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Wet nursing and donor human milk sharing in emergencies and disasters: A review

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ABSTRACT

During emergencies and disasters infant survival can depend on their access to breastfeeding or human milk. Wet nursing and donor human milk sharing are options endorsed by the World Health Assembly (WHA). This study looks at regulatory environments for wet nursing and donor human milk sharing and considers the wider food security and resilience implications.

Legislation and policies relating to wet nursing, donor human milk sharing and milk banking can support appropriate infant and young child feeding in emergencies responses (IYCF-E). However, in many countries there is a lack of legislative and regulatory clarity on protecting and supporting breastfeeding practices in these situations. This is true for all income country settings and geographic regions.

High breastfeeding prevalence in a country can reduce exposure to food insecurity and risk for mothers and their children during emergencies. Regulatory clarity is also needed to protect safe wet nursing and donor human milk sharing, being an important step in developing protocols and plans for emergency preparedness and response. With human milk products becoming more available, there is also an urgent need to ensure full implementation of the IYCF-E Operational Guidance and the World Health Organization (WHO) International Code of Marketing of Breast-milk Substitutes and subsequent relevant WHA Resolutions.

INTRODUCTION

In 2009, a policewoman in China made headlines around the world, when she instinctively breastfed a child orphaned during the disastrous Sichuan earthquake (Zhe & Yinan, 2009). As policewoman Jiang explained, there were nine babies at a local disaster relief centre and she was at the time caring for them. 'Their mothers had either died in the disaster, were injured or were too scared to produce any milk.' Amidst the chaos of the earthquake, she reported, 'We didn't have any milk powder products...'

Such actions by first responders in disasters should perhaps not surprise us, nor is it unexpected that non-availability of milk formula products creates legitimacy for supporting wet nursing. The implementation of the WHO International Code of Marketing of Breast-milk Substitutes ('the WHO International Code') is a key recommendation for infant and young child feeding in emergencies (IYCF-E).

However, it is not widely known that wet nursing or donor human milk sharing is a key recommendation from WHO, within international guidance calling for a comprehensive approach to the protection, promotion and support of breastfeeding in emergencies. For example, most recently, in the context of COVID-19, WHO recommended to health workers that:

In the event that the mother is too unwell to breastfeed or express breastmilk, explore the viability of relactation, wet nursing, donor human milk, or appropriate breastmilk substitutes, informed by cultural context, acceptability to the mother, and service availability. (World Health Organization [WHO], 2020a, p. 12)

However, in many countries it is not clear to health professionals or first responders what legislative or regulatory infrastructure underpins their emergency management in this area. Here we provide an overview of breastfeeding protection, promotion and support in emergencies, looking at relevant experience in selected countries, and available information on regulatory environments for wet nursing or donor human milk sharing.

Australian emergency planning and preparation

In Australia, over 300,000 babies are born each year and the past several months have heightened public awareness of the need for emergency planning and preparedness to keep infants and young children safe. From late 2019 through January 2020, bushfires, air pollution and then floods generated disruption, displacement and widespread necessity for emergency and disaster responses in most Australian jurisdictions. During 2020, concerns then came to

the fore in Australia, as elsewhere, about COVID-19-related hospital policies that imposed separation on new mothers and their infants and discouraged or prohibited breastfeeding or expressed breastmilk provision by mothers with suspected or confirmed COVID-19 disease (Tomori, Gribble, Palmquist, Ververs, & Gross, 2020).

The importance of preparedness on IYCF-E is recognised in the Australian National Breastfeeding Strategy (ANBS) released by the Council of Australian Governments (COAG) in June 2019 (Australian Government Department of Health, 2019), which noted that:

Breastfeeding provides a dependable method of infant feeding in rural and remote locations with limited or sporadic access to alternative infant feeding options. It also provides a safe and reliable method of infant feeding in emergencies, providing a consistent source of adequate nutrition and protection against infections.

A review of evidence commissioned to inform development of ANBS priority actions had identified IYCF-E as an area requiring attention in early 2018 (Smith et al., 2018). The review concluded that based on experience, including in OECD and high income country settings, implementation of specific measures to protect, promote and support optimal breastfeeding could prevent disruption to recommended IYCF practices following emergencies in Australia. A subsequent policy assessment by WBTi Australia (World Breastfeeding Trends Initiative Australia et al., 2018) and a related audit of emergency planning documents in Australian jurisdictions confirmed significant gaps in Australia's planning for IYCF-E. Though infants had been wet nursed in evacuation centres during emergencies, there was a dearth of planning and guidance to support comprehensive implementation of the recommended IYCF-E (Gribble, Peterson, & Brown, 2019).

It is therefore heartening that the 2019 ANBS includes developing a national policy on IYCF-E as a national Priority Action, as well as ensuring that skilled breastfeeding and lactation support is available during disasters (Australian Government Department of Health, 2019).

International context for emergency planning and preparation

The Australian situation is part of a wider problem of 'benign neglect' of IYCF-E (Gribble, 2020). During emergencies, the youngest are at higher risks of mortality and morbidity, so preparedness and response

measures for women and children that protect and support breastfeeding are vital (WHO, 2004).

According to UNICEF, more than 530 million children live in areas affected by disasters or conflicts (UNICEF, 2016) and around 17 million people were newly displaced in their own countries by natural disasters in 2018 (Internal Displacement Monitoring Centre, 2019). This scale of disruption highlights the potential impacts of more extreme events globally, including in high income countries like Australia and New Zealand (Intergovernmental Panel on Climate Change [IPCC], 2018; Watts, 2018).

However, around the world, countries have performed particularly poorly on developing and implementing IYCF-E policies at the national level (Gupta, Suri, Dadhich, Trejos, & Nalubanga, 2019). In 2017, globally, fewer than 30% of WHO member states have relevant IYCF-E recommendations (WHO, 2017).

