

**Istituto per l'Infanzia  
IRCCS Burlo Garofolo**  
Trieste, Italy



**Unit for Health Services Research  
and International Health**  
WHO Collaborating Centre for Maternal and Child Health

## Promotion of Breastfeeding in Europe

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# Protection, promotion and support of breastfeeding in Europe: review of interventions

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## Abbreviations

BF	breastfeeding
ABF	any breastfeeding
EBF	exclusive breastfeeding (only breastmilk)
PBF	predominant breastfeeding (breastmilk and non-nutritive fluids)
FBF	full (exclusive and predominant) breastfeeding
MBF	mixed breastfeeding (breastmilk and other food, including infant formula)
NBF	no breastfeeding
BFH	Baby Friendly Hospital
BFHI	Baby Friendly Hospital Initiative
BM	breastmilk
CF	complementary feeding (solids, semisolids)
EC	European Commission
EU	European Union
FAO	Food and Agriculture Organization
IBCLC	International Board Certified Lactation Consultant
IBFAN	International Baby Food Action Network
IBLCE	International Board of Lactation Consultant Examiners
IEC	Information, Education, Communication
ILO	International Labour Organization
NHS	National Health System
RCT	Randomised Controlled Trial
VELB	European Association for Lactation Consultants
WHA	World Health Assembly
WHO	World Health Organization
WIC	US Department of Agriculture's Special Supplemental Nutrition Program for Women, Infants and Children

## Executive summary

Interventions for the protection, promotion and support of BF, as any other health care and public health intervention, should ideally be based on evidence of effectiveness. The decision to implement a set of interventions should, however, consider feasibility and cost, in addition to effectiveness. This document contains a comprehensive review of interventions. It takes into consideration, besides controlled studies, reports of successful experiences, because it recognises that many aspects of the protection, promotion and support of BF, in particular those not related to the health care sector, are not amenable to the rigorous evaluation of effectiveness implicit in the concept of evidence-based medicine.

The interventions are categorised under policy and planning; information, education and communication; training; and protection, promotion and support of BF. In each category, interventions are graded by quality of the evidence base for each. Due to the limited information available, it is impossible to accurately estimate feasibility and cost; these may differ in different countries and contexts, depending on economic, social and cultural conditions.

The review emphasises once again the need for standardised monitoring of BF rates. In Europe, such monitoring, when carried out, is currently based on inconsistent definitions and methods, leading to indicators that make comparisons among countries, and sometimes even within countries, very difficult. Standardised methods are needed also for monitoring and evaluation of practices in health and social services, and for the implementation of articles of the International Code of Marketing of Breastmilk Substitutes and subsequent relevant WHA Resolutions.\*

The review also identifies some research needs that the public health scientific community should address with carefully designed intervention studies, using standardised definitions and methods for measuring BF outcomes. In implementing research, it is not possible or ethical to randomly assign mothers to BF or not BF. Also, because most of the BFHI practices have already got a strong evidence base, it would not be ethical to have a control group of babies/mothers whose care is not based on the BFHI's '10 Steps'. The same restraints would apply to randomly assigning some women to receive support services and not others.

The review draws the following conclusions on effective interventions:

- The combination of several evidence-based strategies and interventions within multi-faceted integrated programmes seems to have a synergistic effect.
- Multi-faceted interventions are especially effective when they target initiation rates as well as duration and exclusivity of BF, using a combination of media campaigns, health education programmes adapted to the local situation, comprehensive training of health professionals and necessary changes in national/regional and hospital policies.
- The effectiveness of multi-faceted interventions increases when peer counselling support programmes are included, particularly in relation to exclusivity and duration of BF.
- Interventions spanning the pre- and post-natal periods, including the critical days around childbirth, seem more effective than interventions focussing on a single period. The BFHI is an example of a wide-ranging intervention of proven effectiveness, and its extensive implementation is highly recommended.
- Health sector interventions are especially effective when there is a combined approach, involving the training of staff, the appointment of a BF counsellor or lactation consultant, having written information for staff and clients, and rooming-in.
- The impact of health education interventions targeted at mothers on initiation and duration of

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\* The International Code of Marketing of Breastmilk Substitutes and the subsequent relevant WHA Resolutions are jointly referred to in this document as the International Code.

BF is significant only when current practices are compatible with what is being taught.

- The provision of BF information to prospective parents or new mothers, with no or brief face-to-face interaction (i.e. based on leaflets or telephone support), is less effective than the provision of information with extended face-to-face contact. The use of printed materials alone is the least effective intervention.
- The effectiveness of programmes which expand the BFHI beyond the maternity care setting to include community health care services and/or paediatric hospitals, currently being implemented in some countries, has so far not been evaluated. However, these programmes are based on a combination of initiatives which, on their own, have a sound evidence base.
- The development and enforcement of laws, codes, directives, policies, and recommendations at various levels (national, local) and in various situations (workplace, hospital, community) represent important interventions, but it is currently difficult to gather convincing evidence of their effectiveness (few studies, mainly within multifaceted interventions).
- Workplace interventions are especially effective when mothers have the flexibility to opt for part-time work and have guaranteed job protection along with provisions for workplace BF/lactation breaks. These provisions, whether in response to a legislative requirement or as part of a BF supportive workplace policy, involve time off without loss of pay during the working day to BF or express BM, with suitable facilities being provided by the employer.

Political commitment is crucial for decision-making and the implementation of interventions, regardless of feasibility and cost. Because public health initiatives are by their nature publicly funded their feasibility is generally based on getting the best value for the funding available. Also, an intervention not well evidence-based may still be chosen for implementation if it is considered feasible on the basis of its social and political acceptability, and effective based on the informed opinion of experts. This applies in particular to legislation and general policies not easily amenable to rigorous scientific evaluation, but for which experience gleaned from other public health areas anecdotal evidence, and the received wisdom of experts in the field is predictive of a positive effect on BF rates. Finally, a programme for the protection, promotion and support of BF is not just a list of separate interventions. Interventions are usually multifaceted, interrelated and integrated in order to maximise their combined and cumulative effect. Moreover, the effect will depend on continuity, because a change in the behaviour of mothers, families and health professionals, and of the infant feeding culture in a given society, requires that interventions and programmes be sustained for a sufficient length of time.

## **Introduction**

Following the Project team's analysis of the current situation regarding protection, promotion and support of BF in the participant countries, the next task was to review all possible interventions for the protection, promotion and support of BF. A BF programme, as with any other health care and public health programme, should ideally be built on evidence-based interventions.

The objective of this review, which evaluates the gap between what is being done and what could be done, was to lead toward the drawing up of a Blueprint for Action for Breastfeeding in Europe. Therefore, the review is based on an assessment of the full range of possible BF interventions, graded according to the strength of the supporting evidence. Particular consideration was given to interventions implemented in Europe.

## **Methods**

In its development this document has gone through several drafts prepared by the project team based in Trieste, with revisions and adaptations suggested by members of the Steering Committee and other project participants. The document is not a systematic review, as not all known or potential sources of published and unpublished information was accessed. Also, the methodologies of individual studies were not subjected to the rigour of a meta-analytic process. The conclusions drawn also take into consideration reports of successful experiences, even if these are not backed-up by strict scientific evaluation (Annex 1). This decision was justified by the recognition that many aspects of the protection, promotion and support of BF, in particular those not related to the health care sector, are not amenable to rigorous evaluation of effectiveness inherent in the concept of evidence-based medical care.

In addition to reports on successful experiences, account was taken of the determinants for BF (Annex 2) and of existing systematic and non-systematic reviews already published, as well as relevant randomised and non-randomised (eg. pre- and post-intervention) controlled studies. Non-controlled studies were considered when controlled studies were not available to assess the effectiveness of a known intervention, or when they were rated as relevant. Annex 3 presents in summary format all the research studies consulted in the development of this document, giving the type of study, numbers involved, objectives and main results.

The sources for this review included the Cochrane Library, PubMed, Embase, and Cinahl (Cumulative Index to Nursing and Allied Health Literature) databases, the personal and institutional libraries of the Trieste Research Team, and reports submitted by project participants. The vast majority of journals reports and documents consulted were published in English; however some French, Spanish, Italian and Portuguese reports were also reviewed. Project participants submitted summaries of papers published in German, Czech and Norwegian also. It was not possible to review reports in other languages. Research papers reviewing interventions within Europe and other high-income countries were given precedence under each heading. When available evidence/information from developed countries was lacking, reports from low income countries were taken into consideration.

In evaluating the effectiveness of interventions, priority was given to well-conducted systematic reviews and to large randomised controlled trials, following widely accepted recommendations on levels of evidence (Table). The original categories of level of evidence,<sup>1</sup> which include three sublevels for levels 1 and 2, were condensed because the level assigned in this review derives from the pooling of several studies belonging to different sub-categories. It is important to note that evidence graded as 3 or 4 means that it is derived from observational non-controlled studies and reports. This is frequently the only supporting evidence for interventions not amenable to controlled

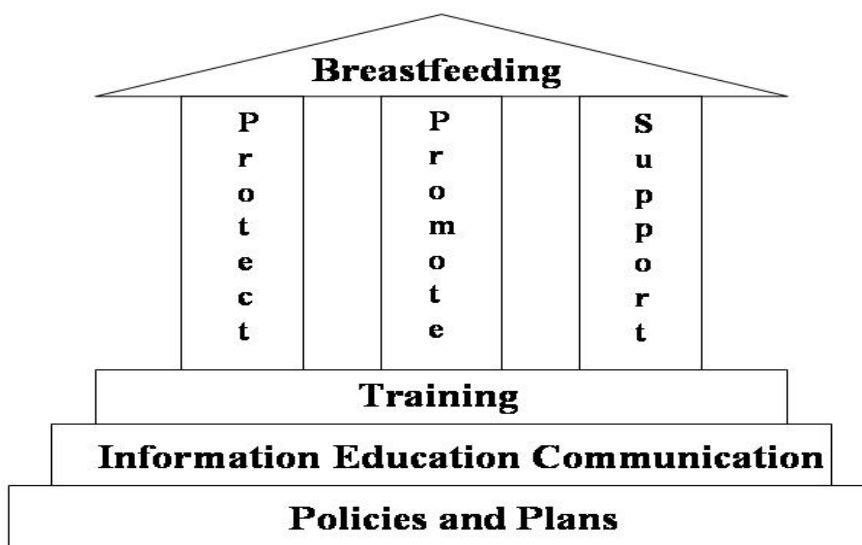
studies, such as implementation of codes, laws and policies.

The main interventions are presented in four chapters under the following headings: 1) policy and planning, 2) information, education and communication, 3) training, and 4) protection, promotion and support of BF. The Figure illustrates the rationale for such a sequence. The reason for the inclusion of an intervention in a particular chapter or section may seem arbitrary, but it was deemed to best reflect their main aim and/or effect of that intervention; it does not preclude the relevance of the intervention to other sections of the document. At the end of each section there is a summary table of the main interventions, along with the pooled estimate of the quality of the evidence base. Chapters on research needs and conclusions complete the document.

Table. Levels of evidence and grades of recommendation (adapted from <sup>1</sup>).

Levels of evidence	
1	Meta-analyses, systematic reviews of RCTs, RCTs
2	Systematic reviews of case-control or cohort studies, case-control or cohort studies
3	Non-analytic studies, e.g. case reports, case series
4	Expert opinion

Figure. The foundations of breastfeeding.



## 1 Policy and planning

The main strategies concern:

1. setting policies;
2. planning activities;
3. monitoring and evaluation.

There is very little evidence available, but some surveys and before-and-after studies help to understand the implications of good policy, planning and monitoring.

### 1.1 Setting policies

Policies on BF have been developed in many countries; more policies are being developed, and old ones are being revised, following the endorsement of the Global Strategy on Infant and Young Child Feeding and the publication of its background papers.<sup>2,3</sup> The effectiveness of these policies has not been assessed and in many cases cannot be assessed in rigorous scientific terms. However, there is wide consensus that the end results will be beneficial for BF, provided the policies are based on good evidence and there is adequate follow-up in terms of planning, implementation, monitoring and evaluation of activities.

Many European countries have national policies; the effects of these, however, have not been assessed. An exception is Ireland, where the National Committee on Breastfeeding, under its Terms of Reference, undertook a review of the Irish National Breastfeeding Policy. This review, which was published in May 2003,<sup>4</sup> showed that the policy was associated with positive impact on BF practices in the health services, in line with the 10 Steps, as well as on the expertise and level of training within some groups of health workers. However, it did not have a major effect on national BF rates. The only other available report from a high-income country comes from Nova Scotia, Canada, where a provincial policy and programme proposed by health professionals, involving access to prenatal classes, nurse follow up after hospital discharge and availability of lactation consultants, led to an increase in initiation of BF.<sup>5</sup>

Other examples of national policies submitted to an assessment of results come from developing countries. In Brazil, a national policy consisting of: 1) training of health professionals; 2) orienting non-professional health workers and peer support groups; 3) promoting the restructuring of health services (e.g. rooming in); 4) the creation of a Brazilian Code based on the International Code; 5) the implementation of legislation protecting working mothers; and 6) the inclusion of BF in primary school programmes, was associated with an increase in BF at discharge and in the mean duration of BF.<sup>6,7</sup> In Kenya, a national policy including: 1) a ban of free supplies of infant formula to hospitals; 2) a directive to promote early BF; 3) full rooming-in; 4) a ban on routine prelacteal and supplemental feeding; 5) modification of hospital routines; 6) the appointment of a national BF officer who organised training nation-wide; and 7) involvement of NGOs, was associated with an improvement in maternity practices and in an increase in policy makers' and maternity staff's knowledge of all aspects of BF.<sup>8</sup> In Honduras, the Proalma Project promoted: 1) changes in health professionals' BF knowledge and practices; 2) changes in hospital policies (early BF, rooming in, no bottles or formula); 3) training of health professionals; 4) support for women (pre-natal and post-partum). Its implementation was associated with a higher median duration of BF.<sup>9</sup>

Intervention	Details of implementation	Level of evidence
Develop national and local policies on infant and young child feeding	Review evidence; write policies; disseminate; monitor implementation	3
Develop national and local policies on protection, promotion and support of BF	Review evidence; write policies; disseminate; monitor implementation	3

## 1.2 Planning activities

A study of planned activities carried out in a region of Italy, that included: 1) a BF reporting system using standard WHO definitions and methods; 2) the inclusion of BF interventions in Regional Health Authority annual plans for 1998 and 1999; 3) the drawing-up of local action plans and targets and the imposition of a financial penalty for Local Health Authorities not achieving stated objectives and targets; showed that the rate of EBF increased significantly between 1998 and 1999 with a corresponding reduction of PBF. The improvement was more significant at hospital discharge, but was still present at 3-4 months of age.<sup>10</sup>

Intervention	Details of implementation	Level of evidence
Develop adequate operational plans for the implementation of the above policies	Set objectives; list activities; ensure resources; deploy staff; monitor	3
Ensure appropriate management of the activities included in the operational plans	Manage human and material resources; assess performance; identify and solve problems	4

## 1.3 Monitoring<sup>†</sup>

Monitoring should be integral to the implementation of all activities to promote, support and protect BF in order to determine their effect on:

1. BF rates (initiation, duration, exclusivity);
2. practices within the health and social services sectors;
3. implementation and enforcement of laws, codes, policies.

In Europe, monitoring, when it is carried out, is frequently based on inconsistent definitions and methods, leading to indicators that make comparisons among countries, and sometimes even within countries, almost impossible. A new document on “Infant and young child feeding: a tool for assessing national practices, policies and programmes” has just been published by WHO and may be useful in future efforts for standardised monitoring and evaluation.<sup>11</sup>

### 1.3.1 Breastfeeding rates

The accuracy of data on the prevalence and duration of BF depends largely on standardised definitions and methods. The WHO recommended the use of such methods in 1991,<sup>12</sup> after a proposal published in 1990.<sup>13</sup> The WHO definitions (see abbreviations on page 2) refer to EBF, PBF, FBF (EBF + PBF), MBF (BF plus other nutritive food and/or fluid, including formula), and NBF; these categories are mutually exclusive (i.e., the sum of EBF, PBF, MBF and NBF for a studied sample or population must be 100%). Moreover, WHO recommends using a 24-hour recall period, as in most nutritional surveys. Another WHO document recommends the extension of the recall period from birth to discharge for the purpose of assessing BF rates at discharge from maternity services.<sup>14</sup>

The WHO definitions and methods have limitations and drawbacks:

- MBF does not differentiate between infants given formula, milk, or other complementary food and fluids, and between infants almost completely breastfed or almost completely formula fed;
- BF at discharge, with a recall period from birth to discharge, does not give due consideration to infants born at home or to the wide variation in length of hospital stays for infants who are

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<sup>†</sup> The tables of this section do not require the level of evidence column because monitoring of interventions is not treated as an intervention in itself in this review.



- born in maternity units;
- there is no definition for initiation of BF (this category is already ill-defined in most reports);
- the 24-hour recall estimate of current feeding status tends to overestimate the lifetime rate of EBF.<sup>15,16</sup>

However, the WHO definitions currently represent the best compromise between accuracy and feasibility for programme monitoring (more accurate definitions would of course be needed for research purposes).

Unfortunately, the WHO definitions and methods are not widely adopted in EU countries. The only published report on prolonged local area monitoring has already been mentioned in 1.2; it shows that the application of the WHO definitions and methods is feasible and useful.<sup>10</sup> Most other published reports fail to accurately represent the real prevalence and duration of BF, or at least do not allow for meaningful comparison with data reported by other studies.<sup>17</sup>

<b>Intervention</b>	<b>Details of implementation</b>
Develop common definitions and methods	Reach consensus; develop guidelines and tools
Set up monitoring systems	Allocate resources; train staff; supervise
Gather and analyse data	Set-up collection systems, determine timeframe, streamline transmission, set up standard tables, monitor accuracy
Report results and act	Identify targets, disseminate, discuss and re-define planning needs as necessary

### 1.3.2 Practices within the health and social services sectors

Implicit in the implementation of the BFHI and the designation of BFHs is the assessment of hospital policies and practices, as well as satisfaction of service-users. Inherent in BFHI is the regular re-assessment of these, hence it also functions as an on-going monitoring and reporting system for hospital practices. National BFHI committees and networks scrutinize policies and practices also, and have their own reporting systems. However, the percentage of BFHs in different European countries varies enormously (from none to 100%). For the BFHI to function effectively as a monitoring process it would need to be applied to all hospitals. Although some national BFHI committees adopt assessment criteria that may differ, comparing BFHI indicators trans-nationally is currently much easier than comparing BF rates. Some countries in Europe have developed a process similar to the BFHI for paediatric units, to assist these units in supporting BF.

Monitoring of practices in non-hospital health care settings is less advanced. Some BFHI committees have designed assessment systems/models for community settings, based on adaptations of the 10 Steps.<sup>18</sup> If these models evaluate positively, it will probably lead to the development of a common set of criteria, definitions and methods for widespread application.

