

# Effective Health Care

Bulletin on the effectiveness  
of health service interventions  
for decision makers

This bulletin reviews  
the evidence for the  
effectiveness of  
interventions to increase  
the initiation of  
breastfeeding.



## Promoting the initiation of breastfeeding

- Breastfeeding is a key public health measure which offers benefits to both mother and infant. Yet the number of women initiating breastfeeding in the UK remains low at around 40% to 60%, with women in social class V having the lowest uptake rates.
- Cultural factors, including media representation of artificial feeding as 'normal' are likely to influence the choice and ability of mothers to breastfeed, as are the facilities provided in public places for mothers to feed their infants.
- Consideration needs to be given to the revision of local and national policy to reflect an evidence-based approach to the promotion of breastfeeding with particular emphasis on the reduction of inequalities in health in accordance with The NHS Plan.
- There is some evidence to suggest that small, informal discussion classes led by health professionals that emphasise the benefits of breastfeeding, and provide practical advice, can increase initiation rates. The use of literature alone appears to have limited impact and cannot be recommended.
- Most breastfeeding training courses for health professionals have not been formally evaluated. Where training courses are provided, their effectiveness needs to be evaluated.
- Peer support programmes offered by experienced and trained peers may increase the numbers of women breastfeeding. Such programmes could be further developed and breastfeeding rates monitored.

## A. Background

### A1. Benefits of breastfeeding

Breastfeeding is a key public health issue. Health benefits associated with breastfeeding include protection against gastroenteritis, respiratory infection, otitis media, urinary tract infections, and diabetes mellitus for the infant,<sup>1</sup> and pre-menopausal breast, ovarian and endometrial cancers for the mother.<sup>2</sup> Breastmilk provides passive immunity for the baby and also enhances the benefits from immunisation through an increased active immune response.<sup>3</sup> As well as the potential health hazards from artificial feeding, contamination<sup>4</sup> and inaccurate preparation of feeds, which can result in over or under concentration of nutrients,<sup>5-7</sup> are additional potential adverse effects.

There are very few examples of conditions where artificial feeding is clearly advantageous. There is concern at present about the best way of preventing transmission of HIV from mother to baby. International recommendations suggest that women who are HIV positive and who live in communities where there are alternatives to breastfeeding, should be advised to feed their babies formula milk.<sup>8</sup> However this removes from these babies the protective effects of breastfeeding against other infections which may be life threatening.<sup>9</sup> A recent study found a difference between transmission rates in babies who are exclusively breastfed and those who are partially breastfed.<sup>10</sup> Babies breastfed exclusively appear to have similar transmission rates to babies fed formula milk; the most hazardous route appears to be partial breastfeeding.

### A2. Support for breastfeeding

A recent Department of Health action report on reducing health inequalities<sup>11</sup> arising from the White Paper 'Saving Lives: Our Healthier Nation'<sup>12</sup> recommended policies to increase the prevalence of breastfeeding. Action to be

taken across Government and through partnerships between local and regional organisations in England includes increasing awareness of the benefits of breastfeeding. The Government provides financial support annually to National Breastfeeding Awareness Week and two part-time national infant feeding advisers have recently been appointed in England.<sup>11</sup> National health inequalities targets will also be set in accordance with the new NHS Plan.<sup>13</sup>

Scotland, Northern Ireland and Wales have developed, or are in the process of developing, strategies for increasing breastfeeding. In 1994 Scotland set national targets for breastfeeding, and in 1995 the Scottish Breastfeeding Group was formed, along with the appointment of a part-time national breastfeeding adviser, who has responsibility for assisting health boards to develop breastfeeding strategies and to reach breastfeeding targets.<sup>14</sup> Northern Ireland published its Breastfeeding Strategy in 1999, which outlines an action plan to make breastfeeding the norm.<sup>15</sup> The National Assembly for Wales is currently developing a breastfeeding strategy, which will be available in Autumn 2000.

**A3. Numbers of women initiating breastfeeding** Despite national initiatives, successive surveys by the Office of National Statistics have shown that the incidence and prevalence of breastfeeding in the UK have remained static since 1980. In 1995 62% of women started to breastfeed in England and Wales, 48% in Scotland and 41% in Northern Ireland.<sup>16</sup> (Figures standardised for mother's age and age finished full-time education.)

Furthermore, breastfeeding rates in the UK have been found to be strongly associated with social class; 90% of women from social class I started to breastfeed in 1995 compared with only 50% of women from social class V.<sup>16</sup>

### A4. Factors affecting breastfeeding rates

Factors relating to the mother, the infant and the environment have been found to be associated with the initiation of breastfeeding.<sup>17</sup> Demographic factors such as maternal age and level of education were consistently associated with infant feeding practices, with older and/or more highly educated women being most likely to initiate breastfeeding. Psychosocial factors, including whether fathers support breastfeeding, have also been found to be associated with uptake.<sup>17</sup>

Cultural norms, such as attitudes towards breastfeeding, media representations of artificial feeding as 'normal',<sup>18</sup> along with facilities provided in public places for mothers to feed their infants are likely to influence the choice and ability of mothers to breastfeed. A recent audit of baby facilities in 27 major shopping centres in Australia found that over half had no baby care rooms, suggesting a lack of support for breastfeeding mothers.<sup>19</sup> Such cultural practices may explain the differences in breastfeeding rates between women in different communities and in different countries.

Artificial feeding has generally become established as the cultural norm in the UK, most of western Europe and the USA, with the possible exception of women from higher income groups. In contrast, breastfeeding is the norm for women in Scandinavia. The challenge facing health professionals, managers and policy-makers is how to encourage women to choose to breastfeed and more specifically, how to address the differences in the uptake of breastfeeding between different socio-economic groups.<sup>20</sup>

This issue of *Effective Health Care* summarises the research evidence about the effectiveness of interventions to promote the initiation of breastfeeding. It is based on a systematic review commissioned by the NHS Health

Technology Assessment Programme.<sup>21</sup> Any type of intervention designed to promote the initiation of breastfeeding was eligible for inclusion. If a study reported other outcomes such as duration or exclusivity of breastfeeding these were also recorded. However, studies which only measured duration or exclusivity were excluded, as were studies where the intervention was implemented after the first breastfeed. Other systematic reviews are available which have focused on ways to breastfeed successfully and have specifically addressed issues of duration and/or exclusivity. Such reviews have shown that women need consistent and well-informed support after they start to breastfeed, and that common problems such as engorgement and 'insufficient milk' can be prevented or treated by such support.<sup>22</sup>

The bulletin is based mainly on interventions which have been evaluated using randomised controlled trial (RCT) or non-RCT designs. Reference is made to findings from before-after studies when there is limited or no evidence from RCTs and/or non-RCTs. Details of all the studies are available in the full report.<sup>21</sup> A summary of the research methods is given in the Appendix.

## B. Promoting initiation

Interventions to promote the initiation of breastfeeding have been classified into five categories and are indicated in the box.

**B1. Difficulties in evaluating the evidence** There are difficulties in trying to assess the relative effectiveness of different interventions. A variety of different study designs have been used, ranging from good quality RCTs to very poor quality before-after studies, and for some types of intervention no evaluations are

**Health education interventions** - factual information about breastfeeding often delivered via leaflets or educational sessions, usually grounded in professional expertise

**Health sector initiatives** - interventions which aim to change the organisational nature of health services in favour of promoting breastfeeding, include health professional training, social support from health professionals, the Baby Friendly Hospital Initiative, and the Women, Infants & Children Programme

**Peer support programmes** - interventions delivered by knowledgeable peers

**Media campaigns** - interventions which use a public medium such as TV and press

**Multifaceted interventions** - interventions which have more than one component

available. The studies are difficult to synthesise because they vary according to the populations studied and, within an intervention category, by the type, duration and the way in which the intervention was delivered. Lack of standardisation in measuring the initiation of breastfeeding also made comparisons between studies difficult and there is an urgent need for a standard and internationally recognised definition of initiation.

**B2. Health education** A variety of health education interventions have been evaluated in 10 RCTs.<sup>23-32</sup> (Table 1.) Some provided information via leaflets or pamphlets and some via group or one-to-one educational sessions. The majority focused on the benefits of breastfeeding and in some, technical information about how to breastfeed was also included.

