Public Health Nutrition: 4(2B), 631–645 DOI: 10.1079/PHN2001147

Breastfeeding in countries of the European Union and EFTA: current and proposed recommendations, rationale, prevalence, duration and trends

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Abstract

Recommendations suggest *exclusive breastfeeding* for at least the first 4 to 6 months after birth. Paradoxically, an overwhelming proportion of breastfeeding (BF) data in Europe refers to *all* BF, i.e. not only exclusive but also partial BF (including formula, juices, water, sweetened water etc). This makes it difficult to estimate to what extent the recommendations are met. There is currently strong evidence for recommending exclusive breastfeeding for at least 6 months.

Exclusive BF has progressively gained scientific support. Prevention of infections, allergies and chronic diseases and a favourable cognitive development are highlighted in the recent scientific literature. Further long-term studies on the effects of BF on prevention of chronic disease in the adult are needed.

Great differences exist in BF prevalence and duration both within and between European countries. Trends point towards higher prevalence and duration, with some exceptions. Young mothers breastfeed less than older mothers; single and/or less educated mothers breastfeed less than married mothers with more education.

However, inefficient and unreliable monitoring systems prevail, and the data are scarce, not only on exclusive BF but also on demographic, socio-economic, psychosocial and medical determinants of BF patterns. National BF co-ordinators have not been appointed in many countries, and only every second country has promotion of BF incorporated into their national plan of action for nutrition.

Conclusions: Efficient surveillance systems, comparable across Europe and using common definitions and methodology, need to be developed. These should include determinants of breastfeeding. A European consensus conference should urgently be organised, in which strategies for successful promotion of exclusive BF should be particularly considered. There is now strong evidence for a recommendation to breastfeed exclusively for about 6 months, which is more than the duration recommended previously.

Keywords
Breastfeeding
Infant Feeding
Monitoring
Prevalence
Health Policy
Health Promotion
Disease Prevention
Equity

Introduction

Recommendations for breastfeeding in most European countries closely relate to those in the Innocenti Declaration[1] advising *exclusive breastfeeding* for the first 4 to 6 months after birth. Exclusive breastfeeding means that no other food or drink is given, except for medical supplements. A number of definitions are provided in Fig. 1.

The Eurodiet Project on Nutrition and Diet for Healthy Lifestyles in Europe, initiated by the European Commission, included issues related to breastfeeding[2]. This report is one of the background papers of this project, and provides an overview of current breastfeeding prevalence and trends in the EU countries.

The situation in the EU member states (plus Norway and Iceland (EFTA) and Switzerland), which is far from optimal when it comes to surveillance and promotion, is described and commented upon here. Exclusive breastfeeding is discussed in relation to recent scientific findings and international recommendations. Based upon this, it is concluded that a longer duration of exclusive breastfeeding should be recommended. Suggestions are also given to further improve surveillance. Aspects of breastfeeding promotion are described and discussed briefly, but will be dealt with in more detail separately[3].

Current recommendations

WHO/UNICEF – The Innocenti Declaration

The Innocenti Declaration[1] was produced and adopted at the meeting on 'Breastfeeding in the 1990s: A Global

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- **Breastfeeding:** The child has received breast milk (direct from the breast or expressed)
- **Exclusive breastfeeding:** The infant has received only breast milk from his/her mother or a wet nurse, or expressed breast milk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.
- **Predominant breastfeeding:** The infant's predominant source of nourishment has been breast milk. However, the infant may also have received water and water-based drinks (sweetened and flavoured water, teas, infusions, etc.); fruit juice; Oral Rehydration Salts (ORS) solution; drop and syrup forms of vitamins, minerals and medicines; and ritual fluids (in limited quantities). With the exception of fruit juice and sugar-water, no food-based fluid is allowed under this definition.
- Exclusive breastfeeding and predominant breastfeeding together constitute **full breastfeeding.**
- **Complementary feeding:** The child has received both breast milk and solid (or semisolid) food.
- **Bottle-feeding:** The child has received liquid or semisolid food from a bottle with a nipple/teat.

Fig. 1 Definitions of breastfeeding, according to WHO[60,88]

Initiative', co-sponsored by the United States Agency for International Development (A.I.D.) and the Swedish International Development Authority (SIDA), held at the Spedale degli Innocenti, Florence, Italy, 1990. The Declaration reflects the content of the original background document for the meeting and the views expressed in group and plenary sessions.

The declaration contains a brief statement on the benefits of breastfeeding, and in particular exclusive breastfeeding. It continues with a declaration concerning exclusive breastfeeding for 4 to 6 months as a global goal for optimal maternal and child health. It highlights the need for reinforcing a 'breastfeeding culture', with support and encouragement of women. Policy-making, advocacy and improvement of skills and knowledge of health care staff are other important issues.

UNICEF

Recommends exclusive breastfeeding: 'Breast milk alone is the best possible food and drink for a baby. No other food or drink is needed for about the first six months of life'. 'Breastfeeding should continue well into the second year of a child's life and for longer if possible'[4]. In the latest UNICEF publication on infant feeding[5], the wording regarding the importance of exclusive breastfeeding is even stronger. 'Babies should be exclusively breastfed – meaning that they receive nothing but breast milk, not even water – for about the first six months of life. Except in the rarest cases, no additional foods or fluids are necessary, and they can be harmful – introducing germs, triggering allergies and filling the stomach so that the infant takes less breast milk'.

Confusion regarding recommendations from WHO/UNICEF

In March 2000, at the WHO/UNICEF Technical Consultation on Infant Feeding (March 13–17, 2000), the technical experts expressed an informal consensus that the appropriate age for recommendation of complementary feeding is 'about six months.'[6]. WHO still uses the recommendation 4–6 months exclusive breastfeeding, in accordance with the Innocenti Declaration[1]. However, WHO is currently undertaking a systematic review of the relevant scientific literature, in accordance with the Cochrane Collaboration's criteria and framework. The aim of the systematic review is to examine and draw conclusions from the published scientific literature on the optimal duration of exclusive breastfeeding. The review's findings, including their implications for WHO's current infant feeding recommendation, will be available early in 2001[7].

British Paediatric Association

The document from 1994, 'Is breast feeding beneficial in the UK?'[8], gives a summary of the scientific background regarding breastfeeding and health at the time of the statement. It concludes that 'Epidemiological evidence convincingly indicate that breast fed infants are at significantly reduced risk of infection, particularly gastrointestinal infection, even in industrialised societies. Breastfeeding is particularly important for low birthweight infants, in whom both the reduced mortality associated with necrotising enterocolitis and advantages in cognitive function have been associated with provision of breast milk. Significant advantages in cognitive function have also been associated with breastfeeding of healthy term infants. Whereas these have previously been attributed to events, which confound choice of feeding method, new evidence about breast milk lipid composition and brain maturation suggests a plausible biological mechanism. Long term benefits of breastfeeding may also include reduction in the risk of juvenile onset diabetes and maternal breast cancer. Debate continues about the relationship between feeding method and allergic disease but there are some grounds to indicate that it is important in those genetically at risk.'

American Dietetic Association

In the Position Statement, 'Promotion of breastfeeding'[9], ADA declares; '…breastfeeding an infant for at least 6 months and preferably longer is not only optimal but should be the norm, and that use of human milk substitutes should be reserved only for a minority of infants and with specific indications.'

'The next challenge to ADA and other organisations is to communicate the importance of sustained exclusive breastfeeding for 4 to 6 months and, optimally breastfeeding with weaning foods for at least 12 months.'

'It is the position of the American Dietetic Association that public health and clinical efforts to promote breastfeeding should consist of activities that support longer duration of successful breast-feeding, in order to optimise the indisputable nutritional, immunological, psychological and economic benefits.'

American Academy of Pediatrics

The Policy Statement, 'Breastfeeding and the Use of Human Milk'[10] recommends breastfeeding practices including early initiation, feeding on demand and exclusively for 6 months approximately and then continued up to 12 months at least. The statement also incorporates sections regarding the prevalence of breastfeeding, pointing out the socio-economic differences.

AAP concludes that; 'Although economic, cultural and political pressures often confound decisions about infant feeding, the AAP firmly adheres to the position that breastfeeding ensures the best possible health as well as the best developmental and psychosocial outcomes for the infant. Enthusiastic support and involvement of paediatricians in the promotion and practice of breastfeeding is essential to the achievement of optimal infant and child health, growth and development.'

