

Low-intensity war¹

In 2002, when the World Health Assembly approved the *Global Strategy on Infant and Young Child Feeding*, with its “global public health recommendation (that) infants should be exclusively breastfed for the first 6 months of life to achieve optimal growth, development and health”, everybody thought that the 7-year war between the “4-to-6-months” and the “6-months” armies was over. This misplaced optimism was fuelled in subsequent years by similar policies and recommendations issued by outstanding professional associations, such as the American Academy of Pediatrics², and by an increasing number of governments, including those of 17 countries in the European Union (EU)³.

The confrontation, however, was not over; it just changed gears, turning into a low-intensity war. Several papers, too many to be cited in a short editorial, were published in many countries, journals and languages that cast doubts on the evidence behind the 6-month recommendation and that promoted earlier complementary feeding, i.e. a return to the old 4-to-6 months recommendation. The last and probably the most discussed of these papers was published in the *British Medical Journal (BMJ)* in January 2011⁴. One other article that has legal consequences on the labelling of baby foods in the EU is the European Food Safety Authority (EFSA)⁵ scientific opinion on the appropriate age for the introduction of complementary feeding. All these papers, though, use the same arguments, those developed by the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) Committee on Nutrition (CoN)⁶ and it is therefore useful to analyse them in detail.

The ESPGHAN commentary recommends that “complementary feeding should not be introduced to any infant before 17 weeks, and all infants should start complementary feeding by 26 weeks”. This, however, is just an opinion of experts belonging to a single paediatric discipline. In terms of evidence-based medicine, expert opinions represent the weakest level of evidence. The authors of the ESPGHAN recommendation, in fact, carefully avoid any statement on the level of evidence or the strength of the recommendation in their commentary. Moreover, they do not describe the methods used to search the literature, the criteria used to select the articles (incidentally, all are observational studies that are subject to bias), the quality rating of the studies they refer to, nor the way they extracted and analysed the data used to support their conclusions. Finally, they base their recommendation almost exclusively on the effects the introduction of complementary foods may have on allergy, celiac disease and diabetes; they do not discuss other possible implications of anticipating complementary feeding on breastfeeding, feeding, nutrition and health. This is what happens when a limited group of specialists does not consult with other stakeholders – in contradiction with what is highly recommended by modern evidence-based medicine.

The ESPGHAN commentary is also affected by heavy conflicts of interest. A footnote on the first page of the paper states that “declarations of conflicts of interest of members of the CoN are submitted yearly to the CoN secretary and are available on request.” This is equivalent to hiding conflicts of interest, because very few readers write to request the authors’ disclosures. Yet in this case there are many conflicts of interests. For example, since 2009, the first author has been a member of the EFSA panel that issued the above-mentioned scientific opinion. No wonder that the EFSA and ESPGHAN recommendations are similar! As such a member, he declared on 17 March 2010 that he had worked and written for Ferrero, Danone, Dicofarm, Dietetic Metabolic Food, Heinz, Hipp, Humana, Martek, Mead Johnson, Mellin, Milupa, Nestlé, Noos, Ordesa, SHS/Nutricia and the Federation of Infant Food Manufacturers. The third author of the ESPGHAN commentary is the first author of the *BMJ* paper mentioned above; upon request from readers of the *BMJ*, she has declared that she “performed consultancy work and/or received research funding from companies manufacturing infant formulas and baby foods within the past 3 years”. Many other authors of the ESPGHAN commentary and similar papers have comparable conflicts of interest.

Who profits from this low-intensity war? Infants are unlikely to benefit from the earlier introduction of complementary foods as it shortens the duration of exclusive breastfeeding, or, as suggested by some data from the UK⁷, it shortens even the overall duration of breastfeeding, especially in low-income communities⁸. This would bring about increased incidence and severity of infections, and higher costs for families and health care services. The presumed advantages in terms of allergy, celiac disease and diabetes are awaiting further evidence.

Parents will not profit nor will they be empowered. A proportion of them will depend on industrial products and medical prescriptions, instead of learning the signs from their infants showing that they are ready for complementary foods - staying in a sitting position and holding their head steady; coordinating their eyes, hands and mouth to look at the food, pick it up and put it in their mouth; being able to swallow solid foods - and then offering them healthy complementary foods in accordance with their physiological development.

On the other hand, industry most certainly profits. Clearly, a proportion of the complementary food given before 6 months will come from industry and will probably continue after 6 months to the detriment of safe and healthy home-made family foods. This corresponds to huge amounts of money.

To conclude, there is no need to challenge and change the global public health recommendation for 6 months of exclusive breastfeeding. This recommendation corresponds to the average physiological growth and neuro-motor development of infants and allows at the same time to respect each child’s individuality as far as the window of opportunity for starting complementary feeding is concerned.

¹Based on: Cattaneo A, Williams C, Pallás-Alonso CR, et al. ESPGHAN’s 2008 recommendation for early introduction of complementary foods: how good is the evidence? *Matern Child Nutr* 2011;7:335-343

²American Academy of Pediatrics Section on Breastfeeding. Breastfeeding and the use of human milk. *Pediatrics* 2005;115:496-506

³Cattaneo A, Burmaz T, Arendt M, et al. Protection, promotion and support of breast-feeding in Europe: progress from 2002 to 2007. *Public Health Nutr* 2010;13:751-9

⁴Fewtrell M, Wilson DC, Booth I, et al. Six months of exclusive breast feeding: how good is the evidence? *BMJ* 2011;342:c5955

⁵EFSA Panel on Dietetic Products Nutrition and Allergies. Scientific opinion on the appropriate age for introduction of complementary feeding of infants. *The EFSA Journal* 2009;7:1-38

⁶Agostoni C, Decsi T, Fewtrell M, et al. Complementary feeding: a commentary by the ESPGHAN Committee on Nutrition. *J Pediatr Gastroenterol Nutr* 2008;46:99-110

⁷Scientific Advisory Committee on Nutrition. *Infant Feeding Survey 2005: a commentary on infant feeding practices in the UK*. London, TSO, 2008

⁸Simard I, O’Brien HT, Beaudoin A, et al. Factors influencing the initiation and duration of breastfeeding among low-income women followed by the Canada prenatal nutrition program in four regions of Quebec. *J Hum Lact* 2005;21:327-37

Introduction of solids

Brown A, Lee M. A descriptive study investigating the use and nature of baby-led weaning in a UK sample of mothers. *Matern Child Nutr* 2011;7:34–47.

An alternative to traditional weaning methods known as “baby-led weaning” (BLW) appears to be emerging in the UK and elsewhere. This approach advocates bypassing typical weaning practices of spoon-feeding puréed foods or baby rice, and encouraging instead the introduction of foods in their whole form to the infant from about 6 months. A key tenet of BLW is self-feeding. Anecdotally, the practice of BLW appears to be gaining in popularity. However, research evidence is scant, and little is known about the nature of BLW and the demography of those who use it. This study aimed to characterize a sample of women who have chosen to adopt the BLW method and to describe associated attitudes and behaviours. Six hundred and fifty-five mothers with a child between 6 and 12 months of age provided information about timing of weaning onset, use of spoon-feeding and purées, and experiences of weaning and meal times. Those participants who used a BLW method reported little use of spoon-feeding and purées and were more likely to have a higher education and occupation, to be married and to have breastfed their infant. BLW was associated with a later introduction of complementary foods, greater participation in meal times and exposure to family foods. Levels of anxiety about weaning and feeding were lower in mothers who adopted a BLW approach.