Of three RCTs<sup>27, 29, 30</sup> which evaluated interventions aimed at specific ethnic or cultural groups, two significantly increased initiation rates.<sup>27, 30</sup> Both studies focused on the benefits of breastfeeding which were discussed in either a group<sup>27, 30</sup> or one-to-one format.<sup>27</sup> In one trial Vietnamese immigrant women in Australia were offered a videotape followed by a series of small group discussions about the benefits of breastfeeding, the content of

which was adapted for their specific cultural needs.<sup>30</sup> The number of women breastfeeding at birth was significantly greater in the intervention group compared with the control (RR 1.92; 95% CI: 1.44 to 2.56) and was maintained at four weeks postpartum, but not at six months. Attitudes and intentions towards breastfeeding were also more positive in the intervention group. In the other trial, Black American women of low income were randomised to receive group or one-to-one educational sessions.<sup>27</sup> The sessions covered the benefits of breastfeeding along with common problems and inhibitions about breastfeeding. Both groups were also compared with a non-randomised control group who received usual care. Both group (RR 1.73; 95% CI: 1.08 to 2.76) and one-to-one education (RR 1.97; 95% CI: 1.21 to 3.21) significantly increased initiation of breastfeeding in hospital, compared with usual care, and this difference was maintained at 12 weeks in women who received group education.

Four other RCTs also targeted low income women in the USA.<sup>23, 24, 26, 31</sup> Only one, however, reported significantly increased initiation rates.<sup>23</sup> This trial compared a self-help manual designed to motivate women to breastfeed which included a problem-solving section for managing common breastfeeding problems with usual breastfeeding advice. However, when the results were recalculated to include all women regardless of whether or not they withdrew, the difference was no longer statistically significant (RR 1.40; 95% CI: 0.99 to 1.99).

Another three RCTs did not focus on women of any specific income or ethnic group.<sup>25, 28, 32</sup> One study recruited women who were already enrolled for childbirth classes in the US.<sup>32</sup> The intervention group attended a breastfeeding education class, which focused on the benefits of breastfeeding along with information about how to

**Table 1** Health education – RCTs

Key on page 9

<b>Author (year) country, study aim</b>	<b>Participants</b>	<b>Intervention</b>	<b>Results</b>	<b>Comments</b>
Rossiter (1994) <sup>30</sup> Australia To assess a culture-specific programme to promote bf	Vietnamese women or those born/reared in Vietnam, Vietnamese speaking, attending given antenatal clinics in Sydney, ≥12wks gestation.	I (n=108) Culturally-specific bf programme (in Vietnamese), consisting of video and 3 two-hour discussion sessions C (n=86) Bf/childbirth pamphlets	No. initiating bf at birth I 73/104 (70%) C 28/73 (38%) p<0.001 RR 1.92 95% CI 1.44, 2.56	Individuals were the unit of allocation/analysis. There were differences at baseline between the study groups. 19 withdrawals
Kistin et al (1990) <sup>27</sup> USA To determine (1) whether antenatal bf education increases the rate of bf among black women, and (2) whether group and individual sessions have different effects on women's choice of infant feeding	Black low income women registered at the Cook County Hospital Midwife Antenatal clinic for 8wk period, <24wks gestation, and born in the USA.	I1 (n=38) 50-80 min group sessions, covering lactation, bf myths/benefits, problem solving. Discussion encouraged, former participants demonstrated bf I2 (n=36) One-to-one sessions, 15-30mins, before 30 wks gestation. Topics discussed similar to those covered for I1. C (n=56) Standard care	Bf rates in hospital I1 17/38 (45%) I2 18/36 (50%) C 13/56 (22%) p<0.05 for I1 vs C and I2 vs C I1vsI2 RR 0.90 95% CI 0.58, 1.41 I1vsC RR 1.73 95% CI 1.08, 2.76 I2vsC RR 1.97 95% CI 1.21, 3.21	Individuals were the unit of allocation/analysis. Random number tables were used for group allocation. There were differences at baseline between the study groups. 29 withdrawals
McEnery & Rao (1986) <sup>29</sup> UK To assess the effects of an antenatal education programme on infant health	Asian women of any parity living in East London, UK, seeking antenatal care, pregnant for less than 16wks on entry to the trial, patients of a specified two-doctor general practice in outer London, and intending to deliver at Whippes Cross Hospital.	I (n=35) 12 weekly 1 hr lectures, covering fertility, pregnancy, childbirth, and child rearing, led by HV, MW, or nutritionist, relayed in Urdu. Literature accompanied lectures, discussion was encouraged C (n=34) Standard care	Participants re-grouped for analysis. 16 women from I who attended >3 lectures designated as educated (E). All others, whether originally allocated to I or C were, designated as non-educated (NE). Any bf perinatally E 7/16 (48%) NE 16/53, (30%) Not possible to estimate RR (ITT)	NB. Results should be viewed with caution due to regrouping of participants.
Coombs et al (1998) <sup>23</sup> USA To evaluate a self-help manual designed to motivate low income women to breastfeed	Pregnant women, ≥18yrs, literate, without high-risk medical or other conditions that would make bf difficult, willing to consider using manual.	I (n=96) Bf manual provided 7wks before delivery covering bf motivation, technique, and problem-solving C (n=104) No bf manual	Initiation of bf I 44/73 (60.3%) C 34/78 (43.6%) p=0.04 RR 1.40 95% CI 0.99, 1.99	Individuals were the unit of allocation/analysis. Baseline comparability not reported. 49 withdrawals
Hill (1987) <sup>24</sup> USA To determine the effects of a bf education programme among low income pregnant women	Women attending antenatal clinic in Chicago, intending to keep baby, delivering a healthy infant, having a telephone or agreeing to return data by post.	I (n=31) 50 min session comprising lecture, discussion, questions/answers. Pamphlet reinforcing lecture content given C (n=33) Standard care	Initiation of bf I : 19/31 (61%) C: 15/33 (45%) RR 1.40 95% CI 0.82, 2.38	Individuals were the unit of allocation/analysis. Study groups reported as comparable at baseline. Groups stratified according to parity
Kaplowitz & Olson (1983) <sup>26</sup> USA To determine the effects of a bf education programme	New York WIC participants, ≥18yrs, of 4-6mths gestation, primiparous or having bottle fed previous children or having had an unsuccessful bf experience.	I (n=21) Pamphlets sent by post over 5 weeks, providing info on lactation, and benefits/techniques of bf. Info also given on positive aspects of bottle-feeding C (n=23) Standard care	Bf at discharge Overall 18/40 (45%), with no significant differences between I and C Not possible to estimate RR as per ITT	Individuals were the unit of allocation/analysis. Study groups reported as comparable at baseline. Women stratified according to intended infant feeding method (bf, bottle-feed, or undecided). 4 withdrawals
Serwint et al (1996) <sup>31</sup> USA To assess the impact of antenatal paediatrician visits on bf decisions of low income mothers	Primiparae, ≥18yrs, 8-28wks gestation, attending antenatal clinic. Those with history of drug use, psychiatric illness, or HIV, were excluded	I (n=81) Antenatal visit at 32-36wks gestation where parents-to-be received bf counselling from the infant's future paediatrician C (n=75) No antenatal paediatrician visits	Bf initiation at birth I 31/74 (42%) C 22/70 (31%) RR 1.21 95% CI 0.89, 1.63	Individuals were the unit of allocation/analysis. Sample size power calculation reported, but lower number recruited. Random number tables used. Groups comparable at baseline. 43 withdrawals, ITT analysis.
Wiles (1984) <sup>32</sup> USA To determine the effect of antenatal bf education on maternal reports of success in bf	Primigravidae, planning bf, ≥32wks gestation, attending childbirth education classes, eventually undergoing vaginal delivery of full-term healthy infant. Women with diabetes, hypertension, toxæmia, heart disease, or infection, were excluded.	I (n=20) Group programme, covering lactation, benefits of bf, bf technique, breast care, problem solving, and resources for the bf mother C (n=20) Standard care	Exclusive bf at 1mth pp / discontinued bf by 1mth pp I 90% / 5% C 30% / 60% RR 3.00 95% CI 1.51, 5.95	Individuals were the unit of allocation/analysis. Study groups reported as comparable at baseline. No withdrawals reported
Loh et al (1997) <sup>28</sup> Ireland To assess the effect of a short intervention on rate of bf	Women of >36wks gestation attending the antenatal clinic at a given hospital in Galway	I (n=98) Fact sheet covering benefits of bf, followed by a questionnaire to reinforce the info C (n=95) Standard care	No. of women bf at discharge I 43/98 (44%) C 30/95 (32%), p=0.07 RR 1.29 95% CI 0.98, 1.69	Individuals were the unit of allocation/analysis. Study groups reported as comparable at baseline. 8 withdrawals
Howard et al (2000) <sup>25</sup> USA To compare the effect of formula company-produced materials about infant feeding with bf promotion material without formula advertising, on bf	Women presenting for their first antenatal visit to one of 6 obstetric outpatient clinics in Rochester, New York were included	I1 (n=277) Commercial education pack, containing info about bf and formula feeding, and gifts (can of formula, coupons redeemable for formula) I2 (n=270) Research education pack, containing info about bf and formula feeding, but no formula gifts/advertising. Vouchers/gifts of other products included	Bf initiation I1 163/235 (69%) I2 148/209 (71%) RR 0.93 95% CI: 0.61, 1.43 (P=0.82) (as reported by authors) RR 0.93 95% CI 0.81, 1.08 (ITT)	Individuals were the unit of allocation/analysis. Details of a sample size power calculation provided. Randomisation was by computer-generated number lists. Study groups reported as comparable at baseline. Overall withdrawal 26.7%

