygiene adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (6)
- 17 (contaminat\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (41)
- 18 (sterili\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (8)
- 19 (disinfect\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (6)
- 20 (hygiene adj4 (baby or babies or infant or infants)).tw. (15)
- 21 ((refrigerat\$ or fridge or freez\$ or frozen) adj4 (milk or formula or breastmilk)).tw. (10)
- 22 ((store or storage) adj4 (milk or formula or breastmilk)).tw. (30)
- 23 (reconstitut\$ adj4 (milk or formula or breastmilk)).tw. (6)
- 24 (reheat\$ adj4 (milk or formula or breastmilk)).tw. (0)
- 25 (heat adj4 (milk or formula or breastmilk)).tw. (5)
- 26 or/16-25 (118)
- 27 15 or 26 (183)
- 28 limit 27 to (english language and yr="1990 - 2006") (165)
- 29 animals/ not (animals/ and humans/) (588)
- 30 28 not 29 (164)
- 31 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (37242)
- 32 developing countries/ (2384)
- 33 31 or 32 (39125)
- 34 30 not 33 (142)
- 35 exp clinical trials/ (35740)
- 36 double-blind studies/ (7110)
- 37 single-blind studies/ (1863)
- 38 triple-blind studies/ (31)
- 39 clinical trial.pt. (16503)
- 40 random assignment/ (12049)
- 41 (randomized or placebo or randomly).ab. (23716)
- 42 trial.ti. (192)
- 43 or/35-42 (50763)
- 44 34 and 43 (8)

Database: EMBASE <1980 to 2006 Week 09>

- 1 exp infant nutrition/ (20180)
- 2 baby food/ (424)
- 3 artificial milk/ (3965)
- 4 bottle feeding/ (878)
- 5 breast milk/ (7422)
- 6 milk ejection/ (218)
- 7 breast feeding/ (11061)
- 8 or/1-7 (20360)
- 9 hygiene/ (5048)
- 10 milk hygiene/ (22)
- 11 food contamination/ (11040)
- 12 instrument sterilization/ (4159)
- 13 disinfection/ (7309)
- 14 freezing/ (5487)
- 15 or/9-14 (31604)
- 16 8 and 15 (469)
- 17 (hygiene adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (33)
- 18 (contaminat\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (807)
- 19 (sterili\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (111)
- 20 (disinfect\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (46)
- 21 (hygiene adj4 (baby or babies or infant or infants)).tw. (34)
- 22 ((refrigerat\$ or fridge or freez\$ or frozen) adj4 (milk or formula or breastmilk)).tw. (186)
- 23 ((store or storage) adj4 (milk or formula or breastmilk)).tw. (189)
- 24 (reconstitut\$ adj4 (milk or formula or breastmilk)).tw. (131)
- 25 (reheat\$ adj4 (milk or formula or breastmilk)).tw. (0)
- 26 (heat adj4 (milk or formula or breastmilk)).tw. (245)
- 27 or/17-26 (1621)
- 28 16 or 27 (1993)
- 29 limit 28 to (english language and yr="1990 - 2006") (1377)
- 30 animals/ not (animals/ and humans/) (12803)
- 31 29 not 30 (1376)
- 32 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (201674)
- 33 developing countries/ (16658)
- 34 32 or 33 (212696)
- 35 31 not 34 (1239)
- 36 controlled study/ (2120299)
- 37 exp clinical trial/ (379947)
- 38 outcomes research/ (54317)
- 39 randomized controlled trial/ (103436)
- 40 (randomized or placebo or randomly).ab. (250615)
- 41 trial.ti. (51695)
- 42 or/36-41 (2428478)
- 43 35 and 42 (389)

Database: PsycINFO <1985 to March Week 2 2006>

- 1 exp nutrition/ (2281)
- 2 food/ (2580)
- 3 bottle feeding/ (109)

- 4 breast feeding/ (808)
- 5 or/1-4 (5439)
- 6 hygiene/ (167)
- 7 5 and 6 (8)
- 8 ((infant or baby) adj1 formula).tw. (16)
- 9 (hygiene adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (1)
- 10 (contaminat\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (5)
- 11 (sterili\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (1)
- 12 (disinfect\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (1)
- 13 (hygiene adj4 (baby or babies or infant or infants)).tw. (1)
- 14 ((refrigerat\$ or fridge or freez\$ or frozen) adj4 (milk or formula or breastmilk)).tw. (1)
- 15 ((store or storage) adj4 (milk or formula or breastmilk)).tw. (2)
- 16 (reconstitut\$ adj4 (milk or formula or breastmilk)).tw. (3)
- 17 (reheat\$ adj4 (milk or formula or breastmilk)).tw. (0)
- 18 (heat adj4 (milk or formula or breastmilk)).tw. (4)
- 19 or/8-18 (32)
- 20 7 or 19 (40)
- 21 limit 20 to (english language and yr="1990 - 2006") (34)
- 22 animals/ not (animals/ and humans/) (2231)
- 23 21 not 22 (34)
- 24 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (18879)
- 25 developing countries/ (1287)
- 26 24 or 25 (20155)
- 27 23 not 26 (30)
- 28 (empirical study or quantitative study).md. (815850)
- 29 treatment outcome clinical trial.md. (10169)
- 30 experimental design/ (4138)
- 31 (randomized or placebo or randomly).ab. (38813)
- 32 trial.ti. (5337)
- 33 or/28-32 (824993)
- 34 27 and 33 (21)

2.3 Expressing milk

A strategy was run in Medline, for 1990 onwards, with the addition of an RCT filter and restricted to developed countries, and English language studies.

This strategy was translated and run in CENTRAL, CINAHL, PsycINFO and EMBASE for the same period and with the same limits.

Database: Ovid MEDLINE(R) <1966 to January Week 3 2006>

- 1 milk, human/ and (suction/ or vacuum/) (27)
- 2 milk ejection/ (437)
- 3 (infant nutrition/ or breast feeding/) and (suction/ or vacuum/) (58)
- 4 ((breastmilk or milk) adj5 (express\$ or pump\$)).ti,ab. (960)
- 5 or/1-4 (1412)
- 6 limit 5 to (english language and yr="1990 - 2006") (874)
- 7 animals/ not (humans/ and animals/) (2919097)
- 8 6 not 7 (469)
- 9 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (428377)

- 10 developing countries/ (45038)
- 11 or/9-10 (444837)
- 12 8 not 11 (440)
- 13 clinical trial.pt. (420116)
- 14 (randomized or placebo).ab. or clinical trials/ (289808)
- 15 randomly.ab. or trial.ti. (146479)
- 16 or/13-15 (587975)
- 17 12 and 16 (59)

Database: CENTRAL 2006/1

- #1 MeSH descriptor milk ejection explode all trees 7
- #2 MeSH descriptor Milk, Human explode all trees 454
- #3 MeSH descriptor suction explode all trees 494
- #4 MeSH descriptor vacuum explode all trees 56
- #5 MeSH descriptor infant nutrition explode all trees 1078
- #6 MeSH descriptor breast feeding explode all trees 688
- #7 (#2 and (#3 or #4)) 5
- #8 ((#5 or #6) and (#3 or #4)) 7
- #9 (milk in All Text near/5 express* in All Text) 89
- #10 (milk in All Text near/5 pump* in All Text) 18
- #11 (breast in All Text near/5 pump* in All Text) 33
- #12 (#1 or #7 or #8 or #9 or #10 or #11) from 1990 to 2006 88

Database: CINAHL - Cumulative Index to Nursing & Allied Health Literature <1982 to February Week 4 2006>

- 1 milk expression/ (88)
- 2 milk banks/ (76)
- 3 Breast Pumps/ (136)
- 4 (milk adj5 (express\$ or pump\$)).ti,ab. (143)
- 5 or/1-4 (351)
- 6 limit 5 to (english and yr="1990 - 2006") (319)
- 7 exp clinical trials/ or double blind studies/ or single blind studies/ or triple blind studies/ (35618)
- 8 clinical trial.pt. (16449)
- 9 random assignment/ (12006)
- 10 (randomized or placebo or randomly).ab. (23643)
- 11 trial.ti. (8392)
- 12 or/7-11 (52226)
- 13 6 and 12 (23)

Database: EMBASE <1980 to 2006 Week 08>

- 1 milk ejection/ (218)
- 2 breast milk/ and (express\$ or pump\$).ti,ab. (587)
- 3 (milk adj5 (express\$ or pump\$)).ti,ab. (917)
- 4 or/1-3 (1404)
- 5 Human/ (5185958)
- 6 Nonhuman/ (2679216)
- 7 6 not (5 and 6) (2306853)
- 8 4 not 7 (818)
- 9 limit 8 to (english language and yr="1990 - 2006") (571)
- 10 controlled study/ or exp clinical trial/ or outcomes research/ or randomized controlled trial/ (2334844)
- 11 (randomized or placebo or randomly).ab. (250253)
- 12 trial.ti. (51631)

- 13 or/10-12 (2424429)
- 14 9 and 13 (261)
- 15 exp africa/ or exp "south and central america"/ (74522)
- 16 developing country/ (16637)
- 17 exp asia/ (131088)
- 18 or/15-17 (212307)
- 19 14 not 18 (244)

Database: PsycINFO <1985 to February Week 5 2006>

- 1 (milk adj5 (express\$ or pump\$)).ti,ab. (23)
- 2 breast pump\$.ti,ab. (3)
- 3 or/1-2 (24)
- 4 limit 3 to (english language and yr="1990 - 2006") (20)
- 5 limit 4 to human (12)

2.4 Supplementary feeding.

A strategy was run in Medline, for 1990 onwards, with the addition of an RCT filter and restricted to developed countries, and English language studies. This strategy was translated and run in CENTRAL, CINAHL, PsycINFO and EMBASE for the same period and with the same limits.

Database: Ovid MEDLINE(R) <1966 to January Week 3 2006>

- 1 animals/ not (humans/ and animals/) (2919097)
- 2 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (428377)
- 3 developing countries/ (45038)
- 4 or/2-3 (444837)
- 5 breast feeding/ or (breastfed or breast fed or breastfeed\$).ti,ab. (19472)
- 6 milk, human/ or (breast milk or breastmilk).ti,ab. (12946)
- 7 or/5-6 (28012)
- 8 ((milk or formula) adj5 (cup or cups or spoon\$ or bottle or bottlefed or bottles)).ti,ab. (286)
- 9 bottle feeding/ or milk fed.ti,ab. (2832)
- 10 formula milk.ti,ab. (190)
- 11 infant formula/ (374)
- 12 or/8-11 (3516)
- 13 7 and 12 (2142)
- 14 complementary feeding.ti,ab. (150)
- 15 infant nutrition/ or infants, newborn/ (8527)
- 16 14 and 15 (73)
- 17 or/13,16 (2209)
- 18 limit 17 to (english language and yr="1990 - 2006") (1297)
- 19 18 not (1 or 4) (1005)
- 20 clinical trial.pt. (420116)
- 21 (randomized or placebo).ab. or clinical trials/ (289808)
- 22 randomly.ab. or trial.ti. (146479)
- 23 or/20-22 (587975)
- 24 19 and 23 (161)

CENTRAL 2006/1

- #1 MeSH descriptor Breast Feeding this term only 688
- #2 MeSH descriptor milk, human this term only 454
- #3 MeSH descriptor bottle feeding this term only 122
- #4 MeSH descriptor infant formula this term only 56

- #5 MeSH descriptor infant nutrition this term only 408
- #6 MeSH descriptor Infant, Newborn this term only 8424
- #7 (breastfed in All Text or "breast fed" in All Text or breastfeed* in All Text) from 1990 to 2006 911
- #8 ("breast milk" in All Text or breastmilk in All Text) from 1990 to 2006 463
- #9 "bottle fed" in All Text from 1990 to 2006 38
- #10 "formula milk" in All Text 58
- #11 (milk in All Text near/5 cup in All Text) 16
- #12 (milk in All Text near/5 spoon in All Text) 1
- #13 (milk in All Text near/5 dropper in All Text) 0
- #14 (milk in All Text near/5 bottle in All Text) 23
- #15 (formula in All Text near/5 cup in All Text) 1
- #16 (formula in All Text near/5 spoon in All Text) 1
- #17 (formula in All Text near/5 dropper in All Text) 0
- #18 (formula in All Text near/5 bottle in All Text) 20
- #19 (#1 or #2 or #7 or #8) 1684
- #20 (#3 or #4 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18) 291
- #21 (#19 and #20) from 1990 to 2006 148
- #22 "complementary feeding" in All Text 20
- #23 (#5 or #6) and #22) from 1990 to 2006 9
- #24 (#23 or #21) 155

