

# Early Initiation of Breastfeeding: the Key to Survival and Beyond

*“Breastfeeding is today the single most effective preventive intervention for improving the survival and health of children”*

WHO Secretariat, 2010

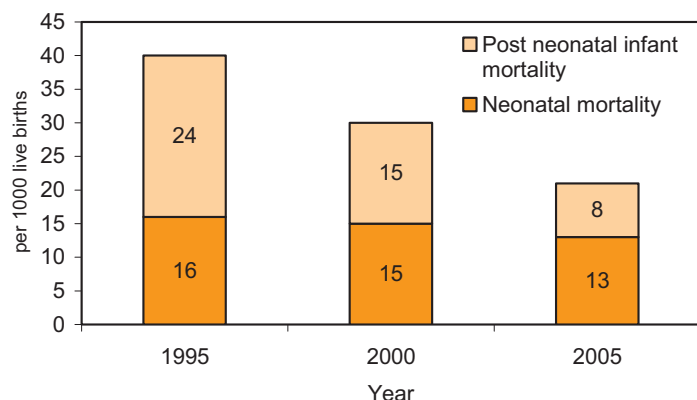
Early initiation of breastfeeding has benefits for survival and beyond. Breastfeeding promotes child survival, health, brain and motor development. While breastfeeding has lifelong benefits for both the mother and child, the risks of not breastfeeding are particularly pronounced early in life.<sup>1-3</sup> Early initiation of breastfeeding and exclusive breastfeeding for the first six months of life prevent neonatal and infant deaths largely by reducing the risk of infectious diseases. This risk is reduced because:

- Colostrum, the first milk, and breast-milk contain a large number of protective factors that provide passive and active protection to a wide variety of known pathogens. Colostrum is particularly rich in these protective factors and its ingestion within the first hour of life prevents neonatal mortality.
- Exclusive breastfeeding or feeding only breast-milk eliminates the ingestion of pathogenic micro-organisms through contaminated water, other fluids, and foods. It also prevents damage to the immunologic barriers in the infant’s gut from contaminants or allergenic substances in infant formula or food.

## Starting early — can prevent neonatal death

Breastfeeding prevents neonatal deaths. In the Americas, not only is infant mortality increasingly concentrated in the neonatal period, but most of the 48% decline in infant mortality between 1995 and 2005 has been through reductions in post-neonatal mortality (**Figure 1**).<sup>4</sup> Within the neonatal period (the first 28 days of life), most deaths occur during the first 7 days, making the first week after birth a particularly vulnerable time.<sup>7</sup> Many causes of neonatal deaths are amenable to intervention; the majority can be prevented. A global analysis of 4 million neonatal deaths showed that infections (sepsis, pneumonia, tetanus and diarrhea) caused 36% of deaths, and preterm birth an additional 27%.<sup>6</sup> The deleterious effects of both can be prevented or reduced by early initiation of breastfeeding (or human milk feeding) and exclusive breastfeeding. In the Americas, infection and low birth-weight account for 56% of all peri-neonatal deaths, which breastfeeding or human milk feeding could, in part, help to reduce.<sup>7</sup> Newborns put to the breast within the first hour after birth are less likely to die during the neonatal period (**Table 1**).

**Figure 1:** Trends in neonatal and infant mortality in the Americas, 1995-2005 PAHO Core Data, 1995, 2000, 2005



**Table 1:** Delayed initiation of breastfeeding increases neonatal mortality

Initiation of BF	Newborns (%)	Deaths (#)	Odds Ratio
Within first hour	43	34	1
1-24 hours	28	36	1.43 (.88-2.31)
Day 2	20	18	2.52 (1.58-4.02)
Day 3	7.3	21	2.84 (1.59-5.06)
> Day 3	1.3	6	3.64 (1.43-9.30)
<b>Total</b>	<b>100</b>	<b>145</b>	

Source: Edmond et al. Delayed breastfeeding initiation increases risk of neonatal mortality. *Pediatrics* 2006; 117<sup>3</sup>.

