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Addressing Extreme Vulnerability: Remaining Barriers to Neonatal Healthcare Delivery in Conflict Areas

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Addressing Extreme Vulnerability: Remaining Barriers to Neonatal Healthcare Delivery in

Conflict Areas

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Preface

My passion for neonatal healthcare began last summer when I partook in the Harvard Summer Program in Neonatology and interned in the Neonatology Department at Beth Israel Deaconess Medical Center. Working alongside my mentor, Dr. Munish Gupta, I conducted a retrospective research study on respiratory outcomes of very-low birthweight, preterm infants and discovered a love for the field. By shadowing various neonatal services such as the delivery room team, neonatal intensive care unit management, preterm infant follow up, and lung clinic care, I found myself in awe at the wonderfully miraculous nature of newborn physiology. More importantly, however, amidst the mechanical ventilators and beeping monitoring devices, I found myself increasingly aware of just how *vulnerable* newborns could be.

Since then, as a student of Biology and Ethics/International Social Justice at Boston College, I have challenged myself to better understand how my passion for neonatology intersects with the field of humanitarian action. Now, in conducting research on the delivery of neonatal healthcare in conflict areas I hope to have taken the first step in bridging my two interests. Moving forward, I hope to continue to critically consider my role in the world and aim to orient my future work towards examining the protection of fundamental human rights for vulnerable populations.

Acknowledgements

I would like to take the time to thank everyone who contributed in any way to make this project possible. First, to my interviewees – Ms. Sheperis, Dr. Bottineau, Dr. Yakubu, Ms. Abu-Haydar, and Dr. Somerville - thank you for sharing your time, knowledge, and passions with me. Without you, this research would not be possible. I would also like to thank Dr. Alexandre Lambert and Françoise Flourens for their support throughout the past few months, for crafting a

truly engaging academic program, and for encouraging me to explore my passion for global health this semester. Thank you to Dr. Anne Golaz for being a true role model in the fields of health and humanitarian action and for her constant guidance in getting me connected to experts in the field. Additionally, I would like to recognize Dr. Elisabeth Meur for her expertise and her feedback/guidance through the writing of this research.

Of course, my ability to complete this research is owed to many other people who have supported me in countless other ways. I am extremely grateful for my homestay family members who have so lovingly opened their lives to me and given me a home away from home. To my friends - both in Switzerland and at BC - thank you for constantly challenging me to be the best version of myself. And finally, the biggest thank you is saved for my family. Mom and Dad, everything I succeed in is owed to you and I can never thank you enough for the unconditional love and support you show me. Mom, thank you for always wearing your heart on your sleeve and teaching me what a strong woman is and Dad, thank you for always reminding me to "keep my courage." Greg, I am constantly inspired by your passion and thank you for constantly pushing me to be aware of the surrounding world. To the rest of my family - thank you for always being there for me, encouraging me to embrace new experiences, and helping me find my voice over the Sunday dinner table.

Abstract

Global statistics show that world-wide neonatal mortality rates are not yet within the target range set by Sustainable Development Goals and reflect persistent violations of the fundamental right to health for newborns around the world. While there is a wide base of knowledge on the main causes of death and minimum standards of care for neonatal health in stable and low-resource settings, there is a significant gap in knowledge regarding the unique circumstances of neonatal healthcare situated in conflict settings. The main objectives of this research are to elaborate on the current state of neonatal healthcare in conflict areas and elucidate remaining barriers that prevent successful newborn health outcomes in these settings. This research found that although various healthcare models have been successful in conflict settings, wide-spread gaps in services and technologies remain. Overall, while remaining barriers were found to vary by context, both direct and indirect challenges to the successful delivery of neonatal healthcare in conflict settings were found including the depletion of human resources, collapse of referral system, legal restrictions on care provision, lack of health information, scarcity of funding, market dynamics, and cultural/perspective differences. Each barrier must be addressed through the framework of "strategic governance" in order for the international community to better protect the right to health for newborns in conflict areas.

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Relevant Abbreviations

Term Used	Abbreviation
Sustainable Development Goals	SDG
Neonatal Mortality Rate	NMR
Médecins Sans Frontières	MSF
Specialized Neonatal Care Unit	SNCU
Continuous Positive Airway Pressure	CPAP
Kangaroo Mother Care	KMC

Introduction

Background and Relevance

In the Sustainable Development Goals, the international community has recognized the importance of protecting the right to health for vulnerable populations. The topic of neonatal healthcare delivery has specifically been a target of international attention, as newborns have consistently been identified as one of the most vulnerable populations in the world. Specifically, the call for the protection of the right to neonatal healthcare intersects the Sustainable Development Goals from the perspective of SDG 3 as the humanitarian community commits itself to "end[ing] preventable deaths of newborns and children under 5 years" (United Nations). The international community has directly begun to address neonatal health outcomes because despite recent improvements in worldwide under-five child mortality rates, neonatal mortality rates have resisted a proportional decline. Neonatal mortality rate (NMR) is defined as the death rate of live-born children in the first 28 days of life and is an important indicator of a health system's protection of the right to health because it depicts the health of children when they are most vulnerable (Wise & Darmstadt, 2015, p.388). While a 58% decline in post-natal under-five mortality was reported between 1990 and 2015, the neonatal mortality rate has declined at a

slower pace (Dörnemann, et al., 2017, p. 168). Currently, neonatal mortality represents almost

three million deaths per year and accounts for more than 40% of all global under-five-child

deaths (Wise & Darmstadt, 2015, p.388).

The challenge of improving the neonatal survival becomes amplified when the global

distribution of neonatal deaths is understood. Specifically, 99% of worldwide newborn deaths

occur in resource-poor countries and the majority of these deaths are due to preventable

complications (Médecins Sans Frontières, p. 5). While high-income countries have a neonatal

death rate of just 3 out of 1000 births, low-income countries' NMR are on average 27 out of

1000 (UNICEF, 2018, p. 1). Furthermore, this uneven distribution of neonatal mortality becomes

increasingly problematic when viewed in humanitarian emergency contexts. Neonatal mortality

rates are the highest during humanitarian emergencies and it has been suggested that newborns

younger than 28 days old have the highest risk of mortality in emergency situations (Lam et. al,

2012, p. 1). More specifically, this relationship is related to the notion that neonatal death rates

have been increasingly linked to political instability. According to Wise and Darmstadt (2015),

while 10% of all neonatal deaths in 1991 occurred in high levels of political instability, this

percentage rose to 31% by 2013 (p. 387). The correlation between neonatal mortality rates and

contexts of humanitarian emergency/poor governance has held steady in recent years despite

improvement efforts. In 2013, 19 out of 20 countries with the highest neonatal mortality rates

were identified as states experiencing chronic conflict and/or poor governance (Wise &

Darmstadt, 2015, p. 388). Most recently, UNICEF data shows that eight out of the 10 countries

with the highest NMRs – in decreasing order: Pakistan, Central African Republic, Afghanistan,

Somalia, Lesotho, Guinea-Bissau, South Sudan, Côte d'Ivoire, Mali, Chad – are "fragile states"

experiencing conflict, natural disasters, instability, and/or poor governance (UNICEF, 2018,

p.12). Furthermore, UNICEF estimates that around 10-20% of all newborn deaths occur in zones of conflict and displacement, but notes it is challenging to accurately measure such a percentage due to lack of data (UNICEF, 2016).

According to Médecins Sans Frontières, this persistently high, global neonatal mortality rate urges a call to action as the organization declares, "with the global advances in child survival and increased proportion of newborn deaths, a growing body of evidence on basic lifesaving measures for newborns and an increased awareness of child rights perspective, it is time for humanitarian organizations to step up improvements in quality of care for all children in humanitarian aid settings" (Nejat, Hiffler, Garcia, & Kadir, 2018). Applying this statement to the disaggregated understanding of neonatal mortality around the world, it is essential that more research be conducted into *how* these humanitarian organizations "step up improvements" and *what barriers* to improvement remain. Additionally, since poor neonatal outcomes around the world are highly concentrated in areas of conflict and humanitarian emergency, a more in-depth understanding of neonatal healthcare delivery in these specific contexts must be developed in order to inform improvement efforts. Overall, if the international humanitarian community is committed to the Sustainable Development Goal 3 target of "reduc[ing] neonatal mortality to at least as low as 12 per 1,000 live births," attention and improvements must be made to neonatal healthcare in such settings (United Nations).