**Database: CINAHL - Cumulative Index to Nursing & Allied Health Literature
<1982 to February Week 4 2006>**

- 1 breast feeding/ or (breastfed or breast fed or breastfeed\$).ti,ab. (6012)
- 2 milk,human/ (1071)
- 3 (breast milk or breastmilk).ti,ab. (729)
- 4 or/1-3 (6594)
- 5 ((milk or formula) adj5 (cup or cups or spoon\$ or dropper\$ or bottle or bottledfed or bottles)).ti,ab. (59)
- 6 bottle feeding/ (602)
- 7 (bottle fed or formula milk).ti,ab. (120)
- 8 infant formula/ (898)
- 9 or/5-8 (1500)
- 10 4 and 9 (930)
- 11 complementary feeding.ti,ab. (22)
- 12 infant nutrition/ (991)
- 13 Infant, Newborn/ (26794)
- 14 11 and (12 or 13) (13)
- 15 infant feeding supplemental/ (116)
- 16 10 or 14 or 15 (1016)
- 17 animals/ not (humans/ and animals/) (587)
- 18 16 not 17 (1016)
- 19 exp africa/ or exp central america/ or latin america/ (9730)
- 20 exp south america/ or developing countries/ (6823)
- 21 or/19-20 (16126)
- 22 18 not 21 (951)
- 23 limit 22 to (english and yr="1990 - 2006") (876)
- 24 exp clinical trials/ or double blind studies/ (35618)
- 25 single blind studies/ or triple blind studies/ (1883)
- 26 clinical trial.pt. (16449)
- 27 random assignment/ (12006)
- 28 (randomized or placebo or randomly).ab. (23643)
- 29 trial.ti. (8392)

- 30 or/24-29 (52226)
- 31 23 and 30 (93)

Database: EMBASE <1980 to 2006 Week 09>

- 1 breast feeding/ or (breastfed or breast fed or breastfeed\$).ti,ab. (12746)
- 2 breast milk/ or (breast milk or breastmilk).ti,ab. (8997)
- 3 or/1-2 (18285)
- 4 ((milk or formula) adj5 (cup or cups or spoon\$ or dropper\$ or bottle or bottledfed or bottles)).ti,ab. (259)
- 5 bottle feeding/ (878)
- 6 formula milk.ti,ab. (197)
- 7 artificial milk/ (3965)
- 8 or/4-7 (4828)
- 9 3 and 8 (2666)
- 10 complementary feeding.ti,ab. (118)
- 11 infant nutrition/ or infant feeding/ (3780)
- 12 10 and 11 (48)
- 13 9 or 12 (2702)
- 14 limit 13 to (english language and yr="1990 - 2006") (2133)

- 15 nonhuman/ not (human/ and nonhuman/) (2309124)
- 16 14 not 15 (2049)
- 17 exp africa/ or exp "south and central america"/ or developing country/ (87885)
- 18 exp asia/ (131342)
- 19 or/17-18 (212696)
- 20 16 not 19 (1801)
- 21 controlled study/ or exp clinical trial/ or outcomes research/ (2338832)
- 22 randomized controlled trial/ (103436)
- 23 (randomized or placebo or randomly).ab. (250615)
- 24 trial.ti. (51695)
- 25 or/21-24 (2428478)
- 26 20 and 25 (769)

Database: PsycINFO <1985 to February Week 5 2006>

- 1 breast feeding/ or (breastfed or breast fed or breastfeed\$).ti,ab. (1020)
- 2 (breastmilk or breast milk).ti,ab. (145)
- 3 or/1-2 (1052)
- 4 ((milk or formula) adj5 (cup or cups or spoon\$ or dropper\$ or bottle or bottledfed or bottles)).ti,ab. (34)
- 5 bottle feeding/ or bottle fed.ti,ab. (143)
- 6 formula milk.ti,ab. (9)
- 7 infant formula.ti,ab. (15)
- 8 or/4-7 (182)
- 9 3 and 8 (107)
- 10 (complementary feeding adj5 infant\$).mp. [mp=title, abstract, subject headings, table of contents, key concepts] (1)
- 11 or/9-10 (108)
- 12 limit 11 to (english language and yr="1990 - 2006") (68)
- 13 empirical study.md. (813568)
- 14 quantitative study.md. (120189)
- 15 treatment outcome clinical trial.md. (10143)
- 16 experimental design/ (4135)
- 17 (randomized or placebo or randomly).ab. (38651)
- 18 trial.ti. (5318)
- 19 or/13-18 (823367)

20 12 and 19 (56)

2.5 Vitamin and mineral supplements

A strategy was run in Medline, for 1990 onwards, with the addition of an RCT filter and restricted to developed countries, and English language studies.

This strategy was translated and run in CENTRAL, CINAHL, PsycINFO and EMBASE for the same period and with the same limits.

Database: Ovid MEDLINE(R) <1966 to January Week 3 2006>

- 1 animals/ not (humans/ and animals/) (2919097)
- 2 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (428377)
- 3 developing countries/ (45038)
- 4 or/2-3 (444837)
- 5 breast feeding/ or (breastfed or breast fed or breastfeed\$.ti,ab. (19472)
- 6 milk, human/ or (breast milk or breastmilk).ti,ab. (12946)
- 7 bottle feeding/ or milk fed.ti,ab. (2832)
- 8 formula milk.ti,ab. (190)
- 9 infant formula/ (374)
- 10 or/5-9 (29251)
- 11 complementary feeding.ti,ab. (150)
- 12 ((additional or supplement\$ or extra or fortif\$) adj5 (vitamin\$ or mineral\$)).ti,ab. (9904)
- 13 exp vitamins/ or exp minerals/ (226809)
- 14 food, fortified/ (5344)
- 15 or/11-14 (233147)
- 16 10 and 15 (2065)
- 17 16 not (1 or 4) (1663)
- 18 limit 17 to (english language and yr="1990 - 2006") (732)
- 19 clinical trial.pt. (420116)
- 20 (randomized or placebo).ab. or clinical trials/ (289808)
- 21 randomly.ab. or trial.ti. (146479)
- 22 or/19-21 (587975)
- 23 18 and 22 (163)

CENTRAL: 2006/1

- #1 MeSH descriptor breast feeding this term only 688
- #2 MeSH descriptor milk, human this term only 454
- #3 MeSH descriptor bottle feeding this term only 122
- #4 MeSH descriptor infant formula this term only 56
- #5 ((breastfed in All Text or "breast fed" in All Text or breastfeed* in All Text) or ("breast milk" in All Text or breastmilk in All Text) or ("milk fed" in All Text or "baby milk" in All Text or "formula milk" in All Text or "infant formula" in All Text)) 1633
- #6 MeSH descriptor vitamins explode all trees 6620
- #7 MeSH descriptor minerals explode all trees 1563
- #8 MeSH descriptor iron this term only 970
- #9 MeSH descriptor iodine this term only 225
- #10 MeSH descriptor food, fortified this term only 625
- #11 ("complementary feeding" in All Text or (additional in All Text near/5 vitamin* in All Text) or (additional in All Text near/5 mineral* in All Text) or (supplement* in All Text near/5 vitamin* in All Text) or (supplement* in Tables near/5 mineral* in Tables)) 1998

#12 (((extra in All Text near/5 vitamin* in All Text) or (extra in All Text near/5 mineral* in All Text)) or ((fortif* in All Text near/5 vitamin* in All Text) or (fortif* in All Text near/5 mineral* in All Text))) 96
 #13 (#1 or #2 or #3 or #4 or #5) from 1990 to 2006 1679
 #14 (#6 or #7 or #8 or #9 or #10 or #11 or #12) from 1990 to 2006 7600
 #15 (#13 and #14) from 1990 to 2006 281

**Database: CINAHL - Cumulative Index to Nursing & Allied Health Literature
 <1982 to March Week 1 2006>**

- 1 (breastfed or breast fed or breastfeed\$.ti,ab. (3460)
- 2 milk, human/ (1072)
- 3 (breast milk or breastmilk).ti,ab. (729)
- 4 exp breast feeding/ (5411)
- 5 bottle feeding/ or milk fed.ti,ab. (617)
- 6 (formula milk or baby milk).ti,ab. or infant formula/ (922)
- 7 or/1-6 (7177)
- 8 complementary feeding.ti,ab. (22)
- 9 ((additional or supplement\$ or extra or fortif\$) adj5 (vitamin\$ or mineral\$)).ti,ab. (1196)
- 10 ((additional or supplement\$ or extra or fortif\$) adj5 (iron or iodine)).ti,ab. (400)
- 11 exp vitamins/ (7380)
- 12 exp minerals/ (1227)
- 13 iron/ (979)
- 14 food,fortified/ (593)
- 15 dietary supplementation/ (5932)
- 16 iodine/ (266)
- 17 or/8-16 (13637)
- 18 7 and 17 (421)
- 19 limit 18 to (english and yr="1990 - 2006") (411)
- 20 exp clinical trials/ (35740)
- 21 double blind studies/ (7110)
- 22 single blind studies/ (1863)
- 23 triple blind studies/ (31)
- 24 clinical trial.pt. (16503)
- 25 random assignment/ (12049)
- 26 (randomized or placebo or randomly).ab. (23716)
- 27 trial.ti. (8414)
- 28 or/20-27 (52389)
- 29 19 and 28 (100)
- 30 exp africa/ or exp central america/ or latin america/ or exp south america/ or exp asia/ (35929)
- 31 developing countries/ (2384)
- 32 or/30-31 (37828)
- 33 29 not 32 (73)

Database: EMBASE <1980 to 2006 Week 09>

- 1 (breastfed or breast fed or breastfeed\$.ti,ab. (6570)
- 2 breast milk/ (7422)
- 3 (breast milk or breastmilk).ti,ab. (4518)
- 4 breast feeding/ (11061)
- 5 bottle feeding/ or milk fed.ti,ab. (1216)
- 6 (formula milk or baby milk).ti,ab. or artificial milk/ (4040)
- 7 or/1-6 (20495)
- 8 complementary feeding.ti,ab. (118)

- 9 ((additional or supplement\$ or extra or fortif\$) adj5 (vitamin\$ or mineral\$)).ti,ab. (9639)
- 10 ((additional or supplement\$ or extra or fortif\$) adj5 (iron or iodine)).ti,ab. (3821)
- 11 exp vitamin/ (184063)
- 12 calcium/ or phosphorus/ or iron therapy/ (94584)
- 13 iron/ (35513)
- 14 vitamin supplementation/ (5854)
- 15 diet supplementation/ (21777)
- 16 iodine/ (6678)
- 17 or/8-16 (313054)
- 18 7 and 17 (3056)
- 19 limit 18 to (english and yr="1990 - 2006") (2248)
- 20 controlled study/ (2120299)
- 21 exp clinical trial/ (379947)
- 22 outcomes research/ (54317)
- 23 randomized controlled trial/ (103436)
- 24 (randomized or placebo or randomly).ab. (250615)
- 25 trial.ti. (51695)
- 26 exp africa/ or exp "south and central america"/ or exp asia/ (201674)
- 27 developing country/ (16658)
- 28 or/20-25 (2428478)
- 29 or/26-27 (212696)
- 30 19 and 28 (967)
- 31 30 not 29 (783)
- 32 human/ (5192102)
- 33 nonhuman/ (2682263)
- 34 33 not (32 and 33) (2309124)
- 35 31 not 34 (695)

Database: PsycINFO <1985 to March Week 2 2006>

- 1 (breastfed or breast fed or breastfeed\$).ti,ab. (723)
- 2 (breast milk or breastmilk).ti,ab. (145)
- 3 breast feeding/ (808)
- 4 bottle feeding/ or milk fed.ti,ab. (117)
- 5 (formula milk or baby milk).ti,ab. (9)
- 6 complementary feeding.ti,ab. (7)
- 7 ((additional or supplement\$ or extra or fortif\$) adj5 (vitamin\$ or mineral\$)).ti,ab. (247)
- 8 ((additional or supplement\$ or extra or fortif\$) adj5 (iron or iodine)).ti,ab. (36)
- 9 exp vitamins/ (1294)
- 10 calcium/ or phosphorus/ or vitamin therapy/ (1062)
- 11 iron/ (178)
- 12 dietary supplements/ (246)
- 13 iodine/ (0)
- 14 empirical study.md. (815121)
- 15 quantitative study.md. (121612)
- 16 treatment outcome clinical trial.md. (10169)
- 17 experimental design/ (4138)
- 18 (randomized or placebo or randomly).ab. (38813)
- 19 trial.ti. (5337)
- 20 africa.lo. (4092)
- 21 developing countries/ (1287)
- 22 or/1-5 (1092)

- 23 or/6-13 (2753)
 24 or/14-19 (824993)
 25 22 and 23 and 24 (11)
 26 or/20-21 (5277)
 27 25 not 26 (11)
 28 limit 27 to (english language and yr="1990 - 2006") (9)
 29 from 28 keep 2-3,5-9 (7)

The search results from all searches were downloaded into an Endnote library and deduplicated. The effect of deduplication means that results only appear once, and a record that is about more than one topic is not labeled with all relevant topics in the custom 4 field.

