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Effects of civil war on maternal and child health care in sub-Saharan Africa

Effekten av borgerkrig på mor- og barnhelsetjenester i Afrika sør for Sahara

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Abstract

The aim of this thesis is to investigate an issue of great concern in developing countries: the impacts of civil conflict on access to and use of health maternal and child health care services, in sub-Saharan Africa. In many ways the thesis is a response to the landmark United Nations Security Council Resolution 1325 and its call for greater knowledge about the impact of conflict on women and girls (UN SC 2000). In this thesis I will regard improvements in health as development in itself. This is in contrast to actors who see health improvements as a means to achieving greater (economic) development. I further argue that the different approaches to improving maternal and child health that are discussed by actors in the public health field and others are discussions of development strategies, although perhaps not conventionally defined as such.

The use of quantitative approaches comparing information across many countries was combined with more in-depth information from interviews in what is now South Sudan. Maternal and child health goals now figure prominently on the international development agenda, and are selected as Millennium Development Goals 5 and 4 respectively, but despite this focus there is still a very long way to go in order to secure adequate health care in the countries included in this thesis. Few of them will be able to reach the targets set by 2015.

Having access to new geo-coded information on occurrence of civil conflict made it possible to compare effects both on a national and sub-national level (i.e. across and within countries). In the first article it was found that civil war countries overall had lower use of maternal health care services, but that having battles within a shorter distance from the location where health data was collected was associated locally with *more* and not less use of the health care services. In the second article it was found that countries embroiled in civil war had a higher occurrence of children with fever but also a one percent higher rate of children vaccinated against measles. Investigation on a sub-national level indicated again against expectations that the proximity to battles was associated with less fever and a higher chance of being vaccinated against measles.

The results were thus different on the two levels of analysis. The conclusion I draw is that civil conflict has a wider, negative systemic effect on the health care services (and child fever) in the affected countries, but that locally the battles tend to take place in areas of more strategic interest, where health care services are at the same time more likely to be delivered by both national and international actors. The negative effects of the fighting are therefore 'covered up' in the statistical analyses.

The level of inequality in service access between different areas within the same country is evident in all the countries studied here. Even when the detrimental impacts of civil conflict affect the best served areas, the negative impact on health care does not show up in the statistical results because the difference compared to marginalized areas is still too large. These findings mean that local politicians and donors need to make a much greater effort to make maternal and child health care services available outside central areas in conflict-affected countries, and in article four I discuss the relationship between conflict, equality and equity in health. On a positive note the results also suggest that some efforts of particular concern for conflict-affected populations are working, as seen in the slightly higher likelihood of being vaccinated against measles.

The findings regarding the distribution of military battles and the link with health care services are partly supported by information from interviews with men and women in South Sudan as presented in the last two articles. This country has been ravaged by Africa's longest running civil conflict, and in many ways the second civil war amounted to 22 years of lost development opportunities for this newly established country. It starts out its existence with probably the world's highest estimated maternal mortality ratio (although the estimates are somewhat uncertain). The time window to find out how many women really died of maternity-related factors specifically because of the war has probably passed now. As far as the civil war contributed to a higher number of maternal deaths by increasing women's vulnerability and preventing access to life-saving maternal health care services, I call them *uncounted war deaths*.

Information from government-held Juba was compared to the situation in Magwe, which changed hands between several military factions. Juba was the central garrison town in the south during the war and was never taken by the SPLA, who otherwise controlled most of the surrounding countryside. While more military battles (narrowly

defined) between the SPLA and the northern regime were reported around Juba than in Magwe, the inhabitants in Juba also received much more assistance, by both national and international actors. The most important attacks on Juba were however concentrated in time, whereas in Magwe the inhabitants were subject to more low-level but very destructive and disruptive warfare. The findings may therefore also be used to draw attention to the how we think about and measure warfare. There was a sharp inequality in access to assets and services between these locations that continued even after the signing of the Comprehensive Peace Agreement in 2005. I argue that this inequality in access to health care services is unfair, in other words it is a matter of inequity.

When I asked in the interviews about more specific barriers that prevented access to maternal health care, the informants revealed that payments that are asked for maternal health care services are one of the greatest obstacles to increasing use of this life-saving aid. One of the policy recommendations to come out of this project is therefore to try to avoid charging user fees for maternal health care services. Payments reinforce the pre-existing inequality between richer and poorer South Sudanese women, and prevent them from accessing help in a situation that can at times be life-threatening. From my research I draw the conclusion that civil conflicts may contribute to greater inequality of access to and use of maternal and child health care, in countries that already strive to achieve equality for their inhabitants in many important spheres of life. Developing more equitable maternal and child health care is acutely needed in conflict-affected countries.

Abbreviations

BSF	Basic Services Fund
CPA	Comprehensive peace agreement
DALY	Disability-affected life years
EmOC	Emergency obstetric care
GAVI	Global Alliance for Vaccines and Immunisation
GOSS	Government of the Republic of South Sudan
IAWG	Inter-agency Working Group
ICDP	International Conference on Population and Development
IDP	Internally displaced person
IGAD	Intergovernmental Authority on Development
IMCI	Integrated Management of Childhood Illness
LRA	Lord's Resistance Army
MCH	Maternal and child health
MDTF	Multi Donor Trust Fund
MDG	Millennium Development Goal
MMR	Maternal mortality ratio
NGO	Non-governmental organization
OECD	Organisation for Economic Co-operation and Development
OLS	Operation Lifeline Sudan
SPLA	Sudan People's Liberation Army
TBA	Traditional birth attendant
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNFPA	United Nations Population Fund
UNSCR	United Nations Security Council Resolution
USAID	United States Agency for International Development
WFP	World Food Programme
WHO	World Health Organization
WB	World Bank

1 Introduction

1.1 A new focus on human consequences of war

Writing about armed conflict has often meant writing about men and about fighting. Herodotus has the expansion of the Persian empire as his leitmotif, discussing mainly men and male exploits in the Histories (Herodotus 2003). Montaigne uses examples from his time of civil wars in France to discuss among other issues military tactics, (male) courage and cowardice (Montaigne 2009). The UN Security Council did not fully discuss humanitarian issues until the 1990s (Hudson 2010), and scholarship on war[1] has often focused on fighting and the number of battle deaths[2]. While violence is of course the prime worry in conflict settings, it does however not give a full account of the destructive effects that are being played out. The fate of civilians and the more indirect effects of war have only more recently attracted greater attention, as part of a post-Cold War move to focus more on humanitarian issues. I argue that this is also as part of an increased concern with human security in general.

Several scholars maintain that men, women and children are affected by armed conflict differently (e.g. Li and Wen 2005; Henry 2007; Kuehnast, De Jonge Oudraat and Hernes 2011). But while there is agreement in the literature that men are more often targeted by direct violence, as the majority of soldiers and potential insurgents, it is less obvious why conflicts have such large negative effects on women and children.

The deaths due to violence are those that attract the most attention in war zones. However, the fatalities due to violence only constitute one part of the war casualties, and often far from the largest proportion (HSR 2005). It is common to distinguish between *direct and indirect deaths* (and direct and indirect effects more generally) in war-affected countries. For the purpose of this thesis I will distinguish between *deaths*

[1] In this introductory text I will use the terms 'armed conflict', 'conflict' and 'war' interchangeably, although I am aware that they have different meanings in specific contexts.
[2] Indeed, the number of battle deaths are counted as part of the definition of 'armed conflict' in one of the most used datasets in today's conflict literature, the UCDP/PRIO dataset.

due to violence which I call direct deaths and *all other deaths to which conflict contributes which I call indirect deaths*. This usage is in line with e.g. the Geneva Declaration (2008), whereas other researchers are more concerned with whether people were killed during a battle or who the perpetrator was (e.g. the different conflict datasets maintained by the Uppsala Conflict Data Program). The death and disability that I will be concerned about in this thesis, both during and after a conflict, are thus of the *indirect* type.

> (…)"in an indirect but very real way, a pregnant woman dying of postpartum hemorrhage in South Sudan or a child dying of cerebral malaria in Sierra Leone are victims of conflict – the most common face, in fact, of suffering in twenty first century conflicts."
> (d'Harcourt and Purdin 2009: 127)

In addition to the direct conflict impacts, it has been found that lives continue to be lost and disability incurred through indirect effects even long after the conflict has stopped (Ghobarah, Huth and Russett 2003). Malnutrition and the four infectious 'killer diseases' (malaria, acute respiratory infections, diarrhoea and measles) are assumed to account for most indirect deaths in wartime (HSRP 2011), and infectious diseases also account for the largest loss of disability-adjusted life-years after the war in Ghobarah, Huth and Russett's analysis (2003). But why should there be large differences in indirect effects between women and men?

Being pregnant and giving birth are some of the most dangerous things a woman can do in developing countries (WHO 2005) where most of today's armed conflicts occur. Child health is very closely linked to the welfare of the mother (UNICEF 2008); and the predominant type of war today is civil war (Themnér and Wallensteen 2011). A natural follow-up to the question above was therefore to start investigating civil war's impact on maternal and child health (MCH) [3]. There are very many ways of approaching this question, but in this thesis the main objective is more specifically to investigate the impact of civil war on access to and use of maternal and child health

[3] Today there is increased recognition of the importance of follow-up in the neonatal period (the first 28 days after birth), because this is where a large number of infant deaths occur. As a reflection of this and of the importance of ensuring a continuum of care during pregnancy, birth and into childhood, WHO in 2005 proposed to rename MCH into MNCH (maternal, newborn and child health). However, as I do not focus on specifically on newborn children, I have kept the term MCH in this thesis.

care services, with a focus on sub-Saharan Africa. The reasons for this selection are explained more in detail below.

Inequality in maternal and child health

Maternal and child death and disability are very unfairly distributed around the globe, with people in developing nations having much higher mortality and morbidity (higher burden of disease) than people in developed countries. Millennium Development Goal 4 is to reduce by two thirds the under-five mortality, but sub-Saharan Africa is not likely to reach the target by 2015 despite speeding up progress considerably in recent years (UN MDG report 2012). Similarly, maternal mortality is not only unequally distributed between countries but also within them, and the higher health risk they run during pregnancy and birth constitutes a very unjust difference between poorer and richer, urban and rural, and more or less educated women. Inequality that is perceived as unfair or unjust may be discussed as a case of *inequity*, and this is the subject of one of the articles in this thesis. There is currently a renewed focus on achieving greater equity in maternal and child health by important actors on the international arena (IFRC 2011), and South Sudan has an explicit policy goal of delivering equitable healthcare (GOSS 2013). Still developments are very uneven. Millennium Development Goal 5 aims to improve maternal health and some progress has been made globally, but sub-Saharan Africa together with South Asia account for 85 % of the remaining deaths (UN MDG report 2012).

> **"MMR, Maternal mortality ratio**: the number of maternal deaths per 100 000 live births. **Maternal death** is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes." (WHO 2012:1)

A focus on health care services

The indicators that are in focus in the MDG process are linked to different types of maternal health care interventions that are known to reduce mortality, and the great variation between maternal mortality ratios in the developed and developing worlds is closely linked to differentials in access to health care during pregnancy and birth. The

World Development Report 2012 attributed the high maternal mortality in south Asia and sub-Saharan Africa to 'a failure of the institutions that deliver medical care and services to expectant mothers' (World Bank 2012 : 25). It is estimated that three quarters of maternal deaths can be avoided by access to appropriate health care services (WHO 2005), in addition to effects of adequate nutrition and a healthy life style more generally. I therefore focus on the use of potentially life-saving health care services. This is a focus that is maintained also by other researchers, and it has the further advantage of avoiding the notoriously difficult problem of estimating maternal mortality ratios:

> "The problems involved in estimating MMR, particularly in the absence of reliable data are well known. Consequently, among the accepted proxies for monitoring progress towards reducing MMR include trends in antenatal, delivery and postnatal care. Policies and programs have been formulated aimed at ensuring that every pregnant woman has adequate antenatal, delivery, and postpartum care. Yet, progress towards covering large segments of the population has been very tardy."
>
> (Chandrasekhar, Gebreselassie and Jayaraman 2011: 26)

1.2 Health improvement as development

Cowen and Shenton (1996) have shown examples of how also the richest countries are engaged in a process of 'development', and within the health field this is particularly easy to see. Even the wealthiest countries have public health programs and campaigns to achieve better health outcomes. Continued medical research focuses on innovations that mostly address diseases afflicting the populations of wealthy nations, and governments are continuously discussing improvements in health care, restructuring of services and so forth. The great difference between developed and developing nations is that the developed nations have the power and freedom to choose their own targets of improvement, whereas developing nations might have to follow the Millennium Development Goals (MDGs) or other externally defined targets in order to secure financial support. This is particularly the case if countries have been engaged in civil wars, which have drained their resources and made them more dependent upon external actors in the development process (RAISE 2009).

The death or disability of a mother or a child is first of all a tragedy to the family involved. Here I will argue that health is intrinsically valuable, and that achieving good maternal and child health should be viewed as a (development) goal in itself. I believe that this does not need justification as a means to a further end. However, it is also obvious that richer countries generally have better health status and that improving maternal and child health would have development benefits for the societies involved, and the relationship between health and development will be discussed briefly in chapter 2.

> "Maternal health is one of the more sensitive indicators of human development in that it reflects access to skilled health services, pre- and postnatal care, nutrition, education, female empowerment, social and economic development."
> (Johnson S. 2011: 43)

The ramifications of high maternal and child mortality are large. Children who lose their mothers are at much greater risk of not attending school, having poorer health and dying early (WHO 2005). It is estimated that in addition to maternal deaths, around 300 million women live with disabilities due to lack of treatment for pregnancy and birth related problems (ibid). On a societal level this loss of potentially productive person-years has large economic effects, and an attempt by the USAID at calculating the economic loss due to poor maternal and child health amounted to USD 15 billion a year (USAID 2001).

> "The absence of good health can result in enormous grief (the loss of a newborn or young child) and can precipitate an economic catastrophe for the family (the sudden death of a working adult)."
> (Commission on Human Security 2003: 96)

Improving maternal and child health is therefore an investment in human *and* in economic development.

1.3 Uncounted war deaths

I argued in the previous section that when it comes to health issues, all countries whether wealthy or poor can be seen as engaging continuously in a process of 'development'. There is an on-going attempt to promote healthy lives also in rich

countries, and the large declines in maternal and child deaths in developed nations is a testimony to what can be achieved with enough resources and effort. When we go through a short history of how maternal and child health came up on the international agenda in a later chapter, we will see that these were often considered domestic issues prior to the 20th century (Rosenfield and Min 2009). It was for a long time considered normal that many children would die in their childhood years, and maternal mortality was high.

Today we are able to avert most of these deaths in developed countries while mortality remains high in much of the developing world. I argue that this becomes a problem of visibility and hence priority in a war and post war context, because when a high mortality is considered normal MCH may not attract sufficient attention when hard priorities have to be made about where to allocate resources. A study by RAISE (2009) that shows inadequate funding for reproductive health in conflict countries will be discussed later. Children will normally have parents who speak for them, but especially women in many of the conflict-prone societies have died in childbirth for many years, and continue to do so, without attracting much attention. In interviews from my field work in South Sudan it was evident that even in the women's minds potentially life-threatening births were not so dramatic compared to times they were directly persecuted by their enemies. More donor attention is paid these days to sexual and gender-based violence, perhaps to the detriment of other issues such as childbirth that are less dramatic and perceived as ingredients of everyday life. This is confirmed by a 2009 RAISE study. But a woman who dies in childbirth because she cannot get to the hospital for fear of being ambushed by soldiers is also a victim of the war. She just does not get the same attention as a person who died on the battlefield, and nobody knows how many women have died this way. I therefore want to call these indirect maternal deaths *uncounted war deaths*.

1.4 Objectives and specific research questions in the thesis

Writing this thesis has been challenging because its topic draws upon knowledge from several disciplines, all with their different discourses and ideas regarding what constitutes 'good research'. In order to write about civil conflict impact on a public

health issue and situate it in a development context it is inevitable that one will come across many debates along the way. Many books have been written on each of the subjects ‘maternal and child health’; ‘health and development’; ‘human security’ and its relation to development, South Sudanese issues, definitions of ‘armed conflict’ and so forth. I have had to make some difficult choices about what to include and what to leave out.

The overall aim of the thesis has been to investigate civil conflict impact on access to and use of maternal and child health care services, in sub-Saharan Africa. More specifically the four articles in the thesis have the following research questions:

1) What are the overall effects of civil conflict on the use of maternal health care services in sub-Saharan Africa? This question is explored both by comparing conflict and non-conflict countries and on a sub-national level in 13 countries in the region.

2) What are the overall effects of civil conflict on child health and the use of health care services for children under five in sub-Saharan Africa? Similarly to the first article, the question is investigated both sub-nationally and by comparing countries with and without conflict, in 15 countries in the region.

3) What are common barriers to the use of and access to maternal health care services as a consequence of the second civil war in Magwe and Juba in South Sudan, in people’s own experience?

4) What is the relationship between civil conflict, equality and equity in health in relation to theory and policy? Can such debates inform policy making in a concrete setting like South Sudan?

The first two articles are used to investigate average effects, assessing whether there are any overall effects of civil war on actual use of maternal and child health care services, in sub-Saharan Africa. Overall impacts cannot be assessed through analysis of individual cases, and I have used data from as many of the countries in the region as possible. However, while such analyses are worthwhile and may answer questions about general effects, they are less suited to investigate *why* and *how* such effects

come about. Further, in some cases health care services are available but are not used, and it is important to understand why. These questions are better answered through the use of qualitative approaches, and I have chosen to do a case study of two sites in South Sudan in order to investigate these issues in article 3. These two research sites (Juba and Magwe) cannot be seen as representative for the whole sub-Saharan African region, not even for the whole of South Sudan, but they give interesting insights into how that civil conflict has affected the access to and use of maternal health care services there. This article thus provides a richer description of how such mechanisms can operate than what was possible in the first two articles. A theme which I realized was important in all the three first articles was how *unequal* the access to services was for the women in the region. The fourth article was therefore used to explore this question further, and reflect upon how civil conflict might impact unequal access to maternal health care services, whether the inequality in these services in South Sudan could be discussed in terms of *inequity*, and whether such a debate could fruitfully inform policy making. Taken together the four articles therefore aim to contribute to an understanding of how much, how and why civil conflict affects access to and use of maternal and child health care services in sub-Saharan Africa.

The relationship between the articles is further thoroughly discussed in chapters 5, 6 and 7. The rest of the introduction chapters are used to present and discuss concepts, relevant theoretical debates and context in more detail than what is possible within the word limit of an article.

1.5 Women presented not only as victims

Writing about civil war effects on women does however not mean that I see them as passive victims. While children are automatically in need of special protection because of their young age, women can and will take charge of themselves if given a chance. Where much scholarship has focussed on women only as victims more or less unintentionally, there has recently been more focus on women's active roles in war (Kuehnast, De Jonge Oudraat and Hernes 2011). The women I interviewed in South

Sudan might not have participated directly in the fighting but they were certainly not passive bystanders.

Among all the war stories I heard, one of those that stands out in my mind was told by a quiet young man in Magwe. He told us how when he was a boy the soldiers had come by an area where some women and children were gathered during the war, and had started to beat him in order to make him say where his father was. His mother, furious, told them that he was just a little boy, and that they should rather go after her instead. And so they did. She was beaten with the butt of a gun in her chest and died from the injuries. She was not a passive victim – she protected her family as best she could. Many women in wartime will do the same, with or without a gun in their hands.

1.6 Structure of the introduction

Writing articles often does not permit space to discuss the context of an issue properly, and I will therefore introduce some general debates into which my research can be placed in the following chapters. I argue that researching maternal and child health in conflict countries in sub-Saharan Africa fundamentally concerns development, no matter how the term is defined. In chapter 2 I will introduce briefly how health and development issues are interlinked, and discuss how maternal and child health in conflict fits under a human security umbrella, arguing that there is some ambiguity involved in invoking the human security term here. In chapter 3 I spend some time introducing the debates and policy changes surrounding maternal and child health in general, taking the position that these are in reality debates over how to pursue development. Looking at how maternal and child health came up on the international agenda we will see how the subject matter has partly been influenced by powerful interests. This chapter also contains some information on the Millennium Development Goals and other relevant UN processes. It ends with a brief discussion of international funding and user fees for maternal health. Aid to Sudan during the war was also highly politicized as will be seen in chapter 4, which also introduces some information on new South Sudanese policies on improving maternal health. In chapter 5 I present previous literature that helped direct my research. There I will

present more information on how we separate direct and indirect deaths from war. I will then go through some research that has mostly used a quantitative approach and that has provided the background information that informed the start of the thesis, and see how my articles fit into this. After that I go through some research which has investigated in more detail the channels through which war impacts health. In chapter 6 I will discuss the relationship between research with a quantitative and qualitative (case study) approach and present the data and methodology used in the different articles. In chapter 7 I present my four articles and discuss the way the findings fit together. This further involves discussing whether the measurements of 'armed conflict' that I have used are really useful, and a short look at whether it is possible that the link from conflict to poor health could be reverse. This introduction then ends with a conclusion and discussion of future research and some policy recommendations in chapter 8.

2 Health, Development and Human Security

Population health in general, including maternal and child health, has improved enormously over the course of history. In one of the following chapters we will look closer at the gains that have been made in maternal and child health. These improvements have often concurred with greater *economic* development in the countries involved, but not in a linear fashion and not always. The different state of maternal health in countries with similar GDPs, and examples like Sri Lanka with a low GDP but comparatively good maternal health in the least conflict-affected areas (Vije and Ratneswaren 2009), show the complexity of this issue. So how should one conceive of the relationship between health and development?

2.1. Health and development

It seems like stating the obvious when saying that health and development are linked. A healthier population will be more productive and can achieve greater economic development, and at the same time, with greater wealth both on state, community and individual level it becomes possible to provide better health care services as well as clean water, enough food and other commodities which enhance population health. This is easy to agree upon. The difficulties arise when one has to prioritize efforts between many worthy goals in environments with finite resources, which is typically the case in developing countries, and even more so when they have been drained by armed conflict. Then the divergences between different ways of conceptualizing the relationship between health and development become important, especially because many conflict-affected countries are dependent upon international assistance in delivering health care (RAISE 2009).

Fundamentally, there is a division between those who believe that achieving better health *is* development in itself, and those who see improved health as something that can lead to greater (economic) development.

These differences are linked to the way that both ‘health’ and ‘development’ are defined, as there is more than one way of perceiving what is meant by these terms.

Still they are used every day, perhaps without different actors like national governments, aid agencies, and NGOs realizing that they are using the same words but in different ways and therefore talking past each other. When it comes to different perceptions of health, Johnson S. (2011) categorizes them into three broad groups. Firstly, health can be seen simply as intrinsically valuable. Secondly, health and a healthy population can be seen as contributing to economic development or state security, because a healthy population is more productive and better able to contribute to military strength. Thirdly, health can be conceptualized as an outcome of physical, social and institutional factors which may be influenced to achieve better health, as in debates over social determinants of health (Johnson S. 2011: 28). These views are not mutually exclusive, and actors may switch between different views over the course of history, as will be demonstrated in the next chapter on maternal and child health as a concern on the international agenda. In the following brief discussion I will draw examples from the World Health Organization (WHO), United Nations Development Fund (UNDP) and the World Bank (WB) and their views on health and development because they are important actors in this field who embrace different visions of these terms and their relationship.

The WHO is an example of an entity which sees health as something that has intrinsic value, and promotes it as a human right. The right to health is written into the Universal Declaration of Human Rights from 1948, and the WHO supports this stance. The definition of its most central concept – health – was however not uncontroversial for the WHO. The creation of this agency and its mandate was initially dominated by Western powers, and especially the US and Great Britain were advocating against a view of health that opened up for promotion of social welfare or protection (Johnson S. 2011: 38). Despite this resistance, the WHO's definition of health also includes broader social aspects: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" WHO (1946/1948: 100).

Looking at health this way, it is not only a biomedical condition, but also linked with other aspects of life ('social well-being'). This notion of health sits perhaps most comfortably with an expanded notion of development, as something more than just

economic growth and poverty alleviation. If health entails 'well-being' in a broad sense then it is seen as important in itself and not only as an instrument to achieve other goals. A deliberate move away from a narrow definition of development has been undertaken by The United Nations Development Programme (UNDP). In their Human Development Reports they have promoted the concept of development as enlarging people's choices, in concordance with Sen's capabilities approach to development (Alkire 2010).

> "Human development is a process of enlarging people's choices. The most critical ones are to lead a long and healthy life, to be educated and to enjoy a decent standard of living. Additional choices include political freedom, guaranteed human rights and self-respect – what Adam Smith called the ability to mix with others without being "ashamed to appear in public"."
> (UNDP 1990: 10)

Seemingly following Sen's changing emphasis on development as enlarging choices towards his conception of development as expansion of freedom, the UNDP has later changed its definition of human development. Health is however kept as one of the central ingredients:

> "Human development is the expansion of people's freedoms to live long, healthy and creative lives; to advance other goals they have reason to value; and to engage actively in shaping development equitably and sustainably on a shared planet"
> (UNDP 2010: 22).

In this definition of development, good health is a critical ingredient. The creation of the Human Development Index, where longevity is included as one out of three factors that measure a country's development state, is also an attempt at expanding the notion of development. These views therefore support an idea of better health as development in itself.

On the other hand, the World Bank is perhaps the best example of a proponent of the more narrow view of development with its strong focus on economic growth. The Bank has long argued that the best way to promote health is to create economic growth, as greater wealth will eventually trickle down and lead to health

improvements also for the poor. However, at least in the short run this view has sometimes gone directly at the expense of health outcomes, as when the structural adjustment programs led to contraction of public expenditure and social security, with poorer health for parts of the population as a result in many of the program countries (WHO 2013).

The World Bank has, partly due to its sheer size as the world's largest lender, become a player in the field of health as well as development although it is not a health agency. With the World Development Report: Investing in Health in 1993 it launched itself explicitly as a health authority. The 1993 report focuses on how governments need to firstly, create an environment conducing households to improve their own wealth; secondly, direct their health spending more towards programs that do more for the poor; and thirdly, governments should aim at promoting more competition in the delivery and financing of health services, finding the right balance between public and private enterprise (World Bank 1993: iii). This focus, and the text on how a healthy population contributes to greater national prosperity, is very different from that espoused by the WHO which sees health as intrinsically valuable. The program that the World Bank set forth in the report was criticized for being inconsistent, for example in that it both urged governments to target services to the poorest population segments, while at the same time embracing the idea of recovering costs by introducing user fees in the health care sector, something that would have an disproportionately negative effect on the poor (Johnson S. 2011: 56). This commodification of health was clearly different from the WHO language of health as a right and as the responsibility of governments (ibid). The 1993 report marked a departure from structural adjustment programs in several aspects, but it also maintained the importance of economic growth as the central development concern. Health thus assumes a more *instrumental* role for the Bank, since the promotion of good health is usually followed by statements about how this is good economic development practice.

These differences become important in policy choices that are made, since the WHO would propose retaining good health as a goal in itself where the World Bank seems to tolerate temporary set-backs in the health situation as long as its leads to economic growth in the longer run, since greater wealth eventually is assumed to lead to better

health also for the poor. Throughout the 1980s and 1990s there was however increasing criticism of the failure of the 'trickle down' policies, and of the very mixed outcomes of the structural adjustment programs (WHO 2013). Later the Poverty Reduction Strategy Papers have been developed in part as a response to the criticism of the earlier approach. In the more recent World Development Report from 2011 which focuses on conflict impact on the MDGs, and in the 2012 report which treats the subject of gender inequality, the World Bank seems to make a greater effort of stating that reaching the different MDGs and improving maternal and girl children's health are goals in and by themselves. However, the reports continue to place a very great emphasis on economic growth whenever 'development' is discussed.

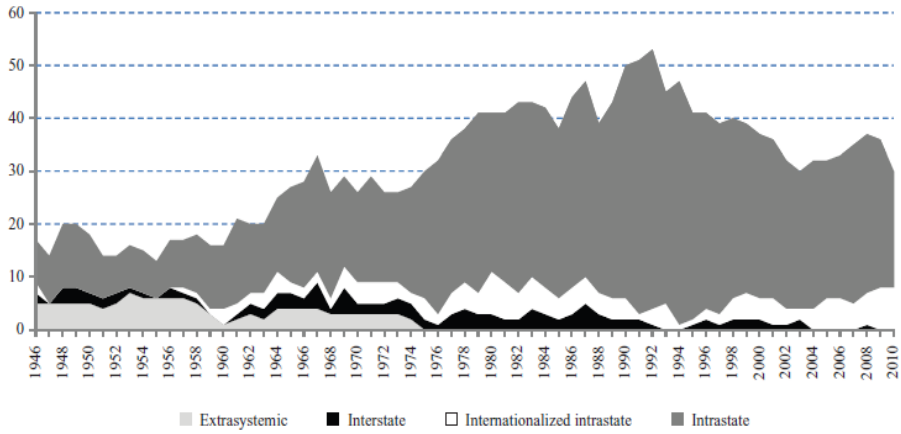
2.2 Maternal and child health in armed conflict and human security

In the following I will state briefly how maternal and child health in armed conflict relates to human security. Some authors like Iqbal (2010) fully embrace a human security perspective on armed conflict and health, but I am slightly more sceptical given the close association between discussing an issue under the human security umbrella and automatically assuming this issue is a threat to security more conventionally defined.

Although the concept of human security and its definition is much debated I will introduce it here because I believe that it captures a real change in perspective that has taken place in discussions of security matters and what really constitutes 'security' in the post-Cold War world. Conceived in the immediate years after the breakdown of the Soviet Union and the end of superpower bloc politics, the term reflects an opening on the international agenda to address issues of a more humanitarian character. This was made possible both by a change in international norms and by the realisation that older, realist theories did not describe very well what were actually the major problems for people on the ground (HSRP 2011). The campaigns on issues like landmines and small arms and light weapons were made possible after the threat of a nuclear winter disappeared into the background and it became clear that these were the weapons that actually killed people in the thousands every year. Likewise, a previous realist concern with state security and state borders in an anarchic world

system has largely been taken over by concerns over civil wars (or *intrastate* wars), as it was realized that these greatly outnumbered wars between countries. Figure 1 illustrates this[4]:

Figure 1 Number of state-based conflicts 1946-2010



Themnér and Wallensteen 2011: 526

Definitions of human security

There are several definitions of human security, but those which are most commonly referred to all include health as a fundamental component. The following excerpt is taken from the widely published 1994 United Nations Development Programme (UNDP) *Human Development Report*:

> "For too long, the concept of security has been shaped by the potential for conflict between states. For too long, security has been equated with the threats to a country's borders. For too long, nations have sought arms to protect their security.
> For most people today, a feeling of insecurity arises more from worries about daily life than from the dread of a cataclysmic world event. Job security, income security, health security, environmental security, security from crime-these are the emerging concerns of human security all over the world."
> (UNDP 1994:3)

[4] As is also evident from the figure above, the number of state-based conflicts (where the state is at least one party in the conflict) has declined (although unevenly) after the end of the Cold War, reflecting how much the super power competition previously acted as a driver in these conflicts.

The text above points to an expanding notion of security threats, from just concerning threats to state borders to including a broader spectrum of threats to the individuals within the states. Threats that arise from armed conflict within states, and that threaten health, ought therefore to be a key concern according to this ground-breaking UNDP report.

Similarly, Annan (2000) included health security as integral to human security, and the Commission on Human Security from 2003 devotes one of its chapters to health risks, including a special feature on the problems of maternal health and reproductive health concerns:

> "Women are often discriminated against in access to education, food, employment, financial resources and primary health care services. Addressing issues of women's status and integrating them into mainstream social and political systems will be essential for improving reproductive health and allowing women wider participation within society. In addition, inexpensive and technologically simple methods are needed to promote women's reproductive health. Improving the quality of reproductive health care and women's access to it will not only improve the security of billions of women around the world, but also that of their children and families."
> (Commission on Human Security 2003: 100).

The main change in thinking introduced with human security is a shift in perspective from the security of the state to the security and survival of the people living within the state. I believe this is its greatest addition to studies of security issues and the reason why it is worth discussing here. While previous realist theories also had the individual as the ultimate referent of security, it was assumed that the interests of the people were served by the state, and this is where attention was focussed. But in highly repressive regimes or in states involved in civil wars, it becomes obvious that the interests of the individual cannot be conflated with those of the state (Mack 2004). To consider this further one can take South Sudan as an example. From a traditional security perspective the new state would have been considered secure once its border were properly established and its different conflicts with Sudan sorted out. I argue that this is very far from how many would think today, where we would not consider the population of South Sudan as 'secure' until south-south violence has diminished or disappeared and they are no longer living in extreme poverty and without access to

services such as health care. Along with a human security perspective there also comes a greater call for action and intervention by the international community to alleviate human suffering, something I will argue has had a bearing on the results I find in my articles (discussed in later chapters).

While the human security concept opens up a space for different issues to be discussed, one of the most common critiques of it is exactly that it is too broad, and therefore has little analytical value (e.g. Owen 2004). If a definition covers everything it defines nothing. The debate and criticism is at times confusing, as when Tadjbahksh and Chenoy (2009) report that human security has been criticised both for neglecting the state and for ultimately remaining state-centric (see Tadjbakhsh and Chenoy 2009 for an attempt at summarizing the debate). It appears that the fluidity and breadth of the concept that some criticize is exactly what its proponents see as its main advantage. Mack (2004) has perhaps one of the best insights when he states that ultimately the human security notion is often used not so much as an analytical concept as much as a signifier of common moral and political values. It is discussed here as a framework to direct attentions towards the human suffering created by civil wars as opposed to studying wars from a perspective centred on states and national security.

2.3 Human security and development

As is evident from the quotes above, there are close connections between human security concerns and development concerns, but the exact relationship between the concepts of development and human security is much debated. Tadjbakhsh and Chenoy (2009) have argued that the relationship between human security and human development amounts amongst other things to a perspective where human security is meant to secure development gains. In my analysis I will focus on how a more traditional security issue (civil war) has consequences for a development issue (MCH), claiming that at least a narrowly defined ‘freedom from fear’ is necessary to attain a certain level of ‘freedom from want’ (as in good MCH). The perspective in my thesis might thus be seen as support for a threshold view of this relationship,

where a certain level of security is seen as necessary for further (health) development to be possible. This is akin to the view proposed by e.g. Owen (2004).

The complexities of bringing up health on the security agenda can be illustrated with an example from South Sudan. In the Joint Assessment Mission that was undertaken in order to investigate needs in Sudan and South Sudan in the period leading up to the Comprehensive Peace Agreement in 2005, health issues and providing basic services in the south were couched in terms of "restoring peace and harmony, including through access to basic services" (JAM 2005: 43). The authors thus perpetrated an understanding of delivery of health care services as important in reducing violence (i.e. *securitizing* the issue). When a further assessment report by Bennett et al. (2010) called into question the link between health and violence reduction, claiming that at least on state level there was no clear link between provision of health services and lower levels of violence, should scarce resources then be prioritized away from health care to other more direct violence-reducing efforts like security sector reform and demobilization, disarmament and reintegration efforts?

In this thesis I argue that improved health and health service provision should be kept as a separate goal, existing in and for itself. I agree to discussing it under a human security umbrella as far as it means focussing attention on new issues that threaten people in their everyday lives and therefore constitutes a new definition of the term 'security', but not if it is implied (as it often is) that poor health is necessarily a threat to security as conventionally defined.

