

A BIOCULTURAL STUDY OF INTERGENERATIONAL HEALTH, ILLNESS AND THE  
POLITICS OF AID IN THE DEMOCRATIC REPUBLIC OF CONGO FROM 2009-2012

By

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To Lyn Lusi (1949-2012) and Prof. Connie Mulligan.  
For without these two women, this dissertation would not be.

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## LIST OF ACRONYMS

DDR	Disarmament, Demobilization and Reintegration
DOCS	Doctors on Call For Service
DOHAD	Developmental Origins of Health and Disease
DRC	Democratic Republic of Congo Doctors on Call For Service
FARDC	Forces Armées de la République Démocratique du Congo
FDLR	Forces Démocratiques de Libération du Rwanda
FGOR	Former Government of Rwanda
FRF	Federalist Republican Forces
GC	Glucocorticoid
GBV	Gender-Based Violence
HEAL	HEAL Africa
ICC	International Criminal Court
IDP	Internally Displaced Persons
IGA	Income Generation Activities
IPPNW	International Physicians for the Prevention of Nuclear War
MONUC	United Nations Peacekeeping force in the DRC (now MONUSCO)
NGO	Non-Governmental Organization
PEP	Post-Exposure Prophylaxis
PtH	Peace through Health
PTSD	Post-Traumatic Stress Disorder
SGBV	Sexual and Gender-Based Violence
UN	United Nations
WHO	World Health Organization

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By

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In this dissertation, I have integrated interdisciplinary data for the purpose of providing a snapshot of health, illness, and the politics of aid amidst violent conflict in the Democratic Republic of Congo (DRC) between 2009-2012. More specifically, there are two goals of the individual papers herein, and their juxtaposition: (1) to explore health and illness in the DRC between 2009-2012; and (2) to investigate the extent to which the stated purpose of development programs is in line with both the priorities of Congolese people and the realities of their suffering. In the first study, I analyze the inner and outer workings of a Congolese non-governmental organization and provide a case study of how their programs fit into the framework of 'peace through health.' In the second study, I document the social determinants of health according to Congolese respondents, and compare their priorities for changes in healthcare and the targets of a few current Western-based development programs. In the last paper, I integrate biological, genetic and sociocultural data to explore some of the effects of the ongoing war on maternal and child health, and advocate for evidence-based management of health programs in the DRC. Using in-depth interviews, focus group discussions,

surveys, participant observation, and biological and genetic data, my research investigates health, the determinants of health, and the functions of current remediation programs, and advocates for greater autonomy for Congolese people, as well as the utilization of an evidence-base in program development and management.

## CHAPTER 1 INTRODUCTION

There is a long history of anthropologists and public health practitioners embarking on research that is closely aligned with the aim of human rights activism and the goal of mitigating the suffering of those who suffer disproportionately. Some of the best-known examples from anthropology are Paul Farmer's work on infectious disease in Haiti (Farmer 2004, Farmer 2006) and Nancy Scheper-Hughes' work on organ trafficking (Scheper-Hughes 2000, 2001, 2004). From public health, examples come from Michael Marmot, Richard Wilkinson and Nancy Krieger, who both focus on socioeconomic status as a driver of health inequalities (Krieger 2005, Marmot and Wilkinson 2003), and from research on racial disparities in health (Williams and Collins 1995, Williams and Collins 2001) including the "weathering" hypothesis which proposes that differences in health outcomes between blacks and whites in the US can be explained by the differences in experiences with social or economic adversity between the two groups (Geronimus 1992, Geronimus 2001, Geronimus et al. 2006). In both the fields of anthropology and public health, researchers have chosen to ask questions that may help to explain why some people are burdened with illnesses that others are not affected by.

An anthropological perspective is invaluable to this pursuit because it is intrinsic to the discipline to interrogate society's big questions. *What are the causes and conditions of social equality? How do humans demonstrate equality in their culture? Where do these behaviors come from? How have these behaviors evolved? Are these behaviors replicable?* Also invaluable to this pursuit is the public health perspective, which focuses on how information gathered can be applied immediately in ways that are

likely to modify the causes and conditions of illness for the sake of bettering health outcomes for all.

In this dissertation, I combine both of these perspectives in a detailed account of health, illness and the politics of humanitarian aid in the Democratic Republic of Congo from 2009-2012. In a country that has been plagued by violence, where health outcomes are some of the worst in the world, yet which receives billions of dollars in aid annually for the purpose of redressing these problems, the studies herein comprise a theoretically integrated probe into the lives of the persons who suffer as a result of violence, and into the programs which are meant to mitigate this suffering.

### **Violence in the Democratic Republic of Congo**

The ongoing conflict in eastern Democratic Republic of Congo (DRC) has been called "Africa's World War" (Prunier 2011) and the world's "deadliest humanitarian crisis" (Coghlan et al. 2006). Though many cite 1998 as the beginning of the war (Coghlan et al. 2006, Maman et al. 2009), others have reported that violence began at least as early as 1996 (Lecoutere, Vlassenroot and Raeymaekers 2009, Lemarchand 2009, Prunier 2009). In fact, a United Nations (UN) report released in 2010 shows evidence of the beginning of violence in 1993, and constituting another genocide, distinct from the genocide in Rwanda in 1994 (UN 2010). The year to which researchers attribute the war's commencement has obvious implications for understanding the long-term impacts on human populations, and it is especially crucial for measuring increases in mortality.

An estimated 5.4 million people have died in the Congo since 1998, according to a study by the International Rescue Committee (IRC 2007). Researchers arrived at this figure using data from five mortality surveys over seven years. This

number is a well-publicized measure of the war's human toll that has widely influenced how humanitarian organizations and the United Nations Security Council allocate funds and resources to the DRC. For example, after the IRC's report was published in 2000, humanitarian aid to the DRC increased by 500% the next year (Mack et al. 2009). But the figure is not without its critics, who claim the high *pre-war mortality rate* in the DRC was not taken into account during calculations (Mack et al. 2009). A more detailed account of the debate over this figure can be found in Chapter 3.

Despite discrepancies about mortality figures and the date of the onset of violence, no one would argue that the spillover from the Rwandan genocide in 1994 has added to the violent warfare that has plagued the eastern DRC for nearly two decades. After the genocide, members of the former government of Rwanda (FGOR), also known as *génocidaires* (or those who perpetrated the Rwandan genocide), organized within refugee camps in the DRC, planning an invasion of Rwanda. The Congolese national army (FARDC) responded, but rebel armies sprouted up, claiming the incompetence of the FARDC to keep safe the Congolese populations off of whom the FGOR was feeding during this time (Prunier 2009).

Between 1994 and 2003, two distinct periods of conflict known as the "Congo Wars" took place, the second of which escalated in scale until it received the title "Africa's World War" because of the simultaneous involvement of eight African countries, all of which cited regional insecurity as their reason for invasion (Prunier 2009, Stearns 2011).

Since the onset of violence in the early 1990s, reports of massive and systematic rape have steadily grown in number and magnitude and include events such

as "Operation Clean the Slate" in 2002, in which a rebel army engaged in a campaign of systematic terror against a community in northeastern DRC following the signing of peace accords (Isango 2003). The perpetrators of this campaign belong to an army led by Jean-Pierre Bemba, the only person in history brought to the International Criminal Court (ICC) for allegedly ordering his troops to rape women during a coup attempt in the Central African Republic in 2002-2003 (Walker 2009). In a similar case at the ICC involving a different commander from the DRC, human rights lawyers and human rights activists were shocked when in 2006 the case against Thomas Lubanga overlooked a specific investigation into the gender-based nature of crimes committed by his army in the DRC during the Congo Wars (Inder 2011).

"Operation Clean the Slate" is just one event among hundreds known to have contributed to the 250,000 rapes *reported* during the Congo Wars. The Special Representative to the Secretary General on Sexual Violence in Conflict at the United Nations estimates that the true number of rapes could be twenty times the number of actual reports (Wallstrom 2010).

The rate at which women are being raped in eastern Congo exceeds rates from all other countries being documented worldwide. For example, 4,500 women were raped each month in 2009 in the region (HEAL Africa). Anecdotal evidence shows that 75% of all the rape cases treated worldwide by "Doctors Without Borders" take place in eastern Congo (Lemarchand 2008). Most recently, a study that analyzed data from the Demographic and Health Study in the DRC in 2007 showed that more than 400,000 rapes were reported in *one* year in the DRC (Peterman et al. 2011). This study suggested that under-reporting of rape during the conflict has been extremely high, and

that intimate partner violence has been an overlooked component to the overall gender-based violence (GBV) found in the DRC.

Some theories highlight the mineral wealth found in the eastern DRC as a driver of the ongoing conflict because it provides armies with the wealth they need to continue their military efforts. A campaign around "conflict minerals," similar to the "blood diamond" which emerged from the war in Sierra Leone, has drawn attention to the electronic companies believed to be working with rebel armies to acquire minerals (UN 2002). Evidence exists to suggest that the continued occurrence of rape in eastern DRC could be seen as a method of controlling populations in order to maintain greater control over swatches of territory known to contain minerals. Rape then, could be an essential element of this control strategy because of the omnipresent sense of fear it creates, making all women potential victims at all times (Brownmiller 1979).

But other scholars argue the rape narrative is too simplistic (Autesserre 2012) and instead cite identity politics from the colonial era and local skirmishes over rights to the land as the most fundamental driver of violence (Lemarchand 2009). Still, gender-based violence, as well as extreme forms of physical violence, are common exposures in the DRC. This topic is further investigated in Chapter 3.

Africa's World War officially ended in 2003, but rebel activity has continued and large sections of the eastern provinces are still controlled by rebel armies instead of by the central government. The magnitude of this problem is evidenced by the fact that the DRC is the only country in Africa with approximately half of its national territory under foreign military occupation (Lemarchand 2009). Though reports of direct-conflict related violence have decreased, reports of widespread rape have not, the most

noteworthy case occurring on New Year's Eve 2010, in Fizi, a region in South Kivu, where 8,000 rapes took place (IRIN 2011).

The most recent spurt of violence in the DRC, caused by a group founded in April 2011, calling themselves the M23, referring to a treaty signed on March 23<sup>rd</sup> at a peace conference at which the group claims promises made have not been upheld. The United Nations has collected damning evidence against the current government of Rwanda for support of the M23 rebels (UN 2012). The evidence is still new, but even before its release, it has been widely accepted in the DRC that Rwanda funds rebel movements operating on DRC soil (Stearns 2011). For example, a policy paper by Timothy B. Reid in 2006 entitled "Killing Them Softly" questioned the extent to which military funding to Rwanda (and Uganda) is being used to wage war in the DRC (Reid 2006). In the face of this newer indisputable evidence from the UN, the United States and other nations have temporarily suspended military aid to Rwanda. Still, since associations between rebel groups with origins in Rwanda and perpetration of GBV has been documented since 1993, clearly this violence must also be understood at the international level—not just as a result of civil war among citizens of the DRC.

Exposure to rape has been particularly devastating in this cultural context, where rape is seen as adultery by spouses who are often forced to watch the rape of their wives (Trenholm et al. 2009). Due to traditional ideas about female sexuality and the culturally defined meaning of sex (which is seen as intended for procreation and not for the enjoyment of the woman), women who are raped are often deserted by their families who view them as damaged and impure. When rape is systematic in a village, the social repercussions for both individuals and the community are devastating and

register at multiple levels. Only few reports of male rape in the DRC exist (Cohen et al. 2013), and most believe that men are too humiliated to seek treatment in a health facility (Zwanck 2008). Still, one study of magnitude shows that 23% of men report experiencing some kind of sexual violence (Johnson et al. 2010).

There has been a great deal of research across disciplines on health in mid- or post-conflict DRC. Mental health has been one obvious topic of study. One study tested whether or not a radio soap opera and post-listening discussion about intergroup conflict and cooperation encouraged tolerance among youth. Results showed that those who listened, but did *not* take part in the discussion, were less mindful of grievances, more tolerant, and more likely to aid disliked communities (Paluck 2010). The author hypothesized that because post-listening discussion groups tended to be contentious, a lack of discussion about such topics might actually encourage tolerance more so than open communication. In my view, this is an important study because it shows that tension is very high in the DRC right now in discussing the conflict. Programs from the outside should take this into consideration, since often Western-donors advocate for and fund Western-style talk therapy programs, which, according to above-mentioned study, could cause harm. Often ignored by development practitioners are the types of grassroots community-based activities shown in Chapter 3 of this dissertation, such as purification rituals and amicable agreements.

Other researchers have attempted to measure the effects of war by looking at post-traumatic stress disorder (PTSD) in the DRC. One such study included former child soldiers from the DRC and found, unsurprisingly, that those with higher

PTSD scores were less open to reconciliation and had more feelings of revenge (Bayer et al. 2007).

Another study showed that PTSD, together with the witnessing or traumatizing events, predicted depression among female survivors of violence in the DRC (Schalinski et al. 2011). In 2010 Pham and colleagues showed variability in their “sense of coherence” measure, a proxy for well-being and resilience, whereas respondents with higher education levels, income and positive social relationships exhibited resiliency (Pham et al. 2010). In general, studies of mental health in the DRC show high levels of trauma, despite the fact that in one survey, 95% of respondents lacked access to mental health care (Johnson et al. 2010). Though it is worthwhile to question whether or not in researching “access” to meaningful mental health care, investigators considered non-Western forms of mental health care (which may not have been studied by researchers), it is still important to recognize that high levels of trauma are clearly found among the population in eastern DRC.

Researchers have also looked at maternal and child health, though not extensively. One study from the Ituri district of eastern DRC showed that pregnancy outcomes were worse during the conflict (Ahuka et al. 2003). Researchers have also shown that birthrates are considerably lower in camps for internally displaced persons than they are among the population (McGinn 2000). Of course, many studies have looked at GBV, though these studies usually focus on women, and less so on children (Baelani and Dunser 2011, Bartels et al. 2010, Farr 2009, Longombe et al. 2008, Onsrud et al. 2008, Steiner et al. 2009, Trenholm et al. 2009)

Given the above-detailed account of war and violence in the DRC, it is logical that scholars would refrain from making overly generalized statements about the nature of the conflict, its drivers, and potential solutions. Instead, scholars have opted to describe the “complexity” (Baaz and Stern 2010, Stearns 2011) and “dynamics” (Lemarchard 2009) of the conflict rather than provide a single narrative that might be too narrow to consider the nuanced nature of the violence over time.

This dissertation builds upon what has been already been documented about the human consequences of the conflict in the DRC. By integrating a detailed case study of Peace through Health initiatives by a local organization, a critical analysis of whether or not Western donors are meeting the needs of Congolese beneficiaries with conventional development practices, and a biocultural study of maternal and child health amidst sexual violence, the goal of this dissertation is to call for evidence-based program development and management in the DRC, and to suggest new ways of imagining the reconstruction of the country with more of a focus on the autonomy of Congolese people.

### **This Dissertation**

Good health in the DRC is hard to come by. When it comes to maternal mortality, just one measure of women’s health, DRC ranks 17<sup>th</sup> out of 183. Publicized maternal mortality rates do not take into consideration women who die without any official reporting, as many women do. And even when travel to the hospital during a health crisis is a possibility, the hospital is often empty, without staff or equipment.

Unlike studies that take a narrow look at one specific health problem in a given place, the studies in this dissertation ask broad questions about health and healing in the DRC. I attempted to ask questions whose answers might have direct

relevance to Congolese people. These questions include: To what extent are current programs effectively bringing change to the country in terms of health outcomes and peace building? (Chapter 2), Is development money from Western donors meeting the needs that Congolese people have identified? (Chapter 3), and Will the presence of violence have long-term effects on the health of those who will be responsible for peace and reconciliation? (Chapter 4).

More specifically, chapter 2 of this dissertation applies the theory of 'Peace through Health' (PtH) to the DRC and uses a case study of one local NGO to provide examples of the ways in which the health sector can be tapped for its peace-building potential. It points out the importance of collecting data to support the theoretical claims of (PtH), while also providing the beginnings of an empirical basis of how one organization in the DRC effectively advocates for peace through activities and programs targeting health. The case study does not overstate the peace-building power of a single organization, but instead points out the strengths and weaknesses of their approach. This chapter fills a gap in the PtH literature by providing a detailed case study of how the application of this theory affects populations in eastern DRC.