Search	Results	Results after deduplication	Custom4 code
Breastfeeding medline	558	369	Breastfeeding medline rct 10/3/06
Breastfeeding central	1507	89	Breastfeeding central rct 10/3/06
Breastfeeding cinahl	261	103	Breastfeeding cinahl rct 10/3/06
Breastfeeding embase	1953	723	Breastfeeding embase rct 10/3/06
Breastfeeding psycinfo	417	268	Breastfeeding psycinfo rct 10/3/06
storage medline	41	35	Storage medline rct 10/3/06
storage central	40	27	Storage central rct 10/3/06
Storage cinahl	8	3	Storage cinahl rct 10/3/06
storage embase	389	314	Storage embase rct 10/3/06
Storage psycinfo	21	14	Storage psycinfo rct 10/3/06
Expressed medline	59	55	Expressed medline rct
Expressed central	88	18	Expressed central rct
Expressed cinahl	23	9	Expressed cinahl rct
Expressed embase	244	187	Expressed embase rct
Expressed psycinfo	12	10	Expressed psycinfo rct
Supplementary medline	161	141	Mixed milk medline rct
Supplementary central	155	27	Mixed milk central rct
Supplementary cinahl	93	52	Mixed milk cinahl rct
Supplementary embase	769	617	Mixed milk embase rct
Supplementary	56	44	Mixed milk

psycinfo			psycinfo rct
Vitamins/minerals medline	163	127	Mineral suppl medline rct
Vitamins/minerals central	281	88	Mineral suppl central rct
Vitamins/minerals cinahl	73	34	Mineral suppl cinahl rct
Vitamins/minerals embase	695	396	Mineral suppl embase rct
Vitamins/minerals psycinfo	7	5	Mineral suppl psycinfo rct

3. UK Studies (not RCTs) (17/03/06)

The search strategies used for the RCT searches of Medline, Embase, Cinahl and Psycinfo were repeated, but RCTs and reviews were excluded, and the searches limited to UK only or studies by UK institutions.

3.1 Breastfeeding uptake and nutrition UK

The search strategies of the Fairbank review and the Renfrew review were combined. With the Renfrew strategy the breastfeeding concepts were ANDed with the Public Health interventions concepts only and other elements of the original search strategy were omitted as irrelevant to the focus of this work. The strategy was;

- (a) run in Medline for 1998 onwards, with the addition of an RCT filter and restricted to developed countries, and English language studies, and UK only.

Database: Ovid MEDLINE(R) <1966 to March Week 2 2006>

- 1 breast feeding/ (17086)
- 2 lactation/ (24145)
- 3 milk ejection/ (439)
- 4 milk, human/ (10988)
- 5 (breastfeed\$ or breastfed).tw. (5849)
- 6 (breast feed\$ or breast fed).tw. (9696)
- 7 (breastmilk or breast milk or babymilk or baby milk).tw. (5405)
- 8 (breast adj4 (fed or milk or feed\$)).tw. (13782)
- 9 (baby adj2 milk).tw. (76)
- 10 (lactation or lactating).tw. (23605)
- 11 (nursing adj2 (mother or mothers)).tw. (667)
- 12 (nursing adj2 (baby or babies)).tw. (59)
- 13 (nursing adj2 (infant or infants)).tw. (558)
- 14 infant food/ (7798)
- 15 infant feeding.tw. (1851)
- 16 infant formula.tw. (1232)
- 17 formula milk\$.tw. (216)
- 18 mixed feed\$.tw. (345)
- 19 or/1-18 (63099)
- 20 exp health promotion/ (26720)
- 21 exp health education/ (90838)
- 22 patient education/ (43769)
- 23 health fairs/ (341)
- 24 public health/ (31828)

- 25 Public Health Practice/ (1818)
- 26 public health nursing/ (7596)
- 27 preventive health services/ (7369)
- 28 parental leave/ (291)
- 29 legislation/ (14035)
- 30 attitude of health personnel/ (55109)
- 31 peer group/ (7140)
- 32 self-help groups/ (5475)
- 33 social support/ (25454)
- 34 community networks/ (2251)
- 35 community health aides/ (2024)
- 36 community health services/ (20299)
- 37 community health nursing/ (15089)
- 38 primary health care/ (30721)
- 39 child health services/ (13270)
- 40 infant welfare/ (1263)
- 41 maternal health services/ (6847)
- 42 maternal welfare/ (2998)
- 43 maternal-child nursing/ (1243)
- 44 maternal-child health centers/ (1638)
- 45 infant care/ (5777)
- 46 rooming-in care/ (337)
- 47 prenatal care/ (13019)
- 48 postnatal care/ (2362)
- 49 (community adj2 (worker\$1 or personnel)).tw. (738)
- 50 (health adj2 (worker\$1 or visitor\$1)).tw. (11561)
- 51 nurse midwives/ (5018)
- 52 midwifery/ (9364)
- 53 (midwife\$ or midwives or birth attendant\$1 or family physician\$1).tw. (15966)
- 54 (gp or gps or generalist\$1).tw. (20858)
- 55 nurses/ (21018)
- 56 nurse practitioners/ (10785)
- 57 counseling/ or directive counseling/ (18973)
- 58 house calls/ (1416)
- 59 world health organization/ (17415)
- 60 united nations/ (3767)
- 61 persuasive communication/ (1696)
- 62 mass media/ (5568)
- 63 delivery of health care/ (41666)
- 64 delivery of health care, integrated/ (4448)
- 65 health behavior/ (13516)
- 66 public policy/ (20671)
- 67 health policy/ (29667)
- 68 nutrition policy/ (2529)
- 69 government programs/ (1543)
- 70 government agencies/ (10362)
- 71 national health programs/ (14157)
- 72 social control policies/ (236)
- 73 teaching/ (29532)
- 74 (health adj4 promot\$).tw. (14782)
- 75 (health adj4 educat\$).tw. (22246)
- 76 ((antenatal or postnatal or prenatal or postpartum or post partum) adj2 (class\$ or educat\$ or care or practice\$1)).tw. (6834)
- 77 (campaign\$ or policy or policies).tw. (76183)
- 78 (promoting or promotion or promote\$).tw. (279194)

- 79 (educat\$ or training).tw. (281465)
 80 (program\$ or programme\$).tw. (287936)
 81 (intervention\$ or scheme\$).tw. (255249)
 82 process evaluation\$.tw. (484)
 83 "process assessment (health care)"/ (1700)
 84 "outcome and process assessment (health care)"/ (14398)
 85 (public adj2 health).tw. (55288)
 86 (public adj2 educat\$).tw. (2944)
 87 (practice adj2 chang\$).tw. (2510)
 88 (parental leave or maternity leave or paternity leave).tw. (258)
 89 ((peer\$1 or lay or professional\$1 or community or agenc\$) adj2 support).tw. (2451)
 90 ((peer\$1 or lay or community) adj2 (group\$1 or network\$)).tw. (3168)
 91 (mother adj2 mother adj support).tw. (15)
 92 ((home or health or followup or follow up) adj visit\$).tw. (8674)
 93 ((healthcare or care) adj provision).tw. (1003)
 94 rooming in.tw. (330)
 95 counsel\$.tw. (34727)
 96 (encourage\$ or motivate\$ or support or supportive or guidance).tw. (382259)
 97 (legislation or legal).tw. (39919)
 98 ((maternal or infant) adj4 (health or nursing or welfare or care)).tw. (7691)
 99 health sector initiatives.tw. (3)
 100 mother friendly.tw. (8)
 101 baby friendly.tw. (229)
 102 la leche league.tw. (25)
 103 wic.tw. (511)
 104 sure start.tw. (22)
 105 welfare food scheme.tw. (3)
 106 unicef.tw. (583)
 107 maternity alliance.tw. (1)
 108 national childbirth trust.tw. (21)
 109 donor milk.tw. (46)
 110 milk banks/ (99)
 111 medical audit/ or nursing audit/ (11509)
 112 audit\$.tw. (58310)
 113 quality assurance, health care/ (31091)
 114 (quality adj2 (assurance or assessment\$1)).tw. (15470)
 115 guidelines/ or practice guidelines/ or health planning guidelines/ (51160)
 116 (guideline or practice guideline).pt. or guideline\$1.tw. (84498)
 117 ((opinion or professional) adj2 leader\$1).tw. (346)
 118 (project adj2 champion\$1).tw. (10)
 119 (interactive adj2 educat\$).tw. (235)
 120 (workshop\$1 or work shop\$1).tw. (13705)
 121 or/20-120 (1903421)
 122 19 and 121 (13375)
 123 clinical trial.pt. (424238)
 124 (randomized or placebo).ab. (190906)
 125 clinical trials/ (125001)
 126 randomly.ab. (98013)
 127 trial.ti. (58943)
 128 or/123-127 (598222)
 129 122 not 128 (12211)
 130 limit 129 to yr="1998 - 2006" (5509)
 131 review.pt. (1169826)
 132 130 not 131 (4270)

- 133 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (433595)
- 134 DEVELOPING COUNTRIES/ (45419)
- 135 133 or 134 (450243)
- 136 132 not 135 (3365)
- 137 limit 136 to english language (3036)
- 138 animals/ not (animals/ and humans/) (2945033)
- 139 137 not 138 (2364)
- 140 exp great britain/ (206617)
- 141 (united kingdom or uk or wales or scotland or england or ireland or great britain).in. (491708)
- 142 or/140-141 (658842)
- 143 139 and 142 (311)
- 144 from 143 keep 1-311 (311)

(b) translated (including RCT filter) for Cinahl and run for 1998 onwards.
Restricted to developed countries, and English language, and UK only.

**Database: CINAHL - Cumulative Index to Nursing & Allied Health Literature
<1982 to March Week 2 2006>**

- 1 exp Breast Feeding/ (5427)
- 2 LACTATION/ (709)
- 3 Milk Expression/ (88)
- 4 Milk, Human/ (1074)
- 5 (breastfeed\$ or breastfed).tw. (3197)
- 6 (breast feed\$ or breast fed).tw. (1312)
- 7 (breastmilk or breast milk or babymilk or baby milk).tw. (756)
- 8 (breast adj4 (fed or milk or feed\$)).tw. (1902)
- 9 (baby adj2 milk).tw. (32)
- 10 (lactation or lactating).tw. (939)
- 11 (milk adj4 (expression or ejection)).tw. (36)
- 12 (nursing adj2 (mother or mothers)).tw. (117)
- 13 (nursing adj2 (baby or babies)).tw. (34)
- 14 (nursing adj2 (infant or infants)).tw. (88)
- 15 exp infant food/ (1044)
- 16 exp infant feeding/ (6425)
- 17 infant formula/ (901)
- 18 infant feeding.tw. (623)
- 19 infant formula.tw. (166)
- 20 mixed feed\$.tw. (17)
- 21 formula milk\$.tw. (56)
- 22 infant food.tw. (3)
- 23 or/1-22 (8587)
- 24 exp health promotion/ (11053)
- 25 exp health education/ (38543)
- 26 patient education/ (20143)
- 27 health fairs/ (222)
- 28 public health/ (6054)
- 29 public health administration/ (1713)
- 30 public health nursing/ (11979)
- 31 Preventive Health Care/ (3307)
- 32 parental leave/ (145)
- 33 legislation/ (6558)
- 34 attitude of health personnel/ (7744)
- 35 Peer Group/ (1178)