Research Question and Methodology

The purpose of this research is to elaborate on the practices and challenges of the provision of neonatal healthcare specifically in *conflict areas.* More specifically, this research asks the following two questions: *How is neonatal healthcare delivered by humanitarian aid organizations in conflict settings?* and *What are the remaining barriers to the successful*

improvement of neonatal health outcomes in these settings? While the main objective of this

research is to elucidate the remaining barriers to successful delivery of neonatal healthcare in

conflict so as to create a stronger knowledge base to inform improvement efforts, the

understanding of general practices of neonatal healthcare delivery serves as an essential

foundation for further analysis.

 For foundational knowledge on the current state of the topic, a literature review for this

research was conducted by searching scholarly databases including NCBI and Google Scholar.

Since the background research for this project spanned many related topics, searches were

conducted using multiple keyword combinations. Databases were searched with the criteria

"neonatal healthcare" or "newborn health" and "conflict areas." Additionally, upon

recommendation from an interviewee, databases searches were conducted specifically on Syria

by searching "neonatal healthcare" and "Syria." Grey literature was found by searching the

websites of known, relevant organizations including Save the Children, Médecins Sans

Frontières, and UNICEF. The results from the scholarly literature search also contributed to the

identification of additional grey literature because any relevant humanitarian aid organizations

that were mentioned in peer-reviewed articles were examined for applicable published works.

Studies were included based on the relevance of findings to examining the general provision

practices (or the barriers to successful provision) of neonatal healthcare in conflict settings. Due

to relatively little information on this very specific topic, resources were considered that also

discussed neonatal healthcare provision in low-resource or humanitarian emergency situations.

Additionally, sources that more generally elaborated on the barriers of healthcare provision in

conflict areas were considered for inclusion based on relevance. Both individual data studies and

meta-analyses were considered for review. Results were excluded based on the fact that they

went beyond the scope of this exploration or did not directly address one (or more) components of the research question.

Following the literature review, a major component of this research consisted of interviewing relevant experts to gain a comprehensive and up-to-date understanding of the topic. The interviewees were recruited and selected by prior research and identification as a having expert-level experience in neonatal healthcare delivery in conflict or low-income settings. While the majority of experts were chosen by research into the staff lists of relevant organization, some were recommended by colleagues through the use of the snowball method. All interviews were conducted at the office of the interviewee and were conducted in English. Each interview was semi-structured in order to gain the information necessary to make accurate conclusions on the topic, but was largely guided by the interviewee's individual answers as to gain a more in-depth and nuanced understanding of the issue. Some interviews were recorded, with full permission of the interviewee, and it was made clear that no quotations would be made from the conversation without the explicit approval of the interviewee. Once both the literature review and interviews were completed, a comprehensive analysis of remaining barriers of neonatal healthcare delivery in conflict areas was conducted to identify the potential ways in which the international community can better deliver on its Sustainable Development Goal to protect the right to health for newborns around the world.

Consideration of Ethics

A Human Subjects Review was completed prior to the start of this research and was approved by the SIT Review Committee. Upon approval, all human subjects policies and ethical research guidelines were followed in order to respect and protect the rights of all subjects involved. Namely, although this research looked at the status of healthcare of the vulnerable

population of mothers/newborns in conflict settings, no vulnerable populations were directly

engaged for information or interviews. All interviewees and points of contact were professionals

with expert level knowledge on the topic so no harm was done by contacting or engaging with

interview subjects. Any interviews that were recorded were only recorded with the explicit

verbal consent of the interviewee and the recorded file of the interview will be deleted no later

than 90 days after the interview was completed. Furthermore, all components of this research

that directly quoted or paraphrased a statement from an interviewee were sent for prior approval

before being included in this write up. Overall, this research was conducted with a constant aim

to respect the integrity and trust of all participants involved, with the hope that a discussion on

the topic would be mutually beneficial for all parties.

Modifications and Research Framework

In the original plan of this research, an interdisciplinary approach was proposed in which

experts from many different disciplines/professions were to be interviewed to gain the most

comprehensive understanding possible of remaining barriers. However, it proved extremely

difficult to identify experts from diverse fields that have relevant experience on this very specific

research topic, so the intended interdisciplinary approach is more readily apparent in the type of

literature included in the research view. Additionally, the original research proposal intended to

examine the delivery of neonatal healthcare in conflict areas by *both* humanitarian aid

organizations and governments. However, it proved extremely difficult to find specific

information about governmental provision of neonatal healthcare during conflicts and no

government representatives could be interviewed on the topic. Due to this unanticipated lack of

available information, the resulting research focuses mostly on the provision of neonatal

healthcare services by humanitarian aid organizations. In this context, extra attention was paid in

literature review and interviews to the way in which humanitarian aid organizations collaborate with governments in their work.

This research will begin by elaborating on the current state of neonatal healthcare provision by humanitarian aid organizations in conflict areas. Through an analysis of the strengths and shortcomings of these practices/protocols, this paper then takes an interdisciplinary approach to identifying the remaining barriers to the successful improvement of neonatal healthcare delivery/outcomes in conflict settings. Finally, this information is used to identify multi-sectoral policy and action recommendations aimed at specifically addressing these evident barriers. It is the goal of this research that the elucidation of remaining barriers and corresponding recommendations will help the international community better commit itself to the protection of the fundamental right to health for newborns around the world. Overall, it was found that although humanitarian aid organizations are able to provide varying degrees of neonatal healthcare in conflict areas, many barriers to successful outcomes remain including the depletion of human resources, collapse of referal systems, legal restrictions on care provision, lack of information, scarcity of funding, market dynamics, and cultural/perspective differences.

Literature Review

Overview: Neonatal Healthcare Delivery

Neonatal healthcare is here defined as all health services related particularly to newborns until 28 days of life. It is important to note that while 28 days is typically the standard age before which a child is considered a "newborn," this definition is not absolutely standard (World Health Organization, 2017). For instance, important actors such as Médecins Sans Frontières define the "neonatal period" as the first four weeks of life (Médecins Sans Frontières, p. 4). In light of this definition, neonatal health services include all health services during and after birth (such as safe

delivery practices, respiratory care, infection prevention/treatment, etc.) and are intimately

related to maternal/antenatal care. Since neonatal healthcare is uniquely situated between

maternal healthcare and pediatrics, there is a wide range of professionals that may play a role in

its provision (this is also highly dependent on the setting as discussed later). In the healthcare

field, professionals including neonatologists, pediatricians, obstetricians, midwives, nurses,

nutritionists, respiratory therapists, etc. can be part of a team delivering neonatal healthcare.

Médecins Sans Frontières, for example, recognizes the involvement of diverse professions in the

provision of neonatal care as its trainings target, "the whole health staff working with neonates –

the midwife, bed nurse working with newborns, general practioner, or clinical officer working

with babies." (M. Bottineau, personal communication, March 29, 2018). However, it is also

essential to understand that especially in an "unstable" situation, many people – both within and

outside of the direct health team – can be implicated in neonatal healthcare delivery.

It is necessary to first understand the overall framework of neonatal healthcare in order to

lay the foundation of how exactly humanitarian aid organizations deliver such care in conflict

settings. In its "Every Child Alive" report, UNICEF (2018) importantly notes that "newborn

deaths are difficult to address with a single drug/intervention… they require a system-wide

approach" (p. 1). In other words, the unique nature of newborn health (compared to the health of

older children or adults) directly impacts the way in which care is delivered. In this way, the

common causes of neonatal mortality both shape the actions of the field and point to persistent

barriers to success. According to MSF, "prematurity and low birth weight, infections, and

asphyxia are the main causes of newborn deaths, together comprising over three quarters of

newborn mortality" (Médecins Sans Frontières, p. 5). Since these three main causes of neonatal

death – sepsis (infection), asphyxia (lack of oxygen) and prematurity/low birth weight – are well

known (and often preventable/treatable) the World Health Organization suggests that at least

two-thirds of all newborn deaths can be prevented with effective health measures (Médecins

Sans Frontières, p. 5).