Wright CM, Cameron K, Tsiaka M, Parkinson KN. Is baby-led weaning feasible? When do babies first reach out for and eat finger foods? *Matern Child Nutr* 2011;7:27–33.

This study used data from a cohort of infants to define the range of ages at which infants reach out for and eat finger foods, and it related this to the infants’ developmental status. Infants were recruited shortly after birth and were followed prospectively by means of questionnaires. Of the 923 eligible children, 602 provided information on when they first reached out for food; 340 (56%) had done so before the age of 6 months, but 36 (6%) were still not reaching for food at the age of 8 months. Infants who had not reached out for food by 6 months were less likely to be walking unaided at the age of 1 year (85 out of 224, 38%) compared with those who did (155 out of 286, 54%). Of the 447 parents who completed a diary on the first five occasions when their child ate finger foods, the first finger food was eaten before the age of 6 months for 170 children (40%) and before the age of 8 months for 383 (90%) of them. Foods offered were mainly bread or biscuits. Of the 604 infants providing information at the age of 8 months about their current intake, 546 (90%) were eating some finger foods at least daily, but only 309 (51%) were eating them more than once a day. BLW is probably feasible for a majority of infants, but it could lead to nutritional problems in infants whose development is relatively delayed.

Nielsen SB, Reilly JJ, Fewtrell MS, et al. Adequacy of milk intake during exclusive breastfeeding: a longitudinal study. *Pediatrics* 2011;128:e907.

This study tested whether and how human lactation and breastfeeding practices adapt to fulfil infant energy requirements during exclusive breastfeeding (EBF) for 6 months: it focused on measuring milk and energy intake, growth and breastfeeding practices at two time points (around 15 and 25 weeks of age) in 50 healthy EBF infants from breastfeeding support groups in Glasgow, Scotland. Forty-seven infants completed the study and 41 were exclusively breastfed till the age of 25 weeks. Milk intakes were higher than literature values (923 [SD: 122] g/day and 999 [SD: 146] g/day) at respectively 15 and 25 weeks of age, and they increased significantly between time points (mean increase: 61 [23–99] g/day). Infant growth was normal compared to WHO Child Growth Standards, and energy intakes were adequate compared to references for energy requirements. Behavioural data indicated no evidence of strain on breastfeeding practices. The results of this prospective study reveal that when mothers are well supported and follow the WHO recommendation on EBF, milk intakes are high and increase over time, and there is adequate energy intake, normal infant growth, and no marked changes in breastfeeding practices.

Breastfeeding why

Diarrhoea

Lamberti LM, Fischer Walker CL, Noiman A, Victora C, Black RE. Breastfeeding and the risk for diarrhoea morbidity and mortality. *BMC Public Health* 2011;11 Suppl 3:S15.

Lack of EBF among infants 0-5 months of age and no breastfeeding among children 6-23 months of age are associated in developing countries with increased diarrhoea morbidity and mortality. This review estimated the protective effects conferred by varying levels of breastfeeding against diarrhoea incidence, prevalence and mortality, all-cause mortality, and hospitalization for diarrhoea illness. The authors systematically reviewed all literature published from 1980 to 2009, assessing levels of sub-optimal breastfeeding as a risk factor for selected diarrhoea morbidity and mortality outcomes. They found a large body of evidence for the protective effects of breastfeeding against diarrhoea incidence, prevalence, hospitalization, diarrhoea mortality, and all-cause mortality. The results from 18 studies included in the review indicated varying degrees of protection across levels of breastfeeding, with the greatest protection conferred by EBF among infants 0-5 months of age, and by any breastfeeding among infants and young children 6-23 months of age. Specifically, not breastfeeding, compared to EBF, resulted in a 10-fold excess risk of diarrhoea mortality among infants 0-5 months of age, and in a 2-fold excess risk among children aged 6-23 months compared to any breastfeeding. These findings support the current WHO recommendation in favour of EBF during the first 6 months of life as a key child survival intervention. They also highlight the importance of breastfeeding to protect against diarrhoea-specific morbidity and mortality throughout the first 2 years of life.

Sudden Infant Death Syndrome (SIDS)

Hauck FR, Thompson JM, Tanabe KO, Moon RY, Venne-mann MM. Breastfeeding and reduced risk of sudden infant death syndrome: a meta-analysis. *Pediatrics* 2011;128:103-10.

Benefits of breastfeeding include lower risk of post-natal mortality. However, it is unclear whether breastfeeding specifically lowers the risk of SIDS, because study results conflict. This review was carried out to estimate the association between breastfeeding and SIDS. The authors identified 288 studies with data on breastfeeding and SIDS through a Medline search (1966-2009) and review articles. Twenty-four original case-control studies were identified that provided data on the association between breastfeeding and SIDS. Two teams of two reviewers evaluated study quality according to preset criteria: six studies were excluded, and 18 studies were analysed. For infants who received any amount of breastmilk for any duration, there was a 45% reduction in the risk of SIDS, with confidence intervals between 31% and 56%. For any breastfeeding at 2 months of age or older, the risk reduction was 62%, and for EBF of any duration it was 73%. Breastfeeding is therefore protective against SIDS, and the effect is stronger when breastfeeding is exclusive. The recommendation to breast-feed infants should thus be included in all SIDS risk-reduction messages.

Obesity

Gooze RA, Anderson SE, Whitaker RC. Prolonged bottle use and obesity at 5.5 years of age in US children. *J Pediatr* 2011;159:431-6.

To examine the association between prolonged bottle use and the risk of obesity (BMI or Body Mass Index ≥ 95 th percentile) at 5.5 years of age, data from the Early Childhood Longitudinal Study Birth Cohort were analyzed for 6,750 US children born in 2001. The prevalence of obesity at 5.5 years was 17.6%; 22.3% of the children were using a bottle at 24 months. The prevalence of obesity at 5.5 years was 22.9% (19.4%- 26.4%) in children who at 24 months were using a bottle, and 16.1% (14.9% -17.3%) in children who were not. Prolonged bottle use was associated with a 33% increase in risk of obesity at 5.5 years after controlling for sociodemographic characteristics, maternal obesity, maternal smoking, breastfeeding, age of introduction of solid foods, time spent watching television or playing videogames, and the child's weight status at birth and at 9 months of age). The authors conclude that avoiding prolonged bottle use may help prevent early childhood obesity.

Huh SY, Rifas-Shiman SL, Taveras EM, Oken E, Gillman MW. Timing of solid food introduction and risk of obesity in preschool-aged children. *Pediatrics* 2011;127:e544-51.