- 36 self-help groups/ (3298)
- 37 social support/ (13795)
- 38 community networks/ (354)
- 39 Community Health Workers/ or Home Health Aides/ (962)
- 40 community health services/ (5575)
- 41 community health nursing/ (11979)
- 42 primary health care/ (10996)
- 43 child health services/ (2049)
- 44 Child Welfare/ (2466)
- 45 Maternal Health Services/ (1549)
- 46 Maternal Welfare/ (142)
- 47 Maternal-Child Nursing/ (846)
- 48 maternal-child health centers.tw. (2)
- 49 infant care/ (1072)
- 50 Rooming In/ or family centered care/ (2106)
- 51 prenatal care/ (3638)
- 52 postnatal care/ (1311)
- 53 (community adj2 (worker\$1 or personnel)).tw. (261)
- 54 (health adj2 (worker\$1 or visitor\$1)).tw. (4906)
- 55 nurse midwives/ or midwives/ (2675)
- 56 midwifery/ (5819)
- 57 (midwife\$ or midwives or birth attendant\$1 or family physician\$1).tw. (9929)
- 58 (gp or gps or generalist\$1).tw. (3195)
- 59 nurses/ (22056)
- 60 nurse practitioners/ (6174)
- 61 counseling/ or directive counseling/ (4911)
- 62 house calls/ (1610)
- 63 world health organization/ (2551)
- 64 united nations/ (603)
- 65 (persuasive adj2 communication).tw. (14)
- 66 Communications Media/ (2016)
- 67 Health Care Delivery/ (9710)
- 68 Health Care Delivery, Integrated/ (1110)
- 69 Health Behavior/ (8033)
- 70 Public Policy/ (3374)
- 71 Health Policy/ (10586)
- 72 Nutrition Policy/ (464)
- 73 Government Programs/ (1657)
- 74 Government Agencies/ (3001)
- 75 National Health Programs/ (13441)
- 76 TEACHING/ (793)
- 77 (health adj4 promot\$).tw. (8571)
- 78 (health adj4 educat\$).tw. (8227)
- 79 ((antenatal or postnatal or prenatal or postpartum or post partum) adj2 (class\$ or educat\$ or care or practice\$1)).tw. (2229)
- 80 (campaign\$ or policy or policies).tw. (24516)
- 81 (promoting or promotion or promote\$).tw. (23473)
- 82 (promoting or promotion or promote\$).tw. (23473)
- 83 (educat\$ or training).tw. (93816)
- 84 (program\$ or programme\$).tw. (65925)
- 85 (intervention\$ or scheme\$).tw. (53522)
- 86 process evaluation\$.tw. (227)
- 87 "Process Assessment (Health Care)"/ (1407)
- 88 "outcomes (health care)"/ or outcome assessment/ (12546)
- 89 (public adj2 health).tw. (10543)

- 90 (public adj2 educat\$.tw. (770)
 91 (practice adj2 chang\$.tw. (1290)
 92 (parental leave or maternity leave or paternity leave).tw. (107)
 93 ((peer\$1 or lay or professional\$1 or community or agenc\$) adj2 support).tw. (1555)
 94 ((peer\$1 or lay or community) adj2 (group\$1 or network\$)).tw. (1082)
 95 (mother adj2 mother adj support).tw. (8)
 96 ((home or health or followup or follow up) adj visit\$.tw. (4009)
 97 ((healthcare or care) adj provision).tw. (579)
 98 ((healthcare or care) adj provision).tw. (579)
 99 rooming in.tw. (67)
 100 counsel\$.tw. (9473)
 101 (encourage\$ or motivate\$ or support or supportive or guidance).tw. (59286)
 102 (legislation or legal).tw. (11778)
 103 ((maternal or infant) adj4 (health or nursing or welfare or care)).tw. (2241)
 104 health sector initiatives.tw. (1)
 105 mother friendly.tw. (20)
 106 baby friendly.tw. (170)
 107 la leche league.tw. (16)
 108 wic.tw. (299)
 109 sure start.tw. (77)
 110 welfare food scheme.tw. (8)
 111 unicef.tw. (152)
 112 maternity alliance.tw. (16)
 113 national childbirth trust.tw. (43)
 114 donor milk.tw. (25)
 115 Milk Banks/ (76)
 116 medical audit/ or nursing audit/ (486)
 117 audit\$.tw. (6618)
 118 Quality Assurance/ (5367)
 119 (quality adj2 (assurance or assessment\$1)).tw. (2803)
 120 guidelines/ or practice guidelines/ or health planning guidelines/ (8775)
 121 (guideline or practice guideline).pt. or guideline\$1.tw. (19706)
 122 ((opinion or professional) adj2 leader\$1).tw. (119)
 123 (project adj2 champion\$1).tw. (1)
 124 (interactive adj2 educat\$.tw. (99)
 125 (workshop\$1 or work shop\$1).tw. (2501)
 126 or/24-125 (403662)
 127 23 and 126 (4222)
 128 exp clinical trials/ (35885)
 129 double-blind studies/ (7140)
 130 single-blind studies/ (1872)
 131 triple-blind studies/ (31)
 132 clinical trial.pt. (16587)
 133 random assignment/ (12107)
 134 (randomized or placebo or randomly).ab. (23811)
 135 trial.ti. (8443)
 136 or/128-135 (52599)
 137 127 not 136 (3871)
 138 limit 137 to yr="1998 - 2006" (2521)
 139 review.pt. (43341)
 140 systematic review.pt. (6502)
 141 139 or 140 (49832)
 142 138 not 141 (2317)

- 143 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (37424)
- 144 DEVELOPING COUNTRIES/ (2388)
- 145 143 or 144 (39310)
- 146 142 not 145 (2044)
- 147 limit 146 to english language (2005)
- 148 animals/ not (animals/ and humans/) (589)
- 149 147 not 148 (2004)
- 150 exp united kingdom/ (92590)
- 151 (united kingdom or uk or wales or scotland or england or ireland or great britain).in. (44381)
- 152 150 or 151 (122049)
- 153 149 and 152 (403)
- 154 from 153 keep 1-403 (403)

(c) translated (including RCT filter) for EMBASE and run for 1998 onwards. Restricted to developed countries, and English language, and UK only.

Database: EMBASE <1980 to 2006 Week 10>

- 1 breast feeding/ (11066)
- 2 lactation/ (10535)
- 3 milk production/ (1084)
- 4 milk ejection/ (219)
- 5 (breastfeed\$ or breastfed).tw. (3668)
- 6 (breast feed\$ or breast fed).tw. (7196)
- 7 (breastmilk or breast milk or babymilk or baby milk).tw. (4544)
- 8 (breast adj4 (fed or milk or feed\$)).tw. (10546)
- 9 (baby adj2 milk).tw. (70)
- 10 (lactation or lactating).tw. (12901)
- 11 (nursing adj2 (mother or mothers)).tw. (553)
- 12 (nursing adj2 (baby or babies)).tw. (33)
- 13 (nursing adj2 (infant or infants)).tw. (305)
- 14 exp infant nutrition/ or exp infant feeding/ (20194)
- 15 infant feeding.tw. (1158)
- 16 infant formula.tw. (1021)
- 17 formula milk\$.tw. (220)
- 18 mixed feed\$.tw. (171)
- 19 or/1-18 (36079)
- 20 exp health promotion/ (18898)
- 21 exp health education/ (56335)
- 22 patient education/ (20445)
- 23 public health/ (23978)
- 24 public health service/ (11564)
- 25 preventive health service/ (3119)
- 26 law/ (33777)
- 27 health personnel attitude/ (360)
- 28 self help/ (2600)
- 29 social support/ or family centered care/ or rooming in/ (14012)
- 30 exp community care/ (16447)
- 31 community medicine/ (905)
- 32 primary health care/ (8533)
- 33 child health care/ (8716)
- 34 infant welfare/ (221)
- 35 maternal care/ (4022)

- 36 maternal welfare/ (2206)
 37 child care/ (8586)
 38 newborn care/ (3357)
 39 prenatal care/ (6843)
 40 postnatal care/ (856)
 41 (community adj2 (worker\$1 or personnel)).tw. (691)
 42 (health adj2 (worker\$1 or visitor\$1)).tw. (8314)
 43 midwife/ (1611)
 44 (midwife\$ or midwives or birth attendant\$1 or family physician\$1).tw. (7438)
 45 (gp or gps or generalist\$1).tw. (18870)
 46 nurse/ (11926)
 47 nurse practitioner/ (1326)
 48 counseling/ or directive counseling/ or parent counseling/ (8799)
 49 world health organization/ (16851)
 50 united nations/ (1493)
 51 persuasive communication/ (624)
 52 mass media/ or mass communication/ (5112)
 53 health care delivery/ or health education/ (50559)
 54 health behavior/ (10782)
 55 policy/ (16152)
 56 health care policy/ (42758)
 57 government/ (26720)
 58 public health/ (23978)
 59 social control/ (506)
 60 teaching/ (8988)
 61 (health adj4 promot\$).tw. (10153)
 62 (health adj4 educat\$).tw. (13419)
 63 ((antenatal or postnatal or prenatal or postpartum or post partum) adj2 (class\$ or educat\$ or care or practice\$1)).tw. (5170)
 64 (campaign\$ or policy or policies).tw. (55708)
 65 (promoting or promotion or promote\$).tw. (239729)
 66 (educat\$ or training).tw. (184232)
 67 (program\$ or programme\$).tw. (215838)
 68 (intervention\$ or scheme\$).tw. (225645)
 69 process evaluation\$.tw. (552)
 70 treatment outcome/ (243616)
 71 "outcome and process assessment (health care)"/ (243616)
 72 (public adj2 health).tw. (36563)
 73 (public adj2 educat\$).tw. (2725)
 74 (practice adj2 chang\$).tw. (3125)
 75 (parental leave or maternity leave or paternity leave).tw. (155)
 76 ((peer\$1 or lay or professional\$1 or community or agenc\$) adj2 support).tw. (2591)
 77 ((peer\$1 or lay or community) adj2 (group\$1 or network\$)).tw. (3309)
 78 (mother adj2 mother adj support).tw. (12)
 79 ((home or health or followup or follow up) adj visit\$).tw. (6106)
 80 ((healthcare or care) adj provision).tw. (778)
 81 rooming in.tw. (141)
 82 counsel\$.tw. (28509)
 83 (encourage\$ or motivate\$ or support or supportive or guidance).tw. (325156)
 84 (legislation or legal).tw. (28174)
 85 ((maternal or infant) adj4 (health or nursing or welfare or care)).tw. (5100)
 86 health sector initiatives.tw. (2)
 87 mother friendly.tw. (3)
 88 baby friendly.tw. (104)

89 la leche league.tw. (14)
 90 wic.tw. (305)
 91 sure start.tw. (14)
 92 welfare food scheme.tw. (2)
 93 unicef.tw. (330)
 94 maternity alliance.tw. (1)
 95 national childbirth trust.tw. (3)
 96 donor milk.tw. (21)
 97 (milk adj banks).tw. (28)
 98 medical audit/ (9541)
 99 audit\$.tw. (47660)
 100 health care quality/ (37819)
 101 (quality adj2 (assurance or assessment\$1)).tw. (14738)
 102 guidelines/ or practice guidelines/ or health planning guidelines/ (84999)
 103 (guideline or practice guideline).pt. or guideline\$1.tw. (66973)
 104 ((opinion or professional) adj2 leader\$1).tw. (289)
 105 (project adj2 champion\$1).tw. (6)
 106 (interactive adj2 educat\$).tw. (185)
 107 (workshop\$1 or work shop\$1).tw. (10345)
 108 or/20-107 (1608968)
 109 19 and 108 (9326)
 110 controlled study/ (2124530)
 111 exp clinical trial/ (380768)
 112 outcomes research/ (54392)
 113 randomized controlled trial/ (103657)
 114 (randomized or placebo or randomly).ab. (251069)
 115 trial.ti. (51785)
 116 or/110-115 (2433306)
 117 109 not 116 (5971)
 118 limit 117 to yr="1998 - 2006" (3236)
 119 review.pt. (636039)
 120 meta analysis/ (24789)
 121 systematic review/ (8791)
 122 or/119-121 (652046)
 123 118 not 122 (2340)
 124 exp africa/ or exp caribbean region/ or exp central america/ or exp latin
 america/ or exp south america/ or exp asia/ (202237)
 125 DEVELOPING COUNTRIES/ (16690)
 126 124 or 125 (213281)
 127 123 not 126 (1915)
 128 limit 127 to english language (1628)
 129 animal/ not (animal/ and human/) (12803)
 130 128 not 129 (1628)
 131 (united kingdom or uk or wales or scotland or england or ireland or great
 britain).in. (839565)
 132 united kingdom/ (67843)
 133 or/131-132 (857846)
 134 130 and 133 (254)
 135 from 134 keep 1-254 (254)

(c) translated (including RCT filter) for PsycINFO and run for 1998 onwards.
 Restricted to developing countries, and English language, and UK only.