In an effort to address these preventable causes of neonatal healthcare, involved

organizations have begun to adjust their programs to more effectively meet the needs of the

underserved neonatal population around the world. Specifically, there has been a large push in

the humanitarian aid community (and the healthcare community more generally) to further

integrate maternal and neonatal/child health services. Dr. Ahmadu Yakubu, Senior Health

Specialist at UNICEF, discusses the benefit of such integration as it relates to immunizations. He

explains that for example, vaccines have been administered to pregnant women and successfully

prevent newborn disease through the passing of acquired antibodies from mother to child (A.

Yakubu, personal communication, April 17, 2018). Due to such successes, Médecins Sans

Frontières has been a longstanding advocate of integrating maternal and neonatal care, but notes

that the scale up of the idea has been slow (Nejat, Hiffler, Garcia, & Kadir, 2018). Additionally,

MSF notes that a challenge to this approach is that, "MSF operates in very diverse environments

when it comes to geography, culture, levels of health system, and degree of security restrictions"

(Nejat, Hiffler, Garcia, & Kadir, 2018). In order to combat this challenge and more effectively

deliver on its intentions to integrate maternal and newborn healthcare for the improved outcome

of both populations, MSF has suggested the development of minimum standards of integrated

newborn and maternal care that can be adjusted to fit any context. (Nejat, Hiffler, Garcia, &

Kadir, 2018).

The idea of minimum standards of care – related to integrated services and/or newborn

services – is a very important concept in examining neonatal healthcare provision in conflict

settings. Overall, according to Médecins Sans Frontières there are three levels of neonatal

healthcare: essential, intermediate, and comprehensive. Distinguished MSF

neonatologist/pediatrician Dr. Marie-Claude Bottineau believes the use of this specific

terminology has important implications because the *essential* level is, "what we want everywhere

in any context and any emergency, disregarding all the rest (M. Bottineau, personal

communication, March 29, 2018). In this first level of neonatal care, which is often located in the

maternity unity, the following services must be provided to all newborns: skin drying, umbilical

disinfection, breastfeeding assistance, provision of vitamin K and antibiotic eye drops, and

vaccinations for poliovirus, tuberculosis, and hepatitis B (Médecins Sans Frontières, p. 19). Dr.

Bottineau also adds that ideally an oxygen source should be included in the essential level of care

(in addition to bag and mask resuscitation) because the World Health Organization identifies

oxygen as an essential drug (M. Bottineau, personal communication, March 29, 2018). The

intermediate level of neonatal healthcare provision is often characterized by the presence of a

kangaroo care unit. Kangaroo mother care has been proven as an effective care for otherwise

healthy, low birth weight newborns (Médecins Sans Frontières, p. 19). Under kangaroo mother

care, mothers (or other family members) rest and keep the baby on their chest for skin-to-skin

contact and warmth until the baby has reached term or is above 2500g (World Health

Organization, 2003, p. 25). In addition to the capabilities of the essential level care, Dr.

Bottineau explains that intermediate neonatal healthcare should also include phototherapy

treatment for jaundice and the ability to place an intravenous line (M. Bottineau, personal

communication, March 29, 2018). Finally, the highest level of neonatal healthcare - termed by

Dr. Bottineau as the "comprehensive" level of care - typically is characterized by a neonatal

intensive care unit. In this level, sick newborns and very low birth weight newborns are cared for

and therefore the unit should have the ability to monitor temperature, glucose levels, etc. in addition to providing the routine essential and intermediate services previously discussed (Médecins Sans Frontières, 19). Dr. Bottineau elaborates that ideally this comprehensive care will have the ability to administer intravenous fluids, and treat respiratory distress with noninvasive interventions such as Continuous Positive Airway Pressure (CPAP) but it is imperative to note that this level of neonatal healthcare almost exclusively exists only in developed country settings (M. Bottineau, personal communication, March 29, 2018).

The Unique Challenges of Conflict Settings

While the international community's increasing knowledge of the main causes of neonatal deaths have lead to the development of standard protocols and minimum standards of care in stable settings, the picture of neonatal healthcare delivery becomes much more complex in humanitarian emergencies. According to Jennifer Lam et. al, there is a knowledge gap in the understanding of the unique needs and challenges of neonatal healthcare delivery in humanitarian emergencies. As Lam et. al (2012) points out, "consensus is lacking regarding programmatic priorities for care of mothers and newborns, and this issue is related to a knowledge gap about the direct causes of deaths and the level of provision of newborn care services in these [humanitarian emergency] settings" (p. 1).

Furthermore, since conflict is just one of many humanitarian emergencies – such as natural disasters, food insecurity, etc. – there is even less known about the unique context of neonatal healthcare delivery in conflict situations. According to multiple health experts, neonatal healthcare delivery (and healthcare delivery more generally) is completely different in conflict settings compared to natural disasters or other humanitarian emergencies because the specific context of healthcare workers is so unique. Dr. Bottineau describes that a large difference in the

delivery of neonatal healthcare in conflict settings, compared to other emergencies, is the level of involvement of the local Ministry of Health. For example, Dr. Bottineau explains that in natural disasters, the Ministry of Health is present and helps drive/coordinate the response (M. Bottineau, personal communication, March 29, 2018). She continues, "in conflict situations, it is completely the reverse. There is generally a total disruption of public services of the Ministry of Health etc. so almost all the response is brought by humanitarian actors" (M. Bottineau, personal communication, March 29, 2018). Importantly, Dr. Bottineau argues that the differences in context between conflict settings and other humanitarian emergencies have implications on the level of care, because in conflict settings organizations such as Médecins Sans Frontières are obliged to be more "minimalist" whereas other humanitarian emergencies receive a higher quality of care in correspondence with the national government (M. Bottineau, personal communication, March 29, 2018). Similarly, Dr. Ahmadu Yakubu of UNICEF agrees that comparatively, the delivery of newborn healthcare is much more challenging in conflict settings due to the effect that the gradual onset of conflict has on the health system. Particularly, Dr. Yakubu notes that largely since "natural disasters are sudden and onset, post event success depends on pre-system structure strength. Human resources are often there and, although they may be displaced, are easily mobilized" (A. Yakubu, personal communication, April 17, 2018). In conflict settings, however, Dr. Yakubu elaborates that the conflict situation often develops and impacts the health system over time, often causing the complete deterioration of services and therefore lessening the ability to mobilize previously available resources (A. Yakubu, personal communication, April 17, 2018). Although Dr. Yakubu and Dr. Bottineau both note that the "status quo of the previous system determines what happens later" regarding neonatal healthcare delivery within conflict settings (this point will be discussed later), it is clear that the unique

context of conflict areas disrupt the standardized provision of newborn care previously outlined

and therefore present unknown challenges to success (A. Yakubu, personal communication,

April 17, 2018).

Current State of Neonatal Healthcare in Conflict Areas

In spite of these unique challenges, humanitarian aid organizations have persisted in

finding ways to deliver neonatal healthcare in conflict areas. Specifically Médecins Sans

Frontières has conducted research that supports that their specialized neonatal care unit (SNCU)

model, "is feasible and showed mortality rates within acceptable limits and consistent across

sites" when used in conflict and post-conflict settings (Dörnemann, et al., 2017, p. 173).

Specialized neonatal care units are characterized by a lack of high technology equipment but

attribute their success to the neonatal-dedicated nursing staff/health team that is able of offer

support care. These SNCUs have been implemented by MSF in conflict settings including

Afghanistan, Central African Republic, and Democratic Republic of Congo as well as post-

conflict and remote areas where no other supporting actors are present (Dörnemann, et al., 2017,

p. 169). According to MSF's minimum standard of care and its assessment of feasible services,

all SNCUs initiated by MSF included dedicated and sufficient medical staff, diagnostics, pulse

oxymeters, oxygen concentrators, warming mattresses, kangaroo mother care, intravenous fluids,

alternative feeding methods, infection treatment, convulsion treatment, apnea treatment, anemia

treatments, and resuscitation capability (Dörnemann, et al., 2017, p. 170). It is also important to

note that due to the low-resource status of these settings, "high technology" equipment including

Continuous Positive Airway Pressure (CPAP), mechanical ventilation, electronic monitoring,

surfactant or incubators were not included in any SNCU (Dörnemann, et al., 2017, p.169).

