Chapter 18
Sustainable Birth Care in Disaster Zones and During Pandemics: Low-Tech, Skilled Touch

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18.1 Introduction: Effective Disaster Care as a Critique of Technocratic Birth

Many chapters in this book and others heavily critique what Davis-Floyd (2001, 2003) has long called “the technocratic model of birth.” Following Ivry et al.’s (2019) suggestion that disasters may provide a differing and powerful perspective for such critiques, this chapter examines effective care in the immediate aftermaths of disasters that render the technocratic model, with its reliance on high technologies, inapplicable in the absence of those technologies. Midwife Robin Lim (2021) brings into geopolitical focus the issues this chapter is designed to address:

Climate change, geological events and socio-political struggles are contributing to disasters devastating communities worldwide. Pandemics, superstorms, ocean surges, tsunamis, rising tides, landslides, floods, blizzards, droughts, bitterly cold and scorching hot weather, earthquakes, volcanic eruptions and wars fought over resources, territories, food security, dogma, and precious water, all destabilize our planet Earth. When the hospitals are reduced
to rubble, electricity is gone, water is not flowing, and people are left homeless, hungry and thirsty, who will receive the babies? Where will the mothers birth? What childbirth protocols will best support life as communities heal in the aftermath?

In this chapter, in response to Robin’s questions, we examine effective care in the immediate aftermaths of disasters that render the technocratic model of birth both unsustainable and ineffective at providing optimal maternal and perinatal care. Many assume that maternity care in disaster settings requires high-tech equipment. Yet as Lim asks above, when the normative spaces usually assigned to birth, such as clinics or hospitals, lie in ruins or are in danger of collapse, how might we create safe and sustainable models of birthing care? When the clock on the wall that indicated time for another cervical check lies shattered and the electricity for monitoring mother and fetus is down, what tools will sustain us? When epidemics and pandemics add to the preexisting risks of hospitals as sites of contagion, where indeed should the mothers give birth?

The accounts presented in this chapter will demonstrate that what is most needed for sustainable care in disaster settings are dedicated and skilled midwives, low-tech equipment, referral to sites with emergency obstetric care or on-site obstetricians, and courageous flexibility of all involved—including administrators, providers, mothers, and their families. We will illustrate how a midwifery model of care that is both “low-tech” and “high-touch” and is based on the 12 Steps of the International Childbirth Initiative (ICI) (Lalonde et al. 2019) can provide nimble and high-quality care for MotherBaby dyads and their communities in times of enormous upheaval and destruction and can produce maternal and perinatal outcomes that match or even improve upon nationwide statistics collected in the absence of disasters and other climate-related shocks. And, as a result of the 2020 global COVID-19 pandemic, we must also ask, what spaces for care and which practitioners will best serve mothers and babies and avoid ongoing disease transmission?

Herein we will focus on the highly sustainable disaster zone maternity care provided by Bumi Sehat under the direction of Robin Lim in Indonesia and the Philippines (see Lim and Leggett 2021; Lim and Davis-Floyd 2021), by Mercy In Action in the Philippines as directed by Vicki Penwell (2020), and in Japan as described by Tsipy Ivry and colleagues (Ivry et al. 2019). While Lim’s and Penwell’s accounts focus on the experiences of the providers, Ivry’s account from Japan offers first-hand descriptions of how mothers successfully delivered their babies in extreme conditions with the help of midwives and nurses. Davis-Floyd describes some of the rapid changes in global maternity care as a result of the coronavirus pandemic and their effects on both practitioners and childbearers. Thus, our chapter seeks to understand optimal maternity care in disaster settings from the perspectives of both providers and mothers.
18.1.1 Obstetric Disaster Responses: A Brief Note

A team of international relief doctors deployed by the Israeli Defense Forces reported that they saw 44 pregnant and 24 nonpregnant patients as early responders covering the earthquake disasters in Haiti in 2010 and Japan in 2011. They handled 16 births, 3 by cesarean section. One-half of the births were complicated by preeclampsia, and 31% were preterm (30 to 32 weeks gestation), leading them to believe that obstetrical specialists plus technological equipment, including fetal heart monitors, gynecologic chairs (birth tables), and an ample supply of blood for transfusions were necessary in order to effectively attend births in disaster zones (Pinkert et al. 2013). Yet the accounts presented in this chapter will demonstrate otherwise. Collectively, we will show that what is really needed in disaster birth care is dedicated and skilled midwives–both traditional and professional, low-tech equipment, courageous mothers and families, some available obstetricians, and flexibility on the part of all involved.