The *Infant and Young Child Feeding in Emergencies Operational Guidance* (OG-IFE) was first produced in 2001 by an international inter-agency collaboration concerned to develop training materials and related policy guidance on infant and young child feeding in emergencies. This has been updated over time in consultation with international, regional and country informants, and consolidating WHO and UNICEF standards and recommendations (IFE Core Group, 2017). The OG-IFE sets out a comprehensive approach to the protection, promotion and support of recommended infant and young child feeding practices in disaster situations. It draws from the recommendations of the WHO International Code (WHO, 1981) and subsequent relevant World Health Assembly (WHA) Resolutions, the WHO/UNICEF *Global Strategy on Infant and Young Child Feeding* (GSIYCF) (World Health Organization/UNICEF [WHO/UNICEF], 2003) and the 2004 WHO guiding principles for feeding infant and young children during emergencies (WHO, 2004).

Notably, it recommends that relactation, wet nursing and donor human milk are options to be considered when infants cannot breastfeed from their mothers. Some infants who are not breastfed may also benefit from the mother relactating, by wet nursing or donor human milk sharing.

Protecting breastfeeding also includes preventing uncontrolled distribution of commercial baby food and milk products. The IYCF-E Operational Guidance (OG-IFE) calls for full implementation of the WHO International Code, which is also important as human milk products become more widely available (Petherik, 2015).

In 2018, the World Health Assembly (World Health Assembly [WHA], 2018) urged member states to:

...take all necessary measures to ensure evidence-based and appropriate infant and young child feeding [IYCF] during emergencies, including through preparedness plans, capacity-building of personnel working in emergency situations, and coordination of intersectoral operations.

This means also building the necessary skills to support actions like relactation, provision of donor human milk and wet nursing. Specialised training is needed at the country level, to be facilitated by trained breastfeeding counsellors and targeting key emergency responders as part of the preparedness efforts at the national and sub-national levels.

Women's and children's human rights in emergencies

Giving lesser priority to human rights in emergencies exacerbates the harmful impacts of a crisis. Breastfeeding is an integral component of the human rights of women and children (United Nations Human Rights. Office of the High Commissioner, 2016). The WHO NetCode Group reiterated in 2019 that:

Governments have an obligation under the Convention on the Rights of the Child and other relevant UN human rights instruments to respect, protect, and fulfil children's rights to health and to nutritious foods and women's rights to be protected from harmful interference by non-State actors, particularly the business sector, and to have skilled support to enable them to breastfeed. (Grummer-Strawn et al., 2017, p. 2)

To improve the quality and accountability of humanitarian responses in situations of disaster and conflict, universal minimum standards have been developed over the period since. The Sphere standards for food security and nutrition include IYCF-E recommendations that align with the recommendations of the OG-IFE (The Sphere Project, 2011).

Responses to the COVID-19 emergency around the world have repeated previous experiences of violations of women's reproductive rights (Gribble, McGrath, MacLaine, & Lhotska, 2011; Palmquist & Gribble, 2018). Early in 2020, WHO interim guidance was issued for home and clinical care patients with COVID-19. For the home care of patients with COVID-19 presenting with mild symptoms, WHO recommended that breastfeeding be encouraged and the mother not be separated from the infant (WHO, 2020d). Regarding mothers who are suspected or confirmed

COVID-19-positive, and recommendations of distancing of at least 1 m from the ill person, WHO states that 'an exception may be considered for a breastfeeding mother'.

Considering the benefits of breastfeeding and insignificant role of the breast milk in transmission of other respiratory viruses, the mother could continue breastfeeding. The mother should wear a medical mask when she is near her baby and perform careful hand hygiene before close contact with the baby. She would need also to apply the other hygienic measures described in this document.

WHO clinical care guidance (WHO, 2020a, 2020b) is that:

Breastfeeding protects against morbidity and death in the post-neonatal period and throughout infancy and childhood. The protective effect is particularly strong against infectious diseases that are prevented through both direct transfer of antibodies and other anti-infective factors and long-lasting transfer of immunological competence and memory. See WHO Essential newborn care and breastfeeding (196). Therefore, standard infant feeding guidelines should be followed with appropriate precautions for IPC.¹

As the COVID-19 pandemic accelerated in March 2020, UN human rights experts raised deep concerns about 'egregious violations of the human rights of women and girls', including in particular the introduction of restrictions on health services which violated their rights during pregnancy and childbirth and prevented or discouraged breastfeeding (United Nations Office of the Human Rights Commission, 2020).

1 WHO adds that 'Breastfeeding should be initiated within 1 hour of birth. Exclusive breastfeeding should continue for 6 months with timely introduction of adequate, safe and properly fed complementary foods at age 6 months, while continuing breastfeeding up to 2 years of age or beyond. Because there is a dose-response effect, in that earlier initiation of breastfeeding results in greater benefits, mothers who are not able to initiate breastfeeding during the first hour after delivery should still be supported to breastfeed as soon as they are able. This may be relevant to mothers who deliver by caesarean section, after an anaesthetic, or those who have medical instability that precludes initiation of breastfeeding within the first hour after birth. This recommendation is consistent with the *Global Strategy for Infant and Young Child Feeding* (<https://apps.who.int/iris/bitstream/handle/10665/42590/9241562218.pdf>), as endorsed by the Fifty-fifth World Health Assembly, in resolution WHA54.2 in 2002, to promote optimal feeding for all infants and young children.

Improving food security for infants and young children through guidance on milk sharing or wet nursing

For wet nursing or donor human milk sharing to be considered in emergency responses, there needs to be an enabling social, cultural and legislative environment, as well as evidence to inform program development. The Chinese police officer acting spontaneously based on her 'instincts of motherhood' was a laudable act of compassion and endorsed by the relevant authorities in this case, but more systematic national guidance and training for first responders in emergencies would be preferable. Consideration by Save the Children of the barriers to wet nursing in emergencies has highlighted that the lack of social acceptability and cultural respect, including from government authorities and health facilities, are important factors reinforcing system level barriers to organising wet nursing in emergencies (Teshome & Iellamo, 2019).