Instead, the MSF model emphasized quality staff over high technology equipment and trained

staff to focus on the prevention/treatment of hypothermia and hypoglycemia and the recognition

of signs of neonatal sepsis (Dörnemann, et al., 2017, p. 171). Overall, 70% of MSF SNCU

patients were cured and discharged and the neonatal mortality rate was 17% (comparable to other

low-resource settings). Importantly, the exit outcomes were similar across sites, which suggests

that MSF's use of non-specialized medical staff in standardized specialized neonatal care units is

feasible and should be implemented at the district level in low-resource and conflict settings.

Overall, this study shows that such a healthcare model is capable of reducing neonatal mortality

rates within acceptable limits even in conflict areas (Dörnemann, et al., 2017, p. 173).

Room for Improvement

Although Médecins Sans Frontières has certainly been identified as a leader in the field, a

broader survey of the current status of neonatal healthcare provision in conflict settings reveals a

large, multi-sectoral pool of actors and stakeholders. Despite the promising results of the MSF

SNCU model, generally there appears to be a significant gap in the delivery of essential neonatal

healthcare services in conflict-affected areas. Namely, UNICEF (2018) demonstrates this by

reporting that in the Central African Republic – a country experiencing long-term conflict –

about fifty percent of all mothers do not deliver in a healthcare facility and the neonatal mortality

rate is the second highest in the world (p. 19). Dr. Jennifer Lam et. al (2012) also shows there is

extensive room for improvement in the delivery of neonatal healthcare in conflict settings as she

conducts an analysis of current practices/programs active in humanitarian emergencies. Of all the

humanitarian organizations surveyed, under half used neonatal kits/umbilical cord disinfectants

and only 30% provided maternal antiretroviral treatment to prevent mother to child HIV

transmission (p. 3). Furthermore, 64% of organization provided feeding support for

premature/small newborns, 73% promoted skin-to-skin contact for low birth weight newborns,

62.5% were capable of performing bag and mask neonatal resuscitation, and – perhaps most

shockingly – only 46% of organizations could provide oxygen (Lam et. al, 2012, p.3). Overall,

while most of these percentages represent a majority of organizations it is evident that significant

gaps in the provision of essential neonatal healthcare remain. Therefore, the first step towards

reducing this service gap and enabling the international humanitarian community to achieve its

2030 Sustainable Development Goal, is to elucidate the barriers that prevent the universal

representation of essential neonatal healthcare services.

Analysis: Remaining Barriers

In UNICEF's "Every Child Alive" report (2018), the organization attempted to assess the

current quality of newborn healthcare and prompt improvements by asking the following

questions: "Are there clean facilities with running water and electricity? Are health workers

adequately trained, paid, and supervised? Do they have ample supplies of life-saving drugs and

equipment, provided in a timely manner? And are mothers – particularly adolescent mothers –

treated with dignity and respect?" (p. 20) In other words, UNICEF suggests that the remaining

barriers of successful delivery of neonatal care in low-resource settings center on *place, people,*

products, and power. According to the research conducted by Jennifer Lam et. al (2012), this

theory is proven in practice because among all surveyed humanitarian actors providing newborn

care in emergency settings, 63% reported insufficient funds, 51% lacked trained workers, and

45% reported personnel/supply shortages (p. 5). Importantly, these barriers were reported

similarly across all types of actors including non-governmental organizations, UN organizations,

and governmental bodies (Lam et. al, 2012, p. 5). Therefore, UNICEF's theory of "people, place,

products, and power" serves as a framework for the identification of persistent challenges of

neonatal healthcare delivery in conflict settings in this research. Upon review, it was found that

barriers to successful delivery of neonatal healthcare in conflict settings vary widely by the specific conflict-setting context, but that both direct and indirect barriers resulting from conflict contribute to the gaps in neonatal healthcare delivery in conflict settings.

Context Specific Challenges

Many sources and experts emphasize that the barriers to successful delivery of neonatal healthcare in conflict settings depend greatly on the strength/weaknesses of the pre-existing health system. As researcher Jennifer Lam et. al (2012) notes, "pre-existing operation and financial barriers can pose additional challenges to humanitarian aid and can affect the ability to provide care broadly and efficiently in emergency situations" (p. 6). Dr. Marie-Claude Bottineau of Médecins Sans Frontières verifies that context indeed matters in practice, as she describes that what one area is lacking prior to the conflict will be exacerbated and pose a greater challenge to success in a conflict situation. Specifically, Dr. Bottineau describes that there is a large difference in the challenges to successful delivery of neonatal healthcare in countries in the Middle East (including Yemen, Syria, and Iraq) compared to African countries (including South Sudan, Nigeria, and the Democratic Republic of the Congo) (M. Bottineau, personal communication, March 29, 2018). Dr. Bottineau explains that the challenges in the two contexts are, "completely different because in Yemen, Syria, Iraq the level of care previous to the war was much higher than in Africa. Neonatal care was existing, developed, etc… the level of national health staff is much higher and they are qualified so we can find people even in the conflict areas" (M. Bottineau, personal communication, March 29, 2018). While Dr. Bottineau maintains that these specific Middle Eastern countries have their own context-specific barriers to access (especially high levels of insecurity), the important point is that the challenges in

successfully providing neonatal care in conflict settings can vary by location and pre-existing system capability.

Laura Sheperis, Midwife and Medical Support Officer at Médecins Sans Frontières, echoes that barriers to success – especially as they relate to the skill level of health workers – can vary by context. Sheperis compares MSF's facility in Nigeria (a country which she explains maintains a high level of education for its midwives) with a hospital facility set up in Sudan that serves a South Sudanese refugee population and the surrounding host community (L. Sheperis, personal communication, April 10, 2018). Compared to Nigeria, Sheperis explains that the midwives in Sudan receive a basic 18-month training (without previous medical instruction) and this basic skill level threatens to endanger patient safety if this level staff oversees complicated deliveries (L. Sheperis, personal communication, April 10, 2018). In settings of conflict, this pre-existing lack of skilled healthcare workers can exacerbate the barrier of depleted human resources (discussed later) and contribute to worse neonatal outcomes, although this may not be as large of an issue for conflict affected countries with strong pre-existing neonatal healthcare systems. Overall, Laura Sheperis and Dr. Bottineau both affirm that the specific barriers to successful delivery of essential neonatal healthcare in conflict areas may vary in relevance/significance to the context based on the pre-existing strengths/weaknesses of the prior healthcare system.

Although the degree to which certain barriers may affect a specific conflict setting may be dependent on the weaknesses of the pre-existing system, it is essential to explore general challenges to the provision of neonatal healthcare in conflict settings to inform recommendations for future improvements within the international community. Upon review, both direct and indirect barriers to the delivery of neonatal healthcare exist in conflict settings. Directly, the danger associated with conflict causes the destruction and collapse of the health system –

through depletion of human resources, collapse of referral systems, legal restricitons of care provision, and lack of information – which contributes to persistently high rates of neonatal mortality. Indirectly, barriers characteristic of low resource settings – including finances, market dynamics/procurement, and culture – are exacerbated by conflict insecurity and secondarily prevent humanitarian organizations from successfully delivering essential neonatal care.

Direct Barriers: Disruption of Health Systems

Primarily, it is important to consider the way in which the danger and insecurity of conflict directly causes the unsuccessful delivery of neonatal healthcare. Specifically, conflict insecurity causes a direct disruption to the healthcare delivery system through the depletion of human resources, the collapse of the referral system, legal restrictions on care provision, and lack of information. Each of these pathways through which conflict disrupts the health system significantly bar humanitarian actors from delivering on the fundamental right to health for newborns in conflict areas and must be individually addressed for improvement.