18.1.2 The International Childbirth Initiative as a Template for Optimal Care

The basic elements of maternity care that are required in disaster or any other settings are laid out in the International Childbirth Initiative (ICI): 12 Steps to Safe and Respectful MotherBaby-Family Maternity Care (Lalonde et al. 2019; see also www.internationalchildbirth.com and the Appendix to this book). The two nongovernmental organizations (NGOs) we focus on here–Bumi Sehat and Mercy in Action–have created flexible, adaptive models of maternity care that implement all 12 Steps of the ICI and exemplify the MotherBaby-Family Model of Care chartered in the ICI. As their statistics show, this model of care is cost-effective,
life-saving, and sustainable, even in the context of utter devastation. In this era of the climate crisis and the global COVID-19 pandemic, where destruction, damage, and tragedy will only increase, birth can and should be gentle, respectful, and holistic. When disaster and tragedy strike, our Birthkeepers must be ready (see Fig. 18.1).

### 18.2 Bumi Sehat’s Disaster Relief Efforts as Recounted by Founder Ibu Robin Lim

Yayasan Bumi Sehat ([http://bumisehat.org/](http://bumisehat.org/)) was founded in 1995 in Bali, Indonesia. “Yayasan” means not-for-profit, “bumi” means “earth-mother,” and “sehat” translates as “healthy,” so our name translates to Healthy Mother Earth Foundation. We operate four Community Health and Education and Childbirth Centers within Indonesia (in Bali, Aceh, Lombok, and Papua) and two childbirth centers in the Philippines (Leyte and Palawan). Additionally, we helped organize and operate post-disaster birth units in Jacmel, Haiti; Dhading, Nepal; and Palu, Sulawesi. At our clinics, we offer a comprehensive range of allopathic and holistic medicine, as well as pre- and postnatal care, breastfeeding support, infant, child and family health services, nutritional education, prenatal yoga, childbirth education, and safe, gentle loving natural birth services. Funding for Bumi Sehat’s work comes from many generous donors including Direct Relief International, Earth Company, WADAH Foundation, Every Mother Counts, Dining for Women, IDEP Foundation, Kopernik, We Care Solar, Rotary Clubs International, and the anonymous generosity of friends.

After providing disaster relief in Aceh, Sumatra, Indonesia, we became early responders after the earthquakes that wreaked havoc in Yogyakarta, Padang, Lombok, Sumatra, Haiti, and Nepal, during the 2017–2018 eruption phase of Mount Agung in Bali and following the super typhoon Haiyan/Yolanda in the Philippines. We still support one of the birth centers there, which is run by Filipino midwives.

Based in Bali yet highly mobile during disasters, we distribute food, tools, shelter tarps, solar lanterns, and precious water filters. We treat illnesses and wounds, both physical and psychological. We carry water in buckets. And we receive babies in tents, by the light of solar lanterns and with rudimentary supplies. Our outcomes in all these settings were and remain far better than the national statistics for these countries. In most of these sites where possible, Bumi Sehat has stayed on following its disaster relief, because we work without an explicit exit strategy; instead, we build sustainable healthcare in cooperation with local midwives or medical staff until they can take over the clinics we establish.
18.2.1 The Aceh Tsunami 2004

Bumi Sehat’s abrupt initiation into disaster relief began with the tremendous tsunami and earthquake (measuring 9.3 on the Richter scale) that hit Aceh, Sumatra, in Indonesia on December 26, 2004. The official death toll was estimated at over 200,000, although the military admitted it may have buried as many as 400,000 victims. Within days of the earthquake, Bumi Sehat collaborated with the Wadah Foundation to provide volunteer midwives, nurses, doulas, emergency responders, and doctors of allopathic medicine, naturopathy, and Chinese medicine, into a very lowest-resource but highest-risk setting. Upon arrival in Aceh, as elsewhere, Bumi Sehat first liaised with the surviving medical professionals and traditional/cultural healers to see what was most needed by the devastated communities. Over the next 3 years, Bumi Sehat helped over 1000 mothers give birth, with basic traveling birth kits, no fetal monitors, gynecologic chairs, or whole blood supplies. We originally camped close to the heart of the disaster, where almost 100% of the population was homeless, with no electricity, little food, and not enough drinking water. According to our estimates, most Acehnese survivors had lost an average of 12 relatives.