Chapter 3 is a paper that highlights the challenges that arise when there is a discrepancy between the needs of the beneficiaries of aid in the DRC, and the limits of development agencies. Using data from an ongoing study that analyzes the social determinants of health in the DRC, this chapter asks whether or not aid monies would be better spent if Congolese nationals were given greater authority over the direction of funds. This paper plays an important role in documenting the status quo in the DRC as it relates to development from the West, and also for imagining how things might look if

there were not a global power dynamic that permits unidirectional dispersal of funds with strict instructions for how to use such funds.

Chapter 4 is a biocultural analysis of maternal and child health in the DRC. Unlike the first two chapters, which grapple directly with the outcomes of development aid as well as the challenges involved, this paper integrates sociocultural and biological data to create a picture of how violence may affect intergenerational health. By showing some of the ways that mothers and neonates are affected, the paper declares itself an empirical basis that should serve to influence decision making of aid organizations. Furthermore, the paper points to the long-term health outcomes that are possible given our results. This allows us to understand not only what how violence affects women and children in the DRC today, but how this effect may have lasting power for decades or more.

In sum, this dissertation is an analysis of one of the largest humanitarian crises in the world that uses perspectives from both anthropology and public health to ask questions about the feasibility and possibility of health and healing. It provides a taste of what the past has felt like and what the future may be like, and makes radical suggestions about how things could change. The suggestions herein may be idealistic, but as one Congolese woman told me along the way: idealism is the only way out.

CHAPTER 2  
HEALING AFRICA? REFLECTIONS ON THE PEACEBUILDING ROLE OF A HEALTH-  
BASED NON GOVERNMENTAL ORGANIZATION OPERATING IN EASTERN  
DEMOCRATIC REPUBLIC OF CONGO

**Background**

Over the last decade, interest in the untapped peace-building potential of various overlooked sectors has been on the increase. The business community is one such example, credited as it is with contributing to the onset of peace negotiations in Israel/Palestine and to post-conflict reconstruction in countries such as Rwanda (Boudreaux 2007, Gross 2010). If business can herald such promise as a tool to promote peace, what then can be said of the health sector with its principles underpinned by humanitarianism?

This question has been tackled at a series of 'Peace through Health' conferences held at McMaster University in recent years, where war has been interpreted as a disease process with manageable risk factors and treatable consequences. Like a disease, the conference organisers argue that conflict demands not only the treatment of its immediate symptoms, but also the mitigation of risk factors to prevent its development, escalation and long-term perpetuation (Yusuf et al. 1998). The unique nature of the health sector and its mandated position within conflict situations is such that it holds not only the opportunity but also a responsibility to make positive interventions during a conflict life cycle. If war, by definition, is a public health problem, it follows that part of the solution lies in the hands of public health practitioners.

This article explores what form those interventions can take in practice through examining the case of HEAL Africa, a health-based non-governmental organisation (NGO) operating within Eastern Democratic Republic of Congo (DRC). Founded in

2000, HEAL operates from its hospital base in Goma throughout North Kivu province, which today remains profoundly affected by conflict as it has been since the early 1990s. Originally responding primarily to the health needs of the local population, today the organisation operates under the expanded mandate of 'enabling conflict-ridden communities to transform, becoming healthy and dynamic' (HEAL 2008). Functioning in one of the most violent and insecure contexts in the world, HEAL Africa's broad range of approaches sheds light on the scope for the health sector's engagement in conflict situations to help promote peace, as well as some of the limitations to its role.

### **Peace through Health**

The conclusions of the McMaster 'Peace through Health' (PtH) conferences provide a useful starting point when considering in abstract terms the potential of the health sector to promote peace in situations of conflict. Drawing parallels between the cycle of war and a disease process, the conference organisers framed the potential response of health actors within their own terms of reference. In their view, conflict can helpfully be understood as an emerging disease which can be prevented by the successful identification and management of certain risk factors at each stage of its development. Risk factors of war can be reduced (primary prevention); the effects of war can be treated (secondary prevention); and in the longer term broken communities and people can be rehabilitated (tertiary prevention) (Vass 2001).

Based on the conceptualisation of conflict as a pathogen, primary prevention requires direct action to identify and combat the root causes of violence. Historically, associations of doctors have undertaken this form of intervention through capitalising on their knowledge base and position in society to draw attention to the negative health consequences of war. Organisations like International Physicians for the Prevention of

Nuclear War (IPPNW), for example, are well known for their campaigns against the use of nuclear weapons, which effectively “engage[s]... war as a major determinant of health” (Rushton 2008).” When effective, such measures can contribute either to the prevention of war, or in the case of IPPNW, to the non-perpetuation of pre-existing conflict.

Secondary prevention has been referred to as a form of ‘peacemaking’ (Arya 2004). This model of prevention goes beyond advocating for peace and diplomacy in the face of violent conflict. Instead, interventions at this stage attempt to directly curb violence and address any consequent health effects on the affected population. During a ceasefire, for example, medical agencies routinely use the temporary halt in violence to inoculate children, treat wounded civilians and evaluate the health of the local population. In addition, health practitioners have also undertaken activities during conflict which are perhaps more commonly associated with those of the peace-building community. One such case has been in Israel/Palestine, where American doctors have used health as a means of unification between Israeli and Palestinian professionals (Arya 2008).

Finally, tertiary prevention within the PtH framework seeks longer term rehabilitation for individuals and societies suffering from exposure to violent warfare. At this juncture, addressing the collective damage of war through activities such as the psychosocial healing of combatants, victims and children becomes a main focus (Gutlove 2008). Tertiary prevention can also take the form of community based interventions such as rehabilitation of those living with disabilities, business generation

as a tool to stimulate the local economy and rebuild trust, or the reintegration of ex-combatants back into society (Boyce 2008).

At all these stages, the health sector in principle stands well placed to mitigate key risk factors because of its unique combination of underpinning attributes: altruism which obliges health actors to treat all sides impartially; science which promotes the collection of impartial data on health effects of conflict; and legitimacy which allows health workers to exert a disproportionate influence on a wide range of conflict actors (MacQueen 2000).

Though theories for peace-building through health look credible on paper, further case studies are required to provide them with a broader evidence base. To date, the examples which serve to provide the PtH framework with an empirical grounding are few in number, and arguably thin in substance. One of the few convincing case studies of tertiary prevention shows reduced post-traumatic stress symptoms among children in post-war Croatia, after exposure to a school curriculum guided by PtH principles (Woodside et al. 1999). Other case studies exist from the WHO's implementation of the Health as a Bridge to Peace (HBP) concept in Haiti, Eastern Slovenia and Mozambique, but remain unevaluated and were undermined by "imperfect application" (Arya 2008).

More specifically, the PtH framework could be strengthened further through case studies which grapple with some of the most common forms of war in the 21<sup>st</sup> century. The WHO's 2009 manual on Analyzing Disrupted Health Systems in Countries in Crisis argues that 'Chronic crises have become a constant feature of the global political landscape' (Pavignani 2010). Indeed, the prevalence of violence around today's world is symptomatic of its highly complex nature, which – as cases like Afghanistan, Sudan

and Somalia illustrate – can no longer be simply demarcated into phases of pre-, mid- and post-conflict. In all these examples, the country in question could be understood to be categorised by overlapping stages of conflict, or even to be in two or three stages at once. In several regions of Sudan, for example, the boundaries between pre, mid and post conflict phases are routinely blurred, as the implementation of its various peace agreements takes place alongside simmering violence at local and regional levels. At the same time, there is arguably still a requirement for effective conflict prevention interventions in order to prevent the emergence of new conflicts over issues such as scarcity of resources. As such, strategies designed to promote peace in these kinds of contexts may need to combine activities which prevent violence, resolve conflict and promote reconstruction. Does the PtH model have anything to say about addressing war in these circumstances?

### **Conflict in Eastern DRC**

The DRC provides a particularly useful example of a conflict context in which the boundaries of conventional sequencing are blurred. At first sight, Eastern Congo might be regarded as being located within a post-conflict phase. The official end of ‘Africa’s World War’ was marked in 2002 with a major regional peace agreement, whilst a national peace accord was reached between the government and rebel groups in 2008. Indeed, in recent years, DRC has displayed many of the characteristics of a post-conflict environment: presidential elections, modest gains in power-sharing, and a national Disarmament, Demobilisation and Reintegration (DDR) programme.

Take a closer look, however, and ongoing developments on the ground could suggest that Eastern DRC remains firmly in the midst of conflict. Rebel groups such as the Forces Democratiques de Liberation du Rwanda (FDLR) and the Federalist

Republican Forces (FRF) continue to fight the national army and the UN peacekeeping force (MONUC), control swathes of territory in North and South Kivu, and victimise local populations. As a consequence, an estimated 1.4 million today remain displaced within the East, 250,000 of whom were forced from their homes during 2008 (Prunier 2000), followed by an additional half a million during the first half of 2009 (Gagnon 2009). In addition, one of the most infamous traits of conflict in the DRC—sexual violence as a weapon of war— remains commonplace (UN 2009). Over 7,500 cases of sexual violence by military groups were registered by the UN in 2008; a Human Rights Watch investigation conducted during the first few months of 2009 suggests that the Congolese Army remains particularly culpable (Human Rights Watch 2009).

Though ongoing, conflict in Eastern Congo remains unpredictable and without a consistent pattern. The fluid allegiances of both individual leaders and rebel groups (Lemarchand 2009) is such that the region continues to witness the splintering and re-forming of armed groups. Moreover, Rwanda's brief foray into Eastern DRC in 2009 illustrates that regional powers retain the capacity to intervene militarily – and their inclination to do so could be influenced by the presence of the FDLR and now the Lord's Resistance Army in parts of the East. It is also arguably the case that many of the drivers of conflict at local levels – over issues of land, resources and ethnic and national identity – remain unresolved and threaten to provoke new forms of conflict, particularly as pressure on land resources intensifies over coming years (Wake 2009). The corollary of these circumstances is that whilst the conflict in Eastern Congo is well established, there remains the potential for it to take on new forms, or for new strands altogether to emerge. Conflict prevention therefore remains an important aspect of any

peace-building intervention in Eastern DRC – alongside strategies to address Congo’s mid and post-conflict challenges.

### **HEAL Africa**

When searching for relevant examples of conflict interventions by health actors, Eastern DRC therefore provides a particularly fitting backdrop. Within this context, the case of HEAL Africa points at a series of potentially positive responses for achieving ‘Peace through Health’ where traditional distinctions between conflict phases are blurred. The history of HEAL as an organisation is itself revealing. Particularly notable is the adaptation of HEAL’s mission to address the broader health needs of the community as the conflict expanded in its size and impact. When the directors of HEAL opened their hospital in 2000 under the name DOCS (Doctors on Call for Service), their focus was on the provision of healthcare to the population through the medical education of Congolese doctors. But the spread of HIV—due in part to the prevalence of rape as a weapon of war—pointed to significant changes in the health needs of the community. The presence of DOCS in the most vulnerable villages exposed an epidemiological reality, namely that lasting gains in health can only be made by the simultaneous treatment, mitigation and prevention of both disease and conflict. Cognisant that its reputation brought legitimacy within local communities unattainable by outside actors, the hospital changed its name and expanded its mandate.

Using medical intervention as a starting point, HEAL’s focus therefore shifted to the goal of curbing—and eventually reversing—the consequences of war through projects designed to help ‘transform’ communities affected by conflict. In practice, this objective has been accomplished by incorporating community education and

empowerment into health outreach programmes carried out by health professions throughout the province of North Kivu.

The next section will examine the outworking of HEAL's approach to assess its peace-building potential, looking at projects through the lens of the primary, secondary and tertiary prevention model discussed above. The findings are based on a series of site visits between May and August 2009, a number of HEAL Africa's own external publications and research projects, and semi-structured interviews with project leaders in July 2009, along with follow-up interviews in October and November 2009. Data analysis was assisted by MAXQDA software.

### **Primary: Modification of risk factors**

The focus of several HEAL Africa projects is to work with vulnerable groups at community levels in order to reduce common risk factors for conflict—notably the lack of access to meaningful employment opportunities, gender inequality and inter-ethnic tensions. The Mawe Hai project, for example, provides training in agriculture in order to enhance productivity and spread the benefits of farming more broadly within communities. In the village of Bweremana, programme representative Wilfrieda Nsimire claims that participants in the scheme have been identified as having improved nutrition and higher school attendance rates. In this way, the Mawe Hai project assists its beneficiaries to earn a living without resorting to trades deriving from the local war economy such as artisanal mining, thereby reducing the numbers of people dependent on the continuation of conflict in order to make a living (Vlassenroot and Raeymaekers 2000).

One of the main objectives of HEAL's Nehemiah programme—a network of committees of locally elected members operating in five districts in North Kivu—is to

promote inter-ethnic conciliation at local levels in the region. This goal is particularly relevant within the context of conflict in Eastern Congo, where the exploitation of rivalries and tensions between ethnic groups at community levels has been widely attributed as a key driver for violence (Lemarchand 2001). The role of the Nehemiah committees is to select vulnerable individuals within their jurisdiction for inclusion in HEAL's initiatives or for treatment at its central hospital. In fulfilling this function, the Nehemiah programme is in a position to combat the volatile inter-ethnic dynamic through ensuring broad representation across HEAL's community projects.

### **Secondary: Treating the Immediate Effects of War**

HEAL Africa's original and central activity remains to treat patients for a wide variety of medical and surgical conditions in its hospital in Goma, as well as in rural health centres, IDP camps and other emergency areas. Treatment of some of the most damaging direct consequences of conflict remains a central feature of HEAL's work, and medical staff claim to provide emergency and long term care for every civilian or military patient in need. A commonly required intervention is vesico-vaginal fistulae surgery—a direct consequence of sexual violence as a weapon of war—for which 262 women were treated in 2008. Another is 'war trauma,' for which 82 patients received care during the humanitarian crisis caused by fighting between October and December 2008 (HEAL 2008 p. 5).

HEAL's hospital also works to treat some of the most harmful indirect consequences of conflict in Eastern DRC, notably HIV and other infectious diseases whose emergence and transmission is favoured by conditions generated during conflict and migration (Murray et al. 2002). Inpatient care for a range of ailments was provided for a total of 3,079 patients over the course of 2008 (HEAL 2008 p. 6).

The context within which the hospital at HEAL is operating makes these patient numbers particularly noteworthy. While HEAL has a principle of treating any patient as quickly as possible, state hospitals operating in the area tend to provide an unreliable and sporadic programme of care due to insufficient funding, corruption and crime. As Project Head Joseph Ciza explains:

'The General Hospital is not used by the people of Goma - they come here to HEAL where they are treated immediately. If you go to the General Hospital... you will spend more than one or two days without treatment because not all of the doctors are full time – many are not paid so they tend to look for jobs in private clinics. If there is ever a donation of medicines to the hospital they are stolen and sold outside. So everyone comes here to HEAL.'

(Rodney N, Unpublished data)

It could be argued that long-term rehabilitation of the health of the Congolese people requires more than the provision of treatment to individuals. To that end, a focus on the rehabilitation of state institutions is an important component of the goal of promoting 'Peace through Health'. In DRC, however, steps taken in this direction in recent years have done little to address the health needs of the population on the Eastern side of the country, which lies 1,300 miles from the capital Kinshasa in the West.

In contrast to state institutions which are losing credibility due to lack of funding and corruption, HEAL Africa has developed a high degree of permanence and sustainability which goes some way to filling the current health gap in Eastern Congo. Entirely run by host country nationals, HEAL possesses a staying power that is distinctly different than that of the majority of the other international NGOs in the region. Furthermore, HEAL's doctors perform surgeries beyond the capabilities of doctors at state institutions. As a consequence, HEAL regards its presence as mandatory during wartime—when there is a need for vesico-vaginal fistulae surgery—as it is during

peacetime—when standard orthopaedic procedures are not available at the general hospital in Goma.

Another key strand of HEAL Africa's work is to address some of the immediate consequences of gender based violence. HEAL's Safe Motherhood programme, for example, oversees the creation of 'maternity insurance groups,' which pool members' resources to provide financial support during pregnancy, delivery and neo-natal care. Over 170 of these groups were functioning successfully by the end of 2008, supplemented by income generating grants and training from HEAL Africa (HEAL 2008 p. 10).

Three outcomes of this programme are worth noting in particular. Firstly, because it funds safe births of children conceived through rape, Safe Motherhood protects women who would otherwise have been neglected due to stigma. Secondly, the programme has helped to bolster the local health care system through increasing demand for the services of local doctors and nurses in regions where Safe Motherhood operates. Interviews with regional hospital staff, administrators and the Médecin Chef de Zone carried out by one of the authors (NCD) confirm that funds from the maternity insurance scheme have been responsible for an increase in the use of local hospital services. Lastly, Safe Motherhood has helped to redress some of the gender imbalances provoked by conflict in recent years. The husband of one participant claimed that the presence of the group in his community had fundamentally altered relationships between men and women involved: 'our wives know more about safe birth practices, about family planning, and most importantly, they have access to money which makes them powerful in our eyes.'