To examine the association between timing of introduction of solid foods during infancy (at less than 4, 4-5, and 6 or more months) and obesity (BMI for age and gender ≥ 95 th percentile) at 3 years of age, the authors studied 847 children in a prospective cohort study. During the first 4 months of life, 568 infants (67%) were breastfed and 279 (32%) were formula-

fed. At the age of 3 years, 75 children (9%) were obese. Among the breastfed infants, the timing of solid food introduction was not associated with the risk of obesity. Among formula-fed infants, the introduction of solid foods before 4 months was associated with a six-fold increase in the risk of obesity at 3 years.

Epilepsy

Sun Y, Vestergaard M, Christensen J, Olsen J. Breastfeeding and risk of epilepsy in childhood: a birth cohort study. *J Pediatr* 2011;158:924-9.

The objective of this study was to test whether breastfeeding reduces the risk of epilepsy in childhood. The analysis was carried out on 69,750 singletons born between September 1997 and June 2003 in the Danish National Birth Cohort and observed until August 2008. Information on breastfeeding was reported by mothers in two computer-assisted telephone interviews at 6 and 18 months after birth. Information on epilepsy was retrieved from the Danish National Hospital Register (inpatients and outpatients). Breastfeeding was associated with a decreased risk of epilepsy, with a dose-response like pattern. Children breastfed for 3-5, 6-8, 9-12, and 13 or more months, had respectively a 26%, 39%, 50%, and 59% lower risk of epilepsy after the first year of life compared with children who were breastfed for less than a month. The association remained when children who had adverse neonatal conditions or children who were exposed to adverse maternal conditions during pregnancy were excluded. The authors conclude that the protective effect of breastfeeding that was observed may be causal.

Mental development

Guxens M, Mendez MA, Moltó-Puigmartí C, et al. Breastfeeding, long-chain polyunsaturated fatty acids in colostrum, and infant mental development. *Pediatrics* 2011;128:e880.

This study assessed the role of parental psychosocial factors and colostrum long-chain polyunsaturated fatty acid (LC-PUFA) levels in the relationship between breastfeeding and children's neurodevelopment. A population-based birth cohort was established in the city of Sabadell (Spain). A total of 657 women were recruited during the first trimester of pregnancy. Information about parental characteristics and breastfeeding was obtained through a questionnaire, and trained psychologists assessed the mental and psychomotor development of 504 children at 14 months of age by means of the Bayley Scales of Infant Development. A high percentage of breastfeeds in relation to all milk feeds during the first 14 months was associated positively with the child's mental development (an increase of 0.37 points per month of full breastfeeding). Maternal education, social class, and intelligence quotient only partly explained this association. Children with a longer duration of breastfeeding who were also exposed to higher levels of LC-PUFAs in colostrum had significantly higher mental scores than children with low breastfeeding duration and low levels of exposure to colostrum.

Heikkilä K, Sacker A, Kelly Y, Renfrew MJ, Quigley MA. Breastfeeding and child behaviour in the Millennium Cohort Study. *Arch Dis Child* 2011;96:635-42.

To examine whether breastfeeding is associated with behavioural development in children aged 5 years, the authors used data from a large UK cohort of 10,037 mother-child pairs of white ethnic background (9,525 term and 512 preterm children). Duration of breastfeeding (at all, or exclusive) was ascertained from parental interviews, when the children were aged 9 months. Child behaviour was assessed through the Strengths and Difficulties Questionnaire (SDQ) completed by parents. Abnormal SDQ scores were less common in term children (12%) than in preterm children (15%). Term children, breastfed for 4 months or longer (29%), had 33% less risks of an abnormal total SDQ score compared to never breastfed children (35%). This effect was similar for all SDQ subscores. In preterm children, longer duration of breastfeeding was generally associated with less risks of abnormal SDQ scores, both total and subscores, but the effect estimates were not precise. The associations between EBF and abnormal SDQ scores were similar to those of any breastfeeding and abnormal SDQ scores. The findings suggest that, at least in term children, longer duration of breastfeeding is associated with fewer parent-rated behavioural problems in children aged 5 years.

McCorry C, Layte R. The effect of breastfeeding on children's educational test scores at nine years of age: results of an Irish cohort study. *Soc Sci Med* 2011;72:1515-21.

This retrospective cross-sectional study examined the relationship between early breastfeeding exposure and children's academic test scores at 9 years of age, independently of a wide range of possible confounders. The final sample comprised 8,226 9-year old school children participating in the first wave of the "Growing Up in Ireland" study. The children were selected through the Irish national school system and were representative of the 9-year old population. Information relating to breastfeeding initiation and duration was obtained retrospectively via parental recall; the children's academic performance was assessed using standardised reading and mathematics tests. In unadjusted analysis, children who were breastfed scored 8.67% higher on reading and 7.42% higher on mathematics compared to those who were never breastfed. While the breastfeeding advantage decreased significantly when adjusted for a range of child, maternal, socio-economic and socio-environmental characteristics, children who were breastfed continued to enjoy a significant test score advantage of 3.24% and 2.23% on reading and mathematics respectively, compared to those who were never breastfed. Any amount of breastfeeding was associated with significantly higher test scores than no breastfeeding, but evidence of a dose-response relationship was weak. The results indicate that the test-score advantage of breastfed children is robust and that the magnitude of the effect varies with the group: it is largest amongst the most socially disadvantaged and falls to near zero among the most advantaged groups.

Oddy WH, Li J, Whitehouse AJO, Zubrick SR, Malacova E. Breastfeeding duration and academic achievement at 10 years. *Pediatrics* 2011;127:e137-e145.

The aim of this Australian study was to examine the relationship between the duration of breastfeeding and educational outcomes. The authors used a cohort of 2,900 women enrolled into the study at 18 weeks of gestation; 2,868 live-born children were followed prospectively. Data from 1,038 children at approximately 10 years of age were linked to standard scores in mathematics, reading, writing, and spelling. Associations between breastfeeding duration and educational outcomes were estimated, with adjustment for gender, family income, maternal factors, and early stimulation at home through reading. Ten-year-old children who were predominantly breastfed for 6 months or longer in infancy had higher academic scores than children who were breastfed for less than 6 months. Interestingly - and this would deserve more in-depth research - the effect of breastfeeding on educational outcomes differed according to sex: boys were particularly responsive (in mathematics, spelling, reading, and writing) to a longer duration of breastfeeding.

Breastfeeding how

Anatomy and physiology

Kim P, Feldman R, Mayes LC, et al. Breastfeeding, brain activation to own infant cry, and maternal sensitivity. *J Child Psychol Psychiatry* 2011;52:907-15.