Database: PsycINFO <1985 to March Week 3 2006>

- 1 breast feeding/ (810)
- 2 lactation/ (543)
- 3 (milk adj2 (expression or ejection or human)).tw. (75)
- 4 (breastfeed\$ or breastfed).tw. (640)
- 5 (breast feed\$ or breast fed).tw. (689)
- 6 (breastmilk or breast milk or babymilk or baby milk).tw. (154)
- 7 (breast adj4 (fed or milk or feed\$)).tw. (814)
- 8 (baby adj2 milk).tw. (4)
- 9 (lactation or lactating).tw. (1168)
- 10 (nursing adj2 (mother or mothers)).tw. (153)
- 11 (nursing adj2 (baby or babies)).tw. (11)
- 12 (nursing adj2 (infant or infants)).tw. (106)
- 13 (infant adj2 (feed\$ or food\$)).tw. (378)
- 14 (infant adj2 (feed\$ or food\$)).tw. (378)
- 15 (baby adj2 (feed\$ or food\$)).tw. (36)
- 16 infant formula.tw. (16)
- 17 formula milk\$.tw. (12)
- 18 mixed feed\$.tw. (13)
- 19 or/1-18 (2729)
- 20 exp health promotion/ (4498)
- 21 exp health education/ (6905)
- 22 patient education/ (1961)
- 23 public health/ (2269)
- 24 preventive health/ (0)
- 25 exp legislative processes/ (671)
- 26 social support/ (15913)
- 27 primary health care/ (4793)
- 28 prenatal care/ (568)
- 29 (community adj2 (worker\$1 or personnel)).tw. (501)
- 30 (health adj2 (worker\$1 or visitor\$1 or fairs)).tw. (2663)
- 31 midwifery/ (173)
- 32 (midwife\$ or midwives or birth attendant\$1 or family physician\$1).tw. (1422)
- 33 (gp or gps or generalist\$1).tw. (2638)
- 34 nurses/ (5825)
- 35 nurse practitioners.tw. (274)
- 36 counseling/ or directive counseling/ (7391)
- 37 persuasive communication/ (2070)
- 38 mass media/ (3054)
- 39 health behavior/ (7594)
- 40 public policy/ (6883)
- 41 government programs/ (1058)
- 42 government agencies/ (792)
- 43 teaching/ (5627)
- 44 (health adj4 promot\$).tw. (6310)
- 45 (health adj4 educat\$).tw. (7827)
- 46 ((antenatal or postnatal or prenatal or postpartum or post partum) adj2 (class\$ or educat\$ or care or practice\$1)).tw. (1058)
- 47 (campaign\$ or policy or policies).tw. (35917)
- 48 (promoting or promotion or promote\$).tw. (34678)
- 49 (educat\$ or training).tw. (180975)
- 50 (program\$ or programme\$).tw. (115948)
- 51 (intervention\$ or scheme\$).tw. (95484)
- 52 (process adj (evaluation\$ or assessment\$)).tw. (805)
- 53 (public adj2 health).tw. (7783)

- 54 (preventive adj2 health).tw. (840)
 55 (public adj2 educat\$).tw. (1887)
 56 (practice adj2 chang\$).tw. (1340)
 57 (parental leave or maternity leave or paternity leave).tw. (183)
 58 ((peer\$1 or lay or professional\$1 or community or agenc\$) adj2 support).tw. (4286)
 59 ((peer\$1 or lay or community) adj2 (group\$1 or network\$)).tw. (5763)
 60 (mother adj2 mother adj support).tw. (22)
 61 ((home or house or health or followup or follow up) adj (visit\$ or call\$)).tw. (1897)
 62 ((healthcare or care) adj provision).tw. (384)
 63 rooming in.tw. (48)
 64 counsel\$.tw. (37507)
 65 (encourage\$ or motivate\$ or support or supportive or guidance).tw. (157726)
 66 (legislation or legal).tw. (20333)
 67 ((maternal or infant or child) adj4 (health or nursing or welfare or care)).tw. (12489)
 68 health sector initiatives.tw. (0)
 69 mother friendly.tw. (2)
 70 baby friendly.tw. (3)
 71 la leche league.tw. (5)
 72 wic.tw. (88)
 73 sure start.tw. (15)
 74 welfare food scheme.tw. (0)
 75 unicef.tw. (44)
 76 united nations.tw. (476)
 77 world health organization.tw. (1147)
 78 maternity alliance.tw. (0)
 79 national childbirth trust.tw. (1)
 80 donor milk.tw. (0)
 81 audit\$.tw. (22439)
 82 (quality adj2 (assurance or assessment\$1)).tw. (2241)
 83 (guideline or practice guideline).pt. or guideline\$1.tw. (17498)
 84 ((opinion or professional) adj2 leader\$1).tw. (211)
 85 (project adj2 champion\$1).tw. (3)
 86 (interactive adj2 educat\$).tw. (123)
 87 (workshop\$1 or work shop\$1).tw. (4350)
 88 or/20-87 (533208)
 89 19 and 88 (1041)
 90 (empirical study or quantitative study).md. (817314)
 91 treatment outcome clinical trial.md. (10192)
 92 experimental design/ (4142)
 93 (randomized or placebo or randomly).ab. (38917)
 94 trial.ti. (5368)
 95 or/90-94 (826491)
 96 89 not 95 (324)
 97 limit 96 to yr="1998 - 2006" (178)
 98 review.dt. (19655)
 99 literature review.md. (41560)
 100 meta analysis.md. (4992)
 101 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (18935)
 102 DEVELOPING COUNTRIES/ (1293)
 103 101 or 102 (20217)
 104 97 not 103 (176)

- 105 limit 104 to english language (165)
- 106 animals/ not (animals/ and humans/) (2235)
- 107 105 not 106 (165)
- 108 britain.lo. (1603)
- 109 united kingdom.lo. (13091)
- 110 (united kingdom or uk or wales or scotland or england or ireland or great britain).in. (125609)
- 111 or/108-110 (127915)
- 112 107 and 111 (29)
- 113 from 112 keep 1-29 (29)

3.2 Milk storage and reheating UK

The strategy used to identify RCTs was amended to exclude RCTs and reviews and run in Medline, for 1990 onwards, and restricted to UK studies only.

This was translated and run in CINAHL, EMBASE and PsycINFO for the same period and with the same limits.

Database: Ovid MEDLINE(R) <1966 to March Week 2 2006>

- 1 exp infant nutrition/ (28909)
- 2 infant food/ (7798)
- 3 infant formula/ (401)
- 4 bottle feeding/ (2428)
- 5 milk, human/ (10988)
- 6 milk, ejection/ (439)
- 7 breast feeding/ (17086)
- 8 or/1-7 (39820)
- 9 hygiene/ (7670)
- 10 equipment contamination/ (5944)
- 11 food contamination/ (16305)
- 12 sterilization/ (12838)
- 13 disinfection/ (6218)
- 14 refrigeration/ (1810)
- 15 or/9-14 (46194)
- 16 8 and 15 (784)
- 17 (hygiene adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (57)
- 18 (contaminat\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (854)
- 19 (sterili\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (189)
- 20 (disinfect\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (118)
- 21 (hygiene adj4 (baby or babies or infant or infants)).tw. (55)
- 22 ((refrigerat\$ or fridge or freez\$ or frozen) adj4 (milk or formula or breastmilk)).tw. (263)
- 23 ((store or storage) adj4 (milk or formula or breastmilk)).tw. (283)
- 24 (reconstitut\$ adj4 (milk or formula or breastmilk)).tw. (217)
- 25 (reheat\$ adj4 (milk or formula or breastmilk)).tw. (0)
- 26 (heat adj4 (milk or formula or breastmilk)).tw. (308)
- 27 or/17-26 (2177)
- 28 16 or 27 (2819)
- 29 limit 28 to (english language and yr="1990 - 2006") (1517)
- 30 animals/ not (animals/ and humans/) (2945033)
- 31 29 not 30 (918)
- 32 clinical trial.pt. (424238)

- 33 (randomized or placebo).ab. (190906)
- 34 clinical trials/ (125001)
- 35 randomly.ab. (98013)
- 36 trial.ti. (58943)
- 37 or/32-36 (598222)
- 38 31 not 37 (867)
- 39 review.pt. (1169826)
- 40 38 not 39 (770)
- 41 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (433595)
- 42 developing countries/ (45419)
- 43 41 or 42 (450243)
- 44 40 not 43 (627)
- 45 exp great britain/ (206617)
- 46 (united kingdom or uk or england or wales or scotland or ireland or great britain).in. (491708)
- 47 or/45-46 (658842)
- 48 44 and 47 (65)
- 49 from 48 keep 1-65 (65)

**Database: CINAHL - Cumulative Index to Nursing & Allied Health Literature
<1982 to March Week 2 2006>**

- 1 exp infant nutrition/ (6179)
- 2 infant food/ (175)
- 3 infant formula/ (901)
- 4 bottle feeding/ (604)
- 5 milk, human/ (1074)
- 6 milk expression/ (88)
- 7 breast feeding/ (5377)
- 8 or/1-7 (7161)
- 9 hygiene/ (627)
- 10 equipment contamination/ (997)
- 11 food contamination/ (815)
- 12 "sterilization and disinfection"/ (2463)
- 13 refrigeration/ (75)
- 14 or/9-13 (4527)
- 15 8 and 14 (79)
- 16 (hygiene adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (3)
- 17 (contaminat\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (34)
- 18 (sterili\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (5)
- 19 (disinfect\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (4)
- 20 (hygiene adj4 (baby or babies or infant or infants)).tw. (12)
- 21 ((refrigerat\$ or fridge or freez\$ or frozen) adj4 (milk or formula or breastmilk)).tw. (9)
- 22 ((store or storage) adj4 (milk or formula or breastmilk)).tw. (29)
- 23 (reconstitut\$ adj4 (milk or formula or breastmilk)).tw. (6)
- 24 (reheat\$ adj4 (milk or formula or breastmilk)).tw. (0)
- 25 (heat adj4 (milk or formula or breastmilk)).tw. (3)
- 26 or/16-25 (98)
- 27 15 or 26 (163)
- 28 limit 27 to (english language and yr="1990 - 2006") (147)
- 29 animals/ not (animals/ and humans/) (589)

- 30 28 not 29 (147)
- 31 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (37424)
- 32 developing countries/ (2388)
- 33 31 or 32 (39310)
- 34 30 not 33 (126)
- 35 exp clinical trials/ (35885)
- 36 double-blind studies/ (7140)
- 37 single-blind studies/ (1872)
- 38 triple-blind studies/ (31)
- 39 clinical trial.pt. (16587)
- 40 random assignment/ (12107)
- 41 (randomized or placebo or randomly).ab. (23811)
- 42 trial.ti. (8443)
- 43 or/35-42 (52599)
- 44 34 not 43 (120)
- 45 review.pt. (43341)
- 46 systematic review.pt. (6502)
- 47 or/45-46 (49832)
- 48 44 not 47 (109)
- 49 exp united kingdom/ (92590)
- 50 (united kingdom or uk or wales or scotland or england or ireland or great britain).in. (44381)
- 51 49 or 50 (122049)
- 52 48 and 51 (4)
- 53 from 52 keep 1-4 (4)

Database: EMBASE <1980 to 2006 Week 10>

- 1 exp infant nutrition/ (20194)
- 2 baby food/ (424)
- 3 artificial milk/ (3969)
- 4 bottle feeding/ (879)
- 5 breast milk/ (7429)
- 6 milk ejection/ (219)
- 7 breast feeding/ (11066)
- 8 or/1-7 (20375)
- 9 hygiene/ (5054)
- 10 milk hygiene/ (22)
- 11 food contamination/ (11052)
- 12 instrument sterilization/ (4162)
- 13 disinfection/ (7319)
- 14 freezing/ (5495)
- 15 or/9-14 (31642)
- 16 8 and 15 (469)
- 17 (hygiene adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (33)
- 18 (contaminat\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (809)
- 19 (sterili\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (111)
- 20 (disinfect\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. (46)
- 21 (hygiene adj4 (baby or babies or infant or infants)).tw. (35)
- 22 ((refrigerat\$ or fridge or freez\$ or frozen) adj4 (milk or formula or breastmilk)).tw. (187)