The presence of a skilled birth attendant at delivery has previously been identified as one of the most important factors in the improvement of maternal/neonatal health, and Dr. Marie-Claude Bottineau agrees that having skilled staff is extremely important in the delivery of care in conflict settings. Dr. Bottineau describes that securing skilled human resources is, "key issue number one… because you cannot do anything without skilled staff and staff should be dedicated to that and trained" (M. Bottineau, personal communication, March 29, 2018). However, in conflict settings there are many ways in which the human resources of neonatal healthcare are negatively affected, contributing to the unevenly high levels of neonatal mortality in these settings. In general, armed groups increasingly target health workers in violent attacks, causing the attrition of these workers and the depletion of human resources. The effect is two fold: the

depletion itself contributes to lack of healthcare access and worsened health outcomes, but this attrition of health workers also causes the remaining workers to work beyond their capacity – a practice that also can have dangerous consequences on neonatal health outcomes.

According Fouad et. al (2017), there is currently a trend towards the increased weaponization of health in conflict zones as armed groups target health workers/facilities to deny and restrict access to healthcare as a weapon of war (p. 1). Despite the 4th Geneva Convention, which explicitly protects health and humanitarian workers providing aid to both sides of a conflict, these attacks occur frequently in today's world and have a large impact on the health of the civilian population (Fouad et. al, 2017, p. 1). Wise and Darmstadt (2015) elaborates on the contexts of these attacks in the political strategy of conflict by noting, "while there is never justification for violence against health workers, claims of neutrality may not be sufficient to protect health facilities and staff. This is because provider neutrality does not mean that services they provide are inherently apolitical" (p. 391). This violent targeting of health facilities and workers has been so "effective" for armed groups that entire health systems in conflict areas have been completely destroyed. Fouad et. al (2017) provides the example of eastern Aleppo (Syria) where – as of November of 2016 – virtually all of the functioning health facilities were destroyed and the numbers of healthcare workers were stricken down to single digits (p. 4). Dr. Marie-Claude Bottineau elaborates on how the insecurity resulting from the increased weaponization of health directly impacts the ability to successfully deliver essential neonatal health services. She describes that insecurity issues are a huge problem in conflict settings regardless of context and that increased bombings on MSF hospitals have obliged the organization to evacuate intense conflict areas. In doing so, Bottineau notes that, "we are protecting health staff but that means we are abandoning our patients" (M. Bottineau, personal

communication, March 29, 2018). While MSF searches for alternative solutions such as moving

to new locations, Bottineau describes that is not always possible like in cases such as Nigeria

where they have been forced to evacuate and leave the civilian population with no medical

support (M. Bottineau, personal communication, March 29, 2018). Specifically, Dr. Bottineau

describes horrific scenes of health complications for mothers and newborns in Angola where the

heightened issues of security in conflict caused a complete lack of access to essential obstetrical

care and cesarean sections. While it is clear the danger and insecurity of conflict settings causes

the attrition of health workers in general, this loss of human resources is especially detrimental to

newborn's health because their high level of vulnerability make them most likely to die in these

situations.

In addition to the immense evacuation and displacement of health human resources,

neonatal health outcomes are negatively affected in conflict settings due to the decreased

capabilities of remaining health staff. Namely, the capacity of remaining health staff is reduced

by the increased "need to do it all" and through interrupted medical training (Fouad et. al, 2017,

p. 5). Specifically, Fouad et. al (2017) explains that as experienced health workers evacuate or

are forcibly displaced by the dangers of conflict, younger trainees are forced to provide a wider

range of care and must learn on the job (especially because pre-conflict education systems in

these settings often do not include intensive care or emergency medicine training) (p. 5). For

newborn healthcare, this unspecialized structure of care is detrimental because as the Médecins

Sans Frontières SNCU model demonstrated, dedicated and skilled neonatal health staff is

imperative to the reduction of neonatal mortality. Additionally, the destruction of health facilities

and the attrition of experienced health workers often forces health students to stop training and

provide care despite low qualifications. As Laura Sheperis mentioned, low education level of

staff causes risk to patient safety and requires additional training of staff to mitigate that risk. However, despite humanitarian organizations' attempts to create informal training, only 36% of surveyed actors reported training of health staff on newborn care in 2009 and almost all reported the need for more training of staff in neonatal complications and the management of low birth weight/prematurity (Lam et. al, 2012, p. 4). Overall, it is clear that the danger and insecurity of conflict poses a barrier to the successful delivery of essential neonatal healthcare by significantly decreasing the availability and capability of skilled health workers.

Secondly, conflict settings contribute to the destruction of health systems and foster persistently high levels of neonatal mortality because the context of insecurity causes health workers and patients to experience restricted movement. This restricted movement can contribute to the collapse of the health referral system, which poses significant barriers to neonatal mortality reduction. Based on the three-level framework of neonatal healthcare delivery previously outlined (essential, intermediate, and comprehensive), a functioning referral system is essential to the successful delivery of life-saving newborn health services and should be present in all conflict areas regardless of level of care (M. Bottineau, personal communication, March 29, 2018). In practice, however, the insecurity of conflict and depleted level of human resources significantly inhibits the ability to refer newborns needing higher levels of care in conflict settings. The Médecins Sans Frontières SNCU-model study itself reported that although referrals to neonatal intensive care units with assisted ventilation technology were needed for extremely/very-low birth weight infants, "these referral options were… almost non-existent, which meant that neonates in need of ventilation support stayed in our SNCU. This contributed to the intra-hospital mortality" (Dörnemann et al., 2017, p. 171). A survey of humanitarian aid organizations active in providing healthcare in emergencies explains further that "limited access

to transportation" and the "inability to move freely" had adverse effects on the ability to

successfully refer pregnant mothers and newborns to necessary services (Lam et. al, 2012, p. 7).

In principle, this disruption of the referral system goes beyond the previously mentioned

depletion of human resources/lack of services because in conflict settings, insecurity may

prevent the access of referral facilities even when the necessary services are available at a

different location (Lam et. al, 2012, p. 4). The prevention of referral systems is a major barrier to

the successful delivery of neonatal healthcare in conflict zones because it prevents newborns

from receiving more comprehensive/life saving care and inevitably contributes to increased

(preventable) neonatal mortality.

Unlike in other emergency or low-income settings, humanitarian organizations also

experience a disruption in the surrounding health systems in conflict areas due to the unique

legal contexts under which they operate. As previously mentioned, in settings of conflict

(especially when the government is directly involved in the conflict) the work of healthcare

workers is not apolitical. Because of this, humanitarian organizations often have to work under

restrictive legal circumstances in conflict settings that can bar them from delivering the essential

neonatal care required by the population. At an extreme level, the legal framework under which

health workers are permitted to work in conflict can directly prevent them from providing care to

patients. In Syria, for example, the government passed a law in 2012, "criminalizing the

provision of medical care to those injured by pro-government forces in protests against the

government" (Fouad et. al, 2017, p. 3). While this is an extreme example of how national

policies can disrupt the healthcare system and prevent providers from securing the right to health

for all, neonatal health systems are also negatively affected by the legal relationship between

humanitarian actor and government in other ways. Namely, Dr. Marie-Claude Bottineau recounts

how the legal relationship between Médecins Sans Frontières and various countries experiencing

conflict has contributed to a lower level of neonatal healthcare. Dr. Bottineau explains that the

legal framework and allowances of the government may vary by context but offers the example

that, "in some countries they refuse MSF to do things that are not done for the rest of the

population to maintain equity. So, we are limited in what we provide because generally the level

of care in MSF is higher than most of the ministries in low resource settings" (M. Bottineau,

personal communication, March 29, 2018). Therefore, the restriction by the government of the

capabilities of humanitarian organizations can pose a significant barrier to the successful delivery

of neonatal healthcare in conflict settings and must be addressed. However, this restriction is not

necessarily experienced the same way by other neonatal healthcare actors in conflict settings. Dr.

Ahmadu Yakubu of UNICEF notes that as a United Nations organization, UNICEF is globally

accepted as an international actor in the protection of children. He continues, "because of this

trust, it is much easier for UNICEF to influence action" (A. Yakubu, personal communication,

April 17, 2018). It is important to understand how different humanitarian actors legally interact

with the national governments in conflict settings because a strained or restrictive legal

relationship between actor and government can have a significant and negative impact on the

success of neonatal healthcare delivery.