### **Tertiary: Post-conflict rehabilitation of individuals and society**

As well as treating the immediate symptoms of conflict, HEAL Africa's projects aim to promote longer-term rehabilitation of both individual patients and their communities. Extending beyond the provision of psychosocial support, the priorities in this area overlap closely with those of HEAL's interventions for primary prevention: namely gender equality, economic security and inter-ethnic conciliation. A good example is provided by the Heal My People programme, one important function of which is to offer psychological and social support to survivors of rape. It does this through training of locally appointed women in counselling, providing husband-wife mediation and conducting community education classes on reintegration. Those who are trained are then able to help facilitate the re-integration process for victims of sexual violence who are often otherwise rejected from their family and society.

Another central aspect of the Heal My People programme is the provision of economic support in the form of micro-credit 'solidarity groups' for women involved in the project, 1,018 of whom were backed by IGAs in 2008 (HEAL 2008 p. 17). The purpose of these groups is partly to provide livelihoods for their members within an economic climate profoundly affected by conflict. More fundamentally, however, the programme's purpose is to enhance the protection of members through some degree of financial security and a rebalancing of gender relations. Indeed, a HEAL Africa case study analysing a Heal My People project in 2008 found that participants felt both more physically secure and personally confident to partake in community discussions. As a consequence, members of solidarity groups may even in some cases be better protected from the activities of rebel groups and subjection to sexual violence in particular. Ownership of livestock, for example, was testified by programme members

as providing a degree of protection from the activities of rebel groups whose violence may be limited in exchange for goats or other animals (Zwanck 2008).

As well as the promotion of equal access to HEAL's programmes, Nehemiah committees also seek to help 'reconstruct the social tissue destroyed by war' through mediating in local disputes (2009 interview with Ndungo Sakoul, head of 'Nehemiah'). Over sixty cases of local confrontations throughout the region were recorded between April and June 2009, in which committee members were invited to mediate by one or both parties. The majority of these cases stemmed from clashes over land ownership, family quarrels and petty disputes at the community level, perhaps unsurprising within the context of social breakdown caused by over a decade of conflict affecting the region. In intervening in local clashes such as these, the Nehemiah committees provide ready access to a form of community-based conciliation where state services are frequently lacking. Moreover, the broad participation of representatives from different ethnic groups, religions and genders allows the committees to engage positively in a wide range of confrontations, including those involving an underlying ethnic dimension.

Finally, the activities of the Gender and Justice Project comprise another form of tertiary prevention offered by HEAL. Focussing on supporting victims of rape, the project provides not only counselling but also legal assistance to allow women to take their cases to court if appropriate. Through the provision of training to lawyers, judges and victims, HEAL estimates that it increased the number of sexual violence cases brought to judicial courts in Goma from an unreported—but likely an astonishingly low—figure to 234 in 2008 (Kimona and McConnell 2009). In so doing, the project has taken

small but significant steps towards reinstating punitive justice and a respect for basic human rights within public consciousness in North Kivu.

### **Analysis and Lessons Learned**

Measuring the success of peace-building activities is notoriously difficult to achieve, not least due to the unstable conditions in which research must be conducted and the inherently intangible nature of key measurement indicators. In the case of HEAL Africa, there are few systematic studies available on the outcomes of its projects, making an assessment of their 'success rate' very difficult to gauge. However, HEAL's model does provide a series of clues about the health sector's peace-building potential in the areas of primary, secondary and tertiary prevention—and indeed what its limitations might be.

An obvious but important first point to make is that as a health NGO centred around a busy, functioning hospital, HEAL Africa's principal activity remains a form of secondary conflict prevention, exemplified by its mandatory HIV testing of pregnant women and child soldiers who come through its doors, or the time spent treating other forms of 'war trauma'. On their own, these activities are clearly worthwhile pursuits—and act as reminders that the primary function of health actors operating in conflict zones remains to treat the immediate effects of war. More relevant for the PtH debate, however, is the fact that it is HEAL's emphasis on secondary prevention which has given it the opportunity to embark upon the range of other interventions outlined above. On close inspection, HEAL's potential as a peace-building actor has been gained for four main reasons.

Firstly, HEAL Africa's reputation as a body providing care based on neutrality has been a key underlying factor in its ability to embark upon tertiary prevention through

activities such as its Gender and Justice project. Building up this mantle over the course of several years has allowed HEAL to take on the role of advocating on behalf of victims of sexual violence, thereby taking sideways steps into the everyday domain of human rights organisations. It also underpins activities such as those of the Nehemiah Committees, which actively practise non-discrimination between different ethnicities and tribes. In so doing, the Committees at the very least allow HEAL to operate without inflaming ethnic tensions, and potentially serving to rebuild trust.

Secondly, as a health actor operating throughout the region of North Kivu, HEAL Africa's intimate access to local people provides inroads for positively targeting the most vulnerable groups. In providing medical care at its hospital in Goma, in rural health centres, IDP camps and during humanitarian emergencies, HEAL is able to identify both individuals and communities most in need of its support. As a consequence, projects like Mawe Hai, Safe Motherhood and the Nehemiah Committees can identify individuals who are most susceptible to the underlying risk factors for conflict.

Thirdly, HEAL Africa's humanitarian emphasis provides a high level of legitimacy amongst local communities which allows it to conduct projects going beyond secondary treatment. The example provided by HEAL illustrates that once trust has been established, a health actor can move beyond traditional functions to provide a more holistic form of care. In the case of the Heal My People project, for instance, HEAL has fused its provision of medical care with interventions in areas like psychosocial wellbeing, livelihoods and gender equality. Via its Nehemiah Committees, HEAL has been able to make forays into the field of mediation to promote societal and inter-ethnic co-operation. The lesson from these examples is that the health sector can in limited

ways take on some functions of post-conflict rehabilitation, particularly when the legacy of conflict has prevented the state from doing so.

Finally, the permanence of HEAL Africa as a health actor in Eastern DRC has been a central factor in its ability to contribute to the long term rehabilitation of the region. In particular, the constant presence of HEAL's hospital in North Kivu since 2000 serves the function of both rebuilding a key social facility and bringing ethnic groups to work together for a common purpose. In this way, HEAL's health activities in the field of secondary prevention serve to provide important building blocks for the re-establishment of societal norms in the aftermath of conflict.

### **Limitations**

As well as providing evidence of the health sector's peace-building potential, this case study can also be weighed against common challenges to the PtH literature to assess some of its limitations. One obvious counter argument, for example, is that health actors operating in conflict zones simply do not possess sufficient spare capacity to allow them to move beyond providing health care alone. According to this view, adding peace-building tasks to an already overwhelming work-load might in fact serve to undermine a hospital's capability to achieve its primary goal of addressing the health needs of a vulnerable population (MacQueen 2008).

The case of HEAL Africa suggests that while its synergistic approach does contain some inherent limitations, these have not served to reduce the efficacy of the healthcare it provides. Partly this is because HEAL's programmes are designed by multidisciplinary teams which always include medical professionals – and secondary healthcare provision always takes priority when necessary. In the case of the Safe Motherhood project, for example, it is the same doctors and nurses who work in the

maternity ward of the hospital who are expected to undertake outreach activities for Safe Motherhood. Looked at positively, this model allows HEAL's doctors to provide healthcare which is mindful of the realities of village life and its health needs. At the same time, however when the hospital at HEAL Africa is seized by an immediate and overwhelming need—as it was in June 2009 when an incident of mass rape occurred at the jail in Goma—outreach programmes often have to be delayed, cancelled, or understaffed.

When viewing HEAL's programme as a cohesive whole, the picture that emerges is therefore a trade-off between emergency and hospital treatment and its other prevention priorities. In the words of one project manager, HEAL's prioritisation has unavoidable implications for its focus and resourcing such that 'every step forward feels as though it is coupled with three, or four steps back' (2009 interview with Ndungo Sakoul, Nehemiah Project Manager). HEAL's emphasis on filling the gap left by the frailties of the national health system can therefore be regarded as a double edged sword—opening up opportunities for intervention but at the same time limiting its ability to carry out other strands of peace-building work, or indeed to carry out evaluative studies of its work.

Another challenge to the PtH model states that when health workers undertake peace-building activities beyond their traditional remit, there is a danger that their position could become politicised and consequently delegitimised. If health workers lose the trust of local communities, then their capacity to undertake both health and peace interventions will be substantially hindered (MacQueen 2008). Findings from data collected on the perception of HEAL amongst its recipients, however, suggest that

it has to date avoided this kind of political tarnishing. This could in part be because HEAL's staff is comprised of individuals from a variety of the region's native ethnic groups. Because ethnic identity in Eastern Congo is often recognisable by either phenotype or name, the observable multi-ethnic composition of HEAL's team may have discouraged the perception of their activities as being politically motivated.

### **Closing Remarks**

Any health actor operating in a context such as Eastern DRC is inevitably profoundly affected by violent conflict—not only because of direct killings, injuries and displacement but also because conflict disrupts health systems and impedes a population's access to health care. The case study provided by HEAL Africa illustrates that as well as treating the direct symptoms of a conflict, a health agency can proactively intervene in the areas of primary and tertiary prevention. HEAL's main activities in these areas – advocating on behalf of the victims of sexual violence, delivering training in livelihoods, promoting gender equality, providing psychosocial support and delivering mediation services—provide useful evidence for advocates of PtH as well as a series of examples which could usefully be replicated in other conflict contexts.

The model of HEAL Africa suggests that the health sector's ability to promote peace in these ways is a direct result of its activities in secondary prevention, which rightfully remains its *raison d'être*. Consistent with the arguments of the PtH theorists, this role has provided HEAL with the necessary neutrality and legitimacy—but crucially also the required access and longevity—to be able to embark upon peace-building strategies traditionally reserved for other actors. These values embodied by HEAL have allowed it to conduct discreet but valuable interventions in preventing or modifying risk

factors, and in contributing to the longer term rehabilitation of the society in which it operates. In complex conflict contexts such as Eastern DRC – where traditional phases of conflict are blurred or overlap considerably – the example of HEAL Africa suggests that these interventions should take place simultaneously and in synergy with one another, in order to allow a PtH actor to maximise its peace-building impact.

HEAL's primary focus on direct healthcare, however, inevitably requires a degree of prioritisation over its other projects. As well as opening up peace-building opportunities in the first place, this acts as a constantly constraining factor on those activities in practice. It would be far-fetched, therefore, to regard the role of health sector as a potential panacea for situations of violent conflict. The promising examples provided by HEAL Africa in Eastern DRC do, however, suggest that international donors would do well to take seriously the peace-building tools which health actors have available—and to include them more proactively when planning conflict management strategies.

CHAPTER 3  
*'YOU SAY RAPE, I SAY HOSPITALS, BUT WHOSE VOICE IS LOUDER?': HEALTH,  
AID AND DECISION MAKING IN THE DEMOCRATIC REPUBLIC OF CONGO*

**Background**

The media representation of rape during 'Africa's World War' (Prunier 2009) led to the Democratic Republic of Congo (DRC) being called 'hell on earth' (Kirchner 2008), 'the worst place in the world to be a woman' (IRIN 2008), and 'the rape capital of the world' (Wallstrom 2010). The use of rape during the conflict has itself been called the 'war within the war' (Human Rights Watch 2002) and 'the greatest silence' (Jackson 2007). In the light of published estimates (UN Women 2011) of magnitude and consequences of rape, these titles are not necessarily surprising.

The prevalence, or the total number of cases, of gender-based violence in the DRC is however extraordinarily difficult to obtain. This is in part because poor communications and difficult terrain in much of the country impede systematic data collection. There is also ambiguity in laws protecting women, which impacts negatively on reporting. For example, the DRC's 2006 Law on the Suppression of Sexual Violence defines statutory rape as sex with persons under 18, while legally one can marry at the age of 15. Thus, whilst Western observers commonly assume that the intention of survivors is to report rape, in reality many societal factors discourage disclosure. Given these difficulties, it is not surprising that estimates of rape vary widely. In 2009 the United Nations reported that 200,000 cases of rape occurred between 1998 and 2009 (United Nations 2009). In 2011 however, UNESCO estimated 130,000–260,000 cases in 2009 alone (UNESCO 2011). The most recent and most systematic estimate puts the number of rapes in 2007 somewhere between 407,397 and 433,785 (Peterman et al. 2011). The main differences in these estimates arise from the proportion of wartime

rape versus rape within marriage. This is further complicated by the change in the definition of rape introduced in the new 2006 law – exactly the time at which most of the above estimates were made.

Notwithstanding this lack of statistical clarity, the widespread publicity around the ‘rape problem’ in the DRC (Oury 2009) both fuels, and is fuelled by, the attention it has received from both humanitarian agencies and academic researchers. Several important studies contribute to our understanding of rape in the DRC, for example demonstrating the degree of violence seen in many cases, as well as the traumatic outcomes for survivors. This body of research thoughtfully details the devastating effects of rape. This includes the profound impact on both individuals and communities, as survivors are often deserted by their loved ones, subjecting them to what could be described as a double-violence, victimisation, or retraumatisation (Bartels et al., Birch 2008, 2010, Chu et al. 2008, Harvard Humanitarian Initiative and Oxfam 2010, Human Rights Watch 2009, Johnson et al. 2010, Kelly et al. 2011, Meger 2010, Pham et al. 2010, Steiner et al. 2009, Trenholm et al. 2009).

These studies have arguably drawn international attention to the nature of rape in the DRC in a helpful way. However, more recent scholarship explicitly interrogates the narratives produced and reproduced in the process of documenting rape in the DRC. For example, the Human Security Report for 2011/12 from Simon Fraser University suggests that the incentive structures that operate within humanitarian agencies focus attention on rape in a way that distorts our understanding of the issue (Human Security Report Project 2012) It has also been suggested that the international attention given to rape has actually increased risk factors for people living

in the DRC (Autesserre 2012: 15.). This is because combatants recognise that if rape is emphasised in international settings above all else, then it can be an 'effective bargaining tool' (Autesserre 2012: 16).

It is therefore necessary to question the need for the continued proliferation of international scholarly, humanitarian and media attention on rape in the DRC. If the shared aim of international assistance is to provide optimal benefit to Congolese people, it is clearly necessary to consult the planned recipients and beneficiaries of such assistance. This article thus utilises survey and narrative data on the social determinants of health, so as to enable Congolese voices to be heard. In so doing, the article directly engages with the question of whether or not narratives around rape have led to initiatives that benefit Congolese people.

### **Problematising the rape narrative**

Speaking at a US Senate hearing in December 2011, a Congolese scholar argued that Western academics and humanitarians reduce the highly complex problems of the DRC to a simplistic 'rape–minerals' narrative (Dizolele 2011). This statement suggests that while the production and maintenance of such a narrative draws positive attention to those persons, institutions and/or agencies which propagate it (by raising money, reinforcing the concept and legitimacy of 'expert' knowledge, and so forth), Congolese people do not see any such benefit.

One such example can be drawn from a multi-million dollar humanitarian intervention currently taking place in eastern DRC, and ongoing until 2015. For this project, a government agency granted more than US\$16 million to an US-based NGO. The project was the subject of considerable publicity and high-profile endorsement,

even receiving a visit from the Under-Secretary of State for Democracy and Global Affairs of the United States.

However, the beneficiaries of the project – survivors of rape – were deprived of the Post Exposure Prophylaxis treatment<sup>1</sup> they had been promised for nearly a year, because US government officials' insistence on sourcing the drugs for the lowest possible cost had the effect of significantly delaying delivery.<sup>2</sup> According to the project's annual report, 'supply of essential medicine for PEP and post-rape treatment for trauma and STIs was limited during the first year' (USHINDI 2011). During a project evaluation carried out after its first year of operation, a chief Congolese doctor who had agreed to volunteer for the project, when asked to describe the success of the project in his community, replied, *'What project? To me there is no project. I am not going to publicise this project to my community when I know in my heart there is no medicine to actually treat people with.'*<sup>3</sup>

In public forums, Congolese people have also questioned whether or not they benefit from efforts made towards documenting gender-based violence. At one such event organised by patients in a hospital in Goma in June 2010, one survivor of rape stated: *'[Researchers] say they can't pay us [for research] because that would be unethical, but they take our dignity for free. They are paid to come here to talk to us but we get nothing!'* Many listeners agreed, with this speaker and a subsequent speaker asked whether or not foreign professors are paid to teach classes based on the

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<sup>1</sup> Post-exposure prophylaxis treatment, or PEP kits, provide critical and time-sensitive treatments to survivors after rape, such as prophylaxis against HIV.

