

# Lessons Learned From Helping Babies Survive in Humanitarian Settings

Ribka Amsalu, MD,<sup>a,b</sup> Catrin Schulte-Hillen, MPH,<sup>c</sup> Daniel Martinez Garcia, MD, MPH,<sup>d</sup> Nadia Lafferty, MBChB, MRCPCH,<sup>e</sup> Catherine N. Morris, MPH,<sup>a</sup> Stephanie Gee, MPH,<sup>c</sup> Nadia Akseer, PhD,<sup>g</sup> Elaine Scudder, MA,<sup>a</sup> Samira Sami, DrPH,<sup>f</sup> Sammy O. Barasa, BScN,<sup>h</sup> Hussein Had, MSc,<sup>i</sup> Maimun Farah Maalim, MD,<sup>j</sup> Seidou Moluh, MD,<sup>c</sup> Sara Berkelhamer, MD<sup>k</sup>

## abstract

Humanitarian crises, driven by disasters, conflict, and disease epidemics, have profound effects on society, including on people's health and well-being. Occurrences of conflict by state and nonstate actors have increased in the last 2 decades: by the end of 2018, an estimated 41.3 million internally displaced persons and 20.4 million refugees were reported worldwide, representing a 70% increase from 2010. Although public health response for people affected by humanitarian crisis has improved in the last 2 decades, health actors have made insufficient progress in the use of evidence-based interventions to reduce neonatal mortality. Indeed, on average, conflict-affected countries report higher neonatal mortality rates and lower coverage of key maternal and newborn health interventions compared with non-conflict-affected countries. As of 2018, 55.6% of countries with the highest neonatal mortality rate ( $\geq 30$  per 1000 live births) were affected by conflict and displacement. Systematic use of new evidence-based interventions requires the availability of a skilled health workforce and resources as well as commitment of health actors to implement interventions at scale. A review of the implementation of the Helping Babies Survive training program in 3 refugee responses and protracted conflict settings identify that this training is feasible, acceptable, and effective in improving health worker knowledge and competency and in changing newborn care practices at the primary care and hospital level. Ultimately, to improve neonatal survival, in addition to a trained health workforce, reliable supply and health information system, community engagement, financial support, and leadership with effective coordination, policy, and guidance are required.

<sup>a</sup>Department of Global Health, Save the Children, Washington, District of Columbia; <sup>b</sup>University of California San Francisco, San Francisco, California; <sup>c</sup>Public Health Section, United Nations High Commissioner for Refugees, Geneva, Switzerland; <sup>d</sup>Medical Department, Médecins Sans Frontières, Geneva, Switzerland; <sup>e</sup>Medical Department, Médecins Sans Frontières, Barcelona, Spain; <sup>f</sup>Department of International Health and Center for Humanitarian Health, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland; <sup>g</sup>Centre for Global Child Health, Hospital for Sick Children, Toronto, Canada; <sup>h</sup>Department of Nursing, Kenya Medical Training College, Machakos, Kenya; <sup>i</sup>Save the Children, Garowe, Puntland, Somalia; <sup>j</sup>Gardo General Hospital, Puntland, Somalia; and <sup>k</sup>Department of Pediatrics, University of Washington, Seattle, Washington

Dr Amsalu conceptualized the study and drafted the initial manuscript; Ms Schulte-Hillen, Ms Gee, Mr Moluh, Mr Barasa, Ms Morris, Mr Had, and Dr Maalim contributed to the design of the study, collected data, conducted the data analysis, and drafted the case examples; Dr Akseer conducted the data analysis; Drs Sami, Garcia, Lafferty, and Ms Scudder contributed to the design of the study; Dr Berkelhamer conceptualized the study; and all authors reviewed and revised the manuscript, approved the final manuscript as submitted, and agree to be accountable for all aspects of the work.

**DOI:** <https://doi.org/10.1542/peds.2020-016915L>

Accepted for publication Aug 4, 2020

Address correspondence to Ribka Amsalu, MD, Department of Obstetrics, Gynecology & Reproductive Sciences, University of California San Francisco, San Francisco, CA 94143. E-mail: [ribkaamsalu.tessera@ucsf.edu](mailto:ribkaamsalu.tessera@ucsf.edu)

## INTRODUCTION

Globally, major advances for improving newborn health have been achieved, including generating the evidence base, developing national strategies and action plans, and reducing neonatal mortality.<sup>1,2</sup> However, in countries affected by humanitarian crises and political instability, newborn outcomes continue to lag behind.<sup>2</sup> Humanitarian crises, driven by disasters, conflict, and disease epidemics, have profound effects on society, including on people's health and well-being. The magnitude and severity of humanitarian crises have increased in the last decade. By the end of 2018, an estimated 41.3 million internally displaced persons (IDPs) and 20.4 million refugees were reported worldwide, which is nearly a 70% increase from 2010.<sup>3,4</sup> Conflict, by its very nature, diminishes national accountability, governance, economic growth, and resources available for social services.<sup>2,5</sup> In addition, the impact of a crisis on health systems can be severe because of the destruction of health facilities, shortage of skilled health workers, disruption of supply chain systems, and restrictive working and operational environments.<sup>5,6</sup>

Although occurrences of extreme weather events, earthquakes, and disease epidemics have also increased in the last decade, for the purposes of this *Pediatrics* article, we have focused on the lessons learned in the implementation of the Helping Babies Survive (HBS) training in contexts of conflict and displacement.