breastfeed. Breastfeeding rates were significantly higher in the intervention group than in the control group (no details given of the control) (RR 3.00; 95% CI: 1.51 to 5.95).<sup>32</sup> The second study randomised women attending an antenatal clinic in Ireland to receive a fact sheet about the benefits of breastfeeding. There was no evidence that breastfeeding rates at hospital discharge were influenced.<sup>28</sup>

In the third RCT the effect of a commercial education pack, including vouchers for infant formula, was compared with a non-commercial education pack which contained vouchers for infant items available at a local store.<sup>25</sup> Initiation rates between the two groups did not differ significantly, although initiation in both groups was high at around 70%. However, women receiving the commercial pack were significantly more likely to stop breastfeeding before hospital discharge and before two weeks post-partum, than women who received the non-commercial pack. Publications from commercial sources have also been found to be available more frequently than information from other sources.<sup>33</sup> Policies about the distribution of infant feeding materials may help to create an environment which is fully supportive of breastfeeding.

Overall, the results from these studies provide some evidence to suggest that small, informal discussion classes, emphasising the benefits of breastfeeding and practical advice on how to breastfeed, can increase initiation rates, and may be particularly effective among women of certain ethnic groups. Literature alone appears to have limited impact.

### B3. Health sector initiatives

#### General health sector initiatives

The organisation of health services is likely to influence the choice and ability of mothers to breastfeed. Even when a policy supportive of breastfeeding is in place mothers may still experience poor practice, such as separation

from their babies on the first night after birth.<sup>34</sup> Health sector initiatives aim to change the organisation of care.

One RCT<sup>35</sup> and three non-RCTs evaluated the effectiveness of general health sector initiatives.<sup>36-38</sup> In the RCT, women from a low income urban population in Nicaragua were randomised to early mother-infant contact combined with breastfeeding promotion followed by complete separation until discharge or standard care (complete separation).<sup>35</sup> Rooming-in (defined as continuous contact between mothers and babies until discharge) with breastfeeding promotion was added as a third arm at a later date. Rates of initiation were significantly greater after rooming-in compared with standard care (RR 1.94; 95% CI: 1.06 to 3.56) and just significant in favour of rooming-in compared to early contact (RR 0.74; 95% CI: 0.56 to 0.97). There was no significant difference between early contact and standard care. The findings are weakened however, as allocation to the rooming-in intervention was not random.

Three non-RCTs which evaluated general health sector initiatives found mixed results.<sup>36-38</sup> One Brazilian trial of rooming-in, breastfeeding promotion, and assistance with breastfeeding significantly increased breastfeeding in the delivery room compared with a control who received standard care (rooming-in) (RR 3.34; 95%CI: 2.78 to 4.02).<sup>36</sup> The median duration of breastfeeding was also significantly longer in the intervention group; 75 days versus 22 days in the control group. Some caution is required however, in the interpretation of these findings as problems with the analysis may have led to the significant results reported.<sup>39</sup>

In a second study, women were offered a structured breastfeeding programme which was integrated into the Maternal & Child Health

Services in Jerusalem.<sup>37</sup> Nurses offered education about the benefits of breastfeeding, guidance on how to breastfeed plus encouragement and support. The number of women initiating breastfeeding at birth did not differ significantly between the intervention and control groups, although initiation rates were high in both groups. At 26 weeks post-partum however, significantly more women in the intervention group continued to breastfeed than in the control group. The third study which was conducted in the UK compared one-to-one midwifery practice (designed to provide continuity of care) with usual care. Initiation rates did not differ significantly between the groups.<sup>38</sup>

#### Training of health professionals

Recommendations for training and updating health professionals about breastfeeding have been made.<sup>40, 41</sup> The main training courses currently available in the UK include those offered by the Baby Friendly Hospital Initiative. However, such courses have not been formally evaluated, and their effectiveness has yet to be established.

Only one RCT was identified which evaluated the effectiveness of training for health professionals.<sup>42</sup> Health professionals' breastfeeding knowledge, clinical and counselling skills were assessed after a 40-hour training course. All three outcomes were found to improve significantly after the course relative to the control. The effect on initiation of breastfeeding was not measured. Two UK-based before-after studies, which assessed initiation rates after training midwives<sup>43, 44</sup> and health visitors,<sup>43</sup> found no evidence of improvement.

#### Social support from health professionals

One UK-based RCT evaluated the effect of social support in the form of home visits and telephone calls from a midwife to socially disadvantaged women, on a number of different outcomes, including initiation of breastfeeding

