Newborns in Adverse Conditions: Issues, Challenges, and Interventions

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Neonatal mortality is intolerably high in developing countries and in situations of crisis or disaster as a result of inequity, poverty, and lack of health care services. A series of effective, low-cost interventions, based on appropriate technologies can be used to address the main causes of neonatal deaths. Among these interventions, promotion of exclusive breastfeeding and thermal control of the newborn infant are very effective ones. Although the effectiveness of interventions such as kangaroo mother care, newborn resuscitation, and infant massage is not widely recognized, they may have important complementary roles in providing heath care to newborn infants in adverse conditions. J Midwifery Womens Health 2004;49(suppl 1): 29 –35 © 2004 by the American College of Nurse-Midwives.

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THE GLOBAL BURDEN OF NEONATAL DEATH

Globally, the youngest have the highest risk of death. Furthermore, there is a mortality gap between developing and developed countries and for those countries experiencing emergency crises or conflicts. Of the 10.8 million children who die each year, a substantial number (3.9 million) die during the first 28 days of life.[1] In developing countries, 23.1% of all deaths in children are due to perinatal conditions.[2] In Afghani refugee camps, 19% of all deaths are newborns.[3] Newborns are at higher risk of dying if they are poor, have unhygienic and unsafe environments, and/or if they are in disaster situations.

When exploring the specific causes of death in the newborn population, it has been estimated that a very high percentage of neonatal deaths (29%) are caused by birth asphyxia, another 24% are caused by severe infections, 7% by tetanus, and 24% by prematurity-related disorders.[1] The list of "top neonatal killers" also includes hypothermia, which is usually underreported and underscored in vital statistics as a cause of death. With the exception of asphyxia, the main causes of neonatal death can be prevented or treated by one or more simple, effective, low-cost interventions implemented at the household or community level. Newborn resuscitation, the available intervention for asphyxia, has limited scientific evidence of effect,[4–6] even though it is widely applied and valued. Some good examples of interventions expected to benefit newborn health and for which there is sufficient evidence of effectiveness are the administration of tetanus toxoid and the antenatal administration of prophylactic steroids for premature birth. A significant reduction in newborn mortality would result from these interventions if they were delivered to a high proportion of newborns and mothers[7] and coupled with an approach for correcting social inequity in child status. Inequity could be defined as an unfair and remediable inequality and refers to relative health status between the most advantaged and the least advantaged in a population.[8] In fact, it is well known that inequity places the child at higher risk for malnutrition and reduced or difficult access to health care.[2,9] Finally, integration of primary (home-based) care with hospital-based care is also important to increase the whole effectiveness of health care services in poorly resourced settings.[10]

In developed countries, intensive care for the newborn infant has improved dramatically in the last 30 years due to increased availability of measures such as antenatal steroids, mechanical ventilation, administration of surfactant, and parenteral nutrition. Most of these interventions are expensive and/or require highly skilled health personnel. Thus, they are out of reach for most health services in adverse social and economical conditions. Modern neonatal care requires a high degree of organization and integration among different health professionals as well as appropriate use of adequate equipment. Such complexity also explains why such neonatal care is severely hindered in situations of disaster such as flood, famine, earthquake, mass migration, and war, when there is a huge gap between the best practice and the available care for newborn infants. This gap causes much frustration among health providers who may then lobby policy makers to prioritize "high tech" care. This in turn may induce policy makers to give a lower priority to newborn care, due to the mistaken idea that provision of health care to a newborn population always and necessarily requires highly sophisticated technology.

In adverse conditions of disasters, emergencies, and resource-poor settings, it is a challenge to sustain some effective antenatal and postnatal interventions among the long list of the possible ones. Nonetheless, neonatal mortality at a global level could be reduced by simply transferring what we already know to be effective into action.[4]

ESSENTIAL NEWBORN CARE

In countries with very limited resources as well as in adverse conditions, it is generally much easier to implement preventive measures or simple selected therapeutic inter-

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Table 1. Appropriate Technologies for Essential Newborn Care

Essential Newborn Care	Appropriate Technologies
Friendly environment for childbirth and promotion of maternal-infant bonding	• Avoidance of unnecessary traumatic procedures for the baby during childbirth • Early contact between mother and baby; avoidance of unnecessary separation
Initiation of spontaneous respiration	• Assessment of the baby at birth (birth weight, gestational age, birth defects) • Resuscitation by bag and mask; oxygen not necessary • Management of asphyxiated newborn
Maintanance of body temperature	• Application of "the warm chain": drying baby immediately after birth, skin-to-skin contact, covering both mother and baby, avoidance of tight swaddling • Early detection of hypothermia and prompt treatment (rewarming) • Special thermal protection to babies at special risk (Kangaroo Mother Care for low birth weight and sick babies) • Adequate thermal protection during transport
Initiation and support of breastfeeding	• Baby to the mother shortly after birth to promote early initiation • Rooming-in and exclusive breastfeeding on demand of a baby well attached to the breast
Prevention and detection of infections	• Cord care • Keep babies with mothers • Avoid routine that could facilitate infections (crowded incubators, etc...) • Ensuring cleanliness of personnel
Prevention of neonatal conjunctivitis	• Ocular prophylaxis (1% tetracycline)
Prevention of neonatal bleeding	• Vitamin K (0.5–1 mg IM)
Immunization	• OPV-0, HBV • BCG (according to the national policy)
Special care	• Identification of sick babies ("dangerous sepsis signs") • Identification of low birth weight infant and implementation of Kangaroo Mother Care

Source: WHO 1996.[11]

ventions to a population of healthy or near-healthy newborn babies than to implement technologically sophisticated, high-cost measures that seek to cure severely ill newborn infants. In adverse settings, the health needs of the newborn can be at least partly covered by relevant, appropriate interventions, defined as "essential newborn care."[11–13] Essential newborn care provides the minimum set of interventions needed to counteract the well-known "top neonatal killers": prematurity-related disorders, asphyxia, hypothermia, infections, and lack of adequate feeding. Essential newborn care is available for all newborn infants and includes the following components:

- Friendly environment for childbirth
- Availability of clean conditions for childbirth to prevent infection (sepsis and neonatal tetanus)
- Promotion of mother-infant bonding
- Promotion of breastfeeding (beginning shortly after birth)
- Thermal control of the newborn
- Resuscitation if needed
- Identification of babies in special need (low birth weight infants and sick babies).

Essential newborn care has proved to be highly cost-effective in reducing neonatal mortality and morbidity in developing countries.[11] Because some of the challenges in disaster settings match those of developing countries, we could also expect essential newborn care to have a positive impact on newborn health when applied in disaster health services. Essential newborn care requires skilled management of pregnancy and delivery and good knowledge of the basic physiological needs of the newborn. Essential newborn care is based on conventional principles in neonatal care (see Table 1) and uses appropriate technologies. The actions and tools applied by essential newborn care to reduce newborn mortality and morbidity are scientifically sound (i.e., effective and safe), culturally acceptable (by patients, parents, health personnel, and society), and feasible (simple to use and maintain).

BREASTFEEDING: AN EXAMPLE OF IDEAL PREVENTION

The concept that human milk is more than a simple food for infants and young children is now widely recognized and accepted by researchers, health workers, and policy makers. Breast milk is unique, species-specific, ready to use, hygienic,

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and inexpensive. Its content of bioactive factors protects infants from various microorganisms and modulates immune function. In addition, breastfeeding improves mother-infant bonding and reduces maternal fertility, with a relevant demographic impact. As a consequence, breastfeeding promotion is an important part of child health programs throughout the world. Breastfeeding provides optimal nutrition and carries lifesaving protection against infectious diseases, especially among disadvantaged populations.

In less developed countries, infants who are not breastfed have a sixfold greater risk of dying from infectious diseases in the first 2 months of life than those who are breastfed. This protection decreases steadily with age probably due to a dose-effect relationship between breast milk intake and biological outcome.[14] It has been estimated that breastfeeding would prevent about 52,000 infant deaths a year in Latin America, a figure corresponding to 13.9% of infant deaths from all causes.[15]

The use of breast milk substitutes in emergencies is a well-known risk factor for the infant population because of the lack of hygienically safe water, poor sanitation, inadequate cooking utensils, shortage of fuel (to boil water), and, depend- ing on the educational level of the mother, lack of knowledge on preparation and use of artificial feeding. In fact, breastfeeding status has been identified as a predictor of mortality among refugee children in emergency situations. The risk of dying over a 3-month period is increased sixfold for weaned than for breastfed children aged 9 to 20 months.[16]

The assumption that mothers in adverse conditions cannot breastfeed because they are under stress is not correct; on the contrary, this assumption may work as an alibi for health care providers not to prioritize effort to promote breastfeeding. Of course, women in emergencies can face additional difficulties with breastfeeding. Promoting breastfeeding among mothers in disasters means giving them priority access to care, improving their nutrition with extra rations, correcting their misconceptions on breastfeeding and human milk, and providing them with skilled counseling. Peer counselors are more effective than health services staff to promote breastfeeding in the community, and the peer one-to-one support intervention should be considered as complementary or an alternative to that of health workers.[17] In disasters, breastfeeding should be strongly promoted and supported, and a special effort must be spent in the surveillance of the use of artificial milk, which is commonly donated and unnecessarily administered to breastfed infants in emergency situations.

In situations of crisis, humanitarian agencies face great difficulties in operating in accordance with international recommendations on infant feeding,[18] and they need a common public health policy and effective coordination on infant-feeding interventions, especially in regions where exclusive breastfeeding is not the norm. In such circumstances, it is important to improve the breastfeeding skills of health workers.[19] The World Health Organization (WHO) Regional Office for Europe has issued a manual that addresses both essential newborn care and breastfeeding management to address newborn care as well as support for the best feeding practices.[20] A comprehensive manual on infant feeding in emergencies has also been developed and issued in November 2001 by the Emergency Nutrition Network (ENN) (*http://www.ennonline.net*) with the collaboration of WHO, United Nations Children's Fund (UNICEF), LINKAGES, and International Baby Food Action Network (IBFAN).

HIV INFECTION AND THE PROMOTION OF BREASTFEEDING: A PUBLIC HEALTH DILEMMA

The use of breast milk substitutes is unavoidable in some circumstances, such as death or severe illness of the mother, relactation, rejection of the baby by the mother, or infant dependency on artificial feeding started before the emergency. The HIV positive status of the mother also factors into difficult decision about feeding, especially when clean water is not available.

HIV transmission through breast milk has been conclusively demonstrated. The Committee on Pediatric AIDS of the American Academy of Pediatrics recently warned that the best way to reduce transmission of HIV-1 is avoidance of breastfeeding. The committee has also recognized that if breastfeeding does occur, several interventions could counteract the transmission of HIV-1.[21] In developed countries, the transmission of HIV from the mother to her child is now below 5% as a consequence of a combination of antiretroviral treatment (to both the infant and the mother), elective cesarean delivery, and no breastfeeding.[22,23] These preventive and therapeutic measures are rarely available and/or applied in many resource-poor areas, so mother to child transmission of HIV could be as high as 35% in those areas.[24]

Although breastfeeding is recognized as a single major contributing factor for mother to child transmission, safe replacement feeding is rarely available in poor countries and in adverse conditions. In such settings, where access to clean water is limited and mothers' education levels low, formula-fed infants can be at a greater risk of dying from diarrhea and malnutrition than from complications due to HIV infection acquired from breastfeeding. The choice between breastfeeding and not breastfeeding raises a modern public health dilemma.[25,26]

Human milk can be viewed not only as a vector of HIV transmission but possibly also as a vehicle of protection.[27] Two phenomena support this assumption. First, the majority of breastfed infants of HIV-infected mothers remain uninfected, even after many months of daily exposure to huge amounts of viral particles via human milk. Second, formula feeding seems to worsen the course of the disease in the HIV-infected child.[28] To determine the factors in human milk that could explain why it protects against HIV infection in the exclusively breastfed infant, research has focused on the neutralizing antibodies and antiviral factors produced by lymphocytes.[29,30]

Safe alternative options to replacement feeding are expres-

sion and heat treatment of the mother's milk, wet nursing by an HIV-negative woman, use of uncontaminated donor breast milk, exclusive breastfeeding (although rarely practiced) for a few months followed by early stopping with avoidance of nursing when there is breast inflammation.[26] In situations when artificial feeding is needed, it is preferable to use a cup instead of the bottle to feed infants because it may lower the risk of contamination and infection.

These options, particularly that of practicing limited exclusive breastfeeding followed by sudden weaning, deserve more research to establish evidence-based practices. These strategies are listed in the WHO, UNICEF, and UNAIDS Guidelines.[31]

In conclusion, differences in risk-benefit ratio could induce two sets of recommendations: 1) in settings with readily available safe breast milk substitutes and a low infant mortality rate, women at risk for HIV can be advised not to breastfeed, because formula feeding is not expected to increase infant mortality and 2) in settings of poverty and disaster, formula feeding may substantially increase infant mortality. HIV-positive mothers should be advised on an individual basis. Although some mothers can provide safe breast milk alternatives for their infants (safe donor milk, pasteurization of human milk, or formula),[32] most of the women would eventually decide to breastfeed.

Although some authors have suggested that breastfeeding may increase mortality among HIV-infected women,[22] others have asserted[33] or shown[34] that it will not adversely affect their health status in terms of progression of HIV-1 disease, anemia, or excessive weight loss.

THERMAL CONTROL OF THE NEWBORN

The newborn infant is a poikilotherm, a being that varies its temperature according to the environment, like a turtle. As a consequence, the newborn infant is prone to lose heat and to become hypothermic if no thermal protection is applied. Hypothermia is defined as body temperature lower than 36.5°C. Neonatal hypothermia can be a serious condition, especially when moderate (<36°C) or severe (<32°C) and may be a cofactor of neonatal death.

Historically, many different interventions, with varying degrees of effectiveness, have been put into practice after childbirth by birth attendants and midwives to protect newborns from hypothermia. Swaddling, and especially tight swaddling, is a good example of a traditional technology for the thermal control of the newborn that has been shown to be ineffective. It is deeply rooted in European history and culture as depicted by the 15th Italian sculptor Andrea della Robbia on the portico of the children's hospital, Ospitale degli Innocenti, in Florence. Swaddling gained its secular popularity because it gives some degree of motor restraint and some reduction of crying. However, it has been shown to lead to poor thermal control, poor breastfeeding, possibly poorer development, and a higher risk of hip dislocation.[35]

A series of interlinked procedures, known as a warm chain,[36] are now internationally recognized as the best procedures to minimize the risk of hypothermia. This chain includes drying and loosely wrapping the baby, placing the baby at the mother's breast, skin-to-skin contact, and some other appropriate heating devices like a small cap.

KANGAROO MOTHER CARE

Kangaroo mother care is defined as the care of a low birth weight (LBW) infant kept close to the mother's body (in a similar way to marsupials), placed between her breasts, covered, and held in position by the woman's clothes.[37] First described in settings with very limited resources, kangaroo mother care has been disseminated both in developing and developed countries, in health facilities of different levels, and has led to improved outcomes in infant mortality and morbidity.

According to the Working Group of the International Network on Kangaroo Care, kangaroo mother care is the early, prolonged, and continuous skin-to-skin contact between the mother and the newborn preterm infant, both in hospital and at home, until at least the 40th week of postnatal gestational age.[38] The mother usually hosts the baby alternatively in the vertical and in the prone position. However, other persons (the father, a member of the family, a close friend, or even a member of the staff) can replace her for variable periods of time. Therefore, the main components of kangaroo mother care are skin-to-skin contact, care of the preterm infant by the mother with the supervision of trained health workers, breastfeeding (exclusive or nearly exclusive), and discharge from the health facility with the newborn in kangaroo position.

Although kangaroo mother care has been shown to be a safe, effective, and feasible alternative to conventional care for stabilized LBW infants,[39–42] skepticism persists in the scientific community. A Cochrane Review concludes that "although kangaroo mother care appears to reduce severe infant morbidity without any serious deleterious effect reported, there is still insufficient evidence to recommend its use in LBW infants."[43]

Like breastfeeding promotion for the general population of newborn infants, kangaroo mother care for the subpopulation of LBW and premature infants improves mother and child health at different levels: 1) it contributes to humanization of the care of LBW infants,[44] 2) it facilitates bonding between the mother and her LBW infant,[44] 3) it promotes breastfeeding,[39] 4) it allows mothers to become competent and confident in the care of their newborn babies,[44] 5) it reduces maternal stress,[44] 6) it reduces the risk of hypothermia,[39] 7) it provides a safe ecological niche, and 8) it reduces the risk of infection.[41] Skin-to-skin contact, sensory stimulation, and better autonomic regulatory control reduce crying and purposeless motor activity during kangaroo mother care,[45,46] with consequent possible improvement in oxygenation[47] (see Table 2). Moreover, kangaroo mother care allows close monitoring of the

Table 2. Effects of Kangaroo Mother Care on Specific Parameters

Physiological parameters	Steadiness of heart rate and respiratory rate
	Good thermal control
	Adequate oxygenation
Behavior	Reduction of response to pain[48]
	Reduction of purposeless activity
	Containment of the premature baby
	Longer period of sleep and decreased crying
	Less crying at follow-up (6 months)
	Neurobehavioural maturation[49]
Nutrition	Promotion of breastfeeding
	More rapid weight gain
Outcome	Lower or at least equal mortality than with conventional care
	Lower risk of infections
	Lower risk of hypo- or hyperthermia
	Earlier mother-infant attachment
	Better behavioral organization and enhanced development[50]
Maternal role	Increase production of breastmilk and longer lactation
	Increased self-confidence to care for a premature infant
	Empowerment
Family	More rapid return home of the mother
Organization of health services	Humanization of care
	Kangaroo transport instead of incubator transport[51]
	Sooner transfer into cot
	Earlier discharge
	Cost saving

Sources: Johnston et al., 2003[48]; Feldman and Eiderman, 2003[49]; Ohgi et al., 2002[50]; Sontheimer et al., 2004.[51]

well-being of infants by their mothers and reduces the need for expensive equipment because the babies either do not stay in incubators or have a shorter duration in incubators. Very few clinical conditions of the premature infant pose a limitation to the use of kangaroo mother care. Kangaroo mother care might be problematic in the presence of unstable conditions, for an extremely low birth weight in the first week of life, or during the acute phase of a critical illness. Where institutional neonatal care is not available, skin-to-skin contact for term normal or sick newborns and kangaroo mother care for preterm newborns and LBW infants could be valid surrogates for incubators. The skin-to-skin component of kangaroo mother care is also recommended for the transport of LBW infants and for rewarming the moderately hypothermic babies when other technologies for the thermal control of the newborn are not available or not effective.[36]

Critical health challenges during disasters justify overcoming the debate about scientific evidence on the effectiveness of kangaroo mother care to provide essential health care for newborns in settings with minimal resources. Although kangaroo mother care can be viewed as a natural and simple procedure, nevertheless it has some special requirements. Neonatal care providers need to fully inform and support the mothers, ensure training of health workers (at least for continuous monitoring and assessment of the baby, transition from tube feeding to exclusive breastfeeding), and develop a wise team strategy for implementation.[52,53]

Table 3. Comparative Effectiveness of Different Interventions on Reducing Neonatal Mortality

Intervention	Level of Effectiveness
Administration of antenatal steroids	High[60]
Clean delivery	High[11]
Antibiotics for the premature rupture of membranes and to treat sepsis	High
Administration of tetanus toxoid	High[61]
Neonatal resuscitation	Limited[4]
Thermal control of the newborn	High[36]
Breastfeeding	High[14] (risk of HIV infection if mother is HIV positive)
Kangaroo Mother Care	Limited[43]
Infant massage	Weak[55]

Sources: Crowley, 2000[60]; WHO, 1996[11]; Rahman et al., 1982[61]; Bang et al., 1999[4]; WHO, 1996[36]; WHO, 2000[14]; Conde-Agudelo et al., 2003[43]; Vickers et al., 2004.[55]

INFANT MASSAGE

Infant massage includes gentle stroking of the skin over different parts of the body[54] and is often combined with other forms of stimulation such as rocking, kinestetic stimulation, talking, and eye contact. The alleged benefits of the massage for the newborn, particularly improvement of daily weight gain and reduction of length of hospital stay, have not been confirmed by a Cochrane Review.[55] At the present, WHO has no official position on this health technology. Nevertheless, infant massage might improve neonatal care in low-resource and disaster contexts, where it could be one of the few interventions available to facilitate positive infant outcomes. Research is needed to provide evidence of the benefits of infant massage in such conditions.

The decision to include infant massage in disaster situations should depend on a thorough cultural, social, and health analysis of the context. Particular consideration should be given to determine whether implementation in disaster settings might divert the already short human and material resources from other interventions (e.g., essential newborn care and breastfeeding promotion) that have proven effectiveness in reducing mortality and morbidity and that could have a better cost-benefit ratio (see Table 3).

RESUSCITATION WITH ROOM AIR

Neonatal resuscitation is generally coupled with the use of oxygen. However, oxygen is an expensive therapy, rarely available in resource-poor settings. The use of oxygen in neonatal resuscitation entered into common practice on empirical grounds, but without evidence of its effectiveness. It is currently used without complete assessment of the safety or danger of short-term exposure to 100% oxygen. In the last 10 years, research has started to focus on the effectiveness of the

use of oxygen in neonatal resuscitation.[56,57] The Resair 2 study was conducted in 11 centers from 6 countries and enrolled 609 newborn infants >1000 g, who required resuscitation. Findings indicate that resuscitation with room air reduces mortality, results in the same acid-base status and oxygen saturation, reduces the time to first breath and first cry, and is equal to resuscitation with oxygen in terms of both resuscitation failure[57] and neurological handicap at age 18 to 24 months.[58] As a result of this and other studies, WHO, the American Academy of Pediatrics, and the American Heart Association recommend room air as the first-line gas for resuscitation if 100% oxygen is not available.[59]

CONCLUSION

The present article has reviewed the main existing heath care interventions to reduce neonatal mortality in settings with limited resources and during crises. Although levels of effectiveness vary for these interventions (see Table 3), growing scientific evidence indicates their association with reduced neonatal mortality. This core of relevant, essential, low-cost interventions, mostly preventive in nature, can be successfully applied in diverse settings. The current challenge for neonatal care is to transfer what we already know from experience and scientific literature into practical preventive and therapeutic simple measures.