## NEONATAL SURVIVAL IN SETTINGS OF CONFLICT AND DISPLACEMENT

Neonatal mortality, defined as death in the first 28 days of life, has declined in both conflict-affected and non-conflict-affected countries from 2000 to 2018.<sup>7,8</sup> However, 55.6% of the countries with the highest neonatal mortality rates (NMRs)

( $\geq 30$  per 1000 live births) can be classified as experiencing political instability or conflict in the last decade (Table 1) on the basis of the Uppsala Conflict Data Program.<sup>9</sup> An ecological analysis using national survey data from low- and middle-income countries, with methodology and definition presented by Akseer et al,<sup>7</sup> found that conflict-affected countries on average have worse NMRs compared with non-conflict-affected countries (Fig 1). Indeed, there continues to be a gap in coverage of interventions during pregnancy, childbirth, and postnatal period between conflict-affected and non-conflict-affected countries (Fig 1).<sup>7</sup>

Several factors have contributed to this divergence, including an increase in severity and scale of conflict and humanitarian crises in the last decade, overstretched national and

global capacities to respond to needs, and challenges in mitigating the consequences of conflict on health systems. In addition, although the evidence base for newborn health has expanded since the *Lancet* series in 2005<sup>10,11</sup> and there are several guidelines for humanitarian settings that promote newborn health,<sup>12,13</sup> there is insufficient capacity in the use of evidence-based interventions to reduce neonatal mortality in the humanitarian field, and most organizations self-report as not providing essential newborn care services.<sup>14</sup>

Authors of a 2014 evaluation of reproductive health services for refugees and IDPs in South Sudan, the Democratic Republic of the Congo (DRC), and Burkina Faso found that 3 out of 5 hospitals and only 5 out of 58 health centers were providing essential newborn care services.<sup>15</sup> Of

**TABLE 1** Occurrence of Conflict and Internal Displacement due to Conflict in 18 Countries With the Highest NMR

Country	Neonatal Mortality per 1000 Live Births, <sup>a</sup> 2018	UCDP: Episodes and Intensity of Armed Conflict, <sup>b</sup> 2010–2017	IDPs in This Country, <sup>c</sup> 2018
Pakistan	42	High-intensity conflict, war	119 000
Central African Republic	41	Minor-intensity conflict	641 000
South Sudan	40	High-intensity conflict, war	1 869 000
Somalia	38	High-intensity conflict, war	2 648 000
Afghanistan	37	High-intensity conflict, war	2 598 000 <sup>d</sup>
Guinea Bissau	37		<sup>d</sup>
Nigeria	36	High-intensity conflict, war	2 216 000 <sup>d</sup>
Lesotho	35		<sup>d</sup>
Chad	34	Minor-intensity conflict	90 000
Côte d'Ivoire	34	Minor-intensity conflict	302 000
Sierra Leone	33	<sup>d</sup>	3000
Mali	33	Minor-intensity conflict	120 000 <sup>d</sup>
Mauritania	33	Minor-intensity conflict	<sup>d</sup>
Djibouti	32	<sup>d</sup>	<sup>d</sup>
Comoros	32	<sup>d</sup>	<sup>d</sup>
Guinea	31	<sup>d</sup>	<sup>d</sup>
Benin	31	<sup>d</sup>	3500
Equatorial Guinea	30	<sup>d</sup>	<sup>d</sup>

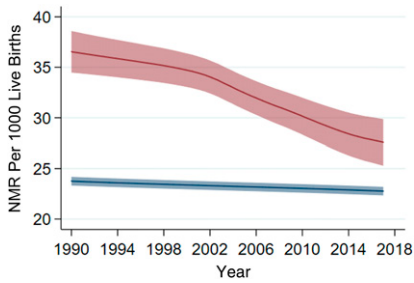
UCDP, Uppsala Conflict Data Program.

<sup>a</sup> NMR: deaths <1 mo per 1000 live births. 2018 estimates by UN Inter-Agency Group for Child Mortality Estimation.<sup>8</sup>

<sup>b</sup> UCDP: unit of analysis events: an instance of fatal organized violence using armed force by organized actor. Minor-intensity conflict: between 25 and 999 battle-related deaths in a given year. High-intensity conflict, war: at least 1000 battle-related deaths in a given year.

<sup>c</sup> Internal Displacement Monitoring Center: Global report on internal displacement in 2019. Number of displaced persons due to conflict up to December 2018.

<sup>d</sup> No conflict documented by UCDP in the reporting period of 2010–2017.<sup>9</sup> No data of displacement due to conflict reported in the report.<sup>3</sup>



**FIGURE 1**

NMR (<1 month), conflict versus nonconflict, 1990–2017. Pooled mortality trends compare conflict-affected (red line) and non-conflict-affected (blue line) low- and middle-income countries. Shaded area indicates 95% uncertainty interval. “Conflict” country is defined as one with a mean battle-related mortality rate of at least 10 per million for each decade between 1990–2017 (ie, 1990–1999, 2000–2009, 2010–2017), else “Non-conflict.” Reprinted with permission from Akseer N, Wright J, Tasic H, et al. Women, children and adolescents in conflict countries: an assessment of inequalities in intervention coverage and survival. *BMJ Glob Health*. 2020;5(1): e002214.

the health centers that failed to provide adequate neonatal resuscitation in Burkina Faso and the DRC, the majority reported a lack of equipment as the main reason for not providing the service: two-thirds did not have a resuscitation bag and infant face masks in the DRC.<sup>15</sup>

Similarly, in recent studies in South Sudan and Somalia, researchers have found low baseline coverage of essential newborn care practices.<sup>16,17</sup> Program staff from the United Nations (UN), nongovernmental organizations (NGOs), and governmental agencies reported that inadequate funding, a lack of trained personnel, and high staff turnover were the top 3 barriers to implementation of newborn health programs in humanitarian settings.<sup>18</sup>

To address the gap in health worker capacity, national ministries, the UN, NGOs, and faith-based organizations tend to rely on in-service trainings. In the area of newborn health, there are few well-designed skill-based trainings for low-resource settings. In this review, organizations that have implemented newborn care programs

in humanitarian settings share lessons learned from their use of one such training: the American Academy of Pediatrics HBS program.