3 Maternal and Child Health on the International Agenda

In this thesis I look at promotion of better maternal and child health as fundamentally a development concern, and one that also wealthy countries invest a great deal of effort into. In the next chapter it becomes clear that the views of what is the best path to promote better MCH – what is the best path to promote health development – have changed a lot over the years. The change in these policies (for example how to relate to traditional birth attendants) is something that has tangible consequences for the situation in South Sudan today, as will be discussed later. From being seen as more or less inevitable, reducing the number of maternal and child deaths became a focus of explicit development practices, or the intentional of development as I understand Cowen and Shenton's (1996) terms.

In this discussion, and in the following chapter on how different concerns have shaped the nature of help afforded to Sudan, I will show how these health issues have not only been subject to needs assessment. Rather, they have often been influenced profoundly by power and politics, in parallel with other development issues.

3.1 Changing strategies for developing maternal and child health over time

Historically, up to the twentieth century maternal and child health were regarded as domestic issues, and it was commonly accepted that a large number of children would die in their childhood years[5] (Rosenfield and Min 2009). In development terms, it was not an issue of intentional development (Cowen and Shenton 1996). Along with advancements of medical science a greater interest was taken in MCH in the early 20th century, and initially child welfare was easier to rally around than maternal welfare. UNICEF was established already in 1946 when the end of the Second World War

[5] Interestingly for this thesis, one author has claimed that it was not until the European nations began to worry about how high infant mortality and declining fertility in the late 19th century might jeopardize their nations' race for political and military supremacy that a more keen interest was taken in improving maternal and especially child health (Dwork (1987) 'War is good for babies and other young children: a history of the infant and child welfare movement in England 1889-1918', cited in Rosenfield and Min 2009).

made more health cooperation internationally possible, even before the WHO which was established in 1948. In 1948 motherhood and childhood were further recognized as entitled to special care in the Universal Declaration of Human Rights, but the strategies for promoting MCH would be the subject of much discussion in the years to come (Rosenfield and Min 2009). Governments, UN bodies, multilateral organizations and NGOs have all wanted to have their say in this agenda.

Adopting a narrow versus broad focus

The first *international* health programs including MCH that were implemented after the establishment of the WHO often focussed on mass vaccinations and efforts at controlling specific diseases. The advent of new vaccinations had made this possible and several of these programs achieved some success, but in a parallel with other development efforts they were often implemented as vertical programs focussing on technical solutions, without proper integration with local health services.

Many of the countries that had recently become independent in the post-colonial era simultaneously made an effort to extend health care to large rural populations, in a move away from the colonial legacy emphasizing large curative hospitals in urban centres (Rosenfield and Min 2009). The limitations shown in vertical programming had led to an increasing understanding of the need to take into account social, cultural and economic dimensions of health and healthcare, as later embodied in the focus on social determinants of health (e.g. the Commission on Social Determinants of Health which delivered its report in 2008). Together with the movement towards a more equitable health service this led to the Alma-Ata Declaration of Primary Healthcare in 1978. This declaration, backed by UNICEF and WHO, outlined a strategy of primary health care as a means of attaining health for all, taking into account the importance of the local communities as actors in this process. Maternal and child healthcare is mentioned specifically as one of the components of primary healthcare which is to be universally available.

> "Primary health care: (…)
> includes at least: education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition; an adequate supply of safe water and basic sanitation; **maternal and child health care**, including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs;" (…).
> (WHO 1978:3, my emphasis)

However, a debate on the merits of a comprehensive versus selective (focussing on the few most dangerous conditions) primary care followed, with UNICEF adopting a selective strategy (Rosenfield and Min 2009). These discussions in the 1980s coincided with structural adjustment programmes calling for cuts in public spending and therefore also in public health, further contributing to the difficulty in promoting comprehensive healthcare for MCH. The World Bank's restrictive view of development and focus on the economy thus had tangible consequences for the health sector.

UNICEF later successfully endorsed implementing a narrowly focussed strategy to improve child survival, managing to reduce the worldwide deaths of under-five year olds substantially, often referred to as the child survival revolution. A parallel to this narrow focus can be found in the large vaccination funds that have been created in the last years, for example the GAVI fund. These initiatives are appealing to donors and are of course laudable, but are at the same time met with some of the criticisms that vertical disease programs in the 1950s attracted. For local health services, managing several vertical programs without integration is a challenge, especially as they do not focus on health systems development. And while these programs may be good in attaining fast results within a limited area and therefore are attractive to fund, they may divert resources away from longer-term programs aimed at more sustainable development of the health system (Meremikwu and Ehiri 2009). Today there is a move back towards more integrated health programming in child health, with IMCI (Integrated Management of Childhood Illness) including some basic services and household and community-level components (Meremikwu and Ehiri 2009). This focus on community health components is important for this thesis, as I have employed a community-level lens in all my articles.

Less focus on maternal health

Compared to the focus on child health, maternal health had for some time disappeared more into the background. Rosenberg and Min (2009) argue that there were three different reasons for this: Firstly, there was no good information available from developing countries to assess the severity of the problem. Registration systems to record maternal mortality and morbidity were usually not available (and are still lacking in most of the countries studied in my articles). The WHO supported some community studies in the 1980s and used available information to come up with regional estimates, but it was actually not until 1996 that individual country estimates on maternal mortality were produced for many developing countries. Since then more estimates have been created. In 2010 two different international research groups (from the Institute for Health Metrics and Evaluation, and a combination of UN bodies and the WB) published new global estimates of maternal mortality ratios. The two research groups arrived at very similar estimates for current maternal deaths worldwide, but had different estimates for previous years. For the developing countries as a whole the estimates have been adjusted downwards, but for some developed countries the estimates have actually been adjusted up, testifying to the difficulty in classifying and counting maternal deaths properly (AbouZahr 2011). In 2014 new worldwide estimates were again released (Kassebaum et al. 2014), again changing some of the previous numbers. The availability of MMR estimates at all has, however, been crucial in drawing attention to the issue.

Secondly, while there have been a number of relatively simple preventive treatments that have reduced child and infant mortality substantially, no such quick solutions are available to reduce maternal mortality. The five most important direct causes of maternal death (haemorrhage, infection, eclampsia, obstructed labour and unsafe abortion) all require medical treatment to be dealt with, and hence a functioning health care system. Provision of Emergency Obstetric Care (EmOC) has therefore been the focus of discussions in the last years, but this is substantially more difficult to develop than delivering vaccinations and oral rehydration therapy to infants.

Thirdly, there was and still is profound gender discrimination against women which makes their voices and concerns less visible on the international agenda. Gender roles vary across societies, but they are rarely equally balanced. This is a point which has

been raised by numerous authors on gender issues. Social, economic and cultural differences arise from unequal gender relations, with women usually having access to less money, information, power, and hence influence (Tolhurst, Raven, and Theobald 2009: 151).

All these factors have an impact on women's (and therefore also children's) health and access to healthcare. Improving gender equity would not only benefit the individual woman, but her entire family in the long run.

Inequality in maternal health as a social injustice

A meeting in Nairobi in 1987 bringing together the World Bank, the WHO and the UNFPA responded to the challenge, resulting in the launch of the Safe Motherhood Initiative. However, there were still concerns over lack of progress on maternal health several years later, and a Safe Motherhood Technical Consultation in Sri Lanka in 1997 set out to focus on just a few important messages (Rosenfield and Min 2009). At the Sri Lanka meeting it was amongst other things decided to advocate for skilled attendance at delivery and EmOC rather than large scale antenatal risk screening, and this is largely the practice today. Traditional birth attendants (TBAs) do not come under the definition of skilled attendant, and as a consequence donors and governments have stopped supporting TBA training in many locations (Rosenfield and Min 2009). This lack of support for TBAs is acutely felt in places like South Sudan today, where TBAs might be the most easily available birth helper around especially for rural women. Realistically they will not be fully replaced by registered nurses or midwives for many years to come in South Sudan, and this leaves the population with a gap in birth assistance that is not properly taken into account by policy makers (DFID and BMB Mott MacDonald 2012).

The Sri Lanka meeting also described maternal mortality as a *social injustice*, reflecting the large differences between developed and developing nations on this issue. Mothers and children had been singled out for special attention already in the Declaration of Human Rights in 1948, and MCH was again framed in human rights terms at the International Conference on Population and Development (ICDP) in Cairo in 1994. At this conference a women's health movement sought to reframe family planning away from population control to a focus on women's health and

rights (Rosenfield and Min 2009). The consequence was that family planning, safe motherhood and sexual health were incorporated as *reproductive health*. These principles were further supported at the Beijing 1995 Fourth World Conference on Women.

3.2 Millennium Development Goals

In 2000 world leaders agreed upon the Millennium Development Goals, where MCH figures conspicuously as MDGs 4 and 5. In the process of deciding which goals to prioritize there was a discussion about including access to reproductive health on the agenda, given the close association with MCH and as a follow-up to the ICDP definition. However, reproductive rights are much more controversial in many countries, and because of pressure by a group of US-led social conservatives it did not become a separate goal in the end (Tolhurst, Raven and Theobald 2009). Today reproductive health issues are therefore reported under the MDG 5 instead (as target 5b), whereas they would clearly have received more attention and recognition as a separate Millennium Development Goal.

At the UN MDG summit in 2010 a renewed initiative to reach MDGs 4 and 5 was proposed under the name of Every Woman Every Child, with UN Secretary General Ban Ki-moon launching a Global strategy for women's and children's health developed together with the Partnership for Maternal, Newborn and Child Health. The strategy focuses on country-led health plans and predictable financing; integrated delivery of health services; stronger health systems; innovative financing and delivery of services; and improved monitoring and evaluation (Ki-moon 2010). A Commission on Information and Accountability for Women's and Children's Health was created in response to the strategy, with WHO tracking progress and reporting, and an independent Expert Review Group was set up to deliver input to the process.

One of the criticisms that have been raised against the MDGs is that they focus on average targets and disregard inequality within countries (Melamed and Samman 2013). There is now more focus on inequity and inequality in discussions about

prioritized goals post-2015, with health as one of the key themes emerging from current debates (Kjørven 2013).

3.3 Attaining the Millennium Development Goals

Despite the politicized process of agreeing upon the goals, the Millennium Development Goals process has made it possible to rally action around globally agreed development targets in an unprecedented fashion. Some goals are about to be achieved. For example one of the targets of goal number 1, halving the number of people living in extreme poverty, has already been met ahead of 2015 according to the UN MDG report 2012. Others are however lagging behind – and MDG 4 and 5 are notably amongst them. This is particularly the situation in sub-Saharan Africa. The MDG steering group for Africa has previously voiced concern about goal 5 in particular, calling for increased attention to health service infrastructure (MDG steering group 2008). It looks unlikely at present that these MDGs will be met by 2015 in this region, even though progress has gained some momentum lately. More attention has recently been paid specifically to the way that armed conflicts hamper progress towards these goals, and the World Development report 2011 stated that violence was now the main constraint towards reaching the MDGs (World Bank 2011).

Regarding MDG 4, following the revolution in child survival, under-five mortality has gone from an estimated 12.2 million annual deaths in 1990 to 6.3 million deaths in 2013 (Wang et al. 2014). This is a remarkable achievement and a testimony to how much progress can be made with a concerted effort. There are however many remaining deaths that could have been avoided by measures well known today. The ten countries with the highest under-five mortality in 2013 are all in sub-Saharan Africa. South Sudan has an estimated 106 deaths per 1000 live births and can be compared to the average 44 deaths per 1000 for all nations globally (ibid). In contrast, northern Africa has already reached the target (UN MDG report 2012). These deaths are unevenly distributed within societies as well, with rural children forty per cent more likely to die than their urban counterparts in sub-Saharan Africa (ibid). This urban-rural divide is also prominent in maternal health, and was clearly demonstrated in my fieldwork from one urban and one rural setting in South Sudan.

As for MDG 5 there were an estimated 293 000 maternal deaths worldwide in 2013 (Kassebaum et al. 2014). While the average maternal mortality ratio for developing nations was 233 deaths per 100 000 live births in 2013, eastern sub-Saharan Africa's MMR of 387 was even higher (ibid). South Sudan had the world's highest estimated maternal mortality in 2013 with a staggering 957 deaths per 100 000 live births (ibid). Almost two-thirds of births are now attended by professional assistants in the developing world as a whole, but in sub-Saharan Africa this is the case for less than half of the births. The situation for antenatal care is somewhat better, with 77% of pregnant women in sub-Saharan Africa currently attended at least once by a professional assistant during pregnancy (UN MDG report 2012). It is important to note that the situation in the region has improved somewhat and that progress is gaining momentum in some areas. Maternal health is however still characterized by extreme inequality both between poorer and richer nations and between poorer and richer women within societies, even in developed countries. The average MMR of 387 for eastern sub-Saharan Africa can be compared to the 12 deaths per 100 000 live births in the developed world, showing that almost all of these deaths can be avoided with appropriate resources at hand (WHO 2012). This is one of the main motivations for the focus on access to and use of health care services in my thesis.

3.4 UN processes

In addition to the focus on the MDGs, specific United Nations processes deal with Children and Armed Conflict, with Women, Peace and Security and with reproductive health of refugees. These are presented briefly below.

3.5 Children and armed conflict

A 1996 study by Graça Machel on the impact of armed conflict on children singled out recruitment and use of children by armed forces and insurgent groups as an alarming characteristic of contemporary conflict, and this issue has been central to much work following on from the report's recommendations. UN Security Council Resolution (UNSCR) 1261 (1999) focuses on the plight of children in armed conflict. It addresses six grave abuses specifically: recruitment and use of children as soldiers;

killing and maiming of children; perpetrating sexual violence against children; abductions; attacks on schools and hospitals as well as the denial of humanitarian access. Health issues are thus seen as integral to the wellbeing of children affected by conflict. A Special Representative of the Secretary-General for Children and Armed Conflict has been created, and UNSCR 1612 (2005) established a monitoring system to gather information on children in armed conflict. Currently, the UN Secretary General issues annual reports to the Security Council on the progress of work in this area, and countries or armed groups involved in any of the six grave abuses are reported especially in a 'naming and shaming' list. One of the issues currently in focus is the abuses that are still committed by the Lord's Resistance Army (LRA) in several countries, including South Sudan. A report by the Secretary General in May 2012 (UN SC 2012) detailed attacks on schools and hospitals and continuing insecurity for the population living in Western Equatoria province. After 2005 UNSCR 1882 (2009); UNSCR 1998 (2011); UNSCR 2068 (2012) and UNSCR 2143 (2014) have all expressed concern and urged action over the status of children in armed conflict.

3.6 Women, peace and security

The UN Security Council Resolution 1325 (2000) was a major landmark in political action on issues regarding women and conflict. It points out the absence of women in decision-making processes concerning conflict prevention and conflict resolution, as well as women's vulnerability to physical violence during wartime. I have earlier mentioned that this thesis responds to the resolution's call for more knowledge about the impact of war on women and girls. Several UN Security Council resolutions were passed over the next years, reflecting a greater international awareness about problems encountered by women and girls during wartime. Most of these are however focussed on the highly dramatic issue of sexual attacks in war, with maternal health as a less visible concern although these issues are linked. UNSCR 1820 (2008) was adopted in order to address sexual violence in conflict, and addresses it as a matter of or threat to international peace and security. It also aims at supporting victims of sexual violence, in part by providing basic health services. UNSCR 1888 (2009) followed up UNSCR 1820 and created the mandate as Special Representative of the

Secretary General on Sexual violence in Conflict. UNSCR 1889 (2009) and UNSCR 1960 (2010) also address these issues, as the international community wants to send a strong message that these crimes are taken seriously, and parties suspected of such crimes will be listed in the Secretary General's report to the Security Council. In 2013 UNSCRs 2106 and 2122 reaffirmed the UN's commitment to the women, peace and security agenda.

3.7 Reproductive health of refugees

An Inter-agency Working Group (IAWG) on Reproductive Health in Crises consisting of UN agencies, humanitarian actors and other partners has been working to improve the reproductive health of refugees and IDPs since its formation in 1995. The IAWG has helped exchange information, identify knowledge gaps and develop tools like the Minimum Initial Service Package (MISP), which is a set of activities that should be initiated at the start of a crisis in order to ensure the populations get reproductive health services. The group has been important in creating awareness of these issues, and has conducted reviews such as the 2004 global evaluation of reproductive health services for refugees and internally displaced populations (IAWG 2004). One of the findings from this review was that awareness of the importance of reproductive health issues had increased since 1995, including more focus on providing services to camp populations. They are currently initializing a new review of the same issues. However, while the IAWG is concerned with the reproductive health of conflict-affected women, most of their work has focused on refugees and IDPs living in camps, who have a very different (and often better) access to health care than the resident population staying behind in a conflict zone, as documented by Guha-Sapir and d'Aoust (2010). The latter group is in focus in this thesis – specifically because we do not have very much knowledge about them.

More recently the IAWG has paid more attention to the gap that exists between humanitarian settings and longer-term development, and the 2009 'Granada Consensus on Sexual and Reproductive Health in Protracted Crises and Recovery' addresses this fact (WHO et al. 2009). Such a strategy should bring in both the needs of displaced persons and of conflict-affected residents. South Sudan is one of the countries that have been fluctuating between an acute crisis and attempts at building

longer-lasting health care infrastructure, unfortunately going back to conflict mode at the time of writing.

3.8 Funding for reproductive health in post-conflict countries

A study that was undertaken by the RAISE initiative in 2009 assessed that reproductive needs were greater in conflict-affected countries than in other countries, and looked into whether funding for reproductive health (of which maternal health care is a part) was matching the needs accordingly. An overview compared official development assistance (ODA) from 2003-2006 to 18 conflict-affected least developed countries (LCDs) and 34 non-conflict LDCs. It was revealed that 2.4 % of ODA went to reproductive health in the conflict-affected countries as opposed to 8.9 % of ODA for reproductive health in the peaceful LDCs. There was thus a clear mismatch between funding and the increased needs in conflict countries (see table 1).

Table 1 Average indicators and ODA for conflict-affected LDCs versus non-conflict-affected LDCs

2003-2006	LDC conflict-affected	LDC non-conflict-affected
Numbers of countries	18	36
MMR	1041.3	716.69
Total fertility rate	5.9	5
Reproductive health ODA per capita in USD	1.5	2.3
Reproductive health as % of all ODA	4.4	8.9

Table copied and reworked from RAISE (2009:2)

3.9 Introducing user fees in the health care sector

Globally there is increased pressure on hospitals and the health care sector to provide high-quality level health care while keeping costs down, and some claim that actors like the WHO have contributed to this by providing a manual for assessing hospital

costs (Aboagye, Degboe and Obuobi 2010). One of the strategies employed to increase income has been the introduction of user fees for health care services. Keeping in mind the combination of increased needs and lower international funding for reproductive health in conflict countries that was documented by RAISE (2009), this issue is of particular relevance to conflict-affected countries which like South Sudan might consider introducing user fees as a means of raising funds for the health care sector.

User fees were introduced in the late 1980s and early 1990s in many sub-Saharan African countries as a means of financing government health services, increasing their quality and creating accountability with the local community, but as there has been more focus on the negative effects on the actual use of such services the policy has become less popular (Perkins et al. 2009). Some studies focussing on the relationship between costs and use of maternal health care services have been undertaken. In their study covering Kenya, Tanzania and Burkina Faso, Perkins et al. (2009) found that women often spent a significant proportion of household income on maternity care, and that poor women paid almost as much as rich women in the three countries. As such, delivery costs may increase differences between poorer and richer segments of the population. Another recent study focussing on health expenditure at three hospitals in Ghana made it clear that user fees only covered a minimal part of the actual cost of service provision anyway (Aboagye, Degboe and Obuobi 2010), further calling this policy into question.

Attempts have been made to introduce exemption to fees for services one wants the public to use more, such as various forms of maternal health care. Bosu et al (2007) found an increase of institutional deliveries in 23 hospitals in Ghana when such fees were waived. The health care system in Ghana was seen as able to cope with the increased workload. Similarly, providing free institutional delivery and caesareans at regional hospitals in Senegal also increased their use (Witter et al. 2010). However, the authors contend that the policy had introduction problems and needed to be followed up carefully and matched with more resources, both financially and in the form of staffing. Similar attempts in South Africa had very mixed effects on patient attendance, and the staff reported being much more stressed (Wilkinson et al. 2001). Ultimately, the discussions of user fees relate to a larger debate about the different

preferences often found between health care providers and consumers in developing countries, and the difficulties in providing high-quality health care in low-resource settings (Berlan and Shiffman 2011).

4 South Sudan

Previous chapters have examined how different political processes have influenced the visibility of MCH and of children and women in armed conflict. High level politics were also crucial in determining military support and even relief aid especially during the Cold War. Douglas Johnson (2011) provides a rather sobering story of manoeuvres by the Sudanese regime and different actors in world politics that had direct bearings on the aid that was – or was not – provided to the suffering Sudanese population. While it is widely known that finding oil has influenced the fighting and which areas are disputed between Sudan and South Sudan, a perhaps lesser-well known story – but one that is more relevant to this thesis – is about how relief aid was manipulated by the parties during the war. This chapter will highlight some of the issues that most influenced the delivery of relief aid at various times up until oil questions took precedence.

The field work and the questions I explore relate to the period called 'the second civil war' in Sudan, from 1983 until the signing of the Comprehensive Peace Accord (CPA) in 2005. When I refer to accounts of the conflict it is this period I refer to. In December 2013 new fighting broke out within South Sudan, and at the time of writing it was not possible to assess the full impacts this would have on civilians including prospective mothers. However, as access to maternal health care had obviously improved after the cessation of hostilities in 2005, the new fighting makes me very pessimistic about their situation.

4.1 Aid to Sudan during the second civil war

The informants I interviewed in Juba said that they were often reliant upon foreign organizations that provided assistance for maternal health care, food and other resources during the war. Such help is however often not only based on needs assessment, and the conflict in Sudan provides an example of how politics have influenced outside parties' interests in a war. Because the second civil war was so protracted it lived through three consecutive US administrations with different foreign

policy objectives as well as large changes brought about by the end of the Cold War, something that had a tangible impact on outside intervention in the conflict.

When the second civil war started in 1983 Ronald Reagan was president of the United States, and he was a staunch supporter of the (northern) Sudanese regime. In a Cold War climate the SPLA's tight connections with the Marxist regime and Mengistu in Ethiopia further did little to help them in the eyes of other countries that might otherwise have been supportive. Johnson D. (2011: 146) claims that US financial support was crucial to several Khartoum regimes, apart from having a direct bearing on the relief aid that was provided. Efforts were made by the warring parties on both sides to win outside sympathy and influence where aid was delivered. In these early years the Sudanese regime had made the improbable claim that only 3% of the civilian population in the south was in areas outside their control, something that could hardly be true given the dispersion of the population and the pattern of control of areas at the time. They managed however to get US support for this position, making the US National Security Council claim that no relief aid was needed in the south outside towns held by the government (Johnson D. 2011: 146). The regime also got several UN agencies to agree to this idea, and in 1986 the then Secretary General forbade UNHCR and the WFP cooperation with the SPLA (ibid). This would severely restrict aid delivered to the southern population, which was much harder hit by the war's consequences than those living in the north. In addition SPLA watched how much of the relief intended for civilians in government-held towns was diverted by the army and others without provoking any reproach from the outside world, at the same time as their own transgressions attracted much international criticism. This naturally created in them an ambiguity towards international actors and organizations that was to last many years (Johnson D. 2011: 147).

Apart from obstructing aid to southerners in need, the other consequence of this policy was a total unpreparedness for coping with the situation that followed Mengistu's fall in Ethiopia in May 1991. By 1989 the Cold War was coming to an end, and in 1991 the Bill Clinton administration was in place. Several NGOs that were unhappy with the UN's policy had made their own contact with the SPLA and set up some relief operations independently in the south. The UNICEF followed, operating out of an office in Nairobi, and actually contributed some health aid *hors loi* in these

years. International press covering the floods in 1988 finally drew attention to the out flux of people from Bahr-al-Ghazal in 1988 due to fighting, and the world seemed to start realizing that much of the human misery seen in these years was created or exacerbated by the fighting. By then UNICEF was positioned to negotiate both with the north and the south in what was to become Operation Lifeline Sudan (OLS) in 1989 (Johnson D. 2011: 148). The OLS would in time become one of the world's largest aid operations. Still, in a large part because of WFP policy (ibid), they were totally unprepared to handle the influx of perhaps 200 000 displaced persons in the south when the refugee camps in Ethiopia were suddenly emptied in 1991 after Mengistu fell. Due to the previous years' policy there were not enough resources on the ground to handle food aid for all these people, and the Sudanese regime's earlier manoeuvres vis-a-vis international actors thus had far reaching consequences for the relief aid that could be distributed.

Similar tactics were employed again after the split in SPLA in August 1991. The Nasir faction which came to cooperate with the northern regime controlled a much smaller territory than the SPLA Torit faction (which was the main faction and under Garang's leadership). The government, which had previously done much to restrict relief access to the south, now changed its policy to allow OLS relief to the populations in the SPLA-Nasir areas while still obstructing relief access to the SPLA-Torit areas (Johnson D. 2011: 150). The government's allowing OLS access to the south at all was dependent upon receiving even larger amounts of aid to populations in government-held towns, while OLS relief aid and support from other agencies also became objects to be won in the fighting between the SPLA factions. At this stage in the war the relief aid and external support was being manipulated on an even greater scale than before (ibid).

The overthrow of the democratic regime in 1989 had made development aid to Sudan come under an international embargo. This led to a substantial drop in development aid to Khartoum, and according to Douglas Johnson the regime then changed its strategy to define relief as part of a development strategy instead (Johnson D. 2011: 150). This mixing of discussions about relief, development and peace is something that also the SPLA has participated in with slogans like 'peace through development',

and that has led to a substantial securitization of e.g. health in the south (something Bennett et al. (2010) claim is a misconception, as previously discussed).

In 1998 the attacks on the US embassies in Nairobi and Dar-es-Salaam brought Osama bin Laden's name up on the US' if not the entire international community's radar. Sudan had already been declared by the US to be 'a country sponsoring terrorism' and it had hosted bin Laden at home. When George Bush junior took charge after the election in 2000, and with the events of September 11 2001, relations with the US were strained, but there was also an interest in 'constructive engagement' and opposition to sanctions that benefited the oil companies involved (Johnson D. 2011: 165). Finding oil and constructing the first pipeline in 1999 had directed some of the fighting as new resources were introduced into the equation, and that part is better known in general due to a large focus on the oil questions and human rights organizations' coverage of the abuses that have taken place in order to clear land for drilling (see e.g. Human Rights Watch 2003). This Bush regime was in all events to be the administration which finally oversaw the signing of the Comprehensive Peace Agreement in 2005, as part of a troika (the US, UK and Norway) supporting the Intergovernmental Authority on Development (IGAD) led negotiations. The peace process and its outcomes are sufficiently covered in other literature, and the end of regular fighting only provides a backdrop to the focus on maternal health in this thesis.

This is short rendition of a much longer history of manipulations during the second civil war. A point I wanted to highlight is that one of the conclusions Douglas Johnson draws is that the war has continuously been waged as a *resource war* (Johnson D. 2011: 151). Territory, foreign support, relief aid, oil and even the population itself has at times constituted the battleground to be won. This information relates to the patterns of fighting and health care that were seen in my two interview locations in what is now South Sudan. Juba was fought over but kept by the northern government, which directed its own and OLS resources towards the town. Magwe was less interesting from a military standpoint, at the same time as it received less help during the long civil war. I should however be careful about drawing absolute conclusions about fighting patterns here, as I could not compare exactly the fighting in the two areas based on my interviews.

4.2 Improving maternal health care in South Sudan

After a period of highly politicized aid to the country during the second civil war, donors pledged quite substantial sums to help rebuild the two countries. At the time of writing a new donor conference for South Sudan will take place in Oslo on 19 and 20 May. The slow build-up of maternal health care documented in the interviews and information from South Sudan appeared to be compounded by a lack of institutional capacity as much as a lack of funds per se in the earliest years after the Comprehensive Peace Agreement (CPA). In contrast with many other conflict-affected countries South Sudan already had substantial financial means available, but the Government of the Republic of South Sudan's (GOSS) income comes almost exclusively from oil. Recent disputes with the North have amply highlighted the risks of relying too heavily on oil income. In addition to its own revenues GOSS receives international aid, and more than 500 million USD were pledged by donor countries shortly after the signing of the CPA to help the reconstruction and development needs of Sudan (World Bank 2011). The funds allocated to the south were gathered in the so-called Multi-Donor Trust Fund-South (MDTF-South) administered by the World Bank. However, even with substantial funds secured, rebuilding the country and improving maternal health will remain important challenges.

Before the current fighting, it appears that several problems had delayed implementation of the plans to develop the health system. A Joint Assessment Mission was undertaken by the World Bank and UN in order to create plans for post-conflict reconstructing and use of the MDTF-South. Individual NGOs were meant to apply to become 'lead agents' for each state, supporting the Ministry of Health in coordinating service delivery and filling in gaps. However, most NGOs are set up for delivering services, not for fulfilling management roles, so the MDTF-South in its initial form was not very useful for this purpose. In addition, implementation of the plans was meant to take at least two years, leaving a gap for immediate service delivery needs (BSF 2005). Due to the slow implementation of this plan a Basic Services Fund (BSF) where NGOs can apply for project funds was created in 2005 by the UK Department for International Development, supporting projects in primary education, primary health, and water and sanitation. The BSF today has funds from

more donors, reflecting attempts to coordinate aid, whereas other donors like the USAID have been operating more independently in the health sector. The BSF was initially only supposed to run for two years (BSF 2005), but has recently been extended through 2013 (DFID and BMB Mott MacDonald 2012). The recent assessment by Bennett et al. concluded that the MDTF-South was not working very well, but that the Basic Services Fund was one of the more successful initiatives after the CPA (Bennett et al. 2010). The report also found that the greatest share of health care services was still delivered by the international community, despite plans for the GOSS to take over. How the international community will react to the current situation is another question.

4.3 South Sudanese policy on maternal health

High maternal and child mortality had been recognized as a problem in South Sudan since after the CPA according to various policy documents. The Sudan Household and Health Survey from 2006 revealed staggeringly high maternal mortality, and was for a long time referred to as a baseline to measure progress against in e.g. government and BSF documents despite the problems of conducting a survey for the first time in a war-torn country. When the GOSS Ministry of Health laid out its plans, the newest data from Kassebaum et al. (2014) were not available. The GOSS Ministry of Health has since 2009 had a strategy for maternal, neonatal and reproductive health that aims at reducing the maternal mortality ratio by some 18 % over a period of 10 years until 2015 (GOSS MoH 2009). This would have been a great feat especially in South Sudan where the challenges of building up the health care system are quite daunting. The GOSS has had several policies on maternal health already, but the goals have usually been equally unrealistic in my own opinion. Organizations working through the BSF have been attempting to scale up the number of women attending 1 and 4 antenatal care visits as well as the number of births assisted by skilled birth attendants (DFID and BMB Mott MacDonald 2012). While the number of women attending ANC have been on target, the number of births attended by skilled professionals has lagging behind the target (ibid) – and this is one of the most crucial factors in reducing maternal mortality. At the same time, support for traditional birth attendants (TBAs) has been withdrawn. While this is in accordance with developments in WHO

policy as described previously, it leaves a shortfall in delivery aid capacity on the ground. Even if fully trained nurses and other professional staff would be better equipped to handle deliveries, a gap in staff availability was created that would not be closed for a long time because of the time it takes to train and deploy new personnel (DFID and BMB Mott MacDonald 2012).

Compounding these problems is reaching out and building up services in places as different as Juba and Magwe. Population structure, infrastructure, accessibility and the international presence in Juba and Magwe was very different during the second civil war, and will still be for a long time. For a woman in Magwe, even getting to the referral hospital in Nimule was out of reach when I conducted the field work. With the current fighting it is possible that the situation is now even worse. For a long time to come, for these women it will indeed be ‘if there is no money you will die’ (which is a quote used in the title of article 4).

5 Previous Literature and Theoretical Expectations

Previous chapters have highlighted how I think that studying the impacts of civil war on maternal and child relates to research on human security, but to direct my work and create more specific hypotheses I consulted previous work on armed conflict and health in general as well as a small body on armed conflict and maternal and child health in particular. Three of my articles deal with maternal health, with one looking at child health. I will now place my articles and the choices I have made within this literature before discussing the findings in earlier articles with a quantitative and qualitative approach. The following review is not meant to be exhaustive, but is rather an attempt to categorize different types of research exploring these questions.

5.1 Conflict and health

In recent years there has been an increase in the number of publications treating the subject of health consequences of war in general, and a small body of literature investigating MCH in conflict in particular. Levy and Seidel's edited volume *War and Public Health* from 1997 presented different aspects of the impact of war on health, and Murray et al. (2002) also proposed to treat war as a public health problem. Another important work was the 2002 WHO world report on violence and health (Krug et al. 2002) which included some information on collective violence (i.e. war), and where it was attempted to distinguish between direct and indirect health consequences of conflict. More recently there have been attempts at bringing together social science and public health scholars with people from the humanitarian aid community to increase mutual knowledge and understanding, and forums such as the Centre for Research on the Epidemiology of Disasters (CRED) and Households in Conflict Network (HiCN) have been central to this effort. The Journal 'Health and Conflict' started publishing in 2007, drawing on knowledge from different research perspectives, and following a joint initiative both the Lancet, Social Science and Medicine and the Danish medical journal had special issues on conflict and health in 2010. The Harvard Humanitarian Initiative has a section focussing on Women in War, and the IAWG mentioned earlier and the RAISE initiative work to increase awareness about reproductive health in emergencies. These efforts have contributed to bringing

concerns over conflict and health up on the international agenda. The report of the high-level panel on MDGs in 2010 contained language on the detrimental effects of conflict in trying to attain the Millennium Development Goals, and the 2011 World Development Report treated the subject of 'Conflict, Security and Development'. Conflict and health issues are thus far more visible than they were just a few years ago. However, the body of research focussing on conflict impact on maternal and child health specifically is still very limited. This thesis attempts to add to that literature.

5.2 On conflict casualty estimates

There are many different ways of *conceptualizing* conflict casualties depending on whether one is interested in direct or indirect casualties; whether one wants to include only deaths or also injuries and disease cases; whether one wants to investigate casualties during conflict or both conflict and post-conflict; and so on. These different conceptualizations then lead to different *operationalizations* of the information one is interested in. Finally there are different ways of *collecting data*, and in the next sections I will present some of the various solutions scholars have used.

Total conflict mortality

In order to estimate the *total* death toll from war one must include both direct and indirect deaths, a task that has proved very difficult. However, what scholars appear to agree upon is that in many conflicts the deaths due to indirect causes outnumber the direct or violent deaths. The Geneva Declaration (2008) provided an estimate of how much of total war mortality was due to violence in different African conflicts, drawing on several sources. The table below is reworked from their data.