The inclusion of wet nursing or donor human milk sharing as an option in the WHO/UNICEF *Global Strategy for Infant and Young Child Feeding*, the recent OG-IFE global guidance for IYCF-E as well as WHO breastfeeding COVID-19 guidance is important in legitimising the inclusion of these in IYCF-E preparedness and response plans. In early 2020, WHO recommended to health workers (WHO, 2020c) that if a mother with confirmed/suspected COVID-19 was not able to breastfeed or to express breastmilk:

Wet-nursing may be an option depending on acceptability to mothers/families, national guidelines, cultural acceptability, availability of wet-nurses and services to support mothers/wet-nurses. ... In settings where HIV is prevalent, prospective wet-nurses should undergo HIV counselling and rapid testing, according to national guidelines, where available. In the absence of testing, if feasible undertake HIV risk assessment. If HIV risk assessment/ counselling is not possible, facilitate and support wet nursing. Provide counselling on avoiding HIV infection during breastfeeding.

Health workers were recommended to prioritise wet-nurses for the youngest infants.

Regarding human donor milk sharing, some countries have improved food security and food supply resilience for infants and young children through initiatives for breastfeeding protection, promotion and support, including developing milk bank networks. Networks of milk banks operate in Brazil, Europe and the United States, while important initiatives have been started and sustained in the Philippines and Viet Nam. There are calls to embed donor human milk

sharing measures in facilities' COVID-19 pandemic response (Shenker et al., 2020). During the COVID-19 pandemic, milk banking has been maintained in existing country jurisdictions. This is despite facing new challenges including maintaining adequate staffing, difficulties in donor recruitment, questions around the safe handling and transportation of donor milk and increased demand as a result of mothers and infants being separated. The *Call to Action* by milk bank leaders noted that:

Local issues have been deepened by the absence of globally agreed operational safety guidelines, no global mechanism for rapid communication among milk banks, with little data and infrastructure to ensure responsiveness during a crisis. The strengthening of human milk bank systems is required to ensure that safe provision of donor milk remains an essential component of early and essential newborn care during routine care or emergency scenarios, such as natural disasters and pandemics.

Below, we summarise selected Asia-Pacific country experiences with IYCF-E, then draw on peer-reviewed research articles and official documents to describe regulatory environments for wet nursing or donor human milk sharing, including how this may differ for emergency situations.

Country IYCF-E experiences and support – key elements relevant to wet nursing and human donor milk sharing

The IYCF-E experiences of selected countries illustrates the gaps, as well as the effective elements of IYCF-E responses, the place of wet nursing or donor human milk sharing in IYCF-E programs and its relation to WHO International Code implementation in disaster responses.

Nepal, a low-income country experienced a major earthquake in 2015 that showed the potential to achieve wide coverage of IYCF programs during an a 3-month emergency. Nepal has very high breastfeeding prevalence, with 93% breastfeeding at 20–23 months and 70% exclusive breastfeeding among infants under 6 months (Victora et al., 2016). The international Emergency Nutrition Response aimed *inter alia*, to protect, promote and support breastfeeding for children aged 0–23 months and avoid the distribution or use of unsolicited donations of breastmilk substitutes. This element of the IYCF-E response achieved over 90% coverage of the target population of around half a million mothers of infants and young children (Aguayo, Sharma, & Subedi, 2015). The Nepal government and international agencies warned against untargeted distributions of

breastmilk substitutes (BMS) and called for measures to establish a protective environment (Government of Nepal & UNICEF, 2015), including (1) establishing a separate 'safe corner' for breastfeeding; (2) skilled staff, volunteer or peer counsellors to provide psycho-social care to traumatised and depressed women and provide IYCF counselling to mothers to encourage them to breastfeed; and (3) skilled staff trained in IYCF to counsel mothers to breastfeed and manage breastfeeding problems or lactation failure. The government also stated that 'every effort should be made to identify ways to breastfeed infants and young children who are separated from their mothers, for example by a wet-nurse'. Despite this, breastfeeding mothers reported receiving distributions of BMS by humanitarian agencies and there was only sparse evidence of the practice of wet nursing (DeYoung, 2015; DeYoung, Suji, & Southall, 2018). Some mothers did not use the BMS, with a cultural norm of breastfeeding as a primary choice in Nepal. However, many decided to feed BMS to the babies to supplement breastfeeding, with perceptions that their milk supply was insufficient after 4 months.

Bangladesh experiences recurrent flood crises that affect the nutrition of mothers as well as infants and young children (Goudet, Griffiths, Bogin, & Selim, 2011). Bangladesh is a lower-middle-income country (LMIC), with high breastfeeding rates (Victora et al., 2016) by effective policies and programs (Menon et al., 2016). Exclusive breastfeeding (0–5 months) is 56% and 89% of young children are still breastfed at age 20–23 months. A humanitarian crisis occurred in August 2017, when intense violence in Myanmar led Rohingya people to flee to neighbouring Bangladesh (Burrell, 2019). UNHCR previously documented wet nursing to be acceptable in the Rohingya population (Sfeir, 2008). Challenges experienced by Save the Children in the Rohingya response included identifying wet-nurses if unavailable among close relatives; relocation of wet nurses; acceptance by the wet nurse's family and expectation of incentives; poor access to nutritious and adequate foods for lactating women; practicality of the arrangements between infant carers and wet-nurses to support exclusive breastfeeding; and preference for use of BMS when it was accessible to the family. The situation also highlighted the lack of guidance for relactation.

Indonesia is also a LMIC that has experienced tsunami, earthquake and flood disasters in recent years (in Banda Aceh in 2004, Jogjakarta in 2006, Sulawesi in 2018). Along with Bangladesh, Indonesia is one of the few countries to score highly (>9) on the WBTi assessments of emergency preparedness (Gribble, 2017; Gupta & Suri, 2016). Breastfeeding prevalence in Indonesia is 96% ever breastfed, 41% exclusively breastfed 0–5 months, 55% still breastfed at 20–23

months (Victora et al., 2016). Studies of emergency responses and outcomes in Indonesia document the experience of increased use of BMS and adverse outcomes for breastfeeding and child health and highlight the importance of appropriate management of donated supplies of BMS (Hipgrave, Assefa, Winoto, & Sukotjo, 2012; IBFAN ICDC, 2018).