The HBS training program comprises 3 components: Helping Babies Breathe (HBB),<sup>19</sup> Essential Care for Every Baby (ECEB),<sup>20</sup> and Essential Care for Small Babies (ECSB).<sup>21</sup> HBB provides a simplified neonatal resuscitation algorithm and skills-based training on the initial steps of newborn resuscitation. ECEB covers immediate newborn care for all infants at birth including thermal care, breastfeeding, monitoring for signs of complications, and predischarge care; ECSB builds on ECEB with a focus on low birth weight (LBW) infants and specialized care for these infants. All 3 programs are designed to train master trainers (via a training of trainers) who can use the materials to cascade training.

## EXPERIENCE WITH HBS IN HUMANITARIAN SETTINGS: CASE EXAMPLES

### Somalia, 2016–2020

#### Context

Somalia has experienced 3 decades of protracted humanitarian crises driven by climate shock and conflict, which have led to an estimated 2.6 million IDPs.<sup>3</sup> The prolonged instability has created a shortage of skilled health workers, low coverage of health services, and fragile health governance. Somalia’s indicators are among the highest globally, with a maternal mortality ratio of 692 deaths per 100 000 live births in 2019 and an NMR of 38 deaths per 1000 live births in 2018.<sup>8,22</sup> The top 3 causes of neonatal death in 2015 were birth asphyxia and trauma (38.6%), infection (28.3%), and prematurity (21.1%).<sup>23</sup>

#### Capacity Building Approach

Recognizing gaps in the provision of newborn care at the primary health facility level in the city of Bossaso

within the Somali state of Puntland in 2016, Save the Children, in coordination with the Puntland Ministry of Health (MoH), conducted a feasibility and effectiveness study of the Newborn Health in Humanitarian Settings Field Guide<sup>13</sup> that included providing an 8-day HBS training to providers.<sup>24</sup> Supplemental modules on maternal health, intrapartum care, supportive supervision, and health information systems were included to address reported gaps in participants’ experiences. In the Bossaso study, researchers found that HBS training was effective in improving knowledge and skill of health workers. Subsequently, Save the Children, in collaboration with the MoH, conducted a 14-day HBS master trainer course for 29 MoH-employed doctors and nurses in Garowe, the capital city of Puntland, in 2019.

#### Results

The Bossaso study found that providers’ knowledge improved from pre- to post-training with a mean difference in score of +11.9% (95% confidence interval [CI] 7.2 to 16.6;  $P < .001$ ), skills in newborn resuscitation improved from pre- to post-training with a mean difference in score of +65.1% (95% CI 53.4 to 76.7;  $P < .001$ ), and learned skills were retained at the 18-month follow-up from post-training with a mean score difference of +0.4 (95% CI -6.6 to 7.4;  $P = .903$ ).<sup>24</sup> In the Garowe master trainer course, the knowledge and skills, as measured by the pre-post training evaluation, improved among the 29 participants (Table 2).

#### Lessons Learned

The lessons learned from Somalia were the importance of the alignment of HBS program to the MoH policies, integrated maternal and newborn health training, and cascading knowledge and skills at the health facility level.

**TABLE 2** Mean Pre-training and Post-training Knowledge and Skill Performance Scores in Garowe Master Training, Puntland, Somalia (*N* = 29)

Module	Assessment	Pre-training Mean (SD)	Post-training Mean (SD)	Mean Difference Mean (SD)	<i>P</i>
HBB	Knowledge test	67.3 (20.2)	82.8 (13.7) <sup>a</sup>	15.5 (16.3)	<.001
	OSCE-A <sup>b</sup> skill performance	49.2 (20.3)	77.4 (15.9)	28.2 (22.8)	<.001
ECEB	OSCE-B <sup>c</sup> skill performance	29.3 (15.8)	72.1 (19.2)	42.9 (22.7)	<.001
	Knowledge test	66.1 (16.2)	79.7 (14.7)	13.6 (13.0)	<.001
ECEB	OSCE-A <sup>d</sup> skill performance	52.4 (20.1)	92.0 (11.0) <sup>a</sup>	39.6 (22.4)	<.001
	OSCE-B <sup>e</sup> skill performance	40.8 (26.5)	85.4 (24.9) <sup>a</sup>	44.6 (34.1)	<.001
ECSB	Knowledge test	67.9 (16.1)	82.1 (12.1)	14.2 (10.7)	<.001
	OSCE-A <sup>f</sup> skill performance	59.2 (17.6)	87.3 (16.7) <sup>a</sup>	28.1 (16.0)	<.001
	OSCE-B <sup>g</sup> skill performance	52.9 (22.4)	90.7 (12.7) <sup>a</sup>	37.9 (18.0)	<.001

OSCE, Objective Structured Clinical Evaluations.

<sup>a</sup> Test in which  $\geq 70\%$  of participants had  $\geq 80\%$  correct answer or performance.

<sup>b</sup> Term infant stimulation.

<sup>c</sup> Preterm bag and mask resuscitation.

<sup>d</sup> Normal birth weight infant ECEB.

<sup>e</sup> LBW infant ECEB.

<sup>f</sup> LBW infant with complication, classification, monitor.

<sup>g</sup> LBW infant feeding with a nasogastric tube.<sup>20</sup>

The endorsement and full engagement of the MoH throughout the process was essential. Several factors facilitated the MoH's acceptance of the HBS curriculum, including the preliminary results of the Bossaso study, promising results from previous studies in African countries, acknowledgment of the challenges and gaps faced in providing newborn health care in Puntland, and the long-standing partnership between the MoH and Save the Children.