To forge liaisons with local Acehnese midwives, we called a meeting of Birthkeepers, including both professionally trained midwives (dukun bayi) and traditional midwives (bidan kampong), as the latter are often the most trusted in disaster settings. Thirty-two midwives showed up; all had experienced severe loss of family and property. One midwife had walked an entire day to attend; another midwife—who was 7 months pregnant—had walked through fallen trees and mud flats after losing her husband, two children, parents, and home. Although everyone had experienced deep trauma themselves, all were there to support mothers in childbirth in this tragic time. Each midwife received mother-baby kits for their estimated number of surviving clients, as well as supplies of high-energy bars, water filters, and midwifery equipment. Our day-long seminar knit the women closer to each other and ended in a moment of silence for those who had not survived the quake/tsunami. We later learned that while the Meulaboh area had 156 midwives before the tsunami, the 32 midwives who attended were the only surviving midwives in the region.

Over the next days, weeks, and months, we found that many women could manage to safely birth with little risk, even in the absence of clinics, hospitals, obstetricians, and extensive medical technology or equipment. We learned that midwives, nurses, and doulas were critical, even as obstetricians and other physicians were lacking. Those obstetricians/gynecologists who did join our team worked closely with the midwives, providing a natural, simple model of supportive and respectful care for mothers in labor, delivery, and postpartum. We found that sound midwifery skills, essential medicines, and simple tools plus a transport vehicle for emergency complications when possible constituted the most effective and sustainable model of maternity care in disaster settings. In the case of complications that required a cesarean section or blood transfusion, transport to clinics or sites in more densely populated areas made more sense than trying to keep obstetricians on hand in widely
dispersed rural areas. Home visits to the shacks or tents where survivors lived offered important support to breastfeeding mothers.

Our outcomes were surprising to others in the Indonesian healthcare system, who had underappreciated how effective a midwifery model of care can be. Out of 1000 births that were attended and followed by the Bumi Sehat Aceh midwives after the tsunami, there were 14 intrapartum and neonatal deaths:

- Four stillbirths, including an intrapartum death at the clinic, an intrapartum death at home, and two stillbirths after transport for fetal distress.
- Six neonatal deaths after preterm delivery of babies between 20 and 32 weeks gestation and birth weights between 500–800 grams.
- Two deaths due to congenital abnormalities.
- One intrapartum death due to shoulder dystocia.
- One early newborn death at one week to a mother suffering from “smallpox”.

Not counting the 4 stillbirths, the 10 neonatal deaths among the 1000 births were better outcomes than Indonesia’s nationwide neonatal mortality rate of 14/1000 in 2017 (UNICEF 2017). There were no maternal deaths during the 3 years that we attended over 1000 births in Aceh.

The traditional midwives—bidan kampong—within the catchment area of over 11 villages that were close to epicenter of the disaster organized and worked closely with Bumi Sehat. The bidan kampong have lifelong skills that they have learned from apprenticeship as well as from their own experiences of supporting mothers during childbirth, but no professional medical training. Each bidan kampong was given a hand phone and a paid phone plan from Bumi Sehat, as well as hand crank chargers and electric chargers, as much of Aceh province had no electricity for up to 4 years following the tsunami, and even now electricity is not always dependable. Training the bidan kampong how to use a phone took time, but the Bumi Sehat team was determined to help these community leaders have a means to communicate with health centers and each other. Furthermore, we conducted monthly trainings for these elderly Keepers of Birth, as the bidan kampong are known within the community.

Once they had cellphones and knew how to use them, the bidan kampong could and would call the professionally trained midwives of Bumi Sehat to attend births with them when mothers preferred home births. The bidan kampong also bring their clients to the Bumi Sehat Aceh clinic for prenatal care and delivery, where they attend their laboring clients side-by-side with the professional midwives. This system of collaboration helps build the skills of the bidan kampong, while also fostering trust in and increasing awareness of the quality of Bumi Sehat’s maternity care. The resulting partnerships help us stay connected to the community, earn the trust of the families we serve, and foster long-term growth and sustainability. Fifteen years after the 2004 tsunami, the Bumi Sehat Aceh Community Health and Childbirth Clinic, which we built with grant-funding, continues to sustainably thrive. We at Bumi Sehat feel that it is critical to enter a disaster area without planning an exit strategy because trust in care and continuity of care are critical for devastated communities.
18.2.2 Volcanic Eruptions in Bali 2017–2018