<sup>2</sup> Interview with the project's Chief of Party, August 2011.

<sup>3</sup> Interview, July 2011.

knowledge gained from visits to the DRC, and suggested that such payments should be shared with their informants.

Whether or not humanitarians or scholars profit in an unfair way from the use of rape in the DRC in their activities is not the primary focus of this article. Nevertheless, in the light of other research confirming that Congolese people actively challenge the dominant narrative focusing on minerals and rape (Autesserre 2012: 14), it is necessary to ask if this focus results in the marginalisation of other health concerns, how this affects the direction of aid dispersal and, ultimately, how it affects the potential of international actors to positively influence health outcomes in the country<sup>4</sup>.

For example, aid workers complain that they have too much funding to treat survivors of sexual violence and insufficient funds for other health issues (Autesserre 2012: 15). This is despite the fact that research shows that the DRC's population suffers from a wide variety of health problems. For example, in examining the causes of the 5.4 million deaths that apparently occurred during the Congo wars, a figure exhaustively cited by humanitarians, scholars, politicians and activists (Coghlan et al. 2007), Mack et al. (2010) suggest that a general breakdown of the DRC's health systems, rather than the war, may be primarily responsible. Mack et al argue that, because reliable pre-war mortality figures were unavailable, the statistic of 5.4 million deaths figure is inherently unreliable and probably an inadvertent inflation of the real figure. The denominator that was used (Coghlan et al. 2007) – the average mortality rate for sub-Saharan Africa – was too low and was not representative of the very high

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<sup>4</sup> For an argument about the negative consequences of misrepresenting HIV in sub-Saharan Africa, see Lolwicki-Zucca, Spiegel and Ciantia (2005).

pre-war mortality in the DRC, which was the result of the long-term erosion of the DRC's health system.

These technical details are important when considering (a) what actually causes illness and death in the DRC, and (b) whether the attention given to these determinants by academics and humanitarian actors duly reflects reality. The argument by Mack et al. (2010) demonstrates the need to consider the diversity of concerns when inquiring into health in the DRC. It also raises the question of whether the priorities of international aid agencies are reflective of known drivers of illness and mortality in the DRC.

This article does not intend to suggest that exposure to rape should be dismissed as trivial, nor that the consequences of rape are not deeply damaging, life altering or profound. Instead, this article broadens the discussion of health and illness in the DRC by including empirical data from Congolese respondents. In so doing, this article also showcases the ways in which Congolese people have been organising to address these issues for decades. This highlights the extent to which narratives created by international organisations, but deemed inadequate or distorting by Congolese people themselves, might remove the latter's agency to define their own vulnerabilities, while simultaneously diverting aid and other resources from the determinants of health seen as most urgent and important by those who actually suffer from these problems.

### **Methods**

This ongoing study began in April 2009 as a collaborative project between researchers at the University of Florida and Congolese social scientists. A team of researchers systematically collects annual data during a four-to-five month period, in order to document Congolese perceptions of the determinants and barriers to health

over time. Respondents are specifically asked what they believe determines health and illness, and are encouraged to discuss personal experiences to elucidate responses.

The narrative data reported in this article were collected during the period between April 2009 and August 2011. In this article, we consider 121 semi-structured interviews from 16 total locations, among male and female respondents ranging in age from 19 to 81.

Data were collected in all four eastern provinces of the DRC (Maniema, North Kivu, Orientale and South Kivu). Part of this study (April 2009–June 2009, May 2010–July 2010) was conducted in conjunction with HEAL Africa, a Congolese NGO that runs a hospital in North Kivu's capital city of Goma. Access to many of the locations and displaced populations (which have been and in some cases still are affected by conflict) would have been impossible without this partnership, given the lack of roads, reliable maps or transportation in the region. Interviews varied greatly in duration according to the safety of the location (e.g. a health centre versus a forest), but the median time was approximately 50 minutes.

During the first round of data collection for this study (April–August 2009), the research team's initial analysis of data revealed the many ways in which Congolese people were organising (both formally and informally) to fill in the gaps left by their health care system, via their own community-based health care provision. This forced the investigators to broaden the research agenda beyond the documentation of determinants of and barriers to health. The research team focused on a second question: are these local providers of health care better placed to identify and address the determinants of illness than international agencies, and, if so, would it be preferable to direct donor funds directly to them?

During analysis, specific attention was paid to the use of metaphor by respondents, as well as to indigenous categories of suffering (Bernard and Ryan 2010). Using a structured codebook of identified themes, presence and absence of themes were analysed (MacQueen et al. 1998). The following findings arise from line-by-line coding of all narrative data and analysis based on both the presence and absence of themes in the codebook. Therefore, the quotes provided in the next section represent overarching themes in the data. Details are also given about which code(s) were applied to quotes displayed below.

### **Findings**

This study has three major findings, each of which is analysed in turn in this section: (1) Congolese people report that the determinants of health most urgently needing redress are structural in nature. (2) Women believe their vulnerability is caused by a variety of barriers to health, of which rape is just one among many. (3) For decades, women and men have organised community-led health care provision.

#### **(1) Structural barriers: (Theme 1) Health Services as a Structural Determinant of Health**

When asked what causes sickness and what leads to health in their communities, respondents in both rural and urban locations placed a strong emphasis on hospitals and health centres: the condition of physical structures, the location of services, the quality of services and the cost of services. The physical decline of hospitals and health centres that respondents describe is occurring in both rural and urban settings. However the situation is reported as being worse outside of the main cities.

Access to hospitals and health centres varies greatly, according to the setting. Rural respondents report that they are frequently unable to visit hospital because of a lack of transportation. Urban respondents did not report travelling long distances. This is unsurprising, given that 80% of Congolese people live in rural locations whereas 80% of services available are in urban locations (Esanga et al. 2010).

For urban respondents however, access to health services depends on their ability to pay high fees. Rural respondents report the same high fees, which frequently prevented access to services, but they reported greater acceptability of payment in kind for health services. Urban respondents reported that when cash is unavailable to pay for services, it is common for the patient to be detained in hospitals until family members could locate sufficient funds. Some respondents linked this detention to increased exposure to pathogens.

A common opinion among respondents from both rural and urban locations was that the variable quality of care provided is a determinant of health. Such variation included the absence of staff members at health care facilities, which was a particular problem in rural locations. Both rural and urban respondents identified the training and attitude of health practitioners as a determinant of health.

## **(2) A variety of barriers to health**

### **(Theme 2) Rape as a Determinant of Illness**

As expected, exposure to rape as a barrier to health did emerge as a theme among women and men. However, Congolese respondents commonly viewed rape within the context of structural determinants. For example, the inability to obtain a legal abortion was often cited as a barrier to health, as carrying to term a pregnancy that was conceived in rape is viewed as strongly detrimental to psychosocial health. The ability of

women to safely terminate a pregnancy was seen as a protective factor, though the risks involved with black-market abortions were also reported for their severity, which respondents explicitly viewed as a structural issue.

There were other ways in which respondents explicitly referred to the structural problems that influence health care delivery for survivors of rape. Women and men were well informed about the risk of contracting a sexually transmitted infection during rape, but viewed this as a consequence exacerbated by a paralysed official healthcare sector. The emphasis was placed on the lack of structural capacity and resources to treat the consequences of rape such as human immunodeficiency virus (HIV) and other sexually transmitted infections (STIs), which are viewed as highly threatening in the context of poor health care delivery. In addition, the question of whether or not exposure to rape is itself a by-product of structural factors, such as travelling long distances, was explicitly raised.

### **(Theme 3): Food Insecurity as a Determinant of Illness**

Lastly, when asked what was the single most significant factor influencing poor health, the majority of female respondents (82%) stated that food insecurity, past experiences with food insecurity, and fear of future food insecurity determine health and illness. This finding was found among respondents in both urban and rural locations and was true even in locations with continuing armed conflict and high rates of sexual violence (such as Shabunda in South Kivu). Respondents emphasised the root causes of food insecurity in describing the negative health consequences that have obvious nutritional causes. Direct references were made to the DRC's unsophisticated agricultural technologies (relative to other countries), lack of both fertilisers and high-

yielding seeds, and lack of basic infrastructure needed for the transport of food products to markets.

### **(3) Community provision of health services**

The unexpected finding of this study is perhaps the most noteworthy. In theory, poverty is pernicious to society because it drains people of the time needed for activities superfluous to individual survival (Maslow 1968), such as organising for social good. However, empirical evidence collected during this study paints a picture that strongly challenges this theoretical paradigm.

Among respondents, an abundance of human resources outweighed their shortage of economic resources, with the result that Congolese people are organising both formally and informally to mitigate their own suffering. This is true at every level, from rural and urban communities of less than 200 persons, to the national level, where large organisations have been established by small groups of people whose work is recognised as effective by their peers. Two well-known examples of such organisations are Children's Voice in North Kivu and the *Programme de Promotion des Soins de Santé Primaires* (the Programme for Promotion of Primary Health Care – PPSSP) in Orientale. Others include *Promotion et Appui aux Initiatives Féminines* (Support and Promotion of Women's Initiatives – PAIF), *Concert d'Actions pour les Jeunes et Enfants Défavorisés* – Collective Action for Disadvantaged and Children and Youth – CAJED) and *Synergie pour la Lutte Anti Mine* (Synergy in the Fight Against Mines – SYLAM).

At a more local level, respondents reported the existence of networks of doctors who are known to provide safe and hygienic abortions<sup>5</sup>, as well as of networks

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<sup>5</sup> Interviews (4): 3, 20 June 2010, 11 July 2011, 19 August 2011.

of women who are knowledgeable about abortion and willing to care for women who have abortions.<sup>6</sup> These networks are often led by midwives and traditional birth attendants, who train family members to recognise risk factors that commonly occur after abortions. Respondents made reference to networks such as these in 10 out of the 16 locations. Although the authors were unable to verify this finding in every instance, it is still significant to report respondents' knowledge of community-led health care provision outside the formal system.

In terms of food insecurity, in North Kivu there are several examples of women within one community organising around a single farm to plant, plough, weed and harvest crops.<sup>7</sup> Typically, half of the harvest is kept and distributed among themselves for their own food, while the other half is sold in the marketplace. Profits earned are then channelled back into the community, to pay for costs such as health care. This finding was cross-checked with the hospital administrator at a large hospital in North Kivu, who confirmed that health care costs are often paid using this collective system.<sup>8</sup> These women prioritise seed-saving practices, to allow for future plantings and harvests. Respondents also reported that money is occasionally made available as microfinance for women wishing to start their own small businesses.<sup>9</sup>

Communities also have their own mechanisms for dealing with the trauma of rape. In all 16 of the locations in this study, there exist purification rituals for survivors

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<sup>6</sup> Interviews (10): 11, 14, 19 May 2009, 4, 29 June 2009, 16 June 2010; 22 August 2010, 13 June 2011, 21, 29 July 2011; Focus Groups (1): 10 August 2009.

<sup>7</sup> Interviews (7): 14, 15 May 2009, 7 July 2009, 11 June 2010, 3, 10, 22 July 2010 Focus Groups (1): 20 June 2009.

<sup>8</sup> Interview (1): 24 July 2010.

<sup>9</sup> Interviews (3): 29 June 2010, 8, 19 August 2010; Focus Group (1): 10 August 2010.

of gender-based violence.<sup>10</sup> Amicable agreements are used as a means of seeking justice between the family of the perpetrator and the family of the survivor.<sup>11</sup> Networks of women willing to support and counsel rape survivors are open in their activities and do not experience the kind of stigmatisation often experienced by individual survivors.<sup>12</sup> Women survivors of gender-based violence have at times decided to leave their communities and have received support in host communities in the form of housing, food, even legal assistance.<sup>13</sup>

In addition, respondents reported the existence of groups of women who gather to talk about their legal rights<sup>14</sup>, women who have formal systems of providing nutritional support to vulnerable community members who are pregnant<sup>15</sup>, and communities who use traditional mechanisms for assembling courts and levying penalties for crimes such as looting the hospital and perpetrating gender-based violence<sup>16</sup>.

Community-led initiatives for mitigating or removing the risk of exposure to rape also exist. For example, women often assemble in groups when travelling to their farms, reporting that this decreases the likelihood of violence against them<sup>17</sup>.

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<sup>10</sup> Interviews (15): 28 April 2009, 3, 8, 18 May 2009, 12 August 2009, 6 May 2010, 12, 19 June 2010, 15 July 2010, 6 August 2010, 17 May 2010, 13 June 2010, 16 July 2010 4, 17 August 2010; Focus Groups (1): 10 August 2009.

<sup>11</sup> Interviews (2): 14 June 2010, 11 July 2010; Focus Groups (1): 12 August 2010.

<sup>12</sup> Interviews (3): 14 June 2010, 11, 30 July 2010.

<sup>13</sup> Interviews (3): 11, 19 July 2010, 8 August 2010; Focus Group (1): 12 August 2010.

<sup>14</sup> Interviews (2): 7 June 2010, 16 May 2011.

<sup>15</sup> Interviews (3): 9 May 2009, 20 May 2009, 11 June 2009; Focus Groups (1): 10 August 2009.

<sup>16</sup> Interviews (4): 3 June 2011, 12 June 2011, 4, 9 July 2011.

<sup>17</sup> Interviews (5): 9 August 2010, 14 June 2011, 26, 29 July 2011, 17 August 2011.

Communities in areas most susceptible to attacks have night-watch systems in place, where armed delegates use cell phone networks and code systems to enable the timely alerting of the community to violent occurrences or potential threats<sup>18</sup>. In Kitutu, a rural community located next to a forest used as a base by soldiers of the *Forces démocratiques de libération du Rwanda* (Democratic Forces for the Liberation of Rwanda – FDLR) who have inflicted numerous acts of rape and violence on community members for nearly a decade, residents have lobbied United Nations’ officials to escort them to FDLR camps so they can invite the soldiers to come and live among them. They have also offered to build houses for the soldiers.<sup>19</sup> According to respondents, integrating the soldiers into community life is the only way to resolve the violence. They believe the community plays a more important role in this process than international agencies, since they are genuinely willing to invite soldiers to live with them, with the prerequisite that they lay down their weapons.

### **Discussion**

Like many anthropological studies of human health, this study sought to identify the determinants of health in the DRC from the perspective of those living in the communities directly affected. The results of the study were (and still are) expected to inform international agencies of ways in which their funding and activities can most effectively influence positive health outcomes. However, as noted above, it became clear that this research question was limited in its ability to paint a complete picture of the needs relating to health and illness in the DRC. The current situation in the DRC, far

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<sup>18</sup> Interviews (2): 6 July 2010, 11 July 2011.

<sup>19</sup> Interviews (3): 10, 13, 14 August 2011.

from being one of destitution and helpless victims in need of outside intervention, is one in which communities are creatively organising on a small scale with success. Though it is difficult to know what the outcome would be, these efforts do indicate real potential for greater impact if they were funded on a large scale. This finding presents a profound challenge to the typical development model in the DRC in which programme targets are not empirically driven (Autesserre 2012). If international aid funding were directly channelled to Congolese communities, would this prove more effective than the current system at achieving the collective goal of positively influencing health outcomes in the country?

Participants in this study clearly state that structural factors are the ultimate cause of poor health in the DRC. Some respondents went as far as to suggest that the 'rape problem' exists because of the absence of adequate services to provide health care, employment and transportation. However, without economic resources, the informal networks of Congolese people who are working to mitigate these circumstances are limited in their ability to produce large-scale changes. Roads need to be paved, hospitals need to be built, and health care professionals need to be better trained to staff them adequately. The astronomically high rates of unemployment in the country suggest that there are millions of people who could be doing this work (Trefon 2011).

Many international organisations working in the DRC understandably prioritise humanitarian intervention. For example, in 2009, of the US\$329,560,000 in Foreign Assistance Appropriations given to the DRC by USAID and the US Department of State, 43.9% was 'humanitarian assistance' which encompasses 'protection,

assistance and solutions'. Only 4.4% of these funds were earmarked for 'economic growth,' which covers 'infrastructure, agriculture, economic opportunity and the environment'. Most of this 4.4% went to agriculture, and infrastructure received no funding whatsoever (USAID 2010).