Finally, some monitoring is needed also for changes in practices relating to pre-service training. Such monitoring should take into account curricular content as well as methods of teaching (e.g. duration of modules, interactivity, problem-based, competency/practice-based) and assessment of learning.

<b>Intervention</b>	<b>Details of implementation</b>
Implement the BFHI	Periodically assess hospitals using UNICEF criteria; increase coverage; report
Develop a baby friendly community initiative	Define assessment criteria; identify services to be assessed; pilot test; extend
Monitor pre-service training	Define criteria and indicators; pilot test; extend

### 1.3.3 Implementation and enforcement of laws, codes, policies

National and local governments are responsible for the implementation and independent monitoring of the International Code, national laws, including those on maternity protection, and policies. Manufacturers and distributors of products within the scope of the International Code bear the responsibility to comply with it, monitor their practices, and manufacture products in accordance with relevant Codex Alimentarius standards, as well as updated scientific recommendations on the composition of BM substitutes. NGOs and associations, including professional associations relevant to, or with an interest in BF may also set up monitoring systems on laws, codes and policies. Professional associations are also responsible for monitoring quality of care.

<b>Intervention</b>	<b>Details of implementation</b>
Monitoring by governments	Define criteria, develop tools, ensure resources, implement, act upon results
Monitoring by manufacturers and distributors of products within the scope of the International Code	Monitor compliance with the International Code at all levels; act upon results; independent audit
Monitoring by NGOs and professional associations	Define criteria, develop tools, implement, report
Monitoring of International Code compliance in health services and the community	Set up a system to monitor compliance and prosecute violations to the International Code

## 2. Information/education/communication (IEC)

The three main strategies are:

1. IEC activities for individuals (or small groups);
2. IEC activities for communities and populations;
3. basic general education.

IEC strategies are rarely carried out as single interventions; they are usually included in multifaceted programmes for the protection, promotion and support of BF. As such, some IEC activities are discussed also in others chapters.

### 2.1 IEC activities for individuals

Two systematic reviews identified a large number of studies on health education, including media campaigns and multifaceted interventions.<sup>19,20</sup> Specific BF health education programmes seem to produce significantly better outcomes, in terms of initiation and duration of BF, when compared to routine or standard pre- and post-natal care, with no significant difference between education activities for individuals and for small groups. Multifaceted interventions produce better outcomes. Other studies, not included in the systematic reviews, report different results. In some studies, no significant difference in BF rates was registered between structured BF education and conventional postpartum care,<sup>21-23</sup> while others reported a significant difference.<sup>24-29</sup> Advice, together with videos and leaflets, produced increased BF knowledge in mothers and fathers in Brazil; mothers with a better knowledge had a 6.5 times higher chance of EBF at three months.<sup>30</sup> The use of printed material alone, such as information booklets given to mothers, showed no effect.<sup>31-34</sup> The “Best Start” educational programme yielded significant results in low income mothers aged 19 years or less.<sup>35</sup>

According to a systematic review, IEC to pregnant women and mothers was especially effective when.<sup>36</sup>

- the provision of IEC in groups or to individuals spanned the pre- to post-natal period;
- intensive approaches were used, involving multiple contacts with peer counsellors or health

professionals;

- IEC was provided at the normal pre- and post-natal care visits, as opposed to additional visits;
- IEC was BF-specific, as opposed to part of a multiple health promotion programme.

Common features for successful interventions were:

- consistency in advice and support;
- personal support from a knowledgeable individual;
- well designed information;
- more intensive, one-to-one interventions for women intending not to BF.

Intervention	Details of implementation	Level of evidence
Integrate BF-specific IEC into routine pre- and post-natal care (multiple contacts)	Develop well designed materials; train health professionals; ensure consistency	1
Ensure more intensive, one-to-one IEC to women intending not to BF	Identify women; make individual IEC and support plans	3

## 2.2 IEC activities for communities

There is very little published information on the knowledge of and attitudes to BF of the general population in European countries; even less on how to improve them. Yet a good knowledge and a positive attitude are probably required for an informed decision. The limited information that is available on effectiveness of IEC interventions comes from outside Europe, for example:

- Adolescent female students exposed to a BF campaign in South Korea showed more positive attitudes towards BF and expressed a higher rate of intention to BF compared to adolescents not exposed to the intervention.<sup>37</sup>
- In South Africa, a nutrition education intervention programme undertaken at village level by trained local women showed positive results in terms of subsequent initiation of BF, when compared with women in a control group of villages.<sup>38</sup>

However, other multifaceted nutrition education interventions carried out by health workers had no effect on BF rates.<sup>39,40</sup>

Fathers and partners can play an important role in the decision to BF and on its duration. If adequately informed, they are more likely to encourage and respect their partner's decision to BF, and offer appropriate support to overcome problems if they arise.<sup>20,41,42</sup> Pregnant women's expectation of the fathers' attitude is a powerful predictor of their intention to BF.<sup>20,43</sup> Improving the knowledge and attitude of fathers may therefore prove to be an effective intervention.

Media campaigns may be useful to introduce people to new ideas, support and reinforce those ideas, when used as part of broader based initiatives and to promote existing programmes. Two systematic reviews considered the effect of IEC via media campaigns and multi-faceted programmes.<sup>19,20</sup>

These reviews showed that television campaigns seem to produce better attitudes towards BF, while newspaper advertisements seem to have no effect. National media campaigns showed a positive effect only among women in higher income groups, while locally developed media campaigns are more likely to increase BF initiation rates among women of all incomes. Media campaigns were found to be especially effective when they were part of multi-faceted programmes and when hospital-based and local media, as opposed to national media, were used for increasing the initiation of BF. It is commonly believed that the use of the media in health promotion may be especially effective when trying to increase awareness among "agenda-setting" decisions-makers.

Since 1992, WABA's World Breastfeeding Week is celebrated annually in many countries. It provides an opportunity for the distribution of good information to the public on different themes related to the protection, promotion and support of BF. Unfortunately, no published evaluation of its

effectiveness exists.

Improving the cultural representation of BF (e.g. by avoiding/preventing the use of the ‘baby bottle’ as the symbol denoting infant feeding, and monitoring good and bad practices) can remove some discrimination against BF and can positively influence public awareness. A study carried out in the UK analysed how BF and bottle feeding are represented by the British media in television programmes and newspaper articles and described how bottle feeding was shown more often than BF and presented as less problematic. Bottle feeding was associated with ordinary families whereas BF was associated with middle class or celebrity women.<sup>44</sup> The appreciation of motherhood by society can influence the success of BF at 3 months.<sup>45</sup>

<b>Intervention</b>	<b>Details of implementation</b>	<b>Level of evidence</b>
National and local policies that foster the delivery of appropriate information	Develop and disseminate national and local policies and recommendations	3
BF included in nutrition education programmes	Revise contents, curricula and materials; train personnel	3
Develop media campaigns (local and national) as part of multi-faceted programmes	Develop well designed messages; pilot test and disseminate; assess coverage and understanding	1
Appropriate information addressed to groups less likely to BF	Identify groups; adapt materials; deliver information	3
Appropriate information addressed to fathers and partners	Adapt materials and deliver the information	3
Target media campaigns to decision-makers	Identify targets; develop and disseminate well-designed messages	4
Improve the cultural representation of BF	Disseminate policies to media; monitor results	4

### 2.3 Basic general education

The school system needs to be highlighted as a potentially good setting to influence attitudes in favour of BF. Promoting BF in schools has the potential of reaching all children, their teachers and indirectly the children’s extended families with the possibility of bringing about a whole cultural change favouring BF. There are, however, no systematic reviews regarding BF promotion in this setting. In the US an interesting intervention tool has been developed by the New York State Department of Health. It has produced a BF education pack aimed at children from kindergarten to level 9-12 and requires teachers to incorporate aspects of the pack’s material in their daily tuition programme.<sup>46</sup> No information on the effect of this intervention is available as yet. A systematic review of the effectiveness of health promotion in schools in general has been published by the NHS Health Technology Assessment programme in the UK. It shows that health promotion activities in schools can have a positive impact on behaviour, but it does not specifically address BF.<sup>47</sup>

<b>Intervention</b>	<b>Details of implementation</b>	<b>Level of evidence</b>
Integrate BF into current health promotion programmes; portray BF as the norm for infant feeding	Develop curricula and teaching tools; revise textbooks; train teachers; assess results	4

### 3. Training

The key strategies for training of health professionals in BF mainly relate to:

1. pre-service training (undergraduate and postgraduate);
2. in-service training.

#### 3.1 Pre-service training

This refers to the contents and methods used in undergraduate and postgraduate education for all kinds of health and allied professionals dealing with BF. Several studies suggest that current pre-service training does not result in health professionals having sufficient competence to effectively support BF. For example, paediatric residents' training, when evaluated, showed an over reliance on the didactic approach to learning and had an inadequate or limited clinical practice component.<sup>48-50</sup>

In the Netherlands, a study examined the BF component in the education of maternity nurses, general nurses, midwives and medical doctors.<sup>51</sup> Midwifery schools spent the most time on BF (average time 36 hours, median time 23 hours), medical schools the least (average time 1,8 hours and median time 1.5). In 38% of these schools/colleges, information materials from infant formula companies were used for teaching purposes, while 24% invited a guest speaker from these companies to give presentations to their students.

The same Dutch study evaluated the adequacy of 17 books on BF. Only 4 books covered most aspects of BF, 11 books gave very limited information and 6 books gave inappropriate guidelines that could negatively influence the success of BF. In 4 books brands of formula were named and in one book a large picture showed several types of formulae with the brand names clearly displayed. In 1993, WHO and IBFAN (unpublished) evaluated the quality of the BF information in 180 textbooks used in medical schools in over 90 countries, scoring the books on a scale of 0 to 1. The results ranged from 0.04 to 0.76, with only four books receiving a score of 0.5 or more. The practical management of BF received much less attention than theoretical aspects of lactation and how problems might arise. Thus, while the contents of these books might convince readers of the value of human milk, they are unlikely to learn from them the skills necessary to help mothers BF.

Unfortunately, there are very few reported audits of effective interventions in under-graduate and post-graduate training. A 4-day multimedia BF educational intervention directed at 49 resident paediatricians in the USA resulted in increased knowledge scores and management skills.<sup>52</sup> Good results in terms of clinical diagnostic skills were obtained by an interactive, problem-based workshop to teach the basics of BF management to family medicine residents, who were given the opportunity to work with a lactation consultant.<sup>53</sup> A well known programme for changes in pre-service curricula is the one developed by Wellstart International,<sup>54</sup> but there is no published evidence of the effects of its implementation. A lack of reported evidence for the effectiveness of BF educational programmes, does not mean there is a shortage of such programmes. In fact there are a large number of different BF educational courses and materials available. These include Internet courses, as well as numerous courses developed by universities, professional associations, BF support groups, etc, mostly aimed at providing in-service training.

<b>Intervention</b>	<b>Details of implementation</b>	<b>Level of evidence</b>
Revise contents and methods of training in all health sciences undergraduate and postgraduate schools	Make BF a compulsory subject; develop adequate training materials; increase duration and quality of BF courses; provide problem-solving and competency-based interactive training; train trainers; assess competency and results	3

### 3.2 In-service training

Since many health professionals appear to have insufficient knowledge and clinical practice skills on BF at graduation, efforts have been made to develop and implement competency-based in-service training modules. These have been evaluated in several studies and in a systematic review.<sup>19</sup> In-service training using the UNICEF/WHO 18-hour course on BF management<sup>55</sup> appears to be effective. For example, a study carried out in eight Italian hospitals, showed increased compliance with the 10 Steps, increased health professional knowledge scores, increased EBF and ABF rates at discharge and at 3 and 6 months following the provision of such a course.<sup>56</sup> In Belarus, the same course was used to train the participants in the PROBIT trial, a large cluster randomised trial, which showed a positive effect on a BF promotion programme modelled on the BFHI.<sup>57</sup> In the UK an intervention, using an adapted version of the same course, resulted in improved knowledge scores in a group of midwives two weeks after the course was undertaken.<sup>58</sup> Similar results were obtained in Chile.<sup>59</sup> In Brazil, a study showed the effectiveness of the WHO/UNICEF 40-hour course on BF counselling<sup>60</sup> in terms of improved professional knowledge scores and health professional counselling skills;<sup>61</sup> these changes also led to improvements in BF-related hospital routines.<sup>62</sup> Other courses have been conducted for many years, but were not evaluated in terms of effectiveness.<sup>63,64</sup>

As the 200-hour exam accredited IBCLC courses, offered by VELB in Germany, Austria, Switzerland, France and by other bodies elsewhere, are based on the WHO/UNICEF courses, these can also be considered excellent models of in-service BF training and continuing education. In the last 10 years, the course offered by VELB has been undertaken by 1500 non-native English speaking health professionals in Europe as an alternative to BF and lactation courses in the English language. Participants undertake these courses primarily as continuing education and to achieve the globally recognised IBCLC qualification. IBLCE, as the examining body, is independent of other continuing education course providers and accrediting bodies. However, the very high standard of scientifically-based knowledge and clinical competence required to achieve and maintain an IBCLC qualification is universally recognised. Hospitals and other service providers utilising the expertise of IBCLC qualified staff have seen increases in BF rates, decreased cost and improved patient satisfaction among mothers of both full-term<sup>39</sup> and pre-term infants.<sup>65</sup>

Intervention	Details of implementation	Level of evidence
Conduct in-service training using existing or adapted effective courses	Identify participants; plan, organise and conduct courses; assess competency and results	1

### 4. Protection, promotion and support

The main strategies for the protection, promotion and support of BF during pregnancy, birth and in the immediate postnatal period, as well as following discharge (in the case of hospital births) and for the duration of BF are:

1. the implementation of the Global Strategy on Infant and Young Child Feeding;
2. the implementation of the International Code;
3. the implementation of the ILO Maternity Protection Convention;
4. the Baby Friendly Hospital Initiative;
5. support by trained health professionals;
6. support by trained peer counsellors;
7. support in the family, community and workplace.

BF, or rather BM, should also be protected from potential and actual contamination by environmental chemicals. BM is often chosen to study environmental chemical contamination

because it can be obtained easily and inexpensively, not because researchers look for an association between exposure to contaminants via BM and infant health. The results of studies showing the presence of environmental chemicals in BM often hit the headlines and discourage BF.<sup>66</sup> Though it is true that BM can contain environmental chemicals that are stored in body fats,<sup>67</sup> this does not necessarily mean that mothers should refrain from BF.<sup>68</sup> Firstly because there is no firm evidence that the average levels of chemical contaminants present in BM are associated with damage to the infant.<sup>69</sup> Secondly, because the most potentially damaging exposure to environmental contaminants will probably occur while the baby is in utero.<sup>70</sup> Thirdly because there is some evidence that BF could actually be protective in heavily contaminated environments.<sup>71</sup> The best protection of BF and maternal and child health from chemical contamination will be achieved through the overall protection of the environment, and in particular of the whole food chain by measures addressing the source.<sup>72</sup> Levels of chemical residues in BM can be and have been used to monitor environmental chemical contamination and could support campaigns for reductions or elimination of emissions, thereby aiding primary prevention.<sup>73</sup> These reports, however, should not be used in the media to alarm mothers and to favour bottle feeding. It is also important to avoid undue focus on BM in monitoring environmental chemical contamination and to develop alternative monitoring methods that involve both father and mother, as more scientific evidence highlights the potential role of male mediated developmental toxicity.<sup>74</sup>

#### **4.1 The Global Strategy on Infant and Young Child Feeding**

On 18 May 2002, the 55<sup>th</sup> WHA adopted the Global Strategy on Infant and Young Child Feeding.<sup>3</sup> The Global Strategy is a guide to country-specific improvements in feeding practices. It strongly reaffirms commitments to the implementation of the Innocenti Declaration, including the International Code and the BFHI. It clearly defines optimal feeding as EBF for the first six months of life,<sup>2</sup> with BF continuing thereafter, in combination with timely, suitably nutritious, safe and properly fed complementary foods for up to two years of age or beyond. The Global Strategy, unanimously endorsed by all Member States of WHO, states that Governments carry the primary obligation to formulate, implement, monitor, and evaluate and adequately fund national policies and plans. But it recognizes also that success in the implementation of effective interventions will be achieved only with the full cooperation of relevant international organizations, health professional bodies, employers, educational authorities, the mass media, and the NGOs, including community-based support groups. Finally the Global Strategy assigns to commercial enterprises the responsibility to ensure “that their conduct at every level conforms to the International Code, subsequent relevant WHA resolutions, and national measures that have been adopted to give effect to both”.

As the Global Strategy is relatively new (at time of writing), there are no studies or reports available on interventions to implement it. Already in place and consistent with the Global Strategy are WHO/EURO guidelines on feeding and nutrition of infants and young children, with emphasis on Eastern Europe,<sup>75</sup> and based on this, an action plan has been drawn up for a food and nutrition policy in the European Region of WHO.<sup>76</sup> The implementation of the Global Strategy through national policies and recommendations should have beneficial effects on BF rates and infant and child health. The project document “Protection, promotion and support of breastfeeding in Europe: current situation” outlines what is already being done in some EU, accession and candidate countries. Some countries, are already adapting their policies in line with the Global Strategy, at a least as far as recommending EBF for six months is concerned.

<b>Intervention</b>	<b>Details of implementation</b>	<b>Level of evidence</b>
Policies and recommendations on EBF for 6 months and continuation of BF for up to two years of age or beyond, or as long as mother and child wish	Develop and disseminate national policies and recommendations to health workers and the public	3
Policies and recommendations on timely and adequate CF from the 7 <sup>th</sup> month (including labelling of industry made complementary food)	Develop and disseminate national policies and recommendations to health workers and the public; apply revised legislation on labelling	3

## **4.2 The International Code of Marketing of Breastmilk Substitutes**

Studies on compliance/non-compliance with the International Code show that violations by manufacturers and distributors of products within the scope of the International Code are widespread and systematic. A study carried out in four countries (Bangladesh, Poland, South Africa and Thailand) showed that in these countries 8% to 50% of health facilities received and accepted free samples of milk formula; 2% to 18% of health workers received and accepted gifts from companies; in 15% to 56% of health facilities information that violated the International Code had been provided by companies and was available to staff.<sup>77</sup> Similar results were found in a more recent study carried out in Benin and Burkina Faso.<sup>78</sup> Reports published by IBFAN, entitled “Breaking the rules, stretching the rules 1998”<sup>79</sup> and “Breaking the rules, stretching the rules 2001”,<sup>80</sup> despite being less methodologically rigorous in terms of sampling (they are as rigorous as the above-mentioned studies as far as defining a violation is concerned), show similar levels of International Code violations in 45 countries including, in Europe, Croatia, Germany, Italy, Russia and Spain.