The final way in which the specific nature of conflict settings directly contributes to the

disruption of the healthcare system - and therefore fosters poor neonatal outcomes - is through

lack of information. Health outcome information is absolutely essential to the evaluation of

healthcare systems/practices. Therefore, lack of such information can majorly bar any efforts for

the neonatal healthcare system improvement and can lead to long-term negative effects for

individual newborns themselves. According to the survey of current practices and challenges of

neonatal healthcare actors in emergency settings, 73% of actors were able to routinely collect information through health information systems (Lam et. al, 2012, p. 5). However, a closer look at the situation in Syria demonstrates how conflict can significantly decrease the ability of health systems to generate and analyze health information on a consistent basis. According to DeJong et. al (2017), "within Syria, public health responsibility is fragmented between opposing forces, which run parallel health systems with shifting geographic areas of coverage, making data collection challenging" (p.2). Beyond the challenge of navigating a multi-actor, fragmented health system, DeJong et. al (2017) explains it is also challenging to assess coverage rates of specific health services in Syria due to the lack of access to conflict-affected populations and the "inability to determine relevant denominators" in the dynamic conflict setting (p.1). This lack of information regarding health interventions and coverage is specifically relevant to neonatal health because data on preterm birth rates and stillbirths were unknown for all settings surveyed in relation to the Syrian conflict (including direct conflict-affected populations, internally displaced people, and refugees in neighboring countries). Additionally, birth registration in Syria (and refugee host countries) has reportedly dropped due to security threats, missing documents, and the legal/logistic barriers of conflict (DeJong et. al, 2017, p.4). Importantly, newborns without birth registrations are at an increased risk of exposure to violence, abuse, and exploitation and can experience long-term hardships including difficulting accessing healthcare and education, difficulty proving state citizenship and crossing borders, and challenges obtaining work or legal services later in life (DeJong et. al, 2017, p.4). More immediately, this lack of knowledge significantly disrupts the health delivery system because, according to Dr. Yakubu of UNICEF, humanitarian actors must first conduct a "needs" analysis in order to most effectively organize and deliver technology, human resources, funding etc. to a conflict area (A. Yakubu,

personal communication, April 17, 2018). Therefore, lack of information regarding neonatal health service coverage rates and outcomes poses a significant barrier to success.

In brief, the context of conflict settings directly bars the successful delivery of neonatal healthcare by humanitarian actors through the disruption of the operating health system. Specifically, due to the depletion of skilled human resources, the destruction of the health referral system, legal restrictions of care provision, and lack of essential health information, humanitarian actors are not yet able to fully succeed in achieving the Sustainable Development Goal of reducing preventable neonatal mortality in conflict-affected areas.

Indirect Barriers – Finance, Market/Procurement, and Culture

Coupled with this direct disruption of the health system, major indirect barriers to the successful delivery of neonatal healthcare exist in conflict settings. Specifically, these barriers are often present in pre-conflict, low-resource settings, but become exacerbated and exhibit a greater negative impact in the context of conflict. Most importantly, funding, market dynamics/procurement, and cultural differences all currently prevent humanitarian actors from reducing neonatal mortality in these areas.

Lack of funding and financial barriers are cited in almost all low-resource settings as a major obstacle to healthcare success, but these financial challenges are worth explicitly exploring in this research due to the unique context they take on in conflict settings. Particularly, financial barriers are manifested at both the organizational and individual levels in conflict areas and in this way they dually contribute to poor neonatal health outcomes. At the institutional level, 63% of humanitarian actors providing healthcare in emergencies reported that insufficient funds were a significant barrier to successful maternal, newborn, and child care (Lam et. al, 2012, p. 5). The lack of financial resources forces actors to settle for a more minimal framework of neonatal care

services (which often doesn't even include all *essential* services) and prevents them from

reaching the comprehensive level of newborn care (Lam et. al, 2012, p. 6). Additionally,

financial challenges can affect patients' access to care and contribute to worse neonatal outcomes

on an individual level. For example, Médecins Sans Frontières notes that in the implementation

of its specialized neonatal care unit model, it observed a significant amount of cases of parents

discharging newborns early against medical advice. These cases included the discharge of many

very-low birth weight newborns before they became clinically stable, and thus posed a huge risk

for the health of the infants. Importantly, many sources identify that these discharges against

medical advice in such settings are mostly for financial reasons (Dörnemann et al., 2017, p. 173).

Therefore, it is clear that the lack of funds at the institutional and individual levels pose barriers

to the successful delivery of neonatal healthcare in conflict settings. It is also important to note,

however, that since MSF care is provided free of charge it is likely that early discharge incidents

also occur for other reasons such as differing priorities/culture (discussed later), lack of bed

space, and lack of training for providers on dangers of early discharge (Dörnemann et al., 2017,

p. 173).

In conflict settings, market dynamics work in conjunction with the previously discussed

lack of funds to hinder the procurement of essential medicines and technologies, therefore

preventing the successful delivery of neonatal healthcare by humanitarian actors. Lack of

technology and essential medicines is a commonly cited challenge for humanitarian actors; in

2009 over 45% of actors reported that supply shortages were a major barrier to success and that

functional supply chains were continuously lacking (Lam et. al, 2012, p.5-7). This lack of

supplies is exemplified by the work of Dr. Neal Russell of Médecins Sans Frontières as he found

an innovation solution to the need for equipment by using a red LED bicycle light as a

transilluminator for newborn venipuncture (Nejat, Hiffler, Garcia, & Kadir, 2018). As MSF

notes, "the idea of using bicycle lamps to illuminate veins… exposes how the current cost of

medical grade equipment is inappropriately inflated and hampers their use in humanitarian

settings" (Nejat, Hiffler, Garcia, & Kadir, 2018). Ms. Elizabeth Abu-Haydar, Senior Program

Officer at PATH, further affirms that the international community has not yet been successful in

securing steady procurement and distribution of essential maternal/neonatal supplies and

describes how market dynamics must be considered in this issue (E. Abu-Haydar, personal

communication, April 19, 2018). According to Ms. Abu-Haydar, the manufacturers of

maternal/neonatal health supplies should consider both the risk and return in creating/providing

these supplies and because of this, the production of these supplies is often dependent on the

demonstration of a sizable sustainable market (E. Abu-Haydar, personal communication, April

19, 2018). Additionally, Ms. Abu-Haydar discusses the importance of cost-effectiveness,

because she maintains that Ministries of Health (and presumably humanitarian actors as well)

will only secure technology/medicine if it is proven to be cost effective (E. Abu-Haydar,

personal communication, April 19, 2018). As an example, Ms. Abu-Haydar says that because of

this, health centers might likely choose to "limit services to basic emergency obstretric and

newborn care (BEmONC) and invest in ambulances to ensure timely and safe transfer to next

level facilities" instead of investing in emergency obstetric and newborn care (EmONC) beyond

the district level (E. Abu-Haydar, personal communication, April 19, 2018). As demonstrated,

this phenomena of cost-effectiveness is essential to consider with respect to neonatal healthcare

delivery because in the context of dangerous conflict and a collapsed referral system, cost-

effectiveness can translate into a lack of essential supplies beyond the district level (and therefore

higher neonatal mortality). Finally, Ms. Abu-Haydar discusses that it is therefore crucial for

country health programs and humanitarian aid organizations to collect data on the frequency of

health outcomes and required equipment in order to better lobby for a secured supply chain for

these technologies/medicines under a cost-effective framework. However, as mentioned above,

lack of health data and information is common in conflict settings causing a greater,

compounded barrier to accessing the essential health supplies that are needed to reduce neonatal

mortality.