Between 2017 and 2018, Bali’s volcano Gunung Agung erupted multiple times, causing more than 140,000 people to be evacuated from their homes. Bumi Sehat’s medical team was responsible for bringing healthcare and supplies to the displaced people (pengungsí) in the evacuation camps. The government had planned to evacuate pregnant women among the pengungsí who were near full-term to tents in a parking lot outside a government hospital, where these women were supposed to wait alone until their babies were born. This isolation went completely against Balinese culture, where no one, especially a pregnant woman, wishes to be separated from their families. So we arranged for the expectant mothers plus their immediate families to be housed at the Bumi Sehat clinic.

We provided all services including a kitchen for the displaced, and truckloads of vegetables were donated twice weekly by the Ubud community. After we had attended births for 7 weeks, the families were permitted to return home, but 3 weeks later when the volcano erupted again more violently and lava and lahar (destructive mud flow) filled the rivers, the evacuees returned to Bumi Sehat for another 13 weeks. By December of 2019, the volcano had quieted, and the evacuees had returned home, but the volcano is still off-gassing and disaster could strike again.

18.2.3 Disasters on Lombok and Sulawesi 2018

In 2018, Bali’s nearest neighbor island, Lombok, suffered a devastating earthquake. Aftershocks and landslides continued to plague the survivors living in makeshift shelters for months, and more violent earthquakes are expected. Across Lombok, many government health centers (Puskesmas) were destroyed, and the main hospital in Mataram was so damaged that all patients had to be evacuated to the parking lot, where they were exposed to blistering sun and torrential rains. Bumi Sehat, led by a professional midwife and Lombok native, provided medical relief in tents; there are plans to build a permanent clinic and childbirth center in Lombok with funding from Direct Relief International. Also in 2018, Bumi Sehat responded to the widespread destruction by earthquake, tsunami, flooding, landslides, and liquefaction on the island of Sulawesi. In 2018 alone, Bumi Sehat’s relief efforts reached 52,121 homeless patients in the aftermath of these disasters. Violent flooding in Papua in March of 2019 led evacuees to flee to the Angel Hiromi-Bumi Sehat Childbirth Clinic in Sentani after their homes were destroyed. When violence broke out across the nearby region of Wamena later that year in August and September, 30 families fled the violence and sheltered at the clinic in Sentani. The increasing rate of natural disasters in Indonesia has only intensified Bumi Sehat’s efforts to tend to communities and families across the region.
Mercy In Action’s Disaster Relief Efforts as Recounted by Founder Vicki Penwell

Mercy In Action (www.mercyinaction.com) was established in 1991 to build birth centers for impoverished families across the Philippines. By 2019, Mercy In Action staff had attended 15,000 births, while tens of thousands of lives have been helped and healed in medical outreaches. At present, Mercy In Action still runs several birth centers and outreach clinics across the Philippines, while many others that it founded have been turned over to local Filipino professional midwives who continue to sustainably practice our model of care, which is based on the ICI. All medical services are provided at no cost, and funding comes from private donors, grants, and the Philippines health insurance system for qualifying individuals.

18.3.1 Mercy in Action’s Disaster Response after Hurricane Haiyan/Yolanda

Super typhoon Haiyan (locally called Yolanda) was the largest storm to ever make landfall in human history, on November 8, 2013. Although our medical staff in the Philippines had lived through and learned from many smaller disasters in the past 25 years, we were struck by the force of this storm, which gave us ample opportunity to put into practice the Disaster Preparedness course we had painstakingly prepared for our midwives.

Within a few days after the hurricane had passed, we loaded up our ambulance, arrived at Ground Zero of the disaster, set up canvas birthing tents, and began to provide free medical care (see Fig. 18.2). Over the next 65 days, we treated 3616 patients, despite having limited food, no running water, no electricity, with area clinics damaged or destroyed, and most of our patients homeless and traumatized.

When we had patients with complications that needed cesareans we could not provide, we transported them to tent hospitals staffed by our partners Doctors Without Borders. We also partnered with UNICEF to create a Mother/Child-Friendly Space for breastfeeding and other services. These were our statistical outcomes:

- Total primary health and wound care: 1532.
- Total deliveries: 116.
- Cesarean section rate: 2%.
- Stillbirths: 1.
- Neonatal deaths: 1 (tetanus at 8 days).
- Maternal mortalities: 0.
- Total breastfeeding women: 648.
• Rate of breastfeeding by mothers when we left: 100%.
• Total women given prenatal care and food: 367.
• Total survivors who attended our healing trauma seminars: 196.