European Union

There is currently no official consensus statement in the European Union on the benefits of breastfeeding.

In Summary

There is a unified message coming from the international community of nutrition experts and health care professionals. It is clearly expressed that exclusive breastfeeding should be promoted during the first 4–6 months of a baby's life. A recommendation specifically developed for the Member States of the European Union remains to be developed. Over the last few years the recommendation has been shifted towards a longer period of exclusive breastfeeding, from 4–6 months to about 6 months.

Rationale – Recent scientific findings

In developing countries, breastfeeding is an essential component for child survival and for child spacing. In Europe, other issues are more relevant, like its importance for the general well being of child and mother, decreased risk of infection in the child, rapid postpartum recovery, as well as possibly reduce the risk of chronic disease later in life. The issue of child spacing should however not be forgotten in Europe as an important effect of sustained breastfeeding. In the following text, the results of some recent studies are described that support the prolonged recommendation for exclusive breastfeeding. Some important papers from earlier studies are included. This brief overview does not claim to be complete, but rather points at the need of a more consistent review of the current position, in collaboration with professional groups in Europe.

Breastfeeding and prevention of infections

A number of papers have been published on the protective effects of breastfeeding against infection [11–21]. They especially point to the protection exclusive breastfeeding provides against mild upper respiratory tract infections, inflammation of the middle ear (otitis media), urinary tract infections, bone and joint infections and diarrhoeal illness. The reduction in morbidity associated with breastfeeding seems to be of sufficient magnitude to be of substantial public health and economic significance.

Breastfeeding and sudden infant death syndrome

Compared to formula fed infants, breastfed infants have a lower risk of dying from sudden infant death syndrome (SIDS)[22]. The baby not being breastfed is stated as one of four important risk factors for SIDS, the others being child exposed to smoking, face-down sleeping position and child sleeping together with others. The magnitude of importance of these risk factors is under current debate, possibly leading to a statement that the protection from breastfeeding is less important than the other factors. The possible reasons behind breastfeeding as protective factor are not yet fully understood, but a number of recent studies have investigated the importance of the suckling reflex as well as bacterial binding to epithelial cells, aggregation of bacteria by antibodies and glycoconjugates and binding of bacterial toxins by breastmilk IgA[23–25].

Health of the mother

Breastfeeding increases levels of oxytocin, resulting in less postpartum bleeding and more rapid uterine involution. Lactational amenhorrea causes less menstrual blood loss over the months after delivery. Breastfeeding women return to pre birth weights more easily. Furthermore, breastfeeding seems to decrease the incidence of premenopausal breast cancer[26,27], even though breastfeeding as protective factor was of small magnitude compared to other known risk factors for breast cancer[28] and of ovarian cancer[29]. It is however of utmost importance that breast feeding patterns are clarified in epidemiologic studies of mothers' health. It has previously been common to classify mothers as 'ever' or 'never'

breastfeeding, while exclusivity and duration seem to play important roles in the understanding of underlying mechanisms for health protection[29].

Child spacing

In some countries, natural methods still play an important role in the regulation of fertility. This is particularly relevant in the candidate countries of the EU, since in some of these countries there are cultural and religious reasons for not using contraceptives, and there may also be problems in access to counselling and to modern contraceptive methods[30–34].

Childhood obesity

In a recent cross sectional study from Germany[35], it was shown that prolonged exclusive breastfeeding reduced the risk of being obese or overweight among 9357 five and six years old children in Bavaria, born in the early 1990s. The data indicated that the effect was associated with the composition of breast milk rather than to lifestyle factors associated with breastfeeding. The effect was dose dependent and related to the number of months of exclusive breastfeeding. According to this study, a 35% reduction in obesity in children at the time of school entry occurs if children are breastfed exclusively for 3 to 5 months.

The study is so far the largest epidemiological study on the impact of breastfeeding on the risk of school age children being overweight or obese. Further studies in the area are warranted, as well as more in-depth analyses of how breastfeeding promotion might possibly decrease the prevalence of overweight and obesity in children.

Diabetes

The hypothesis that lack of breastfeeding (or early exposure to cow's milk) predisposes children to type 1 diabetes, still awaits corroboration[36]. However, Harrison *et al.*[37] postulate that breast milk promotes immunomodulatory agents that in turn promote functional maturation in intestinal mucosal tissues. Insulin in breast milk might thereby induce regulatory T-cells in the mucosa and decrease the incidence of diabetes. McKinney *et al.*[38] found that exclusive breastfeeding significantly reduced the risk of type 1 diabetes in a recent population-based case-control study. These findings have been confirmed in a Chinese study[39] where duration of breast-feeding was found to be protective in a dose-response manner. A later European study found no significant correlation between exclusive breastfeeding or duration of breastfeeding and the development of childhood type I diabetes[40].

The question of type 2 diabetes (NIDDM) and breastfeeding has been studied in Pima Indians[41]. It has been shown that type 2 diabetes is less common in adulthood among those Pima Indians who were breastfed as children. Exclusive breastfeeding for the first two months of life is associated with a significantly lower rate of NIDDM in this population. Whether this type of diabetes can be prevented by increased breastfeeding in the group remains unknown. The emerging link between breastfeeding and childhood obesity[35], might give a clue to adult development of type 2 diabetes. Well-planned prospective studies need to be performed in order to corroborate findings regarding links between breastfeeding and diabetes.

Allergy, atopy

The cornerstone of allergy prevention is breastfeeding[42–44]. It provides the child with nutrients, and it may also provide immunological protection at the intestinal surface, where most antigens are encountered[45]. The importance of milk-borne cytokines as regulators of immune responses is currently investigated[45]. Saarinen and colleagues concluded in a prospective follow-up study[46], that breastfeeding is protective against atopic disease, including atopic eczema, food allergy and respiratory allergy, throughout childhood and adolescence. In studies of 'high-risk' infants, it has been shown that exclusive breastfeeding until the age of 6 months has a protective effect on the risk of developing atopic symptoms during the first 18 months of life[47].

Lipid metabolism in prepubertal children and adults

Recent data suggest that there might be lower cholesterol levels in breastfed children than in formula fed, especially in boys[48]. However, this study is small and concentrates on assessing the type of cow's milk and when it was introduced. Exclusive breastfeeding is not emphasised, which is why further studies are urgently needed. The investigators point to the hypothesis that there is potential for events occurring in utero or in early infancy to program lipid metabolism.

In a recent paper by Ravelli *et al.*[49] describing breastfeeding data from the Dutch famine in 1944–45, exclusively breastfed children are compared to all other children, irrespective of partial breastfeeding or bottle feeding, to assess their risk of CHD risk factors in adult life. The results show that children who were exclusively breast fed during the first days of life had favourable outcomes with respect to glucose and lipid metabolism. The results were still significant after controlling for socio-economic status.

Human milk as carrier of biochemical messages

As well as the psychological and strict nutritional aspects of breastfeeding, human milk is also a biochemical bridge between mother and child. A number of potentially active components can be found in breast milk, e.g. cytokines, growth factors, hormones, lactoferrin and cellular components[50]. However, it is not the presence of active substances that is important, rather the clinical relevance

of their biological activity in the child. These active biochemical compounds inhibit inflammatory reactions and enhance tissue repair, stimulate development of the gastrointestinal tract and stimulate barrier functions, protect against allergies and infections[50]. The underlying mechanisms of biochemical message transfer are still to a large extent unknown, and point towards an exciting future in breastfeeding research.

Development of taste

Many questions are still unanswered regarding the infant's development of taste and smell. Mennella and colleagues[51] have been studying whether early exposure to flavours, from amniotic fluid, breast milk or formula, has a long-term effect on development of food preferences and food habits. The flavours in breast vary greatly, and depend on the mother's diet. There is a distinct possibility that the mother's eating patterns may affect the ability to recognise and welcome the flavours of similar foods when introduced to the child.

Breastfeeding and early bonding

The importance and contribution of breastfeeding for an early and healthy bonding between mother and infant is emphasised in many studies[52–54]. Bonding at an early age is recognised as a foundation for the development of parental caring behaviours, and possibly as a prevention against abuse and neglect.