The final obstacle by which humanitarian actors are indirectly barred from providing

essential neonatal healthcare in conflict settings is cultural/perspective differences between

providers and patients/families. While these differences persist in many diverse settings around

the world, the implications of such differences are especially important to consider in conflict

situations because the extreme drainage of resources and services from these areas makes the

existing health facilities/treatments that much more essential to newborn survival. Through the

example of kangaroo mother care (KMC), both Dr. Bottineau and Laura Sheperis from Médecins

Sans Frontières describe the negative impact that perspective/cultural differences can have on the

delivery of neonatal healthcare in conflict areas. Dr. Bottineau describes that in various countries

in Africa, it can be difficult to implement kangaroo mother care because from the mother's

perspective it is often "perceived as a medicine for the poor" (M. Bottineau, personal

communication, March 29, 2018). While Dr. Bottineau says this perspective difference on KMC

has been successfully mitigated in some parts of the world through peer education, barriers to the

acceptance of KMC in other areas persist. Namely, Dr. Bottineau observes that women in the

Islamic faith also are often hesitant to embrace the implementation of kangaroo mother care, so it

is appears as though that cultural norms stemming from religious beliefs can also play into the

challenge of healthcare providers to successfully integrate KMC into treatment plans (M. Bottineau, personal communication, March 29, 2018).

Laura Sheperis also agrees that barriers persist and elaborates more on the cultural hesitation of women to engage in kangaroo mother care. Sheperis notes that despite how much evidence-based information providers disseminate in support of KMC, a mother can hold onto the belief that, "'this isn't part of my experience… nobody around me is doing it and when they see me doing it they laugh at me… you want me to do something that is not culturally done in my community, so no" (L. Sheperis, personal communication, April 10, 2018). Additionally, Sheperis notes that in some cases she sees a hesitancy in mothers to embrace kangaroo mother care - and other health interventions - because mothers are wary of getting too attached to a very sick newborn (L. Sheperis, personal communication, April 10, 2018). Overall, these cultural barriers to delivering KMC (and other neonatal healthcare interventions) are important to consider in this analysis because, "kangaroo care is really the best for very small babies - for all those that are below 2kg and are stable" (M. Bottineau, personal communication, March 29, 2018). Therefore, when families refrain from engaging in these practices - and refuse other forms of care for similar reasons - newborns do not receive access to the best available services/treatments and humanitarian actors fail in the delivery of the fundamental right to health.

In the final analysis, many barriers persist to prevent humanitarian actors from successfully delivering neonatal healthcare services to populations in conflict settings. While the degree to which each barrier is relevant may vary based on context, the depletion of human resources, the collapse of the referral system, legal restrictions to care provision, and lack of information all directly bar actors from improving neonatal health through contributing to the

disruption of the health system. Additionally, indirect barriers to neonatal healthcare delivery success exist as evident by the ways in which lack of funds, market dynamics, and cultural differences prevent newborns from accessing essential and life saving care.

Looking Forward: Recommendations

The main objective of this research was to explore the current state and challenges of the delivery of neonatal healthcare in conflict settings, with the purpose of providing knowledge to inform improvement efforts. Despite the previously mentioned persistent barriers that currently prevent the success of newborn healthcare in these settings, it is important to remember that improvement is both necessary and possible. In their research on the relationship between political instability/weak governance and neonatal mortality, Wise and Darmstadt (2015) explain, "the variation in these relationships suggests that the presence of political instability and poor governance does not preclude improved neonatal outcomes" (p. 390). More specifically, the varied success of conflict-affected countries in controlling their levels of neonatal mortality suggests there are multiples ways through which interventions can target success (Wise & Darmstadt, 2015, p. 388). Overall, in an attempt to mitigate the previously discussed barriers to the delivery of neonatal healthcare in conflict settings, the results of this research prompt the recommendation for the adoption of a "strategic governance" framework of action through which each barrier is targeted by coordinated interventions.

Researchers Wise and Darmstadt (2015) discuss that while the countries experiencing the highest neonatal mortality rates are typically plagued with conflict and political instability that weakens governance capacity, they maintain that "comprehensive governance" is not necessarily needed to make significant improvements (p. 391). Instead, Wise and Darmstadt (2015) note, "what may be needed for effective health service delivery is not good governance per se but

'strategic governance' in which the minimal conditions of political stability and governance required for health service implementation are met" (p. 391). This idea of "strategic governance" suggests that neonatal health outcomes can be improved by identifying the minimum political/governance practices required to enable large-scale implementation of neonatal health services into areas including conflict settings (Wise & Darmstadt, 2015, p. 391). In practice, this framework also requires actors to develop a concrete understanding of the minimum governance capacities required to implement each neonatal health intervention. Through the adoption of this "strategic governance" framework, local governments and humanitarian actors can find the improvement of neonatal health outcomes more manageable even in the most challenging contexts of conflict settings. Moreover, this framework encourages actors to follow through on the implementation of targeted interventions that are proven to improve health outcomes, even if the structural challenges of weak governance in a conflict setting cannot be completely overcome.

In accordance with this action framework of "strategic governance," the previously elucidated barriers to success must all be individually addressed in order for the international community to take steps towards delivering on the fundamental human right of health for newborns in conflict settings. Each barrier must be specifically targeted for improvement and while the following suggestions serve as examples for policies/actions that should be considered, it is important to note that there are various ways through which improvements can be made. First, in order to mitigate the depletion of human resources in conflicts, the method of "task shifting" has been used by organizations. According to Jennifer Lam et. al (2012), "task shifting, a method of task distribution in which cadres of health care workers are trained to provide various services in different settings, may facilitate the delivery of… neonatal care services…

when the number of highly trained staff are limited" (p. 6). Relatedly, the challenge of inadequately trained health staff must also be addressed to minimize the challenge of collapsed referral systems in conflict settings. As an alternative to the physical referral of patients to a higher level of care in conflict settings, humanitarian actors have recently begun to explore "telemedicine platforms" to connect isolated field medical staff to specialists and other forms of remote clinical support (Nejat, Hiffler, Garcia, & Kadir, 2018). Through this example, "strategic governance" is embraced because although the main barrier of restricted movement may be challenging to address all at once, interventions such as "telemedicine" enable the reduction of neonatal mortality in the midst of a broken referral system.

The legal restrictions to the provision of care that are experienced by humanitarian actors in conflict settings can theoretically be addressed through embracing a more coordinated approach. As Dr. Yakubu mentioned, UNICEF's role as a trusted United Nations organization leads to a "comparative advantage" in its interaction with governments and markets (A. Yakubu, personal communication, April 17, 2018). Therefore, it is likely that humanitarian aid organizations could benefit from a less restrictive legal relationship with local governments through collaboration with such larger, inter-governmental bodies. Furthermore, this increased collaboration between humanitarian actors can also contribute to reducing the challenges of data collection in conflict settings. As previously mentioned, a case study of Syria proved that the fragmentation of public health responsibilities significantly increased the challenge of collecting consistent health data and contributed to worse neonatal healthcare outcomes (DeJong et. al, 2017, p.2). Therefore, increased cooperation between various actors in the delivery of neonatal healthcare in conflict settings will can directly correlate with increased success by reducing the

effect of legal restrictions on care provision and expanding the amount of available health information.

Despite their pervasive nature, the indirect barriers to the success of neonatal healthcare provision in conflict settings must also be addressed head on through the framework of "strategic governance." The issue of lack of funding and market dynamics must be addressed in tandem by humanitarian organizations and must consider the importance that local governments place on "cost-effectiveness." Low-cost solutions to neonatal healthcare must be continuously researched and innovated (although there is already a large body of knowledge regarding this) and there is a "need for advocacy to make pediatrictic medications and equipment for affordable and widely available" (Nejat, Hiffler, Garcia, & Kadir, 2018). Furthermore, as exemplified by the experience of Ms. Elizabeth Abu-Haydar and PATH, intentional efforts must continuously be made throughout the international community to accurately estimate the market size for such low cost solutions so as to better incentive manufacturers to make these technologies and medicines more widely available beyond the district level (E. Abu-Haydar, personal communication, April 19, 2018).

Finally, the perspective/cultural barrier that often prevents newborns and families from fully taking advantage of the health services provided must be recognized and addressed by humanitarian organizations through creative solutions. Laura Sheperis notes that MSF has been successful in overcoming cultural hesitations to health interventions like kangaroo mother care through informal explanations by health promotion teams. Specifically, through creative actions such as light-hearted skits showing that men can partake in KMC and that caring for your infant in this way can be "cool," MSF has found success in shifting mother's cultural hesitations to embracing the practice (L. Sheperis, personal communication, April 10, 2018). Beyond these

practical solutions to mitigate the perspective/cultural differences, Laura Sheperis notes that the

success of neonatal healthcare delivery in conflict settings is contingent on the health

providers/organizations crafting a culturally appropriate plan of action from the start. She

explains, "we are coming in as outsiders who really need to take the time to understand what the

culture is, where we are, what's normal and acceptable for people, what they want... and to really

respect and integrate that into what we're offering. Otherwise it is not going to work" (L.