Little research has addressed the neurobiological mechanisms underlying the relationship between breastfeeding and maternal behaviour in human mothers. This study investigated the associations between breastfeeding, maternal brain response to own infant stimuli, and maternal sensitivity in the early postpartum. Seventeen biological mothers of healthy infants participated in two matched groups according to feeding method: EBF and exclusive formula-feeding at 2-4 weeks postpartum. Functional magnetic resonance imaging scanning was conducted in the first postpartum month to examine maternal brain activation in response to her own baby's cry versus control baby-cry. Interactions between mothers and infants at 3-4 months postpartum were videotaped in the home and blindly coded for maternal sensitivity. In the first postpartum month, breastfeeding mothers showed greater activation in the superior frontal gyrus, insula, precuneus, striatum, and amygdala while listening to their own baby-cry as compared to formula-feeding mothers. For both breastfeeding and formula-feeding mothers, greater activation in the right superior frontal gyrus and amygdala was associated with higher maternal sensitivity at 3-4 months postpartum. These results suggest links between breastfeeding and greater response to infant cues in brain regions implicated in maternal-infant bonding and empathy during the early postpartum. Such brain activation may facilitate greater maternal sensitivity as infants enter their social world.

Doucet S, Soussignan R, Sagot P, Schaal B. An overlooked aspect of the human breast: areolar glands in relation with breastfeeding pattern, neonatal weight gain, and the dynamics of lactation. *Early Hum Dev* 2010; doi:10.1016/j.earlhumdev.2011.07.020

The early nursing-sucking relationship is not to be taken for granted in humans. A number of factors can either facilitate or mitigate its optimal establishment on the mother or the newborn. Among these factors, a feature of human mothers' breasts – the areolar glands (AGs) – has been identified as potentially important because it has been observed that their number varies among women. Also, it is known that 3-day-old infants display attraction for the secretions of the AG, suggesting that the latter could influence the newborn's behaviour during breastfeeding. The study assessed this issue in a sample of 121 Caucasian mother-infant dyads. The areolae of these women were screened during the first 3 postnatal days, in parallel with the infant's sucking performance, body weight fluctuations and time to lactation onset. On average, 97% of the women had AGs; 80% had 1-20 glands per areola and 33% had AGs excreting a visible fluid. Having AGs appeared to be positively linked with neonatal growth after birth and with the speed of lactation onset: infants of primiparous women with lower AG numbers had a lower weight gain than those of mothers with higher quantities of AGs. Furthermore, first time mothers with lower AG counts took longer to begin lactation. This study confirms and extends the fact that AGs, in interaction with maternal experience, might influence the initiation of the breastfeeding relationship.

Baby Friendly Initiatives

Edwards G, Abdulali J, Kumar RR. Meeting the challenge: implementing the Baby Friendly Hospital Initiative in a culturally diverse country. *Pract Midwife* 2011;14:14-6.

This paper describes the successful implementation of the WHO/UNICEF Baby Friendly Hospital Initiative (BFHI) in a large, culturally diverse hospital in the United Arab Emirates (UAE). The rate of initiation of breastfeeding in the UAE is high (more than 90%), although mixed feeding is considered the norm. Traditional religious birth practices are common which may inhibit EBF. An action research methodology was chosen as the most appropriate method to implement the BFHI and a five-stage cyclic approach was implemented. Staff knowledge on breastfeeding and BFHI varied enormously because of the staff's diversity of nationalities. Initially, it was difficult to involve staff, particularly in the delivery rooms and theatres, as breastfeeding was not considered a high priority. There was high resistance to closing the nurseries as both mothers and staff felt it was an advantage for the women to be able to rest away from their babies, and the concepts of bonding and early feeding cues were unknown. By the time of the BFHI assessment a practice transformation had taken place. The authors conclude that implementation of the BFHI was successful and that the achievement could be attributed to the staff's positive feeling towards the BFHI.

DelliFraine J, Langabeer II J, Williams JF, et al. Cost comparison of Baby Friendly and Non-Baby Friendly Hospitals in the United States. *Pediatrics* 2011;127:e989

The objective of this study was to provide an economic assessment of the incremental costs associated with obtaining the WHO/UNICEF BFHI designation. Data from the 2007 American Hospital Association and the 2007 Centers for Medicare and Medicaid Cost Reports were used to compare labour and delivery costs in BFHI and non-BFHI hospitals. Operational costs per delivery were calculated using a matched pairs analysis of a sample of BFHI and non-BFHI hospitals. Costs associated with labour and delivery diagnosis-related codes were analyzed for each BFHI hospital and compared with the mean and median costs incurred by non-BFHI hospitals. Nursery plus labour and delivery costs for the BFHI hospitals were \$2,205 per delivery, compared to \$2,170 for the non-BFHI matched pair. BFHI hospitals presented slightly higher costs (ranging from 1.6% to 5%) than non-BFHI hospitals, but these differences were not statistically significant. These results suggest that becoming a BFHI hospital is relatively cost-neutral for a typical acute-care hospital.

Ingram J, Johnson D, Condon L. The effects of Baby Friendly Initiative training on breastfeeding rates and the breastfeeding attitudes, knowledge and self-efficacy of community health-care staff. *Prim Health Care Res Dev* 2011;12:266-75.

To evaluate the effects of Baby Friendly Initiative (BFI) community training on breastfeeding rates in a large Primary Care Trust (PCT) in the UK in 2008, a total of 141 health visitors and nursery nurses were trained on mandatory 3-day BFI courses during 2008; 137 staff (100 health visitors, 37 nursery nurses) took part in the evaluation. Breastfeeding attitudes, knowledge and staff confidence in helping mothers to breastfeed were measured using a validated questionnaire and a self-efficacy tool at three time points before and after training. Breastfeeding rates at 8 weeks increased significantly, and a baby born in 2009 was 1.57 times more likely to be breastfed than one born in 2006. Statistically significant improvements in staff breastfeeding attitudes, knowledge and self-efficacy were noted after attending the course, in addition to increases in the appropriate management of breastfeeding problems. Process evaluation interviews with 43 health visitors, nursery nurses and managers explored views of the training and changes in practice. The response to the course was overwhelmingly positive and felt to be extremely worthwhile. It led to renewed enthusiasm, it improved the consistency of advice among team members and raised the confidence levels of all staff that helped mothers with breastfeeding. Health visitors felt confident about letting nursery nurses take a greater role in breastfeeding support. Lastly, a survey of some of the mothers showed an increase in EBF and signs of improvement in breastfeeding self-efficacy.

Weight loss in newborns

Regnault N, Botton J, Blanc L, et al. Determinants of neonatal weight loss in term-infants: specific association with pre-pregnancy maternal body mass index and infant feed-

ing mode. Arch Dis Child Fetal Neonatal Ed 2011;96:F217-22.