Breastfeeding and cognitive development

A number of studies on cognitive function in breastfed children compared to those who are formula-fed, have recently been reviewed in a meta-analysis[55]. This paper shows that significantly higher scores for cognitive development were associated with breastfeeding compared to those for formula feeding, an effect that was sustained until 15 years of age, which was the last reliable measurement point. Those who were breastfed the longest showed the most difference. The effects were particularly noticeable when looking at low-birth-weight infants. The authors conclude that nutrients present in breast milk may have a significant effect on development of the nervous system in premature and term infants.

Environmental concerns

Exposure to environmental contaminants of different kinds during lactation and the subsequent presence of toxic compounds in breast milk, should be monitored and discussed, especially in regards to women working or living in heavily polluted areas. It is however important to remember that the benefits of breastfeeding to an overwhelming proportion outweigh the environmental hazards. A series of reviews has been published by US Department of Health and Human Services in Atlanta, providing a public health viewpoint to chlorinated dibenzodioxins and dibenzofurans[56], cadmium, lead and mercury[57] and organochlorine pesticides[58]. It should of course be noted that smoking of the mother significantly adds to the other environmental risks mentioned here.

In Summary

A number of recent scientific reports have been published on the protective effects of breastfeeding against infections, allergy, and atopic eczema. Childhood obesity may be reduced and cholesterol levels in pre-pubertal children and adults may be lower. Cognitive development seems to be associated with breastfeeding. There are an increasing number of studies which indicate that the beneficial relationships demonstrated with breastfeeding are causal. There is an urgent need of a thorough review of all current findings, leading to a consensus statement from professional groups in Europe.

Prevalence and trends

Availability of data

Data on prevalence of breastfeeding can be found in the WHO Europe database[59] (www.who.dk), and the WHO global database on breastfeeding[60], located in Geneva, but so far not accessible on the web. They can also be found in country reports[61–86]. Additionally, a report was published by WHO in 1998[87], as a follow-up of the Innocenti Declaration[1], showing breastfeeding prevalence in a number of countries.

Accuracy of data

The data from the different countries are difficult to compare:

- the breastfeeding indicators may vary (exclusive breastfeeding, percentage children breastfed, initial breastfeeding, partial breastfeeding, breastfed at all etc.),
- the definitions for the operationalised indicators vary (breastfed at x months, feeding during last 24 hours, average duration etc)
- the sample sizes and the data sampling vary widely (in some cases only local data are collected, in others the data are from representative samples, in yet others from national healthcare statistics covering the whole population, etc),
- there are differences in the ages of children when data are collected, and
- the data are not always regularly reported.

It seems as if an overwhelming proportion of breastfeeding data in Europe refer to all breastfeeding, i.e. not only exclusive but also partial breastfeeding (including formula, sugar water etc). This makes it difficult to assess to what extent the current recommendations are met. Greater precision and consistency in defining the various modes of breastfeeding are needed[75,88,89]. A set of indicators for assessing breastfeeding practices have

been issued from WHO, but need to be implemented more widely[88].

This is not to say that those who are active in the field of breastfeeding surveillance are doing an insufficient amount of work. There are many enthusiastic individuals involved in collecting the data, often as volunteers or on unpaid overtime. Without the work these individuals are putting in, the situation would have been much worse. Improvements need to be made at political and policy-making levels, in order to put breastfeeding on the agenda and to build an efficient surveillance system.

However, although there are doubts regarding the accuracy and comparability of collected data, they can serve as rough indicators for tracing prevalence and trends in European countries.

Exclusive breastfeeding

Data on exclusive breastfeeding are scarce. Only Denmark, Poland and Sweden among the EU countries (including the candidate countries) report such data to the WHO Global Data Bank[60], but even among these the definition for exclusive breastfeeding may vary. Sweden has not reported any figures since 1993, although national data on exclusive breastfeeding have been collected and published later than this[83]. Denmark has not reported since 1986, even though there are data available from 1992[64]. Table 1 summarises data available on exclusive breastfeeding[59,61,64,67,70,74,76,83].

Initiation and duration of breastfeeding

Most of the data gathered do not cover initiation rates nor total duration of exclusive or partial breastfeeding.

Table 1 Exclusive breastfeeding rates

	Duration			
Country	1 month	2 months	4 months	6 months
Austria,1998[61]	92	85		46
Denmark, 1992[64]	73	68	44	
Finland, 1995[59]			68	
Germany, 1997[70]		42	33	10
Iceland, 1998[74]		75	49	
Italy, 1996[76]			26	
Sweden, 1997[83]	94	81	69	42
UK, 1995[67]			28	21

Secular trends

Figures 2 and 3 show breastfeeding prevalence amongst European countries. Great differences exist. The trend seems to be towards a higher prevalence, and possibly towards a longer duration. However, there are differences within countries as well as between them, especially regarding duration of breastfeeding and social class[67,83].

In summary

Great differences exist in breastfeeding prevalence and duration both within and between the European countries. Trends point towards higher prevalence and duration, with some exceptions. Inefficient and unreliable monitoring systems prevail however, and the data, especially on exclusive BF, are scarce. Efficient surveillance systems across Europe, using common definitions and methodology, have to be developed.

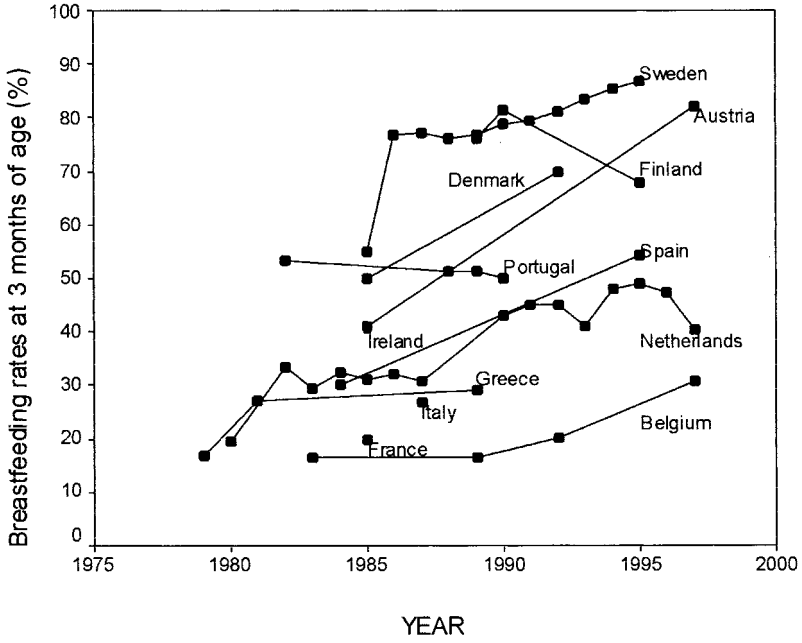

Fig. 2 Percentage children breastfed at 3 months, from WHO[59]. Please note that different definitions on breastfeeding and different methods for data collection may have been used. The data from the different countries may therefore not be fully comparable

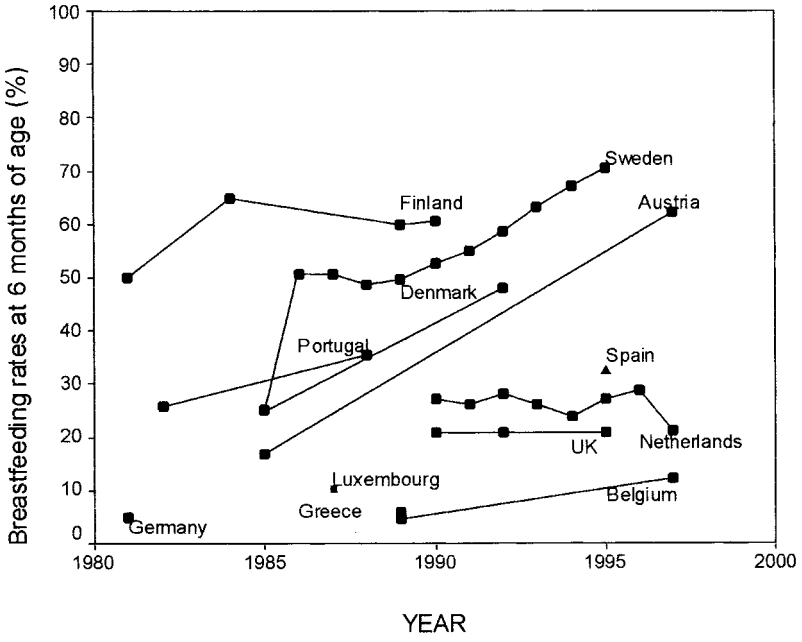

Fig. 3 Percentage children breastfed at 6 months, from WHO[59]. Please note that different definitions on breastfeeding and different methods for data collection may have been used. The data from the different countries may therefore not be fully comparable

Additional country information

In the following text, data are presented that were collected from our literature research and by request of relevant data from national breastfeeding co-ordinators, or in some cases co-ordinators of the national Baby-Friendly Hospital Initiative (BFHI). The situation in each country is summarised in a few lines. An overview is presented for all countries in Table 2, and a list of breastfeeding co-ordinators from each country is presented in Table 3. In Table 2, referral is also made to the WHO report on Nutrition Policy in WHO European member states, where a follow-up was done regarding the presence of an element on breastfeeding promotion in the national nutrition policy[90].