There are no population-based controlled studies on the effectiveness of strict enforcement of the International Code on BF rates. Comprehensive multifaceted interventions involving specific components related to strict compliance with the International Code through policies and recommendations, e.g. creation of a national code or legislation based on the International Code and its enforcement;<sup>6,7</sup> banning of free and low cost supplies of infant formula and stopping the use of routine prelacteal/supplemental feeding,<sup>8</sup> have resulted in better BF rates. Because initiatives addressing the International Code have not occurred in isolation from other components of multifaceted interventions it is difficult to accurately estimate their effect.

A recently published document reports on case studies from different countries.<sup>81</sup> Case reports from India and Brazil show the best outcomes in terms of compliance with the International Code, which is probably the result of the International Code’s strong legal backing and its rigorous enforcement in these countries. The worst case study results are reported from Kenya, Mexico and Bolivia, countries that rely on voluntary codes of conduct agreed with industry. Whilst intermediate results are reported from two EU countries, Belgium and England, both with policies derived from EU marketing regulations, which are considerably weaker than the International Code. The weak legislation in these two countries, along with the low allocation of resources for monitoring and enforcement, as well as the entrenched bottle-feeding cultures prevalent there, which have existed over a number of generations, have probably been re-enforced by the persistent marketing of BM substitutes. These factors together may have contributed to the low BF rates in these and other countries and may have led to difficulties in implementing programmes aimed at increasing the initiation and duration of BF.

An obstacle to the protection of BF in some countries is the policy of distributing free infant



formula to deprived groups in society, such as impoverished indigenous families and asylum seekers in both refugee camps and direct provision accommodation centres.<sup>82-85</sup> In addition to free and low cost formula milk schemes provided by public and private organisations, breaches of the International Code are regularly found in information leaflets, free telephone advice and websites aimed at parents and expectant parents, in the sponsorship/involvement of infant food manufacturers in the training of health workers, and in the distribution and display of marketing materials such as posters, calendars, pens, mugs etc. in health services, all of which discriminate against BF.

<b>Intervention</b>	<b>Details of implementation</b>	<b>Level of evidence</b>
EU and national legislation putting all provisions of the International Code into effect	Revise current EU Directives and national legislation	3
Dissemination of information in health services and the community	Inform health workers and the public through appropriate training and media	3
Implementation of the International Code at all levels and by all actors	Enforce compliance with the International Code and prosecute violations	3
Progressive discontinuation of free formula distribution to deprived groups	Develop alternative BF supportive policy for these groups	4

### **4.3 The ILO Maternity Protection Convention**

Longer maternity leave, flexible working hours, part time, and workplace BF/lactation breaks to either return home to BF, BF in the workplace crèche, have the child brought to work to BF, or facilitating BM expression at work, all seem to be effective practices for the protection of BF in the workplace.<sup>6,7,86</sup> Specific workplace arrangements (facilities for BF/lactation breaks, e.g. private accessible room with comfortable chair, hand washing facilities, fridge, power point and electric pump to express/store BM, paid time off during working day and/or longer maternity leave) are associated with longer duration of BF among working mothers.<sup>86-88</sup> Employers and workers can identify, through questionnaires and interviews, problems, protective factors and strategies for improving BF in the workplace, as well as potential workplace hazards for pregnant and BF mothers (e.g. army servicewomen, biological or chemical industries).<sup>87-96</sup>

<b>Intervention</b>	<b>Details of implementation</b>	<b>Level of evidence</b>
Paid maternity leave for 6 months after birth	Revise national legislation	3
Flexible hours/part time for working mothers who continue to BF after 6 months	Revise legislation and labour agreements	3
Paid BF breaks upon return to work	Revise legislation and labour agreements	3
Facilities for expressing and storing BM	Advise and support employers	3
Monitoring of compliance with ILO convention and national legislation	Set up a system to monitor compliance and prosecute violations	4
Dissemination of information to employers, health services and the community	Inform health workers, trade unions, employers and the public through appropriate training and media	4

#### 4.4 The Baby Friendly Hospital Initiative

WHO has published a review on the evidence available for the 10 Steps.<sup>97</sup> This is not, however, a systematic review, as there are no details on the search strategy and no inclusion criteria. Nevertheless, it provides strong support for the implementation of most of the 10 Steps, and this supporting evidence is confirmed by more systematic reviews and by other subsequent evidence, as detailed below.

The BFHI as a whole leads to increased knowledge of mothers and health workers, and to increased rates of initiation and duration of BF.<sup>19,56,57,98-102</sup> In Belarus, a cluster randomised trial (the PROBIT trial) was carried out to assess the effects of BF promotion modelled on the BFHI. Sixteen intervention and 15 control hospitals were selected within the designated catchment area. Results showed that infants born in the intervention hospitals were significantly more likely to be breastfed at 12 months, were more likely to be exclusively breastfed at 3 and 6 months, and had a reduction in the risk of gastrointestinal infections.<sup>57,103</sup> Similar positive results are reported by other controlled studies carried out in Italy and the USA.<sup>56,104</sup> In Germany, hospitals with a high BF promotion index (more than 5 out of 10 Steps implemented) showed a significant association with higher FBF at 4 and 6 months.<sup>105,106</sup> BFHs in Scotland have increased their BF rate at 7 days by 8.1% over an 8-year period, compared with a rise of just 2.2% among hospitals without a Baby Friendly award. BF rates in maternity units with a BFHI Certificate of Commitment rose by 6.1% over the same period. An analysis of BF rate information on the Metabolic Screening (Guthrie) cards of 131,759 babies born in 1990-91 and of 118,055 born in 1997-98 found that the level of participation by hospitals in the UNICEF/UK BFHI was associated with a significant increase in BF rates.<sup>107</sup>

Concerning each of the 10 Steps, informal, small group, interactive and discursive BF education sessions during antenatal care, with or without the use of supporting literature, result in higher BF initiation and duration rates in women of all income groups and minority ethnic groups.<sup>19,32,33,108</sup> In Australia antenatal education sessions on positioning and attachment of the baby to the breast, resulted in increased rates of BF at 6 weeks post-natally and reduced nipple pain and trauma.<sup>109</sup> Other antenatal programmes aimed at groups less likely to BF showed good results in term of BF rates.<sup>110,111</sup>

Early BF, usually within one hour after birth, does not lead to longer BF duration when compared to first BF delayed 4 to 6 hours, i.e. the typical time lag after a caesarean section, according to a Cochrane systematic review.<sup>112</sup> But early skin-to-skin contact, often associated with the first BF, was found to be effective for longer BF in another Cochrane review,<sup>113</sup> in a non-systematic review,<sup>99</sup> and, more recently, in a prospective cohort study.<sup>114</sup> Two Cochrane systematic reviews show that competent initial help soon after birth leads to increased prevalence and duration of BF,<sup>115</sup> and that BF on demand is associated with longer and less complicated BF.<sup>116</sup> There is no strong evidence that rooming-in on its own influences the type and duration of BF, except for the above-mentioned non-systematic review.<sup>99</sup> Rooming-in is, however, an obvious requirement for BF on demand.

The two most controversial Steps of the BFHI are those related to the routine use of supplements (formula and/or glucose water), and the use of teats and pacifiers. A RCT on supplements conducted in Spain concludes that not giving glucose water supplements in the first days of life increases the probability of successful BF; it did not consider, however, the use of formula supplements.<sup>117</sup> An RCT on the effect of teats carried out in Switzerland shows no difference in BF between two groups of newborn infants given glucose water with a bottle and teat or with a cup.<sup>118</sup> The use of pacifiers was studied in two recent RCTs. In Canada, the use of a pacifier was not associated with differences in BF at 3 months using intention-to-treat analysis, though it was considered a sign of BF difficulties when pacifier use was analysed ignoring the randomised

allocation.<sup>119</sup> Conversely, in a US, the use of a pacifier was shown to have a detrimental effect on both EBF and ABF.<sup>120</sup> An RCT carried out also in the US on preterm infants (1000 to 2500g at birth) showed that nasogastric tube supplementation during transition to oral feedings increases the likelihood of BF at discharge and up to six months when compared with using a bottle and teat.<sup>121</sup>

In addition to the 10 Steps to Successful Breastfeeding, BFHs are required to comply with the International Code. A number of studies analysing the effects of commercial hospital discharge packs, some containing samples of breastmilk substitutes, some just printed promotional materials, show a detrimental effect on initiation and duration of BF:

- the distribution of commercial hospital discharge packs to new mothers reduces the rates of EBF at 0-2 and 8-10 weeks of age;<sup>122</sup>
- women who receive formula company packs at the first prenatal visit are more likely to either cease BF before hospital discharge or before 2 weeks;<sup>123</sup>
- commercial discharge packs have a detrimental effect on FBF at 1 month and on ABF at 4 months.<sup>99</sup>

<b>Intervention</b>	<b>Details of implementation</b>	<b>Level of evidence</b>
Implement the BFHI	Revise hospital policies, train staff, change routines, create BF supportive environment, inform pregnant women	1
Full access to antenatal care consistent with relevant provisions of the BFHI	Develop or revise antenatal care guidelines; change practices; ensure full access	2
Informal antenatal education in small homogeneous groups	Train health professionals, develop materials	2
Help mothers to start BF soon after birth (if possible within one hour)	Revise policy, change routines, create environment, inform pregnant women	2
Have skilled help available and actively offered during the first BF	Specific training of staff on positioning and attachment, expression of BM, and counselling; change routines	1
No supplementation of formula and/or glucose water (unless medically indicated)	Revise policy, change routines, create environment, inform mothers	2
Rooming-in (mother and baby in the same room 24 hours)	Revise policy, create environment, inform mothers	3
BF on demand (as opposed to scheduled BF)	Revise policy, change routines, create environment, inform mothers	1
No use of teats or pacifiers until BF is well established	Revise policy, change routines, create environment, inform mothers	2
Policy on implementation of the International Code	Develop a written policy; inform the public	2
Ban free samples of BM substitutes	Apply written policy	2
No commercial packs at prenatal visits or at discharge	Apply written policy	1

#### **4.5 Support by trained health professionals**

Good BF supportive practices in the health services mainly depend on competent individual support by trained health professionals. The positive outcomes of this have been described in a number of studies, in different settings using different designs. A variety of methods have been evaluated: hospital support, contact in clinics, home visits, telephone support, individual or small group support.

A Cochrane systematic review shows that there is clear evidence of the effectiveness of extra professional support, in addition to routine maternity care, in prolonging ABF, although the strength of this effect on the rate of EBF is uncertain; face-to-face support appears to be more effective than telephone support.<sup>115</sup> There is no evidence to suggest that the duration of BF is improved by antenatal contact that does not specifically address the promotion of BF. Two other systematic reviews identified home visits, individual consultations, group sessions, phone calls, a combination of two or more of these and the distribution of printed information materials as the most frequently adopted strategies.<sup>32,33</sup> Group sessions, one-to-one sessions during pregnancy and/or postnatally, either in the expectant mother's/new mother's own home or in the maternity care centre, or different combinations of these were all identified as effective strategies. Interventions in the prenatal period or spanning both periods were generally more effective than interventions conducted during the postnatal phase alone. The combination of effective strategies seems to produce a synergistic effect. However, the impact of interventions on BF duration was shown to be negligible when practices did not correspond with information given.

Other studies, not included in the above-mentioned reviews, suggest that competent professional support may prolong the duration of BF.<sup>32,33,115,124,124,125,125-127</sup> Some other interventions are mainly focused on “non-professional” psycho-social support provided by a female companion during labour, delivery and the immediate post-partum period (doula),<sup>128-130</sup> and on social support, in the form of 24-hour contact telephone numbers and a programme of home visits in pregnancy, provided by midwives to socially disadvantaged women.<sup>131</sup>

The Best Start educational programme in the USA has developed a multifaceted strategy to promote BF in hospitals and in the community which includes: 1) training of health professionals; 2) educational material made available in the maternity ward; 3) placing of a BF checklist in the medical chart of each prenatal patient for each prenatal visit; 4) lactation nurse available during the first days of hospital stay; 5) telephone follow up by a lactation specialist; 6) home visits (only for low income mothers); 7) lactation clinics for mothers with BF problems. This kind of intervention produced a statistically significant increase in BF rates.<sup>35</sup>

Women submitted to epidural analgesia during labour may need additional professional support. Analgesia during labour may in fact interfere with the spontaneous breast seeking and breastfeeding behaviour of the newborn infant (a significantly lower proportion of infants touch the nipple with their hands before suckling, make licking movements, and suck the breast compared with infants not exposed to analgesia) and may increase the newborn's temperature and crying;<sup>132,133</sup> it may thus have a negative impact on BF in the first 24 hours of life.<sup>134</sup> Epidural analgesia is also associated with a lower rate of spontaneous vaginal delivery, a higher rate of instrumental vaginal delivery and longer labour, particularly in nulliparous women. Women receiving epidural analgesia are also more likely to have intrapartum fever and their infants are more likely to be evaluated and treated for suspected sepsis.<sup>135</sup> Despite these effects, epidural analgesia does not seem to affect BF rates at discharge and at 6-8 weeks postpartum.<sup>133,136,137</sup>

<b>Intervention</b>	<b>Details of implementation</b>	<b>Level of evidence</b>
BF trained health professionals easily available and accessible in health care systems	Identify and train health professionals in all health care facilities; improve access	1
Individual face-to-face counselling and support by trained health professionals (with BF checklist) actively offered to all mothers	Develop standards and materials; train health professionals; offer a wide range of in-house, home and community forms of individual support	1

## 4.6 Support by trained peer counsellors

One of the Cochrane systematic reviews mentioned above also shows that lay support is effective in promoting EBF, although the strength of this effect on the rate of ABF is uncertain.<sup>115</sup> Lay support in the community is usually delivered by volunteer mothers who have breastfed themselves and have received some training in peer counselling. The type, contents and duration of training varies across countries and programmes. Voluntary mother-to-mother individual or group support, when the supporting mother is not trained, is very common in some countries and is rapidly spreading, but has not so far been subjected to a formal assessment of effectiveness. Sometimes peer counsellors work as part of a team alongside health workers, within public health and nutrition programmes. More often, however, peer counselling organizations are set up and operate, including training, on their own initiative. Peer support programmes appear to be effective in increasing both initiation and duration of BF, especially in low income populations.<sup>19</sup>

Peer support programmes have been established in different settings, using a variety of methods:

- postnatal telephone-based support;<sup>138</sup>
- home visits during pregnancy and early post-partum;<sup>139-141</sup>
- hospital and home visits plus telephone support by a community health nurse/peer counsellor team for 6 months after delivery;<sup>125</sup>
- prenatal support by a community health nurse and implementation of a postpartum peer counsellor programme;<sup>124</sup>
- bedside hospital postnatal counselling by a trained counsellor and telephone calls;<sup>142</sup>
- antenatal health and BF education by trained volunteers;<sup>143</sup>
- support by community based women who received 1-week training on key mother and child health problems, including BF.<sup>144</sup>

Some peer support programmes are specifically aimed at low income women.<sup>19,113,140,145-152</sup>

In all the above-mentioned examples, peer support programmes seem to be particularly effective when they are used to support women who were more motivated to BF and it was successful in increasing the duration and exclusivity of BF for these women. The only exception is a recently published UK-based RCT; which found that providing peer support did not significantly increase ABF at six weeks.<sup>153</sup> However, the study sample, including the intervention group receiving peer support, had a higher than average rate of BF compared with the population as a whole. Also, postpartum, the peer counsellors had very little contact with the 336 mothers in the intervention group (20% at least one home visit, 43% just telephone contact, 38% no contact at all).

Community programmes targeting pregnant women seem to contribute to the promotion of BF. They generally involve peer support before and after the baby is born. The WIC programme in the USA is an example. WIC is a federally funded nutrition programme targeted at low income pregnant and BF women, and at infants and children up to 5 years of age. WIC services include nutrition education, the encouragement of BF as well as distribution of iron-fortified formulae for artificially fed infants. The promotion of BF in the WIC programme became federally mandated in the USA in 1991. Since then, BF education and peer counselling have become an integral part of WIC.<sup>146,147,149,151,152</sup> In some cases, institutional changes have been implemented (i.e. appointment of a state BF co-ordinator, hospital practice changes, guidelines implemented).<sup>145</sup> Overall, studies suggest positive results in both initiation and duration of BF. The unique nature and setting of the WIC programme limits the possibilities of comparisons with other welfare programmes and their replication in different settings.

<b>Intervention</b>	<b>Details of implementation</b>	<b>Level of evidence</b>
Identification and training of peer counsellors	Develop training material and methods; offer and organise courses	1
Individual counselling and support by a trained peer counsellor actively offered to all mothers (not necessarily in health care facilities)	Identify and train peer counsellors, advertise, keep links with health care services, offer a wide range of in-house, home and community forms of support	1
Integration of professional and peer support for consistency of approach	Inform all mothers of available BF support; maintain links with peer counsellors	1

#### **4.7 Support in the family, community and workplace**

The importance of the support of fathers and partners has already been discussed. Evidence of the relative importance of other family members in promoting and supporting BF is not available. However, some experts have identified the expectant or new mother's own mother as exercising a powerful influence. It is postulated that this influence can be positive or negative, depending on the latter's own infant feeding experiences. For the same reason, other women may also be a positive or negative influence, whether these be within the mother's kinship or friendship network. However, as previously stated, the effectiveness of mother-to-mother individual or group support, offered by mothers who have not received any training apart from the experience of having breastfed their own children, acting as companions and role models, has not, so far, been assessed.

Evidence shows that support to working mothers through counselling on how to maintain lactation while working, clinical follow up, distribution of information kits and support in the workplace, increases BF duration and EBF rates.<sup>154-156</sup> For specific workplace provisions and their association with higher BF rates among working mothers see 4.3 above.<sup>86-88</sup> Expression of BM seems to be the most effective intervention to maintain lactation among working mothers.<sup>86-88,90,93,94,96</sup>

<b>Intervention</b>	<b>Details of implementation</b>	<b>Level of evidence</b>
Development of information programmes specifically addressing the needs of fathers and partners	Select and adapt information; disseminate in various ways	3
Involvement of fathers, partners and other family members in BF support	Actively involve in antenatal and postnatal support activities	3
Counselling on how to maintain lactation and special follow up for working mothers	Identify working mothers' needs; provide special services	3
Arrangements for BF breaks and/or facilities for expressing and storing BM	Foster employers' support; develop information kits	3

#### **Research needs**

This review of interventions has revealed the following research needs:

- the effect of improved national/regional legislation based on the International Code and its stricter implementation;
- the effect of more comprehensive maternity protection legislation, and stricter implementation of this legislation;
- the effect of policies incorporating the Global Strategy for Infant and Young Child Feeding and their stricter application;
- the effect of expanding the BFHI to include all paediatric and obstetric services as well as

- community health care initiatives promoting BF;
- the effect of improvements in pre-service training;
- the comparative effect of different IEC approaches for individuals and small groups;
- the effect of IEC interventions based on local or national media;
- the effect of appropriate IEC within general education programmes;
- the role of fathers, partners, other members of the family, and of mother-to-mother support (excluding trained peer counsellors because there is already good evidence);
- the effectiveness of interventions aimed at addressing the needs of specific groups such as ethnic minorities, immigrants, low income groups and adolescents;
- the relative effectiveness of different interventions in multi-faceted programmes;
- the role of social norms and cultural representations, including the factors associated with behavioural change;
- the feasibility and cost of different interventions.