This study looked at the determinants of neonatal weight loss measured on the third day of life in term infants. In 2002, a cohort of pregnant women (less than 24 weeks of gestation) was recruited in two French university hospitals. Neonates were weighed every day until discharge from hospital, on average 4.5 days after birth. Altogether, the study included 1,557 healthy term neonates with data on weight and feeding mode at day 3. Factors associated with greater weight loss at day 3 (D3WL) as a percentage of birth weight, whatever the feeding mode, were: higher birth weight, gestational diabetes and caesarean section. Higher gestational age was associated with a reduced D3WL. The association between maternal pre-pregnancy BMI and D3WL differed with the feeding mode. In breastfed babies, mean D3WL ranged from 4.9% for neonates of underweight mothers to 5.8% for neonates of obese mothers. In formula-fed babies, D3WL was highest for neonates of underweight mothers (4.1%) and lowest for those of obese mothers (2.6%). The lower D3WL in formula-fed neonates, especially in neonates of obese mothers, suggests relative overfeeding in the early days compared with breastfed neonates. This may have negative consequences on later health. Overweight and obese mothers may need extra support to prevent overfeeding, and breastfeeding may be a solution.

Supplements

Volpe Holmes A, Auinger P, Howard CR. Combination feeding of breast milk and formula: evidence for shorter breast-feeding duration from the National Health and Nutrition Examination Survey. J Pediatr 2011;159:186-91.

Early introduction of infant formula might be associated with obesity in children. This study examined the association between overall breastfeeding duration and "combination breastmilk and formula-feeding" (CBFF) - defined as: 1) daily breastfeeding and 2) formula-feeding begun in the first week of life. Data from the 1999-2006 National Health and Nutrition Examination Survey (USA) were used to determine the prevalence of CBFF. Among 6,788 children between 0-71 months, 8% were CBFF, 55% were EBF during the first week of life, 33% were never breastfed; the remaining 3% started breastfeeding but moved to exclusive formula feeding during the first week. Factors independently associated with CBFF were Hispanic ethnicity and black race. CBFF was associated with decreased overall breastfeeding duration in the full cohort, but not in the Hispanic or black subgroups. CBFF and formula-feeding, when compared to 4 months of EBF, were associated with an increased risk for overweight/obesity between ages 2 and 6 years.

Wojcicki JM, Holbrook K, Lustig RH, et al. Infant formula, tea, and water supplementation of latino infants at 4-6 weeks postpartum. J Hum Lact. 2011;27:122-30.

The American Academy of Pediatrics recommends EBF until 6 months of age. The authors examined the prevalence and risk factors of infant formula, water and tea at 4-6 weeks in Latino infants of the

San Francisco Bay Area (this group is considered at high risk for future obesity). A cohort of 201 pregnant Latina women was recruited. Infant dietary recall and postpartum depressive symptoms were assessed at 4-6 weeks. The authors found that 105 women (53%) were feeding infant formula and 48 (25%) were supplementing breastfeeding with tea or water. Of the latter, 60% were providing daily supplementation. In multivariate analyses, the risk for supplementation with water or tea was almost two-fold in mothers with postpartum depressive symptoms and having had a caesarean delivery, and 1.3 times higher in infants given formula. Early supplementation with water or teas and infant formula should be discouraged in Latinos, given the high frequency of obesity observed in this population.

Life-threatening events

Becher JC, Bhushan SS, Lyon AJ. Unexpected collapse in apparently healthy newborns: a prospective national study of a missing cohort of neonatal deaths and near-death events. Arch Dis Child Fetal Neonatal Ed 2011; doi:10.1136/F2 of 5 adc.2010.208736

Sudden and unexpected postnatal collapse (SUPC) of a healthy newborn infant is rare, but it carries a high risk of mortality and significant neurodisability in survivors. An underlying condition has been found in 60% of cases undergoing detailed postmortem, but in the other cases there are important associations with other factors: the prone position, breastfeeding, the primiparous status of the infant. The authors undertook a prospective study to ascertain the population incidence of SUPC in the UK. Cases were referred through the British Paediatric Surveillance Unit reporting scheme over a 13-month period. Infants were born at 37 weeks of gestation or more, they reached an Apgar score of 8 or more at 5 minutes, they had collapsed within 12 hours in hospital and had required positive pressure ventilation, and they had either died or received ongoing intensive care. Data were collected on maternal and infant characteristics, clinical investigations and outcome at one year. Forty-five cases were reported, an incidence of 0.05/1000 live births, of which 12 infants died. In 15 of the 45 infants, an underlying disease or abnormality was determined. In 30 of the 45 cases (0.035/1000 live births), no such cause was found, but in 24 of them, the clinical/pathological diagnosis was airway obstruction during breastfeeding or due to the prone position. Mothers were commonly primiparous and had been unattended by clinical staff before the collapse was recognised. Of the 30 infants with no underlying disease/abnormality, 22 (73%) developed a postasphyxial encephalopathy of which ten had a poor outcome (33%): five died and five had neurological sequelae at the age of one year. To conclude, SUPC is rare in any one centre and there is no standard approach to investigation. In those cases where collapse is not due to an underlying abnormality, breastfeeding and the prone position are important associations. Guidelines for safe postnatal care of infants should include appropriate vigilance of infants particularly where mothers are primiparous or where ability to assess the baby may be impaired.

Poets A, Steinfeldt R, Poets CF. Sudden deaths and severe apparent life-threatening events in term infants within 24 hours of birth. *Pediatrics* 2011;127:e869.

A monthly survey was carried out to determine the incidence of and possible risk factors for unexpected sudden infant deaths (SID) and severe apparent life-threatening events (S-ALTE) that occurred within 24 hours of birth. Throughout 2009, every paediatric department in Germany was asked to report such cases in term infants after positive postnatal adaptation (10-minute Apgar score 8 or more). S-ALTE was defined as acute cyanosis/pallor and unconsciousness, requiring bagging, intubation and/or cardiac compressions. Hospitals that reported a case were asked to return an anonymous questionnaire, the discharge letter as well as the autopsy protocol in the SID cases. Of 43 cases reported, 17 fulfilled entry criteria, yielding an incidence of 2.6 in 100,000 live births. There were seven deaths (1.1/100,000); six of the ten S-ALTE infants were neurologically abnormal at discharge. Twelve infants were found lying on their mother's chest or abdomen, or very close to her and facing her. Nine events occurred in the first 2 hours after birth; seven were noticed by a health professional despite the mother being present and awake. The authors conclude that SID or S-ALTE may occur in the first 24 hours after birth, particularly within the first 2 hours. Events often seem related to a potentially asphyxiating position. Parents may be too tired or otherwise unable to assess their infant's condition correctly. Closer observation during these very early hours seems warranted.

Andres V, Garcia P, Rimet Y, Nicaise C, Simeoni U. Apparent life-threatening events in presumably healthy newborns during early skin-to-skin contact. *Pediatrics* 2011;127:e1073-6.

This is a short report of six cases of apparent life-threatening events (ALTEs) in the delivery room during the first 2 hours of life. In each case, the incident occurred in a healthy infant who was in a prone position on his/her mother's abdomen during early skin-to-skin contact. In most cases, the mother was primiparous, and in all cases the mother and infant had not been observed during the initiation of skin-to-skin contact and breastfeeding. There are many benefits of early skin-to-skin contact and breastfeeding in the delivery room. However, in view of the risk of a rare but significant ALTE, the authors suggest that surveillance of all newborns be implemented.