Breastfeeding data collection, promotion and policy are particularly limited in a few countries (France, Netherlands, Italy and Belgium). These countries seem to be the countries within the EU that have the biggest challenges ahead.

Table 2 Comparison of official, national breastfeeding (BF) data collection and policy issues in European countries

	Regular standardised surveys		Other national policy actions	
	Exclusive Breastfeeding*	Socio-economic determinants	Co-ordinator appointed	Nat Plan of Action, incl. BF
Austria	–	–	–	–
Belgium	–	–	–	–
Denmark	–	–	Yes	–*
England	Yes	Yes	Yes	Yes
Finland	Yes	Yes	Yes	Yes
France	–	–	–	–
Germany	–	–	Yes	Yes
Greece	–	–	–	–
Iceland	–	–	–	–
Ireland	–	–	–	Yes
Italy	–	–	–	–
Luxembourg	–	–	Yes	Yes
Netherlands	–	–	–	Yes
N. Ireland	Yes	Yes	–	Yes
Norway	–	–	Yes	–
Portugal	–	–	–	–
Scotland	Yes	Yes	Yes	Yes
Spain	–	–	–	–
Sweden	Yes	–	–	Yes
Switzerland	Yes	Yes	Yes	Yes
Wales	Yes	Yes	–	Yes

* Breastfeeding is included in the Danish public health programme, 1999[66].

Table 3 List of breastfeeding co-ordinators

Austria	Renate Fally-Kausek* Bundesministerium für Arbeit, Gesundheit und Soziales, Abteilung VIII/B/11, A-1010 Wien, Stubenring 1	+43 1 711 72 +43 1 711 72/4385 (fax)
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Austria

Austria is one of the countries in Europe with a high breastfeeding prevalence. As was the case in the Nordic countries, a great increase took place from the mid 1980's up to 1997, when the latest data were collected. Initiation, exclusiveness and duration increased.

A number of initiatives to promote breastfeeding have taken place in Austria, e.g. adoption of the WHO

International Code of Marketing of breast milk substitutes and designation of a number of hospitals as baby-friendly. Breastfeeding promotion material has been produced and disseminated by the Ministry of Work, Health and Social Affairs. Peer support groups has also been created and breastfeeding advisors can be consulted in a few of the Austrian maternity hospitals. Health professionals' support for breastfeeding promotion has been powerful and apparently effective[61].

Belgium

In Belgium, a survey was undertaken in the Flanders and the Dutch speaking maternity wards in Brussels, in 1996–97[62]. The survey showed an average of 56% breastfed infants on maternity wards. The range of breastfeeding prevalence was very broad, from 36% up to 91% between the wards.

The study also showed that most hospitals still gave mothers a free sample of infant formula when leaving the hospital. Glucose solution and pacifiers are still in use in Belgian maternity wards. Data on exclusive breastfeeding are not included in the study. The first BFHI hospital in Belgium is located in Brussels, and will receive its certification during 2000. A similar study to that mentioned above, has been undertaken in the French-speaking parts of Belgium, showing slightly higher breastfed-at-all figures of 68%[63].

Denmark

In Denmark, whilst no official breastfeeding statistics exist, some local data has been collected. In 1992, a study was conducted, based on a representative sample of parents of children from 1 to 12 months of age[64]. Breastfeeding was not the major issue for the study, which concentrated on evaluating the child health care system. Exclusive breastfeeding occurred in 50% of the children at 4 months. Some findings on age, social status and employment, show a lower rate of breastfeeding in younger, socially deprived and non-skilled groups.

The Copenhagen Cohort Study[65], provides a detailed description of breastfeeding patterns and describes social and biological factors influencing duration of breastfeeding. A new study of breastfeeding started in 2000, examining all children who will be 4 months of age in January 2000, and followed up during 2001 and 2002. A new national public health programme (Folkesundhedsprogram) was launched in 1999, where breastfeeding promotion is mentioned as an important priority[66].

England

The Department of Health firmly believes that it is important that women and their partners are able to make a fully informed choice on how to feed their babies based on accurate and consistent information. This means that all English women should have access to information about all infant feeding practices through the relevant health care professional. This standpoint has a number of consequences for effective breastfeeding promotion, since the health care staff are seen as vehicles for providing information about other forms of infant feeding. A survey is undertaken every 5th year, which covers England, Scotland, Wales and Northern Ireland[67]. It is described in the discussion below.

In May 1999 a new Infant Feeding Initiative was announced and included the appointment of two part-time National Infant Feeding Advisers. Their remit is to increase the incidence and duration of breastfeeding amongst vulnerable groups, and to ensure that all mothers have the information and support they need to make informed infant feeding choices. Funds have been made available for new and innovative projects that aim to increase breastfeeding rates amongst mothers on low incomes. So far (spring 2000), more than 30 projects, aimed at low-income women, have been approved for funding.

Finland

A change in measurement and selection criteria has occurred in Finland, which may explain the downward trend (Figs 2 and 3). The 1995 data represent exclusive breastfeeding from the first national survey, whilst previous figures include partial breastfeeding and come from local surveys[59].

France

In France, breastfeeding is not consistently monitored. The only data that are collected are those from a national perinatal monitoring survey which is a 'snap shot' conducted from time to time. These data indicate that in 1995 only 41% of children were exclusively breastfed at the age of 5 days[68]. Other data that are collected yearly are breastfeeding prevalence at the baby's 8th day of life. The national rate of breastfeeding in 1997 in this survey was 49% (excl+non-excl breastfeeding)[69].

Germany

Germany has undertaken four studies between 1981 and 1997[70–73]. The latest, in 1997, was a national survey and the Ministry of Health will publish the report in 2000[70]. Forty-eight % of mothers were still breastfeeding at 6 months of age, and 86% of the mothers planned to breastfeed and subsequently did so. These data demonstrate an improvement, compared to the earlier figures. Figures for exclusive breastfeeding were also collected, where the latest figures show that 33% exclusively breastfed at 4 months and 10% at 6 months. In this survey, data on determinants for breastfeeding and for duration of breastfeeding were also collected.

Greece

A breastfeeding survey has been started in Greece. Results from this will be available in 2001. A breastfeeding

promotion movement, (supported by the Ministry of Health), was started in 1980 with a campaign 'Return to breastfeeding'. In 1998, the Greek Parliament discussed the possibility of including breastfeeding information in school curricula. In 1999 maternity leave was increased to one year, depending on type of employment, granting mothers a full salary.

Iceland

No official breastfeeding data has been collected in Iceland. There are some figures though, the latest from a Master's thesis written in 1998[74]. According to these, 77% of children were still breastfed at 6 months of age. The same report also gives data on exclusive breastfeeding, indicating that about half of the mothers were exclusively breastfeeding when the child is 4 months of age.

Italy

In Italy, there is an ongoing debate on the reliability of collected data on breastfeeding within the country. Figures from local, and sometimes unrepresentative samples of the population, show breastfeeding prevalence varying between 17–52% at 4 months of age[75]. A local report (unpublished) shows a prevalence of exclusive breastfeeding at discharge of 37% and exclusive plus partial 82%[75]. The prevalence of exclusive breastfeeding at 4 months in the same study was 26%. In the same paper, the author emphasises the need for well-designed studies of breastfeeding and its determinants in Italy.