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Status of Women and Infants in Complex Humanitarian Emergencies

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Women and children bear the greatest burden in the midst of war and long-term disasters. Complex humanitarian emergencies are characterized by social disruption, armed conflict, population displacement, collapse of public health infrastructure, and food shortages. Humanitarian assistance for refugees and internally displaced populations requires particular attention to the common issues affecting morbidity and mortality in women and infants. Gender-based violence and reproductive health concerns are discussed within the context of populations affected by conflict and forced migration. Recommendations for midwives and women's health care providers engaging in care for women and children in complex humanitarian emergencies are discussed. J Midwifery Womens Health 2004;49(suppl 1):7–13 © 2004 by the American College of Nurse-Midwives.

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Women face difficult challenges during times of conflict and disaster. Midwives and other specialists in women's health are particularly needed to provide culturally competent and essential care for these populations. In this article, issues confronting women, children, and health care workers are reviewed, and recommendations for care of women affected by war and disasters are presented.

COMPLEX HUMANITARIAN EMERGENCIES

Complex humanitarian emergencies is a relatively new term and is used to describe "humanitarian crises characterized by political instability, armed conflict, large population displacement, food shortages, social disruption and collapse of public health infrastructure" (p. 147).[1] Mortality rates can increase to extremely high levels in complex humanitarian emergencies, mainly due to disease, malnutrition, and trauma. Health professionals working in complex humanitarian emergencies must understand the links between the health needs and the larger political, social, economic, and historical contexts. These conflicts are often civil conflicts in which civilians are targeted and major population displacement occurs. Human rights abuses are rampant, and humanitarian aid workers themselves may be targeted.

WAR, WOMEN, AND HEALTH

The horrors of war are well known. Although it is difficult to quantify morbidity and mortality from armed conflicts, it is widely accepted that with the end of the Cold War, the nature of war has shifted.[2] Increasingly, current conflicts 1) are based on identity or sectarian politics; 2) use techniques to commit eradication of a population through forced resettlement, mass killings and intimidation; and 3) connect local conflicts with global war economies, using people, processes, and ideologies that may be geographically remote.[3] Civilians are often the targets of these armed conflicts as non-state combatants use indiscriminate weaponry and terror.

War and other armed conflicts adversely affect individual and public health due to 1) physical injury, 2) psychological trauma, 3) decreased sanitation and hygiene, and 4) deterioration of health infrastructure. A goal of the World Health Organization (WHO) is to "reduce avoidable loss of life, burden of disease and disability in emergencies and postcrisis transitions" (p. 1).[4] Emergency and postcrisis situations have a profoundly negative impact on the health of women and their infants. The WHO goal for the care of women and infants can be achieved by prioritizing services such as reproductive health services and ensuring the presence and operational capacity of health agents in the field who can immediately and effectively strengthen such services. These efforts should ensure collaboration and sharing of lessons learned among key agencies and concerned populations to maintain the health sector's accountability. In times of war and conflict, specialized knowledge, training, and experience are required to implement an effective and appropriate response to improve the health of women and infants. Midwives and other reproductive health care providers can effect profound and positive improvements in these settings.

War ravages the lives of women and children. Over the past decade, conflicts have left more than 2 million children dead, another 4 million physically mutilated, and another 1 million orphaned or separated from their families.[5] Following the Rwandan genocide, 70% of the remaining Rwandans were females, more than half of which were widowed. A survey in Sierra Leone reported that 94% of displaced

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Table 1. Burden of Conflict Reported in World Health Report 2002

WHO Region	Number of Deaths Attributed Directly to War 2002 (1000s) N (%)
Africa	91 (51.4)
Eastern Mediterranean	35 (19.8)
Southeast Asia	21 (11.9)
Europe	19 (10.7)
Americas	8 (4.5)
Western Pacific	3 (1.7)
World Total	177 (100)

Source: WHO 2003.[7]

families surveyed had experienced sexual violence, including rape, torture, and sexual slavery.[6]

The burdens of conflict weigh most heavily on Africa, East Mediterranean, and South-East Asia. Table 1 illustrates these staggering human costs, particularly on the African continent where more than half of all conflicts occur and the number of deaths exceeds all other regions combined.[7] As an example, a recent study conducted in the eastern region of the Democratic Republic of Congo estimated that 1.7 million excess deaths occurred over 22 months due to war.[8] The vast majority of these deaths (more than 80%) were due to preventable diseases such as malaria, diarrhea, and malnutrition, with 11% due to violent trauma.

IMPACT OF COMPLEX HUMANITARIAN EMERGENCIES ON THE HEALTH OF WOMEN AND INFANTS

In analyzing data on the health effects of conflict, it is important to examine data by gender and separate out the "vulnerable groups" into their distinct categories. The health and well-being of women and infants are disproportionately and adversely affected during complex humanitarian emergencies, yet only recently has public policy focused on gender issues in complex humanitarian emergencies. Save the Children created a data-based Mothers' Index that ranks the status of mothers' well-being in more than 100 countries. The criteria used in the rankings include six factors related to women's health (lifetime risk of maternal mortality, percent using modern contraception, percent of births attended by trained personnel, percent of anemic pregnant women, adult female literacy rate, and participation in national government) and four indicators of children's health (infant mortality rate, primary school enrollment, percent of population with access to safe water, and percent under 5 years suffering from nutritional wasting).[9]

Table 2. Mothers' Index of Countries With Recent Large-Scale Conflict

Countries With Conflict in Bottom 25 Mother's Index Ranking*

Country	Ranking	Country	Ranking
Nigeria	94	Liberia	106
Burundi	95	Angola	108
Haiti	95	Chad	109
Mozambique	95	Guinea	111
Pakistan	99	Sierra Leone	111
Nepal	100	Yemen	111
Central African Republic	103	Guinea-Bissau	114
Eritrea	103	Ethiopia	115

*Rank is based on total of 117 Countries.

Source: Save the Children 2003.[9]

The Mothers' Index reveals that 16 of the 25 (64%) bottom ranking countries are experiencing conflict (Table 2).[9] Regions of war and conflict consistently rank poorly in terms of children's and mother's well-being. The report directly links the health status of the mother with that of her children. Therefore, it is imperative that effective and appropriate care for women includes care for children in conflict settings.

International humanitarian agencies, such as WHO, the World Food Program, the United Nations High Commissioner for Refugees (UNHCR), and the United Nations Children's Fund (UNICEF), are integrating issues of gender into their programs, policies, and trainings. In October 2000, the United Nations Security Council passed Resolution 1325 on Women and Peace and Security.[10] This watershed document places women and a gender perspective into activities such as negotiating peace agreements, planning refugee camps, and reconstructing societies. Rape as a weapon of war has been acknowledged recently, bringing to light the multitude of adverse consequences of sex and gender-based violence in times of conflict and war.

The negative impact of complex humanitarian emergencies on women and infants is profound. The addition of a complex humanitarian emergency to an area with a preexisting high rate of common maternal health complications creates a lethal combination. For example, in 1995, maternal mortality in Afghanistan was estimated at 820 deaths per 100,000 live births.[11] With prenatal care coverage below 10%, alarmingly elevated rates of infant and maternal mortality persisted into 2001 (Table 3).[12] By 2003, following the war in that country, the maternal mortality

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Table 3. Safe Motherhood Indicators in Afghanistan

Coverage of antenatal care (%)	8%
Births attended by skilled attendant (%)	8%
Crude birth rate (per 1000 population)	51.3
Maternal mortality ratio (per 100,000 live births) (estimated range of regions within country: 300–1700)	820
Lifetime risk of maternal death	1 in 15
Low birth weight (%)	20%
Stillbirth rate (per 1000 live births)	70
Early neonatal mortality rate (<7 days) (per 1000 live births)	70.2
Neonatal mortality rate (0–4 weeks) (per 1000 live births)	121

Source: WHO, 2001.[12]

estimate had risen to 1600.[13] Overall, Africa, along with suffering the highest burden from conflict, has the highest rates of maternal death in the world.[14]

During complex humanitarian emergencies, women and infants face multiple health risks. Although the health status of the population as a whole deteriorates during complex humanitarian emergencies, women and infants may be particularly affected due to both biological and sociocultural factors. For example, biology is responsible for women's higher risk of reproductive tract infections and infants' unique dietary needs. Sociocultural norms may dictate that women have little control over financial resources and transport. This may jeopardize both her and her children's access to health care resources. Moreover, women tend to shoulder the burden of being their family's care provider, especially for children and those who are sick or traumatized. This responsibility can in and of itself contribute to deteriorating health outcomes.

Protecting and promoting the health of women and infants in times of conflict can be very difficult. Ward includes nurses and midwives as key actors in facing this challenge.[15] Even after a conflict is over and women and infants have been removed from the conflict zone, significant challenges remain. For example, Table 4 demonstrates an alarming number of rape cases in refugee settlements across Africa.[16] Rape is only one example of gender-based violence that women experience.

During crisis and displacement, women face a myriad of issues that impact their health and well-being. Although the following list of health issues is not exhaustive, it highlights major concerns that health care providers need to address in complex humanitarian emergency contexts.

- Displacement causes mass population movement, exposing individuals and families to environmental, social, and physical dangers. If women travel across international borders, they may receive protection as legally recognized refugees. However, the vast majority flee within a state border and are classified as internally displaced persons and thus do not receive the protection and services provided for refugees.
- Loss of extended family and community support due to displacement and community disruption places additional burdens on the woman. Women are often forced to flee and find themselves in strange environments where they may not speak the language, know the culture, or be able to call on others for support.
- Increases in female-headed households can place women in new, unfamiliar roles, and they may be forced to offer sex in exchange for food, shelter, or protection. This can be exacerbated by social customs and norms that neglect to recognize women as heads of households, thereby denying them decision-making authority and reinforcing disempowerment.[17]
- Sex and gender-based violence is becoming an increasingly apparent feature of war and conflict. A recent survey in Iraq by the United Nations Population Fund reported an increase in sexual violence and noted that health providers are not trained in how to respond to the victims.[18] The social, cultural, psychological, and physical effects of rape and other forms of sexual violence often last for generations, causing overwhelming pain and suffering for individuals, families, and communities. The health impact of this violence can result in physical injuries, unwanted pregnancies, sexual dysfunction, and sexually transmitted infections (STIs), including HIV/AIDS. The mental impact can include posttraumatic stress disorder, depression, anxiety, and suicide. The social or cultural impact can bring about social ostracism and isolation for the victims.
- Communicable diseases, including HIV/AIDS, can rapidly spread in complex humanitarian emergency settings where social instability, massive population movement, poverty, sexual violence and exploitation of women, increasing military presence, and conflict occur. A study

Table 4. Rape Cases Reported in Stable African Refugee Settings

Situation	Population	Year Reported	Actual Rape Cases Reported (No. of months)	Rate of Rape per 10,000 Population/Year
Kibondo, Tanzania	76,740	1998	129 (12)	17.08
Dadaab, Kenya	109,000	1998	128 (12)	11.74
Goma, Congo (Zaire)	740,000	1996	140 (7)	3.24
Ngara, Tanzania	110,000	1998	24 (12)	2.16

Source: Sexual and gender-based violence 1999.[16]

of Rwandan women attending antenatal clinics in Tanzanian refugee camps found that more than 50% of them were infected with some form of STIs.[19] Women and girls' risk of exposure to STIs is aggravated by the low status of women and girls in some settings where they are unable to negotiate sexual activities.

- Mental health problems due to physical and/or mental trauma are real dangers for women in complex humanitarian emergencies. Due to the combined effects of displacement, poor nutrition, lack of access to care, and decreased support systems, increased caregiving burden and exposure to trauma make it likely that women will experience short- or long-term deleterious mental health effects.
- Lack of access to family planning and reproductive health services results in an increased number of unwanted pregnancies and unsafe abortions. In addition, there may be pressure on women to replenish the population that was lost during the conflict. This can result in high fertility rates and pregnancies at close intervals, often negatively affecting the health of the mother and contribute to low birth weight.
- Malnutrition may be a problem during and following disasters for several reasons. The family may have missed their harvest, lost stores of food, or no longer have freedom to scavenge for seasonal sources of nutrition. In addition, poor logistical management or corruption of food distribution may contribute to the problem. In general, women are vulnerable to vitamin and iron deficiencies. However, pregnant and lactating women and small infants have unique needs that may be particularly difficult to meet. A study of Somali refugees reports that up to 70% of women of reproductive age are anemic, probably due to lack of iron in the diet and/or malaria, which decreases the body's stores of iron.[20]
- Maternal morbidity and mortality are high during complex humanitarian emergencies. In countries experiencing conflict, women often cannot obtain prenatal support or emergency obstetric care. Destruction of health infrastructure can mean that women have little or no access to care, remaining health workers may have limited training, referral and supply systems are disrupted, and unstable environments may make it unsafe to seek treatment. Pregnant and lactating women are particularly vulnerable to poor water and sanitation.
- Exposure to chemical, biological, and nuclear weapons is of particular concern for the pregnant or lactating woman. Often women are not aware of what weapons are being used and what effects they have on the population or reproduction.

The health status of infants is closely linked with the mother's health and well-being. It has been reported that the morale and mental well-being of mothers can be important determinants of infant health during wartime.[21]

Issues of concern for infant care providers include the following:

- Low birth weight is associated with poor infant outcomes. Production, distribution, and availability of food all impact nutritional outcomes.[22] Because conflicts negatively impact these aspects of the food system, providers should be alert for poor nutritional status among affected populations. Infant outcomes may be poor because poor nutritional status of the mother contributes to low birth weight.[23] Unfortunately, screening and growth monitoring cannot occur when women lack access to adequate prenatal care, thereby increasing the likelihood that perinatal risk factors like malnutrition will not be detected. Therefore, it is essential that reproductive health services are a priority in these settings. Malnutrition may begin in utero when maternal intake is inadequate for fetal growth and development. Severe maternal anemia can prevent adequate iron stores in the newborn as well. Although breastfeeding is the optimal nutrition for infants, infant feeding is often a challenge if maternal breastmilk is insufficient due to maternal malnutrition or unavailable due to maternal death. In addition, the HIV epidemic in many regions of the world has resulted in increased formula feeding among some populations. Infant formula presents ongoing challenges among populations where clean water is not readily available and contributes to incorrect practices for preparing formula, including harmful proportions of water and substitute milk powder.
- Decreased access to clean water and sanitation often causes frequent and severe diarrhea. Giardia and amebic dysentery are common in areas with unsafe water sources. Diarrheal diseases exacerbate infant malnutrition and are a major factor in high infant mortality rates among refugee populations. Breastfeeding is the best protection from diarrheal diseases.
- Hypothermia is common among preterm and low birth weight infants, as well as malnourished infants. Insufficient fat stores provide diminished ability to maintain body temperature. Lack of shelter, clothing, or blankets can contribute to increased infant exposure. Continuous skin-to-skin care provides an appropriate environment for maintaining infant temperature. However, maternal workload to carry water or firewood and lack of access to family support may make it difficult to provide continuous skin-to-skin contact.
- Poor maternal health due to maternal morbidity, malaria, or other health conditions decreases the ability to provide adequate infant care. As the traditional caretakers for their families, women generally have the responsibility to provide the meals, wash household items and clothing, and care for the children. When a mother is incapacitated, feeding and hygiene of her infant will be compromised unless alternative care providers are available. However, the social disruption of migration and displacement often

separates family and communities, leading to lack of access to needed social support.
- Disruption in immunization during displacement increases the risks of acquiring preventable childhood illnesses. Epidemics can move rapidly through refugee populations with high morbidity and mortality.

RECOMMENDATIONS

In 1994, The Women's Commission for Refugee Women and Children characterized most maternal-child health services in refugee programs as large, well-run programs.[24] What can midwives and women's health professionals do to ensure that this remains true, not only in refugee settings but in other settings where complex humanitarian emergencies have occurred? Strategies for engaging in comprehensive approaches to address the issues of refugees or displaced women and their infants include the following.

Develop Programs and Policies

During conflict and civil strife, a diminished capacity to respond to growing health needs exists, which sometimes results in inappropriate responses. For example, some reproductive health programs in refugee settings were discouraged out of fear they would offend the population or make the refugee setting too appealing and discourage future resettlement.[25,26] Since then, it has been acknowledged that reproductive health services are indeed critical.[24] However, as recently as 2003, reproductive health services were still not adequate due to a combination of factors including a lack of appropriate resource allocation to reproductive health services. Therefore, it is imperative that midwives and other providers, whether they operate at the donor, policy, or field level, advocate that reproductive health services become or remain a priority. Local staff who are knowledgeable in how to care for women and infants in complex humanitarian emergencies should be recruited if possible. Not only can they help ensure the care is culturally appropriate, but they can also readily identify specific needs that may be difficult for outsiders to discern. Numerous technical guidelines, manuals, and reports are available via Web pages of United Nations agencies and humanitarian assistance organizations that provide insight and expertise on how to integrate the needs of women and infants into a general health sector response to complex humanitarian emergencies. It is important that programs addressing specialized areas, such as reproductive health and gender-based violence, be flexible enough to be integrated into wider, more comprehensive programs to meet the different needs of regions, populations, and communities.

Programs implemented in complex humanitarian emergencies need to emphasize low tech and essential packages of services. Programs should include a mix of prevention and treatment strategies, such as tetanus toxoid vaccination, malaria prevention and treatment, curative interventions for STIs, and breastfeeding education.

Conduct Assessments and Report Findings Carefully

It should be noted that data on war-related health consequences is a political issue. Because each party has an interest in either conflating or minimizing the harm, figures are highly biased and demand critical assessment.[27] Zwi suggests that different types of data from a variety of sources be triangulated to build a more accurate sense of the experience.[27] A combination of quantitative and qualitative approaches to needs assessments and program evaluation can help to represent a variety of voices, strengths, and needs.

Involve the Participation of Affected Women Wherever Possible

Participatory approaches have been shown to enhance the quality of data on women in complex humanitarian emergencies.[28] Although involving affected communities during conflict presents incredible barriers, because people may just simply be inaccessible, it is important to make the effort to build bridges to reach women. Through their participation, positive indigenous coping strategies can be promoted and culturally congruent approaches designed and implemented. Moreover, in these unstable settings in which women are often left powerless, participation in such programs can provide sources of empowerment and hope.

Draw From the Experiences of Other Professional Organizations and Communities

Following a disaster, experts from a wide range of disciplines converge quickly to provide aid. It is essential that women and infant health providers communicate effectively with the rest of the relief team. For example, sanitation and engineering experts can provide critical resources to reproductive health programs such as latrine access and adequate lighting for safety. This type of collaboration allows for public health and primary health care experts to learn best practices, coordinate approaches, and share lessons learned. Although each setting is unique, there are cross-cutting lessons and issues that need to be shared among different sectors, organizational types, and cultures. For example, in the area of reproductive health, a group of non-governmental organizations (NGOs), UN agencies and governmental donors worked together to develop the standards to be applied for reproductive health and created a Minimum Initial Service Package (MISP) of supplies and interventions to be provided in emergency settings.[29]

How can donor agencies and their partners be better prepared to tackle issues related to complex humanitarian disasters and, in particular, their effect on women? The War-torn Societies Project, jointly initiated by United

Nations Research Institute for Social Development (UNRISD) and the Program for Strategic and International Security Studies (PSIS), aims to assist groups to understand and respond better to the complex challenges of postconflict settings.[30] Macrae et al. stressed that in consideration of donor agencies' base of support and concomitant influence, agencies must play a major role in postconflict policy formation.[31] And these groups should be held responsible for the success or weaknesses of the policies they influence.

Advocate to Policy Makers on Behalf of Women and Infants Affected by Complex Humanitarian Emergencies

The spotlight must be kept on the realities that women and infants face in complex humanitarian emergencies. Individuals and groups can work to educate representatives, write letters, and raise public awareness. In 2003, U.S. Senator Joe Biden (D-DE) introduced the bill Women and Children in Armed Conflict Protection Act of 2003.[32] This bill is designed to protect women and children during times of armed conflict and to ensure that the U.S. government makes the protection of women and children a priority in all stages of conflict through an integrated strategy, a code of conduct, and a $45 million annual Women and Children's Protection Fund for relevant initiatives. Intraagency advocacy is also important so that reproductive health resources are protected and distributed appropriately during the execution of an assistance program.

Share Your Experience

Health professionals working in complex humanitarian emergency settings have written up descriptions of their experiences in professional journals. These contributions provide invaluable exposure and insight into different roles that professionals play. Heymann relates her experiences as a nurse-midwife working for an international humanitarian aid agency in Kosovo.[33] She presents background and history to the conflict, as well as an orientation to the health care system and women's health issues. Hammes presents excerpts from her diary while working as a nurse-midwife in Kosovo for an international humanitarian aid agency.[34] Through this personal narrative, the readers learn about the various roles that midwives play and challenges they face in complex humanitarian emergencies. Recent commentaries in the *Lancet* describe some of the daily struggles and realities of refugee women and outline the work of some organizations fighting for positive change.[35,36]

CONCLUSION

Moving forward toward peace is the optimum strategy for addressing many of the issues raised above. The Alma Ata Declaration from the International Conference on Primary Health Care provided a foundation for governments and health professionals to connect policies for disarmament and maintenance of peaceful societies with goals for improving global health indicators.[37] A clear priority for the respect for human rights of women and children can guide concrete efforts aimed at providing and improving health policies and services in the context of complex humanitarian emergencies. Midwives and care providers for women and infants can use the educational resources available for humanitarian health workers to build on their existing skills to play a key role in these efforts.

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Disaster Preparedness: What Do We Do Now?