The *Philippines* (LMIC) has experienced numerous disasters from typhoons and earthquakes involving severe disruption to health service delivery including maternity care (Castillo et al., 2016). Breastfeeding rates vary, with 94% ever breastfed and 41% breastfed at 20–23 months (Victora et al., 2016). National data shows a stagnant 34% rate of exclusive breastfeeding among infants under 6 months (National Statistics Office, 2003, 2008, 2013). Experience of emergencies in the Philippines led the WHO to advise that:

...feeding babies with formula in emergencies must only be considered as a last resort, when other safer options such as helping non-breastfeeding mothers to reinstate breastfeeding, finding a wet nurse or pasteurised breast milk from a breast milk bank have first been fully explored. (WHO, 2013)

Philippines experience also showed that significant, rapid improvements in breastfeeding initiation and other important newborn care outcomes can result from staff training even in immediate post-disaster settings (Castillo et al., 2016).

Malaysia, an upper-middle-income country (UMIC), experienced severe floods in Kalimantan in 2014. Breastfeeding data is poor with 29% exclusive breastfeeding (0–5 months) (Victora et al., 2016). Concerns during the 2014 emergency response highlighted negative impacts on infant nutritional status and their health; open space and lack of privacy for the mothers to breastfeed their babies comfortably at the temporary shelters; uncontrolled donations of infant formula, teats and feeding bottles; and lastly, misconceptions related to breastmilk production and quality (Sulaiman, Mohamad, Ismail, Johari, & Hussain, 2016). Donated infant formula caused mothers to hesitate in continuing to breastfeed as they felt it was a waste not to use the free formula milk. A fourth concern was about the breastfeeding misconceptions of mothers, family members, community members, health care workers and those involved in volunteer work during a disaster.

China, now considered an UMIC, has experienced damaging earthquakes, such as in Sichuan in 2009. Breastfeeding prevalence is low, with 28% exclusive breastfeeding at 0–5 months and 9% breastfeeding at 20–23 months (Victora et al., 2016). Wet nursing

was a spontaneous response during the Sichuan earthquake and was offered by women other than the policewoman Jiang cited earlier. Lactating women from other provinces went to Sichuan as volunteer wet-nurses for babies, especially orphans. The nutritional status of children in affected areas was poor (Bengin, Scherbaum, Hormann, & Wang, 2010; Binns, Lee, Tang, Yu, Hokama, & Lee, 2012; Gribble, 2013; Sun et al., 2013). Experience emphasises that health system responses to conserving resources during emergencies has included increased C-section rates, while media coverage has encouraged donation of formula and its introduction to new communities during responses to earthquake emergencies (Bengin et al., 2010).

Japan is a high income country (HIC) with experience of complex emergencies involving earthquake, tsunami and nuclear accident disasters. Breastfeeding data is poor, but initiation is 95%, with 60% continuation at 12 months (Victora et al., 2016). The emergency increased the number of mothers not breastfeeding at all. The 2011 experience showed the importance of clear evidence-based guidance on radiation levels in breastmilk, the adverse impact on breastfeeding of disruptions to antenatal care and the importance of access to skilled breastfeeding support in preventing unnecessary cessation of breastfeeding by new mothers (Ishii, Goto, Ota, Yasumura, Abe, & Fujimori, 2016; Kyozuka, Yasuda, Kawamura, Nomura, Fujimori, Goto et al., 2016; Takahashi & Akabayashi, 2011).

New Zealand is a HIC that has experienced several natural disasters from major earthquakes and volcanic eruptions during its recent history and notably in Christchurch since 2011. New Zealand has poor data collection on breastfeeding but continuation at 12 months is estimated at 44% (Victora et al., 2016). Key findings of studies on IYCF-E in New Zealand relate to the importance of health system responses, including having IYCF-E support capacity and resourcing, and providing support and reassurance via breastfeeding counselling, as well as providing central places where mothers could access breastfeeding support (Hargest-Slade & Gribble, 2015). The Christchurch earthquakes highlighted the need to address concerns about safe sleeping arrangements in evacuation centres (Cowan, Bennett, Clarke, & Pease, 2013).

In *Australia*, a HIC, breastfeeding initiation is around 92% and continued breastfeeding at 12 months around 30% (Victora et al., 2016). Major cyclone, flood and bushfire disasters have been experienced in Australia, as well as earthquakes. A study of the 2010–11 floods in Queensland found that lack of infrastructure for safe preparation of appropriate infant foods and fluids and disruption to breastfeeding during family dislocation were associated with infant

hospitalisation and medical visits (Newby, Brodribb, & Davies, 2012). Infants exclusively breastfed were less likely to visit a doctor than those receiving no or non-exclusive breastfeeding. During this time, wet nursing was assisted by a health worker in an evacuation centre, but on an ad hoc basis. Services were not well prepared to support IYCF-E, particularly with non-breastfed infants (Gribble, 2020; Gribble, Peterson & Brown, 2019).

Regulatory environments for wet nursing and donor human milk sharing in emergencies

An important part of an enabling environment in emergency responses is the regulatory framework at the country level. The legal, as well as the socio-cultural, environment for wet nursing or donor human milk sharing varies considerably in different countries. Our review found few countries with guidance on donor human milk sharing and none with any form of guidance on wet nursing.

It is important to note that the legal environment may change in emergencies. At such times, coercive powers may be exercised by governments in the interests of public safety. In normal circumstances, in common law countries such as Australia, the 'Good Samaritan' rule applies, giving legal protection to people who give reasonable assistance to those who are, or whom they believe to be, injured, ill, in peril, or otherwise incapacitated.^[1] In some jurisdictions there is a duty to rescue which serves a similar purpose. 'Good Samaritan laws may vary from jurisdiction to jurisdiction, as do their interactions with various other legal principles, such as consent, parental rights and the right to refuse treatment. Most such laws do not apply to the on-the-job conduct of medical professionals or career emergency responders, but some extend protection to professional rescuers when they are acting in a volunteer capacity.'