In the months after the typhoon, we raised donations and grants to completely rebuild and restock two clinics/birthing centers in the disaster area and conducted 40 hours of capacity-building training for local midwives. We equipped all midwives who graduated from that training with basic birth kits and emergency equipment so that they could continue to serve as community midwives. The continuity of care by trusted local professional midwives has been critical for women and their families after such traumatic loss and destruction of family and kin networks. Mercy in Action remains involved with rebuilding efforts in 2020, including midwifery training and ongoing partnership with a local midwife and the rebuilt Cumpio clinic. The Center for Disaster Philanthropy provided donations to rebuild the Cumpio birth center, while GlobalGiving was a valuable partner during the typhoon rebuilding stage and for subsequent disasters, including the 2019 earthquake in the Philippines. In addition, Mercy In Action’s nonprofit board members were incredibly generous with general funds during the typhoon disaster and now keep a savings account ready for future disaster responses.
18.4 The Great Japanese Earthquake of March 11, 2011: Mothers’ Perspectives as Recounted by Tsipy Ivry and Robbie Davis-Floyd

It is a pity that we’ve lost practicing independent midwives who could deliver babies close to home. We wouldn’t have been in such trouble if there had been enough midwives in the community. –Japanese midwife as quoted by Etsuko Matsuoka (2019)

Ivry et al.’s (2019) description of births outside a badly shaken hospital in the aftermath of the March 11, 2011 earthquake in Japan shows the power of women. These authors describe how, with the elevators inoperable, mothers protectively cradling their newborn babies, as well as those who were in all stages of labor, including the pushing stage, were able to descend several flights of stairs and walk into the hospital parking lot, where they delivered their babies in cars or on furniture dragged by staff from the hospital. (Fortunately, none of them had epidurals, which Japanese women choose far less often than women in other high resource countries (Williamson and Matsuoka 2018)). Midwives and nurses were able to provide effective care in that parking lot with only the most minimal equipment that was grabbed hastily on the way out—or that they bravely ran back for.

For example, when the shaking ceased, one of the pregnant women took advantage of the intervals between contractions to walk down the stairs, pressing her contracting belly and resting during the contractions. She was told to take refuge in the parking lot, though it was about to start snowing. The nurses grabbed a sofa from the hospital waiting room and laid her down on it, wrapped in thick blankets, but, given that she was wearing a thin hospital gown, the blankets were not enough. So her husband brought their car, and folded the rear seat down. She did lie down there for a bit but soon was up and walking at the height of the contractions. She said that she believed the walking helped to push her baby down. When he was about to be born, she got back into the car, thinking “Let’s get him out!” The car was crowded with the doctor, nurse, and midwife, who had all climbed in to catch the baby. With powerful aftershocks going on, the nurses ran in and out of the hospital building, finding and bringing necessary items “such as water and bath towels and other things” (Namikawa and Kawaguchi 2012: 88–89, cited in Ivry et al. 2019: 174).

In their analysis of this story, Ivry et al. (2019: 179) note that this woman acknowledged her own perseverance in the face of danger, “yet attributed the safe conclusion of her birth to the nurses’ and midwives’ efforts to secure a closed, safe and private place for the birth and low-tech necessities rather than high-tech interventions.” These authors point out the evidence-based nature of her certainty that walking during the contractions accelerated her birthing process—which is in line with the evidence about the benefits of mobility during labor (Lawrence et al. 2013).

A common thread among the narratives of these Japanese birthing mothers was these women saying to themselves, “Let’s get this baby out quickly!” They acknowledged the roles played by their own strong wills, which enabled them to
birth safely in spite of the disruption of the technological surveillance they had previously thought necessary. Yet they also emphasized that they were able to give birth under such extreme circumstances in large part due to the calm and flexible support provided by their providers, mostly nurses and midwives. In other words, as Ivry et al. (2019: 179) state, “the midwifery model of care provided an example of fluid adaptation to mothers’ needs within an urgent and unpredictable situation.”