Table 2 Proportion of violent deaths to total deaths in selected African conflicts

Conflict site	Violent deaths as percentage of total war deaths
Northern Uganda, 2005	15
DRC, 1998-2002	<10
Congo-Brazzaville, Pool region, 2003	17
Burundi, 1993-2003	22
Sierra Leone, 1991-2002	6
Darfur, Sudan, 2003-2005	31
South Sudan, 1999-2005	<10
Angola, 1975-2002	11
Liberia, 1989-1996	14

Adapted from Geneva Declaration (2008: 40)

It is striking that the number of violent deaths constitutes such a small proportion of the total estimated deaths due to war in all these cases. A similar table reported in the Human Security Report 2005, distinguishing between battle deaths and all other war deaths, estimated a very small percentage of battle deaths (3-8 and 3% respectively) for the first and second civil wars in Sudan. (The lower numbers in the HSR 2005 were estimated for battle deaths, not all violent deaths as in the table above, and for the total duration of the war in Sudan.)

Collecting data

Any attempt at providing information about the total number of deaths due to conflict must take into account what the normal level of mortality is, in other words, how high the baseline mortality is. While a surveillance system (real-time reporting by hospitals etc.) is by far the preferable method for collecting information on war casualties and establishing the baseline mortality, such systems often do not exist precisely in those environments where wars are most common. In the absence of surveillance systems other methods have to be used. One of these is incident-based reporting, meaning reporting based on news reports and other historical documents. This is a method that can be used to collect data on e.g. battle deaths but which will not give good

information on indirect casualties, which tend not to be reported. Such methods are much used in conflict datasets, and a dataset on battle deaths has been developed using this method. According to Lacina and Gleditsch (2005) the number of battle deaths has declined in an uneven trend ever since the Second World War. The Human Security Report Project has used this dataset together with other sources of information to draw the conclusion that there is a general trend of falling number of deaths due to armed conflict.

While incidence-based data like those in the battle deaths data referred to above are much used they will necessarily be incomplete due to under-reporting, and typically provide lower conflict mortality estimates than e.g. survey-based datasets. As an example, the data on battle deaths and the conclusion that the number of such deaths are going down was disputed by Obermeier and colleagues in an article in the British Medical Journal. They reached a much higher mortality estimate using a survey methodology, and questioned the downward trend (Obermeier et al. 2008). However, these findings were in turn disputed by Spagat et al. (2009) who defended the use of incidence-based data and pointed to apparent mistakes in the Obermeier et al. article, showing how contested this field is. Conducting surveys during conflicts is also fraught with problems, and recent debates on total conflict mortality have centred on establishing appropriate baseline mortality as well as selecting regions that are more or less violence-prone to represent a whole country. Debates over excess war mortality (i.e. deaths that would not have occurred if there was no war) in places like Iraq and the Democratic Republic of Congo must be seen in light of this difficulty.

Finally it is possible to use demographic methods and look at population composition to determine excess war deaths. A healthy population displays a certain dispersion of age and gender groups that can be taken as a reference point in order to detect anomalies. For example, in western societies it is common that women outnumber men in all the older age categories. The 2008 census revealed that South Sudan has an unusual population structure, with 4.29 million males and 3.97 million females, and men outnumber women in all age categories above 40 years. This could in theory be due to more displacement among females, but at least data on the sex of IDPs in northern Sudan do not support that idea. A previous report by the South Sudanese statistics bureau has suggested that the missing women may be due to high maternal

mortality during the war (NSCSE 2004), and based on my findings in the interviews from South Sudan I find that a high war-time maternal mortality is likely part of the explanation. We do not however know how many of these apparently missing women died due to maternal causes, and who are among those I call *uncounted war deaths*.

In my two first articles I combine health data from surveys with data on conflict *events* based on incidence reporting. As long as we do not have health surveillance data or some form of complete conflict recording available I believe that these are the best possible options.

5.3 Refugees, internally displaced persons and residents

It can be noted above that the ratio of violent deaths to total excess deaths changes substantially from conflict to conflict (table 2), depending on the context. One contextual factor I would like to mention here is the number of people who stay on as residents versus those who flee, either as internally displaced persons (IDPs) or as refugees. Guha-Sapir and d'Aoust (2010) describe how these three population subgroups often face very different health conditions during wartime. In line with the shift in thinking discussed in the section on human security, states did not interfere so much in other states' internal matters before the end of the Cold War, and one consequence of this was that IDPs were not previously under the mandate of the United Nations High Commissioner for Refugees (UNHCR). That has however changed today, and refugees and IDPs that are under UNHCR protection are now usually *better* off than residents (Guha-Sapir and d'Aoust 2010). Residents in areas affected by conflict are often not adequately included in regular development planning (ibid), and whereas there is good knowledge about camp populations once a camp has been established, there is often a lack of knowledge about the specific needs of those who stayed in their home areas. My focus on the resident population in these articles will therefore hopefully contribute to closing a knowledge gap.

5.4 Gender and age differences in conflict impact

Previous research shows that women, children and men are vulnerable in different ways during wartime. Many studies show that men tend to be more targeted by direct violence (probably except for sexual violence), whereas women and children suffer from more indirect consequences (e.g. Ghobarah, Huth and Russett 2003; Plümper and Neumayer 2006; Coghlan et al. 2008; Alkhuzai et al. 2008). The focus on indirect effects of war in this thesis is not meant to downplay the importance of violence and violent deaths that happen during war and the fear they create. Simply, the indirect casualties receive a great deal less attention than direct deaths due to combat and violence and it is necessary to bring more attention to indirect population effects in general. Not even the women I interviewed in affected communities thought of giving birth as a very dangerous war time event, although the risk of dying in childbirth would increase especially in areas that were cut off from medical services. Because maternal deaths are a rare occurrence, relatively, this information is only available through the accumulation of quantitative data (Ahmed and Hill 2010). This information has however usually not been collected, and we will probably never know exactly how many women died due to maternal causes due to the war in places like South Sudan.

Several authors have claimed that children are those who suffer the greatest burden in conflicts. Guha-Sapir and d'Aoust (2010), for example, drew on insights from many surveys in conflict-affected areas assembled in the CRED database to assert this. Ghobarah, Huth and Russett (2003) showed that children were affected by many more disease categories than adults. They studied cross-national variation in 1999 data on Disability Adjusted Life Years (DALYs), which is a measure derived from WHO that takes into account the years people in a society are expected to live with disability or die early due to different ill health conditions. They found that the effects of previous civil wars on health outcomes were as strong as the results from wars conducted that same year, and particularly negative for children. Iqbal (2010) demonstrated that major conflicts and minor conflicts that last a long time significantly increased infant mortality in a worldwide sample using World Bank data. Kim and Fernandez (2009) reported finding up to 69 times higher under-five mortality in conflict countries

compared to selected benchmark countries. Children are the most vulnerable part of the population in peacetime and those who succumb easiest to disease and death in wartime.

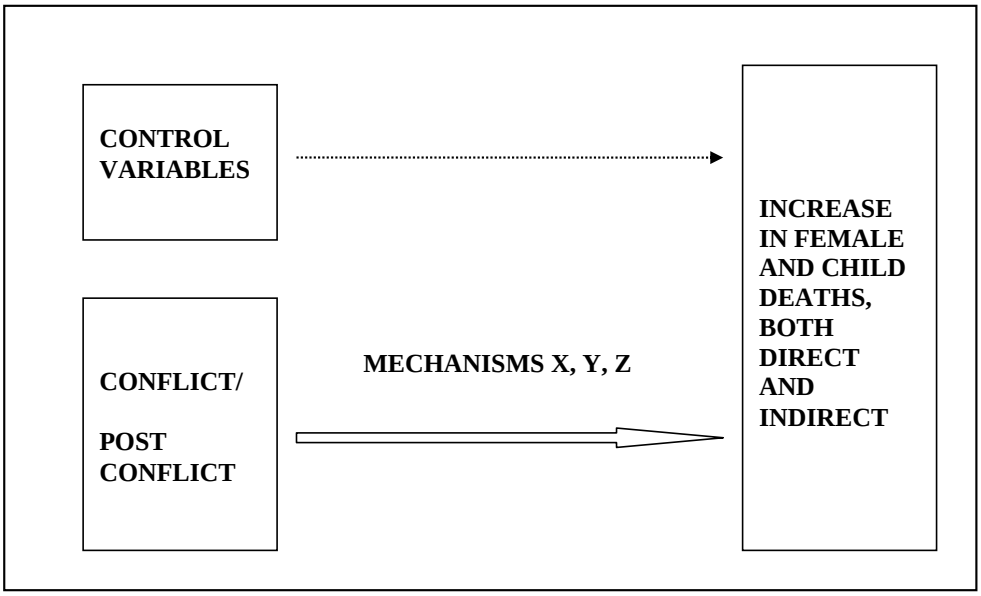
As for gender differences, Ghobarah, Huth and Russett (2003) further argued that women were more affected by civil war's long term negative consequences than men in terms of lost DALYs. Plümper and Neumayer (2006) analysed data on life expectancy, and found that high intensity ethnic conflict tended to decrease the natural gap between female and male life expectancy. They argued that armed conflict affects women more than men, but it should be noted that their results are for one sub-category of armed conflict. Li and Wen (2005) examined effects on mortality for the adult population, and found that men suffered more than women from immediate effects of civil conflict, but in periods following conflicts, men and women had an increased mortality level which was approximately equal. Iqbal on the other hand found that minor conflicts led to negative effects of a similar magnitude on both male and female life expectancy in Africa, but the worldwide estimates only provided significant results for major conflicts on males (Iqbal 2010). While it is easy to understand that the direct violence in conflict affects men, these studies confirm that there are important indirect effects of war on women, and this is worthy of more investigation.

5.5 Different models of conflict impact on health

In the following I will present further research approaches that have been used to investigate more in detail *how* the negative effects of war operate on health. In the literature mentioned above, what is done is to hypothesize various mechanisms (X, Y, Z in figure 2) that are responsible for the increase in female and child deaths and disability seen during conflicts or in post conflict situations. However, empirically, most of these studies actually only measure the direct link from conflict/post conflict to a very aggregate measure of female and child deaths (i.e. the thick arrow in figure 2) net of different control factors, and then rely on the plausibility of the proposed hypotheses to explain this. While such studies are very useful for determining overall effects of conflict on deaths and disability, they are less useful when it comes to

investigating the exact channels or mechanisms responsible for these effects. When researchers have employed measures like life expectancy, Crude Mortality Rates etc. as dependent variables these measures incorporate changes on a societal level, but are too general to guide any action to remedy the consequences due to war more concretely.

Figure 2 Typical model in literature on quantitative health effects of conflict



In the literature I refer to, there is no clear agreement on how to model the effects of war on health more specifically, i.e. what the factors X,Y,Z in figure 2 would be and what the relevant control factors are. Guha-Sapir and d'Aoust (2010), Iqbal (2010), Plümper and Neumayer (2006) and d'Harcourt and Purdin (2010) all provide different examples in their theoretical discussions. In addition the empirical studies make use of different datasets, different time periods and different types of conflict (civil wars/interstate), so that generalizations are difficult to make. It is highly possible that the effects of interstate and civil war on health are different, but I would argue that we do not yet have enough studies that compare such effects to be able to draw that conclusion with certainty. I focus on civil wars because they are more numerous these days, especially in sub-Saharan Africa. A further point is that it is often impossible to

separate between effects happening during a conflict and after a conflict. This may seem like a minor point but it adds to the number of effects that are difficult to disentangle, and new research by Noden, Pearson and Gomes (2011) has demonstrated how age-specific mortality in Mozambique varied from the conflict to the post-conflict phase. A qualitative research approach might be able to shed additional light on this question. Using interviews in the case of South Sudan I was able to demonstrate that somewhat different factors hindered access to health care services during and after the war.

5.6 Channels of impact

While studies of overall increases in mortality are useful in themselves in demonstrating war's deleterious impact on population health, it would be easier to guide action to counteract these effects with more concrete information about how they occur. Some scholars have demonstrated concretely how wars impact the infrastructure or the economy (as examples of mechanisms X, Y, Z in figure 2), which in turn are shown to have negative effects on different health measures. Ghobarah, Huth and Russett (2004) investigate how involvement in enduring military rivalry first leads to lower spending on public health, in addition to demonstrating the more direct effects of civil war on a public health measure called HALE (health-adjusted life expectancy). Iqbal (2010) also separates out effects on the economy, showing that states involved in wars reduce their spending on health significantly, and this is then expected to lead to a deteriorated health situation. She further demonstrates that much of the effect of civil war on life expectancy and infant mortality is channelled through an effect on *infrastructure* measured as DPT (diphtheria, pertussis and tetanus toxoid) and measles vaccination, telephones and roads in a two-stage model. This is interesting as background information for my articles which have a focus on health care services, showing more specifically how civil wars may contribute to poorer health.

A different strand of literature uses more detailed geographical measures of war and its effects (sometimes termed micro-quantitative data) to provide more exact specifications of impact of war, following a general trend of disaggregating the study

of civil war. Networks such as HiCN and MICROCON are important in this effort to find out more about how conflicts have an impact on health issues, and my first two papers are connected to this type of research. Using micro-quantitative data has also been hailed as raising the prospect of fruitful cooperation between quantitative and qualitative scholars (HSRP 2011: 44), as it involves studying phenomena that are much more similar in nature. Equally, by using micro-quantitative data one can account more easily for the fact that a conflict may have different effects in different parts of a country, something that is an important point in my papers.

Some recent work in this line has focussed on the impact of wars on children. After writing a series of papers using survey data from Rwanda and Burundi, Verwimp, Bundervoet and Akresh have presented an overview over channels of impact on child malnourishment and stunting. They sum up that forced displacement and theft and burning of crops lead to child malnutrition in Burundi. In Rwanda, both crop failure and war led to malnourishment (and hence stunting) of both boys and girls (Verwimp, Bundervoet and Akresh 2010). Exposing children under five to conflict was assumed to have long-term negative consequences, both for health more generally and for school participation, grade attainment, cognitive development and income earnings potential (ibid). Kim and Fernandez (2009) showed how child vaccination rates of DPT-3 (the third dose of DPT vaccination) and measles vaccination went down in times of violent conflict as a sign of poor health system performance, and reported higher under-five mortality. O'Hare and Southall (2007) also found lower rates of DPT-3 in conflict countries in sub-Saharan Africa, as well as higher infant and under-five mortality, and rates of under-fives that were moderately underweight. In the second article of this dissertation we looked at civil war impact on fever in children as a measure of health status more generally, and on measles vaccination as a measure of contact with health care services. The disaggregated studies mentioned above measured malnourishment as an important outcome, and this is also a factor that would make children more vulnerable to disease – as indicated by fever – more generally.

5.7 Conflict impact on maternal health

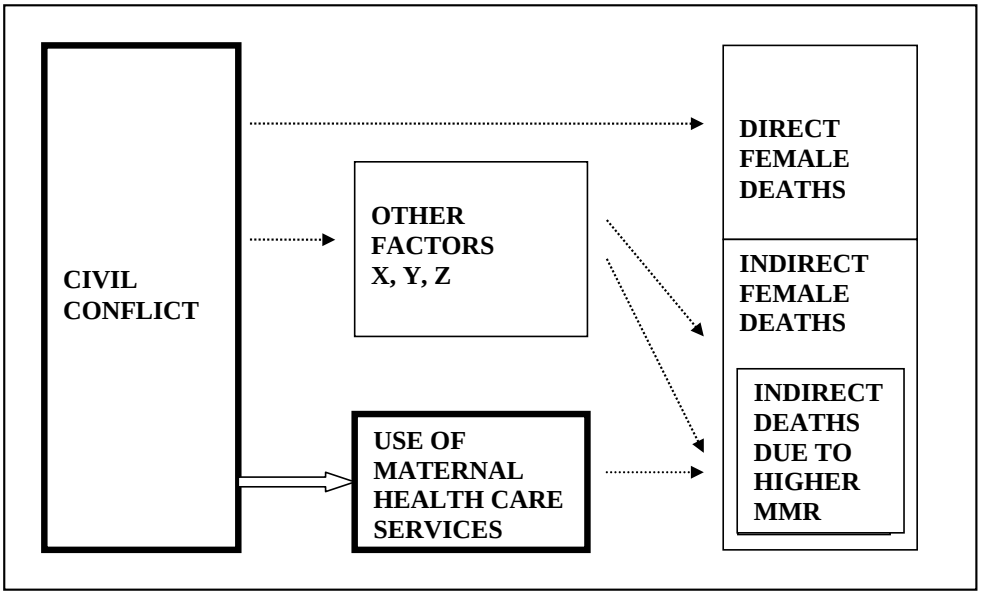
None of these studies mention the impact on maternal health specifically, but this is a likely means by which wars have an indirect effect on female health, given the importance of maternal health for female health overall in developing country settings. Several studies do indeed provide support for this link. The first article by Ghobarah, Huth and Russett (2003) referred to above does not test specifically the mechanisms through which civil wars operate on health, but in using DALYs as the dependent variable provides some evidence as to which disease categories are responsible for the largest loss of DALYs. Various infectious diseases are the most important drain on health, with malaria and other infectious diseases accounting for the largest loss of DALYs overall. However, for women aged 15-44 there is a very strong effect for impact of civil due to 'maternal conditions'. The result is not elaborated upon by the authors, but indicates that civil wars in their study clearly have a negative effect on maternal health. Urdal and Chi (2013) found a slightly elevated maternal mortality rate in conflict-affected countries.

Analysing further, some studies go from stating that maternal health becomes worse in conflict setting to focussing on the use of health care services more specifically. O'Hare and Southall's bivariate analysis concludes that maternal health is substantially poorer in sub-Saharan African countries affected by conflict. They find that both adjusted and reported maternal mortality is higher, and that the number of births attended by skilled personnel is significantly lower than in peaceful countries (O'Hare and Southall 2007). Chandrasekhar, Gebreselassie and Jayaraman (2011) find that the conflict in Rwanda stalled progress in improving maternal health care, by slowing down progress in the number of women attending antenatal care and being assisted by skilled attendants at birth. In addition, the number of women giving birth at home was actually higher in the period covered by the survey in 2005 than in 2000 and 1992.

Compared to the studies that treat conflict impact on overall female mortality, such a focus on conflict impact on maternal health and on the use of maternal health care services goes a long way towards explaining more clearly how armed conflicts have

an effect on female death and disability. This is similar to the model I have used in the first article in my dissertation, as shown in figure 3 below.

Figure 3 Framework for article 1



The framework in figure 3 is similar to the one that is used in the second article on child health, except that this article also investigates an effect of conflict directly on a health measure (fever) in addition to the effect on contact with the health care services (measles vaccination status).

Lastly, while all these studies deal with impacts on maternal health or on the use of maternal health care services, they have mostly focussed on other aspects than the specific reasons *why* women are not using these services. The journal Reproductive Health Matters produced a special issue in 2008 which concentrated on armed conflict's impact on reproductive health. While focussing mostly on refugees and IDPs in Asia, some channels of impact that were identified as leading to poor maternal health might be relevant for my own studies. Mullany et al. (2008) demonstrated how the junta in Burma had made traditional health care services based on assisted delivery in clinics nearly impossible to use in eastern parts of the country.

Due to a scattered population structure, transport problems and security fears as well as actual destruction of the health facilities, record high maternal mortality levels were subsequently recorded in those areas. Instead, a system with mobile clinics was tried out with some success. The study by Mullany et al. does however only provide a short description of the reason why the traditional health care services were unusable, and most of the article details how a system of mobile clinics was tried out. I attempt to explore this issue in more detail by undertaking a more precise study of the barriers to the use of life-saving maternal health care services in two settings in South Sudan (article 3). In figure 3 this amounts to breaking up the thick arrow from 'civil conflict' to 'use of maternal health care services' in order to investigate further what the mechanisms were. This approach further allowed me to explore more how other factors were affected by conflict and how they in turn affected the use of potentially life-saving health care services. The third article therefore represents an improvement over the inevitable simplifications that are introduced in the first two articles.

McCarthy and Maine

Finally, in terms of relating to previous literature and research models it is further necessary to mention the proposed framework by McCarthy and Maine (1992). These researchers set up a framework for studying the determinants of maternal mortality and morbidity, dividing impact factors into *distant* and *intermediate* determinants following Bongaarts' highly influential article on proximate determinants of fertility (Bongaarts 1978). Mosley and Chen (1984) later developed a similar framework for ordering determinants of child mortality in developing countries. In McCarthy and Maine's framework the 'socioeconomic and cultural factors' are grouped as distant determinants operating on the intermediate determinants, which are health status; reproductive status; access to health services, and use of health services. These intermediate determinants then influence more directly on the maternal outcomes pregnancy, complication and death/disability (McCarthy and Maine 1992:25).

It is a little unclear where a factor like 'armed conflict' would be put in this scheme, perhaps outside it pointing to all three levels, as conflicts can have direct consequences for both the distant and intermediate determinants as well as on pregnancy outcomes through direct violence. However, introducing a factor that

operates on all three levels will take away some of the usefulness of the framework by 'messing it up', in that the framework is meant to present how the distant factors must operate clearly though the intermediate factors on the outcome.

The researchers acknowledged that it would be near impossible to study all the factors included simultaneously. Rather, their framework was meant to guide research efforts and provide newer studies with a clearer sense of their contributions and limits (McCarthy and Maine 1992: 30). With my focus on both the use of and access to health care services I am investigating armed conflict's impact on two of the intermediate determinants in McCarty and Maine's framework.

6 Research Approaches, Methods and Data

In the following I will first discuss the relationship between research with a quantitative and a qualitative (a case study) approach, and present how my articles with different approaches are integrated. This discussion relates to general differences, and expectations before the studies were actually conducted. I will then present the data, data collection process (interviews) and methodology used in the different papers with a quantitative (papers 1 and 2) and qualitative (papers 3 and 4) research approach. With a quantitative research approach (where the researcher does not collect her own data), both the *research question* and the *availability of data* will determine which set of methodological tools can be used. Since the health data I used were relatively straightforward in terms of definition and content and the use of conflict data is a more novel aspect in these analyses, more attention is paid to the discussion of the conflict data. I then present how I chose the case study and conducted the interviews in South Sudan which I draw upon in articles 3 and 4. Discussions of the findings and conclusions drawn in the different articles are contained in the next chapter (number 7).

6.1 Relationship between research with a quantitative and qualitative research approach

Several books have discussed the relationship between research with a qualitative and quantitative approach. King, Keohane and Verbona (1994) and George and Bennett (2005) are examples of these which have reached a wide readership. In Norway, Andersen (2013) has recently published a book where similar issues are discussed. Where King, Keohane and Verbona argue that qualitative research methods should be modelled more on the quantitative approaches, George and Bennett attempt to argue for the strengths of *case study* research (as an example of qualitative research) in its own right. This is the type of qualitative research I have used and I will present some of their statements below. I will also briefly refer to Morgan (1998), who has written specifically about the qualitative-quantitative relationship in medical research.

On a very fundamental level, different research practices lean on different understandings of ontology and epistemology. However, I do not believe that there is a clear-cut demarcation line between different ontological and epistemological understandings which corresponds to research with a quantitative or qualitative approach. Rather, I believe it is possible to find some common ground in the middle where a logic of research can be found which is acceptable to users of both methodological approaches. This is similar to George and Bennett's stand (George and Bennett 2005), and to arguments advanced in King, Keohane and Verba (1994) as well as Morgan (1998).

The first two articles are important to investigate average effects, assessing whether there are any overall effects of civil war on maternal and child health and use of health care services. These effects are interesting in themselves and important in order to understand the magnitude of a problem. Such overall impacts cannot be assessed by looking at individual cases, like discussed in chapter 5. However, in order to investigate closer the effects of civil war on access to and use of maternal health care services, a qualitative approach was more appropriate, more specifically a *case study*. With a qualitative approach, the methods used for data collection are more interconnected with the information that is contained in the data (in my case interview data). Questions may be changed after an initial assessment of some interviews, and additional sources sought out in order to collect more information on an aspect the researcher was not previously aware of (Rubin and Rubin 1995). This process is iterative, with the researcher going back and forth between data and refinement of the interview questions, and different from the clearly separated processes of data collection and data processing with a quantitative approach.

Morgan (1998) has outlined a priority-sequence model for mixing the two research approaches, involving a choice of primary method and one of sequencing (which part of the research is done first). I started with the two quantitative articles, before doing field work. The original plan was to use the field work to explore the mechanisms from the quantitative part and generate hypotheses or point out interesting research avenues for a fourth article. All three articles led to an interest in *inequality* of maternal health care issues in a conflict context, and this became the theme for the fourth and last article. This is an article where I discuss the relationship between conflict, inequality

and inequity in health in general, illustrated with examples from my field work in South Sudan.

6.2 An integrated approach

In chapter 5 I outlined two different models of investigating conflict impact on female/maternal deaths (figure 2) and on use of maternal health care services (figure 3). In article 1 I use a model similar to the one in figure 2, whereas the case study in South Sudan provided a chance to investigate more in detail the mechanisms responsible for the conflict impact. This is done by profiting from the use of a case study, and George and Bennett (2005 pp.19-22) have outlined several strengths of case study methods as opposed to statistical methods which are described below:

- *High conceptual validity*. Many of the theoretical concepts of interest to social science researchers are difficult to measure appropriately in a quantitative way, but case studies can be less prone to 'conceptual stretching' because it is possible to concentrate on fewer cases and there is space to explore a concept more in detail. This is not a very important issue when it comes to the maternal health care variables - there is little dissent over what 'an antenatal check-up' is. This issue is of greater importance when it comes to the more contested concept of 'armed conflict', where a case study approach has allowed for a more nuanced description of the warfare in the two locations than use of the UCDP/PRIO and ACLED datasets has done in the two first papers.

- The second advantage George and Bennett mention is that case studies have a high potential to *develop new hypotheses*. When one is doing interviews, for example, one might come across situations where the informants give information that leads to the development of entirely new hypotheses regarding factors that are important in making different decision, for example. In quantitative studies there is no automatic way of discovering new variables and new hypotheses that are 'built into' the approach in the same way.

- The third advantage put forward by George and Bennett is that case studies might be used to *explore causal mechanisms* more in detail. This was interesting from my

perspective, since the hypotheses I had about the channels of the conflict impact were explored much more in detail with information from the case study (see also figure 5).

- The last advantage is case studies' ability to *take into account and model complex causal relations*. Complex causal relationships are notoriously difficult to model accurately with statistics, and are as such more amenable to be explored and described with qualitative methods.

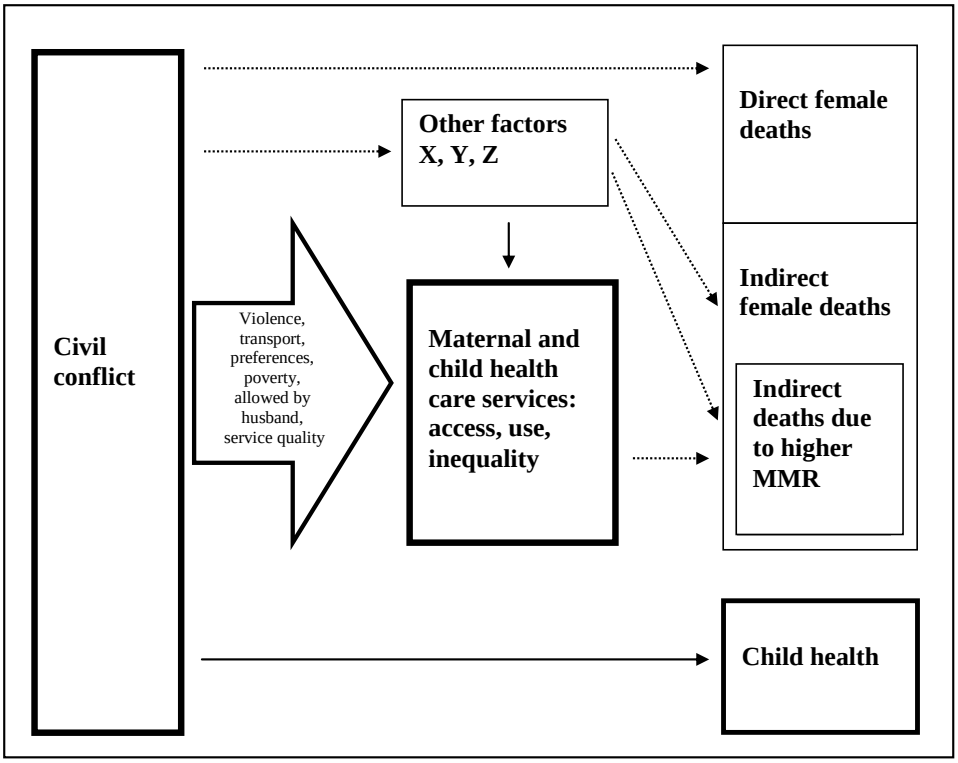
Several of these advantages were important for my particular research interests. I hypothesized in the two first papers that civil conflict would impact access to and use of health care services in the following ways:
- by *changing normal population movement patterns* (including creating refugee movements);
- by *destroying the economy* both locally and nationally;
- by *destroying infrastructure* like roads and health centres;
- by *increasing psychosocial stress* in the population.

These propositions have been further elaborated in the articles. While these hypotheses seemed quite straightforward, one of the main aims of the articles with information from the case study was to investigate more in detail *how* civil conflict impacts the use of maternal health care services. This is similar to debates in the research area discussed in chapter 5. Where several hypotheses might fit the patterns observed in quantitative articles (known as *equifinality*, George and Bennett (2005)), a qualitative approach is often better suited to explore these mechanisms. And where the conflict and health literature I have referred to does not always distinguish clearly between a conflict and a post-conflict phase – indeed that is true of my own first articles as well, since some conflicts continued at the time when the health data was gathered – that question could be better answered by interviewing people who have lived through the change from an active conflict to an (at least nominally) post-conflict phase.

All in all the articles can be integrated in the framework in figure 4. In article 1 I investigate the link between civil conflict and use of maternal health care services, which corresponds to the large arrow between these two boxes in the figure. Article 2 about child health investigates a similar link, as well as the impact on a health measure

(fever) more directly. Article 3 corresponds to investigating more in detail the mechanisms responsible for the impact of civil conflict (the different elements inside the large arrow) on both access to and use of maternal health care services. Article 4 is concerned with one of these mechanisms specifically and focuses on how civil conflict is connected to inequality and (maternal) health, which will have consequences for maternal health as an outcome..

Figure 4 Thesis framework



6.3 Data in articles 1 and 2

The main purpose of the first two papers was to assess the general impact of armed conflict on use of maternal health care services in the form of adequate antenatal care and professional assistance at birth (paper1) and on child measles vaccination and fever prevalence (paper 2). This is a type of question that is best answered by using

quantitative data and research methods. Following research developments towards a more nuanced and disaggregated approach within the quantitative field of conflict studies, as discussed in chapter 5, I wanted to do so both on a country level and sub-country level. The first analyses are important in order to detect whether there is an effect of armed conflict on the country as a whole, but such analyses might obscure the impacts more locally. A combined approach is therefore appropriate in order to investigate the different aspects. This is in line with the discussion in chapter 5, where I separated these approaches within previous research. One of the concrete challenges of this approach was that I needed different conflict data for the two levels of analysis. I employed the same methodology on slightly different datasets in these two first papers, and I will therefore discuss them together.

The *dependent variables* on health care use and child health come from the Demographic and Health Survey data (DHS). The DHS provides one of the world's largest collections of survey data on health issues in developing countries, and they are comparable across countries because they have mostly used the same questionnaires. They have relatively recently begun to disseminate information on the precise geographic location (geo-coding) of the clusters were data is collected. The other possible alternative would have been the Multiple Indicator Cluster Survey data (MICS), but at the time of writing the articles MICS did not provide geo-coded data that I was aware of. Data from DHS is collected in thousands of clusters within each country, where several women are interviewed individually in each cluster. Women are interviewed individually in this dataset. Information pertaining to the women's last birth was used in article 1, specifically adequate antenatal care (i.e. four or more visits, in line with WHO recommendations) and professional assistance at birth. For article 2, information on child measles vaccination and fever prevalence was used. In both cases data for the latest birth or youngest child was used, in order to minimize problems with recall. The information contained in these answers was deemed relatively unambiguous in the way it was defined, as opposed to what constitutes 'a conflict', which is discussed more exhaustively below. Data for the women and children was aggregated by calculating the mean for the whole country for the analyses on country-level, and aggregated by calculating the mean for each cluster to represent the cluster (interpreted as the community) in the sub-national analyses. The variables, which were originally binary, were thus transformed into a

continuous measure from 0-1. The mean was multiplied by 100 so as to represent a *percentage* for all of the four dependent variables. These aggregations were done to match the two similar levels of conflict data (which could not be disaggregated at individual level).

For the *independent conflict variables* I used two different datasets. For the *country-level analyses* I used the UCDP/PRIO armed conflict data, which has become one of the most frequently used conflict datasets with its annual updates. This dataset defines an 'armed conflict' in the following way: "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths" (Themnér 2011:1). This dataset thus relies on a threshold of 25 battle-related deaths per year per armed conflict, and concentrates on state-based conflicts.
For the *sub-national analyses* I needed conflict data that was more disaggregated. A first round of analyses was completed with sub-national conflict zone data coded by PRIO researchers, but when new data were released later with much more specific information on the timing and geo-referenced location of battles, I decided to redo all the analyses with this ACLED dataset (Armed Conflict Location and Event Data) instead. This dataset codes a variety of events like battles, riots, protests, and so on as precisely located in time and space as possible. This kind of data therefore allows for a much more detailed exploration of conflict impact than the data described above. There is no threshold that needs to be met per country or conflict year in ACLED, the aim is to code all such events when and where they happen. I used only information on the *battles*, in order to focus on the most severe type of events. A battle is defined as: "a violent interaction between two politically organized armed groups at a particular time and location" (Raleigh et al. 2010: 656). Such violence occurs mostly within countries with a civil war according to the UCDP/PRIO conflict data in this sample. However, a few battles occurred in all the countries I included in my analyses, even in those not usually considered to be at war, like Zambia. Kenya was the only country not usually thought to be 'in conflict' which had a relatively high number of recorded battles in ACLED. This made it possible to investigate whether even small-scale battle incidents had an effect on the health measures. Another issue is that reporting on the occurrence of a battle which is used to code this dataset might be more accurate than information on whether someone was killed or not (as is

necessary for the UCDP/PRIO dataset). These two datasets therefore measure slightly different forms of fighting.