Two recent studies involving nearly 34,000 newborns show that the risk of death increases with increasing delays in breastfeeding initiation.<sup>1, 3</sup> In Ghana, neonates were 2.5 times more likely to die when breastfeeding initiation began after 24 hours than when breastfeeding began within the first hour after birth. In Nepal, neonates were 1.4 times more likely to die if breastfeeding began after the first 24 hours. The authors estimated that approximately one-fifth of all neonatal deaths (22% in Ghana and 19% in Nepal) could be avoided if breastfeeding were initiated within the first hour of life for all newborns. The benefits of early initiation of breastfeeding are particularly pronounced for pre-term and low-birth-weight infants.<sup>8, 9</sup>

As total infant mortality declines, the proportion of that mortality that occurs during the neonatal period increases. This makes interventions to prevent neonatal mortality particularly important for achieving the Millennium Development Goal (MDG) related to child survival (Goal 4). Early initiation of breastfeeding and exclusive breastfeeding for the first six months of life can make a major contribution to reducing neonatal and early infant mortality, thus advancing MDG 4. The importance of early initiation of breastfeeding is recognized by the World Health Organization (WHO), which recommends that all newborns born at term or with a gestational age greater than 32 weeks or birth weight greater than 1500 grams be put to the breast within the first hour of life (**Box 1**).

### Breast-milk the smartest milk

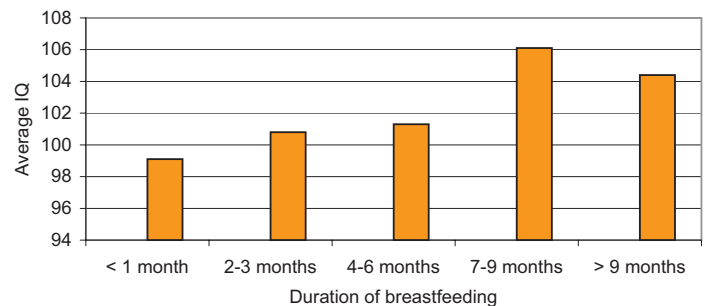
Children breastfed for seven to nine months or longer have on average an intelligence quotient (IQ) about six points higher

#### Box 1: WHO Recommendations for breastfeeding

- Early initiation of breastfeeding within one hour after birth.
- Exclusive breastfeeding (defined as no water, other fluids or foods) for six months (180 days).
- Continued breastfeeding for two years or beyond with the addition of timely, adequate, safe and properly fed complementary foods.

than children breastfed for less than a month (**Figure 2**).<sup>10</sup> This robust finding has caused some to call breast-milk the “smarter milk.” Infants exclusively breastfed for six rather than four months also crawl and walk earlier.<sup>11</sup>

**Figure 2: The “smarter” milk: Breastfeeding and cognitive development**



Source: Mortenson et al., The association between duration of breast-feeding and adult intelligence. JAMA. 2002; 287:2365-71.

### The breastfeeding gap

In the Americas, there is ample room for improvement in early initiation of breastfeeding (**Table 2**). Although nearly all newborns, including those born by cesarean section, can be put to the breast within the first hour of life, the actual proportion that are ranges from 26% to 64%. In nearly half the countries with representative data, this happens with fewer than 50% of newborns. Exclusive breastfeeding, one of the WHO/UNICEF Key Family Practices, is also low in many countries ranging from only 8% to 64%. Urgent action is needed to ensure that virtually all infants are put to the breast within the first hour of life and exclusively breastfed for a full six months.

### The nutritional and immunological attributes of breast-milk

Breast-milk is composed of both cellular and extracellular substances (**Box 2**) that provide active and passive protection against a number of viruses, bacteria, enterotoxins, fungi and protozoa (**Box 3**). These substances are particularly important for the neonate, and especially so for the preterm newborn, as the immune system is not fully developed at birth. Breast-

**Table 2: The breastfeeding gap in Latin America and the Caribbean**

Country	Year	Early initiation of breast-feeding (within the first hour of life) (%)	Exclusive breastfeeding < 6 months (%)	Mean breastfeeding duration (months)
Argentina	2006	Not available	Not available	Not available
Bolivia	2008	63.8	60.4	19.4
Brazil	2006	42.9	38.6	14.0
Colombia	2005	48.9	46.7	17.3
Costa Rica	2006	Not available	Not available	Not available
Dominican Republic	2007	65.2	7.7	10.7
Ecuador	2004	26.4	39.6	16.2
El Salvador	2008	33.0	31.4	20.5
Guatemala	2002	60.1	49.6	20.6
Haiti	2005	44.3	40.7	19.9
Honduras	2005	78.6	29.7	20.3
Mexico	1999	Not available	20.3	9.0
Nicaragua	2006/07	54.0	30.6	18.4
Paraguay	2004	23.1	Not available	11.8
Peru	2004	42.2	63.9	19.6

Source: Demographic and Health Surveys or other nationally representative source of data.