HBS was feasible and easy to contextualize. The use of complementary materials, including Global Health Media Project videos,<sup>25</sup> practical training exercises using simulated case scenarios, and paired participation for peer support, assisted facilitators in instructing participants with variable baseline knowledge and skills. To make HBS training materials more accessible for the future, Save the Children coordinated with the American Academy of Pediatrics and MoH to

have the HBS materials translated into the Somali language.

HBS was implemented in an integrated maternal and newborn health training approach, which was necessary because of limited existing knowledge and skills for maternal health. Such an integrated approach highlighted the importance of the continuum of care and teamwork when managing complications that might arise during childbirth. Introduction of new equipment, such as a resuscitation table with an overhead heater, was not as successful because of the delay in assembly and a lack of familiarity with using the equipment.<sup>24</sup>

The cascade training was done at health facility level. In both the Bossaso study and Garowe master training, participants were empowered with training materials and manikins to continue learning within their facilities and to teach their peers in the same care practice. Although subject matter experts from Kenya and Uganda facilitated the HBS trainings in the Bossaso study and

Garowe master training, such consultancy will not be needed there in the future.

## Chad, Cameroon, and Niger, 2018–2019

### Context

Recognizing the need to strengthen maternal and newborn health services, the Saving Newborn Lives in Refugee Settings project was started by United Nations High Commissioner for Refugees (UNHCR), with support from the Bill and Melinda Gates Foundation and together with the respective MoHs and NGOs in Chad, Cameroon, and Niger in 2018–2019. These countries were selected because they have weak health and human development indicators and are cumulatively hosting nearly 1 million refugees and asylum seekers. In 2018, the national NMRs were 34, 27, and 25 per 1000 live births in Chad, Cameroon, and Niger, respectively.<sup>8</sup> The project aimed to improve maternal and newborn health care provision through strengthening essential maternal and neonatal interventions and reinforcing quality family planning services in refugee settings. Providing quality health services in refugee camp settings faces numerous constraints because camps are often located in remote, border regions, and many have security restrictions. Staff shortages and high turnover of key health staff is common, and limited financial resources may result in a lack of regular training for staff as well as a lack of access to essential medications and supplies.

### Capacity Building Approach

Across the 3 countries, the project covered 29 health facilities in total: 21 health centers in refugee sites and 8 referral district hospitals. A baseline assessment was completed in 2018 to assess needs, identify gaps, and determine priorities for project activities. Specific to neonatal

resuscitation, in Cameroon and Chad, only half or fewer health facilities had a resuscitation bag and mask for term infants available (50% and 33%, respectively) (Table 3); for all 3 countries, a size 0 mask for resuscitation of preterm infants was rarely available (ranging from 13% to 20% of facilities). Oxygen was not available at the assessed health facilities in Niger and Chad, and it was found in only 30% of health facilities in Cameroon. Advanced respiratory support such as continuous positive airway pressure (CPAP) or equipment for intubation was not available. Moreover, the presence of basic resuscitation equipment in a health facility did not mean that it was actually used because some equipment was found locked in offices rather than in the delivery room, and in some cases, midwives stated that they did not use it because of lack of knowledge. At baseline, the majority of maternity staff (64% in Cameroon, 67% in Chad, and 55% in Niger) reported that they had never received training in neonatal resuscitation (Table 3). When asked to demonstrate resuscitation techniques to be used for an apneic infant, they described that newborns were held upside down by the feet and slapped on the back, alcohol was rubbed on the skin to stimulate breathing, and mouth-to-mouth resuscitation was administered in lieu

of the more effective bag and mask resuscitation.

The baseline findings signaled that beyond training, there was a need for context-specific clinical tools and guidance, procurement of essential supplies and medical equipment, infrastructure improvements, technical support and monitoring, and an increased awareness of the importance of providing neonatal health programs among management-level staff. Importantly, the project targeted capacity building of all relevant staff involved in maternal and newborn care, including doctors, midwives, nurses, and nurse aides.

The project applied a low-dose high-frequency (LDHF), competence-building approach, which has been evaluated in other settings to promote maximum retention of clinical knowledge and skills and improve attitudes.<sup>26</sup> The initial step involved 7 master trainer sessions: 3 in the first year and 4 in the second year. Each master trainer session lasted for 10 to 12 days, and 45 health workers were trained overall. The second step involved the rollout of training by master trainers in their own facility (Table 4). The training curriculum included modules from the 3 HBS programs (HBB, ECEB, and ECSB) and 2 Helping Mothers Survive training modules (bleeding after birth complete, and preeclampsia and

eclampsia). Trainings also included a module on integrated management of childhood illnesses (for ages 0–2 months) that was focused on the assessment and management of sick neonates because this was identified as limited in the HBS modules.

## Results

LDHF training was implemented in 29 health facilities. Overall, 118 sessions were conducted on HBB and complemented with sessions on ECEB and ECSB. Over the course of the 15 months during which these trainings were cascaded, a total of 16 326 mother-infant pairs received care at the 29 health facilities (Fig 2). In terms of the impact on newborn survival, low NMRs at baseline (potentially due to underreporting) made it difficult to assess changes in this indicator, although trends seem encouraging. Health facilities increased and sustained the availability of essential supplies, medications, and clinical guidelines.

## Lessons Learned

The key lessons learned can be categorized into 3 broad themes: training implementation, monitoring and communication, and creating an enabling environment.