This research should assess effectiveness in relation to the following outcomes:

- the exclusivity of BF up to six months of age;
- the timely introduction of appropriate CF;
- the continuation of BF up to two years of age and beyond;

in addition to other outcomes related to infant and child health.

In addition, it must be stated that the quality of the research needs to substantially improve, in particular with regards to:

- the use, as far as possible, of an adequate experimental design (RCT and intention-to-treat analysis);
- adequate power and sample size in relation to the objectives of the research (to detect statistical significance with narrow confidence intervals);
- clear criteria for recruitment of study subjects (inclusion and exclusion criteria; no self-selection);
- consistency/standardisation of definitions of feeding categories (including recall periods) and of other variables;
- adequate handling of confounders with proper factorial analysis (comprehensive baseline data);
- use of appropriate qualitative methods when needed;
- the disclosure and handling of potential conflicts of interest.

In implementing research, it would clearly not be ethical to randomly assign mothers to BF or not to BF. Also, because most of the BFHI practices have a clear evidence base, it would not be ethical to randomly or otherwise assign babies/mothers to receive services that do not apply these practices. As women who normally access support services are self-selecting, it would not be appropriate to do a comparative study between these and women who, for numerous reasons (many of which would prove difficult to control for), are currently least likely to use these services.

## **Conclusions**

This review allows some general conclusions to be drawn on effective interventions for the protection, promotion and support of BF:

- The combination of several evidence-based strategies and interventions within multi-faceted integrated programmes seems to have a synergistic effect.
- Multi-faceted interventions are especially effective when they target initiation rates as well as duration and exclusivity of BF, using media campaigns, health education programmes adapted to the local situation, comprehensive training of health professionals and necessary changes in national/regional and hospital policies.

- The effectiveness of multi-faceted interventions increases when peer counselling support programmes are included, particularly in relation to exclusivity and duration of BF.
- Interventions spanning the pre- and post-natal periods, including the crucial days around childbirth, seem more effective than interventions focussing on a single period. The BFHI is an example of a wide-ranging intervention of proven effectiveness, and its extensive implementation is highly recommended.
- Health sector interventions are especially effective when there is a combined approach, involving the training of staff, employment of a BF counsellor or lactation consultant, having written information for staff and clients, and rooming-in.
- The impact of health education interventions to mothers on initiation and duration of BF is significant only when current practices are compatible with what is being taught.
- The provision of BF information to prospective parents or new mothers, with no or brief face-to-face interaction (i.e. based on leaflets or telephone support), is less effective than the provision of information with extended face-to-face contact. The use of printed materials alone is the least effective intervention.
- The effectiveness of programmes which expand the BFHI beyond the maternity care setting to include community health care services and/or paediatric hospitals, currently being implemented in some countries, has so far not been evaluated. However, these programmes are based on a combination of initiatives that on their own are well evidence-based.
- The development and enforcement of laws, codes, directives, policies, and recommendations at various levels (national, local) and in various situations (workplace, hospital, community) represent important interventions, but it is currently difficult to gather strong evidence for their effectiveness (few studies, mainly within multifaceted interventions).
- Workplace interventions are especially effective when mothers have the flexibility to opt for part-time work and have guaranteed job protection along with provisions for workplace BF/lactation breaks. These provisions, whether in response to a legislative requirement or as part of a BF supportive workplace policy, involve time off without loss of pay during the working day to BF or express BM, with suitable facilities being provided by the employer.

The decision to implement a set of interventions should consider feasibility and cost, in addition to effectiveness. Feasibility means checking operational plans against available resources: personnel, equipment, supplies, structures, organization, funds and time (a non-renewable resource), as well as the cultural and physical environment with its opportunities, strengths, weaknesses and threats. When the intervention consists in developing, issuing and enforcing a law or a policy, feasibility often coincides with the political commitment of local and/or national government. It is impossible to accurately estimate the feasibility of a given set of interventions to protect, promote and support BF in general terms. This is because feasibility is contingent on the resources available and the policy structures prevailing in individual countries and regions. Therefore it can only be estimated at local and/or national level.

As far as cost is concerned, the economic benefits of BF for the individual, the family, the society and the health and social system have been highlighted elsewhere.<sup>157</sup> Cost and cost/benefit analyses of interventions supporting, promoting and protecting BF programmes are rare.<sup>95,96,158-161</sup> What little information there is, shows that BF programmes need an initial investment for training of staff as well as costs to provide individual support to mothers with BF problems.<sup>95,96,162</sup> Such investment would be partially repaid by the savings on the use of infant formula and on its consequences, but this economic return cannot be accurately estimated and probably depends on local circumstances.

In calculating cost/benefit, once-off costs need to be distinguished from on-going costs; for example, changes in pre-service curricula or legislation would be a once-off cost (once the new curricula or legislation was in place there would be no additional continuing costs, unless the implementation of new curricula and the enforcement of new legislation requires new staff),



whereas to provide one-to-one support for mothers would entail an on-going cost. It would also be necessary in assessing cost/benefit to take into account the long term health cost savings as a result of the health protective benefits of BF. This would involve reduced future treatment costs for conditions like allergic disease, heart disease, obesity, breast cancer and osteoporosis, as well as respiratory and gastrointestinal infections in infancy. For example, it was estimated in 1995 that the NHS spends £35 million sterling per year in England and Wales in treating gastroenteritis in bottle-fed infants, and that for each 1% increase in BF at 13 weeks a saving of £500,000 sterling in the treatment of gastroenteritis would be achieved.<sup>163</sup>

Interventions to protect, promote and support BF will also prevent the risk and cost associated with contamination of powdered infant formula with microorganisms. In a recent workshop jointly organised by FAO and WHO,<sup>164</sup> a group of experts concluded, after reviewing the available scientific information, that intrinsic contamination of powdered infant formula with *Enterobacter sakazakii* and *Salmonella* has been a cause of infection and illness in infants, including severe disease, and can lead to serious developmental sequelae and death. The report recommends that caregivers, particularly for infants at high risk, be regularly alerted that powdered infant formula is not a sterile product.

As mentioned above, political commitment is more fundamental to the successful implementation of BF interventions than feasibility and cost issues. It is also recognised that in an ideal situation, where cost is not the primary determinant, a public health intervention with a higher cost may be deemed feasible based on economies of scale and a more favourable ratio of benefit to cost. Some strategies and interventions may be recommended even if they lack strong (level 1 and 2) evidence of effectiveness; this applies in particular to legislation and general policies that are not easily amenable to rigorous scientific evaluation. However, expert opinion and experience would show that initiatives such as these do have long-term benefits on BF rates.

Finally, a programme for the protection, promotion and support of BF is not just a list of separate interventions. Interventions are usually multifaceted, interrelated and integrated in order to maximise their combined and cumulative effect. Moreover, the effect will depend on continuity, because a change in the behaviour of mothers, families and health professionals, and of the infant feeding culture in a given society, requires that interventions and programmes be sustained for a sufficient length of time.

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## **Annex 1. Successful experiences**

These short reports of successful experiences are meant to show that the fall and rise in breastfeeding rates is not a natural event. It is usually amenable to changes in health care and social services, in the production and marketing of goods, in the structure of the family and of the labour market, in the distribution of income, in the equality of access to education and information, and it is ultimately amenable to social changes in any given community. This means, for example, that the fall of breastfeeding, as well as its distribution in different population groups, can be prevented and its rise can be accelerated. These reports, therefore, represent the hope of achieving results for all those who are struggling for the protection, promotion and support of breastfeeding. These experiences are just examples; effective programmes exist also in other countries.

### **Norway<sup>1-5</sup>**

In Norway, a multifaceted policy has been implemented at national level for the last 30 years. Since data on breastfeeding rates in Norway are available for the last century, it is possible to analyse the relationship between socio-economical factors, policies and interventions, and breastfeeding rates.

Breastfeeding rates declined steadily from 1930 onwards and ranged, by 1968, around 30% (any breastfeeding) at three months. In 1970 these rates started to increase and by 1985 they had reached about 80% at three months, 50-60% at six months and 15-20% at 12 months, a level which persisted until the early 1990s. This increase, which was most marked among more educated, professional women, seems to have been associated with:

- increased educational and occupational activity of women;
- establishment of mother-to-mother support groups;
- political pressure (i.e. from the feminist movement) leading to better conditions for breastfeeding mothers;
- gradual improvement of knowledge, skills and routines within the health care system;
- increased duration of maternity leave;
- less aggressive marketing of breast milk substitutes.

In 1993, the BFHI was launched in Norway in an energetic and holistic way. In 1996, about 75% of all infants were born in designated hospitals. By 1998 breastfeeding rates had further increased in the whole country (80% at six months and 35-40% at 12 months). This improvement may have been due to the BFHI.

### **Luxembourg<sup>\*</sup>**

The first survey on the prevalence of breastfeeding and on maternity ward practices was carried out in 1987 by the newly founded NGO "Initiativ Liewensufank". Several activities have been carried out over the subsequent 15 years by NGOs and by the Ministry of Health to:

- implement the BFHI (a working group was set up and a National Breastfeeding Coordinator was nominated);
- improve access to information for breastfeeding mothers and the public through a phone hotline, booklets/leaflets ("Stillen von A-Z" written by Initiativ Liewensufank and published by the Ministry of Health), organization of the World Breastfeeding Week every year since 1992, and national campaigns;
- organise and conduct conferences and training for health professionals;
- favour breastfeeding working mothers by ensuring increased communication on prolonged post-natal maternity leave and on breastfeeding breaks and parental leave, which allows

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<sup>\*</sup> Maryse Lehnars Arendt, personal communication

working mothers to stay at home for six months after the three full-salary months of post-natal leave, with monthly compensation of € 1650 and job guarantee on return (six months for fathers too).

Two BFHs were designated between 2000 and 2003, covering more than 35% of births. A recent breastfeeding survey (2003) has shown that some of the baby friendly criteria have already been set in place in the other four hospitals, which will hopefully lead to even more accreditations in the coming years.

The results from the surveys carried out in 1994 and 2002 show that the rate of exclusive breastfeeding has increased from 48% to 65% at discharge from hospital, and from 18% to 41% at four months; the initiation rate of exclusive breastfeeding in the BFHs was 84% in 2002.

### **Czech Republic<sup>6-8†</sup>**

The breastfeeding promotion programme in the Czech Republic was initiated in 1990 by an NGO called ANIMA – Prague IBFAN Group, which joined the International Baby Food Action Network and started collaboration with the UNICEF National Committee in 1991. Since 1998 the Czech Lactation League (LALI) has taken over and expanded the activities for the protection, promotion, and support of breastfeeding previously co-ordinated by UNICEF. During these years a number of activities have been carried out in order to protect, promote and support breastfeeding by:

- establishing a National Breastfeeding Committee and a Breastfeeding Documentation Centre (1993);
- including breastfeeding into Czech national health policy (1995) and adopting an amendment of the Law on Advertisements based on EU legislation on infant foods (2002);
- training health professionals: 70 health professionals of maternity hospitals were trained through 18-hour training courses on lactation management in 1995, and 100 health professionals, 100 lactation consultants (paediatricians, nurses, midwives) and 65 mothers in 2000-2002 (in the framework of a Joint Project on Breastfeeding Support, Promotion and Protection in Central Europe carried out with the support of UNICEF, New York);
- improving access to information and support for breastfeeding mothers and health professionals through a lactation centre and a National Breastfeeding Counselling Service that provides telephone, outpatient and online counselling to health professionals and breastfeeding mothers (2001). The service is operated by LALI which also trains lactation counsellors recruited among health professionals and mothers, sustains the initiation of breastfeeding support and mother-to-mother groups, and assists maternity centres during the procedure to become BFH (10 hospitals are currently in this process);
- developing a wide range of information materials on breastfeeding (videotapes, magazines, posters and education booklets) directed to health professionals and to the general public.

Today, 30 out of 116 maternity hospitals in the Czech Republic have been awarded the BFH Certificate.

A multi-centre survey on infant feeding practices carried out in 1998-99 showed an increased prevalence of breastfeeding at the end of the 6<sup>th</sup> month (23% exclusively breastfed and 30% breastfed with complementary foods) compared to 1991 (15% of infants breastfed for three to six months). An increasing trend in the prevalence of exclusive breastfeeding at discharge from hospitals (from 83.6% in 1993 to 91.3% in 2002) and of any breastfeeding at the end of the 6<sup>th</sup> month (from 9.0% in 1993 to 28.4% in 2002) has been shown by recent national data collected by the Institute of Health Information and Statistics.

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<sup>†</sup> Schneidrová D, Müllerová D, Mydlilová A, Paulová M. Breastfeeding promotion and protection in the Czech Republic. Submitted to the Central European Journal of Public Health

## **Basque Country<sup>9,10</sup>**

In June 1997 the Basque Parliament, in accordance with the criteria set out by WHO/UNICEF, unanimously passed a proposal to sustain the protection, promotion and support of breastfeeding mainly by encouraging the implementation of the BFHI. In November 1997, the hospitals of the Basque Autonomous Community were given the UNICEF self-evaluation questionnaire. Between March and June 1998 an Autonomous Breastfeeding Working Group was established to:

- organise training courses for health professionals on the BFHI (UNICEF/WHO course twice a year);
- set up working groups on the promotion of breastfeeding in all public hospitals;
- develop information materials on the BFHI;
- deliver to public hospitals a set of instructions based on the 10 Steps (draft a written policy, inform all pregnant women of the advantages of breastfeeding, avoid the use of bottles and teats and of materials which promote artificial feeding).

In 2000, the Basque Health Department organized a Breastfeeding Counselling Training Course (WHO/UNICEF) in which eight trainers were certified by WHO. This team of trainers regularly held a 26-hour course for health professionals in the seven maternity centres of the Autonomous Basque Region, one of which was accredited as BFH in November of 2001. Approximately 120 health professionals receive basic breastfeeding training each year with this course. Also, a number of Basque Government Institutions support the local La Leche League Association for the organization of mother support groups, continuing education activities for health professionals and La Leche League Leaders, as well as for the publication of breastfeeding education materials.

Some data on BF prevalence is available for Cruces Hospital, that is the largest hospital in the Basque Country and accounts for more than 5000 births a year (almost one third of the about 16,000 newborns per year). From 1992 to 1999 the percentage of full term infants breastfed at discharge (usually two days) increased from 70% to 87%.

### **Possible determinants of success**

The factors that seem associated with success in these (and other) reports can be summarised as follows:

- a long-term commitment of individuals, institutions and associations, eventually leading to a commitment of local/national governments;
- increased interest in breastfeeding in the society, brought about by an increase in problem-based information, written mostly for, and often by, mothers but read also by health workers;
- increased availability of mother-to-mother support groups, health workers with better management skills (and sometimes personal experience), and rise in collective breastfeeding experience as more women successfully breastfeed;
- increased control on the marketing practices of manufacturers and distributors of breastmilk substitutes;
- increase in paid maternity leave with guaranteed return to previous employment;
- improvement in maternity ward practices, towards mother-infant contact and autonomy, initiated by small groups of mothers and health professionals and brought to scale by the BFHI.

To be added to this, is the paradigmatic shift that took, and still is taking, place with regards to the importance of breastfeeding, first in Scandinavia during the 1970's, subsequently spreading to other countries and regions. There were several driving forces behind that movement. The feminist movement, coupled with a strong environmentalist movement, happened to coincide with a debate

on perinatal routines in hospitals. At the same time or soon afterwards, a number of strongly motivated health professionals, mainly midwives, lobbied for changes in antenatal care as well as for breastfeeding promotion, while breastfeeding peer support groups were formed.

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## Annex 2. Determinants for breastfeeding\*

Determinants for breastfeeding can be defined in many ways. In this example, we have grouped them into the following categories:<sup>1</sup>

- Social and demographic determinants: e.g. age, place of residence, size of the family, marital status, parity, educational level, income, employment, housing.
- Psychosocial determinants: e.g. interpersonal and intrapersonal characteristics, social support, self-confidence, maternal beliefs, shyness.
- Health care determinants and biomedical constraints: e.g. routines in maternity wards and in prenatal care, training of health care staff for good and consistent advice, discharge policies, existence of prenatal classes.
- Community determinants: e.g. local knowledge and action, acceptance of breastfeeding in public, support in the workplace, representation and advocacy in the media.
- Public policies: e.g. official recommendations, consensus statements, surveillance systems, maternity leave and benefits, marketing of breastmilk substitutes, training of health care staff, national plans of action.

The Table shows some important examples of determinants and their potential positive or negative impact on breastfeeding.<sup>2</sup> These and other identifiable determinants should be considered when designing breastfeeding promotion programmes, as well as for the design of monitoring systems. The different nature of these categories makes monitoring of some of them necessary at local and/or individual level (e.g. psychosocial factors), while others can be monitored at regional and/or national level (e.g. public policies, social and demographic factors) or within the health care system (e.g. health care factors).

Category	Positive association	Negative association
Social and demographic determinants <sup>3-14</sup>	Older age and high level of education of mother, small family	Younger age and lower level of education, single, urban, first child, early return to work
Psychosocial determinants <sup>7,15-28</sup>	Supportive family and peers, cultural acceptance, previous successful experience, positive maternal beliefs on breastfeeding and infant health	Low maternal confidence, shyness, mother not breastfed herself
Health care determinants and biomedical constraints <sup>29-46</sup>	Early initiation, prenatal class participation, skills training, apprenticeship	Premature birth, difficult labour, use of analgesics, sore nipples, maternity ward use of teats and bottles, ward distribution of free samples of breastmilk substitutes
Community determinants <sup>26,44,47-50</sup>	Consensus statements, media advocacy, workplace support, existence and acceptance of peer support groups, high level of community awareness and knowledge	Breastfeeding considered as indecent exposure, mis-beliefs, low level of community support and media advocacy
Public policies <sup>45,51-54</sup>	Official recommendations, surveillance systems, maternity benefits including prolonged paid maternity leave, Baby Friendly Hospital Initiative, inclusion in school curricula and in training of staff, code of marketing of breastmilk substitutes	Short maternity leave, low priority of breastfeeding as a health concern, no supportive structure for breastfeeding issues

\* by Agneta Yngve, Unit for Preventive Nutrition, Department of Bioscience at Novum, Karolinska Institutet, Sweden

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## Annex 3.