- 23 ((store or storage) adj4 (milk or formula or breastmilk)).tw. (189)
- 24 (reconstitut\$ adj4 (milk or formula or breastmilk)).tw. (131)
- 25 (reheat\$ adj4 (milk or formula or breastmilk)).tw. (0)
- 26 (heat adj4 (milk or formula or breastmilk)).tw. (245)
- 27 or/17-26 (1625)
- 28 16 or 27 (1997)
- 29 limit 28 to (english language and yr="1990 - 2006") (1380)
- 30 animals/ not (animals/ and humans/) (12803)
- 31 29 not 30 (1379)
- 32 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (202237)
- 33 developing countries/ (16690)
- 34 32 or 33 (213281)
- 35 31 not 34 (1241)
- 36 controlled study/ (2124530)
- 37 exp clinical trial/ (380768)
- 38 outcomes research/ (54392)
- 39 randomized controlled trial/ (103657)
- 40 (randomized or placebo or randomly).ab. (251069)
- 41 trial.ti. (51785)
- 42 or/36-41 (2433306)
- 43 35 not 42 (852)
- 44 review.pt. (636039)
- 45 meta analysis/ (24789)
- 46 systematic review/ (8791)
- 47 or/44-46 (652046)
- 48 43 not 47 (773)
- 49 united kingdom/ (67843)
- 50 (united kingdom or uk or wales or scotland or england or ireland or great britain).in. (839565)
- 51 or/49-50 (857846)
- 52 48 and 51 (101)
- 53 from 52 keep 1-101 (101)

Database: PsycINFO <1967 to March Week 3 2006>

- 1 exp nutrition/ 2743
- 2 food/ 2836
- 3 bottle feeding/ 138
- 4 breast feeding/ 936
- 5 or/1-4 6270
- 6 hygiene/ 168
- 7 5 and 6 8
- 8 ((infant or baby) adj1 formula).tw. 18
- 9 (hygiene adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. 1
- 10 (contaminat\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. 6
- 11 (sterili\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. 1
- 12 (disinfect\$ adj4 (milk or bottle\$ or teat\$ or pump\$ or breastmilk or formula)).tw. 1
- 13 (hygiene adj4 (baby or babies or infant or infants)).tw. 4
- 14 ((refrigerat\$ or fridge or freez\$ or frozen) adj4 (milk or formula or breastmilk)).tw. 2
- 15 ((store or storage) adj4 (milk or formula or breastmilk)).tw. 5
- 16 (reconstitut\$ adj4 (milk or formula or breastmilk)).tw. 3
- 17 (reheat\$ adj4 (milk or formula or breastmilk)).tw. 0
- 18 (heat adj4 (milk or formula or breastmilk)).tw. 4
- 19 or/8-18 42

20 7 or 19 50
 21 limit 20 to (english language and yr="1990 - 2006") 34
 22 animals/ not (animals/ and humans/) 4101
 23 21 not 22 34
 24 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/
 or exp south america/ or exp asia/ 26384
 25 developing countries/ 1383
 26 24 or 25 27756
 27 23 not 26 30
 28 (empirical study or quantitative study).md. 872316
 29 treatment outcome clinical trial.md. 10284
 30 experimental design/ 6033
 31 (randomized or placebo or randomly).ab. 48829
 32 trial.ti. 6447
 33 or/28-32 892430
 34 27 not 33 9
 35 review.dt. 19670
 36 literature review.md. 52860
 37 meta analysis.md. 5055
 38 or/35-37 77305
 39 34 not 38 7
 40 britain.lo. 2271
 41 united kingdom.lo. 13337
 42 (united kingdom or wales or uk or scotland or england or ireland or great
 britain).in. 150040
 43 or/40-42 152729
 44 39 and 43 0 (Nil result)

3.3 Expressing milk UK

The strategy used to identify RCTs was amended to exclude RCTs and reviews and run in Medline, for 1990 onwards, and restricted to UK studies only. This was translated and run in CINAHL, EMBASE and PsycINFO for the same period and with the same limits.

Database: Ovid MEDLINE(R) <1966 to March Week 2 2006>

1 milk, human/ and (suction/ or vacuum/) (28)
 2 milk ejection/ (439)
 3 (infant nutrition/ or breast feeding/) and (suction/ or vacuum/) (59)
 4 ((breastmilk or milk) adj5 (express\$ or pump\$)).ti,ab. (981)
 5 or/1-4 (1434)
 6 limit 5 to (english language and yr="1990 - 2006") (896)
 7 animals/ not (humans/ and animals/) (2945033)
 8 6 not 7 (480)
 9 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/
 or exp south america/ or exp asia/ (433595)
 10 developing countries/ (45419)
 11 or/9-10 (450243)
 12 8 not 11 (451)
 13 (clinical trial or review).pt. (1587126)
 14 (randomized or placebo).ab. or clinical trials/ (295666)
 15 randomly.ab. or trial.ti. (149517)
 16 or/13-15 (1714218)
 17 12 not 16 (324)
 18 exp great britain/ (206617)

- 19 (united kingdom or uk or england or wales or scotland or ireland or great britain).in. (491708)
- 20 or/18-19 (658842)
- 21 17 and 20 (32)
- 22 from 21 keep 1-32 (32)

Database: CINAHL - Cumulative Index to Nursing & Allied Health Literature <1982 to March Week 2 2006>

- 1 milk expression/ (88)
- 2 milk banks/ (76)
- 3 Breast Pumps/ (136)
- 4 (milk adj5 (express\$ or pump\$)).ti,ab. (130)
- 5 or/1-4 (340)
- 6 limit 5 to (english and yr="1990 - 2006") (312)
- 7 exp clinical trials/ or double blind studies/ or single blind studies/ or triple blind studies/ (35885)
- 8 (clinical trial or review or systematic review).pt. (66399)
- 9 random assignment/ (12107)
- 10 (randomized or placebo or randomly).ab. (23811)
- 11 trial.ti. (8443)
- 12 or/7-11 (94590)
- 13 6 not 12 (271)
- 14 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ or developing countries/ (39310)
- 15 13 not 14 (254)
- 16 exp united kingdom/ (92590)
- 17 (united kingdom or uk or wales or scotland or england or ireland or great britain).in. (44381)
- 18 or/16-17 (122049)
- 19 15 and 18 (29)
- 20 from 19 keep 1-29 (29)

Database: EMBASE <1980 to 2006 Week 10>

- 1 milk ejection/ (219)
- 2 breast milk/ and (express\$ or pump\$).ti,ab. (588)
- 3 (milk adj5 (express\$ or pump\$)).ti,ab. (918)
- 4 or/1-3 (1407)
- 5 Human/ (5199459)
- 6 Nonhuman/ (2685222)
- 7 6 not (5 and 6) (2311333)
- 8 4 not 7 (819)
- 9 limit 8 to (english language and yr="1990 - 2006") (572)
- 10 controlled study/ or exp clinical trial/ or outcomes research/ or randomized controlled trial/ or meta analysis/ or systematic review/ (2348833)
- 11 (randomized or placebo or randomly).ab. (251069)
- 12 trial.ti. or review.pt. (686708)
- 13 or/10-12 (2958278)
- 14 9 not 13 (266)
- 15 exp africa/ or exp "south and central america"/ (74842)
- 16 developing country/ (16690)
- 17 exp asia/ (131726)
- 18 or/15-17 (213281)
- 19 14 not 18 (255)
- 20 (united kingdom or uk or wales or scotland or england or ireland or great britain).in. (839565)

- 21 united kingdom/ (67843)
- 22 or/20-21 (857846)
- 23 19 and 22 (42)
- 24 from 23 keep 1-42 (42)

Database: PsycINFO <1985 to March Week 3 2006>

- 1 (milk adj5 (express\$ or pump\$)).ti,ab. (23)
- 2 breast pump\$.ti,ab. (3)
- 3 or/1-2 (24)
- 4 limit 3 to (english language and yr="1990 - 2006") (20)
- 5 limit 4 to human (12)
- 6 (empirical study or quantitative study).md. (817314)
- 7 treatment outcome clinical trial.md. (10192)
- 8 experimental design/ (4142)
- 9 (randomized or placebo or randomly).ab. (38917)
- 10 trial.ti. (5368)
- 11 review.dt. (19655)
- 12 or/6-11 (845976)
- 13 5 not 12 (0)
- 14 (britain or united kingdom).lo. (14685)
- 15 (united kingdom or uk or wales or england or scotland or ireland or great britain).in. (125609)
- 16 or/14-15 (127915)
- 17 13 and 16 (0) (Nil result)

3.4 Supplementary feeding UK

The strategy used to identify RCTs was amended to exclude RCTs and reviews and run in Medline, for 1990 onwards, and restricted to UK studies only. This was translated and run in CINAHL, EMBASE and PsycINFO for the same period and with the same limits.

Database: Ovid MEDLINE(R) <1966 to March Week 2 2006>

- 1 animals/ not (humans/ and animals/) (2945033)
- 2 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (433595)
- 3 developing countries/ (45419)
- 4 or/2-3 (450243)
- 5 breast feeding/ or (breastfed or breast fed or breastfeed\$).ti,ab. (19676)
- 6 milk, human/ or (breast milk or breastmilk).ti,ab. (13073)
- 7 or/5-6 (28292)
- 8 ((milk or formula) adj5 (cup or cups or spoon\$ or bottle or bottledfed or bottles)).ti,ab. (291)
- 9 bottle feeding/ or milk fed.ti,ab. (2852)
- 10 formula milk.ti,ab. (192)
- 11 infant formula/ (401)
- 12 or/8-11 (3566)
- 13 7 and 12 (2166)
- 14 complementary feeding.ti,ab. (153)
- 15 infant nutrition/ or infants, newborn/ (8575)
- 16 14 and 15 (75)
- 17 or/13,16 (2235)
- 18 limit 17 to (english language and yr="1990 - 2006") (1317)
- 19 18 not (1 or 4) (1020)
- 20 (clinical trial or review).pt. (1587126)

- 21 (randomized or placebo).ab. or clinical trials/ (295666)
- 22 randomly.ab. or trial.ti. (149517)
- 23 or/20-22 (1714218)
- 24 19 not 23 (739)
- 25 exp great britain/ (206617)
- 26 (united kingdom or uk or wales or england or scotland or ireland or great britain).in. (491708)
- 27 or/25-26 (658842)
- 28 24 and 27 (97)
- 29 from 28 keep 1-97 (97)

**Database: CINAHL - Cumulative Index to Nursing & Allied Health Literature
<1982 to March Week 2 2006>**

- 1 breast feeding/ or (breastfed or breast fed or breastfeed\$).ti,ab. (6026)
- 2 milk,human/ (1074)
- 3 (breast milk or breastmilk).ti,ab. (731)
- 4 or/1-3 (6611)
- 5 ((milk or formula) adj5 (cup or cups or spoon\$ or dropper\$ or bottle or bottled or bottles)).ti,ab. (50)
- 6 bottle feeding/ (604)
- 7 (bottle fed or formula milk).ti,ab. (121)
- 8 infant formula/ (901)
- 9 or/5-8 (1501)
- 10 4 and 9 (927)
- 11 complementary feeding.ti,ab. (22)
- 12 infant nutrition/ (997)
- 13 Infant, Newborn/ (26932)
- 14 11 and (12 or 13) (13)
- 15 infant feeding supplemental/ (117)
- 16 10 or 14 or 15 (1015)
- 17 animals/ not (humans/ and animals/) (589)
- 18 16 not 17 (1015)
- 19 exp africa/ or exp central america/ or latin america/ (9768)
- 20 exp south america/ or developing countries/ (6894)
- 21 or/19-20 (16235)
- 22 18 not 21 (950)
- 23 limit 22 to (english and yr="1990 - 2006") (875)
- 24 exp clinical trials/ or double blind studies/ (35885)
- 25 single blind studies/ or triple blind studies/ (1901)
- 26 (clinical trial or review or systematic review).pt. (66399)
- 27 random assignment/ (12107)
- 28 (randomized or placebo or randomly).ab. (23811)
- 29 trial.ti. (8443)
- 30 or/24-29 (94590)
- 31 23 not 30 (717)
- 32 exp united kingdom/ (92590)
- 33 (united kingdom or uk or wales or scotland or england or ireland or great britain).in. (44381)
- 34 or/32-33 (122049)
- 35 31 and 34 (106)
- 36 from 35 keep 1-106 (106)

Database: EMBASE <1980 to 2006 Week 10>

- 1 breast feeding/ or (breastfed or breast fed or breastfeed\$).ti,ab. (12754)
- 2 breast milk/ or (breast milk or breastmilk).ti,ab. (9004)