Related to training, we found that the selection of master trainers should ideally follow strict selection criteria to include individuals with adequate knowledge and experience in maternal and newborn health, experience in facilitating trainings, and direct involvement in the health facility and project for maximum success. Poor language proficiency, low levels of knowledge and skills in maternal and newborn health, lack of motivation, and poor communications skills were some of the challenges that impacted rollout. Trainee groups that included both doctors and midwives were favorable, facilitating team dynamics during the training as well as the clinical practices at the

**TABLE 3** Baseline Availability of Neonatal Resuscitation Equipment and Trained Health Workers at Health Facilities in Chad, Cameroon, and Niger in 2018

	Chad ( <i>n</i> = 15 Health Facilities)	Cameroon ( <i>n</i> = 10 Health Facilities)	Niger ( <i>n</i> = 5 Health Facilities)
Resuscitation bag and mask (size 1 – term), %	33	50	100
Resuscitation bag and mask (size 0 – preterm), %	13	20	20
Suction device, %	33	60	40
Oxygen, <sup>a</sup> %	0	30	0
CPAP, <sup>a</sup> %	0	0	0
Resuscitation area with heat source (radiant warmer or other), %	7	40	20
Health workers who never trained in neonatal resuscitation, <sup>b</sup> % ( <i>n</i> )	67 (12)	64 (14)	55 (42)

<sup>a</sup> CPAP and oxygen when available were at hospital level.

<sup>b</sup> A sample of health workers were asked if they have received newborn training in the last year, >1 y ago, or never.

**TABLE 4** Number of Health Workers Trained by Location and by HBS Module From 2018 to 2019

	No. Health Workers Who Received Training	Total No. Health Workers	% of Target Met
Chad			
HBB	91	144	63
ECEB	118	189	62
ECSB	100	160	63
Cameroon			
HBB	154	268	57
ECEB	138	239	58
ECSB	133	234	57
Niger			
HBB	36	53	68
ECEB	46	63	73
ECSB	18	18	100

health facility after training completion. Respectful and patient-centered care was an important topic that was well received and integrated into the care approaches.

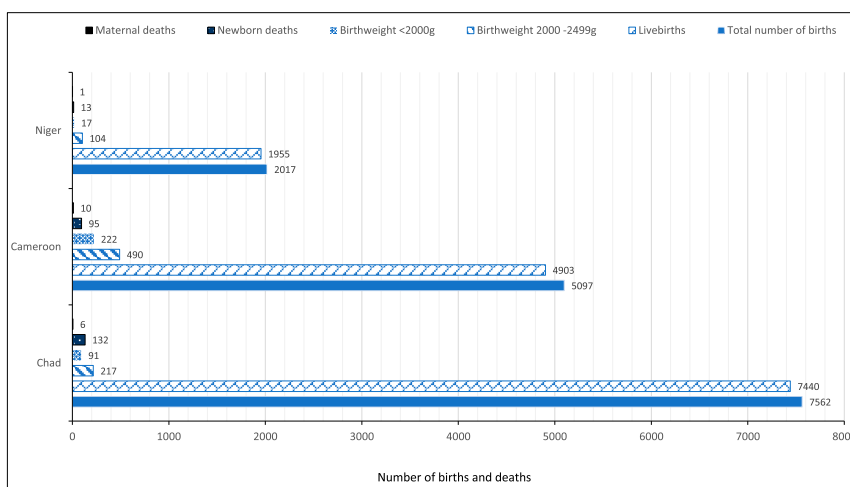
The LDHF approach created a critical mass of providers that learned skills and acquired knowledge at the same pace, allowing an improvement in clinical practice. The availability of master trainers and training materials at each site was necessary because travel between facilities was not always feasible because of security or logistic constraints. This required significant upfront investment to ensure that health

facilities were equipped with training materials and visual aids to allow staff to organize training sessions in a continuous fashion according to their own needs. Doing so facilitated regular skills and drills practices and repetition of modules as needed, for example, with new staff, at no additional costs. At times, master trainers struggled to balance clinical duties with the time required for training preparation and the scenario-based simulation exercise. In addition to technical knowledge and skills improvement, the training approach improved team dynamics, teamwork, and the attitudes toward patients.

Ongoing communication and support for trainers have been keys to success. One WhatsApp group per country was established to include trainers, local UNHCR public health officers, and a UNHCR reproductive health officer in Geneva. WhatsApp is a free platform owned by Facebook, Inc. It allows users to send text and voice messages and video and voice calls and share images and documents ([www.whatsapp.com](http://www.whatsapp.com)). These groups serve as key tools for communication and peer support among trainers who are dispersed throughout remote areas of the country. The trainers share the progress of trainings, challenges and successes, and new clinical guidelines. Difficult clinical cases are often discussed among the group in real time. The group motivates one another, provides practical and emotional support, and reduces feelings of isolation.

During implementation, a monitoring and supervision checklist was completed every 3 months, capturing information on the training sessions held, health outcomes, emergency obstetric and newborn care signal functions performed, and the availability of medications, supplies, and clinical guidelines. These tools served as a monitoring tool for the project and provided a simple framework for supervisory visits, particularly for managers without a strong background in maternity care or pediatrics. It also served as an advocacy tool for the frontline midwife when working with supervisors and UNHCR public health officers, highlighting critical gaps in supplies or equipment. In addition, it allowed for more detailed understanding of the health outcomes for neonates beyond those provided in the standard UNHCR health information system such as neonatal morbidities and mortalities disaggregated by type.

Sustainable change in practice from training requires an enabling



**FIGURE 2**

Maternal and newborn data from October 2018 to December 2019. Data were extracted from project-specific monitoring tools Saving Maternal and Newborn Lives project of UNHCR. Neonatal death (0–28 days) and maternal death are based on death at health facility level or as reported by community health workers.

environment that prioritizes maternal and newborn health. The lack of basic resuscitation equipment found during the baseline assessment highlighted the lack of awareness and/or prioritization of life-saving neonatal interventions among health managers. Recognizing the vital role of management staff in establishing standards of care, additional operational guidance has been developed, including webinars on neonatal health for managers and a short primer on assessing health facility readiness to perform neonatal resuscitation and related minimum standards of care.