### 1. Cochrane Systematic Reviews

Study	Type of study	Studies selection criteria	No. of studies/ Sample	Objectives	Main results
Hodnett	Cochrane Database of Systematic Reviews. Most recent substantive update: 9 May 2003	RCT	15 RCT involving 12,791 women	To assess the effects on mothers and their babies of continuous, one-to-one intrapartum support compared with usual care.	Women who had continuous intrapartum support were less likely to have intrapartum analgesia, operative birth, or to report dissatisfaction with their childbirth experiences. Continuous intrapartum support was associated with greater benefits when the provider was not a member of the hospital staff, when it began early in labour, and in settings in which epidural analgesia was not routinely available.
Anderson	Cochrane Database of Systematic Reviews. Most recent substantive update: 17 February 2003	RCT and quasi-RCT	17 studies involving 806 participants (mothers and babies)	To assess the effects of early skin-to-skin contact on BF, behavior, and physiology in mothers and their healthy newborn infants.	A statistically significant and positive effects of early skin-to-skin contact were found: 1) on BF at one to three months postbirth [8 trials; 329 participants] (OR 2.15, 95% CI 1.10 to 4.22) 2) on BF duration [6 trials; 266 participants] (weighted mean difference (WMD) 41.99, 95% CI 13.97 to 70.00). There was some evidence of improved summary scores for maternal affectionate love/touch during observed BF within the first few days postbirth [3 trials; 119 participants] (standardised mean difference (SMD) 0.73, 95% CI 0.36 to 1.11) and maternal attachment behaviour [5 trials; 211 participants] (SMD 0.76, 95% CI 0.47 to 1.04) with early skin-to-skin contact.
Donnelly	Cochrane Database of Systematic Reviews. Most recent substantive update: 21 February 2001	RCT with or without blinding	9 studies involving 3730 women from North America	To evaluate the effects of commercial discharge packs (containing free formula samples or promotional materials) on BF.	The handing out of commercial hospital discharge packs significantly reduced the number of women EBF at 0 to 2 weeks and 8 to 10 weeks. The effect at 3 to 6 weeks was less pronounced and was non-significant at 16 weeks. Packs with promotional material but no formula sample versus no intervention/non-commercial packs: - Not EBF at 0 to 2 weeks: Peto OR 1.99 [1.04, 3.79] - Not EBF at 3 to 6 weeks: Peto OR 1.23 [1.05, 1.43] - Not EBF at 8 to 10 weeks: Peto OR 1.73 [1.13, 2.64] - Not any BF at 6 months: Peto OR 0.97 [0.79, 1.19] Discharge packs containing formula milk and leaflets versus no intervention/non-commercial discharge packs - Not EBF at 0 to 2 weeks: Peto OR 1.99 [1.04, 3.79] - Not EBF at 3 to 6 weeks: Peto OR 1.25 [1.06, 1.47] - Not EBF at 8 to 10 weeks: Peto OR 1.86 [0.74, 4.62] - Not EBF at 16 weeks: Peto OR 1.10 [0.91, 1.33] Packs with formula promotional material, no formula sample versus no intervention - Not EBF at 0 to 2 weeks: Peto OR 1.84 [0.70, 4.85] - Not EBF at 3 to 6 weeks: Peto OR 1.27 [1.01, 1.62] - Not EBF at 16 weeks: Peto OR 1.04 [0.77, 1.41]

Study	Type of study	Studies selection criteria	No. of studies/ Sample	Objectives	Main results
Sikorski	Cochrane Database of Systematic Reviews. Most recent substantive update: 7 November 2001	RCT or quasi-RCT, with or without blinding	20 studies involving 23,712 women	To assess the effects of BF support.	All forms of extra support 1) RR for stopping any BF before six months 0.88 (95% CI 0.81,0.95); 15 trials, 21,910 women. 2) RR for EBF 0.78 (95% CI 0.69,0.89); 11 trials, 20,788 women. NB: clear evidence of benefit appeared to be confined to settings where there were high rates of BF initiation Extra professional support 1) RR for any BF 0.89 (95% CI 0.81,0.97); 10 trials, 19,696 women. 2) RR for EBF RR 0.90 (95% confidence interval 0.81,1.01); six trials, 18,258 women. Lay support 1) RR for any BF 0.84 (95% CI 0.69,1.02); five trials, 2224 women. 2) RR for EBF 0.66 (95% CI 0.49,0.89); five trials, 2530 women. Face-to-face intervention RR for giving up PBF 0.86 (95% CI 0.78,0.94); eight trials, 20,544 women; Mainly telephone contact RR for giving up PBF 0.92 (95% CI 0.78,1.08); five trials, 1168 women). Studies with antenatal element RR 0.85 (95% CI 0.70,1.04); three trials, 455 women. Studies with only postnatal support RR 0.88 (95% CI 0.80,0.96): 12 trials, 21,465 women.
Renfrew	Cochrane Database of Systematic Reviews. Most recent substantive update: 2 February 1994	RCT or quasi-RCT	3 trials involving 209 women	To assess the effects of BF soon after birth (within 30 minutes) compared to later BF initiation (between 4 to 8 hours after delivery) on the duration of BF and the mother/infant relationship.	Compared with late contact and BF, early contact and BF was associated with greater communication between mother and infants in a two minute observation period (odds ratio 0.14, 95% confidence interval 0.03 to 0.61). There was no difference detected for numbers of women BF after birth (odds ratio for 12 weeks after birth 0.73, 95% confidence interval 0.34 to 1.54).
Renfrew	Cochrane Database of Systematic Reviews. Most recent substantive update: 2 February 1994	RCT or quasi-RCT	3 trials involving 400 women	To assess the effects of frequent BF (two or three hourly) compared with less frequent BF (four hourly restricted feeds) in the early days after birth.	Compared to two hourly, three hourly or on demand BF, restricted (less frequent four hourly BF) was associated with greater discontinuation of BF by four to six weeks postpartum (relative risk 1.53, 95% confidence interval 1.08 to 2.15). Restricted BF was associated with increased incidence of sore nipples (relative risk 2.12, 95% confidence interval 1.22 to 3.68), engorgement (relative risk 2.10, 95% confidence interval 1.25 to 3.21) and the need to give additional (formula) feeds (relative risk 3.14, 95% 1.24 to 8.00).

NB: The two Renfrew's systematic reviews in the above table have been withdrawn from the Cochrane Database of Systematic Reviews because they are considered out of date

## 2. Other Systematic Reviews

Study	Type of study	Studies selection criteria	No. of studies/ Sample	Objectives	Main results
Guise, 2003	Systematic Review	Systematic reviews, RCTs or non randomized CT. Developed countries	30 RCTs and non RCTs; 5 systematic reviews	To evaluate if primary care-based interventions improve initiation and duration of BF.	Educational programmes had the greatest effect of any single intervention on both initiation (difference 0.23; 95% CI 0.12–0.34) and short-term duration (difference 0.39; 95% CI, 0.27–0.50). One woman would breast-feed for up to 3 months for every 3 to 5 women attending BF educational programmes. Support programmes conducted by telephone, in person, or both increased short-term (difference 0.11; 95% CI, 0.03–0.19) and long-term duration (difference 0.08; 95% CI, 0.02–0.16). Written materials such as pamphlets did not significantly increase BF. Data were insufficient to determine whether the combination of education with support was more effective than education alone.
Lieberman, 2002	Systematic Review	RCTs and observational studies published in peer reviewed journals since 1980	Numerous RCTs and observational studies for each of the considered exposures and outcomes	To evaluate the unintended maternal, fetal, and neonatal effects of epidural analgesia used for pain relief in labour by low-risk women	Existing randomised trials are either small or do not allow clear interpretation of the data because of problems with protocol compliance. In addition, few observational studies control for the confounding factors that result because women who request epidural are different from women who do not. There is considerable variation in the association of epidural analgesia and some outcomes, particularly those heavily practice-based. Despite this variation, there is sufficient evidence to conclude that epidural analgesia is associated with a lower rate of spontaneous vaginal delivery, a higher rate of instrumental vaginal delivery and longer labors, particularly in nulliparous women. Women receiving epidural analgesia are also more likely to have intrapartum fever and their infants are more likely to be evaluated and treated for suspected sepsis. There is insufficient evidence to determine whether epidural analgesia does or does not increase the risk of cesarean delivery or fetal malposition. Adverse effects on the fetus may occur in the subset of women who are febrile.
De Oliveira, 2001	Systematic Review	RCTs or quasi-RCTs from 1980 to 1999	33 RCT and 31 quasi RCT. 37 were considered internally valid studies.	To evaluate the effectiveness of prenatal and postnatal interventions to increase BF duration through primary care.	The most frequent strategies identified were home visits, individual consultations, group sessions, phone calls, a combination of two or more strategies and printed material. The most effective strategies identified were group sessions during the prenatal phase; home visits during the postnatal phase or in both periods; and the combination of group sessions, home visits and individual sessions in intervention spanning both periods. Interventions in the prenatal period or spanning both periods were generally more effective than interventions conducted during the postnatal phase alone. The effectiveness of interventions did not seem to be related to the type of personnel involved (health workers or peer counsellors). The combination of effective strategies seemed to produce a synergistic effect. However, the impact of interventions on BF duration was shown to be negligible when practices contradicted messages. Small-scale intervention (limited to a short period of time during pregnancy or postnatal care), isolated use of printed matter, strategies with no or brief face-to face interaction (i.e. based on telephone support) failed to produce significant results. NB: summary measures of association derived with meta-analysis techniques were not considered meaningful

Study	Type of study	Studies selection criteria	No. of studies/ Sample	Objectives	Main results
Fairbank, 2000	Systematic review	RCT, non-RCT and Before/After studies (BA) until 1998	14 RCT 16 non RCT 29 BAs	<p>To evaluate the effectiveness of interventions to promote the initiation of BF.</p> <p>The main categories of intervention considered were:</p> <ul style="list-style-type: none"> <li>-Health education (9 RCT, 7 non RCT, 3 BA)</li> <li>-Health sector initiative (5 RCT, 6 non RCT, 14 BA)</li> <li>-Peer support (2 non RCT)</li> <li>-Media campaigns (2 BA)</li> <li>-Multifaceted interventions (1 non RCT, 10 BA)</li> </ul>	<p>Health education:</p> <ul style="list-style-type: none"> <li>-BF literature alone among general population is not effective in promoting BF (women of different income and ethnic groups in the UK, Republic of Ireland and USA)</li> <li>-BF literature and formal education delivered to low income groups in the USA are not effective at promoting the initiation BF (small-scale studies)</li> <li>-Group health education can be effective (women from different ethnic and low income groups)</li> <li>-One-to-one educational programmes were more effective for women who planned to bottlefeed whereas group programmes were more effective for women who planned to breastfeed (studies on low income black Americans)</li> <li>-Paying participants to attend increased participation rates for group classes</li> <li>-Additional health education from community staff (face to face + telephone contacts in antenatal and postnatal period) was ineffective in one U.K. study.</li> <li>-A coordinated 3 steps approach (advice, leaflets and routine health education + intensive staff training) was effective in 1 Sweden study.</li> </ul> <p>Health sector initiatives:</p> <ul style="list-style-type: none"> <li>-In a combined approach, training of staff, employment of a BF counsellor, written information and rooming-in seems to be effective for both initiation and duration (1 poor quality trial, USA).</li> <li>-WIC programmes seems to be effective. Programmes including a peer support component appeared to be most effective.</li> <li>-Rooming-in has been shown to be an effective measure in developing country settings (only in before-after studies)</li> <li>-Training health professionals as a standalone intervention did not seem to produce statistically significant increases in initiation rates, even if it improves women's knowledge and attitudes about BF. A package of interventions including training may be more likely to influence attitudes and encourage uptake of BF</li> <li>-Social support for disadvantaged women (home visits and telephone calls by a midwife on hospital discharge) seems to be ineffective (1 UK-based RCT).</li> </ul> <p>Peer support:</p> <ul style="list-style-type: none"> <li>-Peer support programmes as standalone interventions have been shown to be effective in both the antenatal and postnatal periods for women who expressed a wish to breastfeed, but not for women who had decided to bottlefeed</li> </ul> <p>Media campaigns:</p> <ul style="list-style-type: none"> <li>-Local media campaigns (in one case TV) can be effective in improving attitudes towards BF</li> </ul> <p>Multifaceted interventions:</p> <ul style="list-style-type: none"> <li>-Multi-faceted interventions have been shown to increase initiation rates. Five out of six effective multifaceted interventions included a media campaign, in combination with health education programmes, training of health professionals and/or changes in government and hospital policies. Four out of six included a peer support programme.</li> </ul>

Study	Type of study	Studies selection criteria	No. of studies/ Sample	Objectives	Main results
Tedstone, 1998	Systematic review	RCT, non RCT, cohort studies (prospective and retrospective)	24 studies, 20 on BF promotion and 6 on good dietary practices in weaning and the post-weaning period: 14 RCT (n=4,158), 6 non RCT, 2 prospective studies with historical controls (n=1,345), 2 retrospective cohort studies (n=280).	To identify the most effective promotional methods to bring about positive dietary changes.	<p>Health education:</p> <ul style="list-style-type: none"> <li>- BF promotions delivered over both the ante- and postnatal period seems to be most likely to have a positive effect on BF. The interventions involved were intensive, involving multiple contacts with a professional promoter or peer counsellor.</li> <li>- One-to-one education sessions were more successful than group education at persuading women, who had initially decided to feed infant formula, to breastfeed</li> <li>- Group sessions were better at increasing duration of BF, and the effectiveness of pre-natal education sessions in terms of initiation of BF was enhanced by contact with peer counsellors</li> <li>- Weaker evidence from single studies suggests that including partners, incentives or changing the contents of the commercial hospital discharge packs given to women may facilitate BF.</li> <li>- The least successful interventions were those where BF promotion was only one part of a multiple health promotion programme, and involved special visits to the hospital/clinic or took place by telephone</li> </ul> <p>Health sector initiatives:</p> <ul style="list-style-type: none"> <li>- the Best Start educational package (training health professionals, educating and support women) seem effective to increase initiation rate (1 study, USA).</li> <li>- Policy changes (including the appointment of a BF adviser, training of staff, prenatal and postnatal outpatient sessions for mothers and visits to all mothers in hospital after delivery) were ineffective on initiation and duration of BF (1 study, UK)</li> <li>- Modification of the contents of commercial packs given to women on hospital discharge significantly increased BF duration and delayed the introduction of daily solids.</li> <li>- One USA-based evaluation of contact with a single lactation specialist provided evidence of an improvement in overall BF outcome.</li> <li>- One cultural and language specific intervention that was implemented in conjunction with clinic visits was successful at increasing BF prevalence up to four weeks post-partum.</li> <li>- One in-patient USA intervention that involved post-natal lactation support from a counsellor significantly delayed introduction of first solid foods</li> </ul>

### 3. Other reviews (non-systematic)

Study	Type of study	Studies selection criteria	No. of studies/ Sample	Objectives	Main results
Protheroe, 2003	Review	Systematic reviews and meta-analyses	2 systematic reviews: Fairbank 2000 and Tedstone 1998.	To evaluate the effectiveness of public health interventions to promote the initiation of BF.	The review summarize the results of the two systematic reviews (see results above)
Stockley (no date)	Review	Systematic reviews and RCTs, studies using traditional methodologies, descriptive and qualitative studies reported since the most recent high quality systematic review.		To consolidate and update the evidence base for the promotion of BF.	<p>General points:</p> <ul style="list-style-type: none"> <li>- Interventions should be long term, intensive, span both the antenatal and postnatal periods, and involve multiple contacts.</li> <li>- Flexible and individualised approaches are more likely to be effective. In particular there needs to be different approaches for women whose original intention is to breastfeed and those whose original intention is to bottle feed.</li> <li>- Encouragement to consider BF is needed as early in pregnancy as possible and preferably before pregnancy.</li> </ul> <p>Low income populations:</p> <ul style="list-style-type: none"> <li>- Self-help manuals for low income mothers may merit further investigation.</li> <li>- Peer counselling appears to give consistently positive results.</li> <li>- Community based drop in centres is a promising approach which needs proper evaluation.</li> </ul> <p>Information/Media:</p> <ul style="list-style-type: none"> <li>- Information provision alone is not effective</li> <li>- The local media can play a useful role in interventions aimed at increasing initiation of BF in low income women. The national media is important in setting agendas, and portraying images of breasts and breast/bottle feeding</li> </ul> <p>Peer support:</p> <ul style="list-style-type: none"> <li>- Peer support programmes provide particularly promising results</li> </ul> <p>Professional development:</p> <ul style="list-style-type: none"> <li>- Professionals need to be consistent in the advice and support they provide.</li> <li>- Professional development needs to encourage changes in attitude as well as knowledge.</li> <li>- De briefing programmes for midwives after they themselves have had children may help them to come to terms with their own experiences.</li> <li>- Basic training for midwives should address practical issues, such as time pressures, promoting BF without stigmatising bottle feeders, and the evidence for introducing the subject of infant feeding as early in the pregnancy as possible.</li> <li>- Encouragement is needed for midwives to regularly attend post basic training, to update their knowledge and skills and assess their own attitudes.</li> <li>- Training for doctors should include more on the benefits of BF, awareness of initiatives such as the BFHI and relevant counselling skills.</li> </ul>
Zinn, 2000	Review article				This article offers suggestions for promoting BF, describes the preplanning that needs to occur, and provides current lactation recommendations and resources. It also offers information on working with employers, the importance of a support network, the decisions that each family must make, the use of breast pumps; milk storage, lactation enhancement including the use of herbs, and practical tips for the mother's working day.
Scott, 1999	Review			To review the factors associated with the initiation and duration of BF among Western women.	<ol style="list-style-type: none"> <li>1. Strong and consistent association with demographic factors such as maternal age and level of education, but a less consistent association with factors such as marital and socio-economic status.</li> <li>2. Consistent negative association has been reported between maternal smoking habits and BF duration.</li> <li>3. Fathers play an important role in the BF decision.</li> <li>4. Intended duration is a strong predictor of actual duration.</li> </ol>

Study	Type of study	Studies selection criteria	No. of studies/ Sample	Objectives	Main results
Dykes, 1998	Review article				This article discusses why BF initiation, duration and continuation rates in the UK are disappointingly low.
Bar-Yam, 1998	Review article				This article describes a return-to-work BF assessment tool designed to help lactation consultants evaluate clients' workplace lactation support.
Bar-Yam, 1998	Review article				This article focuses on the workplace itself, presenting a continuum of types of workplace lactation support; the key players in the workplace, new mothers, supervisors, and human resource managers, who are instrumental in supporting BF at work; workplace philosophies and their impact on workplace lactation support and strategies to help lactation consultants work with companies as their clients in establishing lactation support programmes
Bar Yam, 1997	Review article				This article reviews the research findings on fathers influence in: the BF decision, assistance at first feeding, duration of BF, and risk factors for bottle feeding.
Perez-Escamilla, 1994	Analytical overview of studies until 1991	RCTs and quasi-experimental studies. Only studies in English or Spanish, located with MEDLINE, form personal files, by contacting researchers.	6 RCTs on effect of discharge packs; 2 studies on effect of rooming-in and BF guidance; 7 RCTs on effect of early contact; 3 studies on BF on demand; 1 RCT on in-hospital formula supplements	To review infant feeding policies in maternity wards and their effect on breast-feeding success.	Meta-analysis indicated that: 1) commercial discharge packs had a detrimental effect ( $p < 0,05$ ) on full BF at 1 month and any BF at 4 months. 2) early mother-infant contact might have a beneficial effect ( $p < 0,05$ ) on BF at 2 and 3 months among primiparae (results should be interpreted with caution because of heterogeneity across study and because several studies had more than an intervention). Rooming-in and breast-feeding guidance in a rooming-in context might have beneficial impact on breast-feeding among primiparae (only 2 studies, no meta-analysis). Breast-feeding on demand seems to be positively associated with lactation success (only 3 studies, with methodological problems, no meta-analysis). In-hospital formula supplementation of 48 mL per day was not associated with poor breast-feeding performance (only 1 study).
Greenberg 1991	Review article				This article discusses specific techniques for maintaining maternal fluid intake; pumping, storing and preparing breast milk; wardrobe planning; and personal hygiene. Knowledge of these measures will provide the basis for anticipatory guidance for mothers who wish to balance the demands of BF and employment.