- 3 or/1-2 (18298)
- 4 ((milk or formula) adj5 (cup or cups or spoon\$ or dropper\$ or bottle or bottled or bottles)).ti,ab. (260)
- 5 bottle feeding/ (879)
- 6 formula milk.ti,ab. (198)
- 7 artificial milk/ (3969)
- 8 or/4-7 (4833)
- 9 3 and 8 (2667)
- 10 complementary feeding.ti,ab. (118)
- 11 infant nutrition/ or infant feeding/ (3781)
- 12 10 and 11 (48)
- 13 9 or 12 (2703)
- 14 limit 13 to (english language and yr="1990 - 2006") (2134)
- 15 nonhuman/ not (human/ and nonhuman/) (2311333)
- 16 14 not 15 (2050)
- 17 exp africa/ or exp "south and central america"/ or developing country/ (88102)
- 18 exp asia/ (131726)
- 19 or/17-18 (213281)
- 20 16 not 19 (1801)
- 21 controlled study/ or exp clinical trial/ or outcomes research/ or meta analysis/ or systematic review/ (2348833)
- 22 randomized controlled trial/ (103657)
- 23 (randomized or placebo or randomly).ab. (251069)
- 24 trial.ti. or review.pt. (686708)
- 25 or/21-24 (2958278)
- 26 20 not 25 (830)
- 27 (united kingdom or uk or wales or england or scotland or ireland or great britain).in. (839565)
- 28 united kingdom/ (67843)
- 29 or/27-28 (857846)
- 30 26 and 29 (135)
- 31 from 30 keep 1-135 (135)

Database: PsycINFO <1985 to March Week 3 2006>

- 1 breast feeding/ or (breastfed or breast fed or breastfeed\$).ti,ab. (1030)
- 2 (breastmilk or breast milk).ti,ab. (145)
- 3 or/1-2 (1062)
- 4 ((milk or formula) adj5 (cup or cups or spoon\$ or dropper\$ or bottle or bottled or bottles)).ti,ab. (34)
- 5 bottle feeding/ or bottle fed.ti,ab. (144)
- 6 formula milk.ti,ab. (10)
- 7 infant formula.ti,ab. (15)
- 8 or/4-7 (184)
- 9 3 and 8 (108)
- 10 (complementary feeding adj5 infant\$.mp. [mp=title, abstract, subject headings, table of contents, key concepts] (1)
- 11 or/9-10 (109)
- 12 limit 11 to (english language and yr="1990 - 2006") (69)
- 13 (empirical study or review or literature review or meta analysis).md. (860506)
- 14 quantitative study.md. (122814)
- 15 treatment outcome clinical trial.md. (10192)
- 16 experimental design/ (4142)
- 17 (randomized or placebo or randomly).ab. (38917)
- 18 trial.ti. (5368)
- 19 or/13-18 (868582)

- 20 12 not 19 (12)
- 21 (britain or united kingdom).lo. (14685)
- 22 (united kingdom or uk or wales or scotland or england or ireland or great britain).in. (125609)
- 23 or/21-22 (127915)
- 24 20 and 23 (3)
- 25 from 24 keep 1-3 (3)

3.5 Vitamin and Mineral Supplements UK

The strategy used to identify RCTs was amended to exclude RCTs and reviews and run in Medline, for 1990 onwards, and restricted to UK studies only. This was translated and run in CINAHL, EMBASE and PsycINFO for the same period and with the same limits.

Database: Ovid MEDLINE(R) <1966 to March Week 2 2006>

- 1 animals/ not (humans/ and animals/) (2945033)
- 2 exp africa/ or exp caribbean region/ or exp central america/ or exp latin america/ or exp south america/ or exp asia/ (433595)
- 3 developing countries/ (45419)
- 4 or/2-3 (450243)
- 5 breast feeding/ or (breastfed or breast fed or breastfeed\$.ti,ab. (19676)
- 6 milk, human/ or (breast milk or breastmilk).ti,ab. (13073)
- 7 bottle feeding/ or milk fed.ti,ab. (2852)
- 8 formula milk.ti,ab. (192)
- 9 infant formula/ (401)
- 10 or/5-9 (29552)
- 11 complementary feeding.ti,ab. (153)
- 12 ((additional or supplement\$ or extra or fortif\$) adj5 (vitamin\$ or mineral\$)).ti,ab. (10067)
- 13 exp vitamins/ or exp minerals/ (229267)
- 14 food, fortified/ (5388)
- 15 or/11-14 (235679)
- 16 10 and 15 (2087)
- 17 16 not (1 or 4) (1675)
- 18 limit 17 to (english language and yr="1990 - 2006") (739)
- 19 (clinical trial or review).pt. (1587126)
- 20 (randomized or placebo).ab. (190906)
- 21 clinical trials/ (125001)
- 22 randomly.ab. or trial.ti. (149517)
- 23 or/19-22 (1714218)
- 24 18 not 23 (430)
- 25 exp great britain/ (206617)
- 26 (united kingdom or great britain or england or wales or scotland or ireland).in. (180393)
- 27 or/25-26 (376574)
- 28 24 and 27 (13)
- 29 from 28 keep 1-13 (13)

Database: CINAHL - Cumulative Index to Nursing & Allied Health Literature <1982 to March Week 2 2006>

- 1 (breastfed or breast fed or breastfeed\$.ti,ab. (3458)
- 2 milk, human/ (1074)
- 3 (breast milk or breastmilk).ti,ab. (731)
- 4 exp breast feeding/ (5427)

5 bottle feeding/ or milk fed.ti,ab. (615)
 6 (formula milk or baby milk).ti,ab. or infant formula/ (922)
 7 or/1-6 (7187)
 8 complementary feeding.ti,ab. (22)
 9 ((additional or supplement\$ or extra or fortif\$) adj5 (vitamin\$ or mineral\$)).ti,ab.
 (1099)
 10 ((additional or supplement\$ or extra or fortif\$) adj5 (iron or iodine)).ti,ab. (376)
 11 exp vitamins/ (7414)
 12 exp minerals/ (1231)
 13 iron/ (985)
 14 food,fortified/ (595)
 15 dietary supplementation/ (5950)
 16 iodine/ (267)
 17 or/8-16 (13666)
 18 7 and 17 (423)
 19 limit 18 to (english and yr="1990 - 2006") (414)
 20 exp clinical trials/ (35885)
 21 double blind studies/ (7140)
 22 single blind studies/ (1872)
 23 triple blind studies/ (31)
 24 (clinical trial or review or systematic review).pt. (66399)
 25 random assignment/ (12107)
 26 (randomized or placebo or randomly).ab. (23811)
 27 trial.ti. (8443)
 28 or/20-27 (94590)
 29 19 not 28 (263)
 30 exp africa/ or exp central america/ or latin america/ or exp south america/ or
 exp asia/ (36108)
 31 developing countries/ (2388)
 32 or/30-31 (38010)
 33 29 not 32 (228)
 34 exp united kingdom/ (92590)
 35 (united kingdom or uk or wales or england or ireland or scotland or great
 britain).in. (44381)
 36 or/34-35 (122049)
 37 33 and 36 (23)
 38 from 37 keep 1-23 (23)

Database: EMBASE <1980 to 2006 Week 10>

1 (breastfed or breast fed or breastfeed\$).ti,ab. (6577)
 2 breast milk/ (7429)
 3 (breast milk or breastmilk).ti,ab. (4522)
 4 breast feeding/ (11066)
 5 bottle feeding/ or milk fed.ti,ab. (1218)
 6 (formula milk or baby milk).ti,ab. or artificial milk/ (4044)
 7 or/1-6 (20512)
 8 complementary feeding.ti,ab. (118)
 9 ((additional or supplement\$ or extra or fortif\$) adj5 (vitamin\$ or mineral\$)).ti,ab.
 (9656)
 10 ((additional or supplement\$ or extra or fortif\$) adj5 (iron or iodine)).ti,ab. (3826)
 11 exp vitamin/ (184352)
 12 calcium/ or phosphorus/ or iron therapy/ (94708)
 13 iron/ (35560)
 14 vitamin supplementation/ (5877)
 15 diet supplementation/ (21827)

- 16 iodine/ (6693)
- 17 or/8-16 (313508)
- 18 7 and 17 (3058)
- 19 limit 18 to (english and yr="1990 - 2006") (2250)
- 20 controlled study/ or meta analysis/ or systematic review/ (2147766)
- 21 exp clinical trial/ (380768)
- 22 outcomes research/ (54392)
- 23 randomized controlled trial/ (103657)
- 24 (randomized or placebo or randomly).ab. (251069)
- 25 trial.ti. or review.pt. (686708)
- 26 exp africa/ or exp "south and central america"/ or exp asia/ (202237)
- 27 developing country/ (16690)
- 28 or/20-25 (2958278)
- 29 or/26-27 (213281)
- 30 19 not 28 (996)
- 31 30 not 29 (817)
- 32 human/ (5199459)
- 33 nonhuman/ (2685222)
- 34 33 not (32 and 33) (2311333)
- 35 31 not 34 (786)
- 36 united kingdom/ (67843)
- 37 (united kingdom or uk or england or wales or ireland or scotland or great britain).in. (839565)
- 38 or/36-37 (857846)
- 39 35 and 38 (87)
- 40 from 39 keep 1-87 (87)

Database: PsycINFO <1985 to March Week 3 2006>

- 1 (breastfed or breast fed or breastfeed\$.ti,ab. (728)
- 2 (breast milk or breastmilk).ti,ab. (145)
- 3 breast feeding/ (810)
- 4 bottle feeding/ or milk fed.ti,ab. (118)
- 5 (formula milk or baby milk).ti,ab. (10)
- 6 complementary feeding.ti,ab. (7)
- 7 ((additional or supplement\$ or extra or fortif\$) adj5 (vitamin\$ or mineral\$)).ti,ab. (248)
- 8 ((additional or supplement\$ or extra or fortif\$) adj5 (iron or iodine)).ti,ab. (36)
- 9 exp vitamins/ (1297)
- 10 calcium/ or phosphorus/ or vitamin therapy/ (1066)
- 11 iron/ (178)
- 12 dietary supplements/ (249)
- 13 iodine/ (0)
- 14 (empirical study or literature review or meta analysis).md. (860506)
- 15 quantitative study.md. (122814)
- 16 treatment outcome clinical trial.md. (10192)
- 17 experimental design/ (4142)
- 18 (randomized or placebo or randomly).ab. (38917)
- 19 trial.ti. or review.dt. (25005)
- 20 africa.lo. (4109)
- 21 developing countries/ (1293)
- 22 or/1-5 (1099)
- 23 or/6-13 (2762)
- 24 or/14-19 (888066)
- 25 (22 and 23) not 24 (2)
- 26 or/20-21 (5299)

- 27 25 not 26 (2)
 28 limit 27 to (english language and yr="1990 - 2006") (1)
 29 (britain or united kingdom).lo. (14685)
 30 (united kingdom or uk or wales or scotland or england or ireland or great
 britain).in. (125609)
 31 or/29-30 (127915)
 32 28 and 31 (0) (Nil result)

Results of UK searches

The search results from all searches were downloaded into an Endnote library and then deduplicated. The effect of deduplication means that results only appear once, and a record that is about more than one topic is not labeled with all relevant topics in the custom 4 field.

Search	Results	Results after deduplication	Custom4 code
Breastfeeding medline uk	311	309	Breastfeeding medline uk 17/3/06
Breastfeeding cinahl uk	403	313	Breastfeeding cinahl uk 17/3/06
Breastfeeding embase	254	241	Breastfeeding embase uk 17/3/06
Breastfeeding psycinfo uk	29	23	Breastfeeding psycinfo uk 17/3/06
storage medline uk	65	65	Storage medline uk 17/3/06
Storage cinahl uk	4	2	Storage cinahl uk 17/3/06
storage embase uk	101	101	Storage embase uk 17/3/06
Storage psycinfo uk	0		
Expressed medline uk	32	29	Expressed medline uk 17/3/06
Expressed cinahl uk	29	22	Expressed cinahl uk 17/3/06
Expressed embase uk	42	41	Expressed embase uk 17/3/06
Expressed psycinfo uk	0		
Supplementary medline uk	97	94	Mixed milk 88medline uk 17/3/06
Supplementary cinahl uk	106	88	Mixed milk cinahl uk 17/3/06
Supplementary embase uk	135	130	Mixed milk embase uk 17/3/06
Supplementary psycinfo uk	3	3	Mixed milk psycinfo uk 17/3/06
Vitamins/minerals medline uk	13	12	Mineral suppl medline uk 17/3/06
Vitamins/minerals cinahl uk	23	22	Mineral suppl cinahl uk 17/3/06
Vitamins/minerals embase uk	87	86	Mineral suppl embase uk 17/3/06
Vitamins/minerals psycinfo uk	0		

0-6 months- Update search (January 2007)

Database	Records retrieved	Records after deduplication against update searches and original library.
Reviews		
CDSR (Cochrane Library 2006/2; 2006/3 and 2006/4)	101	25
DARE (CRD admin database)	22	17
NRR (issue 2006/1; 2006/2; 2006/3 and 2006/4)	98	96
HTA (CRD admin database 17/1/07)	0	0
SIGN (SIGN website)	1	0
NGC (NGC website)	1	0
NCCHTA (NCCHTA website)	1	0
NICE (NICE website)	1	0
HSTAT (HSTAT interface)	0	0
ReFeR (ReFeR website)	0	0
TRIP (TRIP website)	1	0
Clinical evidence	0	0
HEBW (website)	0	0
RCTs		
Medline (Ovid, 17/1/07)	122	119
Central (Cochrane Library 2006/2; 2006/3 and 2006/4)	356	73
Cinahl (Ovid, 16/1/07)	112	4
Embase (Ovid, 17/1/07)	627	691
Psycinfo (Ovid, 17/1/07)	78	43
UK		
Medline (Ovid, 17/1/07)	74	47
Cinahl (Ovid, 16/1/07)	79	26
Embase (Ovid, 17/1/07)	78	75
Psycinfo (Ovid, 17/1/07)	4	4

Appendix D – Quality Appraisal

From: National Institute for Health and Clinical Excellence (2006). *Methods for development of NICE public health guidance*. London: National Institute for Health and Clinical Excellence. Available from: www.nice.org.uk

Notes on the use of methodology checklist: systematic reviews

Section 1 identifies the study and asks a series of questions aimed at establishing the internal validity of the study under review – that is, making sure that it has been carried out carefully, and that the outcomes are likely to be attributable to the intervention being investigated. Each question covers an aspect of methodology that research has shown makes a significant difference to the conclusions of a study. For each question in this section you should use one of the following to indicate how well it has been addressed in the review.