Another study shows that use of formula as a supplement to breast milk is still routine in many hospitals in Italy, as well as separation of mother and infant[76]. In the WHO follow up of the International Conference of Nutrition, Italy is stated to have no nutrition policy, plan of action or strategy[90]. However, there are objectives and strategies regarding nutrition in the latest national plan, but these still do not cover breastfeeding.

Ireland

In Ireland, a breastfeeding survey was undertaken in 1997. It did not however monitor exclusive breastfeeding rates. The national health strategy contains an element of breastfeeding promotion. In addition, there is a national breastfeeding policy document.

Luxembourg

Luxembourg has no published data on breastfeeding prevalence. The country has an officially appointed breastfeeding co-ordinator, and there is an element of breastfeeding promotion in the national nutrition policy.

The Netherlands

Figures from the Netherlands showed a decline in breastfeeding at the beginning of the nineties, from 1990 to 1992 and were even lower in 1996, when only 17% of mothers were still breastfeeding after 3 months. There has been an increase in prevalence from 1996 to 1997/1998, when a new survey took place[77]. By then 21% of mothers breastfed at 3 months and 12% at 6 months. However, although 77% of mothers initiate breastfeeding, the duration is short. There is no breastfeeding co-ordinator, but a number of peer support groups exist. New guidelines for infant feeding are under development. There is a foundation in the Netherlands, Stichting Zorg voor Borstvoeding, that was founded in 1996 by UNICEF to support the Baby-Friendly Hospital Initiative. The foundation is today supported by a great number of Dutch organisations.

Northern Ireland

The breastfeeding prevalence in Northern Ireland is lower than in any other part of the UK[67]. This has led to the development of a national plan of action for breastfeeding in Northern Ireland.

Norway

The prevalence of breastfeeding in Norway is high. The latest breastfeeding data indicate that 80% of children are exclusively or partially breastfed at 6 months of age (according to the office of national breastfeeding co-ordinator Gro Nylander via Anne Baerug, Oslo). This is most likely due to active lobbying during the early 1970s which led to major changes in both policies and practices. Norway has so far no national data concerning exclusive breastfeeding. Both the National Breastfeeding Centre and the National Nutrition Council are working with national studies on infant feeding A new national study, SPEDKOST, has recently been undertaken in Norway, covering 2600 children, and will include data on exclusive breastfeeding.

The most recent data come from Oslo and demonstrate a significant increase in breastfeeding duration. These data are not yet published but show that at the age of 3 months 98%, 6 months 84%, 9 months 69%, 12 months 49% and 18 months 15% are breastfed[78].

Portugal

According to unpublished data from WHO European region, a breastfeeding committee exists in Portugal, but no written breastfeeding policy that is communicated to health staff. The country is active in the baby-friendly hospital initiative.

Scotland

The incidence of breastfeeding at birth declined markedly in the UK during the 1960's, rose during the 1970's and remained static during the 1980's. Since 1991 there has been a Scottish initiative aiming to increase breastfeeding rates, which in some areas are as low as 13% at around six days[79,80]. A Scottish breastfeeding target was set in 1994:

'more than 50% of women to be still breastfeeding their babies at six weeks of life by 2005'.

The Diet Action Plan for Scotland, which was produced in 1996 and the government White Paper 'Towards a healthier Scotland' both reiterate the need to encourage and support breastfeeding. The Health Education Board for Scotland (HEBS), which has a remit covering health promotion in Scotland, deals with breastfeeding issues, through the local health boards[81]. The breastfeeding rates were significantly lower in Scotland than in England and Wales at the latest survey in 1995[67].

Spain

In Spain a Committee on Breastfeeding was set up in 1996, within the Spanish Association of Paediatrics (Asociación Espanola de Pediatria-AEP). One of their tasks is surveillance of breastfeeding in the different regions of the country. The most recent data were collected during 1997–98. The proportion of initial breastfeeding in Spain ranged between 80–90%, depending on the region. It decreased to 50% by the 3rd month and was less than 30% by the 6th month. The proportion of breastfeeding mothers was higher in the Central regions of the country (more rural population, more traditional practices). Breastfeeding has increased since the 80's, when on average initial breastfeeding was 60%, although many lactating women today stop breastfeeding early, at around 3 months[82].

Sweden

Breastfeeding trends in Sweden have been upwards over the last two decades, until children born in 1997 (the latest published data)[83]. Both prevalence and duration of breastfeeding have increased, as well as the prevalence and duration of exclusive breastfeeding, which was comprehensively monitored in Sweden.

The Swedish data have been collected by the local child health care providers and are regularly reported. Local data from the Stockholm region for children born in 1997 showed vast regional differences in prevalence of breastfeeding. The prevalence of exclusively breastfed children at 4 months ranged from 38 to 83%.

The lower rates were found in suburbs dominated by lower educated, low-income groups, with higher rates in the more socio-economically fortunate areas of Stockholm[84]. The data collected in Sweden have a different definition for exclusive breastfeeding to that used by WHO. The Swedish authorities say that small portions of other foods given to babies to taste, can be included within the definition of exclusive breastfeeding[83]. An updated version of the Swedish Code of Marketing of Breast Milk Substitutes was recently published by the National Board of Health and Welfare[85]. The authorities are considering a change towards the WHO definitions, since otherwise the data on exclusive breastfeeding from Sweden would be regarded as being artificially high.

Switzerland

In Switzerland, the breastfeeding prevalence is high, but breastfeeding is not necessarily sustained, and there are substantial regional differences. There is a distinct pattern of socially and educationally disadvantaged women breastfeeding for a shorter duration than their more advantaged peers. There is no mandatory maternity leave benefits system, which is why many working mothers have to cease breastfeeding.

Since 1994, most of the Swiss maternity clinics have become more breastfeeding-friendly and 30 have received the BFHI-award. There is a considerable amount of training of health-care staff in progress. A study that was performed in 1994[86], showed that 95% of Swiss mothers wanted to breastfeed, 92% initiated breastfeeding and by four months 48% were exclusively breastfeeding. The goal of the national breastfeeding committee is to encourage exclusive breastfeeding up to at least four months for 80% of mothers.

Wales

A national plan of action for breastfeeding is currently under development, based on an effectiveness review (not yet published) of breastfeeding initiatives. The Welsh initiative seems strong and well built, even though Wales still has not officially appointed a breastfeeding co-ordinator. Welsh breastfeeding statistics are collected every five years[67].

Discussion

Sweden and the United Kingdom – A comparison

These two countries have been chosen for two reasons: Good data are collected in these two countries[67,83], and they represent extremes in breastfeeding rates. In the UK data, the sample composition was slightly changed between 1990 and 1995. The latter sample included more older, better educated mothers in higher social groups, which might explain some of the increase in overall rates over time. The Swedish data are collected yearly from local child health services and cover essentially all children.

Initially breastfed – breastfeeding duration

UK has a much lower number of children who are initially breastfed (66%), while the rate initially breastfed in Sweden is approximately 100% (Fig. 4). The high prevalence in Sweden is mainly due to practice in prenatal care and maternity wards, where exceptions regarding initiation of breastfeeding within the first awake period are usually not made, unless extraordinary conditions apply to mother or child. 50% of the breastfeeding mothers in the UK in 1995 had stopped breastfeeding by 3.5 months. Compared to the figures from 1990 a prolongation of breastfeeding in both countries can be seen.