#### 4. Randomised Controlled Trials

Study	Type of study	Country/Setting/Participants	Objectives/Intervention	Main results
Graffy, 2004	RCT	720 pregnant women (intervention group=363) in 32 general practices in London and south Essex, UK	Whether volunteer support from peer counsellors visiting women once before birth and offering postnatal support by telephone or further home visits after birth would result in more BF in pregnant women considering BF.	No significant difference in any BF at 6 weeks (intervention group 218/336 = 65%; control group 213/336 = 63%). No difference in time of introduction of formula. Non-directive approach in intervention group: antenatal contact 269/336 (80%), at least one postnatal visit 67/336 (20%), postnatal telephone contact 143/336 (43%), no postnatal contact 126/336 (38%). 123/179 (73%) women who contacted counsellors postnatally rated them as very helpful, more than advice from other sources.
Howard, 2003	RCT	Community hospital, 700 breastfed newborns, USA	To evaluate the influence of early pacifier use on EBF prevalence. To evaluate the influence of bottle feeding for those newborn who need supplements on EBF prevalence.	1) Cessation at 1 mo of EBF: Supplementation (n=481) vs not supplementation (n=219) RR 1.49 (1.23-1.80), p<0.0001 2) Cessation at 1 mo of any BF: Early pacifier (n=354) vs late pacifier use (n=346) RR 1.22 (1.03-1.44). 3) Duration of any BF in born from caesarean section: Cup feeding (n=51) vs bottle feeding (n=47): + 5 wks
Dennis, 2002	RCT	256 primiparous women (intervention group=130). Semi-urban setting Toronto, Canada	To assess the effectiveness of peer support (postnatal telephone-based support).	BF at 3 months: - Intervention group: 81%, no intervention group: 67% EBF at 3 months: - Intervention group: 57%, no intervention group: 40% High satisfaction and acceptance of the intervention (82%)
Pugh, 2002	RCT	41 low income women (intervention group=21) in UK	Hospital and home visits, and telephone support by a community health nurse/peer counsellor team for 6 months after delivery compared with usual care.	Infants in intervention group were BF longer (45% EBF vs 25% at 3 months), had fewer sick visits (mean: 0.45 vs 1.2) and used fewer medications (mean: 0.25 vs 0.85). Intervention cost: 301 US\$/mother to implement the intervention. Intervention costs were partially offset by costs savings on formula and health care.
Escobar, 2001	RCT	1014 mother-infant pairs (intervention group=508) with postpartum length of stay <48 hours. California, USA	To evaluate two short-term (within 72 hours of discharge) follow-up strategies: home visits by a nurse (intervention group) and hospital-based follow-up anchored in group visits.	Within 2 weeks after discharge no significant differences in 1) newborn or maternal hospitalizations or urgent care visits; 2) BF discontinuation; 3) maternal depressive symptoms; 4) a combined clinical outcome measure indicating whether a mother-infant pair had any of the above outcomes. Mothers in the intervention group were more likely to rate multiple aspects of their care as excellent or very good and also gave higher ratings on overall satisfaction with the newborn's post hospital care (71% vs 59%), as well as with their own post hospital care (63% vs 55%). Estimated costs: 1) Postpartum home visit =\$265. 2) Hospital-based group visit =\$22 per mother-infant pair; the cost of an individual 15-minute visit with a registered nurse was \$52; the cost of a 15-minute individual paediatrician visit was \$92; and the cost of a 10-minute visit with an obstetrician was \$92.
Henderson, 2001	RCT	160 first-time mothers. Public hospital., Adelaide, South Australia	Structured one-to-one education (intervention group) vs usual postpartum care within 24 hours of birth. Outcome measurement in hospital, at 6 weeks, 3 months and 6 months.	No significant differences in BF rates between the groups at each endpoint, although a trend in the direction of lower rates was seen at each endpoint in the experimental group. This group reported less nipple pain on days 2 (p = 0.004) and 3 (p = 0.04), but this was not sustained on follow-up. No differences were observed in nipple trauma in hospital or in self-reported nipple pain and/or trauma at the three endpoints. Satisfaction with BF at 3 and 6 months postpartum measured with a multiple-item measure showed no significant differences at the three endpoints
Kramer, 2001	Cluster randomised trial	16 experimental and 15 control hospitals. Belarus	BFHI intervention. Follow up: 1 year.	Increased BF prevalence at 3/6 months, and any BF duration. Decrease of gastrointestinal/respiratory infection and eczema
Kramer, 2001	RCT	281 healthy, breastfed newborns. Teaching hospital in Montreal, Quebec, Canada	The influence of regular pacifier use on weaning by 3 months was evaluated.	The experimental intervention: 1. increased total avoidance of pacifier use; 2. reduced daily use and the mean number of pacifier insertions per day (0.8 vs 2.4 at 4 weeks [P<.001]; 0.8 vs 3.0 at 6 weeks [P<.001]; and 1.3 vs 3.0 at 9 weeks [P =.004]); 3. had no discernible effect on weaning at 3 months no effect was observed on cry/fuss behaviour . When randomised allocation was ignored a strong observational association between exposure to daily pacifier use and weaning by 3 months was observed (RR, 1.9; 95% CI, 1.1-3.3).

Study	Type of study	Country/Setting/Participants	Objectives/Intervention	Main results																											
Pinelli, 2001	RCT	Parents of 128 premature infants who planned to breastfeed. Tertiary-level neonatal intensive care unit. Central-west Ontario, Canada	To determine whether a Supplementary Structured BF Counselling (SSBC) for both parents compared with Conventional Hospital BF Support (CHBS) improves duration of BF. SSBC includes viewing a video, individual counselling, weekly personal in-hospital contact, frequent post-discharge contact through the infant's first year or until BF was discontinued. Longitudinal follow-up of infants at term, and ages 1, 3, 6, and 12 months.	The mean duration of BF was 26.2 weeks (SE = 2.7; median, 17.4) in the SSBC group and 24.2 weeks (SE = 2.7; median, 17.4) in the CHBS group (not statistically significant). Number of months planning to BF significantly associated with longer BF. Smoking significantly associated with shorter BF. More than 50% of mothers in both groups experienced BF problems at home.																											
Haider, 2000	RCT	726 women at home. Dhaka, Bangladesh	Peer support (15 home visits during pregnancy and early post-partum).	EBF at 5 months: intervention group (n=363) 70%; non intervention group (n=363) 6%. Intervention group initiated BF earlier than control mothers and were less likely to give prelacteal and postlacteal feeds.																											
Howard, 2000	RCT	547 pregnant women (277 commercial intervention). Hospital, New York, USA	Formula company packs vs specially designed educational packs about infant feeding distributed at the first prenatal visits. BF duration was evaluated in women who choose to BF (294).	BF initiation (RR 0.93, 95% CI 0.61, 1.43) and duration after 2 weeks (hazard ratio [HR] 1.19, 95% CI 0.86, 1.64) were not affected. Women in the commercial group were more likely to cease BF before hospital discharge (RR 5.80, 95% CI 1.25, 54.01) and before 2 weeks (adjusted OR 1.91, 95% CI 1.02, 3.55). In subgroup analyses, women with uncertain goals for BF or goals of 12 weeks or less experienced shortened EBF (HR 1.53, 95% CI 1.06, 2.21), full (HR 1.70, 95% CI 1.18, 2.48), and overall (HR 1.75, 95% CI 1.16, 2.64) BF duration when exposed to the commercial intervention.																											
Ladzani, 2000	RCT	Three study and 3 control rural villages. Northern Province, South Africa	Nutrition education intervention programme undertaken by trained local women (nutrition advisers). More than 1.000 households involved.	The percentage of women who initiated BF on the day of birth improved significantly in the study villages from 60% to 90%.																											
Morrel, 2000 See also: NHSEED-20008262	RCT	623 women recruited from postnatal wards. UK	Postnatal support in the community (up to 10 home visits in the first post-natal month of up to three hours duration by a community postnatal support worker) in addition to the usual postnatal care at home provided by community midwives (control group). Direct costs only were analysed.	No health benefit at six weeks and six months of additional home visits; no savings to the HNS over six months. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Intervention (n=311)</th> <th>Control (n=312)</th> </tr> </thead> <tbody> <tr> <td>At six weeks:</td> <td></td> <td></td> </tr> <tr> <td>- Only BF</td> <td>31%</td> <td>27%</td> </tr> <tr> <td>- Formula fed only</td> <td>55%</td> <td>58%</td> </tr> <tr> <td>- NHS costs (mean)</td> <td>£635</td> <td>£456</td> </tr> <tr> <td>At six months</td> <td></td> <td></td> </tr> <tr> <td>- Only BF</td> <td>13%</td> <td>12%</td> </tr> <tr> <td>- Formula fed only</td> <td>80%</td> <td>79%</td> </tr> <tr> <td>- NHS costs (mean)</td> <td>£815</td> <td>£639</td> </tr> </tbody> </table>		Intervention (n=311)	Control (n=312)	At six weeks:			- Only BF	31%	27%	- Formula fed only	55%	58%	- NHS costs (mean)	£635	£456	At six months			- Only BF	13%	12%	- Formula fed only	80%	79%	- NHS costs (mean)	£815	£639
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- NHS costs (mean)	£815	£639																													
Froozani, 1999	RCT, quasi experimental	120 mother/infants pairs (intervention group = 59). Maternity hospital with rooming in, Shiraz, Iran	Intervention group mothers received BF education, face-to-face, after delivery and during follow-up for 4 months in the mother and child health centre or in their homes.	EBF rates: 54% in the study group; 6.5% in the control group. 5% and 18% of infants, respectively, in the study and control groups had stopped BF by the age of 4 months. The mean number of days of diarrhoea in the study group were significantly lower (P < or =0.004) than in the control group. At the end of 4 months, the mean weight and length of the infants were significantly higher (both P < 0.05) in the study group than in the control group.																											
Jakobsen, 1999	RCT	1250 children. Health centre at immunisation time. Guinea Bissau	Mothers in the intervention group were given health education according to WHO's recommendations	The median duration of BF was 23 months in both groups. There was no difference in the number of children weaned early. Although EBF was promoted by the intervention, early weaning of children in special risk groups was not avoided.																											
Kliethermes, 1999	RCT	84 preterm breastfed infants (weight between 1,000-2,500 g). Metropolitan private perinatal center. Kansas City, USA	To compare nasogastric tube vs bottle supplementation as means of transitioning preterm infants to BF within an established BF support programme.	After adjusting for confounding variables, group receiving nasogastric supplements was: 1) 4.5 times (95% CI 1.4 to 15) more likely to be breastfed at discharge and 9.4 times more likely to be fully breastfed (95% CI 3.1 to 28.4); 2) more likely to be breastfed at 3 and 6 months. There were significantly fewer apnea and bradycardia episodes in the group receiving nasogastric supplements, although they had more episodes that required stimulation for resolution.																											

Study	Type of study	Country/Setting/Participants	Objectives/Intervention	Main results
Morrow, 1999	RCT	130 women at home. Mexico City, Mexico	Peer support (home visits during pregnancy and early post-partum).	EBF at 3 months: - Group 1 (n= 44, 6 home visits): 67% - Group 2 (n= 52, 3 home visits): 50% - Group 3 (n= 34, no visits): 12% Any BF at 6 months: - 87% in interventions groups vs 76%
Rea, 1999	RCT	60 Health Units, 20 experimental and 40 controls. S. Paulo, Brazil	Training (40-hour course) of health professionals. Follow up: 3 months.	Increased of health professionals knowledge score (even 3 months after) and of health professionals counselling skills.
Bolam, 1998	RCT	540 mothers. Maternity hospital. Kathmandu, Nepal	4 groups: A. One to one health education on infant care and postnatal family planning practices immediately after birth and three months later B. At birth only C. At three months only D. None	Mothers in groups A and B were slightly more likely to use contraception at six months after birth compared with mothers in groups C and D (OR 1.62, 95% CI 1.06 to 2.5). There were no other significant differences between groups with regards to infant feeding, infant care, or immunisation.
Kim, 1998	RCT	412 adolescent female students (intervention group=207). Korea	Intervention group students exposed to a BF campaign (panel presentation and a video on the importance and advantages of BF presented as a positive experience for mothers).	Students exposed to the campaign showed positive attitudes and norms toward BF and indicated their intent to breastfeed.
Langer, 1998	RCT	724 primiparous women. Public hospital, Mexico	The effects of psychosocial support during labour, delivery and the immediate postpartum period provided by a female companion (doula) were evaluated compared with routine care (control group).	EBF after 1 months was significantly higher in the intervention group (RR 1.64; I-C: 1.01-2.64). A significant effect on full BF was not achieved. More women in the intervention group perceived a high degree of control over the delivery experience, and the duration of labour was shorter than in the control group. There were no effects either on medical interventions, mothers' anxiety, self-esteem, perception of pain and satisfaction, or in newborns' conditions.
Currò, 1997	RCT	200 women (intervention group=103). Hospital, Rome, Italy	The efficacy of an information booklet to increase the duration of BF was tested compared to verbal counselling only.	No statistically significant difference was found between the 2 groups in the prevalence of exclusive or complementary BF at 6 months of age: 48.5% and 59.2% in the intervention group, 43.7% and 51.5% in the control group. The median duration of exclusive or complementary BF was 24 and 27 weeks in the treated group, 22 and 25 in the control group.
Duffy, 1997	RCT (pilot study)	70 primiparae who intended to BF (intervention group=35). Antenatal clinic of a public hospital in Western Australia	Antenatal teaching session on position and attachment of the baby on the breast at 36 weeks gestational age.	Women in the experimental group were better able to attach the baby on the breast and had significantly less nipple pain and trauma than the control group. At six weeks postnatally, 31 of the 35 (88.5%) women in the experimental group were BF compared to 10 of the 35 (28.5%) in the control group.
Martin-Calama, 1997	RCT	180 normal newborns. Spain	The effect of feeding glucose water to BF newborns on weight, body temperature, blood glucose, and total duration of BF and age at introduction of infant formulas were evaluated.	In the NGW (non glucose water) there was a greater weight loss at 48 hours but not at 72 hours, temperatures higher than 37.5 degrees C were more frequent, and the mean serum glucose levels at 6, 12, and 24 hours were lower. This group also had more serum glucose level determinations under 2.2 mmol/l (40 mg/dL). However, no infants exhibited hypoglycemic symptoms. Infants in the GW received twice as many formulas during the first month and had a shorter duration of any BF.

Study	Type of study	Country/Setting/Participants	Objectives/Intervention	Main results
Schubiger, 1997	RCT	10 centres and 602 healthy newborns. Switzerland	The effect of restrictive fluid supplements and avoidance of bottles and pacifiers during the first 5 days of life on BF prevalence on day 5, and after 2, 4 and 6 months was evaluated.	No significant differences in BF frequency and duration could be found.
Schy, 1996	RCT	150 women (intervention group=75). USA	The effectiveness of an in-hospital lactation education session on BF duration and satisfaction among postpartum women was investigated and compared to routine care.	No differences were found between the groups regarding BF duration, mother's satisfaction level, or her perceived support. In multiple regression analysis three variables were related to length of BF experience: level of satisfaction, educational level of the mother, and expected length of BF.
Brent, 1995	RCT, non-blinded	108 women in a low income inner-city setting. Prenatal/pediatric care ambulatory and maternity ward of a primary care centre. Pittsburgh, USA	Individual prenatal and postnatal (birth, 48 hours, 1 week, and periodically till one year) lactation instruction from a lactation consultant (intervention group=51) vs standard care at the institution.	There was a markedly higher incidence of BF in the intervention group, as compared with that of the control group (61% vs 32%, respectively; P = 0.002). The duration of BF was also significantly longer in the intervention group (P = 0.005).
Sciaccia, 1995	RCT	68 primiparous women enrolled in the WIC programme (low income). Two clinic site. Flagstaff, Arizona, USA	Usual WIC BF education plus: - special incentive to participate in 2-hour BF class - peer counsellors automatically assigned and incentive to contact within 2 days of delivery - incentive to mothers who breastfed	Ever BF at discharge: - Intervention group (n=26) 100%; control group (n=29) 83% (p<0,05) EBF 2 weeks postpartum: - Intervention group 81%; control group 35% (p<0,05) EBF 6 weeks postpartum: - Intervention group 50%; control group 24% (p<0,05) EBF 3 months postpartum: - Intervention group 42%; control group 17% (p<0,05)
Westphal, 1995	RCT before/after	4 experimental and 4 control maternity hospitals, S. Paulo, Brazil	BF training course (14 days) of health professionals. Follow up: 6 months.	Increased compliance with 10 steps (mainly steps 2 and 10), better health professionals knowledge.
Hauck, 1994	RCT	150 mothers of full-term infants. Perth, Australia	Intervention group mothers who were BF for the first time (n=75) received a BF information booklet. Follow up for 52 weeks.	Although the BF information booklet was found to be useful by 97% of the experimental group, there was no significant difference noted for BF duration between groups.
Perez-Escamilla, 1992	RCT	165 low-income mothers who planned to breastfeed and gave normal birth. Urban setting, Mexico	Three groups: A) mothers in a nursery (n = 58) B) mothers in a rooming-in hospital where formula supplementation was not allowed. Mothers received BF guidance during the hospital stay (n = 53) C) Mothers in a rooming-in hospital where formula supplementation was not allowed, control (n = 54)	Non-parametric survival analyses adjusting for potential confounding factors show that BF guidance had a positive impact (P < or = 0.05) on BF duration among primiparous women who delivered in the rooming-in hospital. Among primiparae, the C and B groups had higher (P < or = 0.05) full BF rates than the A group in the short term. In the longer term, only the difference between the B and the A group remained statistically significant.
Hofmeyr, 1991	RCT	Nulliparous women in uncomplicated labour. Community hospital. South Africa	To measure the effects of supportive companionship on labour and various aspects of adaptation to parenthood, and thus by inference the adverse effects of a clinically orientated labour environment on these processes.	Companionship had no measurable effect on the progress of labour. Diastolic blood pressure and use of analgesia were modestly but significantly reduced. The support group were more likely to report that they felt that they had coped well during labour (60 vs 24%, P less than 0.00001). Their mean labour pain scores (26.0 vs 44.2, P less than 0.00001) and state anxiety scores (28.2 vs 37.8, P less than 0.00001) were lower than those of the control group. Compared with the control group (n = 75), at 6 weeks women in the support group (n = 74) were more likely to be BF exclusively (51 vs 29%, P less than 0.01); and to be feeding at flexible intervals (81 vs 47%, P less than 0.0001).