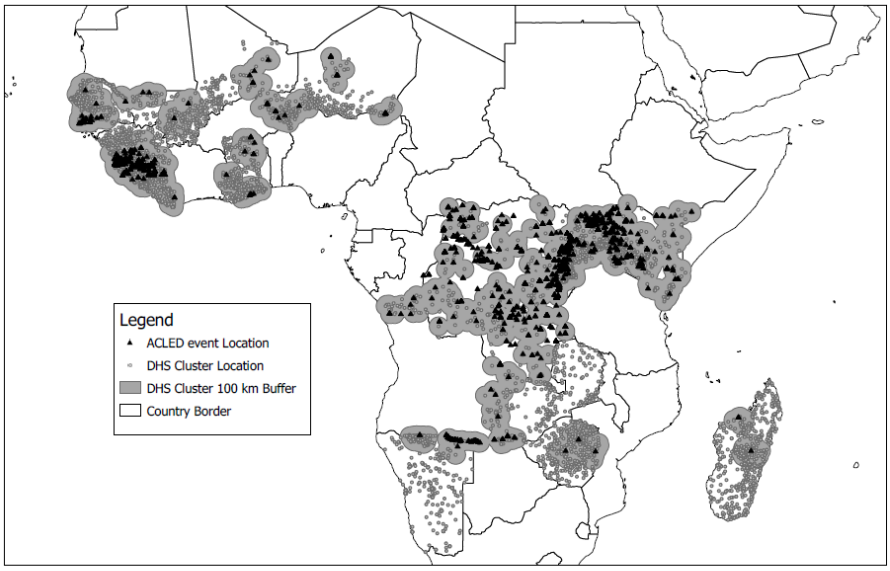
Using this dataset did however impose other restrictions. ACLED data only goes back to 1997 for most sub-Saharan Africa countries, and this meant that the number of countries with both geo-referenced DHS data and ACLED data in sub-Saharan Africa for the relevant period were limited. I got excellent help from Siri Aas Rustad for the first article and Andreas Tollefsen for both of them in order to geo-code the conflict data and discuss these two articles in general. For the analysis of child health data in article 2 we have used ACLED data that cover the three years (counted to the month) immediately before the five-year period covered by the DHS data. A three year period was chosen as a reasonable time-lag of conflict impact. This means that if the DHS data collected in 2006 covered the period from January 2001-January 2006, we coded ACLED data in the period from January 1998-December 2000. DHS data is collected for a different time period for each country so we calculated and selected conflict data separately for the relevant time periods for each country. For the births in article 1 conflict data had to be moved an additional nine months earlier, in order to include a period of pregnancy. That meant that two more countries were eliminated from the analysis (due to the ACLED cut off in 1997) so that we had a total of 15 countries for article 2 and 13 countries for article 1. While this sample does not cover all countries in the region, it is common practice to use the available DHS data for comparative purposes (e.g. Magadi, Agwanda and Obare 2007; Østby 2008), and I think there are enough countries included to provide a sufficiently interesting sample. The sample further included some of the most important conflict countries in the region at the time of data collection, like Uganda and the DRC. This will be discussed more in section 7.5.

The data for the different countries are measured with up to three years' difference depending on the country (the oldest DHS data are from 2005-06 and the newest from 2008-09). Ideally the health and conflict data should have been from the same years for all countries, but with natural variation in conflict occurrence this is not even theoretically possible. A comparative approach with data from different years is used in many other articles, including in DHS analytical reports. The most important factor

here is however *the time elapsed between the health data and the conflict data*, which is the same for all countries.

We wanted to analyse the impact of conflict events in the area around each community (cluster). Figure 5 provides an illustration of our approach. For each DHS cluster, a buffer zone (a circle) around the cluster was defined in two different ways. The number of ACLED battles within both a 50 km buffer zone and a 100 km buffer zone around the cluster was counted. A buffer zone was created because conflict events were thought to have some effect over a distance, and the size of the zones was chosen to accommodate for the fact that ACLED coding is not entirely precise in geographic location. It is not possible to code ACLED events completely accurately because the information about where conflict events take place is not sufficiently precise in the coding material that is used (Raleigh et al. 2010). There is thus a mismatch between the relatively precise geo-coding in the DHS data and the lack of precision to the same standard in the ACLED data, and using buffer zones was a way of overcoming that while at the same time not pretending that the ACLED data is more precise than it actually is. This coding was done separately for all clusters in all countries. In practice, this meant calculating data for 4842 clusters (representing 61959 individuals) for both a 50 km and then a 100 km buffer in the first article, and data for 5505 clusters (representing 73012 individuals) for the 50 and the 100 km buffer in the second article. Only battles within the same country were included, meaning that battles taking place in Zimbabwe would not be counted even if they took place within 50 kilometres from a DHS cluster across the border in Zambia, for example.

Figure 5 Countries included in the statistical analyses in article 2



Different *control variables* on sub-national level were also included, and they are further described in the articles. Some of them, like mother's education, urban location and household wealth are known to influence health care behaviour and are always included in such studies. In addition some control variables that could be related both to the likelihood of conflict outbreak and to the level of health care attendance were included, such as distance from the capital and population density. These factors were important to include in order to avoid spurious results. Finally a country dummy was included, in order to control for systematic variation between countries in health care spending, type of governance structure, wealth and other factors that might otherwise distort the results.

6.4 Analyses in articles 1 and 2

As previously discussed, the decision to use a sub-national analysis restricted the number of countries I could include. The next step was to decide on the best method of analysis.

In theory a comparison of countries before and after conflict would have been interesting, but at the time the analyses were done sufficient information was only available for three or four conflict countries. I was more interested in a comparison across several countries in order to cover more of the sub-Saharan region, so a cross country approach was chosen. A before-after scenario is however something that could be investigated later.

I did initially try out propensity score matching, which is a form of analysis where units are matched on central characteristics (computed in a propensity score) and then compared across treatment and non-treatment groups (i.e. conflict and non-conflict groups). It is usually presented as an attempt at recreating more experimental-like conditions. I tried to use matching methods on the data available, but this was abandoned because it was not possible to balance the two groups so that the matching could be estimated with more than one variable in the propensity score, which undermined the whole purpose of the matching exercise. Further, there was no good guidance on which variables should be included in the propensity score. Another concern is whether it is appropriate to create such clear cut-off measures as 'conflict' or 'non-conflict' affected areas. The methodology I chose allowed for greater exploration of this question, in that what we measured as a conflict-affected area could be varied: we changed the size of the buffer zone around the clusters, tested whether one conflict event (a threshold effect) or rather the number of conflict events (a progressive and linear effect) had an impact on the use of maternal and child health care services in the area.

For the analyses on country level there was not data available for enough countries to conduct a regression analysis, so I therefore conducted a t-test. I compared average health care use between the countries that did have a conflict in the last three years according to the UCDP/PRIO conflict data, and those that did not. A t-test analyses whether the difference in means between two samples is statistically significant. It assesses the size of the difference between the two means, divided by the uncertainty (standard errors) to calculate the size of the t statistic. The number of observations is then taken into account to assess whether the difference is statistically significant (Field, Miles and Field 2012). A t-test like this cannot say anything about causality (i.e. whether the conflicts are the cause of the observed difference in health care use),

but it can say something about how likely it would have been to get the observed difference in means given that the true difference was 0 (the null hypothesis). This is the same class of test that is underlying significance testing in an ordinary least squares regression analysis. Using a t-test is a fairly standard procedure as an initial assessment of the variation in means, and for example Iqbal (2010) and Southall and O'Hare (2007) used a similar procedure in their material.

However, on the sub-national level there was much more information available (4842 and 5505 clusters as described previously) so a regression analysis was possible to do at this level. Since the health data in the independent variables had been transformed into continuous variables, a percentage, it was possible to use ordinary least squares. This is a technique to derive the regression line that best fits all the data points, by minimizing the sum of squared errors (i.e. deviations between the observed values of X and those predicted by the line) (Field, Miles and Field 2012). This is the most common regression technique for continuous dependent variables like I have.
Since we had coded the number of conflict events in both a 50 km and a 100 km buffer zone around the cluster where health data was collected, it was possible to investigate different types of impact of the conflict events:

a) Whether there is a threshold effect of having at least one battle event within the buffer zone (for 50 km and 100 km buffers).
b) Whether there is a relationship between more conflict events within the zone and the health variables (both 50 km and 100 km buffers).
c) Changing the buffer zone from 50 km to 100 km also allows for some exploration of the effect of distance of the conflict events.

Coding and using conflict data exactly this way is something new, and hopefully a contribution to the field of conflict and health studies.

6.5 Case study in South Sudan

Given the problems of conducting research in war-torn environments (Goodhand 2000; Murray et al. 2002), there were several issues I had to consider when choosing a suitable location for field study. The lack of systematic health information in general has been discussed in chapter 5. Conducting research on a health theme in relation to

conflict was probably easier than many other issues. Instead of interviewing people about their political preferences or asking other questions that might imply taking sides with one party against another (which might make people fearful of replying), maternal health is something that is relatively neutral and concerns all parties to a conflict. Warring factions have at times decided on cease-fires to allow for vaccination of children – health is a good that concerns everybody. As such, asking questions about health and conflict were considered less controversial and sensitive than other possible conflict-related research subjects. However, I did not want to get involved with a situation of active fighting for obvious security reasons, and that imposed limits on where I could go.

The field work for the two last papers was conducted in two locations in what is now South Sudan. South Sudan was not the only possible site, but was chosen for several different reasons. *Key criteria were that there had been a recent conflict but the situation was relatively stable, and it should be possible to explore variation in maternal health care and variation in fighting patterns*. Looking at the list of countries included in the first two articles there were a number of them that had not seen much fighting (like Madagascar or Namibia); several where the main conflict had taken place some years ago (like Liberia and Sierra Leone); and some where I thought the situation was still too unstable (like the DRC and Uganda). In South Sudan, on the contrary, the conflict between north and south had formally ended five years before I did my fieldwork. A very important consideration was that I thought that would be an appropriate time lag for having a chance to interview women who had given birth both during and after the war, in order to compare the two situations.

Other reasons why South Sudan was chosen was that I had previously collected conflict information from the country, and thus had a much better knowledge of the specific context there than of the other countries in the region. I already had some information about the conflict and the diversity of fighting patterns. On the contrary there was not much information available on overall maternal health issues in the country, with the Sudan Household and Health Survey 2006 as one notable exception, but I thought that the chance to write about a relatively unexplored subject would be an added advantage. I expected there to be differences between urban and rural areas which was appropriate to explore.

Noragric had further established a very useful research collaboration with the Centre for Peace and Development Studies at Juba university, which contributed substantially to improve the fieldwork. For example, this collaboration made it possible to work with a research assistant (Victoria Guli) who both knew the local context and had previous experience with research on health issues and academic publishing. This competence was a real asset to the research I could undertake. The main drawback of this choice was that South Sudan was absent from the group of countries included in the quantitative analyses in the two first articles. This was not ideal, and detracted somewhat from the coherence of the thesis, but overall the advantages of choosing that location were seen as more important than the disadvantages for my particular research interests.

Reflecting further on how to choose case studies, George and Bennett write: "Case researchers do *not* aspire to select cases that are directly "representative" of diverse populations and they usually do not and should not make claims that their findings are applicable to such populations except in contingent ways" (George and Bennett 2005:30-31). I believe this to be true. A connected issue is that it is not possible to know exactly what one will discover during a qualitative research process and how 'representative' this will be of an overall population – without any uncertainty involved in the results, it would no longer be *research*. I think that quantitative methods can give a probabilistic, not deterministic, picture of overall effects. We cannot foresee exactly what will happen to one particular community when we work with average effects across several cases. There will be areas that are affected in the expected way and other areas that have escaped many of the possible consequences of civil war. No matter how good or accurate the quantitative studies are, there will always be exceptions. I think it is therefore not possible to select just two cases with overall representativity in mind, so the guiding principle for me was to find a site for field work where I could safely explore variation in maternal health care and fighting patterns, within a reasonable time period after a conflict had ended. South Sudan was as previously discussed not the only option available, but it fit my criteria very well.

The same logic applied to choosing research sites within South Sudan. The concrete interview sites were selected in order to cover some important variation in relation to the war and maternal health care in South Sudan. Juba and Magwe experienced very

different types of fighting during the civil war, which was an important criterion. Juba was controlled by the Government of Sudan during the whole war, whereas Magwe changed hands many times. They were further chosen to cover an urban and rural area, which represent one of the major divides in access to maternal health care. In the same way as Sudan cannot represent the whole of sub-Saharan Africa, like George and Bennett cited above, I do not think that these two sites can represent the whole of South Sudan either.

If I had been interested in a different research question, for example attempting to cover the areas hardest hit by recent fighting, including information from other areas or the oil fields might have been interesting. The oil question is important to current developments in South Sudan, and to patterns of displacement. I did however explicitly look for people who had stayed in one area during the civil war, and therefore excluded several former refugees from my sample. I make no claim on collecting information about all the fighting or even the areas in South Sudan that were the hardest hit by the conflict. My choices of research sites are therefore relevant to my research questions, whereas different questions would have entailed a different site selection.

Interviews

Rubin and Rubin (1995:66) list three main criteria for selecting interview participants:
- they should be knowledgeable about the research subject;
- they should be willing to talk;
- if there are different perspectives on this subject the interviewees should represent the full range of views.

In my case this translated into finding women who had lived at the field site (Juba or Magwe) during the civil war and had given birth there; who were willing to participate; and who together could give an account of the different possible experiences in this situation. The men I interviewed were asked if they had lived at the field site and whether they wished to participate.

I conducted a first round of pilot interviews (which were not part of the final material used in the articles) during my first trip to Juba. This served to test out the question

guide I had prepared, and see if people were willing to talk about potentially sensitive subjects like pregnancy and birth. It turned out that the women I talked to were much more knowledge able about antenatal care than what I had assumed previously, and generally interested in talking about these issues. They also revealed that one of the reasons why they did not seek care was that they did not feel that they were treated well by the health care personnel, something I then asked questions about in the final interviews. I also checked out the possibilities of going to Magwe, and concluded that I could come back with my slightly amended questions and proceed with the main part of the interviews as planned. I also realized that it would be necessary to try to interview some health care workers.

Since I was interested in people who had lived in the area during the war time I thought it most appropriate to use a form of *purposive sampling* (snowball sampling). The households in Juba were located in two areas called Nyakoron and Atlabara C. These were relatively wealthy and settled areas, with residents who have stayed here for a long time, unlike the newer housing areas that were constantly being built on the outskirts of Juba for people who are coming in from the outside. I thought these neighbourhoods would be appropriate for finding people who had stayed in Juba during the war. I found interviewees in these locations in Juba by approaching women there at daytime, and asking if they had lived there during the war, had given birth and were willing to be interviewed. If they agreed I asked them to identify neighbours who had also stayed here, in order to have a larger group. People who were interviewed thus came from different households. In Magwe I used a local pastor as door opener, and he approached the two communities I got to interview beforehand so that people knew I was coming. He informed people who had been staying in Magwe during the war and they were very forthcoming in the interview situation.

The interviews were pre-approved by the Norwegian National Committee for Research Ethics in the Humanities and Social Sciences. I started each group interview by reading out a long statement I had prepared on who I was, what my connections were with the University of Juba, what the purpose of the interviews was, and their rights to withdraw at any time.

I interviewed a total of 53 women and 21 men in Magwe, and 32 women and 7 men in Juba. Men and women were interviewed in separate groups. Interviews were conducted in three periods during 2010 in the form of group interviews. The interviewees were 16 to 86 years old and I therefore have a range of views covering the whole war from the start in 1983 until the end in 2005.

These interviews were semi-structured, which I thought suited a topical theme (as opposed to a cultural interview, Rubin and Rubin 1995: 28-30). I collected the same background information from everyone, on their age, number of children, whether they were born during or after the war, previous and current occupations, and whether they possessed a list of household goods (the same standard list as in the DHS). I asked about use of antenatal care and birth in a health facility, and about their experiences with these. Based on the pilot interviews and previous literature I interviewed them about a list of possible barriers to using these services, and asked if they had any additional items to add. I further had some open-ended questions about the war and their experiences during that period, and I ended by asking open questions about changes brought on by the CPA in 2005 and what they thought of the future. More specifically, in order to get more information about how the civil conflict had influenced women's access to and use of maternal health care services, my main questions focused on whether women were going for antenatal check-ups and giving birth at a health facility. Based on the pilot interviews and previous literature I concentrated on whether the following factors influenced their decision to seek health care: perceived usefulness of the services; transport; payments; whether they were allowed by their husbands to attend, what they thought of the quality of the services and whether they preferred to give birth at home. I also always asked if they had any other barriers to add. This was a more detailed list of questions than I was able to investigate in the two first articles. Another goal of the interviews was to give people *public voice* (Rubin and Rubin 1995: 19). I therefore used quotes quite extensively in the finished material.

The interviews in Juba consisted of people from different households who know each other, but not as well as those I talked to in Magwe. Because Juba is the largest town in the south and a meeting place for people from other parts of the country the communities in the areas I talked to appeared much less tightly knit than those in

Magwe. This, in combination with the greater number of people I got to talk to in Magwe (mostly because of the same cohesiveness that led people to be better informed about the interviews), led me to have a more complete picture of the situation in Magwe than in Juba. The different settings thus directly influenced the shape of the interviews.

In Magwe the stories people told me were further very similar, so that I quickly reached *saturation* (meaning that I thought the information I got would not change much by adding further interviewees). In Juba people recalled having more diverse experiences, and it is possible that the information I collected would have changed slightly by adding more interviews, especially amongst the men there. I did however have a limited time available to stay, and I also believe the greater variation in experiences in Juba (especially after the war) reflected a real diversity which was worth highlighting.

In addition I interviewed health care workers in four different clinics in Juba and Magwe, health care workers at Juba Teaching Hospital, and key administrative personnel in the Nursing and Midwifery directorate. These interviews were more open-ended as I sought to fill in the picture from the other interviews. I further interviewed some donor and NGO personnel involved in maternal and child health issues, and have followed up on later policy developments. Particularly health care workers are a group that it would be interesting to learn more from in later studies. Their extremely difficult working conditions are sometimes reflected in a strained relationship with their patients, as discussed briefly in section 3.9.

Information that I collected was checked against other sources including written material whenever possible. In the case of Magwe all the sources pointed to the same conclusions, whereas in Juba there were some differences of opinion regarding the health care available during wartime. Where some differences were real depending on the time people gave birth, there were also a couple of interviews that were excluded from the final material because I thought the information I was given was not accurate when compared to other sources. The material I got was transcribed mostly after I travelled home, but in contrast with other topics of qualitative research it was

relatively easy to analyse and write up – I did not develop new categories of interpretation or new terms during the analysis like one would do with cultural topics.

I used a research assistant (Victoria Guli) in all the interviews from the University of Juba's Centre for Peace and Development Studies, and she also translated from Arabic to English in Juba. She is experienced with academic writing and has previously worked on health issues and helped the research substantially. In Magwe I used two local interpreters to translate from Acholi to English.

I have chosen the approach which I thought most appropriate to gain information about my research questions, but this always involves some trade-offs. Possible drawbacks of this approach are that although the interviewees spoke quite freely about pregnancy and births, there were other issues that were difficult to approach. Asking about male and female relationships and questions of power within the family seemed to be touchy, and I have not drawn heavily upon the information I got from those questions because I was uncertain about the responses. Similarly, because of the often-reported fact that people may want to appear knowledgeable in an interview setting, very few I asked said that they did not know about antenatal services and their importance. Whether the information I got would have been different if I had interviewed people one by one instead of using group interviews is of course worth considering, but as I was interested in the experiences of the groups in those areas rather than those of specific individuals I thought that group interviews were most appropriate.

7 Results and Synthesis

In this chapter I will first present a very brief description of the results and conclusions from each of the four articles. The main part of this chapter consists of a critical discussion of how the conclusions from each article relate to one another. I will pay particular attention to the proposed destructive mechanisms of conflict, and to the battle data used in articles 1 and 2. The findings from South Sudan inform the discussion of the usefulness of battle data for investigations of impacts on the civilian population. I end this chapter by discussing whether it is possible that it is the maternal health situation that leads to conflict (i.e. the opposite of what I investigate in my papers).

7.1 Article 1: Impact of Civil Conflict on the use of Maternal Health Care Services in Sub-Saharan Africa

The first article is a comparison across 13 sub-Saharan African countries, investigating whether there are differences in the use of maternal health care services depending on the level of civil conflict in a country. The use of two important components of maternal health care, adequate number of antenatal visits and professional assistance at birth, are compared. The article combines a simple cross-country-comparison using UCDP/PRIO data on intrastate armed conflict, and explores sub-national variation in the use of health care services linked to information on battles between armed groups from the ACLED dataset. We find that overall, countries affected by civil conflict have lower use of maternal health care services. However, on the sub-national level the closeness to battles and their intensity actually seem to coincide with *more* use of these health care services. Not absolutely all the results go in this direction, and this is further discussed in the paper, but the majority do. We attribute the latter finding to battles taking place in strategic locations where services are provided, and where health aid is more likely to be concentrated. This article is written in conjunction with Siri Aas Rustad and Andreas Tollefsen.

7.2 Article 2: Civil Conflict and Child Health: Impact on Fever and Measles Vaccination in 15 sub-Saharan African Countries

Similarly, in article 2, we assess the impact of civil conflict on child measles vaccination status and fever. This time data from 15 sub-Saharan African countries in the period 2005-2009 are included. The same approach as in article 1 is used, with analyses both on national and sub-national levels. We show that on a country level there is a higher prevalence of fever in conflict countries, whereas there is a one percent higher average of children vaccinated against measles in conflict countries. Sub-nationally, we find that the intensity and proximity of battle violence is associated with less fever and with a higher likelihood of being vaccinated against measles. We believe that what we see can be attributed to the same mechanisms as in the first paper, namely that battles tend to take place in strategic locations within a country where there are simultaneously focussed interventions by the health care systems, as measles is of particular concern in a conflict situation. This article is written together with Andreas Tollefsen.

7.3 Article 3: If there is no money you will die‘: barriers to accessing maternal health care services in two locations in South Sudan as a consequence of the second civil war (1983-2005)

Expectations of a peace dividend after the signing of the 2005 Comprehensive Peace Agreement in what is now South Sudan were high, but five years later the population was frustrated with the lack of progress in several areas. One of the legacies of the second civil conflict I found was the continuing lack of lifesaving maternal health care, and South Sudan probably has the world’s highest maternal mortality ratio. Interviews in Juba and Magwe in 2010 are used to highlight how the situation differed in an urban and mostly rural area. In Juba the problems were related to an inability to pay for all the fees incurred when using the services, which had increased since the end of the war. In Magwe the financial constraints were even more acute because many people lived almost entirely off subsistence-level farming, and in addition it was impossible to get transport to the referral hospital due to high transport costs. This meant that women in the Magwe area in reality still had to rely mostly on the local

clinics for all their maternal health care needs. In both interview sites people further raised various issues related to the quality of care that they received. The very different experiences of citizens in those two locations are used to reflect upon the challenges facing the new government in terms of delivering services equally across a large territory. At the time of writing new fighting had broken out in South Sudan, possibly threatening the gains that had after all been made. That would paint a grim picture for the nation's prospective mothers.

7.4 Article 4: Civil conflict, inequality and inequity in health

This is an article discussing the links between civil conflict, inequality and inequity in health, illustrated with examples from maternal health care in South Sudan. Civil conflicts typically are not fought in equal measure across a country's territory, and it follows that the consequences of the conflict are unlikely to be equally distributed geographically. This inequality may further be enhanced by an unequal distribution of impacts across different population segments, where several authors have claimed that the poorest are likely to be hit the hardest. Inequalities that are perceived as unfair might be discussed in terms of inequity, and this may be one reason why new research on horizontal inequality between population groups, rather than just general measures of vertical societal inequality, has been linked to conflict onset. Several researchers argue that it is the way that inequalities are perceived and whether they are seen as unfair or not in a given society that may act as a conflict trigger. Maternal mortality and morbidity is particularly unequally distributed across the globe, and I discuss whether new policies aiming at promoting greater equity in maternal health may have any practical value in the concrete setting of South Sudan. Norheim and Asada's (2009) framework links discussions of equity in health with theories of social justice. Policies of promoting equity in maternal health are discussed in relation to the concrete setting in conflict-affected South Sudan. The general policies are not well connected to the theoretical debates on equity and what that means more specifically, and the will to promote equity will be tested only when budget allocations and concrete measures are laid out. I also argue that in such a setting, promoting health on the security agenda may backfire if it is found that provision of health care does not actually reduce violence.

7.5 Synthesis

Using a cross-national overview and investigating general relationships come at the expense of detailed knowledge of individual countries, not to mention communities or individuals. The 13 and 15 countries in the two first articles span across all of sub-Saharan Africa, from west to east and Sahara in the north to the south (see map in figure 5). Doing fieldwork in what is now South Sudan provided a chance to talk to people and highlight their experiences, look behind the numbers and explore some of the differences within one country more concretely.

The findings in articles 1 and 2 suggest that overall, countries affected by civil conflict are worse off in terms of maternal and child health care than peaceful countries. However, the health care systems in conflict countries, probably with help from aid organizations, work better for people living within than outside the zones where most of the battles take place.

On the one hand, this is an encouraging finding. On the other hand it is a story of profound inequality – within these countries some places are better served in terms of maternal and child health care than others, despite the destructive effects of violent clashes. What I believe is that the kind of fighting we have measured in the two datasets – battles between armed groups – tends to take place in areas of strategic interest, where there are simultaneously more resources, including for health care. Nonetheless the findings on sub-national level are counter-intuitive, and merit more discussion in light of the research done in the two last articles.

Further, although we explained a quite high proportion of the variance in our data in the first two articles (R squared varies from 0.56 to 0.63 in our analyses), we did not capture all the determinants of maternal health care seeking behaviour in our analyses. A qualitative approach was better suited to investigate the mechanisms at work and explore additional factors which had an impact. This approach further made it possible to distinguish between *access to* and *use of* maternal health care services. While use is the primary concern (and the dependent variable in the first article), there may be slightly different factors that account for access. As an example, I found that although many of those I interviewed in South Sudan in theory had access to maternal

health care services, they sometimes chose not to use them because of the payments they would incur.

The fourth article was written after the three first ones were finalized and after reflecting on some of the findings. A theme that became more and more prominent as I worked was that of *inequality*. It was already evident that poor maternal health was very unequally distributed across and within the sub-Saharan countries, but if it is true that women in more conflict-affected areas within a country still have better access to health care services than those in more remote areas, then in many areas the original differences in service access were possibly staggering. And to which degree would the conflict increase or equal out pre-existing inequalities? Policies aimed at decreasing inequality are rooted in some perception of justice, whereby the inequality may be discussed in terms of *inequity*. This realization together with the very unequal settings in Juba and Magwe prompted the reflections on civil conflict, equality and equity in health in the last article.

Destructive mechanisms

In the two first articles we posited four mechanisms that were believed to be responsible for the destructive effects of civil war on health care services (and health more generally) in addition to the direct violence impacts. We expected civil wars to *change normal movement patterns*, leading to people staying at home for security fears or being displaced from their homes; to *destroy infrastructure* like schools, roads and health care facilities; to *lower economic activity* leading to poverty and depletion of assets; as well as having a *negative impact on people's psychosocial wellbeing*. As it were, we could not show that the health care infrastructure was damaged in the areas most affected by battles since the battles were mostly positively related to use of health care services, but we suspected that this in reality masked the negative impact of the conflict. We thought that battles were more likely to take place in areas of strategic importance, where health care services were also more likely to be offered, and that targeted interventions by the health care services and humanitarian health aid would in sum 'cover up' the negative impact on the health care services more locally. Nonetheless this was a puzzling finding and it was interesting to compare with the answers in the interviews in South Sudan.

For the qualitative articles I asked more specifically about uses of maternal health care services both during and after the second civil war in Sudan (1983-2005), including some questions that I could not investigate in the two first articles. People's answers fit mostly with the broad hypotheses set out in the first two articles about negative impacts in war times. Transport issues and security fears due to warfare had led to restricted movement patterns for the residents I interviewed, as well as creating in Sudan one of the world's largest internally displaced populations. The infrastructure differed a lot in the two locations: whereas Juba after some years had an influx of international organizations providing health aid, the local clinic in Magwe was shut down in the beginning of the war and was not reopened until the war was over. In both places the economy had suffered badly, shutting down a lot of trade opportunities in Juba and stopping any development of the economy in Magwe. In many ways the war led to 22 years of lost opportunities both for human and economic development. As for the psychosocial problems I did not ask about that directly, but many people alluded to a sense of fear and hopelessness that set in as the war dragged on. One woman I interviewed in Magwe said: "In the end they thought the war would stop when they were all killed by the LRA" (interview March 15 2010). People were clearly heavily affected by the constant insecurity the warfare created.

In addition to these broad hypotheses which were proposed in the first two articles, many women and men brought up the poor quality of the services they were offered as a reason for not using them. This is a point which is lacking from the first articles, where I can only document whether or not people have used the services but without being able to say something about their quality. Clearly this is a factor that people take into consideration when deciding whether to spend time and money to go there. The other factor I could not measure in the quantitative articles was whether the women were allowed by their families (husbands) to go to the services, taking time and using money on their own health, but this was a difficult issue to approach and one that was not very well answered in the last articles either. Nurses and health care workers I interviewed were more forthright on this issue, affirming that women's lack of control over family resources was a problem for attending maternal health care. This ought to be investigated further in later analyses. These findings mean that even if people have physical *access* to health facilities they might not decide to *use* them, which is a more subtle analysis than the one I could conduct in the first paper. After

conducting the case study research I was able to provide a more detailed and perhaps convincing account of the ways that civil conflict impact access to and use of maternal health care services.

It also became important to include more detailed information from South Sudan in order to avoid misinterpretations of the positive correlation between battle intensity and location and better maternal and child health care availability in the first two articles. After reading articles 1 and 2 one could in theory ask whether it is necessary to ask for more resources for maternal and child health in conflict areas because these seem to be better served than other areas within the same country, and conflict countries even had a slightly higher measles vaccination rate. Reading the stories from Juba and Magwe should quickly prevent such misguided conclusions. The terrible stories from the war and post-CPA situation that are detailed in the last two articles stand in stark contrast to the impersonal numbers presented in the first part, and the last two articles provide an essential reminder of what we are really talking about when we talk about war.

Battles as a measure of warfare

The approach to testing armed conflict impact on maternal and child health measures employed here is new to the best of my knowledge, and I believe it combines insights on country-level effects with more local effects in an interesting way. It helps avoid the problem of having a cut off for what constitutes an armed conflict (on sub-national level) by including all battles, and this deals with the well-known problem of having conflicts that apparently start and stop frequently because they hover around the threshold, when in fact there is continued low-level violence on the ground. It has allowed for a much more detailed analysis of battle impact across several countries than previous studies have done, and has allowed for investigation of battle distance, presence and intensity. All in all I believe the two first papers have pushed the study of armed conflict impact on maternal and child health measures a small step forward.

There are however other issues with this approach that might be discussed:
Firstly, the types of conflict data that are used here do not capture all the fighting and destruction that happens during a civil war. For the country-level analyses I chose the UCDP data on armed conflict, relying on a definition tied to state-based armed

conflicts. Obviously there are other types of conflicts that do not involve the government that might influence the propensity to use health care services and could be explored, see the short discussion below. The same is true for conflicts that do not reach the 25 battle death threshold for a certain period. Both these issues are partly ameliorated by using the ACLED data in the sub-national analyses.

The ACLED dataset contains a lot of information on non-violent events like riots and protests that I wanted to filter out of the data because I did not expect them to influence the health measures as much as battles would do. The battles were chosen as the most typical war events and those most likely to affect my chosen maternal and child health measures, and battle events are also closer to the definition of civil war used in the dataset on national level. However, battles are not the only type of violent event that could have been included, and further research ought to investigate whether for example violence against civilians or other types of events have a different impact on health measures. Research by Hoddie and Smith (2009) indicates that different types of violence might have different effects on public health and this is clearly a theme worthy of further investigation.

The Uppsala Conflict Data Program has relatively recently released geo-coded data on conflict events related to state-based armed conflicts, non-state armed conflict and one-sided violence (the UCDP GED). These datasets are clear contenders for future investigation of conflict impact on maternal and child health. Eck (2012) has analysed the differences between ACLED data and the different UCDP GED data, and concludes that the UCDP data have a stricter quality control and appear more correctly coded. However, all the UCDP data include events that led to fatalities, and there is no theoretical reason to believe that conflict events leading to at least one death are the most useful for measuring conflict impact on maternal and child health. I have also wanted to use non-fatal events, and in that case ACLED is the only option (Eck 2012: 138). However, for future research with a slightly different focus the UCDP data with their superior consistency might be a better choice.

Further, the selection of countries included in the two first articles was dictated by data availability and not by theoretical considerations. Some of the most salient conflict countries have been included, for example the DRC, Uganda and Sierra

Leone, but Sudan had to be left out of the first two articles because of a lack of data. It is impossible to know exactly what the consequence of this lack of data is for the results. On one hand, an approach which focused only on the country-level could have been selected in order to get a larger number of countries in sub-Saharan Africa included (which would have been possible if I did not need geo-referenced data). This would have given the results greater legitimacy in terms of covering more of the region. On the other hand, I think that with all the criticism these analyses have attracted in later years, this approach would have detracted substantially from the thesis. The link between a pure country-level approach in the two first articles and the case study from South Sudan would also have been less interesting. As new rounds of Demographic and Health Survey data are made available it would be interesting to include more countries. Further rounds of data might also make it possible to compare pre-conflict and post-conflict data for several countries, something that was not possible when I conducted my analyses.

As for the explanations that I offer for the sub-national findings, I did not have any data on 'strategic towns' or on delivery of humanitarian aid. I have proposed that some areas are of more strategic interest than others in a way that is not captured by the control variables I include (like urbanity or population density). I think that there will be certain factors like important bridges, the historical status of a town et cetera that cannot easily be captured in a quantitative dataset. However, for the delivery of humanitarian aid there will be information available that can be assembled, and such data ought to be included in later investigations of this matter. One possible way forward is to use data that measure some form of economic activity, such as electricity use.

Fighting in South Sudan

Comparing information from Juba and Magwe, it appeared that Juba and its surroundings had seen more battles (narrowly defined as in clashes between armed groups) than the Magwe area. As one of the few government garrison towns in the south that the SPLA never managed to take, Juba was shelled and attacked intermittently over the course of the war. Magwe was less strategically important, and although it changed hands several times over the war years the groups seem to have invested fewer resources in holding that area. As an example, the SPLA as the de

facto army in the south after the signing of the CPA did not have a strong enough presence to keep the LRA from roaming around and attacking the inhabitants. This greater strategic importance of Juba appears to have gone hand in hand with greater investment of resources there. In Juba there was a plethora of different aid organizations over the years which provided health care services, in addition to the doctors who were flown in from the north. Juba teaching hospital and a variety of local clinics therefore kept operating through the war, although the quality of the services appeared variable according to the interviews. The situation in Magwe was very different. After the local health care centre there was destroyed at the beginning of the war the inhabitants were without access to professional health care, relying on traditional birth attendants for maternal health care or sometimes managing to get to a health clinic in other villages further away. Apparently the Norwegian Church Aid trained some nurses around Magwe during a quieter time in the fighting (according to informal discussion with a former employee) but I have not been able to substantiate this information, and my informants never mentioned being in contact with them. However, even if some nurses were trained, Magwe would have received much less help than that which was available in Juba.

The relationship I found between battle locations and health services could have been particular for Juba and Magwe, but Douglas Johnson's (2011) account of the civil war in Sudan suggests that this pattern was not atypical for the fighting. In the early phases of the war, he described a type of fighting which corresponds well with what the informants in Juba and Magwe told me. The government had as a policy to despoil and depopulate rural areas (Johnson D. 2011: 147), and destroy any resources to make sure the enemy could not get to them. "Those wells, schools, dispensary buildings and medical supplies which could not be retained by government troops were destroyed rather than be left in guerrilla hands" (Johnson D. 2011: 147). While I do not know who fired the shots that destroyed Magwe's only health care centre, it fits in with the fighting pattern described here. The consequence of this strategy was that services and commerce immediately were withdrawn from rural areas to government-held towns (ibid). The government and their allied militias also had as an objective to cut SPLA supplies from Ethiopia, the SPLA's supporter at the time, meaning that SPLA's own supplies and their relief efforts were severely hampered (ibid). Douglas Johnson's description fits well with what I observed in my interview communities, where the

population in government-held Juba continued to have some minimum services whereas the rural population in Magwe was left largely to fend for itself. However, like discussed in section 6.4, one cannot really draw any strong conclusions about the overall situation in South Sudan.