Tellingly, after the earthquake, the Japanese Nursing Association (JNA) produced a formal recommendation that “all birth professionals providing care in any setting learn how to attend ‘freestyle’ childbirth” (quoted in Ivry et al. 2019: 181)—just as the Bumi Sehat and Mercy in Action midwives do. The JNA statement (2013) echoed one made in 2006 by the White Ribbon Alliance for Safe Motherhood in the aftermath of Hurricane Katrina, which recognized the critical importance of “homebirth skills” in times of disaster, when hospitals may be unavailable, inaccessible, or overwhelmed with casualties. Had this statement been acted upon at the time, it is likely that the United States would have been better prepared for the maternity care challenges presented in 2020 by the COVID-19 pandemic.

18.5 Global Impacts of COVID-19 on Maternity Care

In 2020, the rapid spread of the novel coronavirus SARS-CoV-2 and the disease it produces, COVID-19, caused a large increase in demand for midwife-attended homebirths and births in freestanding birth centers across high-income countries (HIC). This demand was due in part to families’ fears of contagion in hospitals and in other part to hospitals’ sudden refusals to admit partners or doulas into birthing rooms or to force the laboring woman to choose only one support person, who might have to leave immediately after the birth (Davis-Floyd et al. 2020). During this pandemic, many hospitals in HIC were often overwhelmed, while home birth midwives and freestanding birth centers were also overwhelmed by childbearers’ requests for transfers from hospital-based care. Unfortunately, in the United States and in European countries where the numbers of midwives who attend out of hospital births are few, there were not enough community midwives to cover the demand. As a result, many women who sought out-of-hospital births were turned away. Thousands of hospital practitioners faced shortages of personal protective equipment (PPE) for weeks or even months, while many providers and patients contracted COVID-19. Some families resorted to unattended “freebirths,” for which outcomes are difficult to track (Davis-Floyd, Gutschow, and Schwartz 2020). And no statistics for mortality and morbidity in that time period are available as of yet. Clearly, much new research is needed on the global impacts of COVID-19 on maternity care and will soon be forthcoming (Davis-Floyd and Gutschow 2021).
18.6 Conclusion: Lessons Learned from Disaster Zone Maternity Care

Ironically, disasters provide valuable opportunities to examine what happens when high technologies cannot be used during labor and birth (Fortun and Frickel 2012; Hofman 2005). Maternity care in the aftermath of natural disasters that ends with healthy mothers and babies stands in stark contrast to the iatrogenic outcomes of the technocratic model of birth, in which births are seen as potential disasters-in-the making, and interventions that cause harm are routinely employed. In the face of natural disaster, childbirth risk emerges as secondary, and the lack of need for high-tech intervention in most births is revealed (Ivry et al. 2019: 181). In short, disasters, including pandemics, provide a mirror through which to see birth anew and reevaluate the shrill narrative of risk promoted by the technocratic model (Ivry et al. 2019: 165, 180).

As Lim shows, collaborations and partnerships between traditional and professional midwives work to generate an emergent “human resources model” that “promotes a non-bureaucratic system of flexible emergency response” (Monteblanco and Leyser-Whalen 2019:146). This model of flexible response can highlight the need for adapting maternity care to be less institutionalized and lower tech, both during and after disasters. These authors continue:

This model rejects the argument that disasters cause human panic, instead encouraging and challenging scholars and practitioners to view local community members (trained healthcare providers or not) as emergency response resources. . . In [so doing], the emergent human resources model also indicates the necessity for identifying and using non-mainstream and non-institutionalized medical care providers during and post-disasters.

How can we apply the insights from sustainable disaster care provided in this chapter to revolutionize maternity care in non-disaster settings? Can low-tech, high-quality disaster care proceed to unsettle the seeming inevitability of the technocratic management of childbirth? How might analysis of both providers’ and women’s experiences of childbirth in disaster settings contribute to more sustainable model of birth?

More research is needed on the impact of using evidence-based midwifery care in disaster zones and the outcomes produced by midwifery care. Yet already, these accounts of birth experiences in disaster settings help us recognize the value of skilled community midwives who are more flexible and mobile, less tied to hospital or clinic settings, and less reliant on technology than obstetricians and facility-based midwives (Monteblanco and Leyser-Whalen 2019). And their value also extends to local epidemics and global pandemics like the one caused by the coronavirus.

Ultimately, several clear lessons emerge from our study of maternity care in disaster zones:

• Birthing women can be resilient and powerful. Their greatest need is for emotional and physical support from their caregivers and families.
• Skilled community midwives and facility-based midwives collaborating with one another provide invaluable resources in disaster and pandemic settings as well as in all settings during times of normalcy.