Bed-sharing

Möllborg P, Wennergren G, Norvenius SG, Alm B. Bed-sharing among six-month-old infants in western Sweden. *Acta Pædiatrica* 2011;100:226-30.

Bed-sharing is a common practice in many cultures, and can be an important way to maintain EBF during hospital stay post-partum. In recent years there have been, however, several reports of an increased risk of SIDS in connection with bed-sharing. The aim of this study was to examine bed-sharing at 6 months of age and the factors that are associated with bed-sharing. The cohort comprised 8,176 randomly chosen families. At 6 months of age, 5,605 (68.5%) fami-

lies completed a questionnaire and of the total, 19.8% bed-shared. Bed-sharing was associated with an almost two-fold higher probability of breastfeeding. Bed-sharing was also associated with three or more nightly awakenings at 6 months (2.7 times). It was more common to share a bed if the parent was single, and less common if the infant was bottle-fed in the first week. Never using a pacifier was associated with a higher frequency of bed-sharing.

Ball HL, Ward-Platt MP, Howel D, Russell C. Randomised trial of sidecar crib use on breastfeeding duration (NECOT). *Arch Dis Child* 2011;96:630-4.

To determine whether the use of sidecar cribs on the postnatal ward affects breastfeeding duration, the authors carried out a randomised non-blinded parallel trial comparing sidecar cribs with stand alone cots in the postnatal wards of the Royal Victoria Infirmary, Newcastle upon Tyne, UK. Participants included 1,204 pregnant women intending to breastfeed, recruited at 20 weeks' gestation and randomised at 34 weeks to use either a sidecar crib attached to their bed (n=601) or a stand alone cot adjacent to their bed (n=603). Duration of EBF and of any breastfeeding up to 26 weeks was obtained by telephone follow-up. 334 mothers were withdrawn or lost to follow-up, and infant feeding data were therefore obtained for 870 mothers (433 intervention; 437 controls). No significant difference was found between the two groups for duration of EBF and of any breastfeeding or after adjusting for maternal age, education, previous breastfeeding and delivery type. Bed sharing was not significantly more common in mothers randomised to sidecar cribs.

Peer counsellors

Tylleskär T, Jackson D, Meda N, et al. Exclusive breastfeeding promotion by peer counsellors in sub-Saharan Africa (PROMISE-EBF): a cluster-randomised trial. *Lancet* 2011;378:420-7.

The effect of breastfeeding counselling by peer counsellors was assessed in 24 communities in Burkina Faso, 24 in Uganda, and 34 in South Africa, randomly assigned in a 1:1 ratio to either control or intervention clusters. In the intervention group, one antenatal breastfeeding peer counselling visit and four post-delivery visits by trained peers were scheduled. 2,579 mother-infant pairs were assigned to the intervention or control clusters in Burkina Faso (n=392 and n=402, respectively), in Uganda (n=396 and n=369, respectively), and in South Africa (n=535 and 485, respectively). The data-gathering team was unaware of the intervention allocation. The primary outcomes were prevalence of EBF and diarrhoea reported by mothers of infants aged 12 weeks and 24 weeks. The EBF prevalence rates at 12 weeks, based on 24-hour recall, were respectively 79% and 35% in the intervention and control clusters in Burkina Faso; 82% and 44% in Uganda; and 10% and 6% in South Africa. The EBF prevalence rates based on 7-day recall were respectively 77% and 23% in the intervention and control clusters in Burkina Faso; 77% and 34% in Uganda; and 8% and 4% in South Africa. At 24 weeks, the EBF prevalence rates based on 24-hour recall were 73% in the intervention and

22% in the control clusters in Burkina Faso; 59% and 15% in Uganda; and 2% and less than 1% in South Africa. The EBF prevalence rates based on 7-day recall were 71% in the intervention and 9% in the control clusters in Burkina Faso; 51% and 11% in Uganda; and 2% and less than 1% in South Africa. There was no significant difference in the prevalence of diarrhoea at both 12 and 24 weeks of age between intervention and control clusters in the three countries. Low-intensity individual breastfeeding peer counselling is achievable and, although it does not affect the diarrhoea prevalence, it can be used to effectively increase EBF prevalence in many sub-Saharan Africa settings.

Gross SM, Resnik AK, Nanda JP, et al. Early postpartum: a critical period in setting the path for breastfeeding success. *Breastfeed Med* 2011;6:1-6.

In the USA, most mothers who initiate breastfeeding will either stop completely or begin supplementing with formula before their infant is 3 months old. The purpose of this study was to identify this critical period in order to better support and reinforce breastfeeding. Data from participants enrolled in the Maryland State Program of the US Department of Agriculture Supplemental Nutrition Program for Women, Infants, and Children (WIC) were used to explore breastfeeding patterns during the period between birth and postnatal WIC certification. Authors examined how feeding patterns varied in relation to the type of support the local WIC agency provided: breastfeeding peer counsellor support (PC), lactation consultant (LC) support and standard care (SC) support (the two latter types of support acted as comparison for the first type). During 2007, 33,582 infants were enrolled in the WIC programme. At certification, 30.4% of them were breastfeeding, 25.3% had been breastfed but had stopped before certification, and 44.3% had never breastfed. The breastfeeding initiation rate was higher in the PC group (61.6%) compared to the LC (54.4%) and SC (47.6%) groups. Participants in the PC group were more likely to certify as EBF and partially breastfeeding (36.0%) compared to the LC (24.8%) and SC (25.3%) groups.

HIV

Østergaard LR, Bula A. "They call our children "Nevirapine babies?": A qualitative study about exclusive breastfeeding among HIV-positive mothers in Malawi. *Afr J Reprod Health* 2010;14:213-22.

This qualitative study, using observations and in-depth individual interviews, explored patterns of EBF and factors that motivate or hinder women to practice it. HIV-positive women from urban Malawi who intended to practice EBF were selected and interviewed. All women were well informed and had a good knowledge of HIV and EBF, but knew much less about basic breastfeeding. Despite their original intention, less than half of the women interviewed managed to practice EBF. The barriers included the following: perceived lack of milk, lack of control over the feeding situation, perceived and real stigma, and poor counselling. Women who succeeded were older, had the explicit support of their husband and

did not live with their mother-in-law. Weaning at the age of 6 months was as difficult for these women as was EBF. Intention alone is not a sufficient determinant for successful EBF unless a number of enabling factors all come together. Prolonged breastfeeding is the cultural norm in Malawi and programmes should therefore be sensitive to the social expectations of mothers and should involve mothers-in-law and fathers.

Thomas TK, Masaba R, Borkowf CB, et al. Triple-antiretroviral prophylaxis to prevent mother-to-child HIV transmission through breastfeeding: the Kisumu breastfeeding study, Kenya: a clinical trial. *PLoS Med* 2011;8:e1001015.