## **FUTURE DIRECTIONS: TECHNICAL CONSIDERATIONS**

### **Monitoring Impact**

Although health agencies include maternal and newborn mortality, stillbirth, and coverage of maternal and newborn services in their routine monitoring and health information systems, such data are difficult to collect, both at the health facility and community level, and are often delayed and incomplete in humanitarian contexts. Furthermore, the health data collected are patchwork in nature, small scale, and difficult to merge and provide a comprehensive overview. Quality improvement (QI) initiatives, or more funding, are difficult to advocate for in the absence of accurate, timely, and systematic data. Future endeavors need to look at operationally simple approaches to measuring stillbirths and neonatal mortality in addition to reinforcing coverage measurements.

### **QI**

QI initiatives in humanitarian health responses need to be inclusive of HBS with a set of indicators that can be tracked overtime to measure success and impact. Health organizations can help in the development and operationalization of a measurable standard of care for all patients in

resource-limited and humanitarian settings, along with coaching tools to help facilities meet standards. QI initiatives could also contribute to implementation research.

### **HBB**

Humanitarian crises affect countries with varying levels of health care capacity and qualifications. In its use of the HBB program since 2012, Médecins Sans Frontières has identified a challenge in the acceptance of the HBB algorithm in certain contexts. Although 99% of newborns who “do not breathe at birth” recover with stimulation and bag and mask ventilation, the remaining 1% require advanced resuscitation.<sup>27</sup> The lack of technical guidance for infants who need advanced resuscitation can be a hindrance to HBB implementation in contexts where precrisis capacity, as was the case in Iraq, was high and standard of care included specialized newborn care. In such contexts, HBB is too simplistic, whereas comprehensive advanced resuscitation algorithms, such as those provided by the European Resuscitation Council or Neonatal Resuscitation Program are too complex.<sup>28</sup> In such settings, in the absence of standard advanced resuscitation algorithms, resuscitation is conducted in an ad hoc manner.<sup>28</sup> To standardize care and ensure that the latest evidence is practiced, the development and inclusion of a simplified advanced resuscitation algorithm, as an optional addition to the current HBB, could be considered in contexts where appropriate resources and qualified personnel are available to safely provide such care. Obstetric drills and management of intrapartum fetal hypoxia should also be included in training approaches.

### **ECEB**

The reassessment of newborns and the provision of predischarge education and care were noted to be

the least adopted clinical practices in the Somalia study.<sup>17</sup> Job aids such as checklists to determine readiness for discharge and the inclusion of practical sessions on how to counsel and educate mothers might contribute to translating knowledge and skills gained in ECEB training into practice.

### **ECSB**

Care for LBW infants is an area that needs more evidence in humanitarian settings. Inclusion of hands-on practice in the care for LBW infants (in addition to scenario-based trainings), procurement of necessary medical supplies, and improvement in functionality in labor room or maternity wards and pediatric units to admit LBW infants with complications might all be useful in transferring learnings to practice and building the confidence of health workers.

## **IMPLEMENTATION CONSIDERATIONS: A FUTURE DIRECTION NEEDS TO CONSIDER IMPLEMENTATION ISSUES INCLUDING THE FOLLOWING**

### **Low Baseline Knowledge and Skill Means the Need for Flexibility in the Training Schedule and Approach**

Security considerations (shorter working hours, travel restrictions), language barriers, and variable levels of experience in newborn health mandate flexibility in training approaches and the duration of training. A rigid training curriculum shown to work well in stable settings might not be effective in a humanitarian context. The contextualized approach taken in these case studies worked well and allowed staff to absorb the new skills and knowledge directly applicable to their working environments. The LDHF model was indispensable and is worth considering for future capacity building. Additional contextualization such as the availability of HBS materials in local languages, the procurement of manikins and

supplies before trainings (in sufficient quantity per health facility to allow repeat simulated practices), and supportive supervision facilitated skills retention at a high level should be encouraged.

Newborn resuscitation is a time-sensitive clinical emergency intervention that requires providers to act immediately, systematically, and with confidence. In health facilities with a low number of deliveries, events requiring newborn resuscitation are less frequent, and extra investment is required to retain proficiency in skill. This requires access to practice and training materials at each health facility and the use of frequent skill drills. Cognitive and psychomotor skills depreciate over time; similar to practice by paramedics on cardiopulmonary resuscitation techniques, such should be the case for HBB.

### Integration of Maternal and Newborn Health Trainings

Newborn care in humanitarian settings is often the responsibility of health staff in the maternity unit and labor ward instead of the responsibility of specialized neonatal or pediatric staff. HBS should be a shared responsibility among those who work in both child and maternal health. Therefore, it is critical that health staff in pediatrics, labor wards, and maternity units receive training on HBS and that QI for maternal and child health includes newborn indicators. In the case study examples, the approach taken was to combine HBS with maternal health and intrapartum care modules, and as such, integrated delivery models are encouraged for future trainings.

### Achieving Scale

In the case studies, the focus was on having master trainers responsible within each facility to cascade trainings within their health facilities

directly rather than at the district or at provincial levels. Such direction should be considered in scaling up HBS, especially given the changing paradigm of humanitarian crises, leading to more protracted crises, more communities residing in noncamp situations, travel restrictions, and high staff turnover. This facility-level cascading was also instrumental in changing team dynamics and in changing clinical practice in the health facility. However, such an approach requires a master trainer and training supplies including manikins for each health facility, which is a costly upfront investment. To address high staff turnover among responders and decrease dependency on external consultants, investing in local master trainers allowed for a sustainable approach. Improving neonatal survival needs to be a responsibility of the health cluster or sector coordination lead to ensure that all agencies that support or deliver community, primary, or hospital health care are competent and capable in implementing newborn health care programs. Therefore, to achieve scale, the national ministries, health cluster, and partner agencies need to prioritize investment in the HBS training as soon as is feasible after an emergency.