Sheperis, personal communication, April 10, 2018).

Beyond policy/action recommendations, the successes and challenges of this research

prompt recommendations for further study. Namely, more research is needed on the role of

governments in the provision of neonatal healthcare in conflict settings. Additionally, a better

understanding of how the general collapse of services (such as clean water provision, food

security etc.) during conflict settings affects neonatal health is needed. Finally, while the lack of

data information has been cited as a barrier, more current information about the service coverage

in active conflict settings is extremely important to continue further analysis and better inform

context-specific interventions.

Limitations of the Study

Although the intention of this research was to create a comprehensive understanding of

the current state and obstacles to success of neonatal healthcare delivery in conflict settings, it is

imperative to understand the limitations of its conclusions. Namely, although many experts were

consulted from various organizations, only three organizations in total (MSF, PATH, and

UNICEF) were primarily cited in interviews. It is important to note that while these three

organizations are major actors in the field, countless other organizations are involved in the

delivery of neonatal healthcare and their experiences of barriers may vary. Additionally, due to

the challenge of contacting interdisciplinary experts (as previously mentioned) this study was limited in that it mostly considered barriers to success through the perspective of healthcare workers. The research fell short in its explanation of barriers as they relate to relevant actors not directly implicated in health service provision and would benefit from the inclusion of an anthropological/sociological perspective etc.

Conclusion

In the United Nations Sustainable Development Goals framework, SDG 3 aims to fulfill the fundamental human right to health for all, with a particular focus on addressing the needs of vulnerable populations around the world (United Nations). Newborns - defined as infants before 28 days of life - have consistently been recognized as an extremely vulnerable population, and are of particular interest in the fulfillment of SDG 3 because attempts to improve the health of newborns worldwide have proved challenging. Despite recent efforts of the international community, global neonatal mortality rates have resisted the improvements seen in under-five child mortality, partly due to the lack of knowledge on the specifics of neonatal health delivery/outcomes in humanitarian emergencies (Dörnemann et al., 2017, p. 168). More specifically, in recent years there has been an increasing correlation between political instability/conflict and high neonatal mortality, prompting the need to explore what barriers remain to the successful delivery of neonatal healthcare in conflict settings (UNICEF, 2018, p.12).

This research found that despite attempts to integrate maternal and newborn healthcare and implement specialized neonatal care units in areas of conflict, persistent gaps in essential neonatal health technologies and services exist in these settings. While the specific barriers that challenge the success in any one conflict context are dependent on the pre-existing healthcare

structure of that area, common direct and indirect barriers were also identified. Directly, the depletion of human resources, collapse of the referral system, legal restrictions of care provision, and lack of health data all contribute to the disruption of the health system, and therefore contribute to increased neonatal mortality in conflict settings. Furthermore, indirect barriers including lack of funding, market dynamics, and cultural/perspective differences are often already present in low-resource settings but become exacerbated in areas of conflict. While these indirect barriers may not primarily deteriorate the existing health system, they often result in gaps of essential neonatal technologies/services and therefore lead to worse neonatal outcomes in conflicts.

Overall, the purpose of elucidating these barriers is both to contribute to the knowledge base on the particular challenges of delivering newborn healthcare in conflict settings and inform targeted improvements. Under the framework of "strategic governance" it has been suggested that governments/humanitarian actors delivering neonatal healthcare in conflict settings need not be overwhelmed by the feat of strengthening all aspects of governance to improve newborn outcomes. Instead, the particular barriers to success should each be addressed, focusing on fulfilling the minimum governance capacity to overcome each obstacle. In sum, by addressing the barriers discovered in this research, the international community can step closer to its goal of protecting the human right to health for newborns - one of the most vulnerable populations in the world and the future of tomorrow.

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Appendix A

Interview Summaries/Questions

Interviewee: Dr. Claire Somerville
Organization: The Graduate Institute Geneva
Date: Thursday March 29th, 2018
Location: The Graduate Institute Geneva
Interview Type: Informal, In Person
Interview Notes:
My discussion with Dr. Somerville was an informal interview and we largely discussed strategies to begin research. My main goal in contacting Dr. Somerville was to gain an understanding of how anthropology might be used in my research perspective, although Dr. Somerville did not have any anthropological contacts with relevant experience to be interviewed. Dr. Somerville suggested I must develop a thesis that balances both the context-specific and general barriers to success of neonatal healthcare delivery, and suggested I look into case studies of refugee populations to supplement my research.

Interviewee: Dr. Marie-Claude Bottineau
Organization: Médecins Sans Frontières
Date: Thursday March 29th, 2018
Location: Médecins Sans Frontières, Geneva
Interview Type: Formal, In Person, Semi Guided

Interview Questions:

1. What are the main differences between healthcare delivery in conflict zones compared to healthcare delivery in a humanitarian crisis or low-income settings more generally?
2. In your experience in providing healthcare in multiple different conflict settings – are the main challenges/barriers to provision consistent between countries or more context specific?
3. In what ways does MSF coordinate with local and/or national governments to deliver neonatal care specifically?
4. In MSF's "Against the Odds" report, it was mentioned that implementation of mother-involved treatment such as Kangaroo care "can be culturally confronting or unfamiliar for mothers... especially when she doesn't think the baby will survive." Have you experienced a similar issue in your work?
5. In your experience, what is the impact of targeted attacks on healthcare workers/facilities on maternal and neonatal outcomes in conflict areas?

Interviewee: Laura Sheperis
Organization: Médecins Sans Frontières
Date: Tuesday April 10th, 2018
Location: Médecins Sans Frontières, Geneva
Interview Type: Formal, In Person, Semi Guided
Interview Questions:

1. Which settings have you worked in that were classified as active conflict areas - which was the most challenging and why?
2. What are the particular challenges of securing a skilled birth attendant in conflict settings and how can that affect neonatal health outcomes?
3. In your experience in providing healthcare in multiple different conflict settings – are the main challenges/barriers to provision consistent between countries or more context specific?
4. In what ways does MSF coordinate with local and/or national governments to deliver neonatal care specifically?
5. In MSF's "Against the Odds" report, it was mentioned that implementation of mother-involved treatment such as Kangaroo care "can be culturally confronting or unfamiliar for mothers... especially when she doesn't think the baby will survive." Have you experienced a similar issue in your work?

Interviewee: Dr. Ahmadu Yakubu
Organization: UNICEF
Date: Tuesday April 17th, 2018
Location: WHO Headquarters
Interview Type: Formal, In Person, Semi Guided
Interview Questions:

1. What is your role as a Senior Health Specialist
2. Role of UNICEF to assist governments – how does this relationship change/form in conflict setting?

3. How does UNICEF's position as a UN organization inform the organization's work in conflict settings compared to an NGO etc.?
4. If a main goal of UNICEF health is to strengthen referral systems – how does UNICEF approach referral systems in conflict settings?
5. What are the main differences between healthcare delivery in conflict zones compared to healthcare delivery in a humanitarian crisis or low-income settings more generally?
6. In your experience in providing healthcare in multiple different conflict settings – are the main challenges/barriers to provision consistent between countries or more context specific?

Interviewee: Elizabeth Abu-Haydar
Organization: PATH
Date: Thursday April 19th, 2018
Location: Skype Call (Ms. Abu-Haydar is located in Seattle)
Interview Type: Skype Video Call, Semi Guided
Interview Questions:
1. Can you discuss your role and main responsibilities as a maternal and child health specialist at PATH?
2. How do you think market dynamics might impact the delivery of technology or healthcare in conflict settings?
3. Can you talk more about PATHs health technology development which specifically targets low-resource settings?
4. What technology do you think is most important for newborns in low resource/conflict settings? What do you think prevents this/these technologies from being universally obtained?