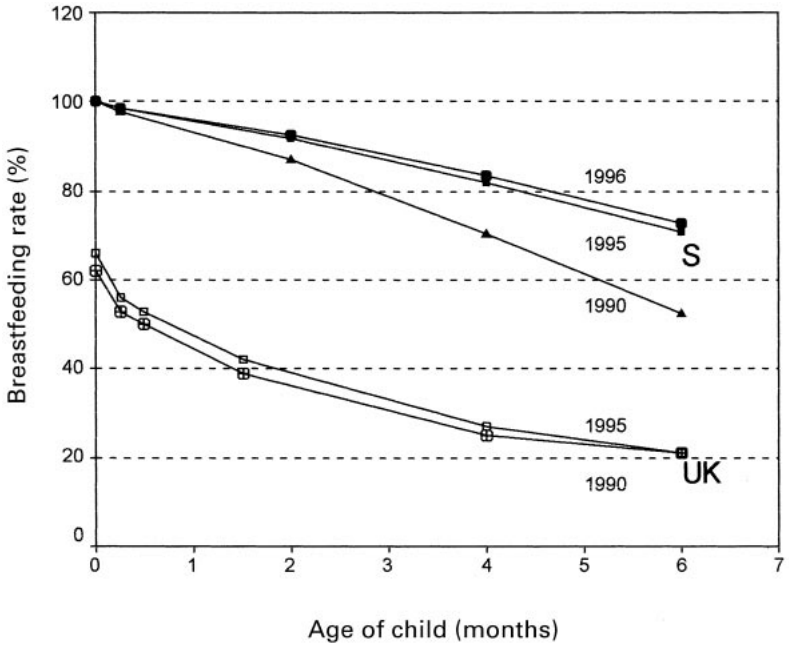

Fig. 4 Prevalence of breastfeeding by age of child, UK[67] & Sweden[83], 1990–1995/96

Socio-economic differences in breastfeeding within the UK

In the UK data, a strong relationship between the duration of breastfeeding and social class was shown, with a pattern of shorter duration of breastfeeding in each consecutively lower social class group. Of the mothers that initially breastfed in the UK in 1995, 48% of the mothers in Social Class I were still breastfeeding after 6 months, compared with 22% of their counterparts in Social Class V (the lowest social class). Younger mothers breastfed to a lesser extent, which was also true for single mothers.

Some reasons for not breastfeeding in the UK 1995 survey were summarised in the NSO report[67]. They are marked according to their preventability by introduction of more Baby-Friendly Hospitals with those most amenable to change at the end of the list:

- Socio-demographic characteristics like age, educational level, influence of family and friends, prenatal class participation
- Previous breastfeeding experience
- Delay of first feeding event (BFHI)
- Formula milk given in hospital (BFHI)
- Lack of breastfeeding support in hospital and after coming home (BFHI)

Baby-Friendly Hospitals in UK and Sweden

Out of 202 hospitals with maternity facilities in the UK, only 2 were designated baby-friendly (in 1996–97)[87] according to the ten steps to successful breastfeeding that are the foundation to the Baby-Friendly Hospital Initiative[91]. The corresponding figures for Sweden were 57 out of 57[87]. It is important to note that the high rates of BFHI designated hospitals in Sweden might be partly due to adoption of a national version of designation procedure.

Maternity leave discrepancies

Rules regarding maternity leave differ between the two countries;

- In the UK the statutory maternity leave is at least 14 weeks. Further maternity absence is possible (up to the infant's 28th week of life) depending on length of employment. The maternity pay in the UK is 90% of salary for the first six weeks and at least 52.50 GBP per week for the next 12 weeks, depending on National Insurance contributions.
- In Sweden the statutory maternity pay is 80% of salary for 360 days, plus another 90 days with a guaranteed amount of 60 SEK (approx. 5 GBP) per day. Out of the total number of 450 days, 225 days are assigned to the father, but can be awarded to the mother, with the exception of 30 days, that are the father's non-negotiable statutory rights for leave. The 450 days can to some extent be used before delivery, for example for prenatal classes, but also later, when the child starts school, up to the age of 8 years.

Thus, the Swedish system seems to be more flexible and rewarding for breastfeeding mothers. The Swedish mothers have more opportunities to attend prenatal classes, as well as have a longer leave with better financial support, than their British counterparts.

Conclusions of comparison

The much lower breastfeeding rates in the UK are likely to be due to a complex interaction of factors, including:-

- lack of baby-friendly hospitals,
- lack of prenatal breastfeeding promotion and lactation management training of mothers, and
- insufficient parental support.

The early introduction of lay groups for breastfeeding support in Sweden (1970s), through a system of volunteer mothers who are accessible for telephone consultation by their less experienced peers, should also be mentioned as an important way of providing encouragement and advice, especially for mothers without experienced family and friends. This is now happening in the UK, both at a national and local level.

The Swedish success story

In Sweden there was a steady drop in breastfeeding until the beginning of the 1970s. The prevalence of exclusive breastfeeding was then around 30% at the age of 2 months. The increase in breastfeeding prevalence has been enormous until children born1997, (latest statistics), when Sweden had one of the highest rates of breastfeeding within the European Union, with 81% exclusively breastfed children at 2 months, and 42% at 6 months[83]. Norway and Austria have also had an enormous increase in breastfeeding prevalence. This provides hope that breastfeeding prevalence and duration certainly can increase in other member states as well, and that breastfeeding promotion can be worthwhile.

Promotion and surveillance systems

Promotion of breastfeeding needs to be supported by a common methodology for data collection between countries and regions. Until this is accomplished, it will not be possible to evaluate the long-term public health effects of breastfeeding, differences between regions, and the effectiveness of promotion initiatives.

Equity

In most countries there are no systematically collected data on differences in breastfeeding related to socio-economic status. The lack of such data is even more striking considering that issues related to equity usually have a high priority. Differences in status, including educational level, age of mother, ethnicity, income, household type and marital status should be covered by national surveillance systems, as well as knowledge and attitudes regarding the importance of breastfeeding. Major support systems and obstacles for breastfeeding should also be monitored. This kind of data can map out risk groups and serve as a basis for the design of promotion programmes. The relative importance of different determinants for breastfeeding is described in a separate paper[3].

Health care practices

The importance of immediate post-delivery mother-offspring skin-to-skin contact as a means of increasing mother-child bonding, as well as for promoting lactational onset and for increased duration of breastfeeding, can not be emphasised enough [52–54,91,92]. This means that introduction of appropriate practices in post-delivery care is essential for successful breastfeeding promotion. This is put into action in the Baby-Friendly Hospital Initiative[93], where a number of specifics for change of practices and training of staff are identified.

In Conclusion

Efficient and valid surveillance systems, comparable across Europe and using common definitions and methodology, need to be developed. These should include determinants for breastfeeding, such as demographic, socio-economic, psychosocial and medical determinants. A more thorough review on the health effects of breastfeeding should be developed on European level, leading to a consensus statement, supported by several health professional bodies. A European conference on breastfeeding should be organised urgently, in which recommendations about breastfeeding and strategies for successful promotion of exclusive breastfeeding should be particularly considered. The development of an official European (EU and EFTA and candidate countries) network of national co-ordinators for breastfeeding should be considered by the European Commission.

Acknowledgements

Many thanks to Elisabeth Kylberg and Monica Kolm-Sandström in Sweden, Anne Baerug in Oslo, Carmen Perez Rodrigo in Bilbao, Ma Daniel Vaz De Almeida in Porto, Inga Thorsdottir in Reykjavik, Lynn Stockley in Bristol, Jan Janssen in the Netherlands, Juergen Koenig in Vienna, Antonia Trichopoulou in Athens, Randa Saadeh at the UNICEF office in Geneva and Pascale Camus-Walter in Strasbourg, who helped to guide us in the gathering of data.

References

1 WHO/UNICEF. *The Innocenti Declaration on the protection, promotion and support of breastfeeding*. Geneva: WHO/UNICEF, 1990.
2 Kafatos A, Codrington C. Nutrition and diet for healthy lifestyles in Europe; The Eurodiet Project. *Publ. Hlth. Nutr.* 1999; **2**: 327–8.
3 Yngve A, Sjöström M. Determinants for breastfeeding – suggested frame work for action in Europe. In Press.
4 UNICEF. *Facts for Life*. Geneva: UNICEF, 1993.
5 UNICEF. *Breastfeeding: foundation for a healthy future*. Copenhagen: UNICEF Geneva Region, 1999.