**Table 2** Health sector initiatives

Key on page 9

Author (year) country, study aim	Participants	Intervention	Results	Comments
<b>Health sector initiatives (general): RCTs</b>				
Lindenberg et al (1990) <sup>35</sup> Nicaragua To examine the effects of various amounts of early pp mother-infant contact on bf	Primiparae delivering at Velez Pais Hospital, Managua, undergoing a vaginal delivery with no complications, living in a poor urban area of Managua, were included	I1 (n=136) Bf promotion with 45mins mother-infant contact immediately pp, then complete separation until discharge I2 (n=116) Bf promotion with continuous pp contact until discharge (rooming-in) C (n=123) Standard care (separation of mothers/infants throughout hospitalisation)	Bf rates at 1wk (exclusive bf / mixed feeding / never breastfed) I1 53% / 33% / 14% I2 63% / 30% / 7% C 32% / 50% / 18% Any bf for I1/I2 combined were greater vs C ( $p<0.001$ ) I1vsI2 RR 0.74 95% CI 0.56, 0.97 I1vsC RR 1.16 95% CI 0.82, 1.65 I2vsC RR 1.94 95% CI 1.06, 3.56	Mother-infant pairs were the unit of allocation/analysis. Participants recruited during the first 3 months were randomised using random number tables to two groups. During the fourth month, women were allocated consecutively to a separate intervention group (I2). Study groups were reported to be comparable at baseline
<b>Health sector initiatives (general): non-RCTs</b>				
Lutter et al (1997) <sup>36</sup> Brazil To examine the effectiveness of a hospital-based bf promotion programme in promoting exclusive bf	Low income women attending hospitals situated in Santos, Brazil, delivering healthy singleton infants with birthweights of $\geq 2000$ g, delivered between June 1992 and March 1993, were included	I (n=236) Bf promotion: rooming-in, early initiation, bf assistance, and talks during hospitalisation (covered the importance of exclusive bf, and problem solving) C (n=206) Standard care: rooming-in, prohibition of free formula, no bf programme	No. bf in delivery room I 154/236 (65.3%) C 5/206 (2.2%) $p<0.001$ RR 3.34 95% CI 2.78, 4.02	Unit of allocation: hospitals. Unit of analysis: individuals. There were differences at baseline between the study groups. Complete follow-up data were unavailable for 20% of original sample; no difference in attrition between hospitals
Palti et al (1988) <sup>37</sup> Jerusalem To evaluate the effectiveness of a structured bf promotion programme integrated into a maternal and child health service in Jerusalem	Women living in 2 adjacent Jewish neighbourhoods in Jerusalem, with children ( $\leq 5$ ys) were included. Those giving birth to twins, adopting children, having very low birth weight infants, or without a telephone, were excluded.	I (n=100 births) PROD programme (routine contact between nurses/mothers, info on benefits of bf, breast care, common problems, bf technique, provision of encouragement and support for bf, and reassurance for those deciding to discontinue bf) C (n=130 births) Standard care	Initiation of bf I 80/100 (80%) C 98/130 (75%) $p=0.004$ RR 1.17 95% CI 0.80, 1.71	Unit of allocation: neighbourhoods. Unit of analysis: individuals. Study groups were reported as comparable at baseline. No withdrawals reported
Page et al (1999) <sup>38</sup> UK To compare the performance of one-to-one midwifery practice with standard care	Women due Aug 1994-Aug 1995 included. Those delivering before 28wks, or moving in or out of the study area, were excluded	I (n=464) One-to-one midwifery care designed to provide continuity of care C (n=603) Standard care	Full bf at 2wks pp I 151/243 (62%) C 201/340 (59%) OR 1.3 95% CI: 0.93, 1.9 (as reported by authors) RR 0.70 95% CI 0.59, 0.84 (ITT)	Individuals were unit of allocation/analysis. Details of a sample size power calculation provided. There were differences at baseline between the study groups. 657 withdrawals
<b>Health sector initiatives (training of health professionals): RCTs</b>				
Rea et al (1999) <sup>42</sup> Brazil To assess the effectiveness of the WHO/UNICEF 40hr course 'Breastfeeding counselling: a training course'	Health care professionals from a maternity hospital providing care to low income populations in São Paulo, Brazil, with a minimum of 8yrs schooling, and currently working in an area dealing with mothers/children, were included	I (n=20) 40 hour bf counselling training course (covered theoretical and clinical aspects of bf, and counselling skills) C (n=40) No training course	Bf knowledge and skills Pre-test: difference between I and C scores n.s. Post-test: significant difference in favour of I ( $p<0.001$ ). The intervention significantly improved clinical and counselling skills	Individuals were the unit of allocation/analysis. Details of a sample size power calculation were provided. Groups were matched at baseline for knowledge of bf, schooling and function in the health service. No withdrawals
<b>Health sector initiatives (social support from health professionals): RCTs</b>				
Oakley et al (1990) <sup>45</sup> UK To determine the effectiveness of a programme of home visits to women at above average risk of having a low birthweight baby	Women attending 4 antenatal clinics in the Midlands/South UK, with at least one previous normally formed baby weighing under 2500g following spontaneous onset of labour, of less than 24wks gestation, singleton pregnancy, and fluent in English, were included	I (n=255) Standard care plus a minimum package of three antenatal home visits plus two telephone contacts or brief home visits between these times, from a research midwife. C (n=254) Standard care	No. bf at discharge I 105 (46%) C 89 (39%) RR 1.14 95% CI 0.96, 1.35	Unit of allocation: individuals. Unit of analysis: groups. Details of sample size power calculation provided. Randomisation was unconcealed. Baseline comparability not reported. 21 participants withdrew, analysis by ITT. Study authors noted degree of overflow of support to C which may have affected outcomes
<b>Health sector initiatives (BFHI): RCTs</b>				
Westphal et al (1995) <sup>49</sup> Brazil To determine whether the SLC bf training course affects HI's compliance with WHO/UNICEF's Ten Steps for Successful Breastfeeding	Public or philanthropic Health Institutions with at least 2 births/day, located within 100 km of São Paulo, Brazil, not previously exposed to a similar course, having staff available to attend the course full time for 3wks, were included	I (n=4 HIs) Staff attended a course (133 hours) covering all aspects of the Ten Steps to Successful bf (comprised theoretical/practical aspects of bf, lectures, videos, practical activities, and visits) C (n=4 HIs) No course	Evaluation of institutional effects After 6 months, changes had occurred in I HIs, but not in C HIs, particularly in relation to steps 2 & 10 Institutional score (mean) in the ten-step score test (post-course) I 3.95 C 2.95 Out of a maximum of 10 points	HIs were the unit of allocation/analysis. Baseline comparability of the study groups not reported. No withdrawals reported
<b>Health sector initiatives (WIC programme): RCTs</b>				
Brent et al (1995) <sup>50</sup> USA To determine the effectiveness of a bf promotional programme in a low income population, when compared with routine care	English speaking women, with an infant receiving care at given hospital were included. Mothers separated from infants at birth, delivering at $<37$ wks gestation, having infants who stayed in the neonatal intensive care unit $>72$ hrs, or taking medications contraindicated in bf, were excluded.	I (n=58) Bf education/support during antenatal/pp periods. Antenatal education consisted of 2-4 individualised 10-15min sessions with a lactation consultant discussing the benefits and practice of bf. PP - mothers followed up by the lactation consultant until weaning or 1yr. C (n=65) Standard care	No. bf in hospital I 31/51 (61%) C 18/57 (32%) $p=0.002$ RR 1.73 95% CI 1.20, 2.51	Individuals were the unit of allocation/analysis. There were differences at baseline between the study groups; adjustments made in analysis. Unblinded study. 7 patients were excluded from the intervention group analyses due to lower attendance rate
Sciacca et al (1995) <sup>51</sup> USA To determine the effects of a partner-supported, incentive-based, educational programme on bf among low income women	Primiparae, WIC participants, attending 2 clinic sites in Flagstaff, Arizona, due date between May 1992 and December 1992, and expressing interest in participating in the programme with partner/baby's maternal grandmother, were included.	I (n=34) Usual WIC bf education (1x2hr class) plus gift incentives for women/partners (breast pump, football tickets) to participate in bf/birth preparation classes. Assigned PC. C (n=34) Usual WIC bf education/ support programme	Ever breastfed at hospital discharge I 26/26 (100%) C 24/29 (83%) $p<0.05$ RR 1.17 95% CI 0.65, 2.09	Individuals were the unit of allocation/analysis. Study groups were reported as comparable at baseline. 13 participants withdrew.

**Table 2** Health sector initiatives cont.

Key on page 9

<b>Author (year) country, study aim</b>	<b>Participants</b>	<b>Intervention</b>	<b>Results</b>	<b>Comments</b>
<b>Health sector initiatives (WIC programme): non-randomised controlled trials</b>				
Schofer et al (1998) <sup>52</sup> USA To determine whether a volunteer peer support programme increases the uptake of bf	Pregnant and pp women who qualified for WIC, resident in rural counties of Iowa, which had had no significant bf promotion programmes within 3yrs.	I (n=2 counties, n=143 women) Women matched with PC who presented short educational lessons, answered questions, organised referrals and provided moral support C (n=6 counties, n=64 women) No educational intervention.	Bf initiation I 82% C 31% RR 2.30 95% CI 1.68, 3.14	Unit of allocation: area. Unit of analysis: individual. The method of treatment allocation between counties was not stated. The study groups were reported to be comparable at baseline. Almost 50% of the women in I were excluded from the final analysis
Caulfield et al (1998) <sup>53</sup> USA To examine the effectiveness of single and combined effects of a motivational video and peer counselling on bf among African American WIC participants in Baltimore, USA	African-American women registering for antenatal care at WIC clinics, entering antenatal care before 24wks gestation, with singleton pregnancy, planning to keep the baby, and to remain in the area, were included. Those for whom breastfeeding was contraindicated (e.g. HIV infection) were excluded	I1 (n=64) Exposed to bf promotional video in waiting room. Posters/pamphlets distributed, bf advice/counselling provided by health professionals. I2 (n=55) PCs provided one-to-one counselling and group sessions up to 16wks pp. Mothers counselled at least 3 times antenatally, then weekly until 16 wks pp if bf I3 (n=66) Video/PC support C (n=57) Standard WIC service	No. of women initiating bf I1 32/64 (50%) I2 34/55 (62%) I3 34/66 (52%) C 15/57 (26%) $\chi^2 p < 0.05$  I1vsI2 RR 1.30 95% CI 0.87, 1.95 I1vsI3 RR 1.03 95% CI 0.73, 1.45 I1vsC RR 1.57 95% CI 1.14, 2.10 I2vsI3 RR 0.83 95% CI 0.60, 1.14 I2vsC RR 2.08 95% CI 1.14, 3.09 I3vsC RR 1.61 95% CI 1.16, 2.21	Unit of allocation: clinic group. Unit of analysis: individual. Within each clinic women were randomly allocated to groups using a 2x2 factorial design. There were differences at baseline between the study groups, but adjustments were made during the analysis. 31/242 women had incomplete data on key variables.
Shaw & Kaczorowski (1999) <sup>54</sup> USA To examine the effect of a peer counselling programme on bf in West Tennessee	WIC participants from rural low income populations, 6wks-6mths pp, registered and seen by health care staff antenatally, were included	I (n=156) Assigned to PCs who provided face-to-face or telephone support by helping with problems and providing info on bf C (n=135) No contact with PC	No. of women initiating bf I 82/156 (53%) C 45/135 (33%) $p < 0.01$ RR 1.58 95% CI 1.19, 2.09	Individuals were the unit of allocation/analysis. There were differences at baseline between the study groups.
Reifsneider & Eckhart (1997) <sup>55</sup> USA To examine the effect of specific antenatal bf info, provided in group classes by nurse practitioners	Women eligible for WIC services, wishing to bf, no previous bf experience, aged $\geq 18$ yrs at the time of delivery, delivering a healthy infant of $\geq 5$ lb birth weight with no, severe congenital anomalies, were included.	I (n=23) Bf classes (covering benefits and techniques of bf) with optional follow-up class (covering bf problems) C (n=24) Standard WIC care	Initiation of bf I 13/14 (93%) C 13/17 (76%) n.s. RR 1.05 95% CI 0.58, 1.90	Individuals were the unit of allocation/analysis. Alternate allocation to study groups. Groups reported as comparable at baseline. 16 withdrawals. Analysis was based on 14 individuals in I and 17 in C