### Box 2: Cellular and extracellular breast-milk components

#### Cellular

Lymphocytes T and B

Neutrophils

Macrophages

Active epithelial cells

#### Extracellular

Immunoglobulins

Enzymes

Transport proteins

Hormones and hormone-like substances

Anti-inflammatory factors

Antimicrobial factors such as IgA and lactoferrin

milk is also a rich source of omega-3 fatty acids that are linked to improved brain development.<sup>12</sup>

## Risks of not breastfeeding

Breastfeeding confers benefits on both mother and child, regardless of wealth or power. But these benefits are particularly important for babies who are already at higher risk of death or illness. Not breastfeeding presents both short- and long-term risks for mothers and children.<sup>13</sup> These risks include:

### For the child

#### 1. Increased risk of mortality

Breastfeeding saves lives. During the first two months of life, infants who are not breastfed are nearly 6 times more likely to die from infectious diseases than infants who are breastfed; between 2 and 3 months, non-breastfed infants are 4 times more likely to die compared to breastfed infants (**Figure 3**).<sup>14</sup> Even at 9-11 months, non-breastfed infants are 40% more likely to die than breastfed infants. These figures likely underestimate the risks of not breastfeeding, as exclusive breastfeeding—the breastfeeding behavior most associated with survival—was so rare that its effects could not be estimated. A recent study in *The Lancet* showed that improved breastfeeding could save 1.3 million lives each year.<sup>15</sup>

#### 2. Increased risk of acute illness

Breastfed babies have fewer cases of diarrhea, respiratory infections, ear infections and other acute illnesses.<sup>16</sup> Although these benefits are greater in developing countries, they are also important in industrialized countries.<sup>13</sup> In the United States

**Box 3: Pathogens against which colostrum and breast-milk have been shown to be effective**

Virus	Bacterias	Fungi/Protoza	Enterotoxins
Coxsackie types A <sub>yr</sub> , B <sub>4r</sub> , B <sub>5</sub>	Campylobacter flagellin	Candida albicans	cholera toxin
Cytomegalovirus	Clostridium (A and B)	E. histolytica	labile toxin of E. coli
Echovirus types 6 and 9	enteropathogenic E. coli	G. lambia	Shigella toxin I
Enteroviruses	Enterotoxigenic E. coli	T. vaginalis	Shiga-like toxin of E. coli
Enveloped viruses HIV	Samonella		Coxsackie types A <sub>yr</sub> , B <sub>4r</sub> , B <sub>5</sub>
Herpes simplex virus	Shigella		
H. influenza	S. Aureus		
Parainfluenzae	V. cholerae		
Polio virus types 1, 2, and 3			
Reovirus type 3			
Respiratory syncytial virus			
Rotavirus			
Rubella			
Simliki forest virus			
S. pneumonia			

alone, breastfeeding for the first six months of life would save nearly 1,000 lives and US\$ 13 billion in excess health care costs associated with not breastfeeding.<sup>17</sup>

### 3. Increased risk of chronic illness

Breastfeeding has long-term benefits in the form of reduced risk of chronic illness. As adults, breastfed infants have lower blood pressure, serum cholesterol and type-2 diabetes.<sup>2</sup> Many, though not all, studies also show a reduced risk of overweight and obesity.

### 4. Reduced intelligence

Breastfed babies are smarter! Breastfeeding for a longer duration compared to less than 1 month improves IQ on average about 6 points (Figure 2).<sup>4, 18</sup> While important for individual children, an increase in the national distribution of IQ also has benefits for national development and economic competitiveness.