Gwen Brumbaugh Keeney, CNM, PhD

Disasters are events that exceed the capacity of the people affected to recover from the adverse affects. Understanding types of disasters and components of disaster responses provides a basis for developing disaster preparedness plans. Disaster preparedness is a process for assessing risks and capacities for responding when disasters occur. Planning can mitigate damages and facilitate rapid and effective disaster response services. Health care workers, including midwives and women's health care providers, can access resources to be prepared as competent responders in disaster contexts to meet the needs of women and their communities. J Midwifery Womens Health 2004;49(suppl 1):2– 6 © 2004 by the American College of Nurse-Midwives.

keywords: disasters, international health problems, health systems, public health, public policy

INTRODUCTION

Recent world events have increased public awareness about the need to prepare for catastrophic events. However, it is important to recognize that disasters, caused by periodic natural phenomena and human conflict, occur each year, affecting large portions of the world's population (Table 1).[1] "Every year, disasters affect tens of millions of people, cause economic losses of tens of billions of dollars, and kill tens of thousands of people" (p. 1).[2] Disaster response requires planning and preparation to ensure adequate policies, a viable plan of action, sufficient emergency supplies, and appropriately skilled personnel. This article provides an overview of types of disasters and response stages, a description of disaster preparedness components, and identification of resources for preparing for disaster response.

DEFINITIONS

An emergency is a critical event that requires cessation of normal activities to provide extraordinary actions to prevent a disaster.[3] A disaster is any event that exceeds the capacity of individuals or communities affected to alleviate their suffering or meet their needs without outside assistance.[3] A disaster results when a hazard, or an event with adverse affects, occurs in a context of vulnerability. Vulnerability is a state of having limited resources to manage hazards, thus being at risk for experiencing serious consequences. Although a community may be susceptible to certain hazards, such as annual hurricanes, vulnerability is mitigated by preparedness activities that reduce loss of life and damage to property, thus averting the occurrence of a disaster.[3]

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TYPES OF DISASTERS

Underlying causes of disasters include natural phenomena, technological catastrophes, and sociopolitical crises referred to as complex humanitarian emergencies (Table 2). Complex humanitarian emergencies are often complicated due to combinations of disastrous events. For example, war can cause population groups to leave homes and become refugees in a neighboring host country while the host country may be in the midst of a drought with large numbers of internally displaced people looking for a hospitable environment for their families and their animal herds. Deforestation, inability to plant and harvest crops or destruction of crops, and political tensions can further compound extreme challenges that preexist the occurrence of some disasters.

DISASTER RESPONSES

Disaster response services must be based on 1) the extent of damage and 2) the capacity of existing services to provide the resources to meet the needs. Local disasters and local responses are confined to people, places, and services from a community or surrounding area (e.g., a factory explosion). A regional disaster or regional response affects multiple communities and occurs within a country (e.g., extensive flood or hurricane) A disaster is global in scope when the severity of impact affects multiple countries or requires assistance from numerous international agencies.

Stages of Response

When disasters occur, the primary response efforts are aimed at addressing the immediate needs of the affected population. This initial focus is categorized as the emergency response or acute disruption phase. In addition, disaster planners need to be prepared to address the recovery response or late, chronic phase (approximately 1

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Table 1. Impact of Disasters on the World Population 1991–2000

- 256 million people were affected by disasters in 2000.
- 665,600 were killed by natural disasters from 1991–2000.
- 86,900 were killed from technological disasters from 1990–2000.
- 31 million people were affected by armed conflict annually.
- 2.3 million were killed by armed conflict from 1991–2000.

Source: International Federation of Red Cross and Red Crescent Societies, 2001.[1]

to 6 months after disaster) and the developmental phase (>6 months after disaster occurs).[4]

During the acute disruption phase, disaster response includes

- Rapid assessment to identify the magnitude of the disaster, the priority health and nutritional needs, environmental conditions, and the local abilities and resources to meet the needs
- Providing basic needs, specifically protection from the environment (shelter and clothing), nutritional food, and safe water
- Provision of basic health care services to attend to emergency care and emergent care targeting the prevalent health problems and adapted to be comparable with the local standards
- Surveillance and monitoring as part of establishing a health information system to manage epidemiologic data, evaluate effectiveness of treatments, and adapt to changing priorities
- Organization of human resources, including identifying available local skills and engaging community members as appropriate in a managed disaster response
- Coordination of planning and service delivery activities among local authorities, disaster relief organizations, and governmental agencies to facilitate communication, minimize duplication of services, and enable appropriate referral procedures.[3]

The chronic phase of a disaster response is a time of rehabilitation. During this period, the primary goal is restoration of normal social functions.[3] Additional services need to be provided to enable recovery if they were not incorporated into the acute phase. Examples of specific services that need to be in place include maternal and child health services, an immunization program, and mental health services.[4] The developmental phase is a period of reconstruction leading to resumption of full socioeconomic activities and development of preventive policies and procedures.[2] Disaster response activities focus on ensuring sustainable services, including health care, education, and economic development. In addition, disaster preparedness planning needs to be developed or reevaluated to prevent or mitigate consequences and enhance response services in the event of a future disaster.

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DISASTER PREPAREDNESS

The goal of disaster preparedness is to reduce the adverse affects of disasters. Disaster preparedness is an ongoing process of assessment, planning, and training to prepare for a well-coordinated plan of action. Disaster preparedness includes measures to predict, prevent, and respond to disasters. Multisectoral collaboration is necessary to achieve the following objectives identified by the International Federation of the Red Cross and Red Crescent Societies[5]:

- Improve disaster emergency response systems at the local, national, and international levels to increase efficiency and effectiveness. This includes 1) development of early warning systems and evacuation plans to decrease potential loss of life and physical damage; 2) public education and training of designated public and private sector officials; 3) training of emergency response personnel; and 4) establishment of disaster response policies, with operational procedures, collaborative organizational agreements, and service delivery standards.
- Strengthening local disaster preparedness by supporting community-based activities. Education and preparations to minimize risks can be conducted via mass media, school programs, and health fairs. In addition, local disaster preparedness includes teaching first aid and cardiopulmonary resuscitation (CPR) to community members for everyday life and for disaster response.

A comprehensive approach is essential to develop a disaster plan of action. Although every community, region, and country needs to create its own unique disaster plan, the following key components should be included in disaster preparedness activities.[5,6]

Table 2. Types of Disasters

Natural disasters		
Earthquakes	Floods	Volcano eruptions
Tornados	Typhoons	Insect infestation
Landslides	Drought	Human or animal epidemics
Technological disasters		
Explosions	Chemical exposures	Building collapse
Fires	Radiation	Transportation accidents
Complex humanitarian emergencies		
War	Displaced populations	Economic disruption

Risk Assessment

An assessment of risk focuses on what types of disasters could impact the area. Risks to be considered include geographic and environmental events, such as potential for flooding, earthquakes, and severe weather patterns. In addition, technological disasters should be considered. Nuclear power plants and dams may not exist within a local community. However, the community may be within the large geographic catchment area that would be affected if a nuclear power plant malfunctioned or was damaged. A risk assessment should heighten awareness of local disaster preparedness teams about the obscure, as well as the obvious, risk factors that could affect their community if an incident occurred. Identifying populations with the greatest vulnerability in the presence of a hazard is also essential. For example, knowing what buildings are most likely to suffer damage in a hurricane can provide a basis for new building codes, facilitate promotion of buttressing or renovation prior to a disaster, and enable prioritization of response services to those areas when a disaster happens.

Response Strategies

Once potential risks are identified, response strategies need to be developed. What are the options available to respond to the identified risks? Typical local response strategies include developing an evacuation plan, stockpiling supplies in an accessible location, and creating or identifying backup systems, such as alternative safe water sources and communication procedures that could be used if existing systems fail. It is also important to include an assets approach to incorporate the existing resources for disaster response within communities, identifying which agencies and personnel have the capacity to provide assistance.[7]

Preparedness Plans

After risks and response strategies are identified, disaster preparedness plans can be developed. Planning needs to include participation of major stakeholders, including personnel from departments of public safety, public health, mass media, transportation, and disaster organizations. A plan provides the guidelines for a response when a disaster occurs. In the midst of a disaster, having a predetermined plan facilitates organization, efficiency, and effectiveness of a rapid response that provides the right resources for the specific form of disaster that has occurred. Disaster preparedness includes development of management strategies for specific activities that can be anticipated during a disaster response (Table 3).[8]

Early Warning Systems

Early warning systems are strategies for identifying the potential for a disaster prior to the onset of disasters. This can include weather tracking to predict hurricanes, recognition of rainfall patterns to predict the potential for drought, or identification of large group migration, which may indicate the need to prepare for refugee camps. Early recognition of mass population movements and prediction of their direction enables the establishment of a protected camp to meet the specific needs of that group.[6,9]

Table 3. Disaster Response Activities

- Emergency needs assessment
- Reliable communication systems
- Warning and notification systems
- Logistics
- Transportation
- Emergency medical care
- Shelter
- Security
- Water and sanitation
- Food and nutrition
- Other household needs
- Family reunification

Source: International Federation of the Red Cross and Red Crescent Societies, 2000.[8]

Coordination

By definition, a disaster requires assistance from outside the affected area. Coordination is essential to reduce duplication of services and to facilitate appropriate referrals to agencies and personnel with the expertise and resources for specific needs. Generally, lead agencies are designated to manage coordination among the various governmental and voluntary agencies involved in a disaster response. In the United States, the Federal Emergency Management Agency (FEMA) and the American Red Cross are lead agencies for many forms of disaster. In international disaster situations that create refugee populations, the United Nations High Commissioner for Refugees (UNHCR) is generally the lead agency in partnership with the national government in the host country.

Information Management

Information management is a crucial component of any disaster response. Communication among disaster relief agencies is necessary to facilitate coordination, to recognize issues that emerge, and to problem-solve when uncertainties exist. Information management is also necessary for communicating to the public, often through the mass media, or door-to-door. Community members need to be informed about what has occurred to dispel rumors, and they need to know what actions they should take to protect themselves and receive services.

Resource Mobilization

Resource mobilization is facilitated by having preparedness plans, coordinated efforts, and information management systems so that people and resources are where they need to

be when a disaster response is needed. Resource mobilization is also a preplanning strategy to identify potential resources for disaster response; it includes knowing what buildings can provide shelter when homes are destroyed or unsafe, which pharmacies can provide medicines for people when existing prescriptions are destroyed, and locations of food supplies that would be available during disasters.

Public Education and Training

Public education and training focuses on preparing community members for disaster response. In addition to teaching basic skills, such as CPR, to a large portion of the population, preparedness education includes informing communities about how to access accurate information in the event of an emergency and how to enhance the safety of their family and property. In addition, education and training includes ensuring that health care workers are prepared to respond to a disaster. It is important for personnel to know what roles they can competently manage in a disaster context, who to contact to discuss availability and needs, and what locations to go to as part of a disaster response. Disaster education and training for health care workers is often provided by employers. A variety of disaster response topics can be learned through certification modules offered by the Red Cross for individuals volunteering through their agency or their partner agencies.

DEVELOPING NETWORKS

It is important to develop networks as a component of disaster preparedness, and it is essential to work within those networks after a disaster occurs. Although disaster response is the responsibility of governments, numerous other stakeholders converge when disasters happen. At national and international levels, other primary agencies provide disaster response assistance and work in collaboration with governmental agencies (Table 4). In addition, news media, families of victims, and individuals spontaneously deciding to donate time or material aid may arrive in the area without direct connections to organized networks. When a well-developed, preexisting network is in place, organizational management and efficiency are optimized, and disaster workers are able to focus on specific tasks while knowing what referral and support systems are in place for tasks beyond their designated task.

PREPARING HEALTH WORKERS FOR DISASTER RESPONSE

Prior to disaster response service, health care personnel need to engage in a thoughtful process to ensure competence and capability for functioning within the unique context of disasters. Basic first aid and CPR are essential skills for disaster response. Ideally, a large portion of the affected population will have these skills as part of a disaster preparedness plan. Health care workers need to be prepared to use basic health care skills but also rapidly adapt to implement more complex clinical interventions using available resources. Public health and epidemiologic assessment skills are often a high priority as part of comprehensively addressing rapidly changing needs. Participating in disaster relief training and emergency drills prior to a disaster is invaluable for building understanding of systems and stakeholders and facilitating health workers' ability to be deployed for disaster response activities expeditiously.[10]

Table 4. Predominant Agencies Involved in Disaster Responses

Governmental Agencies
• Ministries of Health
• Public safety: police, fire departments, military
Non-Governmental Organizations (NGOs)
• Voluntary agencies
• Religious organizations
• Professional associations
International
• Red Cross and Red Crescent: International Committee of the Red Cross (ICRC) International Federation of the Red Cross and Red Crescent Societies (IFRC)
• United Nations: International Strategy for Disaster Reduction (UNISDR) Office for the Coordination of Humanitarian Affairs (OCHA) United Nations Children's Fund (UNICEF) United Nations High Commissioner for Refugees (UNHCR) World Health Organization (WHO)

Although health care workers can be in great demand during the acute stage of a disaster, not every pair of hands will be useful or optimally effective if personnel are not connected to the disaster response network and not prepared for the work to be done. Disaster response is a team effort rather than an individual endeavor. Health workers must rely on numerous personnel in various roles to attend to the logistics of providing supplies, transporting people to various sites, and managing information systems. Collaboration and cooperation are crucial for working efficiently and for establishing trusting working relationships. Referral systems need to be known and used to facilitate optimal and consistent access to goods and services. Although disaster preparedness and planning can reduce the extent of on-the-ground decision making, flexibility and creative problem-solving skills are essential.[10]

During a disaster response, it is important to be prepared to provide therapeutic skills for listening and being present with people affected by disasters. People will often exhibit symptoms of stress, have difficulty processing information or making decisions, be emotionally distraught, and have a need to tell their story repeatedly as they attempt to make sense of their disaster losses and experiences.

Individual disaster response workers need to be aware of their own ability to handle crises. Some events can stimulate recollections of personal life events that may increase stress and diminish ability to cope or function in a disaster.

Posttraumatic stress disorder can develop after responding to disasters and trigger flashbacks in the midst of the current disaster. Organizations, such as the American Red Cross, require mental health debriefing for disaster workers prior to concluding the term of service; these organizations also have mental health services available to volunteers as needed if issues emerge during disaster response activities.

CONCLUSION

Community planning to prepare for disasters can reduce vulnerability and minimize potential damages. Disaster preparedness and disaster response require collaborative efforts of multisectoral organizations to enable a comprehensive approach to addressing needs and providing services. Health care workers, including midwives and women's health care providers, can access educational and informational resources to be prepared as competent responders in disaster contexts. Midwives and women's health care providers have a long history of assessing and addressing public health issues and can be a crucial resource to provide expertise relevant to the care of women and children in disaster planning and response.

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Resources for Providing Care for Women and Infants in Disasters and Low-Resource Settings

EDITOR'S NOTE

There are a broad array of resources for health care workers interested in disaster response or provision of low-tech interventions for women and children. The following Web sites may provide information on service opportunities. Although the list is not exhaustive, interested readers can use the sites listed here for beginning research.

DISASTER AND HUMANITARIAN AGENCIES

United Nations Agencies

United Nations High Commissioner for Refugees

http://www.unhcr.org/

Provides services, policies, statistics, on-line library. Publications of particular interest (full text on-line):

- Handbook for Emergencies
- How To Guide-Safe Motherhood (Refugee care)
- Refugee Reproductive Health Needs Assessment Field Tools
- Reproductive Health in Refugee Situations: An Inter-Agency Field Manual
- Guidelines on the Protection of Refugee Women
- Mental Health of Refugees
- Psycho-Social and Mental Health Programmes

UNICEF Office of Emergency Programmes (EMOPS)

http://www.unicef.org/emerg/

Focus on the basic needs and human rights of women and children.

- Guiding Principles on Internal Displacement
- The Impact of War on Children

UN International Strategy for Disaster Reduction (ISDR)

http://www.unisdr.org

Focus on public awareness, commitments of public authorities, multidisciplinary and inter-sectoral cooperation, and scientific knowledge. Developing benchmarks to monitor effective disaster risk reduction. Includes resources on early warning, sustainable development, and gender.

- Natural Disasters and Sustainable Development

UN Office for the Coordination of Humanitarian Affairs (OCHA)

http://www.reliefweb.int/ocha_ol/index.html

Provides information for humanitarian relief agencies.

UN Population Fund: Humanitarian Response in Emergency Situations (UNFPA)

http://www.unfpa.org/tpd/emergencies/index

World Health Organization: Emergency and Humanitarian Action

http://www.who.int/disaster

Includes numerous documents, country specific reports, and links to UN, academic, and non-governmental organizations. Technical assistance information, including the following reproductive health documents:

- Conflict and Health
- Emergency Contraception: A Guide for Service Delivery
- Emergency Health Library Kit List
- Handbook for Emergency Field Operations
- Minimum Initial Service Package for Reproductive Health in Crisis Situations
- Recommendations for Contraceptive Care in Emergencies
- Recommendations for Prenatal Care and Delivery Care in Emergencies
- Recommendations for the Prevention & Control of Sexually Transmitted Diseases in Emergencies
- Reproductive Health Services During Conflict and Displacement
- Essential Newborn Care
- Essentials for Emergencies
- Technical Guidance on HIV/AIDS
- WHO Fact Sheets on Violence Against Women

Regional WHO Humanitarian Assistance Offices

Pan American Health Organization (PAHO): Disasters and Humanitarian Assistance

http://www.paho.org/english/PED/

- Fact Sheet of the Program on Women, Health and Development: Gender and Natural Disasters

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Humanitarian Assistance in Disaster Situations: A Guide for Effective Aid
Recommendations for the Care of Children in Emergencies
Recommendations for Prenatal Care and Delivery Care in Emergencies

WHO AFRO: Emergency and Humanitarian Action

http://www.whoafr.org/eha/index.html

WHO EURO: WHO Humanitarian Assistance

http://par.who.dk

Food and Agriculture Organization of the United Nations (FAO)

http://www.fao.org

Includes Global Information & Early Warning System on Food & Agriculture (FAO-GIEWS) *http://www.fao.org/giews*

NON-GOVERNMENTAL ORGANIZATIONS (NGOS)

Amnesty International

http://www.amnesty.org/

Focus on human rights, including protection from violence against women.

Center for International Emergency, Disaster and Refugee Studies (CIEDRS)

http://www.jhsph.edu/refugee/

Provides education and training, research, technical assistance, and field projects.

InterAction

http://www.interaction.org/

An alliance of over 160 non-governmental organizations providing relief and development services. Focus on disaster response, sustainable development, and advocacy.

International Committee of the Red Cross (ICRC)

http:// www.icrc.org/

Provides services to protect and assist victims of war through coordination of international relief efforts and strengthening humanitarian law. Emergency response policies available.

International Federation of Red Cross and Red Crescent Societies (IFRC)

http://www.ifrc.org/

Focus on promoting humanitarian principles and values, disaster response, disaster preparedness, and health care in the community. Includes national disaster preparedness plans by country and country office contact information.

Disaster Preparedness Training Manual
Strategies 2010
World Disasters Report

International Centre for Migration and Health (ICMH)

http://www.icmh.ch

Provides information and courses for disaster care. Links to UN, international organizations, and academic institutions involved in disaster and migration issues.

International Organization for Migration

http://www.iom.int

An intergovernmental organization with publications and reports, including gender issues.

International Health Exchange

http://www.ihe.org.uk

Provides short courses to prepare health workers for international disaster relief. Maintains a roster of health workers to help organizations recruit for emergency responses.

Reproductive Health for Refugees Consortium

http://www.rhrc.org/resources

A consortium of service, research, and advocacy agencies is focused on improving quality of reproductive health services for refugees and displaced persons. Resources include reports, field tools, technical documents and policy papers focused on reproductive health and women's health.

Emergency Obstetric Care: Critical Need among Populations Affected by Armed Conflict

Women's Commission for Refugee Women and Children

http:// www.womenscommission.org/

Provides reports, advocacy, technical expertise and consultation, documentation/pictures of conditions for women and children in refugee settings.

The Gender Dimensions of Internal Displacement
Annotated Bibliography on Gender and Internally Displaced Women

INFORMATION RESOURCES FOR DISASTER WORKERS

Disaster Publications and Documents

Regional Disaster Information Center (CRID for its Spanish acronym)

http://www.crid.or.cr/crid/Indexen.htm

A large bibliographic disaster database. An initiative sponsored by six organizations that decided to join efforts to ensure the compilation and dissemination of disaster-related information in Latin America and the Caribbean (primarily Spanish language documents).

SUMA (SUpply MAnagement system for disaster response)

http://www.disaster.info.desastres.net/SUMA

Facilitates the management of humanitarian relief supplies, from donor commitment, to arrival into the disaster area and strategies for storage and distribution. (Available in French, Spanish, Portuguese, and English.)

Virtual Disaster Library

http://www.paho.org/English/PED/about-vdl.htm or http://www.helid.desastres.net

Available on the Internet and the collection is distributed on CD-ROM primarily in developing countries, especially in areas where access to Internet services is still limited. A global collection, including documents from WHO, PAHO, UNHCR, UNICEF, the ISDR, the International Committee for the Red Cross, Project SPHERE, non-governmental organizations, and national organizations.

MENTAL HEALTH INFORMATION

Traumatic Stress

International Critical Incident Stress Foundation (ICISF)

http://www.icisf.org

Education, training, and support services to prevent and mitigate disabling stress. Continuing education and training in Emergency Mental Health Services for professional mental health workers and consultation for developing crisis and disaster response programs.

National Center for Post Traumatic Stress Disorder

http://www.ncptsd.org/index.html

Includes research reports and publications.

Published International Literature on Traumatic Stress (PILOTS database)

http://dciswww.dartmouth.edu:50080/?&&&105&s

PILOTS is an electronic index to the worldwide literature on posttraumatic stress disorder (PTSD) and other mental health consequences of exposure to traumatic events.

Perinatal Stress

Glynn LM, Wadhwa PD, Dunkel-Schetter C, Chicz-DeMet A, Sandman CA. When stress happens matters: Effects of earthquake timing on stress responsivity in pregnancy. Am J Obstet Gynecol 2001;184(4):637– 42.