The environment for IYCF-E responses in a country is also affected by numerous international agreements and conventions that influence how emergencies responses are planned, coordinated and carried out across different countries.²

² For example, the *Sendai Framework for Disaster Risk Reduction 2015–2030* was adopted by UN member governments in 2015 and aims to substantially reduce disaster risk and losses, based on country level targets and priorities for action. To prevent new and reduce existing disaster risks governments undertook to: (i) understand disaster risk; (ii) strengthen disaster risk governance to manage disaster risk; (iii) invest in disaster reduction for resilience; and (iv) enhance disaster preparedness for effective response, and to 'Build Back Better' in recovery, rehabilitation and reconstruction.

Regulation of wet nursing

Our review of 25 countries found no current regulation or guidance in relation to wet nursing, notwithstanding its historic and cross-cultural importance to the survival of infants and young children.

Historically, the practice of wet nursing was a respected and well-remunerated occupation for some women, essential to survival of some children. It remains socially valued and supported by cultural and religious beliefs in many countries. Currently however, in HICs particularly, the practice of wet nursing is unfamiliar to many families as well as to health services and governments (Palmquist, Perrin, Cassar-Uhl, Gribble, Bond, & Cassidy, 2019). Women in such countries appear to be generally more accepting of donor human milk than wet nursing, except for relatives and close friends. Motivations for donating human milk or wet nursing identified in Australia over past decades included having excess milk and helping other women with breastfeeding, as well as assisting the health or survival of vulnerable infants (Gribble, 2014; Thorley, 2009, 2011).

Hence, regulation of wet nursing in HICs is mainly historical and typically directed at employment relationships and contracts, or medical criteria for suitable wet-nurses. The history of regulation of wet nursing in HICs illustrates some issues which potentially emerge in contemporary circumstances, including during emergency or disaster situations.

For example, in Australia until the 1920s, wet-nurses were recruited for mothers having difficulties with breastfeeding, or for orphaned children (Thorley, 2008). Mostly employers provided accommodation for the wet nurse, though some women took the baby to their own home. Such regulation was focused on the wellbeing of the infant, not the wet nurse, and the welfare of the infant of the wet nurse was not usually considered. Medical criteria included requirements that the wet nurse be healthy and have recently had a baby. The wet nurse was also required to be of good character due to beliefs that immorality could be passed to the infant via the milk (Thorley, 2015; Wickes, 1953). Wet-nurses did not have to be told if a child might have an infectious illness such as syphilis contracted from the parents (Thorley, 2015).

Work conditions for wet-nurses varied, with them commonly being provided with live-in accommodation, though sometimes in institutional settings such as in the *lactariums* of France. In France, wet nursing became highly regulated during the 19th Century because there was a widespread practice of sending children away to the country to be cared for, with high rates of mortality (Cohen, 2017; Sussman, 1982). Other studies of wet

nursing, including for the UK and the US, illustrate employment laws or regulation of contract as the basis for regulating wet nursing (Fildes, 1988a, 1988b; Golden, 1988).

The above points to the likely areas of guidance needed for health workers and parents to ensure wet nursing is acceptable, safe and equitable, not only for the infant being wet nursed, but also regarding the health of the wet nurse and her infant, taking account of religious and cultural preferences, and practical aspects such as accommodation arrangements to ensure night nursing is feasible.

Regulation of donor human milk sharing

Most countries do not provide any regulatory guidance regarding donor human milk sharing. Our systematic online search of regulatory documents on infant feeding for 25 high-, middle- and low-income countries found only a small minority of documents ($n=19$, 8.6%) considered criteria for any type of milk sharing or donating in their regulatory systems for trade in food, therapeutic products or human tissues. Even fewer ($n=12$, 5.5%) specifically addressed the question of human milk sharing or donation (see Table 1). None addressed the IYCF-E context. Analysis of these documents showed that where there is guidance on donor human milk sharing, it draws on a variety of regulatory frameworks. There may also be different approaches taken at the state or provincial government level.

Human donor milk is mainly regulated as a product within food regulatory frameworks, along with bovine-based commercial milk formula products. Human donor milk is also included in some jurisdictions under therapeutic goods or human tissue regulatory frameworks.

Of the 19 regulatory documents on milk sharing or donating identified, most related to therapeutic regulation ($n=17$) and two related to food regulation. Documents relevant to donor human milk sharing mostly presented guidelines and protocols for health facilities related to the establishment, management and support of milk banks and their operations. Key examples are summarised below in their country context.

As noted earlier, the *Philippines* is a country that is regularly confronted by natural disasters, including cyclones, earthquakes and floods. Since 2018 the country has implemented multi-sectoral initiatives to step up the protection, promotion and support of breastfeeding, including during emergencies. Human milk banking is one of the most recent national strategies supported by the government and partners, recognised and recommended in national laws and policies. The Department of Health issued an operational manual for human milk banks to support their establishment, management of donor screening, processing and distribution. A total of 21 human milk banks are currently operational in the Philippines (Human Milk Bank Philippines, 2020).

Table 1. Guidance documents relevant to human donor milk sharing

Country (no. of related documents)	Type of document
India (3)	<ol style="list-style-type: none"> 1. Human Milk Banking Guidelines: Indian Pediatrics Association 2. National Guidelines on Lactation Management Centres in Public Health Facilities 3. Guidelines for the establishment and operation of Human Milk Banks
Brazil (3)	<ol style="list-style-type: none"> 1. RDC-ANVISA nº. DE 171, de 04 de setembro de 2006. Dispõe sobre o Regulamento Técnico para o funcionamento de Bancos de Leite Humano 2. Technical procedure for the operation of the Milk Banks 3. Patient flow and coding in the management of the milk banks
Italy (2)	<ol style="list-style-type: none"> 1. Guidelines for the creation of milk banks in Italy 2. National Guidelines for the establishment and the management of Human Milk Bank to support the protection, promotion and support of breastfeeding (G U n.32 del 7/2/2008)
UK (1)	<ol style="list-style-type: none"> 1. NICE clinical guideline 93: Donor breast milk banks: the operation of donor milk bank services
New Zealand (1)	<ol style="list-style-type: none"> 1. Breast Milk Sharing Clinical Guidelines
Norway (1)	<ol style="list-style-type: none"> 1. Guidance for operation of milk bank in Norway 2018
France (1)	<ol style="list-style-type: none"> 1. Instruction N ° DGOS / R3 / 2010/459 of 27 December 2010 on the authorization and organization of lactariums
Philippines (1)	<ol style="list-style-type: none"> 1. https://docplayer.net/75184476-The-philippine-human-milk-banking-manual-of-operation.html