It is important to acknowledge that humanitarian intervention in the current situation in the DRC is a well-meant response to urgent problems. However, its efficacy must be challenged in the light of what we already know about the capacity of indigenous communities to address their own health problems. For example, anthropological scholarship on AIDS in Uganda suggests that potentially hundreds of thousands of lives could have been saved if Western donors had favoured African solutions over their own opinions (Green 2011).

Data presented in this article show that the priorities of many Congolese people are different than Western donors, encapsulated in the phrase of one respondent: *'you say rape, I say hospitals, but whose voice is louder?'* More specifically, the article finds that if funds were reallocated towards Congolese-led and Congolese-inspired solutions such as improving the overall health care system by building health care structures, strengthening the capacity of health professionals, and reducing barriers to access health services, funding would be more effective in helping victims of rape, for which gender-based violence is just one manifestation affecting women's health. Furthermore, supporting community-led initiatives, such as those targeted directly at soldiers, could potentially address one of the root causes of rape perpetration.

Some newer international initiatives demonstrate that this is already being tried in the DRC. Organisations such as IMA World Health, the International Medical Corps and Eastern Congo Initiative now employ almost entirely Congolese staff in their projects, which aim to provide capacity and trained personnel, while other projects are training paralegals (to improve the judicial system) and psychosocial counsellors (to support the health care system). These kinds of projects are also noteworthy for involving Congolese people in project design and implementation. However, even these projects are receiving funding based on their role in addressing the donor community's priority, i.e. mitigating gender-based violence. The current model, in which Western donors decide on areas of intervention and then solicit projects in these areas, means that they predetermine where funding is directed. Instead, ways could be found to enable community members to come together to decide what types of projects they would favour.

### **Recommendations**

This article, having analysed the social determinants of health in the DRC from the perspective of Congolese people, argues that decision-making about aid dispersal must be empirically driven. In building upon other scholarly work about the ways in which Congolese people have provided new services to fill the gaps left by an absent government in eastern DRC (Kabamba 2008), it challenges the conventional dynamics of development and suggests that Congolese community-based networks are better positioned to determine the most effective use of funding aimed at improving women's health. Furthermore, this article adds to the debate around the potential harm in maintaining standard narratives about rape in the DRC.

While no one would deny that incidences of rape in the DRC are very high, two important points could also be highlighted. First, there is a rape problem in many societies worldwide, not just in the DRC. This includes countries within which organisations are tasked with creating projects around the mitigation of sexual violence in the DRC. For example, a recent report from the Centers for Disease Control and Prevention in the United States shows that one in five women in the US are exposed to rape in their lifetimes (Black et al. 2011); an older report found that one in three female soldiers in the US Army experience rape whilst in the military (Sadler et al. 2003). It is important to recognise that high rates of rape are found in places such as the US military, as well as in the DRC.

Second, anthropological inquiry into the socio-cultural context of rape divides studied societies into two groups: 'rape-prone' and 'rape-free'. According to this analysis, the US falls into the category of a rape-prone society and one of the rare examples of a rape-free society is the Mbuti ethnic group in the DRC (Sanday 1981, Turnbull 1965). Although this finding could be outdated, it suggests both that (1) Africans already possess some of the tools to redress the problems they face; and that (2) Westerners look at the DRC as a society of victimhood, and therefore that is what they see.

Wider structural change is of course urgently required in the DRC alongside basic infrastructural improvements. A large number of Congolese organisations are currently at work to improve their country. In some cases, international organisations have recognised their work, and even partnered directly with them. This is true of many of the aforementioned groups, including HEAL Africa,

CAJED, Children's Voice, PSSP and SYLAM. However, the direction of the activities of these local organisations has been shaped by the requirements of funding or the terms of partnerships with international agencies that often have different priorities (whether explicitly or implicitly) to those of Congolese people themselves.

Scepticism about the capacity of aid recipients to organise their own development activities in a country facing grave challenges is understandable, particularly if large sums of money are involved. But if this scepticism stifles the potential of Congolese organisations to control the direction of aid money in their own country, there is a risk of choosing the wrong targets and registering poor results. This study has unearthed a variety of creative ways in which Congolese people have made gains towards meeting their own needs, at times unbeknownst to anyone except themselves. If international agencies entrusted local groups and organisations to define their own needs and then provided funding accordingly, this article suggests that improving the overall access to and quality of the wider Congolese infrastructure of health would be the highest priority.

Table 3-1. Interview and focus group location

Province	Town or Village	No. of Interviews	No. of Focus Groups
Maniema	Ferekeni	10	1
	Lubutu	7	
	Punia	11	
	Birambizo	12	1
	Bweremana	9	
North Kivu	Goma	14	2
	Kayna	10	1
	Kirotsche	9	
	Sake	9	
Orientale	Bunia	8	
	Kisangani	11	
	Komanda	8	
South Kivu	Bukavu	13	
	Idjwi	11	
	Kitutu	7	1
	Shabunda	12	
	Total	161	6

Table 3-2. Quotes from respondents: condition of physical structures

Interview, male, rural	Interview, female, urban	Interview, female, rural
<p><i>Sometimes there are holes in the roof and you get rained on while you are delivering your baby. There are cracks in the walls of the room where you sleep. Mosquitoes and sometimes snakes come through these cracks.'</i></p>	<p><i>'I would like to answer that question with a picture. Can I take you outside quickly?'</i></p> <p>[Interviewer is brought to a wooden latrine lacking a door]</p> <p><i>'My wife had to wash herself right there after she gave birth. That is where a sick man goes to vomit. My wife used that exact latrine [pointing] to wash herself, next to faeces and vomit. Please take a picture to bring to your big meeting at the White House and say this is why women die in Congo. It is not because of rape but because there is faeces where they bathe.'</i></p>	<p><i>Why are we dying? Because our hospitals have been cracking and without medicine since Mobutu's time [1965–1997] and government officials do not care because they can leave the country to get care in South Africa.'</i></p>

Table 3-3. Quotes from respondents: location of services

Interview, female, rural	Interview, female, rural	Interview, male, urban
<p><i>'After a two or three hours of walking, we arrive so tired at the health centre. It even happens that we give birth on the way to the health centre. Those who reach the health centre are so weak that they need care. Maybe a woman has not eaten for all the day.'</i></p>	<p><i>'I am pregnant with this baby now but I will have to sit right here in the forest when the baby comes...I won't take the risk of making that long trip.'</i></p>	<p><i>'Yes, we have hospitals and they are not far. Maybe you don't like what you find inside them but we do have them and you can walk 5 minutes, 6 minutes. There is also a bus.'</i></p>

Table 3-4. Quotes from respondents: payment for health services

Interview, male, urban	Interview, female, urban	Interview, female, rural
<p><i>'It is money. Without money, there is no way you can get care at the hospital. When someone is sick and doesn't have money, you will be kept in the hospital until the day you will pay. And they will not give you food.'</i></p>	<p><i>'I had to have a caesarean section even though I knew I could not pay for it. After the operation I waited in the hospital for three weeks while my husband searched for money. My baby got many fevers during this time because she was surrounded by sickness.'</i></p>	<p><i>'I still have a debt to the doctor who delivered my first child. For this pregnancy I will have to visit a traditional birth attendant because she will accept a chicken instead of money.'</i></p>

Table 3-5. Quotes from respondents: quality of care

Interview, male, rural	Interview, female, urban	Interview, female, rural
<p><i>Sometimes there are holes in the roof and you get rained on while you are delivering your baby. There are cracks in the walls of the room where you sleep. Mosquitoes and snakes come through these cracks.'</i></p>	<p><i>'I would like to answer that question with a picture. Can I take you outside quickly?'</i></p> <p>[Interviewer is brought to a wooden latrine lacking a door]</p> <p><i>'My wife had to wash herself right there after she gave birth. That is where a sick man goes to vomit. My wife used that exact latrine [pointing] to wash herself, next to faeces and vomit. Please take a picture to bring to your big meeting at the White House and say this is why women die in Congo. It is not because of rape but because there is faeces where they bathe.'</i></p>	<p><i>Why are we dying? Because our hospitals have been cracking and without medicine since Mobutu's time [1965–1997] and government officials do not care because they can leave the country to get care in South Africa.'</i></p>

Table 3-6. More quotes from respondents: quality of care

Interview, female, rural	Interview, female, urban	Interview, female, rural
<i>‘Rape is a problem here and it can cause women to be very, very sick if they cannot get to the hospital to be treated ‘</i>	<i>‘Rape is very dangerous to women when they get pregnant because it is illegal in this country to abort a pregnancy. So they look for a doctor who will do this abortion and they will find someone but this person is hiding [because the procedure is illegal] so he does not have clean tools, or the medicine necessary. Very many women die because they tried to get an abortion like this. This is a problem with our medical system.’</i>	<i>‘Would you get a surgery in a house made of mud? My sister died from bleeding after she got her abortion. If she had been in a hospital being cared for this would not have happened!’</i>

Table 3-7. Quotes from respondents: rape exposure and structural determinant

Interview, male, rural	Interview, female, urban	Interview, female, rural
<p><i>'We all know that there are soldiers who try to make us sick with their viruses. They wouldn't be able to do that if we had hospitals here that had doctors and medicine.'</i></p>	<p><i>'If another man has sex with my wife and gives her his sickness, the only way we could continue to live together is if she is treated for this sickness and then no longer has it. Otherwise it is not possible.'</i></p>	<p><i>'Rape is a problem because there are people who try to benefit from the circumstances here in the Congo. People know they can profit. For example, a man sees a woman walking to the hospital 92 kilometres away. He sees that he can profit if he just follows her until no one is around, he can grab her and take advantage of her once she reaches the forest. There is a simple solution for this problem. If we had public transportation and hospitals close by, no one could profit in this way. Many people think rape is unique to Congo but I think it is simply an issue that our conditions allow for profiting and so people profit. That man wouldn't rape if he had a job to keep him busy. That woman wouldn't be raped if she didn't have to walk half the day to get somewhere. Do you see?'</i></p>

Table 3-8. Quotes from respondents: food insecurity (past, present or future)

Interview, male, urban	Interview, female, rural	Interview, female, rural
<p><i>'We have the most fertile land [in Africa] with the least amount of tools to farm [the land]! Do you see why we are sick and dying? We are hungry! You would not see a thirty year old man, so weak that he looks like he is seventy, in a country that has the ability to feed its own people.'</i></p>	<p><i>'I gave birth to seven babies in my life and each time I looked at the baby and thought to myself, that baby was starving inside of me and it will starve now that it is in the world. Three of my babies died because of starvation. I hope I don't have another pregnancy because that baby will starve too.'</i></p>	<p><i>'I think I am sick so often not because I am hungry. My body is habituated to hunger. I think I get sick because I am so scared that I will be hungry tomorrow, and then again tomorrow, and then again tomorrow. This is illness of the mind.'</i></p>

## CHAPTER 4 A BIOCULTURAL STUDY OF THE EFFECTS OF STRESS ON MATERNAL AND CHILD HEALTH IN THE DEMOCRATIC REPUBLIC OF CONGO

### **Background**

The integration of biological and sociocultural perspectives in research on human health is a compelling trend within Anthropology. Since the 1990s, when Anthropologists tasked themselves with turning their discipline's "biocultural split" into a "biocultural synthesis" (Goodman and Leatherman 1998, p. 4), they have pointed out the explanatory value of Anthropological tools in understanding the synthetic relationship between human biology and behavior. Scholars emphasized the conceptual and methodological foundation for integrative research within Anthropology by contrasting the focus in biomedical research on the "molecular, cellular and systemic level" with Anthropology's operation at multiple levels of analysis, spanning from evolutionary to molecular determinants of health (Panter-Brick and Worthman 1999, p. 3). Throughout this lively discussion, the stress process has emerged as a domain rife with promise for studies analyzing human health in the context of the environment, biology and culture.

Anthropologists have defined human health and disease as continuous processes that are subject to the influence of disruptive events in the environment (Armelagos, Goodman and Jacobs 1978). The way in which humans adapt to stressors is a topic that has been interrogated by Anthropologists using a biocultural framework. For example, psychosocial stressors associated with social status incongruity have been shown to influence immune function (McDade 2002). Similarly, Gravlee and Dressler (2005) demonstrate an association between "color incongruity"—the discrepancy between self-perceived color and biological skin pigmentation—and blood pressure. While the role of common, everyday stressors in influencing human health

has been seen as an important topic of inquiry, extreme stressors also impact health and may enhance our understanding of the relationship between stress and health.

The stress of war is a subject that has rightfully received attention across disciplines. Researchers have indexed the symptoms of post-traumatic stress disorder (PTSD) (Ozer et al. 2003) and have described and debated over criteria for evaluating and diagnosing PTSD (Yehuda and Antelman 1993). The impact of war stress on the reproductive health of exposed populations has also received a great deal of scholarly attention (Hynes et al. 2002, McGinn 2000).

Since the articulation of the fetal origins of disease premise (known as “the Barker Hypothesis”) in 1986 (Barker, Osmond and Law 1986), there has been an increase in research on the developmental origins of health and disease (DOHaD).

Researchers have honed in on maternal nutrition and birth weight as factors that have a long-term influence on child health (Bateson et al. 2004, Chmurzynska 2010, Gluckman et al. 2009, Kuzawa and Pike 2005, Meaney et al. 2007). Notably, maternal stress also arose as a mediating factor between the intrauterine environment and birth outcomes (Kuzawa and Sweet 2009, Matthews and Phillips 2010, Wadhwa et al. 2001) and one proposed mechanism for this association is the action of glucocorticoids (Weaver et al. 2004).

The endocrine system responds to stressors by secreting hormones known as glucocorticoids (GCs) (Sapolsky et al. 2000). Circulating GCs provide a signal of the intrauterine environment to a developing fetus for the purpose of maximizing survival (Fowden and Forhead 2004). Fetal response to a signal of adversity leads to accelerated organ maturation, and ultimately the initiation of the hormonal cascade that

triggers parturition, and in some cases, premature parturition (Pike 2005). This response can be seen as a survival mechanism of a fetus that is attempting to protect itself by departing from adverse intrauterine conditions. Since fetal overexposure to GCs has been linked to reduced birthweight as well as adult cardiovascular and metabolic disorders, researchers now believe that GCs may play a critical role in programming or imprinting a fetus during development in a stressful environment (Cottrell and Seckl 2009, Seckl 2001).

Within the scope of DOHaD is a focus on the long-term consequences of maternal stress on future generations. This has encouraged researchers to explore the associations between and mechanisms mediating prenatal exposures and gestational outcomes in environments where stressors are extreme.

The eastern Democratic Republic of Congo (DRC) is an environment of extreme and traumatic stressors to women. An ongoing war in the country since 1996 is known for its use of brutal rape warfare as a tool of war. The result is extremely high exposure to stress both from the occurrence of an actual rape and from the knowledge of the potential that one could be raped at any time. This omnipresent threat of rape is part of the power of using rape as a weapon of war (Brownmiller 1975). Rape warfare, then, leads to exposure to both acute and chronic stressors, as rape itself is an extreme stressor, but so are mundane and unavoidable tasks that could increase the likelihood of being raped, such as fetching water.

A great deal of recent research from the DRC has focused on the social consequences of war. Some studies focus on survivors, documenting emotional trauma and signs of post-traumatic stress disorder among survivors (Pham et al. 2010,

Schalinski, Elbert and Schauer 2011), the interpersonal challenges survivor face in coping with life after rape (Bartels et al. 2010, Kelly et al. 2012, Puechguirbal 2003), the insufficiency of current policies for sexual and gender-based violence (SGBV) (Meger 2010), and the needs of humanitarian workers in protecting potential victims (UN 2008, UN 2011).

Scholarly documentation of the social consequences has also focused on perpetrators of SGBV. Analyses include perpetrators' perspectives and understandings of war rape (Baaz and Stern 2009), their motivations (Ingelaere et al. 2009, Kelly 2010), and the commanders and chains of command implicated in the violence (Human Rights Watch 2009). Scholars have also shed light on rape perpetration, including the patterns of violence (Farr 2009), the complex nature of the violence (Baaz and Stern 2010), prevalence of SGBV (Peterman et al. 2011), and strategies and recommendations for prevention (Enough 2008, Smits and Cruz 2011).