Study	Type of study	Country/Setting/Participants	Objectives/Intervention	Main results
Oakley, 1990	RCT	509 socially disadvantaged women with a history of a low-birthweight baby (intervention group=255). Four hospitals, UK	Women received either a social support intervention in pregnancy in addition to standard antenatal care (the intervention group) or standard antenatal care only. Social support was given by four research midwives in the form of 24-h contact telephone numbers and a programme of home visits.	BF at discharge: 46% in the intervention group vs 39% in the control group. Babies of intervention group mothers had a mean birthweight 38 g higher than that of control group babies; there were fewer very low-birthweight babies in the intervention group.
Frank, 1987	RCT, blinded assessment	343 multiethnic low-income urban women. Boston, USA	One intervention compared bedside counselling by a trained counsellor, who also made eight telephone calls during the first 3 months of the infant's life, with the routine BF counselling provided in the hospital by nurses. The other intervention compared commercial discharge packs provided by formula companies with discharge packs designed to be consistent with the WHO Code of Marketing of Breastmilk Substitutes. Follow up at 4 months.	Bedside counselling delayed the first introduction of solid foods to the infant's diet but did not exert a statistically significant effect on BF by 4 months' postpartum. Women who received the research discharge pack, compared with those who received the commercial pack, were more likely to prolong EBF (P = .004), to be partially BF at 4 months postpartum (P = .04), and to delay the daily use of solid foods in the infant's diet (P = .017). Among the women who received bedside counselling, the research discharge pack was associated with lower rates of rehospitalization of infants than was the commercial pack (1% v 14%; P = .014).

## 5. Other Controlled Studies

Study	Type of study	Country/Setting/ Participants	Objectives/Intervention	Main results
Baumgardner, 2003	Prospective cohort	115 healthy, full-term newborns delivered vaginally of mothers exposed to epidural anesthesia vs 116 newborns not exposed. Wisconsin, USA	To explore the association between labour epidural anesthesia and early breastfeeding success.	Two successful breastfeeds within 24 hours were achieved by 69.6% of mother-baby units that had had epidural anesthesia compared with 81.0% of mother-baby units that had not (OR 0.53, p=.04). These relations remained after stratification (weighted ORs in brackets) for maternal age (0.52), parity (0.58), narcotics use in labor (0.49), and first breastfeed within one hour (0.49). Babies of mothers who had had epidural anesthesia were significantly more likely to receive a bottle supplement while hospitalized (OR 2.63; p<.001) despite mothers exposed to epidural anesthesia showing a trend toward being more likely to attempt breastfeeding in the first hour (OR 1.66; p=.06). Mothers who had epidural anesthesia and who did not breastfeed within one hour were at high risk for having their babies receive bottle supplementation (OR 6.27).
Hillenbrand, 2002	Before-after	49 paediatric residents. Households. N. Carolina, USA	Multimedia curricular educational intervention (4 days) and evaluation by questionnaires and telephone surveys with mothers.	Increased residents knowledge score and management skills.
Martens, 2002	Before-after. Charts audit	283 BF women at community level. Canada	The Sagkeeng First Nation BF initiatives (prenatal instruction by a community health nurse and a postpartum peer counselor programme) was evaluated.	BF initiation rates increased from 38% in 1995 to 60% in 1997 (OR = 2.2, 95% CI 1.2-4.1, adjusted for birth weight and parity). Intervention group was half as likely to wean (RR=0.5, 95% CI 0.25-0.98, adjusted for birth weight and parity), with 61% still BF at 2 months (vs 48% nonclients) and 56% at 6 months (vs 19%). Intervention group women had fewer problems (median 1 vs 2, p=0.044) and greater satisfaction with BF (median 5 vs 4, p=0.07).
Cattaneo, 2001	Non RCT	8 hospitals, 571 health professionals, 2669 mothers. Italy	Training (18-hour course) of trainers and of health professionals. Follow-up: 6 months.	Increased compliance with 10 steps, increased health professionals knowledge score, increased BF rates at discharge and at 3/6 months.
Cattaneo, 2001	Before-after	All maternity hospitals (10) and immunisation clinics of the 6 Local Health Authorities of Friuli Venezia Giulia, Italy	1) A BF reporting system was developed using standard WHO definitions and methods. 2) Regional Health Authority included BF in its annual plans for 1998 and 1999. 3) Local Health Authorities were asked to develop local workplans and targets. 4) Financial penalty was contemplated for Local Health Authorities not achieving objectives and targets.	1) All Local Health Authorities and hospitals set up the BF reporting system and defined BF promotion activities for 1999. 2) The rate of EBF increased significantly between 1998 and 1999 with a corresponding reduction of PBF: - EBF at discharge: 49% vs 37% (p<0,001) - EBF at 16-19 weeks: 30% vs 26% (p<0,001)
Hogan, 2001	Before-after	Nova Scotia, Canada	1) questionnaire to evaluate practices, identify, problems and propose solutions (70 randomly selected subjects); 2) implementation of the proposal promotion programmes (access to prenatal classes; nurse follow-up after hospital discharge; availability of lactation consultants).	Initiation of BF: - Before implementation (1994): 41% - After implementation: 60.5%
Philipp, 2001	Before-after	Two hundred medical records, randomly selected by a computer. Boston, USA	Evaluation of effect of BFHI on BF initiation rates.	The BF initiation rate increased from 58% (1995) to 77.5% (1998) to 86.5% (1999). Infants exclusively breastfed increased from 5.5% (1995) to 28.5% (1998) to 33.5% (1999). Initiation rates increased among US-born black mothers in this population from 34% (1995) to 64% (1998) to 74% (1999).
Radford, 2001	Before-after	21 hospitals, UK	BFHI intervention.	The percentage of breastfed babies rose from 60% two years before the units received their baby friendly award to 70.6% a year after their accreditation. Some of the largest increases were in hospitals serving inner city or deprived areas, which traditionally have low rates. For example, BF initiation at the Ulster Hospital in Belfast has increased from 29% in 1995 to 55% now. Some hospitals in areas with traditionally strong BF rates have also shown increases with the Royal Surrey Hospital, Guildford, showing a rise from 74% in 1995 to 86% today.

Study	Type of study	Country/Setting/Participants	Objectives/Intervention	Main results
Ransjo-Arvidson, 2001	Prospective cohort	Video recordings of 28 newborns. Group 1 mothers (n=10) had received no analgesia during labor, group 2 (n=6) mepivacaine, and group 3 (n=12) pethidine or bupivacaine or more than one type of analgesia. Sweden	To assess the effects of different types of analgesia during labour on the development of spontaneous breastfeeding movements, crying behavior and skin temperature during the first hours of life in healthy term newborns.	All infants made finger and hand movements, but the infant's massage-like hand movements were less frequent in infants whose mothers had received labour analgesia. A significantly lower proportion of group 3 infants made hand-to-mouth movements ( $p<.001$ ), and a significantly lower proportion of infants in groups 2 and 3 touched the nipple with their hands before suckling ( $p<.01$ ), made licking movements ( $p<.01$ ), and sucked the breast ( $p<.01$ ). Nearly one-half of infants, all in groups 2 or 3, did not breastfeed within the first 2.5 hours of life. The infants whose mothers had received analgesia during labour had higher temperatures ( $p=.03$ ) and they cried more ( $p=.05$ ) than infants whose mothers had not received any analgesia.
Ahluwalia, 2000	Before-after	Low income women. Georgia, USA	Georgia's WIC programme implemented from 1991 5 new strategies to promote BF in addition to its standard: 1) enhanced BF education, 2) breast pump loans, 3) hospital-based programmes, 4) peer counselling, and 5) community coalitions. Data from Pregnancy Nutrition Surveillance System (PNSS) and Pregnancy Risk Assessment Monitoring System (PRAMS) databases were used for the evaluation.	PNSS data show that BF initiation increased in the Georgia WIC programme from 31.6% in 1992 to 39.5% in 1996. PRAMS data confirmed this increase (from 33.6% in 1993 to 42.1% in 1996). PRAMS data show a high BF initiation among non-WIC participants (64.7% for 1994 and 70.1% in 1996). The percent change between 1993 and 1996 was 8% for non-WIC participants, and it was 25% for the WIC participants among those responding to the PRAMS questionnaire. Data from PRAMS indicated no statistical change in the percentage of WIC enrollees who breastfed their infants for 8 weeks or more; this estimate was 18.3% in 1993 and 19.4% in 1996.
McInnes, 2000	Non RCT	919 low-income women in poor income setting. Glasgow, UK	Peer counselling of pregnant women and support of BF.	Stated intention to BF at booking: - Intervention group 18%, control group 21% Initiating BF at delivery: - Intervention group 23%, control group 20% (OR 2; 95% CI 1.2, 3.1) BF 6 weeks post-natally: - Intervention group 10%, control group 8% (OR 1.8; 95% CI 1, 3.4)
Riordan, 2000	Prospective cohort	129 mothers delivering vaginally. USA	To examine the relationship of labour pain relief medications with neonatal suckling and BF duration.	Controlling for infant age, birthweight, and gender, infants of unmedicated mothers had higher Infant Breastfeeding Assessment Tool (IBFAT) suckling scores than those of medicated mothers (11.1 vs 8.2 respectively, $p=.001$ ). IBFAT suckling scores for intravenous and epidural groups were similar (8.5), while those who received a combination of both intravenous and epidural medications were lower (6.4 vs 2.96, $p=.001$ ).
Valdes, 2000	Controlled trial	Chile	Support to the mothers (anticipatory counselling and monthly clinical follow-up of mother and infant).	Intervention group: 6 months of EBF 53% and milk expression after returning to work 66%. Control group: 6 months of EBF 6% and milk expression after returning to work 23%.
Volpe, 2000	Controlled trial	91 pregnant adolescents. USA	To determine if specific BF education, provided by a lactation consultant in group classes for pregnant adolescents, would increase BF initiation among students enrolled in a high school adolescent pregnancy programme.	There were no significant differences in BF initiation with regard to age or ethnicity. Of the 48 adolescents who received no specific education, 7 (14.6%) initiated BF. Of the 43 adolescents in the education group, 28 (65.1%) initiated BF, which indicates a significant difference between groups with regard to infant feeding choice ( $P < .001$ ).
Haughwout, 2000	Trial	Family medicine residents. USA	Evaluation of 4.5 hour interactive workshop (with a lactation consultant and standardized patients).	Increased clinical diagnostic skills and residents' comfort with BF (OSCE scores after intervention significantly better in the intervention group for the content areas assessing position and latch and the evaluation of sore nipples: $P < 0.001$ and $P = 0.05$ respectively). All residents in the intervention group correctly diagnosed the cause of both the sore nipples and low milk supply at the follow-up OSCE, with P values of $<0.001$ and 0.068, respectively.
Moran, 2000	Trial (between-subjects design)	Four hospital sites. 28 midwives, UK	Evaluation of the effectiveness of 20-hour WHO/UNICEF BF Management Course by pre-validated BF Support Skills Tool (BeSST).	Increased BF support skills two weeks following the 20-hour WHO/UNICEF BF Management Course.





Study	Type of study	Country/Setting/Participants	Objectives/Intervention	Main results
Schafer, 1998	Non RCT	Rural low-income women eligible for WIC programme. 8 counties (2 intervention and 6 control counties). Iowa, USA	Peer support before and after the baby was born (in-home, one-to-one lessons about healthy diet and BF + informal contact).	Initiation of BF: - Intervention group (n=143) 82%, control group (n=64) 31% BF rates: I (n=72) C (n=20) (p>0,001 for 2, 4, 8, 12 weeks) - 2 weeks 81% 18% - 4 weeks 56% 10% - 8 weeks 48% 10% - 12 weeks 43% 0% BF mean duration: 5,7 weeks 2,5 weeks
Arlotti, 1998	Controlled trial	36 low-income women. Florida, USA	Peer support	Higher rates of EBF across time and more EBF in the intervention group (n=18) than in the control group (n=18).
Akram, 1997	Controlled trial	120 mothers (intervention group=67). Slum area. Karachi, Pakistan	Health education to promote EBF was provided in the form of flip-charts, videos and photographs.	66% of mothers in the control group gave prelacteals as compared to 31% in the intervention group (P < .0001). 97% mothers in the intervention group and 3% in the control group gave colostrum. 94% of intervention group mothers continued EBF till 4 months of age against 7% in the control group.
Moreno Manzanares, 1997	Controlled trial (pre-post)	202 mothers. Madrid, Spain	Intervention consisted in a plan to create positive attitudes toward maintaining natural lactation.	70.2% of mothers in experimental group continued to BF, whereas only 39.5% of the control group did. After four months 55% of the intervention group was still nursing their children, while the control group fell to 30.2%.
Hartley, 1996	Controlled trial (pre-post)	180 low-income mother-infant pairs (intervention group=90). Women's health centre and children's hospital. Toledo, USA	"Best Start" BF educational programme (1994). Control group: 90 mother-infant pairs (1993).	Control group: 13 (15%) of 86 mothers BF at hospital discharge compared with 25 (31%) of 81 (P < 0.03) in the intervention. At the 2-week clinic visit, 11 (13%) of 86 were still BF (control) compared with 17 (21%) of 81 (intervention) (P > 0.20). The impact on mothers aged 19 years or less was particularly marked, with a tripling of the BF rate at hospital discharge from 11% (2/18) (control) to 37% (10/27) (intervention).
Wright, 1996	Before-after	584 postpartum women (392 after intervention) in a teaching hospital maternity ward. Arizona, USA	The impact of hospital practices modifications in accordance with the Ten Steps to Successful BF on the duration of BF was evaluated before and after the implementation.	By 1993, more newborns were put to the breast in the first hour of life (63.2% vs 24.8%); fewer breastfed infants were fed foods other than breast milk (27.9% vs 46.7%); and more mothers received BF guidance from hospital staff (81.9% vs 61.3%). The duration of BF in 1993 was longer for women who did not receive formula in the hospital, who were not given discharge packs containing formula and/or coupons, and who roomed-in more than 60% of the time. These associations persisted after controlling for confounding.
Long, 1995	Before-after	Native American women enrolled in the WIC programme. Salt Lake City, Utah, USA	Peer counsellors contact the subject by telephone and home visits prenatally and at 1, 2 and 4 weeks postpartum. NB: two peer counsellors	BF rates: I C - Initiation 84% 70% - 2 weeks 73% 65% - 1 month 71% 57% - 2 months 55% 41% - 3 months 49% 36% - 6 months 21% 31% Participants: 63 and 78 respectively at the beginning → 34 e 65 at 6 months. Costs: peer counsellors employment costs during study was less than US\$ 1000; saving to WIC on formula milk at least US\$ 10,000.
Prasad, 1995	Before-after	468 mothers (172 recruited before the intervention, 195 immediately after, and 101 six months later). District hospital. Bihar, India	The impact and sustainability of a baby friendly training intervention for staff on initiation of BF and use of prelacteal feeds by mothers was evaluated by interviewing mothers. Intervention consisted in a 10 day training programme for doctors, nurses, and midwives, explaining the benefits and feasibility of early BF and dangers of prelacteal feeds together with instructions on how to explain this information to mothers.	BF was started within 24 hours of birth by 29% of control mothers, 84% in the early follow up group, and 59% in the late follow up group. Prelacteal feeds were used by 96, 43, and 77% respectively. Only 36 mothers in the late follow up group reported receiving education on feeding. Mothers in this group who had received the education were significantly more likely than mothers who received no education to breast feed early (78 vs 17%, p<0.001) and not use prelacteal feeds (58 vs 3%, p<0.001).

Study	Type of study	Country/Setting/Participants	Objectives/Intervention	Main results
Valdes, 1995	Before-after	Hospital and household. Chile	Training of health professionals (3 days)	69% of respondents reported changes in BF support practices.
Rossiter, 1994	Trial	194 Vietnamese immigrant women (intervention group=108). Antenatal clinics. Sidney, Australia	Culturally specific programme: videotape followed by a series of small group discussion (three 2-hour sessions).	Number of women BF at birth higher in the intervention group (70% vs 38%; RR 1,92; 95% CI 1,44-2,56) and was maintained at 4 weeks post-partum (19 withdrawals).
Carroll, 1994	Before-after	Alabama, USA	From 1990 the WIC Programme: 1) appointed state BF co-ordinator; 2) designated BF contact person for each of the 120 WIC clinics; 3) employed lactation consultant; 4) trained staff; 5) provided professional resources and educational tools; 6) implemented guidelines	BF (% of all WIC women): - Before (1990) 17%, after (1992) 29% No BF (% of all WIC women): - Before (1990) 83%, after (1992) 71%
Valdes, 1993	Before-after (cross-sectional)	735 middle class women who gave birth at the Clinical Hospital of the Catholic University of Santiago, Chile	For intervention group: 1) Individual prenatal education + group sessions on experiences, technique, and BF information 2) Modifications of hospital practices to allow early contact + 24-h rooming-in + supplementary feeding discouraged 3) Professional support during post-natal stay 4) Invited to attend open clinic on BF after discharge	Mean time of first feed: - Before 6,7 h, after 2,8 (p<0,0001) Postnatal supplementary feeds in hospitals: - Before 53%, after 19% (p<0,01) Postnatal supplementary feeds after discharge: - Before 6,3%, after 1,6% (p<0,001) Estimated costs per patient days of recovery (separate recovery vs rooming-in): - Separate: US\$ 3,57; rooming-in: US\$ 2,35 (14% cost saving, 34% personnel saving)
Bradley, 1992	Before-after	Kenya	National BF campaign from 1993: 1) ban of free supply of infant formula to hospitals; 2) directive to promote early BF; 3) full rooming-in; 4) ban of routine prelacteal/supplemental feeding; 5) modification of hospital routines; 6) national BF officer who organised training nation-wide; 7) involvement of NGOs.	In 1989 compared with 1982: - Higher score for policy-makers and maternity ward staff in all aspects of knowledge; - Improved maternity practices (e.g. separation of mother and baby, formula feeding and use of bottles have virtually disappeared from Kenyan hospitals); - Less than 50% of health workers interviewed knew about the government directive. None of these could be attributed to any single element of the BF promotion programme.
Lal, 1992	Before-after	10 villages (all pregnant women and mothers). India	Women received 1 week of training on key mother and child health problems for subsequent work in community-based women groups.	Initiation of BF: - Before (n=300) 23%, after (n=300) 60% (P<0,05) BF at 6 months: - Before (n=300) 49%, after (n=300) 60% (P<0,05)
Popkin, 1991	Before-after	Honduras	PROALMA project (1982-88): 1) change health professionals' knowledge and practices 2) change hospital policies (promote early BF, rooming in, no bottles or formula) 3) training of health professionals 4) support women (pre-natal, at delivery, post-partum).	Median duration of BF increased by 2.5 and 1.7 months in the period 1981-84 and 1984-87 respectively. At 5, 9 and 11 months an additional 42%, 52% and 63% of the urban infants in 1984 were breastfed compared with 1981. Increases were smaller for rural infants.