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BIRTHING CARE INFORMATION

Doula and Continuous Labor Support

Hodnett ED, Gates S, Hofmeyr GJ, Sakala C. Continuous support for women during childbirth. The Cochrane Library, 2004, Issue 2. *http://www.cochrane.org/cochrane/revabstr/AB003766.htm*

Taylor JS. Caregiver support for women during childbirth: Does the presence of a labor-support person affect maternal-child outcomes? Am Fam Physician 2002;66(7):1205– 6. *http://www.aafp.org/afp/20021001/cochrane.html*.

Doulas of North America (DONA)

http://www.dona.org

Offers evidence-based certification programs for birth doulas and postpartum doulas and provides supportive companion information and links to related Web sites.

Home Obstetrical MotherCare Experience (HOME)

http://www.homeurope.org/INDEX-ENG.htm

Training models to provide home birth services and to define the roles of the midwife as an assistant to the mother.

Coalition for Improving Maternity Services (CIMS)

http://www.motherfriendly.org

A coalition focused on the care and well-being of mothers, babies, and families. To improve birth outcomes and reduce costs. Includes the mother-friendly consensus document with guidelines to provide culturally competent, evidence-based maternity care in hospitals, birth centers, or home birth settings.

Mother-Friendly Childbirth Initiative (MFCI) and Ten Steps

Lifesaving Skills

Marshall MA. Life-saving skills manual for midwives. Washington (DC): American College of Nurse-Midwives, 1991.

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CARE OF INFANTS AND CHILDREN INFORMATION

Infant Massage and Complementary Care

International Association of Infant Massage

http://www.infantmassage.com/

Access to infant massage research findings, teaching materials, and network of instructors.

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Guidelines for Parents and Caregivers After Traumatic Events

EDITOR'S NOTE

What Do You Do During a Disaster Response With the Affected Children

There is a pervasive myth that children are able to recover from trauma, especially emotional trauma, more easily than adults. It now appears just the opposite is true. Emerging research on childhood brain development suggests that emotional trauma can have a negative impact on early brain development.[1] Many young children have not had the life experiences necessary to develop coping skills for traumatic experiences. Some research studies have shown a higher rate of posttraumatic stress disorder (PTSD) in children than in adults after the same traumatic experience.[2,3] Play, creative art, and talking about their experiences are effective therapeutic interventions for assisting children to manage disaster-related psychological challenges and recover from disasters.[4]

The following document from the Emergency Response/Service Ministries can be used by disaster workers, parents, or clinicians in interacting with young children who have been in a disaster or trauma setting. The American Academy of Pediatrics produced a parent information booklet that addresses the different developmental stages and needs of older children.[5] Although the guidelines were written for families in developed countries, the content can be adapted for various settings.

Roy Winter, EdS, and Gwen Brumbaugh Keeney, CNM, PhD

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After a Traumatic Event Children's Typical Behavior May Change

You may notice one or more of these behaviors as your child struggles to cope with the stress and loss resulting from a disaster.

Remember, these are natural reactions. By showing patience and acceptance, you will reassure the child and encourage the process of getting back to normal.

Young children may

- Demonstrate angry feelings by hitting, kicking, throwing things.
- Become more active or restless.
- Worry about what will happen to them.
- Be afraid to be left alone or afraid to sleep alone. They may have bad dreams or want to sleep with a parent or sibling.
- Behave as they did when they were younger, want a bottle, suck the thumb, wet the bed, want to be held.
- Be afraid that the event will reoccur, asking, "Will it happen again?"
- Be upset at the loss of a favorite toy, blanket, teddy bear, etc.
- Have symptoms of illness such as fever, chills, nausea, vomiting, headaches, loss of appetite.
- Become quiet and withdrawn, not wanting to talk about the experience. Cry excessively, whine, cling to you.
- Express feelings of guilt that they caused the event in some way.
- Feel neglected by parents who are busy with other tasks.
- Refuse to go to day care or school. Children may not let you out of their sight.
- Become afraid of loud noises, storms, or unfamiliar people.
- Show no outward sign of being upset. Some children may never show distress because they do not feel upset. Others may not give evidence of being upset until several weeks or months after the event.

What You Can Do to Help Children Understand Their Feelings

TALK with your child. Respond to questions patiently. Give simple, accurate information about the situation. Correct misunderstandings.

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TALK with your child about your own feelings. However, it is important not to expect your child to provide you with emotional support.

LISTEN to what your child says and how she says it. Watch for behaviors that give clues to stress, fear, and anxiety. Let your child know you are concerned by repeating her words back to her. "You are afraid that . . . ," "You wonder if this will happen again." This helps both you and the child clarify feelings.

REASSURE your child. "We are together. We are safe. We care about you. We will take care of you."

HOLD and cuddle your child. Touching provides comfort and security.

ALLOW the child to grieve the loss of a special toy, blanket, or article of clothing. In time it may be helpful to replace the lost object.

SPEND extra time putting your child to bed. A warm bath can be soothing. Talk and offer extra assurances, like a night light or reminders that you are nearby.

OBSERVE your child at play and listen for concerns expressed through the play activities. A child will deal with anger, fear, or insecurities while playing with dolls, blocks, small vehicles, or imaginary play with other children.

PROVIDE play experiences such as play dough, finger paints, or a tub of water. These activities help a child release tension; if your child seems to want to hit or kick, give him something safe, like a pillow, nerfball, or bean bag game.

ASK FOR HELP for yourself or for your child if prolonged emotional or physical distress persists. Talk to your pastor, your family physician, a school counselor, or mental health professional. There are people in your community who understand and will help.

Your Child Needs You

Children who have recently experienced a traumatic event are likely to show signs of distress. It is quite common, in fact normal, for children to display a wide range of physical and/or emotional reactions after experiencing a sudden disturbing event. Children may likely act or behave differently no matter if they were directly or indirectly involved in the event.

It is hard for young children to understand what has happened to them. Some may have completely mixed-up views of the situation, whereas others, depending on age and level of involvement, may have a clear understanding. The certain fact is that children in distress need your continued guidance and understanding to help them grow through this experience. How you help your child work through this difficult time may have a lasting effect.

It is important to be aware that young children can experience the same intense feelings that you feel about the traumatic event. All children react differently, even children from the same family. Some may show their feelings immediately; others will wait until a later time. Most children will be confused by all the sudden interruption to their routine. This is a very difficult time for them as well as you. Whatever their reaction, be assured it is normal for children to be upset and display feelings about what has happened to them.

This brochure has been prepared to help you become aware of the various ways children may react to a traumatic event. Inside is a list of ways parents and caregivers may help children cope with reactions to a traumatic event.

This resource was prepared by Dr. Karen Doudt, Professor of Education at Manchester College, North Manchester, Indiana, a professional child care consultant who was instrumental in developing the Disaster Child Care framing curriculum.

Disasters Happen: Would You Know What You Can Do?

The focus of this issue of the *Journal of Midwifery and Women's Health* is "Low Tech, High Effect: Caring for Women and Infants During Disasters." By its very nature, a disaster means that events and consequences have occurred that require assistance beyond the ability and resources of the affected population. During the aftermath of a disaster, people from near and far offer their assistance. Some volunteers have much needed skills. Most have good intentions. However, not every pair of helping hands is actually helpful in the midst of a disaster response. The expertise of a health professional may be functional in high-tech environments, but might not be practical in low-resource settings. Communities affected by disasters often experience a period of limited access to resources. Services and supplies may be destroyed or rendered un- available due to lack of electricity, or unreachable due to closed roads or lack of transportation. When resources are limited, providers need to rely on interventions that use basic or minimal technologies. Disaster training and pre- paredness can provide health professionals with an orien- tation for learning new skill sets and adapting existing skills for effective care in low-tech environments.

In the midst of the initial chaos and focus on finding affected people and triaging the wounded, life cycle events continue. Pregnant women go into labor and need someone to assist them through the birthing process. Women and their infants deserve safe, effective care in disaster settings.

The articles presented here share current knowledge of effective care for women and infants in disaster or low-resource settings. Practitioners are provided with an introduction to disasters, disaster response, and disaster preparedness in the article by Gwen Brumbaugh Keeney, CNM, PhD. Naeema Al Gasseer, RN, PhD, Elissa Dresden, RN, ND, Gwen Brumbaugh Keeney, CNM, PhD, and Nicole Warren, CNM, PhD(c), focus the readers' attention on health service and policy issues affecting women and infants in complex humanitarian emergencies, such as war and drought. Judith O'Heir, NM, MN, describes approaches for maternal and reproductive health service delivery in refugee and displaced populations. Doulas or supportive birth companions, providing low-tech interventions that benefit childbearing women in stressful circumstances, are discussed by Debra Pascali-Bonaro, CD, CPPD, BEd, and Mary Kroeger, CNM, MPH. Riccardo Davanzo, MD, PhD, provides the evidence-based data for neonatal interventions that can be used in low-resource settings. In-depth descriptions of neurohormonal stress responses and mediating multimodal interventions for infants, including massage, acoustic, and rocking stimuli, are presented by Rosemary White-Traut, RN, DNSc. Additional resources are listed to facilitate access to disaster literature and information about organizations involved in disaster policy, service delivery, and training. Two informational resources are provided for clinicians to use and/or share with parents and other disaster responders: 1) a delineation of basic steps to manage a birth when there are no skilled attendants, and 2) strategies for assisting young children to help them cope with their disaster experiences.

Midwives and women's health nurses can draw upon their existing knowledge and skills that use minimal intervention to achieve positive outcomes. The interventions presented in this issue are consistent with being "with women" to facilitate optimum care and perinatal outcomes, whether in high-resource, developed country birthing facilities or low-resource settings, such as developing country rural health posts or communities affected by disasters. Knowing what simple technologies are effective and developing the skills to implement those interventions can increase the quality of care in the midst of adverse circumstances.

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Continuous Female Companionship During Childbirth: A Crucial Resource in Times of Stress or Calm

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Continuous support by a lay woman during labor and delivery facilitates birth, enhances the mother's memory of the experience, strengthens mother–infant bonding, increases breastfeeding success, and significantly reduces many forms of medical intervention, including cesarean delivery and the use of analgesia, anesthesia, vacuum extraction, and forceps. The contribution of doula care has become increasingly available in industrial countries and is beginning to be adopted in hospitals in underdeveloped countries. Research continues to demonstrate the far-reaching value of supportive companionship as a corollary to professional health care during birth. Mothers who are at risk because of medical or social factors and those delivering in situations of stress, including disasters, can benefit greatly from labor support.
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keywords: childbirth, obstetric labor, massage, developing countries, stress, disasters, doula, continuous support, labor support

INTRODUCTION

Throughout time and in most known civilizations, women have cared for women during labor and delivery. Artistic depictions of birth through the centuries commonly show a midwife receiving the baby and one or more women standing next to or behind the birthing woman, offering touch and comfort (Figure 1). Today, the introduction of doulas—women experienced in childbirth who provide continuous physical, emotional, and informational support for women during birth and postpartum[1]—is reconnecting this time-honored circle of support.

Extensive research has demonstrated that continuous female companionship during labor in US and international hospitals has a profound effect on both medical outcomes and the woman's feelings about the birth and herself while enhancing her ability to bond with, care for, and breastfeed her newborn. In resource-poor settings, the implementation of doula programs brings a nurturing touch to women in labor and creates an informal network of support and knowledge sharing. This article summarizes current research findings about the effects of doula care. Specific labor support techniques that can be applied by untrained persons in emergency or low-resource situations are described.

BACKGROUND: THE DOULA'S ROLE

Doula care is based on the belief that labor and birth constitute a psychosocial process as well as a physiologic one. Remaining at the birthing mother's side continuously throughout labor and delivery, a doula offers comfort techniques such as massage, touch, acupressure (Figure 2),[2] and hot and cold compresses; assists with encouragement, visualizations, and coping strategies; and suggests position changes that facilitate rotation and descent (Table 1). Doulas support the partners, family members, and friends accompanying women during birth. In addition, doulas facilitate positive communication among all those present, including health care providers.[3–9]

Doulas respect women and encourage them to take an active part in their own care. A doula protects and nurtures the woman's memory of birth, helping to ensure a positive and satisfying experience. Factors that imbue the childbirth experience with a feeling of satisfaction include having good support from caregivers, having a high-quality relationship with caregivers, being involved in decision making about care, and having experiences that are better than expected.[10]

Doulas ensure that a woman's needs and birth preferences are heard and respected on a day that she will never forget.[11] The words and actions of everyone who is present at the birth will leave lasting memories. Although many partners provide support at birth, they often find it difficult to watch a loved one in pain and may also be fearful and nervous. The presence of a doula reassures the partner, building confidence and offering guidance in providing comfort techniques and loving support. In addition, a doula's continuous presence permits other support persons to take meal breaks or a walk.

PHYSIOLOGIC EFFECTS OF EMOTIONAL SUPPORT DURING LABOR AND BIRTH

An unfamiliar setting, unknown staff, and the many procedures involved in even a normal birth can induce stress. There is some evidence that fear, pain, and anxiety induced by encountering attendants, most or all of them strangers, in a busy clinical environment can trigger a catecholamine release that in turn can impede the progress of labor.[12–14]

When the laboring woman is calmer and more confident, labor proceeds more rapidly. A review of animal and human studies on the stress response in females by Taylor et al.[15] proposes that women respond to stress with a

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Figure 1. Northern Cambodia statue of two women offering support during birth. Photograph by Reva G. Kidd. Reproduced with permission.

cascade of brain chemicals that facilitate bonding with other women. In a woman, the release of oxytocin as part of the stress response may buffer the fight-or-flight response and encourage her to tend children and gather with other women. When women engage in "tending" behavior, more oxytocin is released, further countering stress and producing a calming effect.[15] This response could represent the mechanism by which the continuous presence and nurturing touch of a doula help women and their partners to feel calmer during the labor process. In addition, massage increases oxytocin release, which leads to a marked increase in the mother's pain threshold, drowsiness, some relaxation and calming, and an increased feeling of closeness to the baby after the birth.[16]

Penny Simkin, a physical therapist, childbirth educator, and doula, has described the state of "emotional dystocia," in which distress from deep emotional issues causes excessive production of catecholamines, which reduce circulation to the uterus and placenta. As a result, contractions are inefficient and fetal oxygenation is reduced. Thus, labor may fail to progress. We further postulate that the woman's concerns about impending motherhood can impede the progress of labor. For example, she may suddenly identify with her own mother in either a negative or a positive way: "My mother was a terrible mother; I'm afraid I will become her." Or: "My mother was a wonderful mother; I won't be as good." Asking one simple question—"What was going through your mind during your last contraction?"—encourages the laboring woman to consult her emotional state. If she expresses or releases her feelings, her doula can provide sensitive emotional support to help her reconcile strong emotions that cause anxiety and increased catecholamine production.[6]

In a randomized controlled study, South African researchers examined the effects of support during labor and birth on women's confidence and how they affect adjustment to motherhood.[17] The authors, concluding that doula care significantly modifies factors that contribute to postpartum depression, emphasize "the value of paying attention to the human environment in which birth takes place." They state that during labor, women are uniquely sensitive to environmental factors. Therefore, events and interactions during labor may have "far-reaching and powerful psychologic consequences."

LITERATURE REVIEW

The first study on continuous support in labor, published almost a quarter of a century ago, awakened general awareness of the value of this forgotten traditional practice. Subsequently, numerous studies have validated the many benefits of woman-to-woman support in labor in both developed and developing nations. It is not the purpose of this review to present a comprehensive listing from the vast literature on this subject; rather, we describe representative studies from several countries that encompass the experiences of women in both developed and low-resource areas.

Guatemala

While conducting early bonding studies in Guatemala, pediatrician John Kennell, MD, and neonatologist Marshall Klaus, MD, "unexpectedly" observed that continuous female support had a profound effect on the mother, her birth

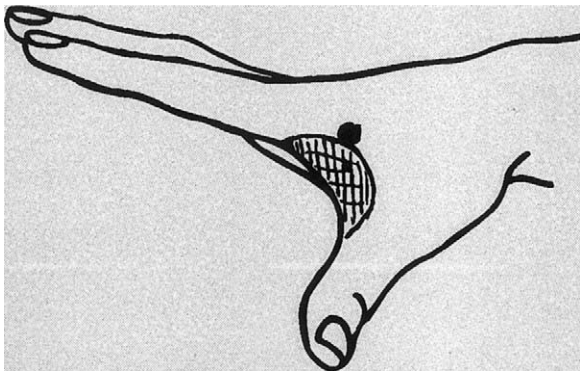

Figure 2. Ho-ku acupressure point. Reprinted with permission from Waters and Raisler, 2003.[2]

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Mary Kroeger, CNM, MPH, is an independent international health consultant. The author of *The Impact of Birthing Practices on Breastfeeding: Protecting the Mother and Baby Continuum* (Jones & Bartlett, 2004), she has worked with the United Nations Children's Fund, the World Health Organization, the American College of Nurse-Midwives, and other non-governmental organizations and national ministries of health.

Table 1. Quick and Easy Comfort Measures

Touch and Massage

Touch, a key aspect of offering comfort, provides emotional support, helps the birthing woman to relax, and eases pain.[4] Support people who establish a close relationship with a laboring woman, whereby she feels safe and nurtured as she is stroked, touched, or massaged, contribute greatly to relaxation and pain management and may improve other obstetric outcomes as well.[5]

Acupressure

The theory behind the use of acupressure during birth is that poor progress or excessive pain in labor is caused by a blockage of energy flow along a meridian of the body. Releasing the blockage permits the energy to flow.[6] Among the acupressure points recommended for labor pain, the most commonly used site is on the hand. Women often report a significant reduction in pain when pressure is applied as follows: Squeeze (from both front and back) the soft tissue between the metacarpal bones of the thumb and the index finger.

The 3 Rs: Relaxation, Rhythm, Ritual

Relaxation

Birthing women are encouraged to practice rhythmic breathing to induce relaxation. As the labor companion matches her words to the woman's breaths, she encourages her, in a calm, gentle voice, to breathe for her baby, exhaling her tension and relaxing all the muscles in her body.

Rhythm

Movement is a natural response to discomfort. Just as babies are rocked in relationship to the amount of distress they are expressing, rhythmic movements can calm the birthing woman. Rhythmic movements in labor may promote labor progress by altering the relationship of gravity to the fetus and pelvis.[4] The woman can also achieve rhythm through vocalizations; a silent focus on a mantra, prayer, or rhyme; and in the way she is stroked, spoken to, or rocked.[7]

Ritual

If the birthing woman discovers an activity that helps her cope, she may want to repeat it during every contraction. Doing this becomes her ritual. The support team and caregivers should take pains not to disturb her, since she may have difficulty in resuming the ritual after any interruption.[7]

Visualization

Mental imagery reduces fear, tension, and pain during labor. The pleasant thoughts or images they conjure up can increase both physical and mental relaxation. Understanding the sorts of images that tend to make birthing women feel safe, protected, relaxed, and strong is a powerful tool in supporting and guiding them through labor. Some images can help the woman to feel a connection with her baby and her body opening.[8]

Position Changes

One way to promote the progress of labor is to encourage birthing women to move in response to the sensations they are feeling. They should be helped to identify physical positions that are comfortable and that use gravity to facilitate labor and reduce pain. Such positions include walking, lunging, and asymmetrical positions that alter and increase the size of the pelvis on the same side as that on which the baby's back is lying. All positions that involve leaning forward promote rotation. Other helpful positions include standing upright, kneeling, leaning on the partner or doula, standing "on all fours," sitting or leaning over a birth ball, side-lying (on the same side on which the baby's back is lying), and lying semi-prone on the side opposite the baby's back.[5,9] In the presence of back pain, which is common with posterior presentation, position changes and comfort techniques provided by the support person can be crucial not only in helping the birthing woman to cope with pain but also in facilitating fetal rotation.

Sources: Lothian, 2000[4]; Simkin and O'Hara, 2002[5]; Simkin and Ancheta, 2000[6]; Simkin and Frederick, 2000[7]; Klaus et al., 2002[8]; and Simkin, 2002.[9]

outcome, and early interactions with her baby. This finding led the researchers to conduct the first randomized study on the subject. The results, published in 1980,[18] showed that labor was dramatically shorter in women who had experienced the continuous presence of a non-clinician during birth compared with those who had received routine care (8.8 vs 19.3 hours, respectively; $P < .001$).

Shortly after conducting the initial Guatemala study, the same US-based group performed a larger study, again in Guatemala, whose results replicated "and substantially extended" those of the first study. The investigators found that the introduction of support during labor was associated with a reduced prevalence of perinatal complications (37% vs 76%; $P < .001$) "in a population of poor women who routinely undergo labor alone in a crowded ward."[19]

South Africa

In 1991, Hofmeyr and colleagues in Johannesburg, South Africa, published the results of a randomized controlled trial of 189 women in which half were attended by volunteer doulas and half were offered routine care.[20] The doulas were previously unknown to the women in labor and not part of the hospital medical or nursing hierarchy. The doulas were members of the local community and, therefore, had values in common with the parturients as well as the ability to communicate with them effectively. The companions were instructed to provide comfort, reassurance, praise, and genuine emotional support.

The doula-attended group more frequently reported that they had coped well during labor compared with the self-evaluation of the women in the control group. The following specific self-assessment measures were improved in the doula group compared with the women in the control group at 6 weeks after delivery: exclusive breastfeeding (51% vs 29%; $P < .01$); flexible feeding schedules (81% vs 47%; $P < .0001$); managing well with baby (91% vs 65%; $P < .001$); and "found it easier to become a mother" (45% vs 11%; $P < .001$). The investigators concluded that these measures of confidence may be of considerable importance if they facilitate breastfeeding, which is "literally a matter

of life or death" in communities lacking access to other safe feeding methods. "To explain the pronounced and persistent effects on feeling, perceptions, and behavior of a relatively short-lived intervention (the doula)," the authors state, "we need to accept the premise that labor is a time of unique sensitivity to environmental factors and that events and interactions during labour may have far-reaching and powerful psychological consequences."[20]

Mexico

In 1998, the results of a large randomized controlled trial in Mexico City of trained doula care versus "routine care" demonstrated that psychosocial support during labor, childbirth, and the immediate postpartum period increased breastfeeding by improving women's emotional state and shortening labor even when the incidence of other labor interventions was not altered.[21] The authors theorized that community doulas might have been more effective than the retired nurses who had been hired to provide support. The nurses, they wrote, may have been desensitized to the feelings of women in labor and may have brought with them a professional hierarchy and a more patronizing attitude.