### CONCLUSIONS

Neonatal mortality is increasingly concentrated in settings of conflict and instability. In such settings, we find that HBS is feasible to implement, often accepted by ministries and partner agencies, effective in improving the knowledge and skills of health personnel, and effective in improving newborn care. To improve newborn survival, the global community needs to place greater focus on the specialized needs of newborns in humanitarian settings. Therefore, attention and advocacy

should be placed on scaling up HBS and ensuring comprehensive care for newborns with complications such as neonatal sepsis, pneumonia, and respiratory distress, as well as a simplified advanced resuscitation algorithm that can complement HBB when feasible.

### ACKNOWLEDGMENTS

This article is the collaborative work of colleagues working in various organizations that have advocated for, supported, or implemented newborn care program in humanitarian settings including Save the Children; UNHCR; Médecins Sans Frontières; Kenya Medical Training College; Gardo Hospital, Puntland, Somalia; Johns Hopkins University Bloomberg School of Public Health; Hospital for Sick Children, Toronto, Canada; and the University at Buffalo, New York. We are thankful for their contribution and dedication to newborn health.

### ABBREVIATIONS

CI: confidence interval  
CPAP: continuous positive airway pressure  
DRC: Democratic Republic of the Congo  
ECEB: Essential Care for Every Baby  
ECSB: Essential Care for Small Babies  
HBB: Helping Babies Breathe  
HBS: Helping Babies Survive  
IDP: internally displaced person  
LBW: low birth weight  
LDHF: low-dose high-frequency  
MoH: Ministry of Health  
NGO: nongovernmental organization  
NMR: neonatal mortality rate  
QI: quality improvement  
UN: United Nations  
UNHCR: United Nations High Commissioner for Refugees



**FINANCIAL DISCLOSURE:** The authors have indicated they have no financial relationships relevant to this article to disclose.

**FUNDING:** No external funding.

**POTENTIAL CONFLICT OF INTEREST:** Dr Berkelhamer is a current member of the American Academy of Pediatrics Helping Babies Survive Planning Group. The other authors have indicated that they have no potential conflicts of interest to disclose

## REFERENCES

1. World Health Organization. Every Newborn: An Action Plan to End Preventable Deaths. Geneva, Switzerland: World Health Organization; 2014. Available at: [https://www.who.int/maternal\\_child\\_adolescent/documents/every-newborn-action-plan/en/](https://www.who.int/maternal_child_adolescent/documents/every-newborn-action-plan/en/). Accessed May 26, 2020
2. Wise PH, Darmstadt GL. Confronting stillbirths and newborn deaths in areas of conflict and political instability: a neglected global imperative. *Paediatr Int Child Health*. 2015;35(3):220–226
3. Internal Displacement Monitoring Centre (IDMC); Norwegian Refugee Council. GRID 2019: Global Report on Internal Displacement. 2019. Available at: <https://www.internal-displacement.org/sites/default/files/publications/documents/2019-IDMC-GRID.pdf>. Accessed April 23, 2020
4. United Nations High Commissioner for Refugees (UNHCR). Global Trends Forced Displacement in 2019. Available at: <https://www.unhcr.org/5ee200e37.pdf>. Accessed April 24, 2020
5. Spiegel PB, Checchi F, Colombo S, Paik E. Health-care needs of people affected by conflict: future trends and changing frameworks. *Lancet*. 2010;375(9711):341–345
6. Salama P, Spiegel P, Talley L, Waldman R. Lessons learned from complex emergencies over past decade. *Lancet*. 2004;364(9447):1801–1813
7. Akseer N, Wright J, Tasic H, et al. Women, children and adolescents in conflict countries: an assessment of inequalities in intervention coverage and survival. *BMJ Glob Health*. 2020; 5(1):e002214
8. United Nations Children's Fund; World Health Organization; World Bank Group. *Levels & Trends in Child Mortality: Report 2019. Estimates Developed by the UN Inter-Agency Group for Child Mortality Estimation*. New York, NY: United Nations Children's Fund; 2019
9. Pettersson T, Höglbladh S, Öberg M. Organized violence, 1989-2018 and peace agreements. *J Peace Res*. 2019; 56(4):589–603
10. Lawn JE, Cousens S, Zupan J; Lancet Neonatal Survival Steering Team. 4 million neonatal deaths: When? Where? Why? *Lancet*. 2005;365(9462):891–900
11. Darmstadt GL, Bhutta ZA, Cousens S, Adam T, Walker N, de Bernis L; Lancet Neonatal Survival Steering Team. Evidence-based, cost-effective interventions: how many newborn babies can we save? *Lancet*. 2005; 365(9463):977–988
12. Sphere. *The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response*. Geneva, Switzerland: Sphere; 2018. Available at: <https://handbook.spherestandards.org/en/sphere/#ch001>. Accessed April 24, 2020
13. United Nations Children's Fund; Save the Children. *Newborn Health in Humanitarian Settings: Field Guide 2018*. New York, NY: United Nations Children's Fund; 2018. Available at: <https://www.healthynewbornnetwork.org/hnn-content/uploads/NewBornHealthBook-Production2017-V4b-WEB.pdf>. Accessed April 24, 2020
14. Global Health Cluster; World Health Organization. *Partners' response capacity*. 2019. Available at: [https://www.who.int/health-cluster/partners/current-partners/partners\\_survey\\_combined\\_results.pdf?ua=1](https://www.who.int/health-cluster/partners/current-partners/partners_survey_combined_results.pdf?ua=1). Accessed April 24, 2020
15. Casey SE, Chynoweth SK, Cornier N, Gallagher MC, Wheeler EE. Progress and gaps in reproductive health services in three humanitarian settings: mixed-methods case studies. *Confl Health*. 2015;9(suppl 1):S3
16. Sami S, Kerber K, Kenyi S, et al. State of newborn care in South Sudan's displacement camps: a descriptive study of facility-based deliveries. *Reprod Health*. 2017;14(1):161
17. Amsalu R, Morris CN, Chukwumalu K, et al. Essential newborn care practice at four primary health facilities in conflict affected areas of Bossaso, Somalia: a cross-sectional study. *Confl Health*. 2019;13:27
18. Lam JO, Amsalu R, Kerber K, et al. Neonatal survival interventions in humanitarian emergencies: a survey of current practices and programs. *Confl Health*. 2012;6(1):2
19. Niermeyer S, Kamath-Rayne B, Keenan W, Little G, Singhal N, Visick M, eds; for Helping Babies Survive. *Helping Babies Breathe: Action Plan* [log-in required]. 2nd ed. American Academy of Pediatrics, Laerdal Global Health; 2016. Available at: [http://internationalresources.aap.org/Resource/ShowFile?documentName=HBB\\_Wall%20Poster\\_Second\\_Edition\\_20-00372\\_Rev\\_D.pdf](http://internationalresources.aap.org/Resource/ShowFile?documentName=HBB_Wall%20Poster_Second_Edition_20-00372_Rev_D.pdf). Accessed May 6, 2020
20. Bose C, Singhal N, eds; for Helping Babies Survive. *Essential Care for Every Baby: Action Plan* [log-in required]. American Academy of Pediatrics, Laerdal Global Health; 2014. Available at: [http://internationalresources.aap.org/Resource/ShowFile?documentName=eceb\\_actionplan\\_english1.pdf](http://internationalresources.aap.org/Resource/ShowFile?documentName=eceb_actionplan_english1.pdf). Accessed May 6, 2020
21. Singhal N, Berkelhamer S, eds; for Helping Babies Survive. *Essential Care for Small Babies: Action Plan* [log-in required]. American Academy of Pediatrics, Laerdal Global Health; 2015. Available at: <http://internationalresources.aap.org/Resource/ShowFile?docu>