To a much lesser extent, researchers have documented the biological consequences of war. The majority of studies tend to be hospital-based, most likely because traveling in eastern DRC can be a dangerous undertaking. These studies are narrowly focused on injuries that present in hospitals, such as those resulting from violent rape. The main focus among these studies is traumatic fistula and genital injury from SGBV (Longombe et al. 2008, Onsrud et al. 2008), including perspectives of contraception among fistula patients (Benfield et al. 2011). Also documented are provisions of surgical care for direct and indirect victims of violence (Chu et al. 2010) and mortality figures (Coghlan et al. 2009, Coghlan et al. 2006, Van Herp et al. 2003).

One expectation of studies that document the social and biological consequences of sexually violent warfare is that they will make predictions and recommendations for the future. Studies which focus on individual survivors usually fit recommendations within the scope of their data, for example regarding the needs of individuals or provisions of care such as psychosocial counseling or medical testing and supplies (ACAC 2009, Farr 2009, Kelly 2010, Kelly et al. 2012, Longombe et al. 2008, Smits and Cruz 2011). Sometimes studies indirectly implicate future generations with more general, untested statements about traumatization to the whole society (Trenholm et al. 2009) or the need for greater investment in and consistent assistance to the DRC (UN 2008, US State Department 2010). Other recommendations directly predict the needs of the future generation by calling for protection of children against recruitment or capture by armies as soldiers or sex slaves (UN 2011) or by pointing to the need for increased care for children conceived and born because of rape (Harvard Humanitarian Initiative and Oxfam 2010). But the effect of war stress on future generations has not yet been investigated directly.

The above-mentioned studies provide a strong basis for understanding the biological and social consequences of sexually violent war in the DRC at both the individual and community level. Our study builds upon previous research and combines cultural, biological and genetic data from new mothers and their newborns in order to better understand the effects of maternal trauma on newborn health and the possible intergenerational transmission of the effects of trauma. We specifically investigate the possibility of an epigenetic mechanism to mediate the effects of maternal trauma on

their newborn's health and we present evidence for intergenerational epigenetic effects of maternal trauma.

## **Material and Methods**

### **Study site and study participants**

This study uses a biocultural paradigm in combining cultural, biological and genetic data from new mothers and their newborns towards an understanding of the possible multigenerational effects of trauma. Twenty-five participants were enrolled in the study directly after giving birth at HEAL Africa hospital in the city of Goma, in North Kivu, eastern DRC. The study took place from June – August 2010 and received ethical review from the Western Institutional Review Board ([www.wirb.com](http://www.wirb.com)), the University of Goma, and from an ethical review committee at HEAL Africa hospital.

### **Cultural Data**

Lengthy interviews were taken from each participant of the study in the Congolese dialect of the Swahili language, one day after giving birth. Women were given the option to bring their newborns with them into the interview room, and many did. The interviews took place in the hospital in one of several private rooms made available during the study. Care was taken to provide comfort to women by allowing them to lie down if they chose, and by including a bassinet in the room.

The interviews were conducted using both ethnographic and oral history interviewing styles. Following Spradley (1979), an emphasis was placed on establishing a rapport with participants. Pre-interview conversations were part of this process, and were the same with each woman. We began with oral consent, which included a very detailed explanation of the project and the possible uses of results. Participants were encouraged to ask questions about the study, and were asked if any

of their family members should provide consent. Two women chose not to participate, and three women brought in family members (husbands (2) or sister (1)) to consent with them. One woman requested that her mother come into the room with her. Participants were also encouraged to ask any questions they had about the research team.

The interview style was also influenced by the literature on taking oral history testimony from survivors of trauma. Though we did not specifically enroll women who were exposed to trauma, we took the precautionary measure of assuming that all the women had experienced or witnessed trauma in their lifetimes and/or during their pregnancies.

Oral historians argue that the one can resist attrition of traumatic memory through the process of being listened to with deep attention (Clark 2005). Thus, we attempted to create a safe space for interviewees to discuss, or withhold, their experiences in a manner comfortable for them. Women were neither asked directly about traumatic exposures nor were they prompted to talk about them until they first brought up these experiences. We found that 100% of participants brought up the war either in discussing their own traumatic experiences, or in reference to war experiences they were circumstantially able to avoid.

The interviews were semi-structured, and began in the same way an oral history does, with earliest childhood memories and experiences. From there we progressed through the life course, with groups of questions directed at different periods of development. Special attention was paid to the period before pregnancy, and to pregnancy experiences.

At the end of the interviews, participants were asked questions from a standardized survey of peri-natal stress (Supplementary Figure 1)(derived from Brunet et al. 2001). Questions revolved around vulnerability during the peri-natal period, as well as protective factors including coping. We planned not to administer the survey to individuals if they did not bring up the war or traumatic experiences on their own (because the survey asked specifically about rape), but found that all of the women volunteered information about the war and their experiences. This is consistent with previous research on the health benefits of self-disclosure, specifically regarding the healthy inclination to disclose intimate details of one's past to individuals they have never met before (Pennebaker 1997).

In addition to stress exposures, other sociocultural data were collected during the interview. Women were asked about early childhood experiences with gender equality as well as their adulthood experiences. Women were also asked about their level of education and that of their husbands if they were married. Categories of education included whether or not the participant and her husband or partner had entered (but not necessarily completed) primary school, secondary school, university, or graduate school.

### **Biological Data**

We sought to collect biological data that would allow us to test the association of maternal health and neonatal health. Given this aim, we collected anthropometric data at the time of birth. Our measures include gestational age, birthweight, and birth length. Our subsequent analysis focused specifically on birthweight given the robust and replicable association between this measure and later disease risk (Barker et al. 2002, Gluckman et al. 2008, Innes et al. 1999).

## **Genetic Data**

Maternal venous blood, placental tissue and umbilical cord blood samples were collected from 25 mother-newborn dyads. DNA was extracted from all tissue types and was tested for methylation marks at 39 CpG sites upstream of glucocorticoid receptor *NR3C1*. Samples were also tested for genome-wide methylation patterns using a human methylation microarray that assays ~450,000 CpG dinucleotides spanning >20,000 genes (Illumina 450 Methylation BeadChip).

## **Coding of Data**

Narrative data were coded with deductive and inductive codes. Categories of stress included material deprivation (deductive) and mundane stressors and war stressors (inductive). According to these categories, we developed three additive models of maternal stress in which each stressor was unweighted. Analyses were performed to test for associations between maternal, placental and infant methylation profiles; maternal stress exposure, stress coping, maternal health; and infant phenotypes, including gestational age, and birth weight. To arrive at a woman's stress score in the categories of material deprivation, mundane stressors and war stressors, we simply counted up the number of exposures a woman faced in each category. Within each category women were compared and tested for correlations with our indicators.

During a second round of analyses, we also considered household education, coded as 0=no education, 1=primary school, 2=secondary school, 3=university and 4=graduate school. Participants were assigned a number which for single women included the woman's education level only, but for partnered women was the average of her level of education and her husband or partner.

## Statistical Analyses

Basic descriptive statistics were first done to get a picture of the sample and see roughly the distribution of stressors. Three categories of stress were then correlated with birthweight using Pearson's correlation in which variation was explained by p values. For the methylation profiles, we did a principal component analysis of maternal and newborn samples.

## Results

### (1) Categories of Suffering

Participants described suffering in three different ways: (1) as experiences they are "bothered" by (*kusumbuka*); (2) as experiences that "cause one to be tired" (*kuchokesha*, the causative form of *kuchoka* (to tire)); or (3) as experiences which are "heavy" (*buzito*) or difficult to explain (*gumu kueleza*).

Specific stressors fell into one of three groups, which were used during analyses: (1) mundane stressors, which include common life hassles and daily experiences with stress; (2) material deprivation, which reflects the presence or absence of financial resources needed for life; (3) war stress, which includes stressors which stem specifically from experiences with war. Responses to answers in all three categories can be found in Table 1.

### (1a) War Stress is a pervasive exposure

Stressors related to war were commonplace (Table 1a). For example, 48% (n=12) of respondents reported former refugee status and 24% (n=6) had parent(s) during the war. Rape was also extremely common. Twenty-four percent (n=6) reported having been raped in the past, and 16% (n=4) were currently giving birth as a result of

rape. Half of those who were raped at some point in their lives experienced ostracism from their community.

Even the women who answered “no” to questions about being a refugee or having had parents killed in the war spent time in their interviews detailing the stress of war, which was described by 84% (n=21) of women as something ‘heavy on the soul’ (*buzito kwa moyo*). Rape, in particular, was described as ‘heavy’, as was the community ostracism that comes with exposure to rape, which was also described as difficult to explain to family members.

### **(1b) Gender inequality is ubiquitous, even during pregnancy**

During the interviews, the majority of women (84%, n=21) told stories about personal experiences with gender inequality. These experiences included being held back or prevented from going to school because of gender (44%, n=11), being used as a “tool” (*chombo*) in the house and community (80%, n=20), including during pregnancy (32%, n=8), and being served less expensive and nutritious food than men (56%, n=14), including during pregnancy (52%, n=13). These experiences were described as bothersome or tiring, i.e. the first two classes of suffering.

Women spoke about gender inequality at multiple levels, including personal experiences, ethnic group practices, and in national political arenas. Despite recent attempts to curtail male dominance by national laws, humanitarian projects, and international bodies, several women report that gender inequality does not seem to be improving (36%, n=9). Women gave examples of gender inequality ranging from the more private experience of verbal abuse to the publicly observable death of women in local political systems.

## **(2) War stress has the most significant effect on birthweight phenotype**

We used birthweight as an indicator of current health and future disease risk in the neonate. All stressors (mundane stress, material deprivation, and war stress) were tested for their effect on birthweight. War stress is most significantly correlated with birthweight ( $p=0.0009$ ) (Figure 1). War stress accounts for a notable 35% of the variance in birthweight. Personal experience with rape, which included whether or not a respondent had been raped in the past or during their recent pregnancy, explains 31% of the variance. The findings were previously published (see Mulligan et al. 2012).

After finding a strong correlation with between birthweight and war stress, we broadened the original additive model to test the robustness of the correlation. Our original model of war stress compared women on a relative scale of their exposures. During the first round of analysis, two women emerged as extremes on the additive war stress measure. For example, both had current pregnancies that were the result of rape, both had been raped during their pregnancies, one woman had been kidnapped and used as a sex slave during her young adulthood, and the other woman was herself conceived because her mother was raped by a soldier. Given the in-depth nature of our interviews, we were able to add questions to the war stress category that were not formally queried in the stress survey (this is an advantage to using open-ended interviews in addition to structured surveys). Specifically, we added three questions that addressed exposure to physical abuse, mental/emotional abuse, and living for an extended period in a rebel-occupied village, where rape exposure would have been a constant threat. Though we added these additional variables to see if war stress would now distribute more evenly across the women, that was not the case. Instead, the two outlying women became even more extreme (one woman had all three exposures and

the other woman had two), demonstrating that these two participants had truly experienced the most extreme exposure to war stress. After addition of these three questions, the significant correlation between birthweight and war stress remained ( $p=0.001$ , accounts for 39.3% of variance in birthweight; Figure 2).

Since our goal was to identify and understand which stressful experiences are most damaging to a woman's health, the identification of personal experience of rape as the most critical factor related to newborn birthweight was essential. When considering this finding together with finding 1a ('war stress is a pervasive exposure'), we developed and tested the hypothesis that part of the reason war stress so perniciously affects the health of women is because war stress leads to public exposure, which can lead to public condemnation.

Though some stressful experiences can be kept secret, war stressors, by contrast, often take place in public. After the first assault (the actual exposure), victims are faced with a second assault of potential stigmatization, even ostracism from the community. While in more industrialized countries with access to public transportation there exists the possibility to move to a new city to "re-invent" yourself, for many reasons, this is not possible for most people in eastern DRC. Instead, an exposure that is known publically may be significantly more difficult to recover from and to lead a normal life after. Of the 24% ( $n=6$ ) of women who were raped in the past, half were ostracized in their community. Among the 16% ( $n=4$ ) women raped in the last nine months, half of them were ostracized as well. The small numbers in this category precluded additional analysis.

### **(3) Household education has a significant effect on birthweight phenotype**

Household education (a composite measure of the education of a woman and her husband or partner when applicable) also explains a significant amount of birthweight variance and is protective against reduced birthweight ( $p=0.0005$ , 42.6% explained variance; Figure 3).

Since we were measuring a wide socioeconomic field, many of the indicators we tested are not independent factors. Though many of these indicators are related, we still found it useful to search for the most salient factor(s) concerning women's experiences relating to health.

As discussed above (*1b gender inequality*), women report that one's gender drastically affects the likelihood of both entering school initially, and parental choice about which children to direct resources for higher education. Thus, this finding illustrates how gender inequality may affect future generations, since education is protective against low birthweight.

However, one possible confounding factor is the way in which education affects birthweight. Though we demonstrate the protective effect of education on birthweight, it is important to note that education can influence the stress process in a number of ways. For survivors of sexual violence, one way that their education level may impact their health outcomes is through provisions of social support, which we would expect to be higher among educated women who have larger social networks than their non-educated counterparts. Thus, when we see that education explains much of the variance in birthweight, we might be seeing the mitigation of effects of stress only on educated women, or more accurately the effect of access to social support and resources.

#### **(4) War stress correlates with newborn NR3C1 methylation/birthweight and genome-wide maternal methylation**

We have previously published results showing that methylation changes in the promoter for the glucocorticoid receptor *NR3C1* in newborns are associated with maternal prenatal stress exposure and newborn birthweight, specifically increased maternal stress is correlated with increased fetal *NR3C1* methylation is correlated with reduced fetal birthweight (Mulligan et al. 2012).

Since first publishing this finding, we have moved beyond gene-specific analyses to analyze total genome-wide methylation, specifically ~450,000 CpG dinucleotides spanning >20,000 genes on the Illumina 450 Methylation BeadChip. Our data show a correlation between maternal war stress exposures and maternal mean methylation at CpG sites across the genome as well ( $p=0.0019$ ; Figure 4). In contrast, there is no correlation between mundane stressors and material deprivation with maternal war stress.

Specifically, there is a correlation between increased maternal stress exposure, decreased maternal genome-wide methylation, and decreased newborn birthweight. We do not see a correlation between war stress and newborn genome-wide mean methylation, in contrast to the methylation results at *NR3C1* (see above). A correlation of war stress only with maternal genome-wide methylation may mean that effects of maternal stress are distributed more widely throughout the maternal genome, but only affect particular genes in the newborn, such as *NR3C1*, which has been previously implicated in newborn birthweight (Filiberto et al. 2011).

## Discussion

Like many recent studies investigating the developmental origins of health and disease, this study shows that prenatal exposures—in this case to war stress—may affect newborn health through the intrauterine environment and possible fetal programming. We show that among a diversity of stress exposures including mundane stress, material deprivation and war stress, stressors that stem from war affect birthweight most significantly. This is consistent with our narrative data in which women suggest that most stressors are just ‘tiring,’ but war stress is ‘heavy on the soul’.

Additionally, methylation changes at the glucocorticoid receptor *NR3C1*—which provides possible evidence of fetal programming—may mediate the effects of maternal stress on newborn health. We also show that war stress appears to have a genome-wide effect on methylation, and presumably gene expression, in the mother. Lastly, we show that personal experiences with gender inequality were ubiquitous among women in our sample, and that education—something parents often deny to girls because of their gender—has a protective effect on birthweight.

This study provides an empirical ground for understanding how war may affect the intergenerational health of a population. Though many previous studies have suggested that the war in the DRC will have multigenerational repercussions, this study provides an evidence base including a suggested mechanism through which stress affects women’s health, and is translated by the body during fetal development. Our conclusions allow for a real-life application of biocultural data that have broad relevance for several domains including maternal and child health practices, reproductive health in conflict, health policy and humanitarian intervention during crisis.

First, we have previously shown that war stress is correlated with methylation in neonates at glucocorticoid receptor *NR3C1*. This methylation could be seen as a predictor of future mental health outcomes. Associations between glucocorticoid disruption and mental health are clearly documented. Glucocorticoids (GCs)—which include the steroid hormones cortisol and cortisone—are principally involved in regulating metabolism and combating (or resisting) stressors like fright and trauma (Tortora and Derickson 2006). GCs are believed to play a role in the molecular mediation of environmental stress and disease outcomes (Fowden and Forhead 2004, Handel et al. 2009, McGowan et al. 2009, McGowan et al. 2011, Meany et al. 2007) and high levels of GCs consistently associate with mental disturbance (Herbert 1997). Therefore, our findings support the trend in the literature implicating GCs in fetal programming, and suggest that widespread mental health disturbance be considered a risk factor not just among specific groups like child soldiers, but among everyone who was in utero since the beginning of the conflict.