India is a LMIC and is among the world's most disaster-prone countries. Breastfeeding rates in India are high, with 97% of mothers breastfeeding their infants, and 46% of infants under 6 months exclusively breastfeeding. Continuation at 20–23 months is 73% (Victora et al., 2016). WHO International Code implementation is strong (Robinson, Buccini, Curry, & Perez-Escamilla, 2018). Wet nursing is deeply embedded in Hindu mythology as well as during the colonial era (Hassan, 2016). The high value placed on breastfeeding is linked to India's contemporary promotion of milk banking for vulnerable infants (Gameti, Vihariya, Kori, & Patel, 2017). Wet nursing as an element of emergency response is long recognised as an option by Indian NGOs and emergency planning government agencies (Breastfeeding Promotion Network of India, Planning Commission Government of India, & UNICEF India, 2005). More recently, India has established milk banking, with guidance covering their establishment and operation (including in public health facilities) and the use of human milk banks in paediatric care. The guidelines set out criteria for the selection and acceptance of human milk donors, including the collection and distribution of the donated breastmilk. The Government of India aims to ensure that breastmilk is universally accessible to all infants, including through the establishment of human milk banks and the provision of donor human milk as part of a comprehensive effort to protect, promote and support breastfeeding. However, no specific guidance for wet nursing or donor human milk sharing in emergencies was identified in our review.

Brazil (an UMIC) has been in the forefront in the establishment of human milk banks, also leading and guiding expansions in the Latin American region. A total of 220 milk banks are operational in Brazil, leading the world in relation to experience and expertise (Palmquist et al., 2019). Brazil reported a 41% exclusive breastfeeding rate in 2014 (World Breastfeeding Trends Initiative [WBTi] Brazil Steering Group, 2014), and a median duration of breastfeeding of 14 months, and has achieved rapid increases in exclusive breastfeeding through integrated and comprehensive policy changes (Lutter & Morrow, 2013). Several federal and state level legislations have been enacted to regulate the establishment, management and maintenance of milk banks at all levels of government (Network of Human Milk Banks Brazil, 2020). Technical manuals and training programs have been developed to support the operationalisation of the milk banks. A governance structure is in place, with wider application (DeMarchis, Israel-Ballard, Mansen, & Engmann, 2017; PATH, 2013).

In *Italy*, early initiation of breastfeeding was reported at 36% with exclusive breastfeeding of 43% of babies aged less than 6 months old (World Breastfeeding

Trends Initiative [WBTi] Italy Steering Group, 2016). Around 86% of babies are breastfed but continuation at 12 months is low at 19% (Victora et al., 2016). A country frequently affected by natural disasters, including earthquakes and floods, it has been heavily affected by the COVID-19 pandemic. In Italy there are a total of 37 operational milk banks and the Ministry of Health and the Italian neonatology associations have issued relevant guidelines for the creation and establishment of human milk banks. These provide guidance on the process of acceptance of donor human milk, processing and utilisation of the pasteurised breastmilk (Italian Association of Human Milk Banks Associazione Italiana Banche del Latte Umano et al., 2010).

In *France*, breastfeeding rates are very low, with 63% of children ever breastfed and only 9% still breastfeeding at 12 months (Victora et al., 2016). Exclusive breastfeeding under 6 months has been reported to be a low 10% (World Breastfeeding Trends Initiative [WBTi] France Steering Group, 2018) with a median duration of breastfeeding of 4 months. Human milk banks have been in operation since the end of World War II and have long been regulated by legislation (Cohen, 2017). Several national guidelines cover all the aspects of human milk bank processes including the serological tests of the donors every 3 months. The Ministry of Health has also issued a regulation related to the selling price and reimbursement by health insurance of human milk.

In the *United Kingdom*, 2016 data show that exclusive breastfeeding at 6 months has been recorded at 17% with a median duration of breastfeeding of 8 months (World Breastfeeding Trends Initiative [WBTi] UK Steering Group, Gray, Meynell, Spiro, & Wise, 2016). Human milk banks have been established since 1930 and a total of 16 human milk banks are now operational across the UK. A national guideline for the establishment and management of milk banks was issued in 2010 by the National Institute for Health Care and Excellence (NICE, 2010). The guidelines cover a wide range of aspects, including the recruitment, screening and support of women who are donating breastmilk, as well as all the processing, transportation and tracing of human milk supplies distributed.

As noted earlier, *New Zealand* is prone to earthquake disasters. The Ministry of Health New Zealand classifies human milk as a human tissue under the *Human Tissue Act 2008*. In line with the Act, it is prohibited to sell or market breastmilk products, unless approved by the Ministry of Health. Key guidelines have been issued for the two operational milk banks that regulate the donation, screening and processing of donor human milk. Informational materials are also

developed and available for parents (New Zealand Ministry of Health, 2020).

In Norway 99% of infants are reported as ever breastfeeding, with an exclusive breastfeeding rate of 44% at 4 months and 17% at 6 months (Theurich et al., 2019). A total of 12 human milk banks are reported as operational and the Pediatric National Association in Norway has issued a national guideline that focuses on ensuring a secure and safe establishment and management of human milk banks.

In Australia, as noted earlier, disasters are varied but planning for IYCF-E is lacking. Donor human milk sharing is regulated as a food in some state jurisdictions and as a tissue in others. There is considerable uncertainty about how human milk sharing is regulated in Australia. While food regulation allows milk to be sold in some circumstances, there are much greater restrictions set by regulations regarding tissues. In 2014, the Australian Department of Health prepared a discussion paper on human milk banking in which the regulatory regime was discussed in some detail (Australian Government Department of Health, 2014). The Australian government decided new regulation was not necessary at that time.