at hospital discharge.<sup>45</sup> Initiation rates between the intervention and control group (standard care) were not significantly different. However, this finding is likely to have been influenced by the support also received by some in the control group. Womens' attitudes towards the intervention were very positive' with 80% of those responding reporting that the midwife listening to them was important.

### Baby Friendly Hospital Initiative (BFHI)

The UK BFHI was launched in 1994 with the aim of helping all parents to make informed decisions about feeding their babies and then supporting them in their chosen method.<sup>46</sup> Best practice is represented by the 'Ten Steps to Successful Breastfeeding'<sup>46</sup> and more recently, the 'Seven Point Plan' which focuses on the community-based health care sector.<sup>47</sup> Currently in the UK there are 29 fully accredited Baby Friendly Hospitals, one Baby Friendly community facility and 71 maternity units or community

services with a Certificate of Commitment.<sup>48</sup>

Despite these figures no RCTs or non-RCTs have evaluated the effectiveness of the BFHI on the initiation of breastfeeding. One RCT was identified which evaluated the implementation of the 'Ten Steps to Successful Breastfeeding'.<sup>49</sup> A hospital in Brazil that had recently achieved the 'Baby Friendly' award provided a training course which covered all aspects of the 'Ten Steps for Successful Breastfeeding' to four other hospitals. Six months after the intervention, the four intervention hospitals were found to have implemented more of the ten steps than the four control institutions (scores out of 10 were 3.95 and 2.95 respectively). Health professionals in the intervention hospitals were also found to be more positive after the course towards making changes to their routines and practices in support of breastfeeding. However, no comparison with the health professionals in the control hospitals was made.

### US Department of Agriculture Special Supplemental Nutrition Programme for Women, Infants and Children (WIC)

WIC is one of the largest federally funded nutrition programmes in the USA. It is targeted at low income pregnant and breastfeeding women, infants and children up to five years of age who are considered to be at nutritional risk.

Six trials<sup>50-55</sup> were identified which evaluated the effectiveness of WIC programmes. One RCT evaluated one-to-one education sessions focusing on the benefits of breastfeeding, and support by a lactation consultant to women eligible for the WIC programme.<sup>50</sup> In the intervention group there were increased numbers of women breastfeeding in hospital compared with controls receiving routine care (RR 1.73; 95% CI: 1.20 to 2.51). The median duration of breastfeeding was also significantly increased in the intervention group; 84 days versus 33 days in the control group. In a second RCT, women and their partners attending WIC clinics

**Table 3** Peer support: non-randomised controlled trials

Key on page 9

<b>Author (year) country, study aim</b>	<b>Participants</b>	<b>Intervention</b>	<b>Results</b>	<b>Comments</b>
Kistin et al (1994) <sup>56</sup> USA To determine whether peer support increases bf initiation in a population of low income urban women	Women able to speak English or Spanish, planning to bf, requesting PC, were included. Eligible PCs had completed training, were from the same racial/socio-economic background as patients, had breastfed, and wished to help other women breastfeed.	I (n=59) Received PC input (antenatal talk, twice weekly phone calls until bf established, phone call every 1-2wks for the next 2mths, then as needed) C (n=43) No PC input	Any bf at discharge I: 55/59 (93%) C: 30/43 (70%) $p<0.05$ RR 1.34 95% CI 1.09, 1.65	Individuals were the unit of allocation/analysis. Intervention provided to first time mothers and those with previous bf problems; the remaining women formed the control group. Groups reported as comparable at baseline. 9 withdrawals.
McInnes et al (1998) <sup>57</sup> UK To determine whether a programme of peer counselling and support increases bf in a socially deprived community	Women booked for antenatal care in two geographically separate socially deprived areas of Glasgow were included. PCs were selected by health professionals, lived in the intervention area, had breastfed for at least 3mths, had at least one child under 5yrs old, and had an interest in helping other mothers to bf.	I (n=474) Two antenatal visits from trained PC who provided info about bf so that women could make an informed choice about infant feeding. Bf women received ≥2 postnatal visits. C (n=521) Standard care	Initiation rates at delivery I=105/449 (23.4%) C = 94/477 (19.7%) RR 1.23 95% CI 0.96, 1.58	Groups were the unit of allocation/analysis. The study groups were reported as comparable at baseline. 76 participants withdrew. Data analysed ITT

were offered education covering the benefits and practice of breastfeeding.<sup>51</sup> The sessions were also intended to motivate and empower women to breastfeed and prizes for participating in breastfeeding classes were also offered. The authors reported significantly higher rates of breastfeeding in the intervention group compared with the control who received standard breastfeeding education. However, when the results were re-calculated to include all women, regardless of whether or not they withdrew from the study, the difference was no longer statistically significant.

Three non-RCTs which evaluated interventions carried out in WIC clinics found that the number of women initiating breastfeeding was significantly increased as a result of the intervention.<sup>52-54</sup> The duration of breastfeeding was also significantly increased in all intervention groups, at 7-10 days post-partum,<sup>53</sup> after six weeks<sup>54</sup> and up to and including 12 weeks.<sup>52</sup> All three interventions consisted of peer support and in one a video, posters and pamphlets were also included.<sup>53</sup> Some caution is required in the interpretation of the findings from two studies<sup>52, 53</sup> as problems with the analysis may have led to the significant results reported.<sup>39</sup>

One other non-RCT offered education about the benefits and the technique of breastfeeding to women who had expressed a

desire to breastfeed. No significant differences in initiation between the intervention group and the control group who received standard WIC care were found. However, the average duration of breastfeeding was found to be significantly greater in the intervention group (76 days versus 30 days in the control group)<sup>55</sup> (Table 2).

These studies suggest that initiation rates can be increased following the implementation of WIC programmes among low income women. In particular those programmes which included a peer support component appeared to influence initiation of breastfeeding.

#### B4. Peer Support Programmes

Other programmes offered by experienced and trained peers outside of WIC clinics have also been evaluated. Two non-RCTs have examined the effect of peer support on initiation rates in low income, socially disadvantaged women.<sup>56, 57</sup> In one US study trained volunteers and mothers who planned to breastfeed were matched according to ethnicity and socio-economic background.<sup>56</sup> Volunteers talked with mothers and maintained telephone contact for at least 12 weeks after the baby was born. At discharge from hospital, significantly more women in the intervention group were breastfeeding than in the control group (RR 1.34, 95% CI: 1.09 to 1.65). Differences in the numbers of women breastfeeding remained

significant up to the final follow-up at 12 weeks post-partum. In a UK study, two similar socially deprived communities in Glasgow were identified and women in one were offered peer counselling.<sup>57</sup> No significant differences in breastfeeding were detected overall between the two communities. However, when the results were re-analysed to take account of differences in socio-economic status between the two communities, significantly more women in the intervention group initiated breastfeeding at delivery. By six weeks post-natally the difference was no longer statistically significant (Table 3).

A qualitative study provides evidence of why peer support programmes may be effective.<sup>58</sup> Interview data gathered from first time mothers living in a deprived inner city in the UK suggested that exposure to breastfeeding was important. Women were more likely to decide to breastfeed if they had regularly seen a relative or friend successfully breastfeed. Women who had not had such an experience or who had only seen breastfeeding at a distance, held more negative views and lacked confidence in their own ability to breastfeed.