The effect of the aid and resources that were invested in Juba would mask the negative effects of the war in that area. The battles would only act *directly* on the propensity to seek maternal health care to the extent that they stopped women from going out due to violence (or killed them), or directly destroyed health care infrastructure. All the other damaging war mechanisms I have proposed in the papers – disrupting movement patterns in general; destroying infrastructure (like roads); damaging the economy at all levels; creating psychological problems – all these are better described as indirect mechanisms. At the same time, the positive effect on the health care availability of increased aid is also an indirect effect of the war. And although on a country level the impact of civil war was negative on health care service use, locally the negative effects were sometimes cancelled out by the increased aid that was offered.

Another factor that might contribute to this difference, and which was not explored in sufficient detail in the two first articles, was the way that military clashes were spread out over time. In Juba the shelling by the SPLA was quite concentrated around the time of the split in SPLA, and everybody I interviewed pointed this out as the worst period. However, despite continued attacks now and again, some rebuilding in Juba was possible. In Magwe, on the other hand, people described what appeared to be less intense attacks (in other words they would count as fewer battles) but they were spread out over time, making reconstruction near impossible and therefore also having a very large impact on people's lives. As I did not ask people directly to 'count battles' (I do not know how that could have been done) I cannot compare exactly, but this is my understanding from reading secondary literature on the conflict.

The focus on battle events in the first two articles misses the chronic insecurity posed by constant low-level warfare, and it was evident in the interviews that this constant lack of security was exhausting for the inhabitants. While the military groups might not have clashed as many times with each other around Magwe they were often

persecuting the local population, stealing food, cooking gear and any other resources from the civilians. The informants told me of many times when they were harassed and accused of supporting the other side, sometimes with a fatal outcome as in the story in the opening pages of the boy who lost his mother. The military battles would likely have a greater chance of being reported in the press (and therefore be included in the conflict dataset), and there would additionally be more information available from a place like Juba where more foreign press and aid was available. Battles clearly do not represent the whole range of fighting and destruction going on in a war.

7.6 A reverse causality between conflict and health?

The assumption thus far – and the one which is made in almost all the literature referred to here – is that it is civil war that leads to poorer maternal and child health, and not the poor health status that leads to civil war in the first place. This problem of possible reverse causality has linkages to the debates about securitization of health issues and will be discussed briefly.

First of all, in cross-country comparisons like the ones performed in my two first articles with quantitative data, it is not possible to guarantee that the causality is not reversed. I have tried to reduce the problem by very carefully using conflict data that is collected prior to the health data, but even then it could in theory be the case that it was the poor health situation that made the conflict break out. So far, however, much research has linked conflict outbreak to a deteriorating health situation, but not much work has demonstrated a relationship the other way around.

If we take high mortality as an example of an issue that people might rally around to launch a war there are is at least one study suggesting that war-affected countries had higher pre-war mortality rates than peaceful countries (Chen, Loayza and Reynal-Querol 2008). Recent work by theorists on horizontal inequality in child mortality within societies has also gathered some support (e.g. Østby 2008; Østby et al. 2011). The crux of these studies is however that there needs to be an inequality between different population sub-groups in order for the mortality to act as a conflict

mobilization issue, not that these countries had a higher mortality overall. The link between conflict and inequality is further debated in the fourth paper.

However, by far the largest bulk of research has focussed on the relationship the other way around. Both Iqbal (2010) and Ghobarah, Huth and Russett (2004) attempt to solve the problem by employing two-stage research methods to demonstrate war's impact on infrastructure and economic factors, which in turn lead to negative health outcomes. Most of the other research has rather relied on introducing time-lags between conflict onset and health measurement.

My own research connects to this discussion in the following way: when I show that conflict-affected countries score worse overall on maternal and child health indicators on a *national* level, I cannot completely rule out the possibility that these countries had pre-existing low health scores before the conflict started, even though I use conflict data collected before the health data. In theory, a low GDP might account for both poor health standards and outbreak of conflict (possibly through low state capacity). A poor health standard might perhaps be part of the reason why conflicts break out, but health care seldom changes very rapidly and I do not think it can be a precipitating factor in conflict outbreak. There is ample evidence of worsened health situations due to conflict outbreak, but I have not found any studies suggesting that a suddenly worsening health situation led to onset of conflict (see e.g. the discussion in the Human Security Report Project 2011). I think that at most it can act as one of several background factors. In my analyses I control for GDP (with the country dummy) and take care to collect health data from the time period after the conflicts, but these interconnections are complicated. I believe that my suggested link from civil conflict to poorer health care is more plausible than a link from poor health to conflict, but perhaps later studies using a before-after scenario will be better placed to answer these questions.

However, once a conflict starts it probably takes on a logic of its own, and one that is not necessarily connected to the reasons for the conflict onset. Fighting will take place where strategy dictates, and that might be independent of why the war started in the first place. This is discussed briefly in the fourth paper. I therefore think it is possible to analyse the results of the fighting more locally (as in the *sub-national* analyses) if

one is careful. Laia Balcells' research supports this proposition. Balcells (2008) argues that initial levels of direct violence during the civil war in Spain were related to pre-war electoral results, but that after conflict onset the violence levels were better explained by war-related factors and control that changed from one group to another. This means that as a war goes on, war-related factors might explain violent outcomes better than initial positions. I suggest that the fighting – at least the battles - tends to take place in areas of strategic importance like Juba rather than in remote locations like Magwe. This occurs despite controlling for urban and densely populated areas, which is where the fighting is often found to take place in other studies (e.g. Buhaug and Rød 2006).

As South Sudan was generally less developed than the north it could be argued that this underdevelopment was part of the reason why the conflict started. However, the immediate trigger was the decision to impose sharia laws and breach the Addis Ababa accord by the north, and Douglas Johnson (2011) has argued forcefully that underdevelopment was not the cause of the war. The studies from South Sudan show very clearly how the conflict onset there led to a deteriorating health situation. The people I interviewed told me how the civil conflict led to malnourishment, poverty and a generally poor health situation in addition to destroying health facilities and making it dangerous to travel to seek health care. The changing logic that dictated where the war was fought could also be investigated in this case. As an example, the front that was opened up between the Torit and Nasir factions of the SPLA had little to do with the initial reasons to start the war, but was highly influenced by Mengistu's fall in Ethiopia.

Finally this discussion relates to debates about securitization as presented in the section on human security and discussed in the fourth paper, i.e. arguing that there is a direct link from a poor health situation to security threats (as traditionally defined). As previously stated, the Joint Assessment Mission in 2005 had discussed provision of services under the heading 'restoring peace and harmony' (JAM 2005: 43) but Bennett et al. (2010) could not find any clear relationship between low levels of health service provision and violence in the southern states. Attempts at securitizing the health provision in South Sudan by posing lack of basic services as a threat to further stability do not seem to be based on correct understanding of what are currently the

main conflict drivers in the South. While it may be true that many inhabitants expected to receive more from their new government (Guli and Salahub 2011), the lack of basic health services does not appear to be important in the current conflict picture.

However, while providing basic health care might not help avoid traditional 'hard' security problems, it might improve the lives of many women and children. I believe that improving maternal and child health care should be promoted as a goal on its own, and not be subsumed under the logic of improving security or contributing to further economic development. Such a focus might risk diverting resources to other areas if the expected security or economic gains are not attained. I therefore think the focus should remain on health improvement as a (development) goal in its own right. The merit of the human security discussion is to draw attention to the multiple ways that people's lives and wellbeing might be threatened, including by poor health. This focus further helps avoid seeing everything in conflict-affected peoples' lives through a conflict lens, as if that is the only important factor in peoples' existence (Goodman 2000).

8 Conclusion

In this dissertation I have explored the impact of civil war on use of maternal and child health care services in sub-Saharan Africa. I have argued that improving maternal and child health is fundamentally a development issue, but one that also rich countries are continuously engaged in. I have further proposed that it should be retained as a goal in itself, instead of being seen as a step towards greater security or economic development. By focussing on residents in conflict areas rather than refugees or IDPs I believe I can complement current work by the RAISE initiative and the Inter-agency Working Group on reproductive health in crisis settings.

The focus is on health care services because they are of crucial importance to saving pregnant women and young children's lives, and they provide an entry point for policy recommendations. Several previous studies have focussed on the increase in mortality or decrease in healthy life years due to war more generally, but while knowing how much wars affect life expectancy is important, it is not knowledge that is well suited for guiding action. With its focus on life-saving health care services and barriers to accessing them, this study should be better suited to recommend concrete steps that can be taken to improve maternal and child health.

I have used both quantitative and qualitative data in this investigation, and although that has added to the challenge of writing the thesis is has also greatly improved my ability to draw conclusions based on my material. Quantitative data serve an important purpose in highlighting the scale of various issues. In my articles I have used such data to draw attention to the lower use of maternal health care services, more frequent child fever, but also slightly higher percentage of children vaccinated against measles found in conflict countries compared to peaceful ones in my samples. Lower use of maternal health care services is closely linked to higher mortality ratios. Since maternal mortality as a relatively infrequent phenomenon is impossible to measure precisely in small locations, aggregation of quantitative data on a higher level is necessary in order to detect any changes in the MMR. The relative lack of data on and attention to the

way wars increase the number of maternal deaths has led me to name them *uncounted war deaths*.

Finding in the two first articles that the location of battles was related to a *higher* chance of using health care services sub-nationally initially sounded counter-intuitive. We explained this by the likelihood of battles taking place in more strategic locations where services would also be provided, and by the greater chance of attracting international aid in those same areas. However it was important to compare this information with more in-depth studies, and this is where some of the main strengths of the qualitative research approach were useful. Studies covering conflict-affected Juba and Magwe in South Sudan in the third article were important in order to support the interpretations made in the first articles; to avoid any premature conclusions that warfare does not have important negative effects locally; and also simply to let some people from a war zone speak with their own voices. It was further found that different barriers prevented access to and use of maternal health care services during and after the war. During the war violence and a lack of services (in Magwe) were the main barriers, whereas after the war the continued poverty and an inability to pay the fees that were demanded created substantial barriers. Low quality of care was also brought up as an issue resulting in lower use of the services.

The fourth article discussed the links between conflict, inequality and inequity in health, illustrated with examples from the field work in South Sudan. Given that many different types of quality are incompatible at the same time, I argued that policies aiming for 'equity in health' would be insufficient as guidelines on a practical level, without further elaboration of what kind of equality was sought more specifically.

There were however several issues that future research should explore further.

The military battles that are used as a measure of warfare in both the first articles clearly do not capture all the destructive events that may occur in a civil war, as discussed previously. The low-level insecurity in places like Magwe, where the state only has a weak presence, might be better measured by other variables (although it is also possible to discuss all relevant events will be reported and amenable to coding).

New geo-referenced data on one-sided violence and non-state violence from the Uppsala Conflict Data Project could be used to explore such issues.

A related point is that it is possible that other factors than those I have proposed, fighting in strategic locations and international assistance, might explain the findings on sub-national level in the two first articles. I believe these are the most plausible explanations, and they are partly supported by the interview information from South Sudan, but there might be other factors involved as well. Like discussed previously it will be difficult to create a quantitative measure of 'strategic location' (at the time of writing we are testing out some data on night lights as a measure of economic activity), but data on international assistance could later be used to check whether this is a likely explanation of the findings.

As for the qualitative interviews, it was difficult to get a good grasp of some of the factors that represented barriers to maternal health care seeking behaviour in South Sudan. Issues like control over resources within the family and male-female power relations were not as well covered as other topics. A research approach focussing on these issues as a main theme and not just one amongst several others would probably be better suited to elucidate these problems.

In a wider development research context, it is further interesting to discuss who is driving priority setting in the development aid agenda. As an example, the MDGs are politicized and this may be part of the reason why they are so difficult to achieve. The political goals of donors and the policy guidelines of specific agencies have been highlighted by development aid field actors as substantial barriers to delivering good reproductive health care services, both in IDP settings and more generally (Hakamies, Geissler and Borchert 2008). Current discussions about including health and equality on the post-2015 agenda should be analysed with this in mind.

8.1 Policy implications

Maternal and child health care in many developing countries remains an issue of *profound inequality*. In my study area some areas were better served than others despite being in proximity to armed clashes. There is clearly a need to improve the

maternal and child health services that are offered to the populations in the countries included in this thesis. My focus on health care does not imply that I believe there are purely technical or economic solutions to problems like poor maternal health, but the way the services function now they often constitute another form of exclusion (e.g. as featured in the World Health Report 2005). OECD/DAC guidelines on preventing 'pockets of exclusion' when engaging in conflict-affected and fragile states (OECD/DAC 2007) should be integrated more fully in current work in conflict countries. While it is a positive development that there is increased focus on achieving equity in maternal health (IFRC 2011) and an explicit policy of providing equitable health services in South Sudan (GOSS 2013), these general policy statements are not enough – the will to achieve greater equity will be tested when resources are to be allocated and concrete programs designed. A continued focus on these issues is necessary to hold policy makers accountable.

On a very concrete note, the women and men I interviewed in South Sudan emphasized that a lack of money and poor quality services stopped them from going – so a starting point for increasing service attendance and delivering more equitable health care should be to improve the services that are offered and keep them free of charge. My findings mirror those of the Sudan Household Health Survey 2006 very clearly in the way poorer women will be less likely to use the health care services. Improving access to these services is a necessary but not sufficient condition for improving maternal health. In circumstances with limited resources it is understandable that user fees and cost sharing are discussed. One of the arguments in favour of such costs is the prevention of unnecessary consultations. However, it is my opinion that maternal health care should be exempt from any user fees because nobody would become pregnant just in order to seek medical care. Once pregnancy has occurred, I believe free maternal health care should be provided to protect both the mother and the child.

This debate and related discussions about payment for maternal health care services are very relevant for South Sudan, where the health care workers I interviewed were frustrated with the lack of resources at their disposal combined with the many tasks they were meant to carry out. Citing criticism of the quality of care offered to the interviewees should in no way be seen as a suggestion on my part that the health care

workers I talked to are not doing a good job. Rather, they are given an almost impossible job given the low level of resources they receive. Improving health care infrastructure (including facilities, equipment and regular supply of pharmaceuticals as well as salaries) would probably work towards improving the recruitment and retention of health care workers as well as improve relations with the patients.

These findings also show that *national policy and international aid matter*. There was substantial variation between the countries in my sample that was not related to conflict. As an example, Rwanda, well-known for its history of civil war and genocide, is doing much better in terms of maternal health care services than much more peaceful Niger. A report by the 3D initiative comparing various health measures across conflict countries, found that countries that were able to keep consistent and high rates of vaccination coverage even during conflict periods where distinguished by a combination of a clear prioritization of domestic public health and/or sustained external assistance (Kim and Fernandez 2009: 20). If the most battle-affected areas in my study countries still provided better health care than more remote locations, then well-targeted aid is likely one of the explanations. It is important to take note of such developments and encourage further assistance.

As new fighting has broken out, the current situation in much of South Sudan is marked by insecurity. It is still too early to assess the full impact on the civilian population, but many areas in the south are marked by continued threats from different groups which risks jeopardizing what little improvement had been made in health care service delivery. The new fighting takes place in a state that is struggling to establish its presence, including the capacity to deliver health services. While there may not be a direct link between provision of health care services and lower levels of violence (Bennett et al. 2010) as suggested in a securitization narrative of these health issues, there are strong arguments about equity that should make the government strive to extend both security and service provision to areas that are marginalized at present, once the current conflict ends. Insofar as civil conflict has contributed to poverty and poorer maternal health care services it will continue to increase maternal mortality, even after the ceasefire. There will be still more uncounted war deaths.

With the new data showing that South Sudan has the world's highest estimated maternal mortality ratio, it is vital to keep focussing on measures to lower the numbers.

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10 Article 1: Impact of Civil Conflict on the use of Maternal Health Care Services in Sub-Saharan Africa

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Abstract

There are discussions over the size and distribution of long-term impacts of civil war on public health, and of the different consequences for women, men and children. In this article we investigate a topic important for female health especially in developing countries: whether there are differentials in use of life saving maternal health care services depending on the level of civil conflict in a country. We perform an analysis of 13 sub-Saharan African countries, and find that overall countries affected by civil conflict have lower use of maternal health care services. However, on a sub-national level the closeness to battles and their intensity actually seem to coincide with more use of these health care services, which we attribute to battles taking places in strategic locations where services are provided, and to attracting more aid in the same areas.

Introduction

While no consensus has been reached on the exact effects of war and civil war on public health, it is clear that women and men experience war differently. Whereas men are more often killed in battle, women seem to be affected rather by the long-term consequences of war (Ghobarah, Huth and Russett 2003; Li and Wen 2005; Plümper and Neumayer 2006). Given that men still make up the majority of the fighters, the heavy toll on women warrants further study. The later, indirect deaths and disability get a lot less attention than war deaths, and merit closer investigation. If they are not fighting, why and how are women vulnerable in conflict and post conflict situations?

Pregnancy and childbearing are major determinants of female health, particularly in developing countries. Sub-Saharan Africa has the highest maternal mortality ratios (MMR) in the world, with averages ranging from 280 to 469 deaths per 100 000 live births in the different sub-parts of the region (Kassebaum et al 2014). In comparison, developed countries have an average MMR of 12 (ibid). In addition to maternal deaths there are a large amount of non-fatal complications, and WHO (2005) estimated that some 300 million women live with disabilities due to lack of treatment for pregnancy and birth related problems. High maternal mortality also has wider developmental ramifications. The loss of a mother is first of all a tragedy to her family. Motherless children, in addition to the emotional loss, are less likely to attend school, and have poorer health and increased risk of early death (WHO 2005). Reproductive age often corresponds to productive age, and if the family loses an income they may descend into poverty. USAID has

previously estimated the lost productivity costs due to poor maternal and child health to amount to USD 15 billion a year (USAID 2001). Since most of these deaths and disabilities occur in developing countries where work is predominantly labour-intensive and economic support networks generally fragile, they happen where they can be the least afforded.

Many of the countries that have trouble improving maternal health face severe problems in terms of governance, low economic growth and poor outreach of health services in general, and in addition many of these countries are experiencing or recovering from civil war. Sub-Saharan Africa (SSA) has, together with Asia, had the largest number of conflicts after the Cold War. In this article we therefore try to assess the effect of civil conflict in sub-Saharan Africa on the use of maternal health care services.

We believe that conflict will have a negative impact on maternal health care services through four different mechanisms: *changing normal population movement patterns* (including creating refugee movements); *destroying the economy* both locally and nationally; by *destroying infrastructure* like roads and health centres; and by *increasing psychosocial stress* in the population.

Increasing attention has been paid in the last few years to the link between health and conflict, and we aim to link some of the knowledge gathered in the public health arena and in research on armed conflict. Civil wars are the dominant type of conflict today (Themnér and Wallersteen 2012). There is an increased understanding also on political level that armed conflict might be one of the

impediments to reaching the Millennium Development Goal (MDG) 5, which aims at reducing maternal mortality by three quarters between 1990 and 2015 (United Nations MDG report 2011).

The Countdown group assessing progress towards MDG 4 and 5 has highlighted the uneven coverage of maternal health care services between countries, within countries, and along the continuum of care (Countdown group 2008). In conflict research there has simultaneously been a movement towards more disaggregated studies over the last few years, and we try to link these insights by investigating maternal health care and control variables at a sub-national level, in comparing countries that have experienced conflict within the last three years with those that have not.

This brings several new aspects to the study of the effect of civil war and civil violence on women. We combine the use of detailed demographic data on maternal health care use (from the Demographic and Health Surveys) with data from the conflict research community. By using two different conflict datasets, the UCDP/PRIO dataset and ACLED, we intend to say something about variation both at the national and the sub-national levels. Combining these two conflict datasets allows us to explore whether there is a threshold effect as well as exploring variation at the sub-national level in intensity and location of battles, and their influence on maternal health care use.

In this article we find that when testing a cross-sectional analysis of 17 sub-Saharan African countries, that overall countries affected by civil conflict have

lower use of maternal health care services. However, on a sub-national level the closeness to battles and their intensity actually seem to coincide with more use of these health care services, which we attribute to battles taking places in strategic locations where services are provided, and to attracting more aid in the same areas.

The article proceeds as follows. First we go through previous research on the impact of conflict on women and maternal health in particular, before we present our own theoretical expectations concerning the relationship between civil conflict and use of maternal health care services. We then present the data and go through the empirical analyses, before we discuss limitations to our study and conclude.

Previous Research

There are debates within the research community concerning the size and distribution of health effects of civil war. Researching health in conflict areas is fraught with difficulties, and measuring conflict impacts is typically not a priority during the chaos of a conflict (Murray et al. 2002). Common sense would suggest that wars are very damaging for population health. Aptly called 'development in reverse' (Collier et al 2003: 9) wars are likely to destroy a country's economy and infrastructure, kill or send health personnel fleeing, hinder population access to services, in addition to inflicting direct killings and injuries. But while no one would suggest that wars are good for population health (possibly outside of giving access to medical services under limited camp conditions, e.g. McGinn 2000)

there are disputes in the research community over exactly *how* damaging wars are. As a case in point, the Human Security Report Project has changed its focus from suggesting that there are very large, indirect numbers of deaths in countries affected by war (Human Security Report 2005) to questioning whether today's wars affect population mortality on a country level (Human Security Report 2011). While these are not technically opposite claims, they point to two very different pictures of the costs of war. The latter report makes the seemingly counterintuitive claim that overall population mortality in sub-Saharan African countries affected by war actually has continued to *fall* even during the war period. While this is a statement that contravenes most conventional thinking, the reasons that are given are relatively mundane: firstly, improvements in preventive medicine made during peace time continue to have an effect and prevent deaths during war time. Secondly, most wars today affect only a small proportion of a country's territory, thereby limiting damage on a national scale. Thirdly, it is claimed that the increased international attention to conflicts and humanitarian aid today is much more effective than before, thereby preventing large deaths tolls (Human Security Report 2011).

One of the studies used in the Human Security Report is Chen, Loayza and Reynal-Querol (2008), who investigate the post-war recovery of countries after at least 10 years of peace by comparing pre-war and post-war data. They find that factors related to combatants (like adult male mortality) are slow to improve compared to the peaceful control countries. However, for infant and adult female mortality, they report that the improvement in post-conflict countries is not significantly different from peaceful countries, and several countries manage to

make progress on child mortality despite the war (Chen, Loayza and Reynal-Querol 2008).

Other articles covering the whole world and focussing on population measures after conflict have concluded that women are more vulnerable to the long term effects of conflict than men are. Ghobarah, Huth and Russett (2003) argue that the indirect effects of civil conflict are under-estimated, and that wars continue to kill people long after they have ended. The study assesses cross-national variation in Disability Adjusted Life Years (DALYs) during one year (1999) and estimate that around 12 million DALYs were lost that year in countries with previous civil wars. The study further estimates that another 3 million DALYs were lost in neighbouring countries. Past fatality figures had a statistically significant effect on more disease categories for women than for men. The three categories yielding the largest loss of DALYs were due to different infectious diseases amongst 0-4 year olds, but the fourth largest loss of DALYS was due to 'maternal causes' in women of reproductive age. Plümper and Neumayer (2006) analyzed data on life expectancy, and found that armed conflict tended to decrease the gap between female and male life expectancy, which was used as evidence that on average armed conflict affects women more adversely than men. Li and Wen (2005) examined effects of armed conflict on mortality for the adult population, and found that the immediate effects of conflict were higher for men than for women, whereas for women it was the long term consequences that were most important. Iqbal (2010) only found a slightly higher impact of minor conflict on female than male mortality in Africa. These studies have, however, stopped short of

empirically investigating more in detail what the reasons for excess female mortality are.

As for maternal health issues more specifically some recent efforts have been made to assess how reproductive health care is affected by conflict, including a special issue of Reproductive Health Matters in 2008. Several case studies were carried out, reporting higher levels of poverty, early marriage, and higher maternal mortality among conflict-affected women in Sri Lanka (Kottegoda et al 2008). Staggeringly high maternal mortality ratios were reported from parts of Burma where the junta had attempted to cut off all resources, and alternative ways of delivering health care had to be sought (Mullany et al 2008). O'Hare and Southall (2007) found a strong bivariate relationship between previous conflict on one side and increased maternal mortality and decreased skilled attendance at delivery on the other, when no control factors were taken into account. In this study, the authors found increased maternal mortality using two different measures, and concluded that skilled attendance at delivery was on average 41% in conflict countries compared to 60% in non-conflict countries (O'Hare and Southall 2007). Chandrasekhar et al. (2011) showed in the case of Rwanda how the conflict had led to a lack of progress in antenatal care attendance, and a decrease in the number of births given in a health facility. In other instances, however, refugee populations have been found to be as well or better off in terms of maternal health care as the national average (McGinn 2000), which has usually been explained in terms of the availability of services in refugee camps. The difference between residents and refugees might not be very large especially if people flee from very poor host communities (Singh et al. 2005).

In this paper we look into the claim made by the Human Security Report Project that health effects may not show up in national estimates if the conflict only affects a small geographical area within a state. We attempt to meet this challenge by using disaggregated conflict and health data on the local level.

Theoretical expectations

The main focus of this article is how civil conflict influences the use of maternal health care services. We believe that conflict will have a negative impact through four different mechanisms: by *changing normal population movement patterns* (including creating refugee movements); by *destroying the economy* both locally and nationally; by *destroying infrastructure* like roads and health centres; and by *increasing psychosocial stress* in the population.

Firstly, civil violence will often stop people from moving about as usual. At first, people might either gather in areas perceived as safe if the violence is of short duration, or they might move out from home if it is longer lasting. As an ultimate consequence people will abandon their homes and end up either as internally displaced persons or refugees, often losing all their assets and becoming exposed to danger in the process. Several of the researchers mentioned earlier have highlighted refugee movements as an important factor in the destructive effect of conflict (e.g. Murray et al. 2002; Plümper and Neumayer 2006). We include local disruptions of population mobility as well; if women become scared of moving about or it becomes impossible to transport patients this will impede the use of

maternal health services. While short-term displacement will often allow people to return to normal as soon as the fighting is over, long-term displacement causes substantial disruption and will impact women's ability to attend maternal health care for a long time.

Secondly, conflicts and battles are likely to be highly destructive to the economy. This has been demonstrated in numerous studies (e.g. World Bank 2011). Destruction on a national level is likely to decrease the financial capacity of states, to channel resources away from healthcare, and to make the use of healthcare funds less efficient (Ghobarah, Huth and Russet 2003). On a local level, conflicts may be expected to interrupt agriculture and trade, potentially leading to malnutrition as well as poverty. However, since maternal healthcare services often are not free in developing countries these factors combine to make it less certain that they will actually receive adequate care. These impacts are not likely to subside immediately once a conflict is over, but could linger for a considerable time.

Destruction of infrastructure like roads and health care facilities is a third factor mentioned by many researchers (e.g. Murray et al. 2002; Li and Wen 2005). In countries where health facilities are scarce and transportation issues are crucial, conflicts may be expected to have a negative effect on health by damaging roads and transportation equipment. Health facilities are also sometimes targeted deliberately during conflicts in order to hurt an enemy population, an infamous example being the Sudanese regime's bombing of the hospital in Yei in what is now South Sudan. Health facilities can become politicized in times of conflict,

and recent incidents of sentencing health personnel to prison in e.g. Bahrain expose the danger that health personnel may become subject to. In our study we are not able to assess the difference between destruction of infrastructure and other factors like killing or scaring away health personnel, but what is important here is the actual use of the services as reported by the women themselves.

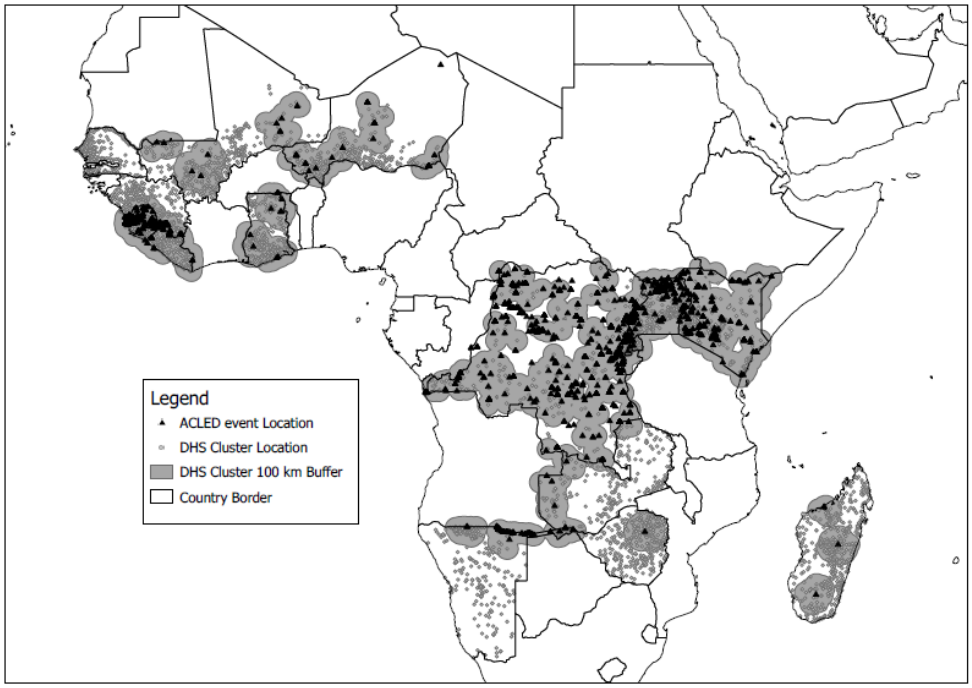
Lastly, a much under-researched factor at least in the conflict literature is the psychosocial stress that accompanies armed conflict in all forms. An exception is Li and Wen (2005) who describe how conflict will lead to decreased community cohesion, which we assume will interact with the individual feeling of stress and contribute to poor health outcomes. At the same time there are examples of how psychosocial services become unavailable at the very time they are most needed, for example did all the psychiatrists in Rwanda leave the country during the war there (Palmer 2002). A psychological study by Robertson et al (2006) on Somali and Oromo refugee women documented higher levels of trauma and associated problems amongst women with more family responsibilities compared to those with smaller families. We believe that the added stress and tension in a conflict situation and afterwards will make the women focus on more immediate life-saving tasks than for example going for antenatal check ups (if it is at all possible due to the other factors mentioned above) and that pregnancy-related matters are seen as less important in times of acute danger.

So far we have discussed how we think armed civil conflict might influence use of maternal health care services. In addition it would reasonably be expected that more severe conflicts have a stronger impact on people's health than less intensive

ones, and this is also supported by previous research (Ghobarah, Huth and Russett 2003; Li and Wen 2005). Severe conflicts are likely to expose the population to greater trauma, and to cause larger destruction to the infrastructure.

The discussion above has led us to develop four different hypotheses concerning the relationship between civil violence and the use of maternal health care services. *Hypothesis 1*: There is less use of maternal health care services in countries recently affected by civil conflict than in countries at peace.
Hypothesis 2: The presence of battle events in an area lowers the use of maternal health care services
Hypothesis 3: The higher the level of battle events in an area (more intense fighting), the lower the use of maternal health care services.

Figure 1 Countries and data included in the analysis



Data

Dependent variables

The Demographic and Health Surveys (DHS) are large, nationally representative surveys focussing on demographic and health factors with a special emphasis on women and children. A survey will often involve 5 000-30 000 households in the country, covering women aged 15-49 years. DHS represents one of the most comprehensive data sources available on health and demographic factors in developing countries. Our sample includes 13 countries in sub-Saharan African countries that had data on geographical locations available because we wanted to include precise location information for the variables in our study. Almost no

countries have geo-referenced data available to permit meaningful time series analysis within the period where both DHS and disaggregated conflict data are available. For the purpose of this article, and following other articles comparing maternal health issues across countries with DHS data (e.g. Magadi, Agwanda and Obare 2007; Kruk, Prescott and Galea 2008) we therefore treat the sample from 2005-06 to 2008-09 as cross-sectional even though the surveys were not carried out in the same year. We analyze the most recent live birth of the women who had a birth in the last five years, using individual recode data. Our total sample consists of 61,959 women.

The current recommendation from the World Health Organization is that pregnant women should receive antenatal care (ANC) at least four times during pregnancy, and be assisted by a professionally trained health care worker during birth (WHO 2003). The exact effect of antenatal care in reducing maternal mortality is debated, but the effect of professional assistance during birth is more uniformly accepted (ibid). An adequate number of antenatal visits (four or more) and professional assistance during delivery both aim at ensuring good maternal health. These have been chosen because they are relatively standard interventions that have been tracked over time, and because they are a part of the recommended interventions that are used to measure progress towards achieving MDG 5. These are process indicators, and more efficient as part of a package rather than as single interventions (Campbell and Graham 2006), but together they represent two different and important aspects of the continuum of care.

In the following sections we have used a restrictive definition of 'skilled health worker' to assess whether the women have received professional assistance at birth, and we include only doctors and nurse/midwife. DHS data are drawn from clusters within the countries for sampling purposes. The data for maternal health care use represent simple averages at the cluster level, which we take to represent a community in this study. We believe such a level is interesting to investigate because much of women's decision making power is exerted at the community level (UNICEF 2008). It is common for other people in the community to be involved in a birth especially in areas with many home births, and we also believe the community may be expected to have an impact on maternal health care service use. The data is presented in percentages, so that the independent variables represent *the percentage of women at each cluster who report having had four or more antenatal visits* or *having had professional assistance at their latest birth*.