• Sustainable midwifery care that is decentralized and locally available is the most appropriate care in disaster settings, during epidemics or pandemics, and in low resource settings, especially when midwives have basic birth kits, cellphones, and the possibility of transport to referral units.

• Obstetricians should be reserved for complicated births, in both disaster zones and in normal circumstances, and they should be concentrated in cities as well as in referral units where women and newborns experiencing complications can be transported.

• Maternity care providers in disaster zones should not enter with an exit strategy but rather with strategies for building trust and providing long-term models of care that continue after the disaster ends.

• Breastfeeding and non-separation of the mother/baby dyad are essential, as are providing potable food and water for breastfeeding mothers; infant formula should be avoided due to contamination risks.

• Maternity care should be decentralized, everywhere.

• All birthing facilities should fully implement the 12 Steps of the International Childbirth Initiative (ICI), which work under all circumstances to improve quality of care and support normal physiologic birth.

Given our ongoing climate crisis, which contributes to global and regional pandemics like COVID-19 and vector-borne illnesses such as dengue, chikungunya, and Zika virus, as well as to natural and human-made disasters and conflicts, the rate of internal and external migrations will inevitably increase and birth care will need to adapt. All these processes will require ongoing, decentralizing shifts in maternity care. We stress that decentralizing birth care in favor of localized systems of support for normal physiologic birth will better prepare low-and-middle-income countries (LMIC) and high-resource nations alike for effective disaster and pandemic responses. Large tertiary care facilities are:

• Extremely costly and thus often economically unsustainable, especially in LMIC.

• In LMIC, plagued by lack of essential supplies and poor quality of care, in part due to their economic unsustainability.

• Highly vulnerable to earthquake, superstorm, and epidemic-caused damage. Hospitals are especially dangerous places to be during large-scale epidemics, due to the large numbers and proximity of staff, patients, and visitors, all of whom can acquire and/or transmit infections. Even in high-resource nations, as the coronavirus pandemic has revealed, hospitals may lack essential supplies such as personal protective equipment (PPE) and thereby become even more unsafe as sites of contagion (Davis-Floyd et al. 2020).

• Sometimes completely unavailable. For example, thousands of women across Latin America have to go while in labor to multiple hospitals trying to find one that will accept them—a terrible situation occurring so frequently that it has been given a name, “peregrination” (Menezes et al. 2006), and was exacerbated during
the 2020 COVID-19 pandemic. Many women, especially in Venezuela, ended up giving birth alone on a sidewalk, sometimes with disastrous results (Turkewitz and Herrera 2020).

Using the human resources model, the push for facility-based birth across LMIC should be turned around 180 degrees and transformed into a push for the support and empowerment of local community midwives, homebirths, and births in smaller clinics or first-referral units rather than tertiary care centers. In smaller birth facilities staffed primarily by midwives, or at home (or in tents), there is less risk of infection and the midwifery model of care can prevail, resulting in vast improvements in the quality of maternity care in general (Johnson and Daviss 2005; Cheyney et al. 2014; Alliman et al. 2019) and enormous cost savings. For instance, Anderson et al. (2021) showed that the United States would save $9.1 billion each year if only 10% more US births took place in homes and freestanding birth centers. Professional midwives should be allowed and encouraged to practice autonomously in varied settings; and instead of being phased out, traditional midwives, wherever they still exist, should be fully incorporated into their country’s maternity care system and supported to continue their community-based care.

We must reiterate that, as Davis-Floyd et al. (2009) clearly demonstrate, women everywhere want care in their communities! Community-based care systems are more flexible and adaptable to the upheaval caused by disasters, more likely to be able to provide high-quality care, more economically sustainable, and also more adaptable to women’s actual needs—which most often do not include technological surveillance and intervention but do include skilled, low-tech care and hands-on physical and emotional support. We conclude by also reiterating that in all birthing models, the Principles and 12 Steps of the International Childbirth Initiative should be used as the template for best practice, as their woman-centered, low-tech approach can be fully implemented in any birth setting, even in the aftermath of devastating disasters. Pregnant women should be fully educated about birth and, when possible, offered the full range of birthing options—which midwives, working collaboratively with obstetricians in cases where they are truly needed, can provide, both under normal circumstances and in the face of multiple types of disasters.

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