Currently, humanitarian agencies in the DRC place a strong focus on the rehabilitation of child soldiers, which is a laudable and important focus. However, the total number of soldiers in the country is likely to be in the tens of thousands (get Stearns ref for this), of which only a portion would be children. When it comes to those exposed to other kinds of war stress, the numbers would be much higher. For example, 140,000 people were displaced due to war in one week in November of 2012 (iDMC 2012), of which 35% or 49,000 would be a low estimate of women of childbearing years (15-44) who, according to our results, may pass on the stress exposure to their future children. Considering that the war has been going on since 1996, attention should also

be placed on all children between 8-17 years old who could potentially experience severe mental disturbance as a result of the circumstances of their fetal development.

The second application of our study's conclusions has to do with the repercussions of gender inequality and the urgency of ameliorating the current situation. One survey on perceptions of gender in the DRC shows beliefs such as 75% of respondents believe that a woman who is not dressed decently deserves to be raped and 65% of respondents say a woman should accept partner violence to keep the family together (Slegh 2012). These numbers are consistent with a unpublished data on a USAID-funded project, which found that 69% of respondents believe that in most cases of rape, a woman got what she deserved.

The personal experiences with gender inequality reported by women in the current study, such as unequal access to educational opportunities, are believed to be part of a larger system that sustains the beliefs described above, and plays a critical role in explaining rape behavior (Brownmiller 1975, Burt 1980). Additionally, this kind of gender inequality has been shown to associate with intrastate armed conflict (Melander 2005). Another study analyzed intrastate conflict between 1960-2001 and found that states characterized by gender inequality have an increased likelihood of succumbing to armed conflict (Caprioli 2005). Though our study only enrolled twenty-five participants, their reports of gender inequality should be seen a snapshot of what has been measured by the United Nations Gender Inequality Index, which ranks the DRC 142<sup>nd</sup> out of 146 countries (SIGI 2012).

Given the association between gender inequality and conflict, it is worthwhile to ask questions about how to ameliorate the current situation. Currently,

there are several humanitarian projects that are attempting to improve gender inequality through behavior change interventions. Two such examples include a \$10 million project conducted by the International Medical Corps and a \$16.6 million project by IMA World Health, both of which are USAID-funded. These projects use radio campaigns in communities and other means to distribute messages they hope will change behaviors (for details about the program, see <https://internationalmedicalcorps.org/sslpage.aspx?pid=1771>). They also facilitate workshops and forums about gender.

These are good faith efforts to better the status of women in the DRC. However if population level change is the goal, then these efforts rely on the hope that individual level change will trickle up to change the realities of gender inequality in the nation. But data suggest higher-level factors are at work. For example, while gender differences in education affect intrastate conflict, so too does female representation in parliament (Melander 2005). Considering that there is only one female parliamentarian in the DRC, perhaps what is needed is change at the population level, which will trickle down and affect individual level behaviors.

To an outside observer, especially from a highly individualized country such as the United States, it is hard to hear stories of rape in the DRC and not assume that rape is a form of violence that is doled out on a personal level. And though a survivor of rape would undoubtedly feel personally attacked, it is important to move the discussion to the factors at the population level that are encouraging the gender inequalities that play out for individuals. Our data show that of all factors, exposure to rape has the strongest correlation with birthweight. But widespread exposure to rape,

such as that which occurs in the DRC, is only possible in a society that treats women as 'tools,' a common experience was reported by women in this study. If real change is expected to occur in the DRC, we believe this change will come through intentional efforts to demonstrate gender equality at the national level.

While everyone in the DRC has a radio and is exposed to what is happening at the national level, very few people have access to the inner workings of small communities in the interior of the country, many of which are targeted by aforementioned humanitarian projects. And while efforts to reach those who are the most secluded should not be cut short, we suggest that equal attention and financial resources be directed at building and funding women's only schools, and supporting women who want to engage in the political process. The direction of this type of intervention may be more effective.

Furthermore, our study shows war stress to be the most significant factor affecting birthweight and maternal mean methylation. This calls attention to recent evidence that found an association between post-traumatic stress syndrome (PTSD) and methylation changes in immune-related genes within a single generation (Uddin et al. 2010). Thus, PTSD may be an outcome for the large portion of Congolese citizens who have been exposed to war stress. To whatever extent possible, humanitarian projects should deliberately screen for PTSD, as should refugee resettlement agencies in other countries who work with Congolese refugees.

Lastly, our findings also raise the question: why is war stress more significant than all other stressors? One could argue stressors from war are the most extreme of all possible stressors. But data show that social support and coping

mechanisms ameliorate the effects of stress (Pike 2005). Even moderate social support has been associated with improved outcomes for women (Pike, Krug et al. 2001). In terms of everyday stressors such as lack of adequate food or disagreements with in-laws, perhaps our results are influenced by the ability to garner social support and coping resources for these types of stressors—an ability that a woman would not have if she is suffering from a more stigmatized exposure such as rape. Furthermore, new data suggest that the environment just after a traumatic event—especially in terms of the response from those around you—might be just as influential to one’s health as the event itself (Betancourt and Khan 2008, also see Dobbs 2012 for discussion of related literature). The DRC, just like many parts of sub-Saharan Africa, is still mostly organized by ethnic group (Green 2010). And one of the negative effects of rape that has been documented is the intention to shame not only an individual, but her family (Birch 2008). In this way, it is important to recognize that our findings may be influenced by the lack of social support offered to women after an exposure that is so stigmatized, such as rape.

There are limitations to this study. We know that many of our variables are not independent which could lead to possible confounding in the results. However, our focus was not an assessment of independent factors, but an investigation of which factors are most salient with respect to our goal of improving outcomes for women and their children. Through this approach, we believe we were able to isolate some of the most important factors that lead to poor health.

### **Summary**

The integration of biological and sociocultural data greatly enhances our understanding of the relationship between lived experience and human health. This

study revealed findings that could not have been generated by either biological data or sociocultural data alone. The ability to tease apart which stressors have the most impact on affected individuals, in addition to some of the ways these stressors may affect intergenerational health, is unique to the design of this study. For example, had we accompanied the biological data with a survey alone, we would not have had the data to go back and test the robustness of our correlations. We also would not have had rich details about each category of suffering, which helped us conceptualize of each category during the statistical analyses, and will help us ask even more detailed questions in future studies. Likewise, if we had only collected sociocultural data, we would have had to guess about the manner in which children of stressed mothers are affected.

Since stress-related conditions continue to plague populations—both in developing and developed settings—biomedical researchers will need integrative studies to guide our understanding of the continued and nuanced impact of stress. As we have shown in this paper, stress can take a toll both on individual health, and possibly on fetal programming, leading to intergenerational and population-level effects. Future integrative research will serve to further shed light on the mechanisms and outcomes of stress exposure.

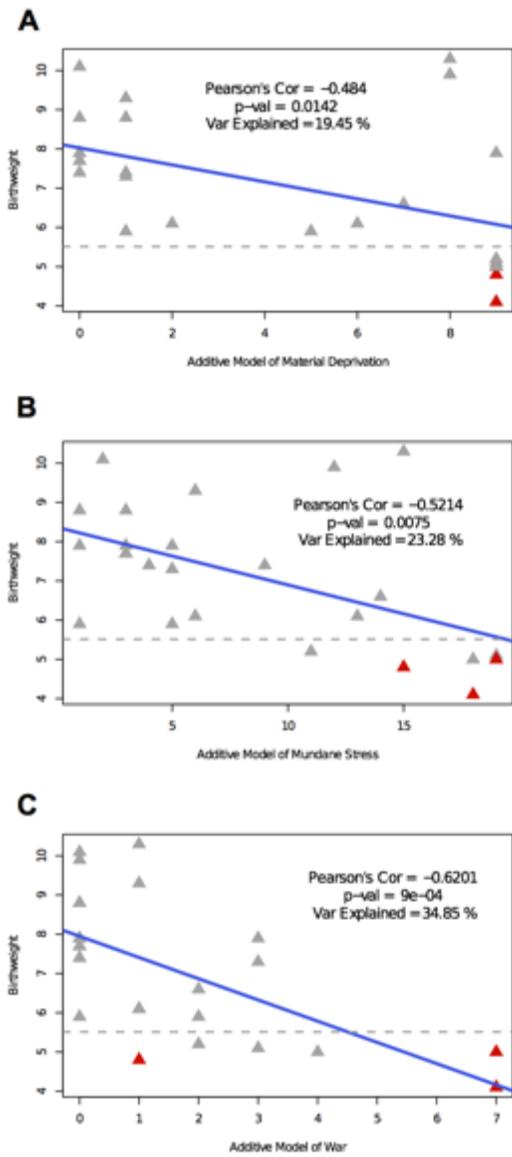


Figure 4-1. Correlation of maternal stressors with newborn weight: (A) effects of material deprivation on birth weight, (B) effects of mundane stress on birth weight, (C) effects of war on birth weight

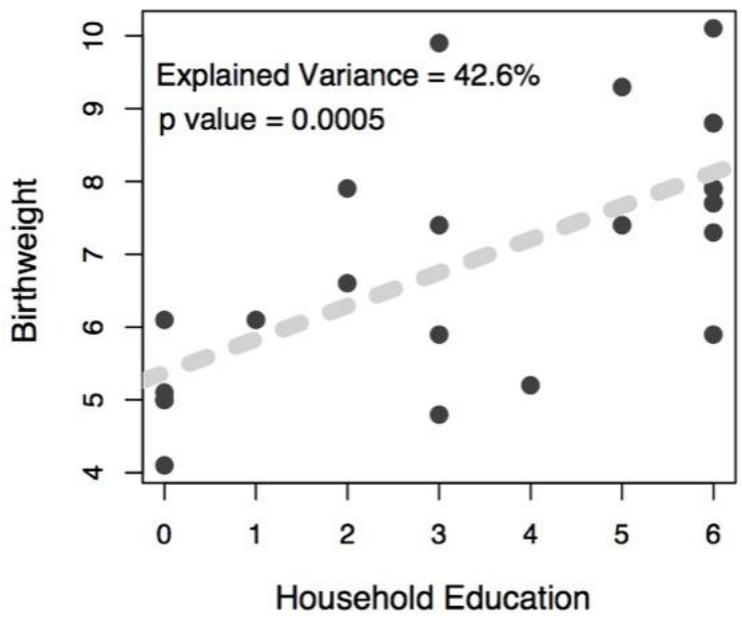


Figure 4-2. Correlation of birth weight and household education

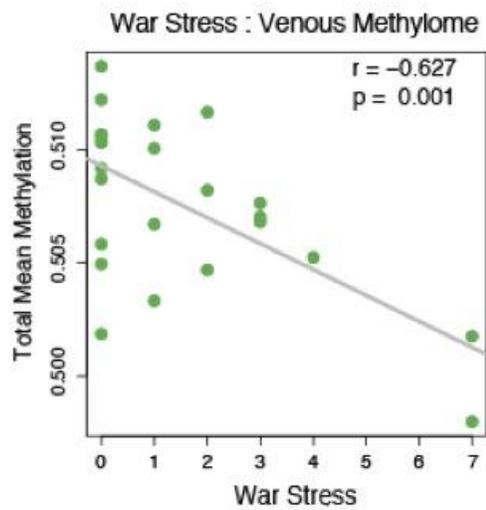


Figure 4-3. Correlation between total mean methylation and war stress

Table 4-1. Number of women answering yes to questions in the three categories of our additive stress model regarding – (1) war stress

Indicator	<i>n</i>	%
Have you been a refugee in the past?	12	48%
Are you currently a refugee?	1	4%
Were your parents killed in war?	6	24%
Were you raped in the past?	6	24%
If raped in the past, were you ostracized by your community?	3	12%
Outside of this current pregnancy, have you conceived a child due to past rape?	2	8%
Is this current pregnancy the result of rape?	4	16%
If you were raped in the last 9 months, were you ostracized by your community?	2	8%
Were you raped during your current pregnancy?	3	12%
Have you been kidnapped in your lifetime?	2	8%
Were your parents raped?	1	4%
Were you conceived because of rape?	1	4%
Is your home village or city rebel occupied?	2	8%
Were you physically abused during pregnancy?	4	16%
Were you emotionally abused during pregnancy?	4	16%

Table 4-2. Number of women answering yes to questions in the three categories of our additive stress model regarding – (2) material deprivation

Indicator	<i>n</i>	%
<i>Do you own a home?</i>	14	56%
<i>Are you currently building a home?</i>	8	32%
<i>Did you have a wedding party?</i>	13	52%
<i>Did you get a private room in the hospital after birth?</i>	13	52%
<i>Do you have new clothes for your infant?</i>	15	60%
<i>Were you given a traditional new cloth to celebrate the birth of your child?</i>	15	60%
<i>Do you have a purse or bag to carry your belongings?</i>	15	60%
<i>Did you pay to have your hair braided before birth?</i>	14	56%
<i>Did you buy nail polish before your birth?</i>	14	56%
<i>While laboring, were you driven to the hospital for your birth?</i>	16	64%
<i>While laboring, did you walk to the hospital for your birth?</i>	9	36%
<i>Were you able to pay your hospital bill?</i>	18	72%

Table 4-3. Number of women answering yes to questions in the three categories of our additive stress model – (3) mundane stressors

Indicator	<i>n</i>	%
<i>Did you pay for prenatal care?</i>	16	64%
<i>Did you have a say in the decision about where to give birth?</i>	20	80%
<i>Did you have someone (ie: husband or sibling) helping to cook while you were pregnant?</i>	8	32%
<i>Did you have someone (ie: husband or sibling) helping to clean the house while you were pregnant?</i>	7	28%
<i>Did you have anyone you could call to help you at home during your pregnancy?</i>	14	56%
<i>Did you have enough to eat while you were pregnant?</i>	17	68%
<i>Before your pregnancy, would you say you had enough to eat?</i>	15	60%
<i>During your pregnancy, were you afraid to walk around at night?</i>	9	36%
<i>Did you regularly cry during your pregnancy?</i>	12	48%
<i>Did you feel stressed during your pregnancy?</i>	11	44%
<i>Would you say you have a happy marriage or relationship with the father of your latest child?</i>	14	56%
<i>Did you want this pregnancy?</i>	15	60%
<i>Do you have reproductive choice at home (ie: to use contraception)?</i>	15	60%
<i>Are you a co-wife?</i>	1	4%
<i>Did you feel ashamed to cry during your pregnancy?</i>	5	20%
<i>Do you have a chronic illness?</i>	3	12%
<i>Did you get sick (not including morning sickness) during your pregnancy?</i>	13	52%
<i>Do you experience stress from your in-laws?</i>	3	12%
<i>Were you beaten during your pregnancy?</i>	4	16%
<i>Did someone (ie: husband, partner, sibling) escort you to the hospital when you were in labor?</i>	15	60%

### General survey questions

- (1) I was happy to learn that I was pregnant: Y/N
  - (2) I was sad to learn that I was pregnant: Y/N
  - (3) Before I got pregnant, my level of happiness with my life was: High, Normal, Low
  - (4) During my pregnancy, my level of happiness was: High, Normal, Low
  - (5) During these months of my pregnancy, I was unhappy: (Indicate months)
  - (5b) During these months of my pregnancy, I worried spent time worrying and/or nervous: (Indicate months)
  - (6) During my pregnancy, these events took place (circle all that apply and write the month to the best of your memory):
    - I was beaten by my husband
    - I was beaten by someone else
    - I was raped
    - I was deserted by my husband
    - I was deserted by my children
    - I was deserted by my mother
    - I felt stress
    - I cried more than I usually do
  - (7) In general, I have a friend/relative/neighbor/child/sibling with whom I talk to when I feel sad (circle all that apply)
  - (8) Before I was pregnant, I did these things when I was sad (circle all that apply)
    - I talked to a friend
    - I talked to a relative
    - I prayed to God
    - I cried
    - I did not talk to anyone
    - I drank alcohol
    - I smoked
  - (9) While I was pregnant, I did these things when I was sad (circle all that apply)
    - I talked to a friend
    - I talked to a relative
    - I prayed to God
    - I cried
    - I did not talk to anyone
    - I drank alcohol
    - I smoked
  - (10) Regarding my new baby, I feel this level of closeness: High, Normal, Low
  - (11) I have a chronic illness: Y/N
- Peri-natal distress Questions
- During pregnancy: (Y/N)
- (12) I felt sadness and grief
  - (13) I felt frustrated or angry I could not do more to change my circumstances
  - (14) I felt afraid for my safety
  - (15) I felt ashamed of my emotional reactions
  - (16) I felt worried about the safety of others
  - (17) After stress, I had difficulty controlling my bowel and bladder
  - (18) After stress, I had physical reactions like sweating, shaking, and pounding heart
  - (19) After stress, I felt I might pass out

Figure 3-1. Peri-natal Stress Survey

## CHAPTER 5 CONCLUSION

This dissertation has attempted to take a broad look at what has previously been described as the greatest humanitarian crisis in our lifetimes and the attempts to fix it from both outside and inside the country. Whereas many researchers undertake studies with a narrow approach, attempting to isolate and detail a small part of a picture such as the crisis in the DRC, this dissertation purposely did the opposite. Instead, it was my intention to take a broad look at health, illness, and the politics of the development aid money and programs that are meant to bring about change in the country.