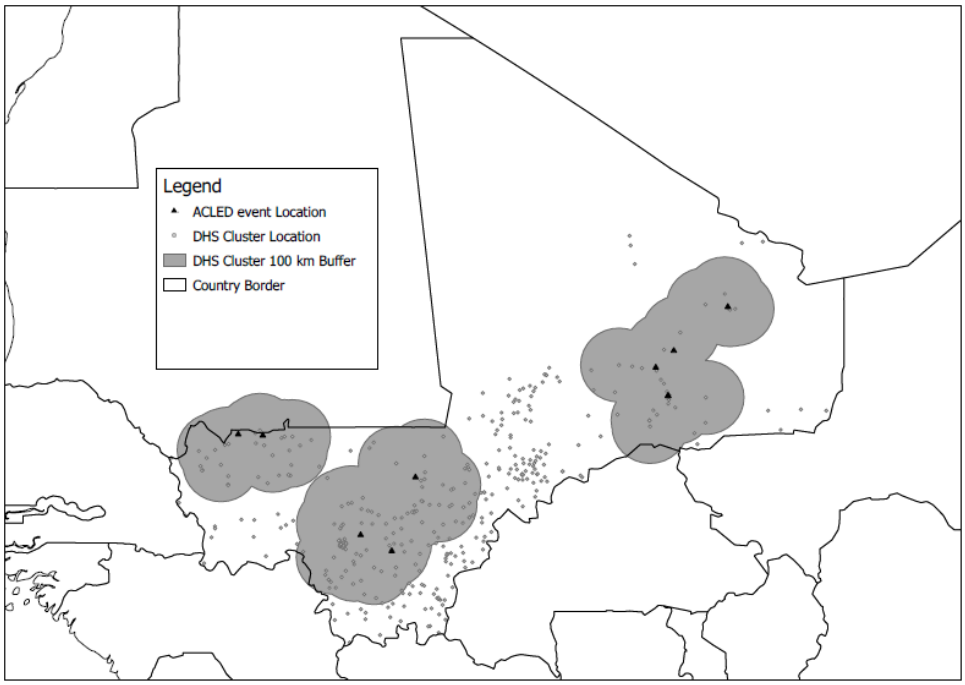
Conflict data

The conflict data we use come from two sources. Firstly from the UCDP/PRIO dataset, where an armed conflict is defined as 'a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths' (Themnér 2011:1). This is a country-year measure. We use this dataset to include civil conflict on a country level to assess whether there has been civil conflict or not within the last three years before the pregnancies and births covered by the DHS data. Secondly, in order to do a more detailed analysis of the geographic variation of conflict we use the ACLED dataset which aims at including information on internal political violence by several actors, and not only

where the state is a party (Raleigh, Linke, Hegre, and Carlsen 2010). ACLED reports on several categories of events but we concentrate here on the battles, defined as 'a violent interaction between two politically organized armed groups at a particular time and location' (Raleigh et al 2010: 656). We do this in order to separate out what we consider the most severe events from other reported events like rioting, protests and establishment of rebel headquarters etc. that we would not expect to have the same impact on people's use of health care services. We have further discussed this choice below. Such violence usually – but not always - occurs within a civil war or fragile state framework (ibid), but in the countries we include here there are always some battles reported in the time period we have chosen, even in those not usually considered to be at war (like Madagascar or Zambia).

We have coded the ACLED battle events in the following ways. We first created a dataset including all battle events within a 100 km buffer around the cluster where DHS data is gathered. We then coded a dummy variable representing the presence of at least one battle event within this buffer zone in order to test hypothesis 2. Almost 60 % of the clusters have at least one battle located within this zone. Secondly we included all the battle events within this zone in the conflict variable, to test whether conflict intensity would have a different impact on health care service use (hypothesis 3). Since the 100 km limit was chosen somewhat arbitrarily we also created a new dataset, this time only including battle events within a 50 km buffer around the cluster. We then used these data to assess whether lowering the distance to the battle events would have a different impact on health care service use.

Figure 2 DHS clusters and ACLED event buffers in Mali



Control variables

Even in conflict ridden areas there is a certain stability in the socio-demographic factors that influence a woman's decision to seek health care (McGinn 2000). More educated mothers usually have healthier families overall, and previous DHS comparative reports have shown that more educated mothers are more likely to receive antenatal care from a medically trained person and to get professional delivery care (Bell, Curtis and Alayon 2003). Women in urban areas are usually more likely to receive maternal health care than women in rural areas (Bell, Siân and Silvia 2003; Magadi, Agwanda and Obare 2007; Magadi, Nyovani and Nascimento Rodrigues 2000). A finding that is near universal is that wealthier

women receive better care (Magadi, Nyovani and Nascimento Rodrigues 2000; UNICEF 2008) whereas the differentials according to age are a little more unclear (Bell, Curtis and Alayon 2003; Magadi, Agwanda and Obare 2007). In addition to these well established links we want to control for the number of children a woman has had in the last five years has an impact, and we expect she will have less time and opportunity to attend such health care with responsibility for more children at home. The data on all these variables are taken from the DHS data set. The women are grouped into four different levels on educational attainment, age is a continuous measure and we use the five-level wealth index created by DHS.

TABLE 1 Countries, DHS data year, clusters and individuals included in our study

Country	DHS data year	Clusters	Individuals represented
DRC	2007	293	5272
Ghana	2008	401	2129
Kenya	2008-09	397	3988
Liberia	2007	291	3867
Madagascar	2008-09	585	8344
Mali	2006	405	8904
Namibia	2006-07	486	3770
Niger	2006	338	5764
Rwanda	2007-08	248	3568
Sierra Leone	2008	349	3912
Uganda	2006	336	4396
Zambia	2007	319	4006
Zimbabwe	2005-06	398	4039
Total		4846	61959

In our study it is important to include variables that can control for spurious results resulting from confounding factors that might have an impact both on the likelihood of conflict outbreak and on health care attendance. Distance from the

capital is one of the factors that influence the risk of civil conflict. Areas further away are likely to have less government control, and therefore a higher risk of conflict (Buhaug and Rød 2006). Since distance to the capital (or at least to large urban areas) might also lower the probability of getting good health care services (Gage 2007), it is a variable that is important to include as control factor. Similarly, most conflict studies find that civil conflicts are more likely to break out in densely populated areas (Buhaug and Rød 2006; Hegre, Østby and Raleigh 2009). By including a measure of the number of people living in the area we intend to control for this fact and the simultaneous higher likelihood of receiving maternal health care in such environments. We believe these two factors are particularly important to include in order to avoid spurious results. The population density is measured by taking the absolute population within a zone of 20 km radius around the cluster. We use gridded population from CIECIN (year 2005) and log-transform the data. For each cluster we measure the distance to the capital, and report it in kilometres.

In addition to all these factors there will be variation depending on the country, its resources, allocation of spending on health care generally and on maternal health care more specifically, and so forth. To control for these factors we include a dummy variable for each country, using Zambia as the reference category. We run the regressions with Stata 10.0, using ordinary least squares regression.

Results

50 % of the 61959 women in our sample had the four recommended or more antenatal visits. 13 % of the women did not have any antenatal visits at all, and constitute a particularly vulnerable group. Country wise Ghana had the highest percentage of women having four or more antenatal visits, with 79 % reaching this target. Niger was at the opposite end with only 19 %. Namibia topped the list with 81 % of women having professional assistance at birth, compared to Mali and Niger at the lower end with 27 % professional assistance. In the total sample 46 % were assisted by a professional health care worker at their last birth, but in the group of women who had no antenatal visits at all (the 13% mentioned above) that was the case for only seven % - this probably points to the importance of antenatal counselling as a starting point for adequate follow up along the continuum of care.

Simple bivariate comparison

Since there are only 13 countries in our sample we do not run a regression on country level, but first do a bivariate comparison to check whether there are any differences in the dependent variables according to whether the country has had a conflict in the last three years, using the UCDP/PRIO data on intrastate armed conflict (version 4-2011). This is similar to the approach e.g. Southall and O'Hare (2007) and Iqbal (2010) have employed.

TABLE 2 Difference in means of women with adequate antenatal care and professional assistance at birth between countries with civil conflict the previous three years and non-conflict countries, two-sample t-tests with equal variances

	Four antenatal visits	Professional assistance at birth
No intrastate armed conflict last three years	53.989	49.428
Intrastate armed conflict last three years	43.740	41.160
Statistical significance of difference ≠ 0	0.000	0.000

As is evident from Table 2, there is a statistically significant difference in the use of maternal health care services between countries marred by intrastate armed conflict in the last three years and those who have remained peaceful, with the peaceful countries having a higher use of these services. The difference is quite substantial in size, with 10% more of women in peaceful countries having adequate antenatal visits and eight % more having professional assistance at birth.

These simple tests support hypothesis 1 and are in line with what many other studies have found, namely that there is overall poorer indicators for maternal health care in countries affected by violent conflict (Southall and O'Hare 2007; World Development Report 2011; Chandrasehkar et al. 2011). We believe that partly because of this effect, overall countries affected by violent conflict risk having higher maternal mortality as one of the lingering effects of conflict.

Regression on sub-national variation

We then turn to our regressions in order to explore the sub-national variation in battle intensity and battle location. Model 1 tests whether battle presence (hypothesis 2) within 100 kilometres from the cluster lead to changes in the use of maternal health care services. Models 2 and 3 test whether the number of battle events (hypothesis 3) has a significant effect. The purpose of making this distinction is to investigate whether there is a threshold effect on our results. Model 4 tests whether reducing the maximum distance to battles to 50 km has an impact on these results.

TABLE 3 The effect of battle events on adequate antenatal care, OLS regression

Variable	Model 1 dummy battle event 100 km	Model 2 All battle events 100 km	Model 3 All battle events 100 km, logged	Model 4 Dummy battle event 50 km
At least one ACLED battle event, 100 km	4.372*** (0.753)			
All ACLED battle events, 100 km buffer		0.013 (0.013)		
All ACLED battle events logged, 100 km buffer			0.940** (0.341)	
At least one ACLED battle event, 50 km				3.323*** (0.727)
Urban residence	3.296*** (0.898)	3.121*** (0.901)	3.110*** (0.900)	3.024*** (0.899)
Mother's education	10.998*** (0.874)	11.093*** (0.877)	11.066*** (0.876)	11.057*** (0.875)
Wealth	3.369*** (0.423)	3.437*** (0.424)	3.504*** (0.425)	3.447*** (0.423)
Mother's age	0.567*** (0.109)	0.558*** (0.110)	0.568*** (0.110)	0.572*** (0.110)

Other children born within last five years	-7.995*** (1.309)	-8.108*** (1.314)	-7.858*** (1.317)	-7.878*** (1.312)
Ln(population)	0.343 (0.230)	0.613** (0.226)	0.516* (0.229)	0.369 (0.232)
Distance to capital	0.004** (0.001)	0.004*** (0.001)	0.004** (0.001)	0.004** (0.001)
Democratic Republic of Congo	-20.867*** (1.814)	-18.091*** (1.755)	-19.569*** (1.847)	-19.322*** (1.770)
Ghana	14.052*** (1.551)	15.866*** (1.525)	15.721*** (1.525)	15.455*** (1.524)
Kenya	-16.955*** (1.612)	-14.144*** (1.552)	-16.183*** (1.744)	-15.823*** (1.583)
Liberia	11.669*** (1.719)	14.489*** (1.652)	13.297*** (1.714)	13.151*** (1.676)
Madagascar	-9.365*** (1.369)	-8.957*** (1.372)	-8.911*** (1.371)	-9.108*** (1.369)
Mali	-17.775*** (1.689)	-16.604*** (1.683)	-16.654*** (1.682)	-16.816*** (1.680)
Namibia	7.608*** (1.505)	9.045*** (1.489)	8.519*** (1.502)	8.167*** (1.499)
Niger	-36.377*** (1.786)	-34.294*** (1.755)	-34.983*** (1.773)	-35.343*** (1.767)
Rwanda	-38.346*** (1.879)	-35.353*** (1.815)	-37.586*** (2.010)	-37.266*** (1.858)
Sierra Leone	11.783*** (1.804)	14.159*** (2.053)	11.477*** (2.208)	12.666*** (1.798)
Uganda	-13.024*** (1.697)	-10.151*** (1.652)	-12.072*** (1.813)	-11.723*** (1.660)
Zimbabwe	2.663 (1.528)	3.003* (1.532)	3.110* (1.532)	2.859 (1.529)
Constant	28.749*** (4.717)	26.502*** (4.717)	26.835*** (4.715)	28.270*** (4.724)
Observations	4842	4842	4842	4842
R-squared	0.56	0.56	0.56	0.56

Note: standard errors in parentheses. *p < 0.05, **p < 0.01,***p<0.001

Contrary to our expectations, in the first three regressions on adequate number of antenatal visits (table 3), we see that both the existence of at least one battle and the total number of battle events within 100 kilometres from the cluster actually are associated with a *higher* number of women with adequate visits. Similarly, in model 4 we find that a decrease in distance to the battles heightens the chance of

having an adequate number of visits, instead of lowering it as we hypothesized. The coefficient for this result is smaller than the one for battle presence within the 100 km buffer. Since the results are contrary to our expectations we will discuss these results more in a later section, after reviewing the results for professional assistance at birth.

The other control variables are all significant and go in the expected direction except for one. Urban women are likely to have more visits than their rural counterparts; more educated women have more visits; wealthier women and those living in more densely populated areas are all more likely to have the four recommended antenatal visits. Older women also have adequate visits more often than younger women in this sample, whereas more births in the last five years make it less likely that women have adequate visits. The only unexpected result with the control variables is the positive effect of a larger distance to the capital, which we theorized would be negative. To investigate whether there was an overlap between the effects of the urban variable, population density and distance to capital measure we reran the analyses with all battle events included without the population density and distance to capital, with no substantial changes to the model. The urban and population density variables are not highly correlated, and appear to pick up different effects. The country dummy variables are in general significant, meaning that there are differences between the countries like their government system, economy and health care spending that reasonably makes a difference in the health care service use.

Professional assistance at birth

Next, we investigate the effect of battle events on the likelihood of having professional assistance at birth. Similarly to the previous regressions, models 1, 2 and 3 test whether the presence and number of battle events within 100 kilometres from the cluster lead to changes in professional assistance at birth (hypotheses 2 and 3), whereas model 4 tests whether changing the average distance to battles changes our results.

TABLE 5 The effect of battle events on professional assistance at birth, OLS regression

Variable	Model 1 Dummy battle event 100 km	Model 2 All battle events 100 km	Model 3 All battle events 100 km, logged	Model 4 Dummy battle event 50 km
At least one ACLED battle event, 100 km	3.534*** (0.821)			
All ACLED battle events, 100 km buffer		0.007 (0.014)		
All ACLED battle events logged, 100 km buffer			0.371 (0.372)	
At least one ACLED battle event, 50 km				-0.715 (0.794)
Urban residence	10.880*** (0.980)	10.741*** (0.982)	10.737*** (0.982)	10.764*** (0.982)
Mother's education	15.403*** (0.951)	15.475*** (0.953)	15.463*** (0.953)	15.476*** (0.953)
Wealth	9.580*** (0.461)	9.629*** (0.462)	9.654*** (0.463)	9.613*** (0.462)
Mother's age	0.005 (0.119)	-0.003 (0.120)	5.18e-04 (0.120)	-0.008 (0.120)

Other children born within last five years	-9.049*** (1.426)	-9.160*** (1.429)	-9.065*** (1.433)	-9.235*** (1.430)
Ln(population)	0.059 (0.251)	0.284 (0.246)	0.248 (0.250)	0.352 (0.253)
Distance to capital	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)
Democratic Republic of Congo	-10.804*** (1.979)	-8.506*** (1.913)	-9.068*** (2.014)	-8.105*** (1.933)
Ghana	6.799*** (1.693)	8.256*** (1.662)	8.195*** (1.663)	8.324** (1.665)
Kenya	-0.490 (1.760)	1.866 (1.691)	1.096 (1.902)	2.440 (1.729)
Liberia	6.314*** (1.876)	8.620 (1.801)	8.160*** (1.868)	8.976*** (1.830)
Madagascar	4.609** (1.494)	4.932*** (1.495)	4.949*** (1.495)	4.953*** (1.495)
Mali	-8.809*** (1.843)	-7.865*** (1.833)	-7.885*** (1.833)	-7.822*** (1.834)
Namibia	21.947*** (1.640)	23.119*** (1.620)	22.920*** (1.635)	23.354*** (1.634)
Niger	-10.370*** (1.949)	-8.676*** (1.911)	-8.944*** (1.932)	-8.423*** (1.928)
Rwanda	7.215*** (2.051)	9.702*** (1.978)	8.847*** (2.192)	10.280*** (2.029)
Sierra Leone	-7.426*** (1.967)	-5.161* (2.233)	-6.076* (2.405)	-3.969* (1.961)
Uganda	1.200 (1.853)	3.640* (1.800)	2.929 (1.977)	4.270* (1.813)
Zimbabwe	13.584*** (1.668)	13.851*** (1.670)	13.891*** (1.671)	13.867*** (1.670)
Constant	9.998 (5.143)	8.183 (5.135)	8.306 (5.136	7.763 (5.152)
Observations	4846	4846	4846	4846
R-squared	0.63	0.63	0.63	0.63

Note: standard errors in parentheses. *p < 0.05, **p < 0.01, ***p<0.001

In the estimations of whether mothers were delivered by a trained health professional or not (table 5) we also see an unexpected pattern for the battle variables. It is only the presence of at least one battle within the 100 kilometre buffer that is statistically significant, and it is associated with a *larger* number of women having professional assistance at birth in model 1. Including all the battle

events as a measure of fighting intensity in models 2 and 3 has a positive, but not significant effect. Having at least one battle within a 50 km buffer zone has the expected negative effect on professional assistance at birth, but it is a small coefficient that is not statistically significant. All in all the effects of battles on the chances of having professional assistance at birth are less clear than the results for adequate antenatal visits. The control variables all perform as last time except that the age variable is changing sign from model to model (but is no longer significant).

Robustness checks

Since the results were not in compliance with our expectations, we ran a number of robustness checks in order to make sure that they were not reliant on the specific tests we were performing.

Firstly, we wanted to investigate whether using the specific dependent variables we had chosen would impact the results. We therefore performed the same bivariate tests on a number of other indicators of maternal health care services, to check the difference between peaceful and conflict affected countries (hypothesis 1). The results confirmed our finding of less use of maternal health care services in the countries affected by intrastate armed conflict: the conflict-affected countries had a higher proportion of women with no antenatal visits at all (15 % versus almost 13 %); a higher proportion if women who were assisted at birth by traditional birth attendants (26 % versus 22 %); a lower proportion of women who delivered in a health facility (45 % versus 51 %) and a higher number of women

who reported having no assistance at all during delivery (seven % versus less than five %). All these differences were statistically significant. Only for getting a tetanus injection was there no difference between the peaceful or conflict affected countries, at about 71% each (and the small difference was far from statistically significant). We therefore think that in our sample, the evidence clearly points to poorer maternal health care service use overall.

Testing further whether including all the battle events within the 50 km buffer would change anything yielded largely the same results as for the dummy variable (and they were not statistically significant). We have placed less emphasis on the 50 km buffer results than on the 100 km buffer results because we know that the information used to code ACLED events is often not completely precise. News outlets oftentimes cite clashes within a region rather than a specific location for example, and we therefore think that the 50 km distance gives the reader a sense of precision that is not completely warranted by the data. This is the reason why we feature the results for the 100 km buffer more prominently.

Discussion

Our findings in this article speak to previous research in two different ways. On a national level, we confirm earlier findings indicating that there is a general detrimental effect of conflict on maternal health care. The results we find here support hypothesis 1 – that there is overall less use of maternal health care services in post-conflict countries. This should come as no surprise, given the devastating potential of civil conflict to destroy the national economy,

infrastructure and psychosocial wellbeing of affected persons in addition to creating mass movement of people as refugees or internally displaced persons. However, we do not find the geographical pattern that we expected sub-nationally (hypotheses 2 and 3), and this necessitates some further discussion. First of all, we would like to point out that we do not take the sub-national results to mean that there is a causal link from battle events to *better* maternal health care. There are no apparent reasons for why this could be so, and in that case there should also be better maternal health care overall in the countries affected by the most battles, which is not what we find. Instead we believe there is a more indirect explanation for the observed patterns:

Firstly, the battles might be occurring more often in strategic locations in a country. By strategic location we mean a town or other space that is both important to capture militarily and is somewhere the government is particularly interested in providing services. Examples might be an area important for trade, a town with a central bridge and so forth, and this is a mechanism that might not be fully captured by our controls for urban location and population density.

Secondly, it is highly possible that the battles are the most salient war events (that is partly why we selected them in the first place) and that the places where they happen therefore attract the most aid both nationally and internationally in the aftermath. Battles are highly dramatic events and may also be reported more than other types of events (Raleigh et al. 2010). International humanitarian aid is the explanation that Iqbal (2010) puts forward when she fails to detect a very strong impact of conflict on male and female life expectancy. Interestingly some of her

findings are somewhat similar to ours, in that she finds a clear negative relationship of armed conflict on health-adjusted life expectancy in a bivariate analysis, whereas the effects are more unclear in the multivariate analyses (Iqbal 2010).

Both of these explanations are compatible with other, qualitative research. For example, Ormhaug (2012) compared access to and use of maternal health care services in two locations in South Sudan during and after the second civil war. It was clear that inhabitants in Juba (the new capital) had received much more health care aid, both from the northern regime and from the international community, than the inhabitants of the remote and rural area Magwe. At the same time Juba as a garrison town was probably the location of the highest number of battle events in the sense that we count here, pitching the northern regime against the SPLA, whereas the fighting around Magwe took a different form. A question that could be asked of future research is whether the way we measure and use battle events here is the most appropriate for measuring destructive effects, but that is a large debate.

Maternal health care is an issue of profound inequality, both within and across countries. It is striking to see that even when the detrimental effects of battles are taken into account, some areas are still better served than others in terms of health care services.

These findings also address research presented in the Human Security Report (2011), where the increase in humanitarian aid after the cold war was used as an

explanation for why some countries continue to see declining deaths rates even through a conflict period. If humanitarian aid is dispatched quickly to war-affected areas that might explain what we see in terms of availability of health care, particularly because we investigate two measures of maternal health care that humanitarian agencies might be likely to provide.

However, we differ with the Human Security Report when they come to the conclusion that a reason for the lack of effect of conflict on national mortality rates is the fact that conflicts only affect a small proportion of a country – on the contrary, our results seem to indicate that effects (at least on maternal health care services) are not necessarily restricted to the immediate surroundings, but that there is rather a systemic, nationwide effect of conflict on health care.

As for our four proposed channels of detrimental effects of conflict on maternal health care services (restricting normal population movement, destroying infrastructure, destroying the economy and reducing psychosocial wellbeing) we should perhaps moderate our hypotheses about infrastructure, or at least conclude that some components of health care might be delivered to parts of the affected populations quite quickly. These are findings that it would be very interesting to explore further.

Limitations and suggestions for future research

We believe our study breaks new ground in research on conflict impact on maternal health care, nonetheless it has several limitations. While we believe our

data on use of health care services is very interesting from a policy perspective, it is important to keep in mind that we do not observe directly the outcome 'better maternal health' which is the end goal of having these services. We are neither in a position to say anything about the quality of the health care the women receive in the health facilities, nonetheless we believe the information on outreach documented here is interesting.

Using the battle events in ACLED might obviously omit several other conflict factors that might influence women's decision to seek health care. Although it is a step forward from using datasets that include more narrow definitions of conflict, it seems reasonable to expect that the occurrence of e.g. genocide or politicide might be equally if not more damaging to public health including maternal health, as indicated by Hoddie and Smith (2009). Such analyses ought to be performed to investigate this matter further.

Although we explain a quite high proportion of the variance in our data (R squared varies from 0.56 to 0.63 in our analyses), we do not capture all the determinants of maternal health care seeking behaviour in our analysis. Systematic variation in factors like cultural preferences for home births should be picked up by the country dummy variables, however, there may also be similar variance within countries that we are not able to measure. These factors might, however, be less amenable to the standardization required in quantitative research approaches, and could be explored in a better way using qualitative data. Linking more findings from the quantitative and qualitative approaches would enhance our

understanding in general of the factors involved in determining maternal health care seeking behaviour in an environment where violent battles take place.

Conclusion

Common sense would indicate that wars are detrimental to population health, and several studies have shown this in various ways (e.g. Murray et al. 2002: Ghobarah, Huth and Russett 2003; O'Hare and Southall 2007; World Development Report 2011). These studies have focussed on measures of both population mortality and disability, and have found that there are clear, negative health effects in countries affected by war. Other research has challenged this perspective, claiming that female and child mortality in post-war countries ten years on is indistinguishable from peaceful countries (Chen, Loayza and Reynal-Querol 2008) and that many sub-Saharan African countries continue to experience declining mortality even during war time (Human Security Report 2011). In this study we found that post-conflict countries on average have lower levels of maternal health care use than non-conflict countries. However, when investigating the variation on sub-national level in a multivariate model, we actually found somewhat higher use of maternal health care services in areas where battles had been geographically closer or more intense. The results are less clear for professional assistance at birth than for adequate antenatal care. We attribute these findings firstly to a propensity to fight over strategic locations in a country where health services are also more likely to be provided, and secondly to the battles as attracting more attention and therefore more aid in the aftermath. In contrast there will be marginalized areas within a country where the poor health and lack of

maternal health care services are less visible, and where women suffer the consequences in silence. Maternal health and access to maternal health care continue to be issues of profound inequality both within and across countries.

Overall the results we find in this article suggest that more attention should be paid to maternal health care in countries experiencing civil war and violent battles, especially making sure that peripheral areas are not systematically neglected. Funding for reproductive health including maternal health remains insufficient in conflict-affected countries (RAISE 2010), which may contribute to the difficulties in achieving MDG 5. These results should therefore be of interest to the UN, individual countries and NGOs working to fulfil the MDGs.

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11 Article 2: Civil Conflict and Child Health: Impact on Fever and Measles Vaccination in 15 sub-Saharan African Countries

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Abstract

In this article we assess the impact of civil conflict on fever and child measles vaccination status in 15 sub-Saharan African countries. We show that on a country level there is higher prevalence of fever but also slightly more children vaccinated against measles in conflict countries, whereas sub-nationally, the intensity and proximity of battles violence is associated with unclear results for fever and a higher likelihood of being vaccinated against measles. We believe that the sub-national results are explained by battles that take place in areas where health care is more likely to be provided, and that attract more aid.

Introduction

Countries embroiled in civil conflict face many challenges. Most research on civil war has focused on why the conflicts break out, but more attention is currently being directed towards the post conflict situation, balancing justice versus peace, and investigating longer term impacts on the affected populations. Important issues include managing resettlement of refugees and internally displaced persons; rebuilding infrastructure; managing demobilisation, disarmament and reintegration of combatants and fostering economic growth. In this paper we consider how civil conflict affects child health.

Reducing child deaths is high on the list of international priorities, as confirmed by selecting it as Millennium Development Goal (MDG) 4. Target 4A is to reduce by two thirds, between 1990 and 2015, the deaths of children under five. Progress has been made recently in reducing under-five mortality, and the global number of deaths has been assessed to have gone down from over 12 million in 1990 to an estimated 7,6 million in 2010 (UN 2012). Yet the numbers remain too high. 70% of children who die before the age of five in sub-Saharan Africa die due to five largely preventable conditions: lower respiratory infections, diarrheal diseases, malaria, HIV/AIDS, and measles (Mathers 2009: 19). The continued deaths of these children represent a failure to provide safety to the most vulnerable members of the human community.

Currently the assessment is that the MDG4 will not be reached by 2015 (UNICEF 2011, UN 2012). In addition to being too slow, the progress of reducing mortality

is also highly uneven. Sub-Saharan Africa has nearly doubled its average rate of reduction since 1990 from 1.2 per cent a year in the period 1990-2000 to 2.4 per cent a year in 2000-2010 (UN 2012), however , almost one in eight children in this region still die before reaching five years of age (UNICEF 2011). 24 of the 26 countries with under-five mortality above 100 per 1000 live births are found in this region (ibid) and that is why we are focussing on this geographical area.

In addition to poverty, poor governance and inadequate health systems, a possible aggravating factor is that many of these countries are experiencing or recovering from civil conflict. Sub-Saharan Africa has together with Asia had the largest number of conflicts after the Cold War, and most of these are civil conflicts. Of the 37 armed conflicts active in 2011, 36 were internal conflicts (Themnér and Wallensteen 2012) and we have therefore chosen to focus on these. Language on the detrimental effect of armed conflict for reaching the MDGs was recently included at the MDG review summit in 2010 (United Nations General Assembly 2010) and was the focus of the World Development Report 2011, showing that this issue is beginning to gain attention including on the highest political levels. It is therefore timely to try to assess the effect of armed conflict on child health.

Previous research has highlighted several ways that war and conflict increase death and disability for the populations involved (e.g. Ghobarah. Huth and Russett 2003; Plümper and Neumayer 2006; Hoddie and Smith 2009). In this paper we focus on how civil conflict in the form of violent battles has consequences for two specific indicators of child health: prevalence of children with fever in the last two weeks and coverage of measles vaccination in children. Fever is a symptom of

poor child health in general, and the underlying causes can vary from relatively innocuous childhood diseases to severe conditions like HIV/AIDS or malaria. Many of the diseases that contribute to loss of healthy life-years demonstrated in previous studies (e.g. Ghobarah, Huth and Russet 2003; Hoddie and Smith 2009) will be accompanied by fever. Measles vaccination status on the other hand is a very specific measure, and provides information on contact with the health care system. The UN Millennium Development Goals Report 2011 states that estimated child deaths due to measles have declined dramatically from 2000 to 2008, but that progress is now threatened by reduced funding. Although MDG 4 has as a main goal to reduce mortality, the specific targets focus on interventions that are known to contribute to mortality reduction. One of these targets is to increase measles vaccination of 1 year old children, and Guha-Sapir and d'Aoust (2010) have pointed out measles infections as one of the biggest risks specifically after armed conflict. In this article we are therefore particularly interested in measles vaccinations, in order to assess whether they reach out to vulnerable population segments. We are here thus focussing on underlying causes of childhood morbidity which can guide action, and not directly on mortality.

We believe that we bring several new aspects to the analysis of the impact of civil conflict on child health. Firstly, in addition to a country-level assessment, we use *cluster-level* geographic information on the location of clusters with child data and combine this with equally disaggregated conflict data. DHS clusters are drawn from various locations within our sample countries and we use this information as a measure of health status at community level. Secondly, the inclusion of sub-national geographical information allows us to vary the threshold we set for how

far away conflict events are expected to impact child health, unlike previous national level studies that do not take this variation into account. Thirdly, by using the battle events as coded in ACLED we can go beyond the conventional definitions of civil conflict that rely on a set number of battle deaths per year, and investigate whether the battles themselves, without a possibly arbitrary threshold, have an impact on the child health situation. This avoids the problem where some conflicts hover around the threshold for inclusion in datasets, as is otherwise often the case. Using this approach means that data availability restricts our sample to 15 sub-Saharan African countries where we use data from 2005 to 2008-09 in a cross-country comparison, but we believe it is a worthwhile trade off in exchange for much more detailed information. Lastly we use two concrete measures of child health status that may be more interesting from a policy perspective than an aggregate measure like disability-adjusted life years (DALYs) or life expectancy, which are difficult to act on for policy makers. All in all this gives us a more detailed picture of how civil conflicts have consequences for child health compared to most previous studies.

Previous research

Murray et al. claimed in a study from 2002 that armed conflict should be seen as a public health problem. The study of conflict impact on population health has since then not coalesced around a common understanding of which definitions of conflict to use, which population measures or data sets one should focus on, or which channels of conflict impact are the most important, so the studies we refer

to in the following use very different definitions of all these important parameters. Some commonalities can however be found amongst most of them.

A finding that is common is that children, women and men are not affected by conflict in the same way. Several authors conclude that men are more often victims of direct and violent attacks whereas women and children are suffering mostly from the indirect effects of armed conflict, with children being the most affected overall (Ghobarah, Huth and Russett 2003; Hoddie and Smith 2009; Hsiao-Rei Ricks et al. 2011).

Assessing more specifically how wars or civil wars have an effect on child health is an understudied but growing area of research. There are a few global studies and some that cover single countries, and in this review we will focus mostly on those from the African continent. Some global studies have shown an increase in general child mortality in conflict areas. Reza, Mercy and Krug (2001) showed an elevated mortality rate for 0-4 year olds of both sexes due to conflict. Ghobarah, Huth and Russett (2003) and Hoddie and Smith (2009) report some of the largest increases in disease and disability in children under four in post-civil war countries compared to other population groups. Iqbal (2010) reports that major and minor conflict duration is associated with higher infant mortality, although the results do not hold for the African continent. The World Development Report 2011 states that violence is a main barrier to reaching the MDGs, and that fragile and conflict-affected states have an under-five mortality that is almost twice as high as other developing countries (World Bank 2011).

As regards single country studies which explore variation within one nation, several have focussed on issues of nutrition related to armed conflict and other crises (i.e. more indirect measures of health, similar to what we do). Bundervoet and Verwimp showed that children affected by the conflict and the subsequent embargo in Burundi had a much smaller height-for-age than children who had escaped the two shocks (Bundervoet and Verwimp 2005). The findings were significant for rural children, who became severely undernourished, whereas the same effects were not found for children living in urban areas. Similarly, Alderman, Hodinnott and Kinsey (2004) reported that children living through the civil war and following droughts in Zimbabwe were on average 3.4 centimetres shorter than they should have been under normal circumstances. Focussing on child health is important because sometimes ill health in early childhood has damaging consequences that cannot be reversed later in life. Yamauchi (2006) further demonstrated in a study from South Africa how healthier and less undernourished children started school earlier, got better grades and had to repeat fewer classes than their less healthy siblings. Investment in child health is therefore important.

As for articles including specifically results on vaccination status, O'Hare and Southall found a clear association between recent armed conflict in sub-Saharan African countries and lower rates of DPT3-vaccinated 1 year olds and higher rates of under-five mortality (O'Hare and Southall 2007). Iqbal (2010) found lower measles vaccination status in conflict affected countries. Gustavson et al. (2001) showed how interrupted tuberculosis treatment during a conflict in Guinea-Bissau led to much higher mortality among patients, and Senessie, Gage and von Elm

(2007) demonstrated that children born in Sierra Leone in times of increased warfare were less likely to receive full age-appropriate immunization. In Sierra Leone the immunization programs were however not abandoned completely, showing how some health care is still available during war time. We will now investigate whether this is the case for measles vaccinations in our sample.

Although more studies have been done recently there is so far no common agreement on exactly how large the effects of conflict on child health are, how far they extend, or how long they last for. The Human Security Report Project has gone from indicating that there are very large, indirect numbers of deaths in countries affected by war (Human Security Centre 2005) to questioning whether today's wars affect overall mortality on a country level (Human Security Report 2011). While these views are not theoretically incompatible, they nonetheless give two very different indications of the human costs of war. The latest report claims that on a country level, most conflict-affected sub-Saharan African countries have continued to have declining mortality levels even during war periods. The reasons that are given for this are that pre-war health interventions (like vaccinations) continue to protect the population during the war period; the fact that many conflicts only affect a small proportion of national territory; and the substantial increase in humanitarian aid after the cold war. One of the studied they used in the report was performed by Chen, Loayza and Reynal-Querol (2008), who found that decline in infant mortality was not significantly different in post-conflict countries from peaceful countries. Other authors like Singh et al. (2005) found that under-five mortality was not different between refugees and host populations from Uganda and southern Sudan, because people fled communities that were very poor

in the first place. It is therefore not clear how or how much children are affected by civil armed conflict, and our article is contributing to this debate.

Theoretical expectations

The independent variable of primary interest in our study is civil conflict, which we investigate both on country level and more detailed in the form of violent battles on a sub-national level. As discussed in the previous section there are different ways of conceptualizing how armed conflict affects child health, and we will here outline our own understanding of the problem. What is not always clear in the examples mentioned above is how armed conflict will impact societies and child health at different levels. In our empirical analyses we are able to separate out how battle events differ between clusters, and we will see these clusters as examples of local communities and focus most of our attention there. We believe the community level is particularly interesting in our case because reports on maternal and child health (e.g. UNICEF 2008) discuss how women's decision making power is often felt at the community level, and outline how important it is to involve the whole community when trying to improve maternal and child health (ibid). WHO and UNICEF therefore currently back a strategy of integrated management of childhood illness (IMCI), which includes household and community components as integral to promoting healthy child practices (Meremikwu and Ehiri 2009).