Well covered

Adequately addressed

Poorly addressed

Not addressed (that is, not mentioned, or indicates that this aspect of study design was ignored)

Not reported (that is, mentioned, but insufficient detail to allow assessment to be made)

Not applicable

The study addresses an appropriate and clearly focused question

Unless a clear and well-defined question is specified, it will be difficult to assess how well the study has met its objectives or how relevant it is to the question you are trying to answer on the basis of its conclusions.

A description of the methodology used is included

One of the key distinctions between a systematic review and a general review is the systematic methodology used. A systematic review should include a detailed description of the methods used to identify and evaluate individual studies. If this description is not present, it is not possible to make a thorough evaluation of the quality of the review, and **it should be rejected as a source of level 1 evidence** (though it may be useable as level 4 evidence, if not better evidence can be found).

The literature search is sufficiently rigorous to identify all the relevant studies

A systematic review based on a limited literature search – for example, one limited to Medline only – is likely to be heavily biased. A well-conducted review should as a minimum look at Embase and Medline, and from the late 1990s onward, the Cochrane Library. Any indication that hand searching of key journals, or follow up of reference lists of included studies were carried out in addition to electronic database searches can normally be taken as evidence of a well-conducted review.

Study quality is assessed and taken into account

A well-conducted systematic review should have used clear criteria to assess whether individual studies had been well conducted before deciding whether to include or exclude them. If there is not indication of such an assessment, **the review should be rejected as a source of level 1 evidence**. If details of the assessment

are poor, or the methods are considered to be inadequate, the quality of the review should be downgraded. In either case, it may be worthwhile obtaining and evaluating the individual studies as part of the review you are conducting for this guideline.

There are enough similarities between the studies selected to make combining them reasonable

Studies covered by a systematic review should be selected using clear inclusion criteria. These criteria should include, either implicitly or explicitly, the question of whether the selected studies can legitimately be compared. It should be clearly ascertained, for example, that the populations covered by the studies are comparable, that the methods used in the investigations are the same, that the outcome measures are comparable and the variability in effect sized between studies is not greater than would be expected by chance alone.

Section 2 relates to the overall assessment of the paper. It starts by rating the methodological quality of the study, based on your responses in Section 1 and using the following coding system:

++	All or most of the criteria have been fulfilled. Where they have not been fulfilled the conclusions of the study or review are thought very unlikely to alter.
+	Some of the criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are thought unlikely to alter the conclusions.
-	Few or no criteria fulfilled. The conclusions of the study are thought likely or very likely to alter.

The code allocated here, coupled with the study type, will decide the **level of evidence** that this study provides.

The aim of the other two questions in this section is to summarise your view of the quality of this study and its applicability to the patient group targeted by the guideline you are working on.

Methodology checklist for SRs**First author/year****Section 1: Internal validity**

	In a well-conducted SR:	In this study this criterion is: (copy one option into your column with comment if required)	Reviewer 1 (initials)	Reviewer 2 (initials)
1.1	The study addresses an appropriate and clearly focused question	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.2	A description of the methodology used is included.	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.3	The literature search is sufficiently rigorous to identify all the relevant studies.	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.4	Study quality is assessed and taken into account.	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.5	There are enough similarities between the studies selected to make combining them reasonable.	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		

Section 2: Overall assessment of the study

2.1	How well was the study done to minimise bias? Code ++, + or -	Reviewer 1 (initials) Comment if desired	Reviewer 2 (initials) Comment if desired	(Reviewer 3) Agreed
2.2	If coded as + or – what is the likely direction in which bias might affect the study results?			
2.3	Taking into account clinical considerations, your evaluation of			

	the methodology used, and the statistical power of the study, are you certain the overall effect is due to the study intervention?			
2.4	Are the results of this study directly applicable to the patient group targeted by this guideline?			

Notes on the use of methodology checklist: randomised controlled trials

Section 1 identifies the study and asks a series of questions aimed at establishing the internal validity of the study under review – that is, making sure that it has been carried out carefully, and that the outcomes are likely to be attributable to the intervention being investigated. Each question covers an aspect of methodology that research has shown makes a significant difference to the conclusions of a study. For each question in this section you should use one of the following to indicate how well it has been addressed in the study.

Well covered

Adequately addressed

Poorly addressed

Not addressed (that is, not mentioned, or indicates that this aspect of study design was ignored)

Not reported (that is, mentioned, but insufficient detail to allow assessment to be made)

Not applicable

The study addresses an appropriate and clearly focused question

Unless a clear and well-defined question is specified, it will be difficult to assess how well the study has met its objectives or how relevant it is to the question you are trying to answer on the basis of its conclusions.

The assignment of subjects to treatment groups is randomised.

Random allocation of patients to receive one or other of the treatments under investigation, or to receive either treatment or placebo, is fundamental to this type of study. **If there is no indication of randomisation, the study should be rejected.** If the description of randomisation is poor, or the process used is not truly random (for example, allocation by date, alternating between one group and another) or can otherwise be seen as flawed, the study should be given a lower quality rating.

An adequate concealment method is used.

Research has shown that where allocation concealment is inadequate, investigators can overestimate the effect of interventions by up to 40%. Centralised allocation, computerised allocation systems or the use of coded identical containers would all be regarded as adequate methods of concealment, and may be taken as indicators of a well-conducted study. If the method of concealment used is regarded as poor, or relatively easy to subvert, the study must be given a lower quality rating, and can be rejected if the concealment method is seen as inadequate. B.2.4 Subjects and investigators are kept 'blind' about treatment allocation.

Blinding can be carried out up to three levels. In single-blind studies, patients are unaware of which treatment they are receiving; in double-blind studies the doctor and the patient are unaware of which treatment the patient is receiving; in triple-blind studies patients, healthcare providers and those conducting the analysis are unaware

of which patients received which treatment. The higher the level of blinding, the lower the risk of bias in the study.

The treatment and control groups are similar at the start of the trial.

Patients selected for inclusion in a trial should be as similar as possible, in order to eliminate any possible bias. The study should report any significant differences in the composition of the study groups in relation to gender mix, age, stage of disease (if appropriate), social background, ethnic origin or comorbid conditions. These factors may be covered by inclusion and exclusion criteria, rather than being reported directly. Failure to address this question, or the use of inappropriate groups, should lead to the study being downgraded.

The only difference between groups is the treatment under investigation.

If some patients received additional treatment, even if of a minor nature or consisting of advice and counselling rather than a physical intervention, this treatment is a potential confounding factor that may invalidate the results. **If groups were *not* treated equally, the study should be rejected unless no other evidence is available.** If the study *is* used as evidence it should be treated with caution, and given a low quality rating.

All relevant outcomes measured in a standard, valid and reliable way.

If some significant clinical outcomes have been ignored, or not adequately taken into account, the study should be downgraded. It should also be downgraded if the measures used are regarded as being doubtful in any way, or applied inconsistently.

What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?

The number of patients that drop out of a study should give concern if the number is very high. Conventionally, a 20% drop-out rate is regarded as acceptable, but this may vary. Some regard should be paid to *why* patients dropped out, as well as how many. It should be noted that the drop-out rate may be expected to be higher in studies conducted over a long period of time. A higher drop-out rate will normally lead to downgrading, rather than rejection of a study.

All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention-to-treat analysis).

In practice, it is rarely the case that all patients allocated to the intervention group receive the intervention throughout the trial, or that all those in the comparison group do not. Patients may refuse treatment, or contra-indications arise that lead them to be switched to the other group. If the comparability of groups through randomisation is to be maintained, however, patient outcomes *must* be analysed according to the group to which they were originally allocated, irrespective of the treatment they actually received. (This is known as *intention-to-treat* analysis.) If it is clear that analysis was not on an intention-to-treat basis, the quality of the study should be downgraded.

Where the study is carried out at more than one site, results are comparable for all sites.

In multi-site studies, confidence in the results should be increased if it can be shown that similar results were obtained at the different participating centres.

Section 2 relates to the overall assessment of the paper. It starts by rating the methodological quality of the study, based on your responses in Section 1 and using the following coding system:

++	All or most of the criteria have been fulfilled. Where they have not been fulfilled the conclusions of the study or review are thought very unlikely to alter.
+	Some of the criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are thought unlikely to alter the conclusions.
–	Few or no criteria fulfilled. The conclusions of the study are thought likely or very likely to alter.

The code allocated here, coupled with the study type, will decide the **level of evidence** that this study provides.

The aim of the other two questions in this section is to summarise your view of the quality of this study and its applicability to the patient group targeted by the guideline you are working on.

Methodology checklist for RCTs

First author/year

Section 1: Internal validity

	In a well-conducted RCT study:	In this study this criterion is: (copy one option into your column with comment if required)	Reviewer 1 (initials)	Reviewer 2 (initials)
1.1	The study addresses an appropriate and clearly focused question	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.2	The assignment of subjects to treatment groups is randomised	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.3	An adequate concealment method is used	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.4	Subjects and investigators are kept 'blind' about treatment allocation	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.5	The treatment and control groups are similar at the start of the trial	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.6	The only difference between groups is the treatment under investigation	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.7	All relevant outcomes are measured in a standard, valid way	Well covered Adequately addressed Poorly addressed Not addressed		

		Not reported Not applicable		
1.8	What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?	Where available, Reviewer 1 report and Reviewer 2 check: Number randomised into each arm Number in each arm with outcome data at the end of the trial Dropout rate (%) for each arm Dropout rate (%) overall		
1.9	All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis, ITT)	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		
1.10	Where the study is carried out at more than one site, results are comparable for all sites	Well covered Adequately addressed Poorly addressed Not addressed Not reported Not applicable		

Section 2: Overall assessment of the study

2.1	How well was the study done to minimise bias? Code ++, + or -	Reviewer 1 (initials) Comment if desired	Reviewer 2 (initials) Comment if desired	(Reviewer 3) Agreed
2.2	If coded as + or – what is the likely direction in which bias might affect the study results?			
2.3	Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain the overall effect is due to the study intervention?			
2.4	Are the results of this study directly applicable to the patient group targeted by this guideline?			

Appendix E – The Baby Friendly Hospital Initiative

A. Ten Steps to successful breastfeeding

All providers of maternity services should:

1. Have a written breastfeeding policy that is routinely communicated to all healthcare staff.
2. Train all healthcare staff in the skills necessary to implement the breastfeeding policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding soon after birth.
5. Show mothers how to breastfeed and how to maintain lactation even if they are separated from their babies.
6. Give newborn infants no food or drink other than breastmilk, unless medically indicated.
7. Practice rooming-in, allowing mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no artificial teats or dummies to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

B. Seven Point Plan for the protection, promotion and support of breastfeeding in community health care settings

All providers of community health care should:

1. Have a written breastfeeding policy that is routinely communicated to all healthcare staff.
2. Train all staff involved in the care of mothers and babies in the skills necessary to implement the policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Support mothers to initiate and maintain breastfeeding.
5. Encourage exclusive and continued breastfeeding, with appropriately-timed introduction of complementary foods.
6. Provide a welcoming atmosphere for breastfeeding families.
7. Promote co-operation between healthcare staff, breastfeeding support groups and the local community.