In the process of doing the research for this dissertation, it has become abundantly clear to me that the biggest problem—and perhaps the biggest obstacle towards improving health outcomes—with conventional development programs is the lack of autonomy given to Congolese people to control how and where millions of dollars are spent in their country. This is perhaps best evidenced by data shown in Chapter 3, where the majority of respondents said the most pressing health issue is the decrepit state of the hospitals –something development practitioners say is not within their purview to attend to. In doing the research for Chapter 2, it was made clear to me that Congolese people are aware of the power dynamics involved in aid distribution and are cognizant of the fact that they must agree with their foreign higher ups in order to keep their jobs. Then, behind closed doors, they joke about the inefficacy of the very programs for which they are working.

For example, during the ethnographic research for this dissertation I was evaluating a USAID-funded sexual and gender-based violence mitigation intervention.

The program was publicizing and enforcing the laws surrounding child marriage. In the DRC, you must be 16 before you get married, according to the latest laws meant to protect women and girls. After work one day I was relaxing with some of the female leaders of the project. The joke of the night, for them, was that though they were wearing shirts that promoted 16 as the legal age of marriage, they themselves would be in jail if that law applied to them, since they were all married before the age of 16. Since all the women had happy marriages—which is not true of everyone to whom this law applies—this was merely a joke with very little consequence. But underneath this joke were real questions. *‘How can we expect girls not to get married before 16 if they live in a town without a school or a job to keep them busy? Would this law effectively empower or disempower girls living in abusive homes who choose to leave home to marry and join another family where they are treated better? If girls are engaging in sexual activity before 16, taking care of younger siblings and cousins since a very young age, and responsible for all the housework in their homes—why not use their autonomy and maturity to create their own homes?’*

While no one would deny that laws meant to protect women and girls are positive measures, one also may not deny that certain policies—that often are influenced by forces outside of the DRC—may not be realistic given the current state of affairs. Furthermore, there is even more tension when Western-based development programs pay Congolese people to enforce laws that they themselves know are not realistic, seen in the example above in which Congolese women are questioning how they are going to enforce that girls under the age of 16, who do not even have a school to keep them busy, must delay their marriages.

Another example comes from what has been called “the business of rape” by many Congolese. When interviewing perpetrators of rape in jails throughout eastern DRC, I found one common theme at every jail I visited. Visitors to the inmates always included the women who were supposedly raped by the inmates, landing them in jail. The female visitors were bringing food, clothes and cigarettes to the men behind bars. After noticing this trend, I began interviewing the women as well as the men in order to get the whole story.

As it turned out, many community members were profiting from programs, such as the one I was evaluating, that financially support families who bring in “victims of rape.” Since development programs are enforcing the law that says statutory rape is rape of anyone under the age of 18, the families of girls under 18 who were impregnated by their boyfriends often brought a lawsuit against the boys’ families for the sake of receiving this financial support—even when the sexual act was consensual. In some cases, this was a group effort, including partners from the boy’s family and the girl’s family. Congolese staff working in these programs often knew this was going on, but since they often disagreed with the premise of the programs they were working for to begin with (and just saw their job as paying their bills), they did not see the need to take action—which might threaten their income. Instead, they deemed this “the business of rape.”

While I do not support this manipulation of the system, it is important to point out that this is the likely result of development programs that are simply not homegrown solutions to the problems faced by citizens of the DRC. And when this happens on a large scale with programs that affect the education and judicial systems, it

is impossible to measure the effect this has on shaping the country at the hands of development programs. This conundrum is investigated in Chapter 3, whereby I question whether or not conventional development systems need to be replaced by a new model that gives more control over the goal of projects to Congolese staff. My position, after three years of research on this topic, is that Congolese people, or the host country nationals in a country receiving aid from outside, are the ones who should decide how this money is spent. In Chapters 2 and 3 of this dissertation, I show evidence that Congolese people would prioritize goals different than the goals of development programming.

While both foreigners and Congolese might broadly say they want to improve health outcomes in the country, Chapter 3 shows that residents of the DRC are the first to say that in order to see those kinds of changes, the priority must be building the infrastructure of the country. Development workers from outside are unfortunately not hired to build or oversee the building of infrastructure. I found this out when I worked on a project funded by USAID that was imprisoning perpetrators of rape. In my evaluation presented to USAID I showed that the jail where perpetrators were being sent did not have a lock-able door (Image 1). I interviewed the prison guards who, when asked if people escape, responded, “*Are you kidding lady? Every day. Every hour.*” Yet when Congolese staff requested that USAID spend less than 1% of their budget on building a door so their program is not undermined by the fact that anyone who is imprisoned can escape, they responded that they should not have anything to do with the actual building of the jail.

Instead of supporting the explicit needs of Congolese people, the process of Western development programs has been to identify problems, think of solutions, and develop programs that might redress the targeted issues. But the reason this process has been criticized by researchers of development since the 1960s is that this has not been proven to be a sustainable solution. While it is helpful in the short term that governments outside of the DRC provide medicine and fund radio messages about gender inequality, I believe it is necessary to ask whether or not their physical presence in the DRC is necessary at all, or if Congolese people, if given the funds directly, are better able to decide on the priorities of these funds.

This is a radical view, one that has been removed or greatly softened by journals editors who have published my work. This question undermines the entirety of development practices that depend on foreign staff to be on the ground controlling their programs. But the question of whether or not the DRC would be better served if Congolese were given aid money directly, I believe, is a question worth asking. Previous research on Western non-governmental organizations (NGOs) in other countries supports this view. For example, in 2010, an Afghan Economics Ministry report shows that international NGOs used approximately 60% of resources provided on their own expenses (Mayr 2010).

The alternative is hire foreigners to come in do this work instead. But unfortunately, the effect of brining in foreigners goes beyond the inner workings of their programs. These foreigners bring big cars, live in fancy houses and they support expensive restaurants. This changes the basic fabric of cities in countries that are the recipients of aid, such that host country nationals cannot afford to shop at the market,

rent homes, or buy homes—all because there is too much money to be made off of foreigners. This is not unique to the DRC. Previous research in Mozambique has documented a similar problem whereby the presence of NGOs was documented to contribute to greater local social inequality (Pfeiffer 2003).

Though one could argue that development isn't perfect, but it is still worth supporting because it's the only way—I would disagree, and I am not the first to do so. After decades in which billions of dollars have been spent in the DRC, there have been no noticeable changes in health outcomes. In fact, on a number of indicators, health outcomes are getting worse. For example, according to the World Bank, the DRC has a lower Human Development Index today than it did in 1970, and in the last four decades life expectancy has slowly decreased. Also important, the goal set by the World Bank for the reduction of maternal mortality between 1990 and 2015 is not close to being met (World Bank 2011). In other words, Congolese people are just as poor and just as sick as they were before they became the focus of development, and there isn't much reason to think they will do anything but continue along that path.

A political solution, on the other hand, might change the fate of Congolese people in a real way. Instead of supporting dictators in the DRC, such as Mobutu Sese-Seko (Devlin 2008), the US government might instead support free and fair elections—something they purported to do in 2011. After the election was stolen, and ample data revealed the flaws (Carter Center 2011), the United States did not support a re-election because of the cost. Real democracy, I believe, would be better for the DRC than a handful of health programs.

My main recommendations for Congo have been detailed above and within this dissertation. My central claim is that Congolese people must be in control of how development aid money is spent in their country. Their specific recommendations have been documented in this dissertation, and include prioritizing the build of infrastructure in the country. In one such example, found in Chapter 3, a group of Congolese people in the South Kivu province suggested using United Nations funds not to fight, but to build houses for the soldiers who have been living the forest and raping members of their community for over a decade. Their logic was that if the soldiers were given the opportunity to be legitimate members of their community, they would have to conduct themselves as such. To an outside observer this may sound preposterous, and it certainly is not the kind of intervention a Western donor would support. But is it really that far-fetched?

Another central focus of this dissertation is the recommendation that the management of development programs—whether by Congolese or by foreigners—must be evidence-based. While I recommend that Congolese people have autonomy over development funds, I strongly recommend that programs are created and managed on the basis of empirical evidence. If the decision about the priorities of health programs is put in the hands of Congolese people, with the expectation of evidence-based program management, there would be objective measures of both action and evaluation. Studies such as the biocultural analysis of maternal and child health in Chapter 4 is an example of the type of integrative study that is useful in detecting whether or not the allocation of funds corresponds to the data that is available.

There are many, wonderful aspects of Congolese life and traditional practices that support family-centered life and community-style living. For example, in a family with 7 adult siblings, it is very common for the wealthiest sibling to pay the school fees of all of his or her nieces and nephews. It is also common for three, even four generations of a family to live together, and mutually support each other. If we fail to give control over development funds to Congolese people themselves, we stifle the organic growth of Congolese society and instead will end up with a society that is an unsatisfactory merger of developing world realities and developed world finances/priorities.

In conclusion, this dissertation looked at health and illness in the DRC and development programs designed to address these health problems, from both national and international organizations. The research herein unearths the problems, the politics, and the realities of development interventions as they currently stand. I have made bold, data-driven suggestions for how conventional development programs may change, and possibly lead to long-term change in the DRC. This however, I believe, will only be possible when Congolese people have full autonomy over their future.

Figure 5-1. Prison in Beni, Democratic Republic of Congo, which lacks a door (Photo courtesy of Nicole Rodney)



APPENDIX  
RAPE IN THE DEMOCRATIC REPUBLIC OF CONGO: THE FECUNDITY OF A WAR  
STRATEGY

Violent conflict in the Democratic Republic of Congo is marked on the bodies of rape survivors. It is marked on villages where mass rape has broken marriages and forever scarred kinship. And it is marked on children who were conceived in violence. I know this because I saw it with my own eyes, wearing shoes soaked through with amniotic fluid, and hands bloodied by the newborns I caught day after day, born to mothers who were violated in ways that should not be written on bodies or paper.

I arrived in the Democratic Republic of Congo in May 2009 as a medical anthropologist and as a birthing doula. Wearing two hats, I was tasked with establishing the feasibility of my dissertation, which would be studying the intergeneration health effects of rape in Congo. Using the womb as a starting point and the health of babies who would become teenagers as an ending point, my dissertation will be stage one in a long-term project examining intrauterine stress and fetal programming, using methods that consider both cultural and biological factors.

My second hat was that of a clinician; I would be providing emotional and physical support during the labors of women who were survivors of sexual violence. Though I had worked as a birthing doula in international settings before, never had I done so in a war zone, knowing that a child I would help welcome from the womb was the product of brutal physical and psychological torture. My experiences with birth were bounded by the cultures in which they took place. They had all been joyous events. But for the women of Congo whose births I attended, their newborns brought them horror and shame, feelings quite antithetical to joy. These feelings, I knew, could

squelch the nurture hormones produced after birth. Muted would be those inherent guidelines, cueing mothers to love their newfound kin.

### **In the Belly of a Gestating Beast**

War has been ravaging the DR Congo for over 14 years. From the onset, the raping of men and women has been the most acutely life threatening strategy, function and result of the conflict. The perpetrators lack any unifying characteristics; former *genocidaires* from Rwanda, rebel soldiers from all nine of Congo's bordering countries and the national army (FARDC) are all equally ruthless and indiscriminate in doling out sexual violence. Control over the country's mineral-wealthy soil, gold and coltan mines appear only a secondary, added bonus to those who use the bodies of men and women to exert control in the face of an uncontrollable war, to prove their power to powerless enemies. Thousands of women and men have been raped, often with vaginal and anal fistulas, the forced pregnancies and subsequent children becoming permanent battle scars. In part due to the criminality of abortion in the Congo, women bear children whom they sometimes despise, seen as nothing more than memorabilia from a trauma they cannot escape. Sexual violence as a war strategy has prodigious lasting power on the health of the Congolese people across generations.

### **Survivors Themselves**

I spent several months in North Kivu traveling to villages havocked by war, sleeping next to men, women and children who had survived sexual violence. When the topic of rape came up, children were lifted and dangled by a single arm. Mothers were quick to display their personal experiences with such great shame: embodied suffering, which can move and breathe.

The effects of stress on the intrauterine environment are well documented. Gestational age, birth weight, early childhood development and adult health are sensitive markers of the conditions of the womb. Preterm birth among survivors is commonplace and despite the known association between gestational weeks and general health, there is no immediate solution; if an overabundance of cortisol was saturating you like a sponge, you too, would demand out.

Abortion remains illegal in the Congo even though the government signed the “la Charte Africaine,” an international document guaranteeing abortion rights to rape survivors. The guarantee is contingent upon the signatures of three doctors, a requirement which renders abortion an impossibility: a woman would be hard pressed to find even one doctor she could confide in, who would put his job on the line to perform a procedure he most likely disagrees with.

If stress fails to threaten the life of the growing fetus, extrauterine war conditions and maternal and village level ostracism will surely pick up where cortisol left off. Child survival under these conditions is a phenomenal stroke of luck.

### **Villages Themselves**

Rape works as a strategy because it is not a woman who is raped alone. When a mother is violated, so is her family and the tribal members of her village. Rebel soldiers have made a habit of raping women in front of their parents and husbands—even their children if they are present. I was told by a survivor how she learned from experience not to walk in public with her brother or father. Soldiers get a thrill from incest, she told me, and will unquestionably force a man to rape a woman if this relation is known.

As the circle of rebel troops closes upon a village, residents run in fear of the permanent humiliation that would come with the raping of men and women, husbands and wives, brothers and sisters. Taking long-term cover in the forest or vegetable fields, unavoidable life events such as birth and death take place outside. The only barrier between human bodies and mineral-rich soil is a banana leaf, when made available. Birth outcomes under these conditions contribute hard and fast to the grave statistic that villagers do not have the luxury of knowing, or caring about: 83 deaths per 1,000 live births in 2008.

### **Children Themselves**

Those who survive—call them lucky or unlucky—are disproportionately predisposed to poor health during early childhood development and even into adult life. Advances in the field of epigenetics and developmental biology in the last two decades reveal how elevated maternal cortisol—the driving force behind premature delivery—also influences which genes become expressed and silenced for a fetus programmed in a womb exploited by war. The hypothalamic-pituitary (HPA) axis of children like this, responsible for their immune function among other crucial biological processes, will be damaged, doggedly impairing health over a lifetime threatened by violence and warfare.

Survivors of sexual violence often spoke to me about their child's survival with indifference. Usually abandoned by their husbands because of the *mea culpa* stance assigned to them by Congolese society, the financial and psychological burden of a child conceived in violence is unwanted. *Do you want this thing?* a woman asked me, describing how her new baby's presence will thwart her effort to avoid the stigma inherent in a life after rape.

## Moving Through, Moving On

The post-colonial Democratic Republic of Congo had not been an outward concern of the international community until US Secretary of State Hillary Clinton arrived in Goma, Eastern Congo in August 2009. Clinton met with survivors and held a press conference at the hospital where I was then based. Though the Congolese were bubbling with excitement over her visit, the war persisted with the same fervor after Clinton's five hour stay as it had before her arrival. The Congolese were left waiting to find out if promises of video-cameras for women in isolated villages would undermine the soldiers' anonymity, mitigating the gusto with which they rape.

The health effects of the war in the Congo are not hidden. The living relics of warfare are seen in the staggering walk of the country's Ruined, as they wobble towards the one hospital in the province capable of vaginal or anal fistula repair. The relics are found in vacant villages, where health centers have been deserted and rape survivors abandoned, left to die. And these relics will persist. Limp and premature newborns conceived in violence will grow into the stunted and wasted bodies they will inhabit as adults, when they will be responsible for peace and reconciliation in a nation annihilated by war.

I left the Democratic Republic of Congo wearing a third hat—that of a **witness**, now burdened with the moral responsibility to make sense of the suffering living in my thoughts and dreams, so I can do my best to help alleviate it.

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