In the following we concentrate on the indirect health effects of armed conflicts, which arise in addition to the direct killing of people. We believe the channels of

impact can be broadly divided into the four following categories, which may be mutually reinforcing: disruption of normal movement patterns; disruption of economic activity; destruction of infrastructure and reduced psychosocial wellbeing.

One of the first impacts of civil conflict will be to *disrupt normal movement patterns*. Other researchers have often focused on refugees and migration (e.g. Murray et al. 2002; Plümper and Neumayer 2006) but initially battles might force people to stay at home, with consequences for their ability to fetch water and get food, and to seek medical help in case of illness. All of these factors will lead to a poorer health situation for both adults and children. If the battles persist, a likely outcome will be that people are fleeing, with all the pertaining negative consequences. With heavy battles nearby more people can be expected to move out of the area for a longer period, either as internally displaced persons or refugees. Displaced persons are often exposed to danger, lose their assets and therefore are worse off than before, and that this has negative consequences for the health situation of the entire family including the children (World Bank 2011). In cramped refugee camp conditions communicable diseases are more likely to spread quickly, but on the other hand some evidence has actually pointed to potential benefits in terms of availability of health care for those who end up in a refugee camp (McGinn 2000). This is especially true when people move out of communities that are very poor (Singh et al. 2005).

Secondly, civil conflict will *disrupt economic activity in many areas*, with wide ranging consequences for population health. Locally, patterns of farming and

trading are likely to be disturbed. If crops are destroyed, stolen by soldiers, or farmers are too scared to attend their plots like normally, there will be risk of malnutrition which severely impacts child health. Verwimp, Bundervoet and Akresh (2010) showed with micro-level data how theft and burning of crops during the conflict in Burundi led to poorer child health because of malnutrition. If many adult males are employed as soldiers a similar negative effect on farming could arise because of less labour supply. Disruption of trade could have the same effect in areas that are not self-sufficient with food, with negative health consequences for adults and children alike. Malnutrition leads to greater susceptibility for diseases in general. On a national level conflicts have a negative impact on a country's economic growth (World Bank 2011). With less national income it may be expected that there is less money to spend on health care, and that this would influence the availability of health care facilities and health care personnel, with fewer services to the public as a consequence of this. Ghobarah, Huth and Russett (2003) develop most of their theoretical framework around issues of availability of human and especially financial resources, and explain how civil conflict can be expected to decrease the resources (GDP) available; reduce spending on public health, and reduce efficiency in the spending the funds that are actually allocated for public health. All these economic factors taken together will influence child health in a negative way.

Thirdly, civil conflict might have consequences for child health through the *destruction of infrastructure*, both directly through targeting of health clinics and through destruction of roads where patients, medicines and equipment can no longer be transported. This is a factor that most research mentioned above

includes in the theoretical framework. Locally there might be a great variation in how many health personnel are killed or how many choose to flee, depending on how safe they feel. We believe that destruction of health infrastructure and depletion of health personnel in this way contributes to the destructive power of conflict on child health.

Fourthly, we expect civil conflict to have a negative impact on child health through *reduced psychosocial wellbeing*, a factor that is mentioned e.g. by Li and Wen (2005) but otherwise often overlooked in the conflict research literature. It would be difficult to measure such a channel of impact more directly, nonetheless we believe it can be important. People who are traumatized by war can be expected to suffer to varying degrees from post traumatic stress syndrome (PTSD), with important consequences for their ability to look after themselves and their children. Factors related to the mother are often of special importance for child health (we will discuss this more in detail in the next section) and we believe that civil conflict might induce traumas in the parents that lead to less healthy children as well. A study by Smith et al. (2001) showed that children traumatized by war in Bosnia Herzegovina showed higher levels of PTSD, whereas their levels of anxiety and depression were linked with the mother's reaction to the war traumas.

We will here use both the UCDP/PRIO data on civil conflict and the newer ACLED dataset. Some comments on the use of ACLED data are also relevant theoretically, as it is different from using the standard datasets on civil war, which often focus on number of people killed in battles, disregarding more subtle

conflict dynamics. We believe that including a more disaggregated dataset like ACLED allows us to investigate in much greater detail how conflict events have an impact on the civilian population. We see several distinct advantages to this approach:

We will not be restricted by relatively arbitrary definitions of 'war' and 'post war' (over or under 25 battle deaths per year with the UCDP/PRIO conflict dataset, or over or under 1000 battle deaths with the COW dataset). We can therefore test whether even small-scale battle incidents have an effect, as we believe these might also have an impact on child health even if they are not as destructive as a full blown war.

Furthermore the focus on battle deaths in other datasets has been shown by Hoddie and Smith (2009) to be a poor predictor of post war public health, at least if the estimated number of battle deaths is to be used as the independent variable. By focussing on the occurrence of battle events, with their power to destroy infrastructure and scare people from seeking health care even if nobody gets killed in the incident, we get a more relevant measure of conflict intensity. A related point is that in terms of creating a conflict dataset, reporting on the occurrence of a battle may be more accurate than reporting on the exact number of people who were killed in battle.

Finally we will be able to have a much more precise estimation of impact in space with the geo-referenced conflict data. The location aspect allows us to analyse how the proximity to battle events impacts our measures of child health. Hence,

we believe that using a disaggregated conflict dataset is an important step forward in the analysis of conflict impact on the civilian population.

A question that could arise is whether there was more fighting in areas with poorer health standards so that any finding of negative health effects of battle events might be spurious. Time wise we are careful to only use conflict data recorded before the collection of health data, but to be able to control for some of the factors that simultaneously would increase the risk of conflict and impact the use of health care services, some key geographical measures are included. Firstly, a well-known example from the conflict literature is distance from the capital. Governments generally have less control over areas further away from the capital, and remote areas are therefore more likely to have conflict outbreaks (Buhaug and Rød 2006). Similarly, we would expect health services to be less available in areas far from the capital. Secondly, conflict studies that control for population density tend to find that civil conflicts more often break out in densely populated rather than sparsely populated areas (Buhaug and Rød 2006; Hegre, Østby and Raleigh 2009; Hagelstein 2008). We therefore include a measure of the number of people living in the area to control for the simultaneously heightened chance of seeing a conflict outbreak and finding a health care centre close to many people.

Hypotheses

Based on this discussion we have developed four hypotheses, focussing on country level conflict, sub-national battle presence, battle intensity and distance from battle events:

Hypothesis 1: *Countries involved in civil armed conflict will have poorer child health (in terms of more fever and fewer measles vaccinations).*

Hypothesis 2: *The presence of battles in the surrounding area has a negative effect on child health.*

Hypothesis 3: *The greater the conflict intensity in the surrounding area, the more negative is the local impact on child health.*

Hypothesis 4: *The closer to the community that battle events happen, the more negative the impact on child health will be.*

Data and methods

We will first describe the two independent variables before we describe the independent variables included.

Child Health

The dependent variables in these analyses are two measures of child health: occurrence of fever in the last two weeks and measles vaccination status. The data are taken from the Demographic and Health Surveys (DHS) which represent one of the most comprehensive data sources available on health and demographic factors in developing countries, and importantly for our analysis, they have started releasing the geographic location of each cluster where data is collected. In the DHS surveys the mothers were asked if their youngest child had had fever in the last two weeks preceding the survey. We use the data reported by the mothers to create a dummy variable for 'yes' or 'no', excluding those who did not know. Data for measles immunization are based on vaccination cards (as reported in the

DHS) if such were available, otherwise on mothers' recall. It has been shown that immunization recall in the DHS data declines with the child's age and with the number of doses received (Gage, Sommerfeldt and Piani 1996). To minimize this problem we use only data pertaining to the last birth of a mother and only use a dummy variable to distinguish between 0 or 1/more doses. We analyze data for the latest child borne to the women who had a birth in the last five years before the survey, so the children are all in the under-five category.

We included data from 15 sub-Saharan countries that had both sufficiently new DHS data and ACLED data available, and had not been embroiled in war with another country according to the UCDP/PRIO interstate conflict definition. The total sample consists of 73012 women grouped in 5505 clusters who have answered questions about the health of their youngest child. The women who are interviewed are grouped in clusters for sampling purposes, and since the conflict variable can be related to the cluster location we use the average DHS measures per cluster (and not per individual). That way the dependent variables represent the *percentage of children in each cluster location having had fever in the last two weeks* or *being vaccinated against measles*.

Table 1. Countries, DHS Studies, Clusters and Individuals Represented

Country	*DHS data year*	*Clusters*	*Individuals represented*
DRC	2007	293	5272
Ghana	2008	401	2131
Guinea	2005	291	4277
Kenya	2008-09	397	3990
Liberia	2007	291	3867
Madagascar	2008-09	585	8344
Mali	2006	405	8904
Namibia	2006-07	486	3771
Niger	2006	338	5765
Rwanda	2007-08	248	3569
Senegal	2005	368	6762
Sierra Leone	2008	349	3913
Uganda	2006	336	4402
Zambia	2007	319	4006
Zimbabwe	2005-06	398	4039
Total		5505	73012

Civil Conflict

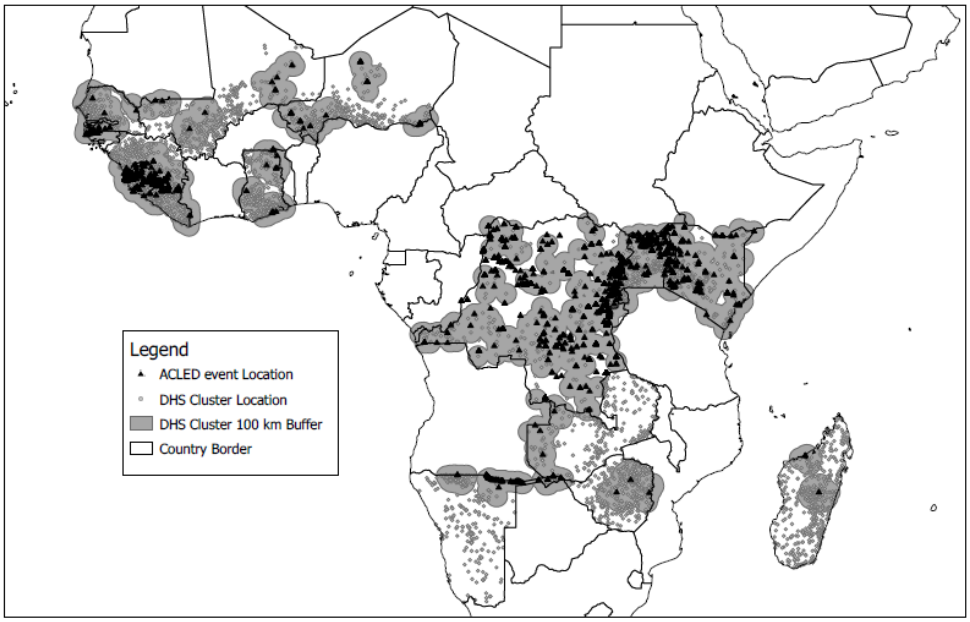
The key explanatory variable in this analysis is the occurrence of civil violence, both in the form of internal armed conflict as defined by UCDP/PRIO and in the

form of violent battles in the ACLED dataset. To test hypothesis 1 about impact of civil armed conflict on country level we use the UCDP/PRIO dataset (version 4-2011). The countries that are identified as conflict countries in the relevant time periods are Sierra Leone, Liberia, Uganda, the Democratic Republic of Congo and Rwanda. In order to test hypotheses 2, 3 and 4 we use ACLED, which defines a battle as "a violent interaction between two politically organized armed groups at a particular time and location" (Raleigh, Linke and Dowd 2012: 8). Most of this activity occurs within a civil war framework and is compatible with the UCDP/PRIO data (ibid), but like we have discussed previously there is no threshold of deaths or number of events per year that must be met for an event to be coded, unlike in the more traditional conflict datasets. There are therefore battle events in more countries than those identified as conflict countries within the UCDP/PRIO framework. Events are recorded with the date and geographical information on location available, which allows for a very detailed analysis. We choose to focus on battles as that allows us to separate out more severe events from those (like riots and protests) which cannot be expected to impact the health situation in a similar way. To explain this choice the reader may consider that a country like Zambia, which by most analysts is regarded as relatively peaceful, has recorded 643 different ACLED events from 1997 to 2011, out of which only 16 were battles. It therefore became necessary to exclude some information in order to be able to discern between more or less severe incidents in these countries.

We have coded ACLED battle events occurring in a country in the three years before the time period covered by the DHS data, counting months backwards from

when data collection started in each country. The lack of ACLED data before 1997 and the number of newer DHS datasets with GPS information from countries not embroiled in international war have been the main limiting factors for the number of countries included in our analysis. The countries are listed in table 1 and shown on a map in figure 1.

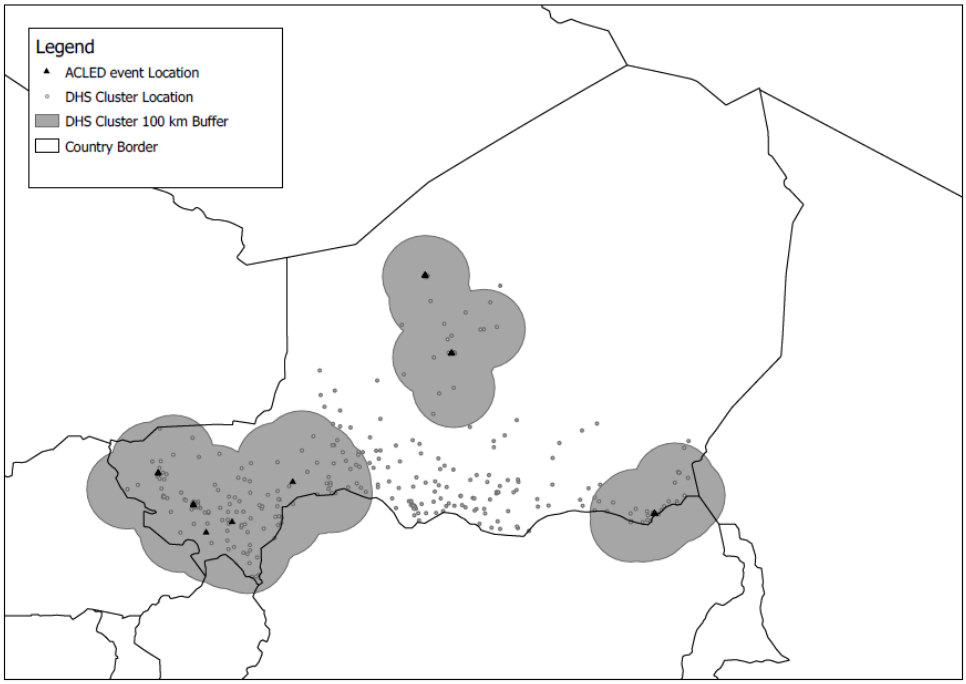
Figure 1 Countries included in the analysis



We then created two different datasets, one where all battles within a 100 kilometre buffer zone around the cluster were included and one where the zone was reduced to a 50 kilometre buffer. It is important to note that these are upper limits, so that all battles from the cluster itself (0 kilometres) up to 50/100 kilometres are included. This allows us to explore conflict impact in several

different ways with each of the approaches having its strengths and weaknesses. We first test whether there is an effect of having one or more battles events within the 100 km buffer around the community, creating a dummy variable. Using the full *event count* within each buffer zone 100 km away we further get a measure of conflict intensity, which varies between clusters from 0 to 174 battles. See figure 2 for an illustration of the battles surrounding different clusters in Niger as an example. The battle event count measured this way allows us to investigate the influence of all values along a continuous variable. It is worth noting that the highest average battle counts are mainly recorded in the countries identified as conflict countries in the UCDP/PRIO dataset, with Kenya standing out as an exception with a high number of battles even if it is not identified as a civil conflict country in the UCDP/PRIO dataset. These approaches do however miss out the effect of distance, so to check if changing the mean distance to the battles would have a different impact we then investigate the effects of using a 50 km buffer zone around the cluster. Here, the number of battles varies from 0 to 155 in the different clusters. Combining these different approaches has allowed us to explore variations in battle effects in several ways.

Figure 2 DHS clusters and ACLED battle buffer zones in Niger



Control Variables

Control factors related to the mother are of special interest because she is often the one who will have the greatest influence on a small child's health. Children of more educated mothers are healthier overall (UNICEF 2011), and the variable on education is taken from the DHS data. The women are grouped into four different levels on educational attainment, ranging from 33333 individuals with no education up to 1220 who have higher than secondary education. A difference between urban and rural settings is also uniformly reported, with urban settings usually having higher vaccination rates (Magadi, Nyovani and Nascimento Rodrigues 2000; Bell, Curtis and Alayon 2003; Magadi, Agwanda and Obare

2007). A measure of rural or urban residency is therefore included from the DHS data.

Further, an almost universal finding is that women from wealthier households and their children receive better health care (Magadi, Nyovani and Nascimento Rodrigues 2000; UNICEF 2008), and we therefore include the DHS wealth index which divides households into five wealth levels within each country.

Regarding the variables that control for conflict outbreak, population density is measured by taking the absolute population with a buffer zone of 20 km radius around the DHS cluster. The population data is based on gridded population from CIESIN from 2005 and log-transformed. The distance to the capital is measured for each cluster, and reported in kilometres.

So far we have concentrated on effects on a local level, but there will also be variation in the health situation from one country to another. Additional factors that will determine a country's public health are the GDP per capita, allocation of resources for health and the utilization of these resources (Ghobarah, Huth and Russett 2003). Further variation will exist depending on disease vectors, migration patterns and so forth. Since most of our analyses focus explicitly on the community (cluster) level, a dummy variable is introduced for each country in order to control for these country-specific factors.

The data are originally cross-sectional in nature, with information regarding one child per woman, which we average across each cluster to match our cluster-level

conflict variable. The surveys are treated as cross-sectional (even if they vary from 2005 to 2008-2009 depending on the country), which is an approach that has also been used in other articles using the DHS data for comparative purposes (e.g. Magadi, Agwanda and Obare 2007; Kruk, Prescott and Galea 2008). We use ordinary least squares regression, with Stata 10.0.

Empirical analyses

A quarter of the children had had fever in the last two weeks. The highest prevalence was found in Uganda with 46 % and the lowest in Zimbabwe with nine %. For measles vaccination, overall 58 % answered that the child was vaccinated. Rwanda topped the ranking with 76% of the children vaccinated, and Niger was at the bottom with 43 %. The ranking between the countries changed for these two measures, and they are not very highly correlated, which confirms our belief that these measures capture two separate effects and are worth considering in two different analyses.

Country-Level Differences

Table 2. Mean Fever and Measles Vaccination Status in Countries with Civil Conflict Versus no Conflict the Last Three Years, Two-Sample t-tests with Equal Variances

	Fever	*Measles Vaccination*
No conflict last three years	22.59	55.34
Conflict last three years	35.16	56.50
Statistical significance of difference ≠ 0	0.00	0.01

In this first assessment of country-level differences (hypothesis 1) we use the UCDP/PRIO armed conflict data. From table 2 it appears that there is a rather clear difference on country level for fever, with conflict-affected countries having more than 12% higher fever prevalence. However, the conflict-affected countries actually appear to have a slightly (one per cent) higher prevalence of measles vaccination than the non-conflict countries.

Sub-National Differences

We then turn to our sub-national analyses with more detailed geographic information. Below we analyze first the impact of battle events on the prevalence of fever in the children, and second the impact on measles vaccination. For each of our dependent variables we first analyze the evidence supporting hypothesis 2 (that the presence of battles in the surrounding area leads to poorer child health) before we assess hypothesis 3 (that a higher battle intensity, or event count, leads

to poorer child health) and hypothesis 4 (that battle events closer to the community will lead to poorer child health).

Fever

In our first analysis (model 1 table 3) we include a dummy variable of ACLED battle events within the 100 km buffer, to assess whether there is a threshold effect of battles per se. We expect the presence of at least one battle event within the buffer zone to be associated with more fever (hypothesis 2). We further expect a higher event count (higher intensity) to be associated with a higher prevalence of fever in model 2, where all events within the 100 km buffer are included (hypothesis 3). In the third model (testing hypothesis 4) we include only battle events that happen within 50 kilometres from the cluster (model 3 table 3). We expect that the shorter distance to battle events is associated with an even higher prevalence of fever in this model.

Table 3 The Effect of Battle Events on the Prevalence of Child Fever, OLS Regression

Variable	*Model 1: at least one battle event within 100 km from cluster*	*Model 2: all battle events within 100 km from cluster*	*Model 3: all battle events within 50 km from cluster*
One or more battle events within 100 km (dummy)	0.999		
	(0.600)		
All battle events, 100 km buffer		-0.037**	
		(0.012)	
All battle events, 50 km buffer			-0.090***
			(0.022)
Urban residence	-0.089	-0.106	-0.058
	(0.765)	(0.764)	(0.764)
Education	-0.306	-0.295	-0.252
	(0.747)	(0.746)	(0.746)
Wealth	-1.667***	-1.705***	-1.740***
	(0.357)	(0.357)	(0.357)
Ln(population)	0.239	0.344	0.406*
	(0.200)	(0.197)	(0.198)
Distance to capital	0.003*	0.003*	0.003*
	(0.001)	(0.001)	(0.001)
Democratic Republic of Congo	14.448***	15.492***	15.346***
	(1.625)	(1.573)	(1.568)
Ghana	0.218	0.509	0.412
	(1.364)	(1.352)	(1.351)
Guinea	15.401***	15.835***	15.795***
	(1.623)	(1.607)	(1.606)
Kenya	3.980**	5.408***	5.429***
	(1.438)	(1.391)	(1.381)
Liberia	16.124***	17.290***	17.168***
	(1.531)	(1.487)	(1.479)
Madagascar	-8.335***	-8.259***	-8.280***
	(1.230)	(1.228)	(1.228)
Mali	-1.304	-1.058	-1.028
	(1.509)	(1.500)	(1.499)
Namibia	-1.305	-0.783	-0.691
	1.329	(1.312)	(1.311)
Niger	9.440***	9.946***	10.043***
	(1.581)	(1.560)	(1.559)
Rwanda	3.338*	4.795**	4.514**
	(1.668)	(1.620)	(1.605)
Senegal	13.551***	14.062***	14.105***
	(1.513)	(1.499)	(1.497)
Sierra Leone	7.291***	10.771***	10.570***
	(1.590)	(1.750)	(1.617)
Uganda	23.925***	25.887***	25.636***
	(1.512)	(1.493)	(1.455)
Zimbabwe	-11.620***	-11.364***	-11.418***
	(1.361)	(1.352)	(1.351)
Constant	21.484***	20.527***	19.892***
	(2.397)	(2.370)	(2.377)
Observations	5505	5505	5505
R-squared	0.26	0.26	0.26

Note: standard errors in parentheses.

*p < 0.05, **p < 0.01, ***p< 0.001

As can be seen in model 1 table 3 the dummy conflict variable has a positive (but not significant) effect on the reported prevalence of child fever, indicating that having at least one battle in the area around a community is negative for child health. Hypothesis 2 is weakly supported by this evidence. However, when we look at model 2 where all battles within the 100 km buffer zone are included the results are reversed, and statistically significant. Higher battle intensity seems to be associated with a lower chance of observing child fever. The last model (model 3 in table 3) only confirms these puzzling results. Including all battles within a 50 km zone around the community gives a larger coefficient for the conflict measure as expected, but in the opposite direction of what we thought. So far hypotheses 3 and 4 have clearly not received support and the evidence for hypothesis 2 is not strong.

The other control variables mostly go in the expected direction. Both urban children, those from wealthier households and children with more highly educated mothers are less likely to be ill with fever than others (but the urban-rural and education variables are not significant). The variables on population density and living further away from the capital are associated with a positive effect, but only living far from the capital is statistically significant. We keep both variables in the analyses, however, since they are meant to control for conflict onset. The urban variable and the population density variable could in theory account for the same impact, but testing reveals that these two measures actually pick up two different effects. They are not very highly correlated and there is no high autocorrelation in the regression results. We can note so far that the size of the conflict impact is

clearly smaller than the effect of increasing the level of wealth. Wealthier communities have a substantially lower amount of children with fever.

Zambia is the reference category, and almost all of the country dummy measures are significant. This is not surprising since we have countries as diverse as the DRC and Niger included in the sample, given that they will pick up any variation at national level that is not taken out by the other variables we include already.

Measles Vaccination

We now turn to the analyses of civil conflict impact on child measles vaccination. This variable is interesting because the children necessarily must have been in contact with the health services in order to get vaccinated, and it thus provides a better indication of the outreach of such services than the previous measure. For these regressions, it is important to keep in mind that we are looking for the same effects with the *opposite sign* – a negative coefficient for the battle variables means that the children are less likely to have been vaccinated against measles in a conflict country (i.e. a poor health outcome similar to having more reported fever).

Table 4. The Effect of Battle Events on Child Measles Vaccination, OLS Regression

Variable	*Model 1: at least one battle event within 100 km from cluster*	*Model 2: all battle events within 100 km from cluster*	*Model 3: all battle events within 50 km from cluster*
One or more battle events within 100 km (dummy)	2.556***		
	(0.681)		
All battle events 100 km buffer		0.068***	
		(0.014)	
All battle events, 50 km buffer			0.090***
			(0.025)
Urban residence	0.133	-0.013	-0.041
	(0.868)	(0.867)	(0.868)
Education	7.723***	7.817***	7.761***
	(0.847)	(0.847)	(0.847)
Wealth	2.976***	3.097***	3.090***
	(0.405)	(0.405)	(0.406)
Ln(population)	-0.172	-0.095	-0.121
	(0.227)	(0.223)	(0.225)
Distance to capital	-0.008***	-0.008***	-0.008***
	(0.001)	(0.001)	(0.001)
Democratic Republic of Congo	-8.530***	-7.378***	-6.938***
	(1.844)	(1.785)	(1.782)
Ghana	2.241	3.019*	3.110*
	(1.549)	(1.534)	(1.535)
Guinea	-12.587***	-11.799***	-11.695***
	(1.841)	(1.824)	(1.825)
Kenya	-2.624	-2.086	-1.505
	(1.632)	(1.578)	(1.569)
Liberia	-10.773***	-10.006***	-9.456***
	(1.737)	(1.687)	(1.681)
Madagascar	-6.925***	-6.679***	-6.667***
	(1.396)	(1.394)	(1.395)
Mali	-5.609***	-4.921**	-4.963**
	(1.713)	(1.702)	(1.704)
Namibia	4.170**	4.784***	4.830***
	(1.508)	(1.488)	(1.490)
Niger	-16.320***	-15.396***	-15.421***
	(1.795)	(1.770)	(1.772)
Rwanda	8.901***	9.555***	10.430***
	(1.893)	(1.838)	(1.824)
Senegal	-4.762**	-4.168*	-4.072*
	(1.717)	(1.700)	(1.702)
Sierra Leone	-15.455***	-18.178***	-15.730***
	(1.804)	(1.985)	(1.837)
Uganda	-11.713***	-11.942***	-10.677***
	(1.715)	(1.694)	(1.653)
Zimbabwe	-19.171***	-18.555***	-18.493***
	(1.545)	(1.534)	(1.536)
Constant	51.213***	50.280***	50.623***
	(2.720)	(2.689)	(2.702)
Observations	5505	5505	5505
R-squared	0.27	0.27	0.27

Note: standard errors in parentheses.

*p < 0.05, **p < 0.01, ***p< 0.001

The results for hypotheses 2, 3 and 4 on impact of conflict for measles vaccination are the opposite of what we expected. In models 1 and 2 in table 4 we see that both the presence of at least one battle, and a higher battle event count within 100 kilometres from the cluster, actually seem to correspond to an *increase* in measles vaccination status. The result for model 3 in the same table further indicates that reducing the buffer zone to 50 km (hence measuring events closer to the cluster) actually corresponds to a higher likelihood that the children are vaccinated. These results are statistically significant and are contrary to our expectations and will be discussed more in detail below. Otherwise the variables concerning educated mothers and household wealth are significant and go in the expected direction, but there are no clear results for urban residence. The education variable has the largest coefficient, showing that increasing mothers' education by one level makes the children seven times more likely to be vaccinated, an effect that is three times as large as the effect of the battle dummy in model 1. A higher population density is associated with a lower likelihood of being vaccinated but is not significant. The distance to the capital appears to be significant, with a negative impact on vaccinations further away from the capital.

Possible Explanations

The results on sub-national level have not been in accordance with our expectations, and we believe there may be two possible reasons for this. Firstly, it is possible that battles tend to take place in what we will call strategic locations, meaning trading hubs, towns with a bridge over a river or other aspects that make certain locations both militarily interesting and somewhere that health care services are more likely to be delivered. Despite our efforts to control for urban

location and factors associated with conflict outbreak, it is possible that battles tend to take place in areas of higher health service availability.

Secondly, these locations might attract more aid by both national and international actors in the aftermath of fighting. Earlier we mentioned that measles was of particular concern in conflict areas (Guha-Sapir and d'Aoust 2010), and it is one of the diseases that for example the humanitarian organization Médecins sans Frontières is actively working to eradicate. The Human Security Report (2011) has also underscored the increased efficiency of humanitarian aid in later years – it might be such an effect in conflict areas that we have detected here.

As for the different results for the two dependent variables we chose them specifically because it is likely that they capture two separate aspects of child health. Fever accompanies many of the conditions that are dangerous for children and is a disease symptom whereas vaccination status informs us of contact with health care services. One possible explanation for the somewhat different impact of battles on the two dependent variables could be that some states and aid organizations are able to conduct vaccination campaigns targeted at vulnerable populations, whereas fever may depend on several factors (prevalence of infectious diseases and disease vectors, outreach of hygiene information) that are more difficult to change if they have become worse due to fighting. The variable which measures 'distance to capital' is almost three times as large for vaccinations as for fever, perhaps indicating that outreach of state structures are more important for vaccinations than for fever. These issues relate to a much broader discussion within the public health field. It is much more demanding to build up health care

services equally across a country than it is to conduct vaccination campaigns, however, system level focus is necessary in order to achieve health improvements in the long run. Vertical disease programs aimed at specific diseases or vaccination programs are popular among funders because they deliver quick results that are easily quantifiable, but there is a fear that they may divert resources away from longer-term funding for sustainable improvement of the whole health care system (Meremikwu and Ehiri 2009).

Robustness checks

Since our approach is quite new and the results surprising particularly on sub-national level, we tested them in different ways to see if they were upheld. To check further whether countries with previous conflicts have poorer child health overall (hypothesis 1), we tested another measures of poor child health – diarrhoea – in a similar bivariate analysis as we did for fever and measles vaccination. The statistically significant results showed that conflict countries had a higher incidence of diarrhoea, with a reported 21% compared to less than 18% for the non-conflict countries in our sample. Diarrhoea is a disease symptom that might be due to different types of infections and is similar to fever in that way. What we believe we see is that conflict countries have poorer child health overall, as shown by these disease symptoms that are present, but that efforts are being made at targeting vulnerable populations with vaccinations and these are to some extent successful.

A second factor we wanted to investigate more was the role of migrants in our sample. As discussed in a previous section we were somewhat ambivalent regarding the impact of displacement on public health measures, suggesting that while displacement might well bring negative effects because people lose assets and must move through territory with new disease vectors, there are also instances where displaced persons (especially in camps) receive better health care than they did before, particularly when they move away from very poor host communities. DHS includes a variable that records how long the respondent has lived in the present location, but it is not entirely clear to us whether 'location' means just household, community or the same part of the country. We have already taken out from the sample respondents that were only visitors in the household. To make sure that respondents who did not actually stay in the present location when the battles happened were not included, we excluded all respondents who had lived less than five years in the same location. This constituted a significant proportion of the data, with 21 % of respondents deleted (but not 21 % of the clusters, which represent an average of several people). Our fear is that we also delete many persons who have just moved between houses within the same community, and thus should theoretically be included. In trying out the new dataset we found that both the dummy conflict variable and the variable including all battles within a 100 km buffer yielded results that were basically the same in size, direction and significance as before. All in all we therefore think our results are quite robust.

Limitations to this research

Before concluding, it should be acknowledged that several limitations exist to the research done here. Firstly, the battle variable that is used does not encompass all forms of violence that may take place during wartime or otherwise. We chose to focus on battles in order to stay closer to other definitions of civil war, in particular the one in the most commonly used UCDP/PRIO dataset (which we also use for our national level analyses). Further analyses could go more into detail regarding how different forms of violent or non-violent activity impacts population health status, following the lead of e.g. Hoddie and Smith (2009) who claimed that genocide and politicide were better predictors of future rates of disability and deaths in post-war states than battle deaths.

Secondly, the inclusion of DHS data from different years, spanning from 2005 to 2008-2009, might be questioned (see an overview of the data in table 1). There might be slight differences between the included countries simply based on the year the DHS survey was done. This could potentially lead to missing out on larger, exogenous health trends that work across all countries, which Ross (2006) has pointed out as a problem in several publications on health issues. However, the year of the DHS survey is necessarily dictated by outside factors.

Thirdly, the vaccination measure we investigate here does not tell us directly what the quality of health care services is, only something about their availability or how much they are used. Nor can we conclude from our research whether the vaccinations were conducted in an age-appropriate manner. It would further have

been very interesting to be able to tell the difference between vaccinations delivered from state health care services versus aid organizations in order to refine our results, but that information is not available in the data we have.

Conclusion

In this article we have provided an assessment of how armed civil conflict and battle events in 15 sub-Saharan African countries affect two measures of child health. Fever is an outcome variable measuring disease symptoms whereas measles vaccination status informs us of contact with the health care system. We found that countries affected by civil armed conflict have higher reported incidence of fever but also a one per cent higher measles vaccination rate. Checking further we found that conflict countries also had higher levels of diarrhoea than peaceful countries. The negative results for child fever and diarrhoea are similar to that found by other researchers in cross-country comparisons on child health in general (e.g. Ghobarah, Huth and Russett 2003 and Iqbal 2010), but the higher level of measles vaccination in conflict countries is different from what other researchers have found (e.g. Iqbal 2010). When we analyzed results below the country level, first counting only battles in a 100 km radius around the communities, we found that the presence of battles within that buffer was associated with more child fever (although not statistically significant) but also with more children vaccinated against measles. More intense battles or battles closer to the community were actually associated with a slightly lower

chance of having fever (although not consistently) and a higher chance of under-five year olds being vaccinated against measles.

We believe that two different indirect mechanisms might explain the results on a sub-national level. Firstly, it is possible that battles take place more often in certain strategic locations, where there is simultaneously a higher level of health care services available. Secondly, these areas might receive more attention and more aid after the fighting, and therefore have higher levels of vaccinated children for example. We think our results suggest that battle events might lead to a general, unspecific worsening of child health (as measured in the higher prevalence of fever and diarrhoea on a national level) but that certain health care interventions like measles vaccinations might be targeted to vulnerable population segments with some success.

In some respects, our findings speak to the Human Security Report with its counterintuitive conclusions. Where we believe that our findings on national level support all the previous studies showing negative health effects of war, the sub-national level findings indicate that the conflict-health nexus more locally might not be as expected. The Human Security Report has probably directed attention to some solutions by pointing out the disconnection that might exist between local areas and the national level, as well as highlighting the increased aid by the humanitarian community in the post Cold War which we believe has been effective at targeting populations in need with measles vaccinations.