6 Ferriman A. WHO accused of stifling debate about infant feeding. *BMJ* 2000; **320**: 1362.
7 WHO. The World Health Organization's Infant Feeding Recommendation. http://www.who.int/nut/. Accessed October 30, 2000.
8 Statement of the Standing Committee on Nutrition of the British Paediatric Association. Is Breastfeeding beneficial in the UK? *Arch Dis Childhood* 1994; **71**: 376–80.
9 Position of the American Dietetic Association: promotion of breast-feeding. *J. Am. Diet. Assoc.* 1997; **97**: 662–6.
10 American Academy of Pediatrics. Policy Statement; Breastfeeding and the use of human milk. *Pedicatrics* 1997; **100**(6): 1035–9.
11 Dewey KG, Heinig MJ, Nommsen-Rivers LA. Differences in morbidity between breast-fed and formula-fed infants. *J. Pediatr.* 1995; **126**: 696–702.
12 Howie PW, Forsyth JS, Ogston SA, *et al.* Protective effect of breast feeding against infection. *BMJ* 1990; **300**: 11–6.
13 Kovar MG, Serdula MK, Marks JS, *et al.* Review of the epidemiological evidence for an association between infant feeding and infant health. *Pediatrics* 1984; **74**: 615–38.
14 Popkin BM, Adair L, Akin JS, *et al.* Breastfeeding and diarrheal morbidity. *Pediatrics* 1990; **86**: 874–82.
15 Beaudry M, Dufour R, Marcoux S. Relation between infant feeding and infections during the first 6 months of life. *J. Pediatr.* 1995; **126**: 191–7.
16 Frank AL, Taber LH, Glezen WP, *et al.* Breastfeeding and respiratory virus infection. *Pediatrics* 1982; **70**: 239–45.
17 Saarinen UM. Prolonged breast feeding as prophylaxis for recurrent otitis media. *Acta. Paediatr. Scand.* 1982; **71**: 567–71.
18 Aniansson G, Alm B, Andersson B, *et al.* A prospective cohort study on breastfeeding and otitis media in Swedish infants. *Pediatr. Infect. Dis. J.* 1994; **18**: 183–8.
19 Duncan B, Ey J, Holberg CJ, *et al.* Exclusive breastfeeding for at least 4 months protects against otitis media. *Pediatrics* 1993; **91**: 867–72.
20 Montgomery D, Splett P. Economic benefit of breast-feeding infants enrolled in WIC. *J. Amer. Diet. Ass.* 1997; **97**: 379–85.
21 Heinig MJ, Dewey KG. Health advantages of breast feeding for infants: a critical review. *Nutr. Res. Rev.* 1996; **9**: 89–110.
22 Ford RP, Taylor HM, Mitchell EA, *et al.* Breast feeding and the risk of sudden infant death syndrome. *Int. J. Epidemiol.* 1993; **22**: 51–9.
23 Gordon AE, Saadi AT, Mackenzie DA, Molony N, James VS, Weir DM, Busutiil A, Blackwell CC. The protective effect of breast feeding in relation to sudden infant death syndrome (SIDS): I. The effect of human milk and infant formula preparations on binding of toxigenic Staphylococcus aureus to epithelial cells. *FEMS Immunol. Med. Microbiol.* 1999; **25**: 155–65.
24 Gordon AE, Saadi AT, Mackenzie DA, Molony N, James VS, Weir DM, Busuttil A, Blackwell CC. The protective effect of breast feeding in relation to sudden infant death syndrome (SIDS): II. The effect of human milk and infant formula preparations on binding of Clostridium perfringens to epithelial cells. *FEMS Immunol. Med. Microbiol.* 1999; **25**: 167–73.
25 Gordon AE, Saadi AT, Mackenzie DA, Molony N, James VS, Weir DM, Busuttil A, Blackwell CC. The protective effect of breast feeding in relation to sudden infant death syndrome (SIDS): III. Detection of IgA antibodies in human milk that bind to bacterial toxins implicated in SIDS. *FEMS Immunol. Med. Microbiol.* 1999; **25**: 175–82.
26 Newcomb PA, Storer BE, Longnecker MP, *et al.* Lactation and a reduced risk of premenopausal breast cancer. *N. Engl. J. Med.* 1994; **330**: 81–7.
27 Marcus PM, Baird DD, Millikan RC, Moorman PG, Qaqish B, Newman B. Adolescent reproductive events and subsequent breast cancer risk. *Am. J. Public Health* 1999; **89**(8): 1244–7.
28 Bernier MO, Plu-Bureau G, Bossard N, Ayzac L, Thalabard JC. Breastfeeding and the risk of breast cancer: a meta-analysis of published studies. *Human Reproduction Update* 2000; **6**(4): 374.
29 Heinig MJ, Dewey KG. Health effects of breast feeding for mothers: a critical review. *Nutr. Res. Rev.* 1997; **10**: 35–56.
30 Karro H. Abortion in the framework of family planning in Estonia. *Acta. Obstet. Gynecol. Scand* 1997; **164**(Suppl): 46–50.
31 David HP. Abortion in Europe 1920–91: a public health perspective. *Stud. Fam. Plann.* 1992; Jan-Feb; **23**(1): 1–22.
32 Kovacs L. Abortion and contraceptive practices in eastern Europe. *Int. J. Gynaecol. Obstet.* 1997; Jul; **58**(1): 69–75.
33 WHO Task Force on Methods for the Natural Regulation of Fertility. (1999) The World Health Organization Multinational Study of Breast-feeding and lactational amenorrhea. III. Pregnancy during breast-feeding. *Fertility and Sterility* 1997; **72**(3): 431–40.
34 Vural B, Vural F, Erk A, Karabacak O. (1999) Knowledge on lactational amenorrhoea and contraception in Kocaeli, Turkey. *East African Medical Journal* 1999; **76**(7): 385–389.
35 Kries R, Koletzko B, Sauerwald T, Mutius E, Barnert D, Grunert V, Voss H. Breast feeding and obesity: cross sectional study. *BMJ* 1999; **319**: 147–50.
36 Gerstein HC. Cow's milk exposure and type I diabetes mellitus. A critical overview of the clinical literature. *Diabetes Care* 1994; Jan; **17**(1): 13–9.
37 Harrison LC, Honeyman MC. Cow's milk and type 1 diabetes: the real debate is about mucosal immune function. *Diabetes* 1999; Aug; **48**(8): 1501–7.
38 McKinney PA, Parslow R, Gurney KA, Law GR, Bodansky HJ, Williams R. Perinatal and neonatal determinants of childhood type 1 diabetes. A case-control study in Yorkshire, U.K. *Diabetes Care* 1999; Jun; **22**(6): 928–32.
39 Tai TY, Wang CY, Lin LL, Lee LT, Tsai ST, Chen CJ. A case-control study on risk factors for Type 1 diabetes in Taipei City. *Diabetes Res. Clin. Pract.* 1998; Dec; **42**(3): 197–203.
40 Dahlquist GG, Patterson C, Soltesz G. Perinatal risk factors for childhood type I diabetes in Europe: The EURODIAB substudy 2 study group. *Diabetes Care* 1999; **22**(10): 1698–702.
41 Pettitt DJ, Forman MR, Hanson RL, Knowler WC, Bennett PH. Breastfeeding and incidence of non-insulin-dependent diabetes mellitus in Pima Indians. *Lancet* 1997; Jul 19; **350**(9072): 166–8.
42 Grulee CG, Sanford HN. The influence of breast and artificial feeding on infantile eczema. *J. Pediatr.* 1980; **9**: 223–6.
43 Zeiger RS. Prevention of food allergy and atopic disease. *JR. Soc. Med.* 1997; **90**(Suppl 30): 21–33.
44 Vandenplas Y. Myths and facts about breastfeeding: does it prevent later atopic disease? *Acta Paediatr.* 1997; **86**: 1283–7.
45 Kelly D, Coutts AGP. Early nutrition and the development of immune function of the neonate. *Proc. Nut. Soc.* 2000; **59**: 177–85.
46 Saarinen UM, Kajosaari M. Breastfeeding as prophylaxis agains atopic disease: prospective follow-up study until 17 years old. *Lancet* 1995; **346**: 1065–9.
47 Halken S, Hoest A, Hansen LG, Østerballe O. Effects of an allergy prevention programme on incidence of atopic symptoms in infancy. A prospective study of 159 high-risk infants. *Allergy* 1992; **47**: 545–53.
48 Plancoulaine S, Charles MA, Lafay L, Tauber M, Thibult N, Borys JM, Eschwège E. Fleurbaix Laventie Ville Santé Study group. Infant-feeding patterns are related to blood cholesterol concentration in prepubertal children aged 5–11 y: The Fleurbaix-Laventie Ville Santé study. *Eur. J. Clin. Nutr.* 2000; **54**: 114–9.
49 Ravelli AJ, van der Meulen JHP, Osmond C, Barker DJP, Bleker OP. Infant feeding and adult glucose tolerance, lipid