In 2017, the COAG established a clinical guidelines group to consider the wider ethical and social implications of trade in donor human milk, following concerns raised about exploitation and misleading marketing, and other social and equity issues (Smith, 2017).

More recently, milk banking was examined by the ACT Government (ACT Health, 2019).

In neither case did this consideration include the question of regulatory frameworks for emergency and disaster situations. The recent audit of emergency planning and response documents indicated that Australia remains among the majority of high income countries that have no plans in place for the appropriate protection and support of breastfeeding in emergencies, and specifically no consideration of how to support safe milk sharing, wet nursing or milk banking for such contexts.

What is needed to protect, support and promote breastfeeding through donor human milk sharing and wet nursing in disasters?

This overview of the diversity of contexts, IYCF-E experiences of the above countries and the multidimensional regulatory environments for wet nursing or donor human milk sharing illustrates the many complexities and different approaches to implementing IYCF-E guidance, and particularly

around supporting the option of wet nursing and donor human milk sharing in emergencies.

As evidenced from country experiences, wet nursing and donor human milk sharing is not unusual among women with young children affected by disasters, and has potential benefits for mothers and their children, but is rarely included as part of considered IYCF-E responses. If prior arrangements were made through organisations established for that purpose as in the Philippines, it could be more widely available as an option (Kent, 2018).

Reflecting the practical difficulties of crisis situations, evidence to inform public health interventions in emergencies can be difficult to find. A recent systematic review of interventions to support breastfeeding in emergencies found a dearth of studies available to inform and guide policy and program development (Dall'Oglio et al., 2020). The authors call for urgent research to inform agency responses for improving breastfeeding practices in emergencies. Nevertheless, wet nursing and self-help group support were among the most important interventions identified by the review. Along with staff training and breastfeeding counselling, wet nursing was identified as an intervention which worked to improve breastfeeding in emergencies. The 2017 Academy of Breastfeeding Medicine *Position Statement on Informal Breast Milk Sharing for the Term Healthy Infant* provides detailed guidance for healthcare providers to inform their patients about informal milk sharing, which does include wet nursing (Sriraman, Evans, Lawrence, Noble, & Academy of Breastfeeding Medicine, 2018). Yet there remains little practical information for health and emergency workers on wet nursing or donor human milk sharing.

On the other hand, a notable pattern in disasters is for hospitals to change policies and practices due to limited medical facilities or supplies, patient overload, or to eliminate uncertainty about labour duration and birth timing. This has led to routine and increased caesarean deliveries, shortened postpartum hospital stays, reduced breastfeeding education and support, and requirements to give formula or withhold breastfeeding (Bengin, 2010; Palmquist & Gribble, 2018). Reduced priority and resources for acute maternity care and breastfeeding in emergencies, including during the recent COVID-19 pandemic (Berveiller, Guerby, & Garabedian, 2020) create barriers to breastfeeding.

A study of the Jogjakarta earthquake of 2006, the Wenchuan earthquake in Sichuan Province in 2008, and the north-east Japan earthquake and tsunami of 2009, stressed the importance of maintaining baby-friendly hospital (BFHI) practices in emergencies, and

recommended that every effort should be made to continue the public health benefits of breastfeeding in the community during an emergency (Binns et al., 2012).

Although there is a low strength of evidence from published intervention studies to date, other recent research has shown feasibility, acceptability and improved IYCF outcomes from implementing interventions including relactation and wet nursing. For example, some mothers were supported to relactate as part of the Rohingya Response in Bangladesh and a small study showed that around half of the non-breastfed infants aged less than 6 months were successfully wet nursed (Azad, Rifat, Manir, & Biva, 2019; Burrell, 2019; Burrell et al., 2020).

A 2014 review by Action Against Hunger (Action Contre la Faim in French, 2014) of 'baby-friendly spaces' in emergency evacuation centres identified the importance of these in preventing or reducing the negative effects of unsolicited and unmonitored distributions of breastmilk substitutes, as well as providing appropriate and sustainable solutions for non-breastfed infants (De Brabandere, David, Dozio, & Bizouerne, 2014). 'Baby-friendly spaces' was shown to facilitate a comprehensive approach to supporting pregnant and lactating women and young children in emergencies. Its detailed recommendations addressed wet nursing and donor milk, as well as relactation, and are reproduced in the Appendix.

Human milk products are emerging as a proposed strategy for emergencies. These may have a limited role where strategies for supporting breastfeeding, relactation or wet nursing are not feasible or acceptable. Nevertheless, they have significant risks. Cold chain systems or suitable infrastructure for safe use may be lacking, but most importantly, such strategies risk displacing breastfeeding support and creating confusion among emergency planners, managers, health care providers and caregivers with commercial milk formula products. This reinforces the urgency of national implementation of the OG-IFE and the WHO International Code to ensure human milk products as well as other commercial breastmilk substitutes are not promoted in ways which displace or undermine breastfeeding but are accessible as a last resort for infants who need them.

CONCLUSION

Global nutrition priorities relating to climate change include improving food supply resilience. However, important gaps exist regarding food security and food supply resilience for infants and young children (Salmon, 2015). Countries with effective implementation of GSIYCF policies, a strong breastfeeding culture and high breastfeeding prevalence are likely to be more

IYC-food-supply-resilient during emergencies, as lactating women and skilled and knowledgeable health professionals and community members are more likely to be available to assist.

In 2018 the WHA called on member states to do all that is necessary to build the capacity of emergency responders to protect, promote and support breastfeeding during emergencies. Strategies to protect women and infants and young children in emergencies require preparedness measures to protect, promote and support breastfeeding. This includes planning for the nutrition and care of both breastfed and non-breastfed infants. It also includes integrated and effective policies and programs which support breastfeeding as a social norm and as a preventative health priority.