- mentName=ECSB\_Action\_Plan.pdf. Accessed May 6, 2020
22. Directorate of National Statistics, Federal Government of Somalia. The Somali Health and Demographic Survey 2020. Available at: <https://somalia.unfpa.org/en/publications/somali-health-and-demographic-survey-2020>. Accessed May 6, 2020
23. United Nations Children's Fund (UNICEF). Maternal and newborn health disparities. Country profiles. Somalia. November 2016. Available at: <https://data.unicef.org/resources/maternal-newborn-health-disparities-country-profiles/>. Accessed April 3, 2020
24. Amsalu R, Morris CN, Hynes M, et al. Effectiveness of clinical training on improving essential newborn care practices in Bossaso, Somalia: a pre and postintervention study. *BMC Pediatr*. 2020;20(1):215
25. Global Health Media Project. Global Health Media. Available at: <https://globalhealthmedia.org/>. Accessed April 23, 2019
26. Jhpiego. Low dose, high frequency: a learning approach to improve health workforce competence, confidence, and performance. 2016. Available at: [www.healthynewbornnetwork.org/hnn-content/uploads/Jhpiego-LDHF\\_brief-1.pdf](http://www.healthynewbornnetwork.org/hnn-content/uploads/Jhpiego-LDHF_brief-1.pdf). Accessed April 24, 2020
27. Wall SN, Lee AC, Carlo W, et al. Reducing intrapartum-related neonatal deaths in low- and middle-income countries-what works? *Semin Perinatol*. 2010;34(6):395-407
28. Umphrey L, Breindahl M, Brown A, et al. When Helping Babies Breathe is not enough: designing a novel, mid-level neonatal resuscitation algorithm for Médecins Sans Frontières field teams working in low-resource hospital settings. *Neonatology*. 2018;114(2):112-123

**Lessons Learned From Helping Babies Survive in Humanitarian Settings**  
Ribka Amsalu, Catrin Schulte-Hillen, Daniel Martinez Garcia, Nadia Lafferty,  
Catherine N. Morris, Stephanie Gee, Nadia Akseer, Elaine Scudder, Samira Sami,  
Sammy O. Barasa, Hussein Had, Maimun Farah Maalim, Seidou Moluh and Sara  
Berkelhamer

*Pediatrics* 2020;146;S208  
DOI: 10.1542/peds.2020-016915L

**Updated Information & Services**

including high resolution figures, can be found at:  
[http://pediatrics.aappublications.org/content/146/Supplement\\_2/S208](http://pediatrics.aappublications.org/content/146/Supplement_2/S208)

**References**

This article cites 14 articles, 1 of which you can access for free at:  
[http://pediatrics.aappublications.org/content/146/Supplement\\_2/S208#BIBL](http://pediatrics.aappublications.org/content/146/Supplement_2/S208#BIBL)

**Permissions & Licensing**

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:  
<http://www.aappublications.org/site/misc/Permissions.xhtml>

**Reprints**

Information about ordering reprints can be found online:  
<http://www.aappublications.org/site/misc/reprints.xhtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®



# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

## **Lessons Learned From Helping Babies Survive in Humanitarian Settings**

Ribka Amsalu, Catrin Schulte-Hillen, Daniel Martinez Garcia, Nadia Lafferty, Catherine N. Morris, Stephanie Gee, Nadia Akseer, Elaine Scudder, Samira Sami, Sammy O. Barasa, Hussein Had, Maimun Farah Maalim, Seidou Moluh and Sara Berkelhamer

*Pediatrics* 2020;146;S208

DOI: 10.1542/peds.2020-016915L

The online version of this article, along with updated information and services, is located on the World Wide Web at:

[http://pediatrics.aappublications.org/content/146/Supplement\\_2/S208](http://pediatrics.aappublications.org/content/146/Supplement_2/S208)

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 345 Park Avenue, Itasca, Illinois, 60143. Copyright © 2020 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN®