Effective strategies are needed for the prevention of mother-to-child HIV transmission (PMTCT) in resource-limited settings. The Kisumu Breastfeeding Study was conducted between July 2003 and February 2009. The overall aim was to investigate whether a maternal triple-antiretroviral (ARV) regimen that was designed to suppress the viral load maximally in late pregnancy and the first 6 months of lactation was a safe, well-tolerated, and effective PMTCT intervention. HIV-infected pregnant women took zidovudine, lamivudine, and either nevirapine or nelfinavir from 34-36 weeks gestation to 6 months postpartum. Infants received single-dose nevirapine at birth. Women were advised to breastfeed exclusively and wean rapidly just before 6 months. HIV-transmission and death rates were estimated from delivery to 24 months. HIV-transmission rates were compared among subgroups defined by maternal risk factors, including baseline CD4 cell count and viral load. Among 487 live-born, singleton, or first-born infants, cumulative HIV-transmission rates at birth, 6 weeks, and 6, 12, and 24 months were 2.5%, 4.2%, 5.0%, 5.7%, and 7.0%, respectively. The 24-month HIV-transmission rates stratified by baseline maternal CD4 cell count (less than 500 and 500 or more cells/mm³) were 8.4% and 4.1%, respectively; the corresponding rates stratified by baseline maternal viral load (less than 10,000 and 10,000 or more copies/ml) were 3.0% and 8.7%, respectively. None of the 12 maternal and 51 infant deaths (including two second-born infants) were attributed to ARVs. The cumulative HIV-transmission or death rate at 24 months was 15.7%. This trial showed that a maternal triple-ARV regimen from late pregnancy through 6 months of breastfeeding for PMTCT is safe and feasible in a resource-limited setting.

Zeh C, Weidle PJ, Nafisa L, et al. HIV-1 drug resistance Emergence among breastfeeding infants born to HIV-infected mothers during a single-arm trial of triple-antiretroviral prophylaxis for prevention of mother-to-child transmission: a secondary analysis. *PLoS Med* 2011;8:e1000430.

Nevirapine and lamivudine given to mothers are transmitted to infants via breastfeeding in sufficient quantities to have biological effects on the virus; this may lead to an increased risk of a breastfed infant developing resistance to maternal ARVs. The Kisumu Breastfeeding Study assessed the safety and efficacy of zidovudine, lamivudine, and either nevirapine or nelfinavir given to HIV-infected women from

34 weeks of gestation to 6 months of breastfeeding. All infants in the cohort were tested for HIV-infection at multiple study visits during the 24 months of the study, while the plasma viral load for all HIV-positive infants was evaluated retrospectively. Specimens from mothers and infants with a viral load higher than 1,000 copies/ml were tested for HIV-drug resistance mutations. Overall, 32 infants were HIV-infected by 24 months of age, and of this group, 24 (75%) infants were HIV-infected by 6 months of age. Of these 24 infants, nine were born to mothers on a nelfinavir-based regimen, whereas the remaining 15 were born to mothers on a nevirapine-based regimen. All infants were also given single-dose nevirapine within 48 hours of birth. Genotypic resistance mutations were detected in none of the eight infants who were HIV-PCR-positive by 2 weeks of age, for 30% (6/20) at 6 weeks, 63% (14/22) at 14 weeks, and 67% (16/24) at 6 months postpartum. Among the 16 infants with resistance mutations at 6 months, the common mutations conferred resistance to lamivudine and nevirapine. Genotypic resistance was detected among 9/9 (100%) and 7/15 (47%) infected infants whose mothers were on nelfinavir and nevirapine, respectively. No mutations were detected among the eight infants infected after the breastfeeding period (age 6 months). To conclude, emergence of HIV-drug resistance mutations in HIV-infected infants occurred between 2 weeks and 6 months post-partum, most likely because of exposure to maternal ARV drugs through breastmilk. These findings may impact the choice of regimen for ARV treatment of HIV-infected breastfeeding mothers and their infected infants.

Social determinants

Soni S, Gupta A, Jacobs AJ. Exclusive breastfeeding rates in a multiethnic population at a community hospital. *J Reprod Med* 2011;56:195-8.

This study was carried out to evaluate EBF rates in a multiethnic community and to find factors associated with the selection of feeding methods. Electronic medical records of 100 patients who delivered from January to August 2009 in a US community hospital were reviewed retrospectively. Patients who breastfed exclusively were compared with patients who bottle fed their infants partially or exclusively during the hospitalisation period immediately after delivery. Continuation rates were assessed at the infant's initial follow-up examination. The Asian populations had the highest EBF (50%) and continuity rates. Besides ethnicity, the only factors found to have an impact on the mode of feeding were the educational status and being single or not. On the other hand, employment, obesity, mode of delivery, birth weight, and sex of newborn did not have a significant effect on the type of feeding. At multivariate analysis, only the educational level had a significant association with EBF (odds ratio of 2.1). EBF was not well accepted by non-Asian populations. Because the educational level was associated positively with breastfeeding, ways of encouraging mothers with limited education to practice breastfeeding should be developed.

Shroff MR, Griffiths PL, Suchindran C, Nagalla B, Vazir S,

Bentley ME. Does maternal autonomy influence feeding practices and infant growth in rural India? *Soc Sci Med* 2011;73:447-55

This study examined maternal autonomy as a determinant of breastfeeding and infant growth in children 3-5 months of age. Cross-sectional baseline data on 600 mother-infant pairs were collected in 60 villages in rural Andhra Pradesh, India. In addition to anthropometric and demographic measures, a questionnaire was developed to measure different dimensions of autonomy (e.g. decision-making, freedom of movement, financial autonomy, and degree of acceptance or refusal of domestic violence). The results indicated that mothers with high financial autonomy were more likely to breastfeed their infants at 3-5 months than others. In the same vein, the infants of mothers who participated actively in decision-making at home were less underweight and less wasted. These results suggest that improving maternal financial and decision-making autonomy could have a positive impact on infant feeding and growth outcomes.

Maternity leave

Ogbuanu C, Glover S, Probst J, Liu J, Hussey J. The effect of maternity leave length and time of return to work on breastfeeding. *Pediatrics* 2011;127:e1414.

Paid maternity leave in the USA is not mandatory in all states. This paper investigates the effect on breastfeeding of the length of maternity leave and of the time of return to work. It uses data from a birth cohort that was restricted to 6,150 singletons whose biological mothers had responded to an interview at 9 months after delivery and had worked during the 12 months before delivery. Among these mothers, 69.4% initiated breastfeeding, with a positive association with total length of paid maternity leave and time of return to work. Compared to mothers who had returned to work within 1-6 weeks, women who had not yet returned to work had higher probabilities of initiating breastfeeding (13%), of continuing breastfeeding beyond 6 months (25%), and of predominant breastfeeding after 3 months (70%). Women who returned to work at or after 13 weeks postpartum had a two-fold higher probability of predominant breastfeeding after 3 months. If new mothers delay the time when they return to work, breastfeeding duration among US mothers may increase.

Low birth-weight infants

Maia C, Brandão R, Roncalli A, Maranhão H. Length of stay in a neonatal intensive care unit and its association with low rates of exclusive breastfeeding in very low birth weight infants. *J Matern Fetal Neonatal Med* 2011;24:774-7.