META-ANALYSIS OF CONTINUOUS SUPPORT IN LABOR TRIALS

In July 2003, the internationally respected Cochrane Library published a systematic review of the effects of continuous labor support.[22] The review includes 15 studies summarizing the experiences of a total of 12,791 women in Australia, Belgium, Botswana, Canada, Finland, France, Greece, Guatemala, Mexico, South Africa, and the United States. The Maternity Center Association, a supporter of this work, has made the entire review available on its Web site (*http://www.maternitywise.org/pdfs/continuous_support.pdf/*).

A major contribution of this analysis is the observation that the type of person who provides labor support makes the greatest difference. At least four of the studies in each category, involving a total of at least 1000 women, demonstrated that the effects of labor support were greater when continuous support was provided by a caregiver who was not an employee of the hospital. Women who received continuous support were 36% less likely than women who did not receive continuous support to report dissatisfaction or a negative rating of their birth experience, 28% less likely to receive analgesia or anesthesia, 26% less likely to give birth by cesarean delivery, and 41% less likely to give birth with vacuum extraction or forceps. The reviewers conclude that continuous support during labor "should be the norm, rather than the exception. All women should be allowed and encouraged to have support people with them continuously during labor."[22] Data show that the greatest benefits from continuous support during labor accrue when support begins in early labor, when the provider is not an employee of the institution, and when epidural analgesia is not routinely used.

Continuous Versus Intermittent Labor Companions

In a meta-analysis of 11 clinical trials by Scott et al.,[23] five studies included continuous support by predominantly community-based lay women and six trials included intermittent care by midwives and midwifery students. The departure from the labor room by midwives or students taking breaks or attending to other responsibilities for 1 hour or more decreased their ability to provide the benefits associated with uninterrupted support by lay providers.

Trained Versus Untrained Labor Companions

Similar positive conclusions were drawn in a recent review published in this journal.[24] Rosen analyzed eight published reports of labor support provided by persons in five categories: unfamiliar, untrained lay women; unfamiliar, trained lay women; female relatives; nurses; and monitrices (lay midwives acting solely as labor support persons). The author found that support by untrained laywomen, starting in early labor and continuing into the postpartum period, provided the most consistent beneficial effect on childbirth outcomes. Rosen concludes: "All persons planning to provide labor support must be capable of being fully present to the woman, accepting her attitudes and behaviors, and offering her ongoing praise and encouragement as she strives to have a safe and satisfying birth experience."[24] This is the essence of doula care.

Inclusion of the father, long barred from the birth, on the labor support team has become standard in the United States. The doula encourages the father's participation and teaches him how to support his partner physically and emotionally throughout the birth (Figure 3). The addition of a doula to the mother–father dyad during birth has been shown to improve outcomes. In a randomized controlled trial of births in which the woman's partner or spouse was present, one group received continuous support by a doula and the other did not. The former had a significantly lower rate of cesarean delivery (15.0% vs 24.2%; $P < .014$) and fewer requests for epidural analgesia (68.7% vs 80.5%; $P < .004$).[25]

DOULA CARE FOR HIGH-RISK POPULATIONS

Because research has identified a positive impact of labor support on certain birth outcomes, on women's perceptions and behavior during birth, and on outcomes such as breastfeeding success in the immediate postpartum period, it seems plausible that this impact might be magnified with more vulnerable mothers. When childbirth occurs at a time of intense personal emotional, social, or cultural stress or during a natural disaster, social or civil unrest, or a refugee situation, the benefits of doula care are likely to be

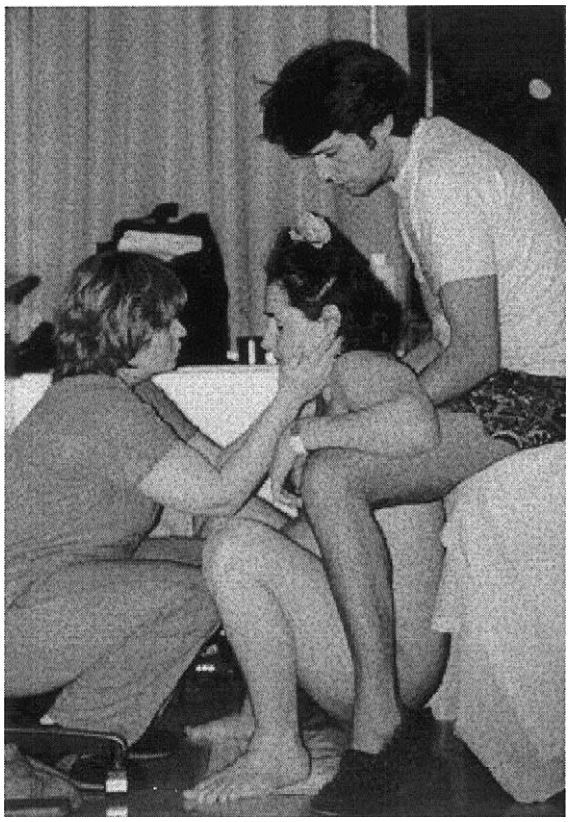

Figure 3. The doula and partner support the birthing woman together in ways that neither could achieve separately. Photograph by Judith Elaine Halek. Reproduced with permission.

especially powerful. Although this hypothesis has not yet been well studied, early reports are promising.

Reaping the beneficial effects of doula support may be especially important for high-risk mothers with limited social resources. In the United States, programs providing doula care to underserved populations are gaining in popularity and support. For example, a project in Boston, the Cambridge Doula Program, is currently training doulas from a diverse inner-city community that serves a predominantly Medicaid-eligible at-risk population (see discussion box on page 24). This program is an example of a doula intervention that serves women from diverse cultural backgrounds and intentionally provides doulas to women preassessed to be at social risk.

The Chicago Health Connection Doula Project (*http://www.chicagohealthconnection.org*), begun in 1998, has demonstrated positive outcomes following the provision of labor support for single low-income adolescent mothers. The mothers in the study group received a total of six doula visits, both before and after birth, as well as continuous support in labor. In preliminary data, from 217 doula-assisted births, the cesarean birth rate was 7%, well below the rate of 14.5% among US mothers under age 20. Doula-supported clients had an epidural rate of 11.4%, far lower than the estimated national rate of 50%.[26]

More than 80% of the adolescents assisted by doulas initiated breastfeeding. This rate was more than 1.5 times greater than the rate for US mothers under age 20.[27] Of these, 64.6% continued to breastfeed exclusively for at least 6 weeks.[16,28] The presence of a supportive environment before birth, during labor, and postpartum, aided by a team approach between health care personnel and doulas, may markedly enhance the parenting skills of women in high-risk settings.[29,30]

Doula's Role for Women With a History of Abuse

Labor can trigger memories of sexual abuse, violence, and other profound life experiences.[6] Simkin and Klaus propose that a doula's presence may benefit women with a history of sexual abuse in many ways.[31] If distrust of authority figures is an issue, for example, she may serve as an intermediary with the caregiver. If the woman fears abandonment or solitude, the doula's continuous presence will reassure her. If fear of losing control is an issue, the doula can help ensure that the woman's birth plan is followed by asking nurses and other caregivers whether they have reviewed it. If the plan is not being followed, doulas can remind the woman or her partner to address the problem directly with the nurse or caregiver.

The doula who is aware of the woman's triggers and personal strategies can help her to cope in a stressful situation. With the woman's permission, the doula can inform the staff about the abuse and its impact on the woman so that they can better understand and respect her needs. By being aware of the additional stressors experienced by pregnant or laboring women who have been abused, the doula can adapt care to reduce the potential for new trauma.

A doula's nurturing presence can help the woman to feel safe in a foreign setting and to move past her memories and into her labor and birth feeling safe and secure. By meeting the woman's emotional needs during labor, the doula reduces distress and anxiety, diminishing the effects of prolonged labor.[31]

IMPORTANCE OF CONTINUOUS SOCIAL SUPPORT IN TIMES OF DISASTER

Although data in this area remain scarce, logic and the extensive related psychological research should be considered. Disaster programs need to include supportive attendants during labor and delivery. One reason additional care during birth may be warranted in times of disaster is that such events can redouble trauma by triggering memories of abuse.

Even in a disaster situation, when new personnel cannot be trained, merely enlisting the supportive presence of community members can improve the birth experience and outcomes while reducing medical interventions. That the doula's greatest contribution is her continuous presence was demonstrated in a study by Kennell et al. of 615 birthing women at a low-income hospital in Houston.[32]

MULTICULTURAL DOULA OUTREACH PROGRAM

The Cambridge (Massachusetts) Doula Program began in 1995 with grant funds from the Boston Foundation. (All information on this program was obtained through personal communication with Lorenza Holt, Doula Coordinator, Cambridge Doula Program, Cambridge Health Alliance, Cambridge MA, February 2004.) By early 2004, the program had trained 52 multicultural doulas to help women from Bangladesh, Haiti, India, Pakistan, and Tibet as well as various countries in Africa, Asia, and Europe. The doulas serve not only English-speaking women but also women whose first language is Arabic, Bengali, French, German, Haitian Creole, Hindi, Italian, Portuguese, Punjabi, Spanish, Urdu, and Vietnamese. From June 1996 through early 2004, doulas had attended 1,369 births at Cambridge Hospital and the Cambridge Birth Center, 2326 postpartum home visits, and 1214 prenatal home visits.

Doulas are recommended when the pregnant woman is a teenager or when a preassessment identifies a language barrier, lack of family support, or a history of trauma or depression. Doulas not only help to improve birth outcomes but also facilitate communication, increase patient satisfaction, and link families back to the medical system for appropriate postpartum or neonatal interventions. Doulas making home visits have identified mothers with symptoms of postpartum depression, infants who were receiving insufficient nutrition, lack of household food or heat, and domestic violence. When necessary, the doula helps the mother and family contact the Cambridge Health Alliance to request professional services or community organizations for extended support services.

Women were divided into three groups. One group received the continuous support of a doula; one was observed but not touched or communicated with during labor; and one served as a control group. The cesarean delivery rate was 8% in women attended by a doula, 13% in women who had had an observer in the room, and 18% for women in the control group ($P = .004$ for the supported group versus the control group; differences with the observed group were not statistically significant).

The same pattern was evident in use of epidural anesthesia, spontaneous vaginal delivery, use of oxytocin, duration of labor, prolonged infant hospitalization, and maternal fever. "Even in a busy, well-staffed labor area," the authors conclude, "a mother may feel alone and needy." Women in disasters may also be alone and potentially separated from family and friends, increasing their need for the continuous presence of another woman. When resources are limited or unavailable, increasing the potential for a non-interventional birth by providing a doula or continuous companion may contribute greatly to maternal and infant well-being.

IS DOULA CARE PRACTICAL IN RESOURCE-POOR COUNTRIES?

The cumulative experience of 13 years of training maternity staff in developing countries in lifesaving skills through the American College of Nurse-Midwives has revealed that in most government hospitals in underdeveloped regions of the world, family members are still excluded from the labor wards (personal communication, Sandra T. Buffington, February 2004). Reasons given include hospital policy, lack of space or privacy (mothers typically labor and deliver in large open wards), fear of spread of infection or criticism of staff performance, or simply the assumption that relatives will "get in the way." These reasons resemble those that were in place in the United States 30 years ago, when families began to demand the presence of a spouse or partner in the labor wards. In fact, it is in resource-poor settings that family support may best serve the staff, because midwives must often attend numerous laboring women, reducing the time available to give much personal attention to each.

The authors of a Zambian study on barriers to introducing social support during labor and birth concluded that the health staff's negative views were based largely on their unwillingness to accept a practice that was traditional rather than evidence based. Health care personnel, the authors urge, should be exposed to new research findings through continuing education, and this new knowledge should be included in the midwifery curriculum.[33]

One randomized controlled clinical trial in Botswana studied 109 young, nulliparous mothers (average age 19 years) at a large referral hospital.[34] Each member of the study cohort chose a female relative who was untrained in any special doula techniques to remain with her throughout labor and delivery. Women in the control cohort received routine care by the staff. Outcome differences were dramatic. The supported group had significantly higher normal spontaneous deliveries (91% vs 71%, $P < .05$), half as many cesarean deliveries, one fourth as many vacuum extractions, and significantly less need for anesthesia, amniotomy, or oxytocin augmentation. The differences were all statistically significant ($P < .05$).

Mothers in the study area had lived in settings where delivery normally took place at home with a traditional birth attendant and support from female family members. The authors theorized that the supported mothers "suffered less stress, pain, anxiety, and tension" as a result of having a relative at the bedside. An unexpected outcome was that staff midwives responded spontaneously to the study by inviting companions to be with women who were not part of the study.

PROMOTING LABOR SUPPORT WORLDWIDE

Thanks in part to the growing accumulation of study data, interest in continuous support during labor and birth has expanded greatly. The recommendation that such support be provided has appeared in an increasing number of official documents, national and global initiatives, and a law.

Society of Obstetricians and Gynaecologists of Canada

A strong affirmation of labor support for all women was published by the Society of Obstetricians and Gynaecologists of Canada nearly a decade ago. The society's 1995

Guidelines on Dystocia state, "The continuous availability of a caregiver to provide psychological support and comfort should be a key component of all intrapartum care programs, which should be designed for the effective prevention and treatment of dystocia (non-progressive labor)."[35]

Coalition for Improving Maternity Services

The first of the 10 steps of the Mother-Friendly Childbirth Initiative, published in 1996 by the Coalition for Improving Maternity Services (CIMS), incorporates the need for a doula. The Initiative states that the mother-friendly hospital, birth center, or home birth service should offer to all birthing mothers[36]

- Unrestricted access to the birth companions of their choice, including father, partner, children, family members, and friends
- Unrestricted access to continuous emotional and physical support from a skilled woman—for example, a doula or labor-support professional
- Access to professional midwifery care

The Bologna Score of Evidence-Based Management

The World Health Organization Regional Office for Europe convened a meeting in January 2000 to develop key indicators for evaluating effective care during normal labor. Motivation was based on growing concerns that in many countries, labor was considered "abnormal" in increasingly and unjustifiably large proportions, thus consuming scarce resources that would be more appropriately directed toward genuinely abnormal pregnancy and labor. The key indicator, which comprised five measures of effective evidence-based management of normal childbirth, came to be called the Bologna Score after the venue of the meeting. These measures are

- Presence of a companion at birth
- Use of partogram
- Absence of augmentation
- Use of non-supine position
- Skin-to-skin contact of mother and baby for at least 30 minutes within the first hour after birth

Two additional indicators serve as "qualifiers" and assist in understanding the overall environment of labor management. These indicators are the percentage of women with induced labor or undergoing cesarean delivery and the percentage of women attended by a skilled attendant. Although the Bologna Scoring process has not been widely used to date, the tools are available from the World Health Organization Regional Office for Europe for field testing.[37]

Better Births Initiative

In 2000, Dr. Justus Hofmeyr and colleagues began the Better Births Initiative (BBI), which was developed following the results of observational studies that documented the gap between evidence-based care practices and labor management practices on labor wards in China, South Africa, and Zimbabwe. The BBI model is currently being instituted in several countries with the overall goal of improving obstetrical care in developing nations. The BBI "targets practices that can help save lives and improve the quality of care and practices that are harmful or unnecessary. The Initiative has identified practices relevant to middle- and low-income countries where research evidence available through the WHO Reproductive Health Library provides some guidance on best practice. The interventions are grouped around three areas: saving lives, improving quality, and avoiding harms."[38]

Companionship provided by a family member or lay carer during labor is a component of improving quality. A videotape from the BBI, "Real Experiences of Implementing Companionship in Labour Wards in South Africa," is available online (*http://www.liv.ac.uk/lstm/ehcap/BBI/bbiresourceguide.htm*).

Global Health Council

A recent report from the Global Health Council, based in Washington, DC, states that companionship by a family member or "lay carer" during labor "improves maternal satisfaction, shortens labor, improves breastfeeding, and reduces the need for pain relief and assisted delivery." Mobility during labor, an important aspect of labor support, shortens labor and reduces the need for pain relief and assisted delivery.[39]

Uruguay Legislation on Labor Support

In 2001, Uruguay became the first country in the world to pass legislation mandating the right of every birthing woman to have continuous support. Law No 17.386 states that "every woman, during the time her labor lasts, including the moment of birth, has the right to be accompanied by a person she trusts, or if not, at her own will, by somebody specially trained to provide her [with] emotional support." This applies to "all professionals and health care institutions, being either public or private."[40]

CONCLUSION

It is no coincidence that the original doula studies emerged from studies intended to evaluate bonding, for the two are intertwined. A woman's experience at the time of childbirth is influenced by her own preconceptions, expectations, and history. Just as important, however, her experience is influenced by the environment in which she labors and gives birth. Every person who comes to her bedside, every medical procedure and intervention, every medication she is given can directly or indirectly affect how she will labor, how she will deliver, and how ready she will be to receive and breastfeed her newborn.[41]

In resource-poor settings and countries, epidural and other forms of anesthesia—in fact, most methods of pain relief—are not widely available during labor. Staff shortages and, at times, poor staff attitudes and morale leave many laboring women alone and frightened, lying on their backs, often with little privacy, without fluids to drink, and lacking the reassuring comfort of touch. Yet the basics of labor support can be learned quickly and applied immediately. By focusing attention on the laboring woman, the labor companion facilitates birth, helping to make the experience a joyous occasion for the woman she attends.

Even in settings of armed conflict or natural disaster, women deliver babies and must take care of them. Often there is an extreme shortage of trained providers to attend to childbirth. Disaster relief agencies and policy makers would do well to understand and provide the benefits of ensuring a labor companion—even a willing person who lives in a nearby tent—thus facilitating a shorter, more normal birth. Support during labor also improves early mothering and breastfeeding. In emergency situations, exclusive breastfeeding provides optimal nutrition, maintains warmth, and protects the neonate against infectious disease.

Whether in areas of disaster or calm, in industrialized or developing countries, or in urban or rural settings, doula care complements that of the trained birth attendant. A relatively new, yet age-old, addition to the maternity team, the doula helps to maintain a positive environment for laboring women and their partners and families as well as for midwives, nurses, and all other health care providers. The continuous presence of a birth attendant such as a doula clearly is a best practice.

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Pregnancy and Childbirth Care Following Conflict and Displacement: Care for Refugee Women in Low-Resource Settings

Judith O'Heir, NM, MN

Women in developing countries experience the same problems during pregnancy and childbirth and die of the same complications, regardless of whether they live in stable situations or in situations of conflict and displacement. They need services and/or care during pregnancy and childbirth wherever they are and in whatever circumstances prevail. This article provides an overview of the Safe Motherhood Initiative, including the recent directions taken to prevent maternal and neonatal mortality and morbidity. In addition, pregnancy and childbirth care in complex humanitarian emergencies is examined, highlighting the experiences in refugee settings. In some of these settings, pregnancy outcomes have been better than in host or home countries. The challenge remains to ensure that good-quality pregnancy and childbirth care, in line with the global standards set for achieving safe motherhood, is consistently available and accessible to women affected by complex humanitarian emergencies. J Midwifery Womens Health 2004;49(suppl 1):14 –18 © 2004 by the American College of Nurse-Midwives.

keywords: safe motherhood, pregnancy and childbirth care, complex humanitarian emergency, pregnancy outcome, refugee setting

INTRODUCTION

Every year, approximately 210 million women become pregnant and about 130 million give birth.[1] Although most of these pregnancies proceed uneventfully, it is estimated that 15% develop complications, approximately one third of which are life-threatening. Thus, more than half a million women, the majority of whom live in developing countries, will die each year as a result of these complications.

Factors, such as poverty, lack of education, early childbearing, malnutrition, and the low status of women and the limited choices they have in their lives, impede access to care when women most need it. Collectively, these factors contribute to maternal deaths. In addition, the health care systems in many developing countries fail to provide the care necessary to prevent, detect, and manage the major obstetric complications and/or the equipment, drugs, and supplies to respond effectively.

This article begins with an overview of the Safe Motherhood Initiative, highlighting the recent directions taken to prevent maternal and neonatal mortality and morbidity. Pregnancy and childbirth care in complex humanitarian emergencies is examined, with particular emphasis on the experiences in refugee settings.

SAFE MOTHERHOOD

The Safe Motherhood Initiative (SMI), launched in 1987 at an international conference held in Nairobi, Kenya, aimed to place maternal health at the forefront of the international public health agenda; attention was drawn to the magnitude of poor maternal health in developing countries and to the need for countries to address the high rates of maternal mortality and morbidity caused by the complications of pregnancy and childbirth. The goal of the SMI, which was later adopted at several United Nations (UN) conferences, was to reduce maternal mortality by half by the year 2000; however, the estimates of maternal mortality, based on 1995 data and released by the World Health Organization (WHO) in 2001, indicate that the estimated number of maternal deaths had not fallen as anticipated.[1]

Nonetheless, during the first 10 years of the SMI, much was learned about interventions that are effective, barriers preventing access to care, constraints to program implementation, and the elements of care that are essential during pregnancy and childbirth. However, efforts to reduce maternal mortality were often spread too thin, were too technical, and managerial and political problems hampered progress. The lessons learned were highlighted at the Safe Motherhood Technical Consultation held in 1997 in Colombo, Sri Lanka,[2] and form the basis of a joint WHO/United Nations Population Fund (UNFPA)/United Nations Children's Fund (UNICEF)/World Bank statement on the reduction of maternal mortality, released in 1999.[3] The joint statement is addressed to governments, policy makers, program managers, non-governmental organizations (NGOs), community members and WHO, UNFPA, UNICEF, and World Bank staff. The statement aims to facilitate decision making at national and local levels, adapt interventions to meet the specific needs of the country/situation, mobilize resources, and use them effectively to make pregnancy and childbirth safer.

The key messages in the joint statement describe the policy and legislative actions, the social and community interventions, and the health sector actions needed to reduce maternal mortality. In essence, Safe Motherhood is recognized as a human right, supported by laws that lead to

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increased access for women to good-quality health care services during pregnancy and childbirth.