### For the mother

#### 1. Increased risk of breast and ovarian cancer

Breastfeeding benefits mothers by reducing their risks of ovarian cancer<sup>19</sup> and premenopausal breast cancer.<sup>20-22</sup> In a prospective study of over 60,000 women who had had at least one child, breastfeeding women who had a close relative with

breast cancer had nearly 60% less risk for premenopausal breast cancer compared with similar non-breastfeeding women. A recent study concluded that no breastfeeding or a short lifetime duration of breastfeeding, typical of women in developed countries, makes an important contribution to the high incidence of breast cancer in these countries.

#### 2. Reduced risk of Type 2 diabetes

Breastfeeding reduces the risk of Type 2 diabetes in young and middle-aged women possibly by improving glucose homeostasis. In a study of two large cohorts of women in the United States, there was a reduced risk of diabetes of 15% for each year of breastfeeding.<sup>23</sup>

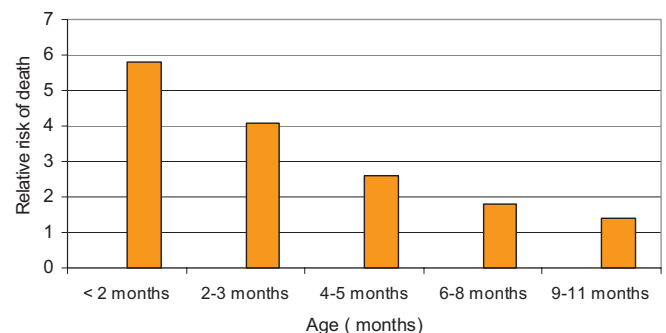
#### 3. Reduced postpartum weight loss

Breastfeeding helps mothers to lose weight postpartum, particularly during the period of exclusive breastfeeding.<sup>24</sup> Inasmuch as overweight and obesity are increasing problems in Latin America and the Caribbean, even a relatively small effect of breastfeeding on post-partum weight loss can be important.

#### 4. Reduced birth intervals in the absence of modern contraceptives and increased risk of anemia

Breastfeeding lengthens post-partum amenorrhea and in the absence of modern contraceptives lengthens birth intervals.<sup>25, 26</sup>

**Figure 3: Non-breastfed infants die more from infectious disease**



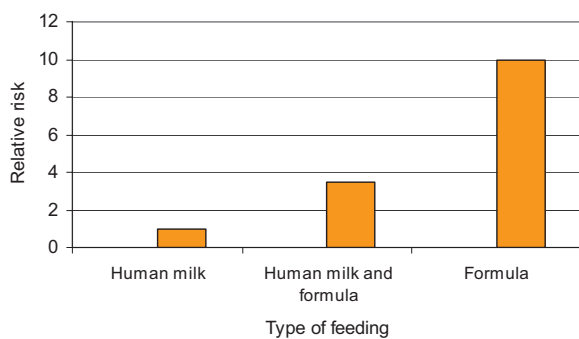
Source: WHO Collaborative Study Team on the Role of Breastfeeding on the Prevention of Infant Mortality. Lancet 2000.

A longer period of amenorrhea also helps to replenish maternal iron stores that were lost during delivery, and thus reducing the risk of anemia.

## Human milk banks and feeding at-risk newborns

While breast-milk is important for all babies, it is particularly so for the smallest and most at-risk newborns.<sup>27</sup> A multicenter randomized prospective study of feeding of preterm infants and necrotizing enterocolitis showed that formula-fed infants were 10 times more likely to contract the disease than infants fed human milk (Figure 4).<sup>28</sup> Human milk banks that pasteurize donor milk can play an important role in feeding at-risk newborns. The use of human milk is especially important since powdered infant formulas are not sterile products and pose particular risks for preterm and low birthweight newborns.<sup>29</sup> Led by the Government of Brazil and in collaboration with PAHO, the Latin American Network of Human Milk Banks has been expanding. These banks not only provide vitally needed human milk for at-risk newborns but also serve as centers for breastfeeding promotion, protection and support as well as training of health workers.

**Figure 4: Human milk feeding of preterm infants reduces necrotizing enterocolitis**



Source: Lucas and Cole. Breast milk and neonatal necrotizing enterocolitis. *Lancet* 1990;336:1519-1523.