Study	Type of study	Country/Setting/Participants	Objectives/Intervention	Main results		
					Before (1981)	After (1987)
Rea, 1990	Before-after	Mother with infants 0-12 months. Sao Paulo and Recife, Brazil	From 1981 Brazilian National BF Campaign: 1) Media campaign 2) Train health professionals 3) Encourage research 4) Orient non-professional health workers 5) Promote restructuring of health services (e. g. rooming in) 6) Create a Brazilian Code based on WHO Code 7) Legislation for working mothers 8) Peer support group 9) Include BF in primary school	BF at discharge: - S. Paulo (n: Before 300, After 380) - Recife (n: Before 300, After 356) BF at interview: - S. Paulo (n: Before 274, After 360) - Recife (n: Before 264, After 333) BF mean duration (days): - S. Paulo (n: Before 300, After 380) - Recife (n: Before 300, After 380)	91% 88% 41% 32% 43 15	95% 94% 63% 51% 67 32
Kistin, 1990	Trial	Black low income women. Midwife antenatal clinic, USA	8 week period intervention. 3 groups: A. group education B. one to one educational sessions C. usual care	Both groups A and B increased initiation of BF in hospital and this difference was maintained at 12 weeks in women who received group education.		
Rodriguez-Garcia, 1990	Non RCT	Antenatal clinic. Four communities, Mexico	Group 1 (n=160): teaching and counselling by trained volunteers resident in the community Group 2 (n=122): group teaching of mothers by site supervisor Group 3 (n=148): 1+2 Group 4 (n=155): no intervention	Initiation of BF - Baseline - Post-intervention EBF at 1 month EBF at 5 month EBF at 6 month	I groups 75% 89% 71% 14% 9%	C group 66% 56% 63% 15% 3%

## 6. Other studies

Study	Type of study	Country/Setting/Participants	Objectives/Intervention	Main results
Aguayo, 2003	Multisite cross sectional survey	Staff at 43 health facilities and 66 sales outlets and distribution points, 186 health providers, and 105 mothers of infants aged 5 months in 16 cities were involved. Togo and Burkina Faso	Monitoring compliance with the International Code in health systems, sales outlets, distribution points, and the news media.	14% of health facilities had received donations of breast milk substitutes and all donations were being given to mothers free of charge. Health providers in 12% of health facilities had received free samples of breast milk substitutes and in 12% of health facilities had received promotional gifts from manufacturers. Promotional materials of commercial breast milk substitutes were found in 16% of health facilities. Special displays to market commercial breast milk substitutes were found in 44% of sales and distribution points. 40 commercial breast milk substitutes violated the labelling standards of the International Code. 90% of health providers had never heard of the Code, and 63% of mothers had never received any counselling on BF by their health providers.
Dulon, 2003	Cross-sectional survey plus follow-up survey	177 randomly chosen maternity hospitals. 1487 mothers delivering in these hospitals. Germany	Information on the fulfilment of the Ten Steps was collected by a postal questionnaire. BF duration was assessed through telephone interviews (baseline) and by mail (2, 4, 6, 9, 12 months).	Hospitals with a high BF promotion index (more than 5 steps implemented) showed no association with early BF but a significant association with full BF at 4 and 6 months. After adjusting for confounding factors, delivery in a hospital with a low BF promotion index was associated with an increased risk of short-term BF OR 1,24 (0,99-1,55), although associations with maternal demographic variables (young age: OR 3,34, 95% CI 2,03-5,49), low educational level (2,81, 2,23-3,55) and upbringing in East Germany (2,27, 1,33-3,89) were stronger.
Kramer, 2003	Observational cohort study nested within a large RCT	2862 infants exclusively breastfed for 3 months and 621 infants who were exclusively breastfed for $\geq$ 6 months. Hospitals, Belarus	Infant growth and health outcomes associated with 3 compared with 6 mo of exclusive BF.	<ol style="list-style-type: none"> <li>1. In the 3-mo group weight gain slightly greater [difference: 29 g/mo (95% CI: 13, 45 g/mo)], as was length gain [difference: 1.1 mm (0.5, 1.6 mm)] from 3 to 6 mo</li> <li>2. In the 6-mo group: faster length gain from 9 to 12 mo [difference: 0.9 mm/mo (0.3, 1.5 mm/mo)] and larger head circumference at 12 mo [difference: 0.19 cm (0.07, 0.31 cm)].</li> <li>3. In the 6-mo group significant reduction in the incidence density of gastrointestinal infection during the period from 3 to 6 mo [adjusted incidence density ratio: 0.35 (0.13, 0.96)]</li> <li>4. No significant differences in risk of respiratory infectious outcomes or atopic eczema</li> </ol>
Libbus, 2002	Survey	Employers in a small Midwestern City, USA	Survey: 85 mail out questionnaires to the employers.	Half of the employers had personal experience with BF. A large percentage of the sample, however, indicated that they would be willing to facilitate women who wished to breastfeed or express milk in the workplace. However, these employers also stated that they saw little value to their business of supporting BF in the work environment.
McIntyre, 2002	Descriptive study	1571 valid contacts. Australia	Distribution of information kits to workplaces, employers and women in Australia with the aim to balance BF and paid work. The material for the women was summarised and translated into Arabic, Chinese, Turkish, Spanish and Vietnamese. Conferences, newspaper articles, newsletter etc.	The response rate was 12.8% (n = 202). 70% of responding businesses rated the information kit as excellent. Over half anticipated the kit would be useful in their organisation, while over two-thirds agreed that the kit provided sufficient information and suitable solutions to support balancing BF and work in their organisation.
Mikiel-Kostyra, 2002	Prospective cohort study	1250 children, 3 years follow-up. Poland	The influence on BF of early skin-to-skin contact after delivery and the role of skin-to-skin contact among other potential factors influencing the duration of BF, were evaluated.	Infants kept skin-to-skin with the mothers for at least 20 minutes after delivery were exclusively breastfed for 1.35 months longer and weaned 2.10 months later. The skin-to-skin contact after birth significantly coexisted with the other BF supportive hospital practices, especially rooming-in without separations exceeding 1 h in 24 h [relative risk (RR) = 3.18, 95% confidence interval (95% CI): 2.34-4.31] and first BF within 2 h after birth (RR = 2.94, 95% CI: 2.36-3.67). Multivariate analysis indicated skin-to-skin contact and mother education as two independent variables influencing the duration of exclusive BF.
Brown, 2001	Survey	Employers knowledge, attitudes and practices (KAP) survey. Texas, USA	To explore KAPs from a social marketing perspective.	Employers knew about the benefits of BF for mothers and children. However, they did not place a high priority on providing BF support. Employers identified the barriers to and motivators for providing BF support, as well as effective communication and marketing strategies for the dissemination of BF support messages and materials for employers. Participants revealed important employer variables, such as the size of the company or agency, which must be considered when designing social marketing campaigns that target employers.

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DiGirolamo, 2001	Mail survey	1085 women with prenatal intentions to breastfeed who initiated BF. USA	The impact of the type and number of BFHI practices experienced on BF was evaluated. Predictor variables included indicators of the absence of specific BFHI practices (late BF initiation, introduction of supplements, no rooming-in, not BF on demand, use of pacifiers).	Only 7 percent of mothers experienced all five Baby-Friendly practices. The strongest risk factors for early BF termination were late BF initiation and supplementing the infant. Mothers experiencing no BFHI practice were approximately 8 times more likely to stop BF early. Additional practices decreased the risk for early termination.
Kersting, 2001	Cross-sectional survey plus follow-up survey	177 randomly chosen maternity hospitals. 1717 mothers delivering in these hospitals. Germany	Information on the fulfilment of the Ten Steps was collected using a postal questionnaire. BF duration was assessed through telephone interviews (baseline) and by mail (2, 4, 6, 9, 12 months).	Wide variations in BF promotion in hospitals were shown: some steps (3, 4, 8) were practised in about 90% of the hospitals, others (steps 7, 9) in only 10%. Prevalence of exclusive and any (in brackets) BF as defined by WHO was: 73% (86%) at discharge, 60% (85%) at 14 days, 42% (70%) at 2 months, 33% (59%) at 4 months, 10% (48%) at 6 months, <1% (26%) at 9 months 0 (13%) at 12 months.
Mc Innes, 2001	Community based study	Pregnant low income women. Glasgow, UK	Peer counselling and support for BF comprising antenatal and post-natal home visits over 3 years.	Peer support appeared to be acceptable to mothers and health professionals, initiating and maintaining peer BF support was possible.
Eden, 2000	Survey	Directors of 209 accreditation council for graduate medical education ACGME. USA, Puerto Rico	Evaluation of educational needs.	43% of directors believed the current level of BF residents education inadequate or in need of improvement and many rated the quality of their programme as poor.
Henderson, 2000	Content analysis	Mass media. UK	Television programmes and newspaper articles that made reference to infant feeding were analysed to examine how BF and bottle feeding are represented by the British media.	235 references were identified in the television sample and 38 in the newspaper sample. Bottle feeding was shown more often than BF and presented as less problematic. Bottle feeding was associated with "ordinary" families whereas BF was associated with middle class or celebrity women. The health risks of formula milk and the health benefits of BF were rarely mentioned.
Rea, 1999	Descriptive	Sao Paulo, Brazil	Sixty-nine factory workers were interviewed both during pregnancy and when they returned to work	Median duration of EBF, PBF, and any BF were 10, 70, and 150 days in three groups of women. Duration of EBF was longer among women with support for BF at work, and shorter for those working on weekends or doing shift work.
Schanler, 1999	Survey	1062 active fellows of AAP. Texas, USA	Evaluation of educational needs.	Significant education need: lack of knowledge, wrong recommendations, unfamiliar with BFHI, lack of BF training in the last 3 years.
Tarkka, 1999	Longitudinal study	Finland	Information on factors which contribute to the success of BF in first-time mothers when the child is 3 months old were collected through questionnaires.	Factors influencing successful BF in first-time mothers at 3 months postpartum seems to be the mother's own resources and attitude to BF, support from the social network and the current appreciation of BF in society.
CCL Family Found, 1998	Descriptive	Norway	Government family policies: 1) 42 weeks of full pay maternity leave or 52 weeks with 80% of salary; 2) flexible part-time for women from 2 months after giving birth with income supplemented with maternity benefits; 3) after returning to work, women are entitled to 1- to 1.5-hour breaks to return home to BF, or to have the child brought to work.	Any BF - initiation: 97% - at 3 months: 80% - beyond 12 months: 20%

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Elgueta Noy, 1998	Survey	Chile	Intervention: 82 mothers who received the "Support consultation to the working mother" (Centre of the Pontifical Catholic University of Chile). Analysis of the results on 30 mothers.	Mothers receiving the "Support consultation to the working mother" succeeded in EBF and reached ideal weaning age. The power of resolution of the Consultation -according to mothers- was satisfactory. The support given to the mother after her re-incorporation to work is the most significant intensifying factor in relation with the increase in the probability of keeping on BF.
Taylor, 1998	Survey; participants randomly selected in groups	1468 pregnant women, 1582 mothers of infants aged <=6 months, and 466 health workers at 165 health facilities. One city in each of Bangladesh, Poland, South Africa, Thailand.	Women were asked whether they had received any type of free samples of substitutes for breast milk, bottles, or teats. 3 health workers were interviewed at each facility to assess whether the facility had received free samples, to determine how they had been used, and to determine whether companies had given gifts to health workers.	Violations of the code were detected: 26% mothers in Bangkok (97/370) reported receiving free samples, infant formula, bottles, or teats compared with only 1 out of 385 mothers in Dhaka. Across the 4 countries from 8% to 50% of health facilities received free samples; from 2% to 18% of health workers received gifts from companies; in 15% to 56% of health facilities information that violated the Code had been provided by companies and was available to staff.
Rea, 1997	Survey	13 factories, Sao Paulo, Brazil	All women in the 3rd trimester of pregnancy were interviewed (76), and re-interviewed (69) when they went back to work (around 5,4 months after delivery).	BF initiation was 97%, with median duration of 150 days. EBF and PBF had 10 and 70 days, respectively, of median duration. Higher socio-economic status and nursery facilities, and the existence of a place in which to extract and store mother's milk at the workplace were factors associated with longer duration of BF.
Horton, 1996	Cost-effectiveness analysis	Three pairs of hospitals with maternity services (serving low income groups) in Brazil, Honduras, Mexico	Estimates of the cost and impact of 3 BF promotion programmes implemented through maternity settings were done through several steps: 1) Direct measurement of the impact of BF practice and cost of promotion activities (through a cross sectional study) 2) Translation of data on BF impact in mortality and morbidity effects and in estimates of DALYs gained (using risk ratios and estimates of cases and deaths from diarrhoea and ARI in Latin American region) 3) Mortality, morbidity and DALY impacts were combined with cost data to generate a set of cost-effectiveness measure	Two different scenarios are analysed: 1) Hospitals starting with high use of formula feeding in nurseries/maternity wards and low education/support to women (Mexico): → an annual cost of 30-40 US cents per birth can reduce diarrhoea cases for approximately \$0.65 to \$1.10 per case prevented, diarrhoea deaths for \$100 to \$200 per death averted, and reduce the burden of disease for approximately \$2 to \$4 per DALY. 2) Hospitals starting with restricted use of formula feedings in nurseries/maternity wards, rooming-in and high education/support to women (Brazil, Honduras): → investing from \$2 to \$3 per birth can prevent diarrhoea cases and deaths for \$3.50 to \$6.75 per case, and \$550 to \$800 per death respectively, with DALYs gained at \$12 to \$19 each. Conclusion: BF promotion can be one of the most cost-effective health interventions.
Levitt, 1996	Mail survey	Representatives of 572 hospitals providing maternity care. Canada	The extent to which policies and practices are consistent with the WHO/UNICEF 10 Steps to Successful BF, the WHO International Code of Marketing of Breast-Milk Substitutes and the WHO/UNICEF BFHI was evaluated.	Although 58.4% (296/507) of the respondents reported that their hospital had a written policy on breast-feeding, only 4.6% (21/454) reported having one that complied with all of the WHO/UNICEF steps surveyed. This figure dropped to 1.3% (6/453) when compliance with the WHO code (distribution of free samples of formula to formula-feeding and breast-feeding mothers) was added. Hospitals in Quebec and the Prairie provinces were significantly more likely than those in Ontario to give free samples of formula to both breast-feeding (OR 2.39 [95% CI 1.39 to 4.09] and 20.22 [95% CI 9.27 to 44.33] respectively) and formula-feeding mothers (OR 1.82 [95% CI 1.07 to 3.11] and 8.03 [95% CI 3.29 to 19.6] respectively).
Croft, 1995	Survey	British army servicewomen, UK	A survey of the potential health risks in the workplace to British Army servicewomen who are pregnant or breastfeed.	A total of 30 major workplace hazards to pregnant or BF servicewomen were identified. Medical guidance in this area was lacking.

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Kelly, 1995	Descriptive article		Several recommendations on support BF in emergencies were reported.	Those who provide health care and relief assistance during emergencies should undertake the following measures to support breast feeding and to protect the health of mothers: 1) work for agreement between outside agencies and local health workers on breast feeding policy and practice, share up-to-date information, and establish mechanisms to ensure actions are implemented in a coordinated manner; 2) ensure that maternity care practices follow WHO/UNICEF guidelines; 3) encourage women who are not breast feeding to do so, rather than criticizing them; 4) educate the whole community about the benefits of breast feeding and highlight the importance of family and social support; 5) offer one-to-one assistance to mothers who are experiencing difficulty breast feeding through use of a network of experienced mothers, or by training breast feeding counselors (women), who are sensitive to the culture, health beliefs, and circumstances of the mothers they assist; 6) provide assistance with relactation to mothers with infants who have stopped breast feeding early; 7) supply adequate basic food rations to every family, targeting supplementary food for pregnant and breast feeding women, and children of weaning age, not young infants; and 8) only provide infant formula to infants who do not have access to breast milk, and make sure their caregivers have the knowledge, skills, and resources to prepare and give feeds hygienically by cup rather than bottle.
Katcher, 1985	Descriptive	Non-profit voluntary community hospital, the Hunterdon Medical Centre, USA	Intervention: time off during the work day for nursing mothers to pump their breasts. An electric breast pump in a suitably accessible location and supportive professional advice were offered.	Mothers nursed for longer times and were more likely to continue nursing after return to employment when this programme was available.
Freed, 1995	National survey	National random sample of paediatric residents (999) and practitioners (610). N. Carolina, USA	Evaluation of residency training through assessment of paediatricians' knowledge, attitudes, training, and activities related to BF promotion.	Lack of clinical knowledge and experience, inappropriate recommendations, BF curricular training in lecture format with limited clinical practice.
Kistin, 1994	Case-control	Low income women who planned to BF. Urban setting, Brazil	Trained peer counsellors vs no counsellors.	Initiation of BF: - Intervention group (n=59) 93%, control group (n=43) 70% EBF: - Intervention group (n=59) 93%, control group (n=43) 70%
Naylor, 1994				BF as a primary health care strategy must be a part of any health care reform and, as such, will be a service expected to be provided by perinatal health professionals.
Auerbach, 1984	Survey	567 women, USA		Timing of return to employment and number of daily hours worked, rather than type of job, influenced weaning. Timing of return to work had more negative effect than the number of hours worked. Mothers who used breast pumps or hand-expressed their milk were more likely to nurse longer than women who did not pump their breasts at times of missed feedings.

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