In connection with the joint statement, WHO has embarked on Making Pregnancy Safer,[4] an initiative that aims at refocusing the WHO strategies and support for Safe Motherhood. Although the overall goals for the SMI and Making Pregnancy Safer are the same, the aim of the latter is to work with the health sector, focusing on effective evidence-based interventions that target the major causes of maternal and neonatal mortality and morbidity by strengthening the health system and identifying actions at the community level needed to ensure that women and their newborn have access to the care that they need.

Other recent examples of support for safe motherhood include JHPIEGO's Maternal and Neonatal Health (MNH) Program[5] and Columbia University's Averting Maternal Death and Disability (AMDD) Program.[6] The MNH Program strives to improve maternal and newborn survival through increased access to, demand for, and use of services provided by skilled health care workers, and uses interventions that are evidence-based and applicable to the lessons learned for saving the lives of mothers and their newborn. The AMDD program was launched in 1999 to work with developing countries on improving the availability, quality, and use of emergency obstetric care (EmOC).

PREGNANCY AND CHILDBIRTH CARE IN COMPLEX HUMANITARIAN EMERGENCIES

To this point, an overview of safe motherhood in developing countries has been presented, together with recent programmatic responses for improving care during pregnancy and childbirth to reduce maternal and neonatal mortality and morbidity. Many, if not most, developing countries have, even at the best of times, limited resources in terms of health care facilities, trained personnel, and essential supplies and equipment. What happens, then, when one of these countries experiences a complex humanitarian emergency? What has experience shown about reproductive health care when this occurs? And, with respect to Safe Motherhood, what services do women need during pregnancy and childbirth in situations of conflict and displacement?

The traditional response to complex humanitarian emergencies has been to provide food, clean water, shelter, sanitation, and basic health care to combat malnutrition and infectious diseases. Until the mid 1990s, the response to reproductive health needs during complex emergencies was limited. In 1993, for example, the Women's Commission for Refugee Women and Children found few or no reproductive health services offered in eight refugee sites visited. However, there has been considerable improvement in the attention given to reproductive health in war-affected and displaced populations since then. In 1994, at the International Conference on Population and Development, held in Cairo, the reproductive health needs of migrant populations, including refugees and the displaced, were acknowledged. Following that meeting, the Interagency Working Group on Reproductive Health in Refugee Situations formed, with representatives from UN agencies, NGOs, and governments. In addition, representatives from a group of NGOs formed the Reproductive Health for Refugees Consortium.[7]

In 1995, following an interagency Symposium on Reproductive Health in Refugee Situations, an Interagency Field Manual on Reproductive Health in Refugee Situations[8] was produced and distributed for field-testing in countries around the world. The revised version of the *Field Manual* was made available in 1999; it supports the provision of quality reproductive health care, including care during pregnancy and childbirth, and is based on technical standards set by WHO (full text of the *Field Manual* is available at *http://www.unfpa.org/emergencies/manual/index.htm* or *http://www.unhcr.ch/cgi-bin/texis/vtx/publ*).

In addition to the *Field Manual*, a Minimal Initial Services Package (MISP) was developed, which incorporates the basic reproductive health services needed during the initial acute phase of an emergency situation. UNFPA assembled the material resources necessary for implementing the services into a kit, *The Reproductive Health Kit for Emergency Situations,*[9] which is made up of 12 subkits. With regard to pregnancy and childbirth care, the following subkits apply:

Subkit 2: clean delivery sets

Subkit 6: professional midwifery kits

Subkit 8: management of abortion complications

Subkit 9: suture of cervical and vaginal tears

Subkit 10: vacuum extraction

Subkit 11: surgical and other life-saving interventions

Subkit 12: blood transfusion

During the 2 years or so following the introduction of The Reproductive Health Kit it was used in 34 countries, and the subkits most frequently ordered were those designed for births (i.e., subkits 2 and 6).[10]

This is the experience at a programmatic level with respect to recognizing and responding to reproductive health needs, including the needs of women during pregnancy and childbirth, in the event of a humanitarian emergency. However, it is also important to consider what happens "on the ground" or beyond the programmatic level.

Judith O'Heir, NM, MN, is an international consultant for reproductive health and safe motherhood, with recent experience in Afghanistan. Several years ago she compiled a *How To Guide for Strengthening Safe Motherhood Services* in refugee settings and is currently coordinating the Interagency Global Evaluation of Reproductive Health Services for Refugees and Internally Displaced Persons.

WHAT HAS EXPERIENCE SHOWN?

Several years ago a review of data from both published and unpublished sources was conducted to determine if and how reproductive health is affected by refugee or displaced status.[11] Most of the data were from work undertaken in the 1990s, although some studies from the 1970s and 1980s were also reviewed. Refugees living in stable camp settings comprised the population most often studied.

In terms of safe motherhood, the review of available data on pregnancy outcomes for mother and baby suggest that poor pregnancy outcomes are common in many war-affected populations and may be worse during the acute phase of an emergency. However, the data suggest that once stabilization occurs, adverse pregnancy outcomes may be no more common than in host or home countries. For example, in 1998 the United Nations High Commissioner for Refugees (UNHCR) compiled service and survey data on reproductive health from eight refugee settings around the world, indicating that neonatal death rates and estimates of maternal deaths at all sites were lower than estimates for both host and home countries.[12] The main explanation provided for better pregnancy outcomes is the availability and use of health services. This explanation is supported by a review of emergency obstetric care available to refugees at eight sites in Africa; refugees at all of these sites had access to at least some aspects of emergency obstetric care. Overall, the emergency and other services available to refugees at these sites were found to be better in both quality and quantity than in their home country during, and in most cases, before the conflict that made them refugees.[13]

The findings of a recent study of maternal mortality among Afghan refugees in Pakistan[14] indicate that the maternal mortality ratio and lifetime risk of maternal death was significantly lower than the corresponding numbers reported in Afghanistan. The maternal mortality ratio for Afghan refugees in Pakistan was 291 per 100,000 live births compared to 820 per 100,000 for Afghanistan. However, most of the refugee women (27 of the 66 deaths among women of reproductive age were due to maternal causes) who died of maternal causes faced multiple barriers to health care and their deaths were preventable. Although 60% of the babies born to these women were either born dead or died after birth, the neonatal mortality rate was 25 per 1000 live births compared to 121 per 1000 for Afghanistan. At the conclusion of this study, suggestions to overcome barriers at the first level of care included increasing the number and training of lay midwives; educating women, men, and their families about symptoms and signs expected in healthy pregnancies and those with complications; and seeking antenatal care and delivery with a trained birth attendant. In addition, the need to improve the availability and accessibility of comprehensive essential obstetric care was identified.

In 1998, during an assessment of safe motherhood services in 10 refugee camps in Tanzania,[15] the number of maternal and neonatal deaths in the camps was found to be small. For example, 11 maternal and 35 neonatal deaths were recorded between January and October 1998 in these camps. The maternal mortality ratio for this period in 7 of the 10 camps (3 camps reported that there had been no maternal deaths) ranged from 70 per 100,000 to 199 per 100,000 live births, and the neonatal mortality rate from 1 to 8 per 1000 live births, whereas the maternal mortality ratio in Tanzania, the host country, was estimated in 1995 to be 1100 per 100,000 live births and 1900 per 100,000 live births in Burundi, the home country for most of the refugees.

At the time of the assessment, most of the camps had been in existence for approximately 2 years and most had a range of services for women during pregnancy and childbirth. The services were accessible and well used by the women living in the camps and included antenatal care, labor and delivery care, care of the newborn, and to a lesser extent, postpartum care. With the exception of obstetric surgery, it was possible to manage most of the common obstetric complications in the camp health facilities. One of the 10 camps had the capacity to provide cesarean birth for women from this and an adjacent camp, whereas women from the other camps were referred to a district or mission hospital for this procedure, when necessary.

Although the overall impression of pregnancy and childbirth care in the camps was favorable, the quality of care needed improvement, particularly with respect to streamlining the provision of antenatal care, ensuring the availability of a skilled attendant for births on the maternity wards, expanding the content of postpartum care, ensuring that the referral system functions properly, and providing written clinical guidelines for all aspects of care.

In 2001, an assessment of reproductive health services was conducted in the refugee camps in Kakuma and Dadaab, Kenya,[16] where it was found that the services for women during pregnancy and childbirth were, in some respects, less comprehensive than in the camps in Tanzania. The camps in Kenya had been in existence for approximately 10 years, which may have influenced the ongoing availability of resources and the quality of the services provided. In the camps in Dadaab, for example, antenatal care was available, but important interventions were missing or poorly implemented, including intermittent preventive treatment for malaria, syphilis screening, preparation of birth plans, and individual health education and counseling. However, maternal deaths were few in number. For example, in 2000 there were 4 maternal deaths reported in the Kakuma camp and 22 in the three camps in Dadaab, with respective maternal mortality ratios of 216 per 100,000 live births and 460 per 100,000 live births. Both of these ratios were lower than the maternal mortality ratio for the host country, Kenya (1,300 per 100,000 live births at that time). The cases of maternal deaths were not reviewed in any of the camps, in either Tanzania or Kenya, at the

Table 1. Safe Motherhood Services in Stabilized Situations for Women Affected by Conflict and Displacement

Antenatal Care	Labor and Delivery Care	Postpartum Care
At least four visits during a pregnancy -Careful assessment (obstetric history and present problems/complications such as vaginal bleeding, pregnancy-induced hypertension, anemia, fever, STDs, including HIV) -Early detection and management of pregnancy complications -Syphilis screening, and treatment for woman and partner, if positive test result -Iron/folate supplementation -Vitamin A supplementation -Tetanus toxoid immunization -Antimalarials (according to country policy) and anthelmintics (hookworm) in endemic areas -Advice and counseling about choosing the safest place for delivery; the importance of clean delivery; signs and symptoms of complications; where to seek care for complications; early and exclusive breast feeding; maternal nutrition; STD/HIV/AIDS prevention; and birth spacing and family planning	Clean and safe delivery -Continue to provide clean delivery kits and train, support and supervise TBAs to perform clean deliveries, provide basic newborn care, and detect and refer problems early -Equip and staff health facilities with skilled attendants (midwives, doctors, nurses) for the detection and management of complications, including use of the partograph to monitor labor -Provide essential newborn care, including warmth, basic newborn resuscitation, cord care, eye care, and early and exclusive breast feeding Emergency obstetric care -Make available parenteral antibiotics, parenteral oxytocics, parenteral anticonvulsive and antihypertensive drugs; obstetric surgery; safe blood transfusion; and manual procedures such as those required for removal of the placenta and retained products of conception, repair of tears and lacerations, and assisted deliveries (vacuum extraction) -Referral for the management of complications beyond the capacity of on-site services	Follow-up within 24 hours of delivery, preferably by a skilled attendant -Careful assessment of mother and baby -Early detection and management of complications -Iron/folate and vitamin A supplementation -Advice and counseling on breast care; hygiene; continuation of iron/folate and vitamin A supplementation; signs and symptoms of complications and where to seek care for these; breast feeding; newborn care; and STD/HIV/AIDS prevention -Family planning counseling and methods

time of the assessments, making it difficult to identify avoidable factors; nevertheless, possible factors may include inadequate skills and abilities of the workers involved and failure of the referral system to respond to obstetric emergencies in a timely manner.

With respect to reducing maternal mortality and morbidity, the long-term aim of the Safe Motherhood Initiative is to have skilled attendants (i.e., a midwife, doctor, or nurse who is able to manage normal labor and birth recognize the onset of complications, perform essential emergency interventions, and safely refer the mother and/or her newborn, when necessary) present for all deliveries. But in the refugee settings in Tanzania and Kenya, the majority of deliveries are attended by trained traditional birth attendants (TBAs), and refugee workers who have been trained on the job often provide other services, such as antenatal care. Nonetheless, there are trained health professionals available, who meet the criteria of the skilled attendant, to provide supervision, support, and backup for these workers, particularly when complications occur, and there is a functioning referral system in place in most instances. These resources are particularly important to the work of TBAs, who provide a critical link between the community and the formal health care system in refugee settings and in many host and home countries.

This brief overview of experience indicates that reproductive health care, including pregnancy and childbirth care, has improved considerably since the early 1990s for refugees affected by complex humanitarian emergencies. The programmatic developments and the services on the ground are due to the combined efforts of governments, NGOs, and UN agencies involved in humanitarian and emergency work. Although there is not a great deal of documentation available about maternal and newborn outcomes relevant to conflict and displacement, and even less about these outcomes in the acute phase of a crises, available data indicate better, although not ideal, outcomes than in host or home countries. This is due, at least in part, to accessible health services, including those needed during pregnancy and childbirth.

WHAT SERVICES DO WOMEN NEED DURING PREGNANCY AND CHILDBIRTH?

Women affected by conflict and displacement (e.g., those who are forced to live in refugee settings) need the same services and/or care during pregnancy and childbirth as women living in host or home countries. *The Interagency Field Manual*, mentioned earlier, outlines the care needed during pregnancy and childbirth, which includes antenatal care, care during labor and delivery, care of the newborn, and postpartum care. In the initial phase of an emergency, the Field Manual focuses on

- Providing clean delivery kits for use by mothers or birth attendants to promote clean deliveries
- Providing midwife delivery kits (UNICEF or equivalent) to facilitate clean and safe deliveries at a health facility
- Initiating the establishment of a referral system for obstetric emergencies.

It is recommended, however, that as soon as is feasible, antenatal, labor, delivery, and postpartum care be organized to include the services outlined in Table 1.

CONCLUSION

Women in developing countries experience the same problems during pregnancy and childbirth and die of the same complications, regardless of whether they live in stable situations or in situations of conflict and displacement. They need the same services and/or care wherever they are and in whatever circumstances prevail.

Until the mid 1990s, reproductive health needs during complex emergencies had been given little consideration. Nevertheless, much progress has been made since then, due to the collaborative efforts of governments, NGOs, and UN agencies, both at the programmatic level and on the ground. In terms of childbirth care, the Reproductive Health Kit for Emergency Situations has been found useful with respect to providing clean and safe delivery care during the initial phase of an emergency. Once stabilization takes place, however, successful implementation of comprehensive reproductive health care depends to a large extent on factors such as the presence of well-trained staff, the availability of supplies, equipment, and drugs appropriate to low-resource settings, sufficient funds, effective community participation, and coordination among relief agencies.

These factors have made pregnancy and childbirth care in refugee settings available and accessible to women in these settings. As a consequence, experience in some of these settings has shown that pregnancy outcomes are better than in host or home countries. This is not to say that life is good for refugee women; quite the contrary—they have lost their homes, their possessions, their livelihoods, and possibly family member and friends. But what it does say is that it is possible to make pregnancy safer and prevent maternal death and disability, when concerted efforts are made to meet the needs of women during pregnancy and childbirth.

The challenge remains to ensure that good-quality pregnancy and childbirth care, in line with the global standards set for achieving Safe Motherhood, is consistently available and accessible to women affected by complex humanitarian emergencies.

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Providing a Nurturing Environment for Infants in Adverse Situations: Multisensory Strategies for Newborn Care

Rosemary White-Traut, RN, DNSc

Giving birth in dangerous settings, such as natural disasters and war, can have long-lasting consequences on infant growth and development. It is during birth and the neonatal period that mother and baby are particularly vulnerable to environmental stressors. This article explores the neurohormonal aspects of stress and social bonding and offers strategies aimed at reducing maternal and infant stress and improving the mother-infant relationship. Low-tech interventions, such as massage, Kangaroo Mother Care, and multisensory intervention (maternal voice, massage, eye-to-eye contact, and rocking) are described for their use in adverse environments. J Midwifery Womens Health 2004;49(suppl 1):36 – 41 © 2004 by the American College of Nurse-Midwives.

keywords: neonate, infant development, bonding, Kangaroo Mother Care, massage, acoustic stimulation, maternal behavior, disasters

INTRODUCTION

Over the course of history, mothers and their infants have often faced dangerous situations either through natural disasters or war. There is mounting evidence that early environmental stressors can affect infant growth and development.[1,2] Animal models have allowed researchers to study the physiologic response to stress, including hormonal regulation and neurodevelopment. The ability to measure the physiologic response to stress in infants has progressed in recent years, with the use of non-invasive methods such as salivary cortisol levels, heart rate, and respiratory rate. This article explores the neurohormonal aspects of stress and social bonding and evaluates low-tech interventions aimed at reducing maternal and infant stress in adverse environments.

Animal studies have demonstrated that early environmental events can contribute to the development of the pituitary/adrenal response to stress and can program the stress response capabilities of the nervous system.[3,4] Sensory deprivation and maternal separation, for example, have been linked to an increased magnitude of stress response and vulnerability to stress-related illness later in life in primates.[5–9] Early experience may have a long-term effect on animal behavior as well. Maternal separation has been shown to induce fearful, submissive, and less social play behaviors.[10]

The effects of stress occurring at one stage of development may depend on previous sensory experience. In rats, fearful behaviors attenuate when the pup is handled by an adult rat.[11] Thus, the timing of the return of normal sensory input may also affect the potential for reversal of negative effects.[12] These findings indicate that sensory experiences in the postnatal environment have an important effect on the long-term response to stressors, yet the timing and duration of the altered environment and the return of such are undetermined.

NEUROHORMONAL ASPECTS OF STRESS AND SOCIAL AFFILIATION

Glucocorticoid Receptors

Glucocorticoids are hormones produced by the adrenal glands and secreted in response to stressful stimuli. The major glucocorticoid in humans is cortisol, which can be used to measure levels of stress. Animal studies of stressors, such as maternal separation, lack of physical touch, and painful events in the postnatal environment, have found that these stresses increase the expression of glucocorticoid receptor genes, which can result in permanent increased sensitivity to stressors.[13] Moreover, newer evidence suggests that the alteration in gene expression in response to maternal separation is resistant to subsequent environmental influences, which suggests the effects may be irreversible.[12] Postnatal touch stimulation without concomitant social interaction is thought to increase corticosteroid levels and glucocorticoid receptor gene expression.[14] In the hippocampus, early postnatal handling (which includes primarily touch) has been shown to directly alter (increase) the number of glucocorticoid receptor sites per cell.[15,16] These findings suggest the environment is a critical factor in the development of the neuroendocrine system and stress reactivity.[4] Additional research is needed to delineate which type of touch is optimal compared with potentially stressful touch.

Oxytocin

Oxytocin is a neuromodulator that is well known for its involvement in birth and lactation, and its release from the posterior pituitary is influenced by a diverse array of external stimuli.[17–22] The relationship between oxytocin and the stress response is complex.[23] In some situations, oxytocin may be inhibited by stress; in other situations,

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oxytocin may counteract stress.[17–19,22,24–27] In animal models, administration of exogenous oxytocin decreases the stress response following maternal separation, and stress-induced release of central oxytocin has a similar effect.[28–30] Oxytocin also plays a role in maternal behavior.[31–33] Most importantly, in the animal model, oxytocin mediates social bond formation including the initiation of maternal behaviors, intimacy between partners, breastfeeding, and activities that involve touch.[34–38] Both psychological and physical stressors can inhibit activities that initiate increased levels of oxytocin, such as coitus, labor and delivery, and lactation.[20] The release of oxytocin during breastfeeding is thought to reduce both maternal blood pressure and levels of maternal stress.[23,39] Lactating women have lower blood pressure and higher vagal tone in response to stress than non-lactating women.[40] Lower levels of serum oxytocin have been linked to mothers with distress and sad emotions, and oxytocin release has been shown to increase following standard selective serotonin reuptake inhibitor treatment for depression.[41,42]

In the animal model, oxytocin is related to physiologic changes in the young after tactile stimulation such as maternal touching or grooming.[43] At birth, there are few oxytocin-producing neurons in the supraoptic nucleus and the paraventricular nucleus of the hypothalamus.[44] However, the number increases markedly during the immediate postnatal period.[45,46] In prairie voles, maternal touch (in the form of grooming) for only 1 day after birth results in significantly less oxytocin neurons in the paraventricular nucleus compared with maternal handling once a day for 7 days.[47] In addition, maternal separation has been thought to change biochemical processes[48] and may hinder the development of oxytocin-producing neurons in the brain.[47] Massage of rats triggers oxytocin secretion, providing additional evidence to support the importance of tactile stimuli and the release of oxytocin.[49]

INFANT CARE IN STRESSFUL SETTINGS: EVALUATION OF TOUCH AND MULTISENSORY INTERVENTIONS

Research on human infants cannot be conducted by using the same biochemical or anatomic outcome measures that are used in the animal model. Therefore, research on touch and multisensory interventions for human infants has used behavioral and clinical outcome measures. On the basis of clear evidence from animal studies, it is postulated that continued environmental and physical stressors, such as prolonged hospitalization or separation from the mother, may have devastating consequences for the human infant's growth and development.[1,2] In a previous study with orphaned infants, those who received a multisensory intervention had increased weight gain, increased growth, decreased illness rates, and decreased clinic visits compared with infants who did not receive the intervention.[50] The multisensory intervention consisted of the behaviors mothers normally use with their newly born infants and consisted of talking, rocking, stroking, and looking at the infant.

Different methods of sensory intervention aimed at reducing stress have been evaluated in healthy and at-risk infants as well as premature and fullterm infants. Oral sensory (sucking the breast or pacifier with sucrose added), skin-to-skin (also termed Kangaroo Mother Care), tactile (via gentle human touch or stroking via massage), and multisensory (talking, stroking via massage, eye-to-eye contact, and rocking) interventions have shown many benefits for infants such as reduction of irritability during painful episodes, change in sleep/wake behavior, increased number of prefeeding behaviors, improved progression of oral feeding, reduced length of hospital stay, and improved development.[51–63]

Kangaroo Mother Care

Kangaroo Mother Care began in Bogota´, Columbia, to safeguard premature infants by keeping them warm and making the breast continuously available for breastfeeding.[64] Because Kangaroo Mother Care is simply the placement of the infant on the mother's chest, usually between her breasts, the baby remains inside her clothing and the infant's body temperature is maintained. This intervention was initiated secondary to a lack of hospital equipment and facilities for preterm infants. Kangaroo Mother Care allowed mothers to successfully care for their preterm infants at home. Currently, Kangaroo Mother Care is used in other developing countries for home care of fullterm as well as preterm infants. In addition, skin-to-skin care has been adapted to include fathers or other caretakers when thermal therapy is needed.