## HIV and infant feeding

WHO's guidance on HIV and infant feeding has been recently updated to clarify and simplify guidance on infant feeding in the context of HIV.<sup>30</sup> The current recommendations are guided by a number of key principles including that

recommended infant feeding practices by mothers known to be HIV-infected should support the greatest likelihood of HIV-free survival of their children and not harm the health of mothers. Another key principle states that national or sub-national health authorities should decide whether health services will principally counsel and support mothers known to be HIV-infected and whose infants are HIV uninfected or of unknown HIV status to either breastfeed and receive antiretroviral interventions or avoid all breastfeeding.

This decision should be based on consideration of the socio-economic and cultural contexts of the populations served by maternal, newborn and child health services, availability and quality of health services, local epidemiology including HIV prevalence among pregnant women, main causes of maternal and child undernutrition and main causes of infant and child mortality. WHO is developing guidance to assist countries in this decision-making process. When HIV-infected mothers do breastfeed they should exclusively breastfeed their infants for the first 6 months of life, introducing appropriate complementary foods thereafter, and continue breast-feeding for the first 12 months of life. Breastfeeding should then only stop once a nutritionally adequate and safe diet without breast milk can be provided. Mothers of infants and young children known to be HIV-infected are strongly encouraged to exclusively breastfeed for the first 6 months of life and continue breast-feeding up to two years or beyond.

PAHO guidance issued in 2009 for infant in the context of maternal HIV infection recommends that the region as a whole opt for avoiding all breastfeeding.<sup>31</sup>

## Effective actions

Breastfeeding promotion is a public health "best buy." It has a large effect in reducing infant morbidity and mortality and also is highly amenable to public health intervention. Research has shown that individual maternal behaviors are amenable to change and that changes in individual behaviors collectively contribute to positive national trends in breastfeeding.<sup>32</sup>

To ensure that virtually all newborns benefit from breastfeeding and breast-milk, a concerted effort by governments, health systems, employers and infant food companies is needed. Actions are also needed by non-governmental organizations and

communities to ensure that every mother lives and works in an environment where the decision to breastfeed can be easily carried out.

Below are some examples of needed action in key arenas:

### Governments

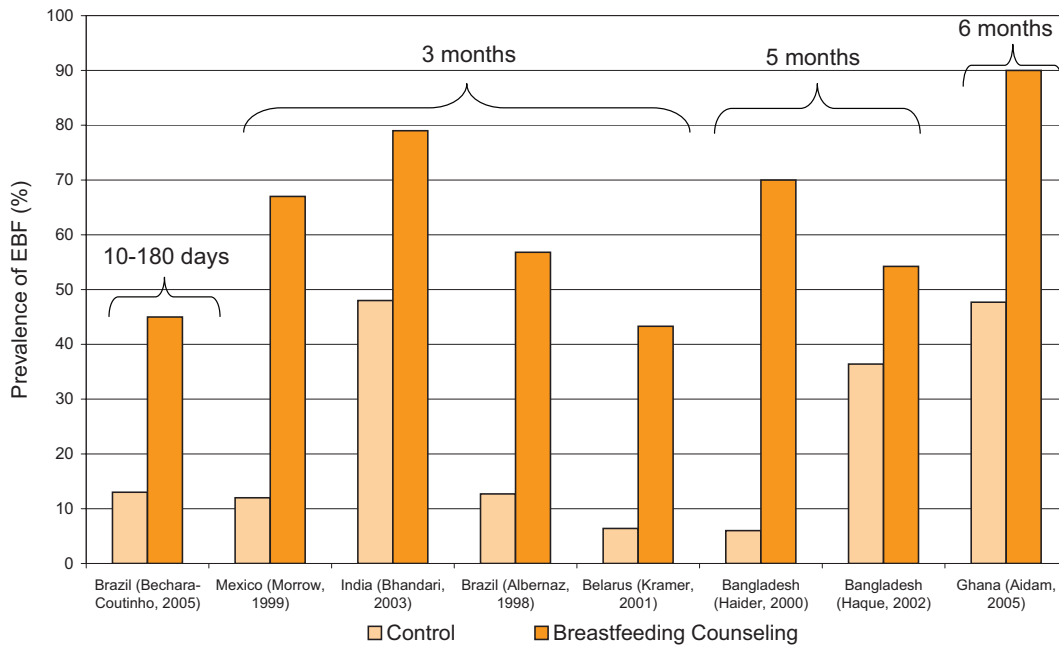
- *Develop and implement a comprehensive strategy on infant and young child feeding.* The WHO/UNICEF Global Strategy for Infant and Young Child Feeding is a broad framework for action.<sup>33</sup> However, each country needs a comprehensive national strategy and plan of action for infant and young child feeding. WHO and UNICEF have developed a Planning Guide for national implementation of the Global Strategy to guide this process.<sup>34</sup>
- *Implement, monitor and sanction violations of the WHO International Code of Marketing of Breast-milk Substitutes.* All countries in Latin America have adopted parts or all of the Code. Nevertheless, in most countries mechanisms are not in place for routine Code monitoring and numerous examples of violations exist.
- *Legislate maternity protection to facilitate breastfeeding and*