Peer support programmes offer the opportunity of contact over time with a woman who has successfully breastfed, and the trials reviewed here offer some support for such programmes. In the UK, several voluntary

**Table 4** Multifaceted interventions: non-RCTs

<b>Author (year) country, study aim</b>	<b>Participants</b>	<b>Intervention</b>	<b>Results</b>	<b>Comments</b>
Rodriguez-Garcia et al (1990) <sup>61</sup> Mexico To evaluate three methods of promoting bf	Women aged 15-45yrs, with gestation up to 8mths, and previous child living 6mths or more, were included. Primigravidae were excluded	I1 (n=160) Individual teaching and counselling by trained volunteers resident in the community, with extensive use of educational materials I2 (n=122) Group teaching from health professionals I3 (n=148) Group/individual teaching C (n=155) No intervention	% change in initiation rates Baseline: I1, I2, I3 combined 74.9% C 65.9% Post intervention: I1, I2, I3 combined 88.8% C 56.0% Not possible to estimate RR as per ITT	Groups were the unit of allocation/analysis. Group comparability not reported. No withdrawals were reported. Results from I1, I2, I3 were combined for analysis & compared with C

Abbreviations: bf - breastfeeding; I - intervention group, C - control group, E - patients later designated as 'educated' (i.e. attended more than 3 lectures), NE - patients later designated as 'non-educated' (i.e. attended 3 lectures or less), n.s. - not significant, PROD - promotion of growth and development of children from 0-5 yrs, BFHI - Baby Friendly Hospital Initiative, HI - health institution, WIC - US Department of Agriculture Supplemental Nutrition Program for Women, Infants, and Children, SLC - Santos Lactation Centre, Sao Paulo, Brazil, pp - postpartum, PC(s) - peer counsellor(s), info - information, HV - health visitor, MW, midwife, ITT - data analysed on an intention-to-treat basis, no. - number, vs - versus, RR - relative risk, 95% CI - 95% confidence intervals.

Note: Relative risks (RR) shown in the results have been estimated for initiation rates by the review team on an intention-to-treat basis wherever possible, unless otherwise stated.

organisations offer peer support including La Leche League, the National Childbirth Trust, the Association of Breastfeeding Mothers and The Breastfeeding Network.

**B5. Media campaigns** National media campaigns, such as National Breastfeeding Awareness Week, offer an opportunity to raise public awareness about the importance of breastfeeding. Local media activities can also be used to promote breastfeeding, but their impact in shaping cultural norms and breastfeeding rates needs to be monitored.

Although no RCTs or non-RCTs evaluating the impact of media campaigns were identified, the results from two before-after studies suggest that local campaigns targeted at pregnant women<sup>59</sup> or girls in high school<sup>60</sup> can influence breastfeeding rates<sup>59</sup> and attitudes towards breastfeeding.<sup>60</sup> However, it is difficult to attribute change to the campaigns since there were no concurrent controls.

#### **B6. Multi-faceted interventions**

A 'package' of different interventions provided simultaneously has been evaluated in one non-RCT in Mexico.<sup>61</sup> Four groups of pregnant women within communities were allocated to receive breastfeeding education from a trained health professional, individual teaching and support from an experienced peer, both types of intervention or no intervention. The results,

however, were presented for all intervention groups combined and compared with the control group. Initiation of breastfeeding in the intervention groups was reported to be 89% compared with 56% in the control group (the results were not compared statistically) (Table 4).

Findings from before-after studies indicated that successful multi-faceted interventions tended to include education about breastfeeding, structural changes to the health sector combined with peer support programmes<sup>62</sup> and/or some kind of media activity.<sup>63-66</sup> Due to the nature of the study design, outcomes may have been affected by factors other than the intervention occurring prior to, or during the evaluation period.

## C. Gaps in the evidence

There is very limited information on the cost-effectiveness of interventions to promote the initiation of breastfeeding. Studies addressing this issue should include assessment of health service resources and the costs to the family. These will arise from differences in short and long term outcomes for babies and women, as well as from the resources needed to support breastfeeding and the costs of formula feeding.

Only one study, included in the section on support from health

professionals, provided any information about the impact of the intervention on women themselves.<sup>45</sup> Information about the acceptability of interventions to promote breastfeeding is very limited and future evaluation studies need to explore women's views.

Whilst public policy initiatives such as legislation about maternity leave have been implemented in a variety of settings, no evaluations of the impact of such changes on intention to breastfeed and the likely effect on decisions to breastfeed are available. Only one before-after study provided some evidence for the effectiveness of the implementation of government policy about the promotion of breastfeeding.<sup>65</sup> Infant feeding practices in Scotland following recommendations from the Department of Health in 1974 were monitored over a three year period. In addition the media gave extensive coverage to the advantages of breastfeeding. Initiation rates were reported to increase by around 20%.

Similarly, no studies were identified which have evaluated the impact of providing supportive environments, such as facilities for women to breastfeed in public places. There is also a need to address the issue of public acceptability and social barriers to breastfeeding.

## D. Implications

Whilst a few of the studies were conducted in the UK, many of the interventions were implemented and evaluated in the US. Although there are issues around applicability because socio-cultural factors can have an important influence, particularly on the acceptability of interventions, a number of recommendations for policy and practice can be made based on the evidence in this bulletin.

- Consideration needs to be given to the revision of local and national policy to reflect an evidence-based approach to the promotion of breastfeeding with particular emphasis on the reduction of inequalities in health in accordance with The NHS Plan. Specific policy developments could include: the development of national health inequalities targets to support local initiatives; the collection of standard data about the uptake of breastfeeding; and increased access to breastfeeding promotion services for black and ethnic minority communities.
- Trusts have an important role to play in promoting breastfeeding and should be encouraged to update policies to take account of the evidence presented here. This could include an audit of existing information and education programmes. Small discussion classes focusing on the benefits of breastfeeding along with practical advice could be encouraged as there is some evidence from RCTs that such classes can increase initiation.
- Trusts may need to consider providing training for staff so that consistent information is given. Although evidence for the effectiveness of providing training is very limited, this should not be taken as evidence of no effect. Where training courses are provided, their effectiveness needs to be evaluated, which should include initiation of breastfeeding as well as other outcomes such as professionals' knowledge.

- Although the RCT evidence for peer support programmes is relatively limited, the breadth of evidence suggests that such programmes could be further developed, either through the NHS or by contact with organisations which already offer such services. The impact of peer support programmes needs to be monitored and this also includes programmes where peer support is provided as part of a 'package' of different services.
- Trusts should be encouraged to meet the required standard for accreditation as 'Baby Friendly'. In achieving accreditation they are required to collect statistics on breastfeeding rates as well as to develop a written policy, provide training for staff, offer information to women about benefits and on practices which are beneficial to success as well as providing an environment supportive of breastfeeding.
- Although evidence for the impact of media activities is limited, campaigns such as National Breastfeeding Awareness Week offer an opportunity to promote breastfeeding via a co-ordinated public campaign, at both national and local levels. Their impact on helping to create a culture which is supportive of breastfeeding needs to be evaluated.
- The introduction of current good practice needs to be monitored, and as a minimum, breastfeeding rates should be routinely recorded. In the 1997 Audit Commission review of maternity services only eight of the 13 trusts visited could provide information on breastfeeding rates at hospital discharge.<sup>40</sup> Guidance on the use of standard definitions for measuring initiation rates would assist in monitoring and make it possible to distinguish between exclusive and partial breastfeeding at different stages. The definition of 'ever breastfed' used in UK surveys could be adopted.<sup>16</sup>
- Increased co-ordination between breastfeeding

promotion organisations and researchers is required to encourage good quality evaluations. More information about the intervention along with details of its implementation are required. Womens' views about the acceptability of interventions to promote breastfeeding should also be explored using qualitative approaches.

- Research is needed to identify the most cost-effective interventions for promoting breastfeeding, including both health service and public/social interventions such as early return to work, media images, lack of facilities and lack of public tolerance for breastfeeding.

### Appendix - Research methods

This bulletin is based on a systematic review commissioned by the NHS HTA programme<sup>21</sup> and carried out according to national guidelines.<sup>67</sup> Update searches have been performed (up to and including April, 2000) based on the original set of search strategies. New studies have been incorporated into the results presented in this bulletin.