Beneficial outcomes of this intervention include increased sleep and less irritability, stable physiologic parameters (such as heart and respiratory rates), reduced stress during painful episodes, increased breastfeeding episodes, positive behavior at 6 months, and better development at 1 year.[54–57,65–70] The practice of Kangaroo Mother Care is clearly safe for the infant and would be an important strategy to safeguard the infant in an adverse environment.

Tactile-Only Stimulation via Massage

There are several reports of benefits from infant massage, including improvements in weight gain,[71–74] changes in behavioral state,[58,71] and decreases in serum cortisol level.[75] Unfortunately, the reports in the literature do not specify how the massage was administered or within what context. Specifically, they do not indicate the amount of human social contact that was given in conjunction with the massage. We have evaluated tactile-only stimulation (mod-

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erate pressure massage without talking or looking at the baby) and found significant increases in heart and respiratory rates. Tactile-only stimulation produces rapid yet short-lived changes in behavioral state (from sleep to alertness), and we have concluded that this intervention is overstimulating for infants.[76] In our experience, we found it very difficult to massage a baby without talking or looking at him or her. We suspect those reporting on "massage" are most likely talking and looking at the baby, thus providing multisensory intervention. However, the lack of reference to the specifics of the interventions provided has led to the difficultly of interpreting other researchers' findings. We recently compared tactile-only with multisensory intervention and found that tactile-only stimulation is associated with higher levels of stress, as measured via salivary cortisol.[77] Taken together, these results have led us to *discourage* tactile-only stimulation via massage as a form of intervention for infants; instead, we recommend a moderate pressure massage in conjunction with human social contact that includes talking, eye-to-eye contact, and rocking. These are all behaviors mothers normally use when taking care of their infants and interacting with them.

Multisensory Intervention

The Auditory, Tactile, Visual, and Vestibular (ATVV) Multisensory Intervention includes behaviors that mothers normally engage in with their infants. It has been shown to improve patterns of mother-infant interaction, facilitate feeding, and may reduce infant stress.

A 15-minute ATVV intervention begins with infant-directed talk via a soothing female voice (auditory stimulation) as a way to alert the infant that someone is nearby.[78] Infant-directed talk consists of talking in a higher pitched voice with pauses to allow the infant to respond. Parents normally talk with their infants in this manner. After a minimum of 30 seconds of talk, the infant is placed in a supine position and the head is massaged, followed by strokes over the chest and abdomen, legs (thigh to ankle), and arms. The massage is given with moderate pressure. The infant is then placed in the prone position and the back and head are massaged. The back is massaged with straight continuous strokes followed by circular stroking directly over the spine. The baby's head is stroked from the front of the hairline to the nape of the neck. After 10 minutes of talking and stroking, the infant is swaddled. The swaddling is done to make the infant feel secure but could also be done by simply holding the baby with the arms and legs in flexion. For the remaining 5 minutes, the infant is rocked. In premature infants, we have used horizontal rocking. However, in fullterm infants, we have found vertical rocking is better to organize the infant's behavior. Throughout the 15-minute period, we attempt to engage in eye contact with the infant. The intervention was designed to be adaptable. For example, if the infant displays negative disengagement cues such as hiccoughs or finger splay, crying, fussing, or spitting/vomiting, that component of the intervention is discontinued and the next component of the intervention is attempted.[78]

In previous studies, we documented the improvement in both maternal and preterm infant behaviors.[79] Infants were more likely to give clearer behavioral cues and were more responsive to their mothers. In addition, maternal responsiveness to her infant was markedly increased. Prior to the infants' hospital discharge, mothers were more sensitive to their infants' behavioral cues and engaged in more behaviors that foster cognitive growth.

In our experience, ATVV intervention administered after feeding promotes a change in infant behavioral state from sleep to a quiet alert, and the infant is ready to attend and interact with his or her mother.[62] ATVV intervention administered prior to feeding also promotes a change to an alert and active state, which facilitates feeding.[83] Indeed, ATVV intervention improved (accelerated) feeding progression from full gavage to full oral feeding in very low birth weight normal preterm infants and brain-injured preterm infants.[60] In another study, we documented an increased number of prefeeding behaviors (such as hand-to-mouth, sucking on hand, sucking on tongue or empty sucking) in well preterm infants who received ATVV intervention.[61] It is not surprising that we have consistently found a reduced length of hospital stay, by as much as 2 weeks, in well and at-risk premature infants who were given ATVV intervention.[60,79–81] Improved development, as measured by the Bayley Scales, and a reduction in cerebral palsy have also been reported in at-risk premature infants who were given ATVV intervention.[63] We have found the ATVV intervention safe for preterm infants, fullterm infants, and infants prenatally exposed to illicit substances.[59,82–86]

DISCUSSION

Since 1977, we have developed and implemented a series of research studies designed to evaluate infants' behavioral, physiologic, neuroendocrine, and developmental responses to multisensory intervention. The ATVV multisensory intervention was originally selected for our research program because it is composed of different sensory modalities that are most often involved during mother-infant (or caregiver) interaction and learning.[87] The results of our studies using ATVV intervention in preterm and fullterm infants support animal data and provide strong evidence that infants need to remain close to their mothers and receive tactile contact in conjunction with human social interaction.

IMPLICATIONS

The first priority in adverse situations is to remove the mother and baby from immediate danger and ensure that they are kept together in a more secure, quiet, and warm space. Both the infant and the mother need to be warm and

hydrated. Kangaroo Mother Care provides warmth and the proximity to the breast for frequent breastfeeding. Sucking may also calm the infant. Encouraging skin-to-skin contact may also help the baby sleep. When the mother and baby are out of danger, the use of the ATVV multisensory intervention can be used to promote alert states for successful breastfeeding and mother-infant interaction. It is critical to reduce maternal stress so that she will be able to care for her infant.

SUMMARY

The combination of Kangaroo Mother Care with multisensory intervention is encouraged because Kangaroo Mother Care provides warmth, promotes infant sleep, and facilitates frequent breastfeeding, whereas the use of ATVV intervention reduces infant stress, improves infant feeding, and fosters the mother-infant relationship. Tactile stimulation is vital to development of the central nervous system; however, tactile-only stimulation must be distinguished from multisensory interventions that include a tactile component. Further evidence-based studies are needed to help implement these low-tech interventions in all settings, particularly those in which both mother and baby are exposed to severe stressors.

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Original Review

The Professionalization of International Disaster Response: It Is Time for Midwives to Get Ready

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Disasters and humanitarian emergencies due to natural or human origins result in severe and often prolonged suffering of the affected population. Midwives have a role to play in providing assistance because women and their infants experiencing such crises have unique vulnerabilities and needs. This article introduces midwives and other women's health care practitioners to international humanitarian emergency response efforts and describes preparation and training activities they can undertake to get ready to volunteer with an international health aid agency. Various clinical realities and challenges are discussed, including recommended priorities for providing reproductive health care in disaster zones. Common ethical dilemmas in crisis health care settings are also reviewed. By arriving in the field well prepared to participate and collaborate, midwives can make substantial contributions to the safety, health, and comfort of women and their families who have experienced a natural disaster, armed conflict, or diseaseepidemic.

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INTRODUCTION

During humanitarian crises, the affected population experiences a multitude of resource limitations simultaneously: shelter, potable water, food, transportation, security, and health care, to name a few. Disasters and humanitarian emergencies are usually caused by weather phenomena (eg, storms, drought, floods), geological catastrophes (eg, earthquakes, tsunamis, volcanic eruptions), or direct human factors (eg, terrorism, war, civil society collapse).[1,2] Epidemics and pandemics due to diseases such as influenza, cholera, or Ebola can also create a crisis when they overwhelm a community's ability to cope.[3,4] The Center for Research on the Epidemiology of Disasters reports that, on average, 350 to 400 disasters occur annually worldwide, with approximately 100,000 lives lost and 300 million people affected.[1] Reports of lives disrupted and destroyed by violent conflicts or epidemics are more difficult to characterize with annual averages, but nonetheless frequently make the headlines.

Although definitions of what is officially designated as a *disaster* or *emergency* vary, descriptions generally include a situation in which a community, region, or country—often quite suddenly and dramatically—is unable to meet some or all of its own needs.[1,4,5] Outside assistance eventually arrives. Search and rescue teams, road clearing crews, humanitarian aid personnel, and others fan out over the affected areas to rescue trapped victims, reestablish communications and road access, manage dead bodies, and distribute commodities and services to the survivors. It must be appreciated, however, that disaster response primarily occurs on the local level. Community members who are able, including midwives, serve as first responders. International efforts to acknowledge and support this reality have only recently been launched (see First Responders Campaign in Appendix 1).

The populations of women and infants that midwives care for require a special type of assistance because they have unique vulnerabilities and needs during humanitarian emergencies. Not only are they exposed to the physical and psychological harms associated with disasters, but normal health care services are usually unobtainable as well. Lack of gynecologic and prenatal clinics, skilled attendance during labor, and postpartum support may result in incomplete monitoring and treatment for acute and chronic health problems. In addition, new hazards are often experienced during the crisis, such as increased exposure to nutritional deficits, infectious diseases, and sexual assault.[3,5,6] Parents' worries and grief over possible or actual harm happening to their children can also have short- and long-term negative health consequences.[7]

Midwives from outside the affected region can volunteer to respond to a disaster or other type of emergency situation, either immediately or in the months and years to come. They usually assist with efforts to provide gynecologic and perinatal clinical services, support maternal–child public health activities, help rebuild the maternity health care infrastructure, or contribute to restoring midwifery education. However, most volunteer health practitioners (VHPs), including midwives, do not have the clinical or cross-cultural training and experience that prepare them to function effectively in crisis settings.[8–11] The purposes of this article are to inform certified nurse-midwives (CNMs) and certified midwives (CMs) about the professionalization of disaster health care, review preparation and deployment considerations, and discuss several clinical realities of providing clinical care in catastrophic situations.

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Quick Points

- Women and infants face unique health hazards and challenges during humanitarian emergencies.
- Midwives have important knowledge and capabilities to assist disaster survivors and those suffering from civil conflict or epidemics, but few midwives are trained to provide health care in low-resource crisis contexts.
- Midwives who want to volunteer with international disaster and humanitarian emergency health care teams should join a recognized organization to ensure appropriate training, deployment, support, and protection.
- Midwives can take and CMs can also take independent action to prepare themselves personally and professionally to volunteer in emergency settings.

INTERNATIONAL DISASTER RESPONSE COORDINATION AND CONDUCT

Media stories and visual images from major disaster zones inspire health care professionals from all over the world to volunteer. But packing a bag and boarding a plane on one's own is highly discouraged. Well intentioned but uncoordinated assistance efforts frequently result in spontaneous volunteers becoming a burden in an already chaotic scenario that is not prepared to accommodate their personal and professional needs.[11] The VHP who is not registered with an agency is exposed to excess health hazards, security threats, and medicolegal liability.[11–13] Best practices in humanitarian response encourage all health professionals to join a team deployed by a recognized aid agency. This ensures that an appropriate scope of work is negotiated with local partners, patients are treated by legitimate VHPs, logistical support is provided, and volunteers are safeguarded from various potential hazards.[11,12] (See Table 1 for a list of several nongovernmental organizations (NGOs) that are active in disaster response.) Responsible and effective NGOs will train their volunteers in the distinctive aspects of providing health services in a humanitarian crisis context,[9] including field operations administration, codes of conduct, security issues, and core competencies, which are briefly discussed below.

The United Nations (UN) Cluster Approach is the international system for organizing disaster response (see Figure 1).[14] The UN Office for Coordination of Humanitarian Affairs organizes the *clusters* (specialty areas) in partnerships with local and national agencies such as the Ministry of Health. All domestic and foreign humanitarian NGOs should have a policy for how they coordinate with the UN cluster organizations most relevant to their missions in order to promote open communication, ensure proper distribution of assets, discourage inappropriate activities, and maintain safety and security. Midwives deployed with an international volunteer clinical team might interface with the following clusters: health, nutrition, shelter, protection, and water/sanitation/hygiene. Attending UN cluster meetings is valuable for networking with aid workers from other NGOs to share information about the local context, which can help refine one's understanding and approach to establishing appropriate relationships and partnerships within the affected community.

Humanitarian staff and volunteers are expected to conduct themselves, both professionally and personally, in a manner that respects human rights, local laws, societal norms, cultural customs, and professional standards.[5] Aid personnel are in positions of relative power because they control needed resources. It is unfortunate that inappropriate, corrupt, and illegal activities by relief workers occasionally occur.[5,15] Therefore, most humanitarian agencies require staff to agree to a code of conduct that clarifies expectations for behavior in the field.[5] The codes generally cover issues such as not participating in commercial or political activities, refraining from sexual contact with persons from the local communities, and rules about photography and online postings. All midwives should follow these policies and do their best to represent themselves, the midwifery profession, their organization, and their home country with the highest possible standards. The American College of Nurse-Midwives (ACNM) Division of Global Health supports a Disaster Preparedness and Response Caucus; its code of conduct can be found online (see Appendix 1).

Codes of conduct promote amiable community relationships: an aid organization's good reputation among the local population is important for team acceptance and safety.[16] Safety and security in the field for both foreign visitors and local staff are considerations that aid agencies must take seriously.[16,17] Security intelligence should be frequently sought and informational briefings regularly held. It is often repeated during briefings that safety directives always trump service delivery. If health care teams are asked to refrain from traveling to certain places or are told to evacuate from current locations, they are expected to cooperate and return to headquarters where they can gather more information and reassess the threats. Disaster scenario safety hazards include unstable infrastructure, poorly functioning utilities, insecure transportation, weather-related warnings, and communicable disease exposures. In addition, access to resources that are in short supply can make aid workers the target of criminal activities, or they might be threatened due to political, religious, or other issues that put them at odds with various groups in the area.[13,17]

In an effort to standardize training so that all humanitarian workers are educated in the operational issues discussed above, core competencies for humanitarian health professionals have been proposed.[9,10,18–20] Several

Table 1. Examples of International Nongovernmental Organizations that Participate in Disaster Health Care Response

Organization Name and US Location	Web Site	Brief Summary of Organizational Goals
Bumi Sehat Foundation International Barre, VT	http://www.bumisehatfoundation.org/?reqp=1	Started by a certified professional midwife, Bumi Sehat's mission is to promote breastfeeding and caring, culturally appropriate childbirth. The organization is nonsectarian and selectively responds to disaster situations.
CARE USA Atlanta, GA	http://www.care.org/	CARE is nonsectarian and is active in numerous countries. One aspect of this organization's extensive development activities is to work with communities to prepare for disasters and to support emergency response efforts.
International Medical Corps (IMC) Los Angeles, CA	http://internationalmedicalcorps.org	IMC is a nonsectarian organization dedicated to improving individual and public health through training and interventions for relief and development that build local capacity and health care systems.
International Rescue Committee (IRC) Seattle, WA	http://www.rescue.org/	IRC assists people who are seriously affected by conflict and disaster across the globe, including specific attention to women and children. It is a nonsectarian agency.
Islamic Relief USA **Alexandria, VA**	http://www.irusa.org/campaigns/emergency-response/	Islamic Relief distributes emergency aid and administers medical care when disasters strike on any continent "regardless of race, religion or gender," although it does have a special focus on women's programs.
Jewish Coalition for Disaster Relief (JCDR) New York, NY	http://www.jdc.org/jcdr/	JCDR serves to coordinate disaster response activities of its member agencies, supporting humanitarian relief to persons regardless of religious affiliation. The operations Web page indicates active programs and the agencies involved in providing services.
Médecins Sans Frontières (MSF) Doctors Without Borders USA, New York, NY	http://www.msf.org/	MSF provides comprehensive medical assistance and advocacy for populations in distress, from both sudden and long-term natural disasters, and also in situations of armed conflict. MSF values its "independence from all political, economic, and religious powers."

Continued

Table 1. Examples of International Nongovernmental Organizations that Participate in Disaster Health Care Response

Organization Name and US Location	Web Site	Brief Summary of Organizational Goals
Medical Teams International (MTI) Tigard, Portland, OR	http://www.medicalteams.org/	MTI is a Christian-based organization that provides medical and dental care in disaster and other low-resource settings to "all people in need regardless of religion, nationality, sex, or race."
Project HOPE Millwood, VA	http://www.projecthope.org/	Project HOPE offers both land- and hospital ship-based clinicalservices and health education programs for disaster response, often partnering with the US military.
Relief International (RI) Los Angeles, CA	http://www.ri.org/	RI is nonsectarian and is active in emergency relief, rehabilitation, development assistance, and program services to vulnerable communities. RI has a 2-day disaster training workshop for clinicians.
RN Response Network (RNRN) Silver Spring, MD	http://www.nationalnursesunited.org/site/entry/rnrn	As part of National Nurses United, RNRN is organized by nurses, for nurses, to educate about disaster preparedness, participate in response activities, and assist with deployment.
Tzu Chi International Medical Association South El Monte, Los Angeles, CA	http://wpress.tzuchimedicalfoundation.org/	The Buddhist Tzu Chi organization serves needy communities internationally with medical humanitarian aid regardless of "age, sex, race, or religious affiliations." Clinical services include those from both Eastern and Western traditions.
World Vision Federal Way, Seattle, WA	http://www.worldvision.org/our-impact/disaster-relief	World Vision describes its work as Christian, child-focused, and community-based. They partner with local churches in disaster-affected areas but serve all people regardless of "race, religion, ethnicity, or creed."

competencies are recommended for all VHPs, such as mass casualty triage and biohazard protection, whereas other competencies are specific to public health or clinical specialties.[9,10] In 2006, the World Health Organization (WHO) was the first to outline 6 core competencies that addressed the unique contributions of midwives and nurses during humanitarian emergencies (see Table 2).[18] In 2010, Jorgensen et al. then described a comprehensive educational framework on disaster core competencies for perinatal and neonatal nurses, which are applicable to midwives as well.[19] Their learning objectives included topics that incorporated all-hazards planning, disease detection and hazards exposure, cultural competencies, management and communication systems, safety and security, clinical/public health assessments and interventions, altered standards of care, evacuation arrangements, and professional and ethical considerations. The International Confederation of Midwives encourages incorporation of this type of disaster education into preservice midwifery training curricula.[21]

PREPARING TO VOLUNTEER

Midwives interested in volunteering in emergency settings should make preparations well before the occurrence of an actual incident.[8–10,20] In addition to joining a governmental or nongovernmental disaster response agency, midwives can

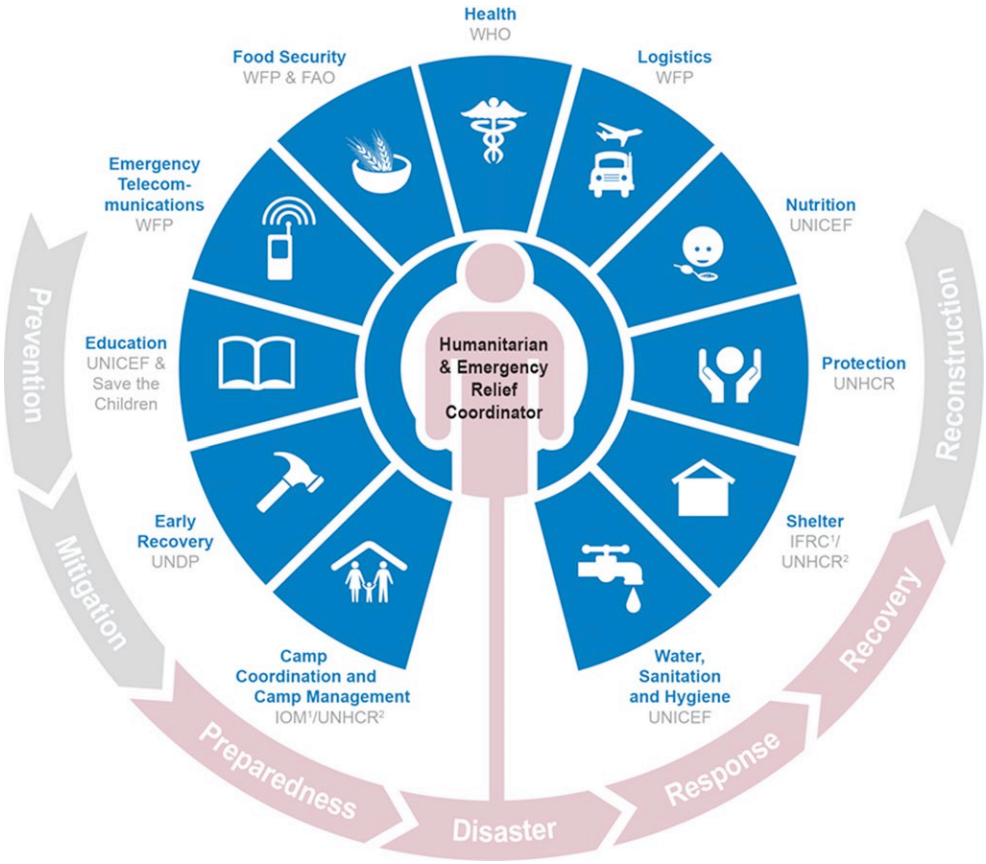

Figure 1. United Nations humanitarian response clusters

Abbreviations: FAO, Food and Agriculture Organization; IFRC[1] , International Federation of Red Cross and Red Crescent Societies; IOM[1] , International Organization for Migration; UNDP, United Nations Development Program; UNHCR[1,2] , United Nations High Commissioner for Refugees; UNICEF, United Nations Children's Fund; WFP, World Food Program; WHO, World Health Organization.
Source: United Nations Office for the Coordination of Humanitarian Affairs[14]
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Table 2. Summary of World Health Organization Core Competencies for Nursing and Midwifery in Emergencies

Group 1	Preparedness and organization of response: policy making and organizational and personal planning
Group 2	The health team and basic human care: mass casualty management; maternal, newborn, and child health; communicable and noncommunicable diseases, pharmaceuticals, etc.
Group 3	Needs assessment and planning: providing and managing care
Group 4	Treating people with special health needs: vulnerable groups and addressing gender-based violence
Group 5	Maintaining the care environment and team system: communications, supply chain, cold chain, environmental health, etc.
Group 6	Professional development: monitoring, mentoring, and evaluation; leadership, coordination, and team work; legal and ethical accountability

Source: World Health Organization.[18]

accomplish several tasks independently, such as maintaining a professional portfolio and completing courses on disaster response. Most humanitarian agencies will require professional verification during an application and vetting process, but some do not; therefore, midwives should assemble a portable folder of education, certification, licensure, and disaster course completion documents in order to demonstrate, to any agency or community, that they are trained professionals. Although humanitarian health volunteers await the development and implementation of validated competency-based disaster-focused educational programs,[20] a variety of individual classes can be taken both in-person and online. Relevant topics include mass casualty triage, cultural competency in disaster response, and hazardous materials decontamination protocols. Courses can be found on the Web sites for the Disaster Information Management Resource

Center, National Disaster Life Support Foundation, SuperCourse Initiative, US Office of Minority Health, and Reproductive Health Response in Crisis Consortium (see Appendix 1).