Wet nursing or human donor milk sharing are recognised options for feeding infants and young children in emergencies and disasters. Reflecting the uniquely complex qualities and functions of human milk, as a food, tissue and/or therapeutic product, the relevant regulatory frameworks for donor human milk sharing and wet nursing are fragmented and inconsistent. Mostly though, country regulatory frameworks are entirely absent.

Emergency planners and responders need clarity to protect and support recommended breastfeeding practices in crisis situations. Without this, breastfeeding may be considered a low priority and options for supporting it will not be prioritised in planning. Regulatory reticence creates gaps into which milk formula supplies intrude in disasters. At the same time, evidence suggests that there is an urgent need by all the relevant emergency management bodies to invest in creating the relevant capacities that are needed to ensure that women and their children are supported in ensuring safe, appropriate and timely feeding practices.

For Australia, we urge the implementation of the ANBS priority actions on developing a national policy on IYCF-E, as well as creating capacities by ensuring that skilled breastfeeding and lactation support is available during disasters (Australian Government Department of Health, 2019). The Australian Dietary Guidelines (National Health and Medical Research Council, 2013) should also be updated to provide more detailed IYCF-E guidance for parents and health and emergency workers. This might not only incorporate WHO and UNICEF guidance on breastfeeding protection, promotion and support during the COVID-19 pandemic, but could also include expanded information and guidance to assist the public and emergency planners and responders in protecting infants and

young children through the option of wet nursing and human donor milk sharing in emergencies and disaster situations.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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APPENDIX

From De Brabandere, A., A. David, E. Dozio & C. Bizouerne (2014). *Baby friendly spaces: Holistic approach for pregnant, lactating women and their very young*

Ahmed and Mohammed are twin baby boys of 2 months, living in an IDP camp in Darfur. They have recently lost their mother, who died of an illness. Their aunt, Fatima, is breastfeeding her own baby boy of 6 months, and is willing to nurse the twins, but she is worried she does not have enough milk. The aunt and the three babies are admitted in the feeding centre, where a milk supplement is given to the twins through a little tube attached to the breast, which the babies obtain by suckling the breast. She also continues to nurse her own baby. The staff gradually reduces the quantity of milk supplement, while monitoring the babies' weight. When the babies no longer need any supplement, Fatima stays some more days to monitor that all three babies maintain their weight through breastfeeding only. She can then go home, feeling happy and confident that she can feed the three babies. She is admitted in the SFC, where she receives a supplementary ration for herself, and where the weight of the babies is monitored every 2 weeks.

children in emergency, Paris, France, Action Contre la Faim in French.

Relactation

Relactation should be proposed to all mothers who have stopped breastfeeding but present no medical conditions or receive medication that would contra-indicate starting again. Regarding HIV, in low HIV prevalence areas, it might be sufficient if the mother is not aware that she is HIV+ or does not present any symptoms that could lead to the suspicion of HIV infection. This should be done according to national guidelines.

Relactation can also be proposed to another woman in the family or community of the child, who is willing to breastfeed, but currently has no milk, such as an aunt or a grandmother. It should be explained to mothers/caregivers what the negative effects of artificial feeding in this emergency context might be and how breastfeeding would provide better nutrition, better protection against diseases, how it would be cheaper, etc.

The choice will be taken together with the mother/caregiver and possibly her family.

Wet nursing

Wet nursing is the practice where a breastfeeding woman breastfeeds another child, which is not hers. Usually, it is done in addition to her own child. For children who are not breastfed by their mother, this is the best and safest solution. The wet-nurse can be a woman in their family or in close proximity (an aunt, a neighbour, etc) or can be somebody chosen by the family of the child (in which case clear agreements must be made). The possibility of this practice depends on the culture. In some places, women will wet nurse another child spontaneously, as this is common practice, while in other cultures it is not common practice but accepted. In yet other places it is not culturally accepted to do so. Proposing wet nursing will therefore depend whether it is acceptable or not.³

It is preferable that the wet-nurse is in good health and accepted by the family. In low HIV prevalence areas, it might be sufficient that she is not known to be HIV+ and does not present any symptoms that might lead to the suspicion of HIV. In areas of high HIV prevalence, it might be necessary to request from the wet-nurse that she is tested and that she agrees to protect herself from infection throughout the period when she is breastfeeding the child. These

³ In the Koran, there is specific mentioning of wet nursing. It states that if a mother cannot breastfeed the baby, the father must find a wet nurse.

decisions must be in line with national protocols and in agreement with the family and wet nurse. If the wet-nurse is worried about not having sufficient milk to breastfeed two children simultaneously, she can be followed closely for some time to stimulate her breast milk production, or can temporarily use a BMS, given by supplementary suckling technique [a breastmilk supplementer]. Close follow-up of her and the children she feeds will give her the confidence she needs to successfully continue breastfeeding. She should also receive food supplements or micronutrient supplements as other lactating women do. If the two children she breastfeeds are different ages this is not a problem. Women have even successfully breastfed two babies at the same time, even in emergency settings! If the mother of the child is still alive, she should be encouraged to engage in bonding activities with her baby, such as bathing, carrying, singing, playing and feeding them with complementary food so that an emotional bond will be created. If the mother is not present, this role can be taken over by the father, grandmother or other caregiver.

Donated breastmilk

In some situations, a woman cannot be found to wet nurse, but one or more women from the community might be willing to manually express their milk and give it to the child without having to actually breastfeed. This way the baby can still benefit from many advantages of breastmilk. The caregivers of the child might find several women, who can each donate some milk. The health requirements for the donating mother should be the same as mentioned above for wet-nurses. The expressed breastmilk should be stored in a clean container with a lid and kept for a maximum of 8 hours in a temperature of around 25°C. It can be kept cooler by putting it in a fridge, on a block of ice, covering it in a wet cloth, or placing it in the coolest area of the house. It must be fed by cup to the child, never by bottle. The child should receive 150 ml/kg/day, spread over 8 to 12 feeds. If the child passes urine 6 times per day (if solely fed on breastmilk), passes stools 2 to 6 times per day and gains 125 g/week, while remaining in good health, they have received sufficient milk.




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