Fifteen electronic databases were searched from inception to April 2000. Relevant journals were hand searched and the reference lists of all retrieved papers were examined. Contact was made with over 400 experts, organisations and lay groups with an interest in breastfeeding to identify other published or unpublished studies. Studies were not limited by country of origin, language or date. Each study was assessed according to pre-determined inclusion criteria independently by two reviewers. Data extraction and quality assessment was carried out by one reviewer and checked independently by a second. Any differences were resolved by discussion, or, if necessary, by recourse to a third reviewer. A formal pooling was not carried out due to differences between studies in participants, interventions, settings and outcome measures. Data synthesis was therefore qualitative. Relative risks with associated 95% confidence intervals for initiation rates have been estimated (where possible) for individual studies (it should be noted that in some cases results reported as statistically significant by authors, when re-calculated based on an intention-to-treat basis, became non-significant). Further details of methodology are available in the full report.<sup>21</sup>

## References

1. Heinig MJ, Dewey KG. Health advantages of breast feeding for infants: a critical review. *Nutrition Research Reviews*. 1996;9:89-110.
2. Heinig MJ, Dewey KG. Health effects of breast feeding for mothers: a critical review. *Nutrition Research Reviews*. 1997;10:35-56.
3. Pabst HF, Spady DW. Effect of breast-feeding on antibody response to conjugate vaccine. *Lancet*. 1990;336:269-70.

4. Miller SA, Chopra JG. Problems with human milk and infant formulas. *Pediatrics*. 1984;74:639-47.
5. Taitz LS, Byers HD. High calorie/osmolar feeding and hypertonic dehydration. *Arch Dis Child*. 1972;46:257-60.
6. Smith BA. Feeding overstrength cow's milk to babies. *BMJ*. 1974;4:741-2.
7. Lucas A, Lockton S, Davies PSW. Randomised trial of a ready-to-feed compared with powdered formula. *Arch Dis Child*. 1992;67:935-9.
8. WHO/UNICEF. HIV and infant feeding: a policy statement developed collaboratively by UNAIDS, WHO and UNICEF. 1997.
9. Sachs M, Buchanan P, Broadfoot M et al. Infant feeding and HIV study does not support Minerva's view. *BMJ*. 2000; 321:303.
10. Coutsoudis A, Pillay K, Spooner E, et al. Influence of infant-feeding patterns on early mother-to-child transmission of HIV-1 in Durban, South Africa: a prospective cohort study. *Lancet*. 1999;354:471-476.
11. Department of Health. *Reducing health inequalities: an action report. Our healthier nation*. 1999, The Stationery Office: London.
12. Department of Health *Our healthier nation*. 1998, Department of Health: London.
13. Department of Health. *The NHS Plan. A plan for investment. A plan for reform*. Cm 4818-1,2000.
14. Warren J. Breastfeeding in Scotland. *Health Bulletin*. 1998;56.
15. Department of Health & Social Services. *Breastfeeding. Strategy for Northern Ireland*. 1999.
16. Foster K, Lader D, Cheesbrough S. *Infant feeding* 1995. 1997, Office for National Statistics: The Stationery Office: London
17. Scott JA, Binns CW. Factors associated with the initiation and duration of breastfeeding: a review of the literature. *Breastfeed Rev*. 1999;7:5-16.
18. Henderson L, Kitzinger J, Green JM. Does media reporting promote bottlefeeding and discourage breastfeeding? *BMJ*. (in press)
19. McIntyre E, Turnbull D, Hiller JE. Suitability of breastfeeding facilities outside the home: an audit of baby change rooms in shopping centres. *Breastfeed Rev*. 1999;7:17-20.
20. Department of Health. *Independent inquiry into inequalities in health: report*. Chairman: Sir Donald Acheson. 1998, The Stationery Office: London.
21. Fairbank L, O'Meara S, Renfrew MJ, et al. Promoting the initiation of breastfeeding. A systematic review to evaluate the effectiveness of interventions to promote the initiation of breastfeeding. *Health Technol Assess*. 2000 (forthcoming).
22. Renfrew MJ, Woolridge MW, Ross McGill H. *Enabling women to breastfeed: A structured review with evidence-based guidance for practice*. 2000, The Stationery Office: London.
23. Coombs DW, Reynolds K, Joyner G, et al. A self-help program to increase breastfeeding among low income women. *J Nutr Educ*. 1998;30:203-209.
24. Hill PD. Effects of education on breastfeeding success. *Maternal-Child Nursing Journal*. 1987;16:145-56.
25. Howard C, Howard F, Lawrence R, et al. Office prenatal formula advertising and its effect on breast-feeding patterns. *Obstet Gynecol*. 2000;95:296-303.
26. Kaplowitz DD, Olson CM. The effect of an educational program on the decision to breastfeed. *J Nutr Educ*. 1983;15:61-5.
27. Kistin N, Benton D, Rao S, et al. Breast-feeding rates among black urban low income women: effect of prenatal education. *Pediatrics*. 1990;86:741-6.
28. Loh NR, Kelleher CC, Long S, et al. Can we increase breast feeding rates? *Ir Med J*. 1997;90:100-1.
29. McEnery G, Rao KP. The effectiveness of antenatal education of Pakistani and Indian women living in this country. *Child: Care, Health & Development*. 1986;12:385-99.
30. Rossiter JC. The effect of a culture-specific education program to promote breastfeeding among Vietnamese women in Sydney. *Int J Nurs Stand*. 1994;31:369-79.
31. Serwint JR, Wilson ME, Vogelhut JW, et al. A randomized controlled trial of prenatal pediatric visits for urban, low income families. *Pediatrics*. 1996;98:1069-75.
32. Wiles LS. The effect of prenatal breastfeeding education on breastfeeding success and maternal perception of the infant. *J Obstet Gynaecol Neonatal Nurs*. 1984;13:253-7.
33. Valaitis RK, Sheeshka JD, O'Brien MF. Do consumer infant feeding publications and products available in physicians' offices protect, promote and support breastfeeding? *J Hum Lact*. 1997;13:203-208.
34. Beeken S, Waterston T. Health service support for breastfeeding. Are we practicing what we preach? *BMJ*. 1992;305:285-287.
35. Lindenberg CS, Artola RC, Jimenez V. The effect of early post-partum mother-infant contact and breast-feeding promotion on the incidence and continuation of breastfeeding. *Int J Nurs Stand*. 1990;27:179-86.
36. Lutter CK, Perez-Escamilla R, Segall A, et al. The effectiveness of a hospital-based program to promote exclusive breastfeeding among low income women in Brazil. *Am J Public Health*. 1997;87:659-63.
37. Palti H, Valderama C, Pogrund R, et al. Evaluation of the effectiveness of a structured breast-feeding promotion programme integrated into a maternal and child health service in Jerusalem. *Israel Journal of Medical Sciences*. 1988;24:342-8.
38. Page L, McCourt C, Beake S, et al. Clinical interventions and outcomes of one-to-one midwifery practice. *J Public Health Med*. 1999;21:243-248.
39. Campbell MK, Grimshaw JM. Cluster randomised trials: time for improvement. *BMJ*. 1998;317:1171-1172.
40. Audit Commission. *First Class Delivery. Improving Maternity Services in England & Wales*. 1997, Audit Commission: London.
41. National Assembly for Wales. *Breastfeeding Wales*. 2000, National Assembly for Wales.
42. Rea MF, Venancio SI, Martines JC, et al. Counselling on breastfeeding: assessing knowledge and skills. *Bull World Health Organ*. 1999;77:492-498.
43. Brimblecombe FSW, Cullen D. Influences on a mother's choice of method of infant feeding. *Public Health*. 1977;91:117-26.
44. Stokoe B. Failure breeds success. *Health Visit*. 1994;67:170.
45. Oakley A, Rajan L, Grant AM. Social support and pregnancy outcome. *Br J Obstet Gynaecol*. 1990;97:155-62.
46. UNICEF. *Implementing the Ten Steps to Successful Breastfeeding*. 1998, Unicef: London.
47. UNICEF. *The Baby Friendly Initiative in the community. A seven point plan for the protection, promotion and support of breastfeeding in community health care settings*. 1999, UNICEF.
48. The Baby Friendly Initiative. Global Award for Baby Friendly Hospitals. 2000, May. [homepage of Baby Friendly Initiative] <http://www.babyfriendly.org.uk/home.htm>
49. Westphal MF, Taddei JA, Venancio SI, et al. Breast-feeding training for health professionals and resultant institutional changes. *Bull World Health Organ*. 1995;73:461-8.
50. Brent NB, Redd B, Dworetz A, et al. Breast-feeding in a low income population. Program to increase incidence and duration. *Arch Pediatr Adolesc Med*. 1995;149:798-803.
51. Sciacca JP, Phipps BL, Dube DA, et al. Influences on breast-feeding by lower-income women: an incentive-based, partner-supported educational program. *J Am Diet Assoc*. 1995;95:323-8.
52. Schafer E, Vogel MK, Viegas S, et al. Volunteer peer counselors increase breastfeeding duration among rural low income women. *Birth*. 1998;25:101-6.
53. Caulfield LE, Gross SM, Bently ME, et al. WIC-based interventions to promote breastfeeding among African-American women in Baltimore: effects on breastfeeding initiation and continuation. *J Hum Lact*. 1998;14:15-22.
54. Shaw E, Kaczorowski J. The effect of a peer counseling program on breastfeeding initiation and longevity in a low income rural population. *J Hum Lact*. 1999;15:19-25.
55. Reifsneider E, Eckhart D. Prenatal breastfeeding education: its effect on breastfeeding among WIC participants. *J Hum Lact*. 1997;13:121-5.
56. Kistin N, Abramson R, Dublin P. Effect of peer counselors on breastfeeding initiation, exclusivity, and duration among low income urban women. *J Hum Lact*. 1994;10:11-5.
57. McInnes RJ, Love JG, Stone DH. Evaluation of a community-based intervention to increase breastfeeding prevalence. *J Hum Lact*. 2000;22:138-145.
58. Hoddinott P, Pill R. Qualitative study of decisions about infant feeding among women in east end of London. *BMJ*. 1999;318:30-34.
59. Coles EC, Cotter S, Valman HB. Increasing prevalence of breastfeeding. *BMJ*. 1978;2:1122.
60. Friel JK, Hudson NI, Banoub S, et al. The effect of a promotion campaign on attitudes of adolescent females towards breastfeeding. *Can J Public Health*. 1989;80:195-9.
61. Rodriguez-Garcia R, Aumack KJ, Ramos A. A community-based approach to the promotion of breastfeeding in Mexico. *J Obstet Gynaecol Neonatal Nurs*. 1990;19:431-8.
62. Hartley BM, O'Connor ME. Evaluation of the 'Best Start' breast-feeding education program. *Arch Pediatr Adolesc Med*. 1996;150:868-71.
63. Rea MF. The Brazilian national breastfeeding program: a success story. *Int J Gynaecol Obstet*. 1990;31:79-82.
64. Wright AL, Naylor A, Wester R, et al. Using cultural knowledge in health promotion: breastfeeding among the Navajo. *Health Educ Behav*. 1997;24:625-39.
65. Kirk TR. Appraisal of the effectiveness of nutrition education in the context of infant feeding. *J Hum Nutr*. 1980;34:429-38.
66. McDivitt JA, Zimicki S, Hornik R, et al. The impact of the Healthcom mass media campaign on timely initiation of breastfeeding in Jordan. *Stud Fam Plann*. 1993;24:295-309.
67. NHS Centre for Reviews and Dissemination. *Undertaking systematic reviews of research on effectiveness. CRD guidelines for those carrying out or commissioning reviews*. 1996, University of York: York. 1-92.