*work.* Breastfeeding and work are compatible. However, working women need maternity protection and, once they return to work, safe places to express and store their breastmilk and/or access to their infants to breastfeed during the day.<sup>35</sup> Recently, Brazil launched a campaign promoting breastfeeding among working mothers by organizing an event with employers and producing a booklet, folder and video. Brazil also published government regulations for Breastfeeding Rooms at Work Places.

### Health systems

- *Revitalize breastfeeding promotion, protection and support in all relevant aspects of primary health care, including but not limited to maternity and well and sick-child care.* Counseling lengthens the duration of exclusive breastfeeding. Multiple randomized trials consistently show that individual breastfeeding behaviors can be significantly improved through one-on-one counseling provided early in the postpartum period (**Figure 5**). WHO and UNICEF have developed a number of courses to improve health worker capacity in breastfeeding. Breastfeeding is also a key component of both

**Figure 5: Post-partum breastfeeding counseling improves exclusive breastfeeding**



Source: Lutter and Chaparro, Malnutrition in infants and young children: achieving the Millennium Development Goals. Pan American Health Organization: Washington DC, 2008

clinical and community Integrated Management of Childhood Illnesses (IMCI) national strategies. Opportunities to counsel mothers about breastfeeding through these and other child survival strategies need to be strengthened.

- *Revitalize the Baby Friendly Hospital Initiative (BFHI)* through a systematic recertification and monitoring process, and expansion of the Initiative to cover all facilities providing maternity services. BFHI promotes 10 hospital practices consistent with optimal breastfeeding practices (**Box 4**). Although a large number of hospitals have been designated as Baby Friendly, only a few countries have established a formal process of recertification. Hospital recertification is vital to ensure that established standards are consistently in place. The revised WHO/UNICEF BFHI materials have been translated into Spanish and Portuguese and are available on the PAHO website. PAHO is also supporting training of trainers and ongoing replication in countries, and in collaboration with the University of Galileo in Guatemala is launching a distance learning course on BFHI.
- *Develop capacity in breastfeeding knowledge and skills, including how to manage common breastfeeding problems and health worker responsibilities under the Code.* Skilled and motivated health personnel are critical to the success and sustainability of any health intervention and have been shown to be especially important in increasing exclusive breastfeeding. Capacity development is particularly important given that a whole new generation of health workers has come of age that often does not have knowledge of the Code nor their responsibilities under the Code.
- *Monitor and evaluate coverage of key breastfeeding promotion interventions and trends in breastfeeding.* Investing in and monitoring not only trends in breastfeeding but also the coverage of key breastfeeding interventions is important to assess progress, make necessary policy and program adjustments and assess impact.

### Employers

- *Comply with national legislation on maternity protection and inform employees of their legal rights under this protection.* Breastfeeding benefits employers, as breastfed babies get

#### Box 4: 10 Steps to successful breastfeeding

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

sick less often, reducing employee absenteeism. One quasi-experimental study of two corporations documented that 25% of all one-day maternal absences were among mothers who breastfed their babies, while 75% were among mothers who formula-fed theirs.<sup>36</sup>

- *Provide on-site day child care and/or breastfeeding rooms where mothers can privately express their breastmilk and safely store it.*

### Infant food companies

- *Comply with the WHO International Code of Marketing of Breast-milk Substitutes and related World Health Assembly Resolutions and national Code legislation.* As stated in the Global Strategy for Infant and Young Child Feeding, “Infant food companies should ensure that their conduct at every level conforms to the Code, subsequent relevant Health Assembly resolutions, and national measures that have been adopted to give effect to both.”

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## Aknowledgements

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