This study was set up to identify the inpatient maternal and neonatal factors associated with the weaning of very low birth-weight infants (VLBWI) in the north-east of Brazil. From July 2005 to August 2006 in a maternity unit certified as Baby Friendly and using Kangaroo Mother Care, 119 VLBWI (less than 1,500 g) were monitored from birth to the first ambulatory visit after discharge. Of these infants, 88 (75%) returned to the facility, 22 (25%) were exclusively breastfed, and 66 (75%) were either partially breast-

fed or formula fed. The authors found an association between non-EBF and lower birth-weight, longer stays in the neonatal intensive care unit (NICU), and longer length of stay in the hospital, in addition to longer enteral feeding and birth-weight recovery period. Multivariate analysis showed that the length of stay in the NICU was the main determinant of non-EBF. The negative effect on EBF of an extended stay in the NICU represents a significant challenge for health professionals wishing to provide better nutrition to VLBWI.

Commercial promotion of formula

Sadacharan R, Grossman X, Sanchez E, Merewood A. Trends in US hospital distribution of industry-sponsored infant formula sample packs. *Pediatrics* 2011;128:702.

To describe trends in the proportion of US hospitals that distribute industry-sponsored formula sample packs to new mothers, the authors surveyed hospitals in all 50 US states in 2007 and in 2010. In 2010, they selected the ten best-record and the ten worst-record states with regards to industry-sponsored formula sample-pack distribution in 2007. They contacted all hospitals (n=1,239) in these 20 states and asked if the maternity service distributed a "formula company-sponsored diaper discharge bag" to new mothers. In 2007, 14% of these hospitals were sample pack-free. In 2010, 28% of the same hospitals were sample pack-free; the proportion of sample pack-free hospitals per state ranged from 0% (five states) to 86% (Rhode Island). In the ten best-record states, the weighted proportion of sample pack-free hospitals increased by a mean difference of 18% between 2007 and 2010. In the ten worst-record states, the weighted proportion of sample pack-free hospitals increased by a mean difference of 6%. These trends indicate a significant change in practice; increasing proportions of hospitals eliminate these packs. Change was more significant in states where higher proportions of hospitals had already eliminated packs in 2007.

Berry NJ, Jones SC, Iverson D. Circumventing the WHO Code? An observational study. *Arch Dis Child* 2011; doi:10.1136/adc.2010.202051

This study compared formula milk advertisements that appeared in parenting magazines published in two countries (Australia, UK) that have enacted measures to restrict the advertising of infant formula products in response to the International Code with two that have not (USA, Canada). Content analysis was used to compare the type and frequency of formula milk advertisements that appeared in parenting magazines collected during 2007, and to examine whether there was a relationship between these frequencies and advertising regulations. Advertisements that promoted formula products or brands occurred in all of the magazines sampled but the type of product advertised differed. Follow-on formula advertisements occurred almost four times more frequently in titles from the UK than in titles from the USA and Canada. Toddler milk advertisements appeared more frequently in titles from Australia than in titles from countries where direct-to-consumer infant and/or follow-on formula advertising

was permitted. The authors concluded that bans on the advertising of infant formula products did not prevent companies from advertising follow-on or toddler formula. These products were presented in ways that encouraged consumers to associate the claims made with a product line that included infant formula.

Reviews

Edmunds J, Miles SC, Fulbrook P. Tongue-tie and breastfeeding: a review of the literature. *Breastfeed Rev* 2011;19:19-26.

In Australia, initial EBF rates are 80%, falling at 6 months to 14%. One factor that contributes to early breastfeeding cessation is infant tongue-tie, a congenital abnormality occurring in 2.8-10.7% of infants. It is characterised by the presence of a thickened, tightened or shortened frenulum. Tongue-tie results in breastfeeding difficulties, as well as in speech and dental problems. It may prevent the baby from taking enough breast into its mouth to form a teat, and the mother may experience painful bleeding nipples and frequent feeding with poor infant weight gain. These problems may contribute to early breastfeeding cessation. This review analyses the evidence on tongue-tie to determine if appropriate interventions can reduce its impact on breastfeeding cessation. The authors conclude that, for most infants, frenotomy (surgery) offers the best chance of improved and continued breastfeeding. Furthermore, studies have demonstrated that the procedure does not lead to complications either for the infant or for the mother.

Imdad A, Yakoob MY, Bhutta ZA. Effect of breastfeeding promotion interventions on breastfeeding rates, with special focus on developing countries. *BMC Public Health* 2011;11 Suppl 3:S24.

Given the recognized benefits of breastfeeding for the health of mothers and infants, the World Health Organization (WHO) recommends EBF for the first 6 months of life. However, the prevalence of EBF is low in many developing and developed countries. There is much interest in the effectiveness of breastfeeding promotion interventions on breastfeeding rates in early infancy. A systematic literature review was conducted to identify all studies that evaluated the impact of breastfeeding promotional strategies on any breastfeeding and EBF any breastfeeding and EBF rates at 4-6 weeks and at 6 months. After reviewing 968 abstracts, 268 studies were selected for potential inclusion, of which 53 randomized and quasi-randomized controlled trials were selected for full abstraction. Thirty-two studies provided the outcome of EBF at 4-6 weeks postpartum. There was a statistically significant 43% increase in this outcome, with 89% and 20% significant increases, respectively in developing and developed countries. Fifteen studies reported EBF outcomes at 6 months. There was an overall 137% increase, with a significant 6-fold increase in EBF in developing countries, compared to a 1.3-fold increase in developed countries. Further sub-group analyses underlined that prenatal counselling had a significant impact on breastfeeding outcomes at 4-6 weeks, while both prenatal and postnatal counselling were important for EBF at 6 months.

Schmied V, Beake S, Sheehan A, McCourt C, Dykes F. Women's perceptions and experiences of breastfeeding support: a metasynthesis. *Birth* 2011;38:49-60.

Both peer and professional support have been identified as important for successful breastfeeding. The aim of this review was to examine women's perceptions and experiences of breastfeeding support - either professional or peer - to better understand the components of what they deemed to be "supportive". The review included studies concerning formal ("created") peer and professional support for breastfeeding women but excluded studies on family or other informal support. Qualitative studies were included as well as large scale surveys as long as they analysed qualitative data gathered through open-ended responses. Primiparae and multiparae who initiated breastfeeding were included. After assessment for relevance and quality 31 studies undertaken

between January 1990 and December 2007 were included. The synthesis indicated that breastfeeding support occurred along a continuum, from authentic presence at one end that was perceived as effective support, to disconnected encounters at the other that were perceived as ineffective or even discouraging and counterproductive. A "facilitative" approach opposed to a "reductionist" approach were identified as contrasting styles of support that women experienced as either helpful or unhelpful. These findings emphasize the importance of person-centred communication skills and of relationships in supporting a woman to breastfeed. Organizational systems and services that encourage continuity of the caregiver, such as, for example, continuity of midwifery care or peer support models, are more likely to create an authentic presence, involving supportive care and a trusting relationship with professionals

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