profile, blood pressure and obesity. *Arch. Dis. Child* 2000; **82**: 248–52.
50 Bernt KM, Walker WA. Human milk as a carrier of biochemical messages. *Acta Paediatr.* 1999; **430**(Suppl): 27–41.
51 Mennella JA, Beauchamp GK. Early Flavor Experiences: Research Update. *Nutr. Rev.* 1998; jul; **56**(7): 205–11.
52 Zetterström R. Breastfeeding and infant-mother interaction. *Acta Paediatr.* 1999; **430**(Suppl): 1–6.
53 Christensson K, Cabrera T, Christensson E, Uvnäs-Moberg K, Winberg J. Separation distress call in the human neonate in the absence of maternal body contact. *Acta Paediatr.* 1995; **84**: 468–73.
54 Widström AM, Wahlberg V, Mathiesen AS, Eneroth P, Uvnäs-Moberg K, Werner S, Winberg J. Short-term effects of early suckling and touch of the nipple on maternal behaviour. *Early Human Develop.* 1990; **21**: 153–63.
55 Anderson JW, Johnstone BM, Remley DT. Breastfeeding and cognitive development: a meta-analysis. *Am. J. Clin. Nutr.* 1999; **70**: 525–35.
56 Pohl H, Hibbs B. Breastfeeding exposure of infants to environmental contaminants – a public health risk assessment viewpoint: chlorinated dibenzo-p-dioxins and chlorinated dibenzofurans. *Toxicol. Ind. Health* 1996; **12**(5): 593–611.
57 Abadin H, Hibbs B, Pohl H. Breastfeeding exposure of infants to environmental contaminants – a public health risk assessment viewpoint: II. Cadmium, lead, mercury. *Toxicol. Ind. Health* 1997; **13**(4): 495–517.
58 Pohl HR, Tylenda CA. Breastfeeding exposure of infants to selected pesticides: a public health viewpoint. *Toxicol. Ind. Health* 2000; **16**: 65–77.
59 WHO Regional Office for Europe. *Health For All Data Base, European Region*. Copenhagen: WHO, 1999.
60 WHO Headquarters Nutrition Unit. *Global Data Bank on Breast-feeding*. Geneva: WHO, 1996.
61 Österreichisches Bundesinstitut für Gesundheitswesen. Stillen im Österreich, Wien: Bundesinstitut für Gesundheitswesen, 1998.
62 VBBB, Verslag Bevordering van Borstvoeding, onderzoek op vraag van M. Colla, federaal Minister van Volksgezondheid, Bryssel: VBBB, 1997.
63 VBBB, L' Allaitement maternel: un facteur de santé publique. Rapport de l'enquête menée auprès des services de maternité en Wallonie et à Bruxelles, entre janvier et août 1997. Bryssel: VBBB, 1997.
64 Sundhedsstyrelsen. Spaedbarnsernaering. Om amning og erstatninger. Rapport fra en konference den 19 marts 1996. Copenhagen: Sundhedsstyrelsen, 1996.
65 Michaelsen KF, Larsen PS, Thomsen BL, Samuelson G. The Copenhagen cohort study on infant nutrition and growth: duration of breast feeding and influencing factors. *Acta Paediatr.* 1994; **83**: 565–71.
66 Sundhedsstyrelsen. Regeringens Folkesundhedsprogram 1999–2008. Copenhagen: Sundhedsstyrelsen, 1999.
67 Office for National Statistics, Infant Feeding 1995, London: Stationery Office, 1997.
68 Blondel B, Bréart G, du Mazaubrun Ch, Badeyan G, Wcislo W, Lordier A, Matet N. Santé publique; la situation périnatale en France. Evolution entre 1981 et 1995. *J. Gynecol. Obstet. Biol. Reprod.* 1997; **26**: 770–80.
69 DREES – Direction de la recherche, des études, de l'évaluation et des statistiques. *Perinatal health monitoring*. Paris: DREES, 1999.
70 Unpublished study of the Research Institute for Child Nutrition, Dortmund, On: Breastfeeding in the Federal Republic of Germany performed between II/1997 and VI/1998, to be published in the 2000 Nutrition Report (Ernährungsbericht) for Germany.
71 Kersting *et al.*: Studies on Breastfeeding 1981–1983 with 1500 mothers in Dortmund and Haltern. Parts I, II, III. Monatsschr Kinderheilkd 1987; **135**: 204–9; 249–52; 314–9.
72 Kersting and Schöch: Stillen in der Geburtsklinik und Fortsetzung der Säuglingsernährung imersten Lebensjahr. In: Stillen in Deutschland. Tietze, Trumann, Sedemund (Hrsg). Berlin: RKI-Heft 8/1995, 18-32.
73 Bergmann *et al.*: Wie werden Säuglinge in Deutschland ernährt? *Monatsschr Kinderheilkd* 1994; **142**: 412–7.
74 Atladóttir H. Research on infant nutrition in Iceland. A thesis submitted in partial fulfillment of requirements of the degree of Master of Science in human nutrition. Supervisors: Professor Inga Thorsdottir and Gestur Palsson, Department of Food Science, Faculty of Science. Reykjavik: University of Iceland, 1998.
75 Cattaneo A, Davanzo R, Ronfani L. Are data on the prevalence and duration of breastfeeding reliable? The case of Italy. *Acta Paediatr.* 2000; **89**: 88–93.
76 Faldella G, Di Comite A, Marchiano E, Govoni M, Salvioli GP. Brestfeeding duration and current neonatal feeding practices in Emilia Romagna, Italy. *Acta Paediatr.* 1999; **430**(Suppl): 23–6.
77 TNO Preventie & Gezondheid. Vierde Landelijke Groeistudie, 1998. Zeist: TNO 1998.
78 Hay G. Institute for Nutrition Research, University of Oslo. Personal Communication.
79 Ferguson AE, Tappin DM, Girdwood RWA, Kennedy R, Cockburn F. Breastfeeding in Scotland. *BMJ* 1994; **308**: 824–5.
80 Warren J. Breastfeeding in Scotland – where are we now? *Health Bulletin* 1998; **56**(4): 772–9.
81 Britten J, Broadfoot M. Breastfeeding in Scotland – Statistical sources. *Health Bulletin* 2000; **58**(1): 11–9.
82 Comité de Lactancia Materna, Asociación Espanola de Pediatria. Informe sobre Lactancia Materna en Espana. Madrid: AEP, 1998.
83 The National Board of Health and Welfare, Centre for Epidemiology, Official statistics of Sweden, Breast-feeding, children born 1997, Stockholm: The National Board of Health and Welfare, 1999.
84 Barnhälsovården SLL. Amning av barn födda 1997. Stockholm: Barnhälsovården SLL, 1998.
85 Socialstyrelsen. Amning och bröstmjölksersättning. Stockholm: Socialstyrelsen, 1999.
86 Conzelmann C. Stillhäufigkeit und Stilldauer in der Schweiz 1994. Basel: Institut für Sozial- und Präventivmedizin der Universität Basel, 1994
87 WHO Regional Office for Europe, Headquarters and United Nations Children's Fund, Comparative Analysis of Implementation of the Innocenti Declaration in WHO European Member States, Geneva: WHO/UNICEF, 1998.
88 WHO. *Indicators for assessing breastfeeding practices*. Geneva:WHO/CDD/SER/91, 14, 1991.
89 Persson L-Å. III Multivariate approaches in the analysis of breastfeeding habits. WHO Bulletin 1985; **63**:1129–36.
90 WHO Europe, Nutrition Unit; Nutrition Policy in WHO European member states. Copenhagen: WHO, 1995.
91 Buxton KE, Gielen AC, Faden RR, Brown CH, Paige DM, Chwalow AJ. Women intending to breastfeed: Predictors of early infant feeding experiences. *Am. J. Prev. Med.* 1991; **7**: 101–6.
92 Perez-Escamilla F, Pollitt E, Lonnerdal B, Dewey KG. Infant feeding policies in maternity wards and their effect on breastfeeding success: An analytical overview. *Am. J. Publ. Health* 1994; **84**: 89–97.
93 Saadeh R, Akré J. Ten steps to successful breastfeeding: A Summary of the Rationale and Scientific Evidence. *BIRTH* 1996; **23**: 154–60.