# Effective Health Care

This bulletin is based upon a systematic review commissioned by the NHS HTA Programme. The review was carried out by:

*The Mother and Infant Research Unit, University of Leeds:* Lisa Fairbank, Mike Woolridge, Mary Renfrew

*NHS CRD, University of York:* Susan O'Meara, Amanda Sowden, Deborah Lister-Sharp, Lisa Mather

The bulletin was written and produced by staff from NHS CRD and The Mother and Infant Research Unit.

The *Effective Health Care* bulletins are based on systematic review and synthesis of research on the clinical effectiveness, cost-effectiveness and acceptability of health service interventions. This is carried out by a research team using established methodological guidelines, with advice from expert consultants for each topic. Great care is taken to ensure that the work, and the conclusions reached, fairly and accurately summarise the research findings. The University of York accepts no responsibility for any consequent damage arising from the use of *Effective Health Care*.

## Acknowledgements:

*Effective Health Care* would like to acknowledge the helpful assistance of the following who commented on the text:

- Association of Breastfeeding Mothers
- Mark Baker, North Yorkshire HA
- Jane Britten, The Breastfeeding Network
- Rosamund Bryar, University of Hull
- Phyll Buchanan, The Breastfeeding Network
- Christine Carson, Department of Health
- Leslie Davidson, University of Oxford
- Jane Eminson, Wolverhampton HA
- Alison Evans, University of Leeds

- Robert Finch, Department of Health
- Elspeth Gleeson, National Childbirth Trust
- Mavis Kirkham, University of Sheffield
- Dee Kyle, Bradford HA
- Stuart Logan, University of London
- Sue Martin, Department of Health
- Miranda Mugford, University of East Anglia
- Colin Pollock, Wakefield HA
- Jim Sikorski, GKT School of Medicine
- Mary Smale, University of Leeds
- Rosemary Thompson, Department of Health
- Colin Waine, Sunderland HA
- Jenny Warren, Scottish Office
- Janette Westman, Bradford Royal Infirmary

## Effective Health Care Bulletins

### Vol. 2

1. The prevention and treatment of pressure sores
2. Benign prostatic hyperplasia
3. Management of cataract
4. Preventing falls and subsequent injury in older people
5. Preventing unintentional injuries in children and young adolescents
6. The management of breast cancer
7. Total hip replacement
8. Hospital volume and health care outcomes, costs and patient access

### Vol. 3

1. Preventing and reducing the adverse effects of unintended teenage pregnancies

### Vol. 5

1. Getting evidence into practice
2. Dental restoration: what type of filling?
3. Management of gynaecological cancers
4. Complications of diabetes I
5. Preventing the uptake of smoking in young people
6. Drug treatment for schizophrenia.

### Vol. 6

1. Complications of diabetes II

Full text of previous bulletins available on our web site: [www.york.ac.uk/inst/crd](http://www.york.ac.uk/inst/crd)

## Subscriptions and enquiries

*Effective Health Care* bulletins are published in association with Royal Society of Medicine Press. The National Institute for Clinical Excellence (NICE) funds a limited number of these bulletins for distribution to decision makers. Subscriptions are available to ensure receipt of a personal copy. 2000 subscription rates, including postage, for bulletins in Vol. 6 (6 issues) are: £46/\$75 for individuals, £74/\$118 for institutions. Individual copies of bulletins from Vols 1–5 are available priced £5/\$8 and from Vol. 6 priced £9.50/\$15. Discounts are available for bulk orders from groups within the NHS in the UK and to other groups at the publisher's discretion.

Please address all orders and enquiries regarding subscriptions and individual copies to Subscriptions Department, Royal Society of Medicine Press, PO Box 9002, London W1A 0ZA. Telephone (020) 7290 2928/2927; Fax (020) 7290 2929; email [rsmjournals@roysocmed.ac.uk](mailto:rsmjournals@roysocmed.ac.uk) Cheques should be made payable to Royal Society of Medicine Press Ltd. Claims for issues not received should be made within three months of publication of the issue.

Enquiries concerning the content of this bulletin should be addressed to NHS Centre for Reviews and Dissemination, University of York, York YO10 5DD; Telephone (01904) 433634; Fax (01904) 433661; email [revdis@york.ac.uk](mailto:revdis@york.ac.uk)

**Copyright NHS Centre for Reviews and Dissemination, 2000. NHS organisations in the UK are encouraged to reproduce sections of the bulletin for their own purposes subject to prior permission from the copyright holder.** Apart from fair dealing for the purposes of research or private study, or criticism or review, as permitted under the Copyright, Designs and Patents Act, 1988, this publication may only be produced, stored or transmitted, in any form or by any means, with the prior written permission of the copyright holders (NHS Centre for Reviews and Dissemination, University of York, York YO10 5DD).

Funding for the bulletin is provided by NICE. The NHS Centre for Reviews and Dissemination is funded by the NHS Executive and the Health Departments of Wales and Northern Ireland. The views expressed in this publication are those of the authors and not necessarily those of NICE, the NHS Executive or the Health Departments of Wales or Northern Ireland.

Printed and bound in Great Britain by Latimer Trend & Company Ltd., Plymouth. Printed on acid-free paper. ISSN: 0965-0288

The contents of this bulletin are likely to be valid for around one year, by which time significant new research evidence may have become available.