Midwives should also make practical preparations to be ready for deployment with only a few days' or weeks' notice.[11] In terms of personal health and safety, vaccinations for international travel (eg, typhoid, tetanus, Hepatitis A, and yellow fever) and for providing maternal–newborn care (ie, influenza, pertussis, rubella, and Hepatitis B) should be up-to-date. Organizing a supply of personal medications is essential, including antimalarial tablets and antiretroviral prophylaxis (in case of an exposure), as well as feminine hygiene products and spare prescriptive lenses or hearing aids. Female volunteers should consider packing a long loose skirt and a headscarf in case these are required for the local dress code. Males should pack at least one pair of long pants because shorts are not appropriate in all cultures. Credit cards and automated teller machines might not function in disaster zones; therefore, carrying a few hundred US dollars in cash is advisable (no torn or marked bills, or those older than 2006), even if the deploying agency claims it will be covering all costs. The UN Disaster Assessment and Coordination Field Manual is a valuable resource for personal packing recommendations for international humanitarian work, and the ACNM Disaster Preparedness and Response Caucus Web site also offers preparation and packing advice (see Appendix 1).

Leaving home on short notice requires advanced planning for work and home life as well. Employers and clinical colleagues will need to manage while the midwife is absent, so arrangements for flexible scheduling should be carefully considered. Some VHPs use paid time off to ensure continuing income, whereas others take leave without pay. The midwife should discover if there is a risk to employment status because, unlike federally sponsored domestic disaster deployment, leaving work suddenly to volunteer internationally does not legally guarantee the right to return to one's job. Additionally, organizing plans at work needs to be accompanied by making arrangements at home. Financial and domestic tasks may need attention while the midwife is away; therefore, family members and friends will require instructions on how to assume unfamiliar responsibilities.

Finally, midwives should acknowledge, before deployment, that humanitarian aid workers are not immune to the effects of stress that crises provoke.[8,18,22] Unfamiliar and austere environments, witnessing suffering and destruction, trying to meet the complex needs of vulnerable people, working long hours, and living in close quarters with other team members will all take their toll. It is essential that VHPs make proactive efforts to function collaboratively and supportively with coworkers in order to create positive team cohesion. A team leader who understands this should be nominated or assigned before deployment if possible, but each individual team member should also plan to take responsibility for giving and receiving feedback regarding issues such as workload distributions, debriefing clinical scenarios, self-care awareness, code of conduct behaviors, and monitoring for mission effectiveness and relevance.[7,8,22]

CLINICAL REALITIES IN THE CRISIS SETTING

Anticipatory Planning

Anticipating the clinical realities on the ground in a crisis zone is possible, even when the health care team does not know exactly what to expect. As discussed in more detail below, midwives should plan to provide reproductive health and maternity care, breastfeeding support, contraceptive care, and sexual assault services, often through the use of interpreters. Midwives might also participate in primary care clinics, assist with managing the onsite pharmacy, and spend a large amount of time attending to their patients' psychological well-being.

Once informed of the location of the deployment, the midwife must become quickly educated on a wide variety of background information. It is important to learn about the culture and people of the locality, as well as regional endemic diseases and other illnesses that might occur if public health and other infrastructure systems are broken. Assembling both paper and electronic resources that will be useful onsite is worthwhile, such as a local language dictionary and clinical manuals for low-resource settings. Several well-respected organizations provide guidelines for feeding infants and small children during crises. The importance of breastfeeding assistance and advocacy cannot be over-emphasized; these resources provide information and tools for both public health advocacy and clinical decision making. Table 3 provides a list of selected resources. Bookmarking and downloading Internet resources on a laptop, tablet, or smartphone before leaving home is advisable and convenient but unfortunately may not be reliable in the field because electricity and connectivity are often inconsistently available. Before departure, the midwife should contact other team members to discover their areas of expertise, coordinate packing lists, and introduce to them what midwives can do. The other clinicians on the team are usually relieved to discover that someone in their group is comfortable caring for pregnant women!

Initial Reproductive Health and Maternity Services

After arriving in the field, the team's midwife will be expected to coordinate with local midwives and other practitioners who normally provide reproductive health and maternal–newborn services in the area. The standards set by the Minimum Initial Services Package (MISP), which prioritizes care based on the stage of the disaster, offers a template for planning.[23] For implementation, the midwife must discover assets that are or may become available to deliver services including contraceptive care; sexually transmitted infection (STI) treatments; nutritional counseling (including food availability and cultural restrictions); prenatal and postpartum care; access to laboratory tests and ultrasound imaging; and clean birth kits for distribution. Midwives should strive to develop and support birth facilities that can provide basic emergency obstetric and newborn care (EmONC) and to know where comprehensive EmONC facilities are located in case women require surgical or high-risk medical care such as cesareans or blood transfusions.[24] Employing gender- and age-appropriate interpreters and ascertaining what is culturally appropriate is also important; preserving the dignity, social integrity, and spiritual safety of patients is paramount.[7,25–27] For

Table 3. Recommended Clinical Resources for the Disaster Setting

Resource	Web Sites	Brief Description
Books		
Me´decins Sans Frontie`res (MSF). *Clinical Guidelines: Diagnosis & Treatment Manual.* Paris, France: MSF; 2013.	http://www.refbooks.msf.org/msf_docs/en/MSFdocMenu_en.htm	Doctors without Borders (MSF) is a Nobel Prize-winning international medical organization that publishes comprehensive and practical clinical resources for austere environments. Can purchase book or download the manual as a PDF.
Hesperian Health Guides: Werner D, Thuman C, Maxwell J. *Where There Is No Doctor.* Berkeley, CA: Hesperian; 2013. Burns A, Lovich R, Maxwell J, Shapiro K. *Where Women Have No Doctor.* Berkeley, CA: Hesperian; 2014. Klein S, Miller S, Thomson F. *A Book for Midwives.* Berkeley, CA: Hesperian; 2013.	http://hesperian.org/books-and-resources/	Hesperian Health Guides are developed by health care practitioners with extensive experience in low-resource communities. Multiple pictures assist with learning. These and other books can be purchased from the Hesperian Web site; many are also available as PDF downloads in several languages.
Hawley A, Matheson J. *Making Sense of Disaster Medicine: A Hands-On Guide for Medics.* London, UK: Hodder Arnold Publishers; 2010.	http://www.crcpress.com/product/isbn/9780340967560	Written specifically for the disaster context, this book guides the health care volunteer through all steps of the experience before, during, and after deployment.
Iserson K. *Improvised Medicine: Providing Care in Extreme Environments.* New York, NY: McGraw-Hill Publishers; 2012.	http://accessemergencymedicine.mhmedical.com/book.aspx?bookID=666	This text assists the health care provider in managing almost any clinical situation that occurs in chaotic crisis settings. Appendices include guides to hospital and remote medical disaster preparedness.
Online Resources		
World Health Organization. *The Contribution of Nursing and Midwifery in Emergencies.* Geneva, Switzerland: WHO; 2007.	http://www.who.int/hac/events/2006/nursing_consultation_report_sept07.pdf	This document reviews the competencies, training, research priorities, and cross-cutting issues relevant to crisis context nursing and midwifery.
World Health Organization. *Integrated Management of Pregnancy and Childbirth (IMPAC): Pregnancy, Childbirth, Postpartum and Newborn Care: A Guide for Essential Practice.* Geneva, Switzerland: WHO; 2006.	http://www.who.int/hac/techguidance/en/	The IMPAC clinical manuals are recognized by maternity care providers across the globe. They set standards for health care that can guide clinicians in all countries, based on advice by multiple international experts. PDF download available in Arabic, English, French, Portuguese, and Russian.

Continued

Table 3. Recommended Clinical Resources for the Disaster Setting

Resource	Web Sites	Brief Description
World Health Organization. *IMCI: Integrated Management of Childhood Illnesses (IMCI) Chart Booklet.* Geneva, Switzerland: WHO; 2014.	http://www.who.int/maternal_child_adolescent/documents/IMCI_chartbooklet/en/	An essential triage tool for clinicians who will treat pediatric patients. IMCI has been disseminated worldwide and is familiar in most countries. PDF download or printed version available, as well as an online training course.
Resources on Infant Feeding		
Emergency Nutrition Network (ENN). *Infant Feeding in Emergencies, Module 2.* London, UK: ENN; 2007.	http://www.ennonline.net/ifemodule2	
WellStart International. *Infant Feeding in Emergencies.* San Clemente, CA: WellStart; 2005.	http://www.wellstart.org/Infant_feeding_emergency.pdf	
La Leche League International (LLLI). *Resources for Breastfeeding during Emergencies.* Chicago, IL: LLLI; 2015.	http://www.llli.org/emergency.html	
World Health Organization. *WHO Model Lists of Essential Medicines.* Geneva, Switzerland: WHO; 2013.	http://www.who.int/medicines/publications/essentialmedicines/en/	The WHO medicine lists are required for pharmaceutical planning across international borders. These downloadable lists are updated regularly.
Centers for Disease Control and Prevention (CDC). *Emergency Preparedness and Response.* Atlanta, GA: CDC; 2015.	http://www.bt.cdc.gov/	The CDC is recognized worldwide as an authoritative resource for public health topics. This Web site contains information on both common and unusual pathogens, including bioterrorism.
Cochrane Collaboration. *Evidence Aid.* Dublin, Ireland: Evidence Aid; 2015.	http://www.evidenceaid.org/	Evidence-based systematic reviews relevant to providing health care in crisis settings. The Web site is continually updated to include information packages for current disasters.

example, modesty and religious customs should be taken very seriously. Learning from local practitioners, women leaders, cultural liaisons (*culture brokers*), and the patients themselves promotes provision of reproductive and maternity services that are acceptable to the local population.[25]

Breastfeeding Support

Breastfeeding is a priority in all humanitarian crises.[28–33] The volunteer midwife's knowledge and advocacy is essential to support this life-saving and comforting activity. The midwife should review guidelines on the hand expression of breast milk, wet nursing, relactation, breastfeeding in high HIV-prevalence areas, and preterm newborn nutrition. Excellent free online resources can be found at Wellstart International, the Emergency Nutrition Network, the World Health Organization, US Health and Human Services, and Breastfeeding USA (see Appendix 1). Maternal and child health (MCH) professionals must continually educate others with accurate information because several myths about breastfeeding during disasters exist: women under stress cannot produce milk (they can); women cannot relactate after weaning (many can); and breastmilk substitutes are necessary during emergencies (they are not, except for special cases).[28,29] International

protocols on breastmilk substitutes should be followed because excess morbidity and mortality have occurred with early weaning and when breastmilk substitutes for general distribution were imported during humanitarian crises.[29–32] The establishment of breastfeeding corners or tents in housing encampments and health care clinics provides a refuge for nursing mothers who will benefit from privacy; nutritious snacks; and practical and emotional support from MCH professionals, community health workers, and other mothers.[33]

Contraceptive Care

Contraceptive care is another important immediate service to establish for women in a humanitarian emergency setting.[23,34,35] Personal contraceptive items are often lost, plus pharmacies and women's health clinics may have been damaged or destroyed. In the aftermath of a disaster or in the midst of a refugee crisis, women's choices are influenced by their personal circumstances and should be respected: some may wish to prevent pregnancy, whereas others may desire to become pregnant right away. For women who want contraception, experts[23,34,35] recommend injectables and long-acting reversible contraceptives (eg, intrauterine devices) during the early weeks of a crisis due to their safety and simplicity of use. Pills are more difficult to manage, but are familiar to many women and should thus be made available. Emergency contraceptive tablets are also essential to have in stock. Freely distributing condoms is necessary for both pregnancy and disease protection.

Care for Sexual Assault Survivors

Sexual crimes are unfortunately common in the unstable and insecure crisis environment[6,36]; therefore, midwives should anticipate that they will provide care and comfort to patients (female or male) who have been assaulted. The midwife's empathetic demeanor and gentle clinical skills are appropriate for these distressing circumstances. Treating injuries and prescribing STI, HIV, and pregnancy prophylaxis are urgent matters, as well as gathering forensic evidence as appropriate to the local situation.[23,36] Nonjudgmental collaboration to determine the survivor's preferences for care and follow-up is essential, but counseling can be difficult due to potential language barriers and cross-cultural uncertainties, as well as potentially unsettled law enforcement and judicial circumstances. The midwife should contact the agency assigned to lead the gender-based violence programs for the UN protection cluster (see Figure 1).[6,14] Involvement of culture brokers is also essential to understanding the potential significance of this event for patients within their societal, religious, and family contexts.[5,6,25]

Primary Care

In addition to concentrating on familiar midwifery activities in the disaster zone, the midwife should anticipate treating patients with primary care complaints such as diarrhea, upper respiratory infections, asthma, otitis, arthritis, skin disorders, gastritis/ulcers, urinary tract infections, hypertension, diabetes, and injuries. Endemic diseases such as malaria, dengue, and helminths (worms) may be common diagnoses. Coordinating with the UN health cluster agencies is critical when participating in the prevention and treatment of outbreaks of infectious diseases such as measles, cholera, or leptospirosis, or when reestablishing structured treatment protocols for tuberculosis and HIV/AIDS.[5,14] Most CNMs and CMs from the United States are not accustomed to diagnosing and treating many of the conditions mentioned above, especially in children. Nevertheless, just-in-time training on well-developed case definitions, combined with the support of an interdisciplinary clinical team that includes local providers, is usually adequate to quickly expand the midwife's clinical knowledge and capabilities.

Pharmaceutical Management

Whether treating patients for primary care diagnoses or reproductive health concerns, the midwife will likely find prescribing medications in the disaster zone challenging. Unlike at home, VHPs in disaster zones actively participate in all aspects of pharmaceutical management: accessing essential medications, interpreting the use of medications packaged with unfamiliar names or languages, deciding whether or not to use expired medications, responsibly disposing of medications, and coping with decisions that need to be made when patients may not have access to follow-up care.[37–40] The midwives can contact their agencies before leaving home to inquire if the agencies have the WHO Essential Medications list for the relevant country[41] and if Interagency Emergency Health Kits and Reproductive Health Kits have been ordered (see Appendix 1). Aid organizations should have protocols and procedures in place for medication acquisition and donation that are compliant with WHO guidelines.[39,42] In addition, the US Food and Drug Administration or Drug Enforcement Administration may need to be contacted for permission before transporting medications across international borders (see Appendix 1).

Psychological Considerations and Interventions

In addition to providing physical health care, midwives who volunteer to serve in devastating emergency situations will continually attend to the psychological and emotional health of their patients. Expressing compassion, human warmth, and a genuine interest in others are significant contributions that midwives can offer to persons of any age or gender affected by disaster. Completing a course in crisis mental health interventions, such as Psychological First Aid, will improve the midwife's ability to provide the appropriate level of mental health care (see online Supporting Information: Appendix S1). Psychological First Aid is a focused set of support skills that aligns well with the midwifery model of care.[5,43] During catastrophic situations, responders concentrate on being calm and kind, helping people feel safe, assisting people to meet their basic needs, giving realistic reassurance, not compelling individuals to talk but listening when they do, encouraging positive coping skills, enhancing social support, screening for serious or prolonged psychological or psychiatric problems, and referring to a disaster mental health worker if indicated and available. The PsySTART checklist is a mental health triage tool that has been

developed for the crisis setting that compliments the Psychological First Aid approach.[44] It identifies and ranks disaster-context experiences and risk factors that guide the VHP on indications for referral. As with other types of health care, local culture brokers should always be consulted to assist VHPs in understanding and navigating the cultural meanings and societal norms regarding mental health issues in the region.[25]

ETHICS AND CRISIS STANDARDS OF CARE

The classic ethical principles of autonomy, beneficence, nonmaleficence, and justice can apply to disaster medicine scenarios just as they do in clinical practice back home.[26,45,46] In humanitarian work, it is generally agreed[5] that aid recipients deserve to be respected as persons and be provided with services that do good and do not do harm. Furthermore, health care activities and commodities should be distributed fairly and without prejudice. The crisis context, however, usually requires that a utilitarian perspective also be considered, which implies that the needs of any one individual do not override the needs of the majority.[26,47,48] Efficient mass casualty triage and rationing medical supplies and medications is sometimes the fairest course of action but means that some individuals will not receive complete services or treatment. The nature of such discussions and decisions can be psychologically distressing to clinicians, especially because the research evidence base for appropriate clinical protocols in chaotic disaster situations is in its infancy.[26,43,47,48] If a disaster zone health care facility, for example, has access to just one small tank of oxygen per day, or there are only a few vials of gentamicin left, or a single set of sterile instruments is available to perform one cesarean, then decisions must be made about who is eligible to justify use of those scarce resources and who is not. The best course of action is to make sure all VHPs are trained in mass casualty triage and to approach decisions about rationing as a team that includes both local and visiting multidisciplinary health professionals, relevant community leaders, and culture brokers.[25,26,47–50]

Inevitable and unpredictable resource limitations stimulate ongoing dialogue about standards of care during emergencies. Midwives should review documents that address this concept so they will understand how to participate when conventional care transforms into crisis standards of care.[50] Crisis standards of care are guidelines to assist health professionals to provide the "best possible medical care when there are not enough resources to give all patients the level of care they would receive under normal circumstances."[50] The Sphere Project[5] is universally recognized as a global leader on these issues, and the Institute of Medicine[50] has published a comprehensive document addressing crisis standards for the US context. Mass casualty triage systems define crisis standards to assist emergency responders and clinicians in focusing on the utilitarian ethics of extreme resource limitations in overwhelming situations where some victims may not survive due to the inability to deliver the needed but unavailable level of medical care.[49] Additionally, guidelines and protocols are currently being debated and developed regarding how to prepare for and adequately staff health facilities during a deadly epidemic, radiation release, or bioterrorism scenario.[2,48] Health care personnel may struggle with ethical conflicts concerning their duties to care for and not abandon patients versus protecting themselves and their family.[18,47]

In addition to crisis standard of care considerations, another common ethical challenge in disaster medicine is when VHPs need to perform beyond their normal clinical duties. Responsible clinicians worry about where to draw the line. That is, they want to know how far they can extend when they have to provide health care beyond their usual training and scope of practice.[18,45–47] For example, pediatricians may be required to treat adult patients, obstetricians may be needed to perform nongynecological surgeries, and midwives may be pressed into treating patients with unfamiliar acute and chronic conditions. It is accepted that, in crisis situations, most VHPs in the field will be nudged out of their professional comfort zones, but there are ways to mitigate the potential for malpractice. The most experienced and trained person available should provide the necessary care or closely supervise those who just received training on tasks that can be shifted. It must be emphasized, however, that the disaster context is not to be used as a pretext for VHPs to learn new procedures or seek the thrill of providing care that they are not permitted to perform back home. Disaster survivors deserve competent, respectful, and patient-centered care; and VHPs are ethically, professionally, and legally accountable for their actions even in emergency situations.[9,10,26,27,45–47]

RETURNING HOME

Arriving home after volunteering in a crisis environment is a joyous time, but also presents particular stressors for VHPs.[7,8] For example, going to work for the first time can feel odd; everything there was business as usual while the midwife was away having an intense and demanding experience. The relative excess of clinical equipment and supplies compared to the limited resources in the disaster zone may seem strange and out of balance. Perhaps most distressing, however, is that people back home who have not experienced a disaster environment may find it difficult to listen to and understand the midwife's stories, which can result in feelings of isolation.

International aid agencies should provide their volunteers with mental health guidelines and support while they reorient to the home environment, but this is not always the case. The Substance Abuse and Mental Health Services Administration has information on its Web site to support disaster volunteers who are readjusting to their normal lives.[22] Midwives and their families should review these resources, making special note of the list of signs and symptoms that indicate the need to seek professional psychological assistance, such as prolonged disorientation, anxiety, depression, or drug/alcohol misuse. To help each other adjust, disaster team members sometimes spontaneously maintain contact after returning home to share memories and try to make sense of what they experienced.

CONCLUSION

Certified Nurse-Midwives and CMs are well suited to providing many of the health care services and types of support that women and infants require during disasters and other humanitarian crises. Therefore, midwives should become actively involved in preparing for and responding to catastrophic events when communities request assistance. The significant impacts

midwives can make in crisis settings will be enhanced when they join their professional colleagues in recognizing that disaster health care is evolving into a specialized discipline.[9–11] To be effective, midwives must understand the unique context of the crisis scenario, be familiar with humanitarian organizational issues, and know what to expect from low-resource and sometimes chaotic clinical settings. In addition, midwives must plan ahead so they are prepared to deploy and to keep themselves healthy and safe while working in crisis environments. Major disasters and humanitarian emergencies occur every year all over the globe. It is time for midwives to get ready.

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CONFLICT OF INTEREST

The authors have no conflicts of interest to disclose.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's Web site:

Appendix S1 Websites for Online Resources Referred to in this Article

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