Earlier research on civil war effects on child health have provided new insight, but have often relied on quite unspecific measures like an increase in DALYs or decrease in life expectancy. While this is valuable knowledge to have, it is very difficult to act on for policy makers because there are many underlying causes that lead to such general negative effects on child health. Our study has on the contrary focused on two much more concrete health effects. Fever may be a symptom of many childhood diseases that are not dangerous, but also signal more serious illnesses like HIV/AIDS or malaria. Measles continue to kill many children under five despite the existence of good vaccines, and our results say something about the outreach of health care to populations dispersed in these countries. Policy makers should therefore monitor the health status of children in areas where battles have occurred, and follow up vaccination programs targeted at vulnerable populations. Our study indicates that these possibly have some success in reaching out to those who need it most, and these are important insights to have in post-war countries.

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12 Article 3: 'If there is no money you will die': barriers to accessing maternal health care services in two locations in South Sudan as a consequence of the second civil war (1983-2005)

Abstract

South Sudan probably has the world's highest maternal mortality ratio, and is one of the few countries where mortality has risen overall for the period from 1990-2013. The high mortality is problematic first of all for the families involved, but also on a societal level as it impedes development. Expectations after the signing of the Comprehensive Peace Agreement in 2005 were high, but several years later one legacy of the second civil war was the continuing lack of potentially life-saving maternal health care. Interviews from Juba and Magwe highlight how an inability to pay for fees, lack of rural secondary care, transport problems and low perceived quality of care continued to impede use of maternal health care services. With new fighting recently in within South Sudan, at the same time as the north-south conflict continues to have an impact on this issue, prospective mothers in South Sudan face great uncertainty.

Introduction

A growing body of research has linked increased female mortality and morbidity to armed conflict.[1] These authors identify increased female mortality due to warfare during the fighting as well as in the post conflict period. While measuring the increase in female mortality and morbidity itself is important, these studies often remain under-specified when it comes to the exact mechanisms that link the armed conflict to the resulting increased female mortality, and there is no clear consensus in the literature of what these mechanisms are. Being pregnant and giving birth is one of the most dangerous things a woman in a developing country can do,[2] and based on this I argue that a part of the increased female mortality and morbidity seen after conflict is likely due to poor maternal health. A few studies have investigated impacts of armed conflict on maternal health in different settings and shown that it is sometimes associated with dramatic increases in maternal mortality and morbidity.[3] This literature is however not well connected to the studies of overall effects on female deaths and disability in conflict. This article will bring the two types of literature closer together, and specify in greater detail *how* the consequences of armed conflict affects access to and use of maternal health care, in the specific setting of South Sudan.

Reducing maternal mortality was chosen as Millennium Development Goal (MDG) 5 as an indication of its importance. Every year about 293 000 mothers die worldwide,[4] 99 per cent of them in developing countries, and it is one of the MDGs with largest differences between the rich and the poor.[5] A large part of these deaths might have been avoided through improved access to appropriate maternal health

care.[6] The loss of a mother is a tragedy first of all to her family, but it also has negative consequences for a country's labour supply and productive capacity overall.[7]

Interviews were conducted before the fighting in South Sudan broke out in late 2013, and focus on impacts of the second civil war in Sudan (1983-2005). When I talk about 'the conflict' it is thus this period which is referred to. The study is based on interviews with women and men in Juba and Magwe, to investigate what they perceived as the greatest barriers to maternal health care service attendance and how this is linked to the conflict. In addition I have interviewed several health care workers and key state administrative and international donor and non-governmental organization (NGO) personnel. I focused on maternal health care in the form of *attending antenatal care* and *giving birth in a health facility*. Out of all the barriers we talked about, the interviews revealed that payment for services is one of the biggest obstacles to maternal health care service use, together with the quality of care. In a situation where health care facilities were lacking a lot of equipment and resources the patients were usually asked to pay for the care, something that was a real problem for many of those I interviewed. This puts a strain on the relationship between carers and patients, and ultimately contributes to reinforcing a cultural tradition of home births.

The next section will detail some of the literature and theory in the field, before I describe the interviews and methodology. The main part describes people's perceived barriers to using maternal health care services in Magwe and Juba linked to the second Sudanese civil conflict, before there is a short conclusion.

Literature review

High level political documents have highlighted the negative effects of warfare on the Millennium Development Goals[8] and on public health and development.[9] These calls for action are based upon research showing the mortality and morbidity caused by warfare, and how this is in fact highly gendered. Women and men are vulnerable in different ways during wartime. Whereas men have the highest mortality due to direct violence such as gunshot wounds (and although women suffer more than men from direct sexual violence), women usually suffer from the more indirect consequences of war.[10] Raised levels of indirect deaths due to the war can still occur long after a peace agreement has been signed, but often receive a great deal less attention than direct deaths.

Ghobarah, Huth and Russett have argued that the indirect effects of civil conflict are largely under-estimated.[11] By studying cross-national variation in 1999 data on Disability Adjusted Life Years (DALYs) they estimated that around 12 million DALYs were lost that year in countries where civil wars had recently ended. The effect was stronger on women and children than on men. Plümper and Neumayer[12] analysed data on life expectancy, and found that armed conflict tended to decrease the gap between female and male life expectancy, suggesting that armed conflict affects women more adversely than men. Li and Wen[13] examined the effects of armed conflict on mortality for the adult population and found that conflict raised male mortality the most in the short term, whereas women were mainly affected by the long term, indirect consequences.

This quantitative literature has hypothesised various mechanisms that are responsible for the increase in female deaths and disability seen during conflicts or in post-conflict situations. However, they actually only measure the direct link from conflict/post conflict to a very aggregate measure of female deaths net of different control factors, and then rely on the plausibility of the proposed hypotheses for explanation. Ghobarah, Huth and Russett[14] are an exception in that they provide a short discussion of some of the disease categories that DALYs are made of, but they do not discuss the results for 'maternal factors' in any detail. Such studies are very useful for determining overall effects of conflict on deaths and disability, but less useful when it comes to investigating the exact channels or mechanisms responsible for these effects. A better understanding of exactly *how* conflict causes increased female mortality is vital if we are to try to reduce the excess deaths identified in the quantitative studies.

Increased maternal mortality is one apparent means by which indirect effects of conflict could disproportionately affect females, and some studies have looked in detail at the relationship between conflict and reproductive health (of which maternal health is an important part). A special issue of *Reproductive Health Matters* in 2008 concentrated on armed conflict's impact on reproductive health. It showed higher levels of maternal mortality and generally poor maternal health in various conflict settings, mostly in Asia, and it focussed more on internally displaced persons or refugees than on resident populations. Conflict lead to early school drop-out which was further linked to early marriage, early pregnancy and higher maternal mortality among women in six different locations in Sri Lanka. [15] In Burma the junta had attempted to cut the eastern parts of the country off from food, funding and

information, making traditional health care services unusable, leading amongst other things to a recorded maternal mortality of 1200 deaths per 100 000 live births in parts of that region. [16] Chandrasekhar et al.[17] showed in the case of Rwanda how the conflict had led to a lack of progress in antenatal care attendance, and a decrease in the number of births given in a health facility. All these articles have portrayed the difficult situation for women in protracted conflict situations or situations characterised by an uneasy peace, and detailed negative consequences for maternal health. However, it is difficult to assess how many more women have died of maternal conditions due to conflict. The number of these deaths has not been estimated, and I would call them *uncounted war deaths*. Recent research has additionally shown that international funding for reproductive health is often insufficient in conflict countries. [18] In other instances, however, refugee populations fleeing war have been found to be as well or better off in terms of maternal health care as the national average.[19] This has been explained by the better availability of health services in the refugee camps, especially when people have fled very poor communities. While all these studies focused on impacts on reproductive health, they have usually focused on other aspects than the specific reasons *why* women do not, or are unable, to use health care services, which is the focus of this article.

Maternal health care in South Sudan after the peace agreement in 2005

The period after the formal cessation of warfare is one marked by transition. Aside from the end of one form of violence, many of the physical and social conditions in a country do not change upon the signing of a peace treaty. What peace

brings is the renewed potential to improve people's lives, and repairing the damage wrought by warfare can take many years. Roads and buildings need to be constructed, people trained and educated and above all, economic activity needs to be revived so the population can lift itself out of poverty and subsistence. During this period, the conflict is in a very real sense responsible for continuing levels of excess mortality.

In South Sudan many of the exigencies of the previous war remained even before the fighting broke out again in late 2013. It is still too early to know what the impacts of the current fighting will be. In this article I therefore focus on the impacts of what is commonly known as the second civil war in Sudan, from 1983-2005. Africa's longest running civil war ended in 2005 with the signing of the Comprehensive Peace Agreement (CPA). The war had left the country devastated. In addition to the perhaps 2 million deaths, between 4.5 and 5.2 million remained internally displaced[20]. During the second civil war South Sudan channelled almost all its resources into achieving statehood and securing its territory by use of arms. After the peace agreement some of the Government of South Sudan's (GOSS) attention was still necessarily focussed upon traditional, or hard, security issues. Armed clashes between groups in the south never stopped completely[21], and the new state still faces hard negotiations with the north over land demarcation, citizenship, oil and Nile water issues[22]. A considerable proportion of the national budget has been allocated to the security sector, particularly army salaries[23].

After a period with focus on external security threats and achieving an independent existence, the new state had tried to get into a better position where it could channel more of its resources towards soft, or human security issues. The long

war left the country with little economic or institutional capacity to meet the expectations of a peace dividend for its people[24]. Traditionally the state had never had a strong presence in most areas of South Sudan, but without supplying any kind of peace dividend, it would face what has been called *a growing crisis of expectations* [25].

Firstly, the documentation efforts that were undertaken in the run-up to independence showed that the civil war had left a legacy of poverty and inequality[26]. 51 % of the population was living below the locally defined poverty line, varying from 24 % in urban areas to 55 % in rural areas.[27] Only 52.7 % of the overall population lived in households which used cash in the previous seven days[28], and presumably a large part of these households were located in Juba and another few major towns. Secondly the civil war led to a situation with poor infrastructure and a lack of even basic services[29]. Provision of health services was extremely difficult during the war[30], and continued to be so afterwards[31]. In Magwe for example, the health centre that was built before the war by the Norwegian Church Aid was shot to pieces when the war broke out, and a new centre had to be built from scratch after the CPA. Both poverty and infrastructure problems affected maternal health care in South Sudan in the relatively peaceful period.

According to the 2008 census South Sudan has 8,26 million people, of which 4,29 million are males and 3,97 million females. A previous report by the South Sudanese statistics bureau explicitly linked the greater number of males (despite their participation in the fighting) than females to the high maternal mortality.[32] The many years of war led to a near complete lack of information about vital population measures including public health in the south, but in 2006 a survey covering the

whole of Sudan was undertaken. Information in the Sudan Household Health Survey 2006 (SHHS 2006) covers births in the two previous years. The way the report is structured allows for comparisons at state level between the 25 states, a national average and often a specific average for the ten states that comprise the new South Sudan. The report gives a rather alarming picture of the maternal health situation in Sudan. One of the most striking features is the large differences between the states, with maternal health care in general being better in the northern than in the southern states.

Maternal mortality is notoriously hard to estimate, and a testimony to this was given by two new worldwide revisions made by different research groups in 2010, in some instances downsizing previous figures considerably whereas other figures were increased. In 2014 new worldwide estimates were again released. Maternal mortality is usually measured by the maternal mortality ratio (MMR), defined as maternal deaths per 100 000 live births. The report recently published in the Lancet[33] concluded that the MMR for Sudan in 2003 was 357 and 873 for South Sudan the same year, probably indicating that the national estimate of 1107 for Sudan as a whole from the SHHS 2006 was too high. The South Sudanese MMR is nonetheless much higher than even the eastern sub-Saharan African MMR of 387 (from the Lancet 2014 study). Even more worryingly, South Sudan is one of very few countries that showed an upward trend in mortality in the period from 1990 to 2013, with the 2013 level estimated at 957. This was the highest estimate for any country at all in 2013, so the new country starts its life by topping the index of maternal mortality. There are thus good reasons to look closer into what the causes of the high mortality levels could be.

Components of birth care are usually considered much less contentious and problematic to measure. Based on the SHHS 2006, nationally it was found that 69.9 per cent of women received antenatal care (ANC) at least once during pregnancy in the two previous years. The mean for southern Sudan was considerably lower, at 40.1 per cent. The variation ranged from 98.4 per cent in Khartoum state to 22.4 per cent in Jonglei (in South Sudan). ANC visits are considered important for checking the women's health, detecting problems and cure or refer as necessary, and for counselling about safe health practices and warning symptoms. The percentage of women receiving ANC at least once was highest amongst young women aged 15-19 and lowest amongst those aged 45-49, hopefully corresponding to a trend whereby more and more women will receive ANC, although more recent reports seem to indicate that raising these figures is difficult[35].

Nationally, 19.4 per cent of women in Sudan gave birth in a health centre, ranging from 54 per cent in Khartoum state to 5 per cent in Blue Nile state (also in northern Sudan). The average for the southern states was 13.4 per cent, or 30 per cent lower. The SHHS 2006 also revealed striking patterns with regards to poverty. Only 1.5 per cent of women from the richest quintile of households nationally received no assistance during birth, compared to 23.5 percent from the poorest quintile. While my study was very small, the relationship between poverty and lack of assisted delivery seemed generally supported by the women I interviewed.

Government policy on maternal health care

Providing health care is expensive. Concerning the costs of health care services, the GOSS Ministry of Health has had as its stated purpose:

… 'to ensure that good and affordable basic medical services are available to all people in Southern Sudan. We achieve this through providing subsidised medical services while promoting individual responsibility for the costs of healthcare services. Our population is thus encouraged to adopt a healthy lifestyle, taking responsibility for one's own health. Safety nets are provided, however, to ensure that no Southern Sudanese is denied access into the healthcare system or turned away by public hospitals because of lack of money.'[36]

As we will see, individuals in Juba and Magwe had to pay some of the costs of health care, but in an inconsistent fashion. The Ministry of Health stated that safety nets were meant to be provided in order that nobody should be denied health care because of poverty. According to the women I interviewed, however, lack of money *did* stop many of them from accessing health care services, especially when they were about to give birth. The GOSS has shown ambitions to provide health care; donors would like them to take over services that are today run by international organizations, and in the interviews I found that people had expectations of the new government as well.

Methods and study areas

In the interviews I looked for information about conflict impact on perceived barriers to accessing and using maternal health care services both during and after the second civil war, with a focus on residents. I therefore needed to collect information about births both during and after the war (in other words interview both older and younger women), and I wanted to include some expected variation in access (a rural and urban area) as well as variation in fighting during the war. Since the focus was on those who had been residents in Juba and Magwe during the war period, I had to exclude a large part of the current population that had been away during the conflict. At the time of doing the field work there was no information available to pre-select residents from former refugees, and I therefore needed to use a form of purposive sampling method (snowball sampling). Respondents were chosen according to three criteria, as outlined in Rubin and Rubin[37]: They had to be knowledgeable about the issues involved (i.e. to have given birth or have a wife who had given birth and have stayed there all the time); they had to be willing to participate; and when there were several different opinions on an issue the respondents should cover the whole range of views.

A related point which is important to remember is that although I believe I achieved a certain overview over the situation in Juba and Magwe, the people I interviewed and these two sites cannot represent the overall situation in the whole of South Sudan. The interview areas were chosen because I expected them to present some important variation in access to maternal health care services (a rural and an urban area) as well as differences in fighting patterns during the war.

Interviews were conducted during three field trips in 2010. During the first trip I conducted pilot interviews (which are not included in the final material used in this article). I tested out different questions and tried to ask more open-ended questions than I did in the subsequent round of interviews. All in all people responded and talked about many of the barriers to receiving maternal health care that are found in the literature, and I learnt additionally that a reason many people did not seek care was that they felt that they were not treated well by the health care personnel. This was something I added to my list of questions, and I used semi-structured interviews in the two last rounds (while always making sure to ask open-ended questions in the end to look for further information).

I interviewed 32 women and 7 men in Juba and 53 women and 21 men in Magwe. The difference in numbers stems largely from using slightly different approaches to gaining access in the two areas; in Juba I walked from door to door and gathered people and their neighbours who had lived there during the war through snowball sampling, whereas in Magwe a local pastor introduced us beforehand to two resident Acholi communities (so those who wanted to participate talked to their neighbours and came to us). Because people in Magwe came from two closely knit communities their stories were more similar than in Juba, where the picture was more heterogeneous. I continued adding informants until I thought there was not much new information that would come out of further interviews. This form of saturation was in the end better achieved in Magwe than in Juba, but I thought the more heterogeneous picture emerging form Juba reflected a real difference in access to services depending on different time people gave birth as well as differences in access to money and other resources.

Background information was collected about everybody's age; education; current and previous jobs; how many children they had and whether they were born during or after the war; their tribe; and whether they had any of the seven household goods (a radio: a TV; a fridge; a bicycle; a motorcycle; a car; electricity) on a standard list taken from the Demographic and Health Surveys. People in Magwe were substantially poorer than in Juba, which will be discussed later. The answers about maternal health care seeking behaviour are however most representative at group or community level. Some older people had comments on a daughter or daughter in law's experiences, as well as comments on contrasts between the war times and afterwards. The interview subjects' reported age varied from 16 to 86, although a few people (especially the older) did not know their exact age. Women and men were interviewed in separate groups, although in some cases persons of the opposite sex would stay in the background while we were speaking. Conducting interviews with men in Juba was more challenging than with other groups, mainly due to the problem of finding suitable men to interview in the neighbourhoods during daytime – many were away from home and working. Their stories have mainly confirmed what the women said, and overall I have chosen to give most space to the women whose health is the focus of this study. My research assistant in all the interviews was from the University of Juba's Centre for Peace and Development Studies and translated from Arabic to English in Juba, and in Magwe I used two local interpreters to translate from Acholi to English.

I also interviewed health care workers at four different health care clinics in Juba and Magwe, at Juba teaching hospital, and I interviewed representatives in the Nursing and Midwifery Directorate. Furthermore I talked to key donor and NGO

health care personnel, and have been following up our exchanges as well as following policy developments later.

Juba

Juba in Central Equatoria state is the current capital of South Sudan and where the new ministries and most of the international presence are located. The situation I describe here and in Magwe relates to the relatively peaceful period between 2005 and 2013. To the extent that the new state is present in South Sudan, it is most visibly demonstrated in Juba. People have kept migrating to the outskirts of the town, so the current population may be well above the 368 460 registered in the 2008 census[38]. For people who could pay, many modern amenities were available. At the time it was hoped that improvements were likely to accelerate, with more donors moving in and the government hopefully able to concentrate more on development rather than security. Yet most of the population in Juba still lived in traditional tukuls (clay and straw huts) and poverty was widespread. What the situation is like at the time of writing is very difficult to assess.

Fighting was fierce around Juba during the second civil war. It was a garrison town that was one of few areas that the SPLA never managed to capture, although they controlled most of the countryside around it. The northern based government managed to keep in control of Juba itself, but at a terrible human cost. People I interviewed agreed that the worst periods were the starvation in 1988 and the heavy shelling by SPLA in 1992. During all this time, Juba Teaching Hospital and several other health clinics were kept open, largely by the aid of the International Committee of the Red Cross and other NGOs. The inhabitants thus had access to some basic

health care, including maternal health care, although not in sufficient quantity or quality. This was one major difference with the situation in Magwe.

Magwe

Magwe is a small rural town located in Eastern Equatoria state. The entire Magwe payam (town and surrounding area) had 41 778 inhabitants according to the 2008 census.[39] When I visited the town had a few new buildings and shops set up along the main road in the centre, and there were a couple of cafés and guest houses. However, for inhabitants in places like Magwe the state did not have a very strong presence.

The situation in Magwe was also very different from Juba during wartime, when Magwe changed hands between different military groups many times. The local health centre was destroyed almost immediately. In the beginning the town was held by the northern based government, but as the SPLA gathered strength they took over in 1986. The SPLA later lost the town back to the government due to infighting, but retook the area in 1997 and held it at least nominally until the end of the north-south war in 2005. Every time the area had changed hands the story was the same, with the residents being accused of supporting the other side and harassed by those in power for the moment. The CPA arrived in 2005, but it did not spell peace for the inhabitants of Magwe, who by then were tormented by the Lord's Resistance Army (LRA). Some women recalled soldiers cheering and sending out messages that the war was over in 2005, but that did not change their lives dramatically because the LRA was still around. The most horrific stories they told concerned atrocities perpetrated by this group and this was clearly who they had been most afraid of. People in Magwe

continued to live in fear until 2008, when the LRA moved from Eastern to Western Equatoria. Since the Sudanese state presence was so weak that it could not stop them from roaming the countryside, the inhabitants of Magwe did not feel safe from attacks until the LRA physically left their home area. And while state presence in relatively remote locations like Magwe will take a long time to build up, the new South Sudanese state will in the long run have to be able to protect its citizens also outside the largest centres in order to gain legitimacy. At present the situation there is unclear.

Barriers which prevent access to maternal health care

Several studies have investigated different factors that contribute to low use of maternal health care in resource-poor settings in sub-Saharan Africa.[40] Based on the pilot interviews, these studies and the literature mentioned above, I concentrated on the following mechanisms which might explain whether women in post-CPA South Sudan accessed antenatal care and gave birth in a health facility or not:

- whether they were aware of the importance of antenatal check ups and giving births in a health facility, or whether they did not perceive this as useful
- whether they had difficulties getting transport to the health facilities
- whether they needed money to pay for such services
- whether they needed their husband's permission to attend these services
- what they thought about the quality of the services they were offered (including how they were treated by the health care personnel)
- whether they preferred giving birth at home instead because of culture or tradition.

Some of these mechanisms or barriers may be related to the demand for maternal health care services (awareness; husband's permission; cultural tradition) whereas others are more related to the service supply (especially payments demanded and quality of care), although of course there is some interaction between the different factors. Questions related to these proposed barriers formed the main focus of the field investigations and are explored in greater detail in the following section. It is important to remember that the main focus is all the time on the respondents' understanding of these issues.

Perceived barriers to the use of maternal health care services in post – CPA South Sudan

1) Awareness, or perceived usefulness, of the need to go for ANC or give birth in a health facility

Before a woman can use maternal care she must be aware of the services that are on offer, and want to use them. Self-reported awareness of the importance of ANC both in Juba and Magwe was high, perhaps surprisingly including those who had received no education. The women were able to give very concrete examples of why one should go for antenatal check ups. A group I interviewed in Juba listed why they thought it was important to go with the following examples: the doctors could tell you why you had pain; see if you had other sicknesses; and give you medicine for that. He would tell you not to do hard work; and possibly tell you to give birth in a clinic if a problem was detected.[41] All in all the women I interviewed appeared to be relatively well informed about the importance of ANC; though other barriers may prevent them from attending (see below).

My impression was that the women I interviewed generally found it useful to have the opportunity to give birth in a clinic. Especially in Magwe, many still preferred to start the birth at home, where a nurse, midwife or other assistant would often be called to help, and only if the birth became complicated would they try to transfer to a health facility. It did however appear as if the younger cohorts were more inclined to favour births in health facilities overall, something that corresponds to the findings of the SHHS 2006. This may be due both to a greater availability of services in those days and due to changing attitudes. A relatively young group of women in Magwe aged 16-40 years, of which many had given birth after the war and had used the health clinics, described it this way:

> "They would choose to deliver at the centre because it is hard to deliver at home. If you deliver in the hospital they will help you, they will give you full service, but not in the family."[42]

To sum up, it appeared that they would like to have these services on offer, but then choose themselves how to use them. Lack of awareness was not the most significant barrier amongst interviewees.

2) Transport to health facilities

Problems of getting to a health facility were not the same in the two locations. In Juba there were several private and public health centres to choose from close to the area where I conducted the interviews, including Juba Teaching Hospital. Transport in Juba had been a major problem during the war, but was no longer a great

concern amongst those I interviewed. In contrast, Magwe just had four very basic health clinics. This means that antenatal care and care during an unproblematic birth was relatively easily available for the inhabitants in the surrounding area, but complications could not be dealt with locally. In difficult cases, the inhabitants of Magwe ought to be transferred to the referral hospital in Nimule. Nimule is several hours drive away – how many depends on weather and road conditions.

Transport to Nimule hospital was a major problem. First of all there was the journey time:

> "These days delivery is not easy. The hospital is in Nimule, there is just a health centre here. If you go to Nimule it will take time, they will write this paper to take you to Nimule … sometimes you will reach Nimule, sometimes you will die on the way."[43]

The second, and perhaps most immediate concern, was paying for the transport to Nimule. There was an ambulance stationed in Magwe primary health care centre, but the centre did not have money for *fuel*. The ambulance became a symbol of a state that was trying to expand its outreach, but without succeeding. The health care workers in the centre were also very unhappy with the situation, but as the leader asked rhetorically, 'should we pay it out of our own pockets?'.[44] The fuel to go to Nimule was estimated to cost about 180 SDG (circa 72 USD at the time), a sum that the inhabitants I interviewed simply could not afford. If they did not have money, they would have to rely on the primary health care level services available in Magwe. A 42 year old man who spoke good English stated the following:

"Here we have an ambulance. This ambulance is a problem. This problem is hard, open and clear. You have to contribute money to buy fuel."[45]

3) Paying fees for health care

In addition to transport, the greatest barrier women faced was the fees they had to pay for maternal health care services. The problems were more severe in Magwe than in Juba. Inhabitants of South Sudan continue to be very poor, and much of society especially outside the largest towns continues to have very little cash circulating. These problems affected facility-based births much more than attending ANC, which was a lot cheaper and therefore easier to use, so here I concentrate on payments for giving birth in a health facility. It was not possible for me to establish a specific cost for a birth because rates varied among facilities and costs would also depend upon the personnel and pharmaceuticals used, but some indicative charges are shown below. Instead, the most important barrier was that the women knew they would have to pay *something*, and this affected their decision to use the facilities or not.

Payment affected the women before going to a health facility, during their stay and at the time they were to leave. First, in some circumstances they did not even try to go if they expected that they did not have enough money. Even if the services were suddenly to become free of charge, the health care provides would have to raise awareness about this and change people's perceptions. Second, there were times when women were admitted and were not instantly treated because they did not have money. In that case other people in the family often had to search for cash in the

meantime. Third, it was apparently not unusual to 'detain' the women in the health facility if they could not pay up after they had been treated. I was told of several examples of this, both directly by an informant and by people who had negotiated the release of other women.

In Juba many international organisations had been present during the war, some of them providing free health care, and the transition to more government responsibility for health care after the CPA has not been easy. The major complaint I heard from the women was that maternal health care had become so expensive after the war. It was clear that the women had to incur many different expenses: the payments ranged from 1 SDG (about 40 cents USD at the time) just to enter Juba Teaching Hospital; to 1-2 SDG (40-80 cents USD) for ANC cards; pharmaceuticals were not always free; and especially giving birth in a health facility was costly. Private clinics appeared to be more expensive than public centres, charging up to 60 SDG (about 24 USD) for giving birth, but several women expressed that the quality was better there than in the public units. The overall agreement among the women was that maternal health care was now too expensive. What constitutes 'too expensive' would obviously vary from family to family. The households where I conducted interviews in Juba were located in two areas called Nyakoron and Atlabara C, which were relatively settled and wealthy areas. These were also close to Juba Teaching Hospital and other health clinics, so the residents here should have a greater chance than others to actually receive maternal health care. Women I interviewed were mostly at home or working in the informal sector, selling pancakes and brewing. While some were able to muster rather large sums of money (one woman I interviewed had spent 90 SDG, about 36 USD, on some tests in a private clinic),

others were much poorer. It was clear that women in Juba were comparing the situation to that during the war, and that they expected a larger peace dividend than they received:

> "At the time during the war it was free, they could get free access to the clinic. But now even entering to the main hospital you have to pay money at the gate in order to enter. And for everything inside there you have to pay money. Even to give birth at the maternity you have to pay some money before getting out. Otherwise you will be detained until your husband brings everything, money, soap and other things. Then they will release the mother. So things have changed but you have to pay a lot of money."[46]

Problems of paying were much more acute in Magwe. People I interviewed there were much poorer than those in Juba. In questions about household goods very few replied that they had a radio, let alone the six other items on the list. And whereas women in Juba came from a mix of poor and some relatively better off households, and some had been able to pay for giving birth in a private health facility, the impression form Magwe was that the women there genuinely *could not* get hold of money. Since only a few people there were employed in jobs other than more or less subsistence farming, only very little cash would circulate through their hands. A couple of the men had other jobs (e.g. teaching) and there were two female traditional birth attendants (TBAs), but the rest did not have many opportunities for finding cash-generating work. One woman confirmed that she had been held back in a health facility until her sister came with 10 SDG to get her released, and a man told me how he had been back and forth to the clinic over a period of several days, trying to secure

money to get his wife some injections and to get her out. Needless to say, such practices do not encourage more women to use the health services.

> "If you are going for a check up they will not ask for money, but if you deliver in the health centre they need soaps and money from you. That is their worry. Because of that money and the soap you have to bring they are getting worried.
>
> So, in the family the two of you will have to decide. If you are not getting that money, and then you go and deliver there in the health centre, who will pay for it?
>
> The family will rather say to you to deliver at home, and the husband will say to you to deliver at home.
>
> If you go there you will remain there, there is no one to bring you back home."[47]

Clashing with what the health care users said, the health care workers I interviewed did not appear to understand the degree to which it was difficult to make the required payments. Many pointed out that ANC was free or only cost 1 or 2 SDG (which I believe most people would be able to pay) but the discussion became more difficult when we talked about payments for giving birth in a clinic. The answers ranged from denying that the women had to pay anything (which might be true in some cases) to more or less willingly admitting that it in reality cost a small sum of money and soaps. It was easy for me to observe that even getting into Juba Teaching Hospital cost 1 SDG, which was collected at the entrance. Some of the health care workers explained that the money was used for things like paraffin and sterilization,

but whether it was also used for other purposes was not possible to verify. In Magwe primary health care centre they were also discussing introducing new charges to perhaps buy fuel for the ambulance.[48] Discussions like these, together with the stated government health policy on fees, do not take into account the severity of the current payment practices and how they affect health care attendance.

In a society with widespread poverty, several people expressed concern about how poverty prevented access to healthcare. During the war they had all suffered, but now "it depends on you and whether you have money" as one woman put it.[49] People also clearly expected more from the government:

> "The government should help those who are poor, because everything has to be paid for with money and people who are very poor they cannot afford it. Sometimes tests will be done and the doctor will prescribe the medicine and tell you to you go and buy the medicine from the pharmacy outside. That becomes difficult for the poor because now the situation is not the same as before, there are now people who are poor and others that are rich.
> So at least the government should do something about the poor people, and open a place where the poor people can have access to the health clinic."[50]

In this environment, having money or not could spell the difference between life and death, and people in both locations had no illusions about the situation:

"The problem is the money. During the war doctors could sympathise with you, they would treat you or give you medicines. But now everything has to be paid for with money. If you don't pay they will just leave you like that, nobody will take care of you, you might even die."[51]

"If you are bleeding your husband must buy medicine. We don't have this bleeding medicine in the health centre, but it is there in the private clinic. If there is no money you will die!"[52]

4) Decision to allocate money for women's health care

Payment was clearly linked to decision-making in the family. Both in Juba and Magwe it became clear that this was a difficult issue, with differences between different households and families. In Juba there was more money available overall, and therefore payment was more often down to the individual man or family to decide. In Magwe the women were aware that little money was available in the family, but even there it would differ from household to household whether they would get money or not. Either way it became clear that the women were not usually the ones in control of the family spending. This was also highlighted by many women who reported that they had lost household goods they owned previously after their husband died - either they had had to sell it, or their husband's family had claimed the goods.

Women looked for independent sources of income. In Juba the question about allocating money for women's health care started an excited discussion amongst this group of unusually outspoken women:

"For health costs they were the ones searching for money. If you don't have money the man looks for money for himself, and if you don't do some work to get money for yourself you will not get money for the treatment. Maybe he would give some money for buying food, but not for the health of the women or the children.

There is no plan for women and men putting money together, they don't have that plan here, it is not working.

It is difficult for the woman to ask the man the reason why he is not giving money for her health and for the child's health. Sometimes he may decide to give money if he thinks that the child is in a critical condition, but sometimes it doesn't help. The child may die because it is too late.

Then if you ask the man why he is behaving like that, you will get into trouble with him. So the women will be afraid to question or to ask money from the men."[53]

In Magwe women could cut a type of grass to sell themselves, but they also blamed the lack of job opportunities, saying that the men were aware of women's problems but unable to get the cash:

"If you're pregnant here the men will not give you money if you are sick so that you may go and buy medicine.

Your option is to go to the bush and cut grass, you then go and sell it, if you sell it and then keep the money you may use it if you are sick.

If you just sit and wait for the men to give you money, you will suffer.

The problem is that the men are not working. The men have no money."[54]

Several of the health care workers also confirmed that the decision about whether to attend maternal health care services was not only up to the woman herself. It became clear that spending time and money on women's health was not always seen by men as legitimate. Linked to these questions of power and control in the family are issues like fertility control and domestic abuse. The health care workers confirmed that domestic violence was a problem for several of their patients, whereas only one group of women I talked to said this directly. The same was true for access to family planning, which is highly lacking in South Sudan.[55]

5) Quality of care

Although the quality of care might not technically be described as a barrier it turned out to have an important influence on women's choice to use the health care services, as women might not attend clinics if they perceived the quality of care to be low. The quality of care has two components, both *what* is done and *how* it is done. (It is important to know that the following is based on people's own impressions, as I did not observe any ANC consultations or births.) In Juba, people generally agreed that health care had improved a lot since the end of the war. More clinics were open, more sophisticated equipment (like ultrasound scanners in some instances) was available, although some pharmaceuticals could still be difficult to find. Again, the quality seemed to depend quite a lot on purchasing power. Most antenatal check ups appeared to consist of taking the blood pressure, weight and checking the foetus' position. Urine or blood tests would only be performed if they were demanded, and not as a routine check (which is not in line with WHO recommendations[56]). In Magwe the health clinics had all had to be built after the war, and some of them were still lacking

equipment for blood tests, according to the women I interviewed. And while some women in Magwe expressed satisfaction with the health care services, others were highly critical of the lack of blood and specifically HIV tests.

While it was perhaps difficult for the women to evaluate specifically the contents of the ideal antenatal check up and follow-up during facility births, they were often not happy with the way they were treated by the staff. Both in Juba and Magwe there were complaints about poor treatment by health care staff, especially if they arrived without any money. Some repeated the point that without cash they did not see any point in going. It also became clear that it could depend upon connections in the health facility:

> "They see that their tribe is losing, even in the hospital. Those who do not have relatives who work in the hospital, nobody cares for them."[57]

> "There are good nurses and there are also bad nurses who are harsh, who don't have the language of nursing."[58]

It is important to note that the health care workers I interviewed were also tremendously frustrated with their situation. They often commented on the shortcomings of the services they were able to offer. They raised issues like a lack of regular supply of medicines and equipment in general; not being able to offer night services for security reasons; and not always knowing why the patients didn't attend. Some of these discussions took place at the same time as there was a strike by health

workers who had not received their pay, although salaries were not mentioned directly by any of those I spoke to.

The health care workers also emphasised the critical lack of trained health personnel in South Sudan, and this was frustrating to them. Government plans have been made to exchange TBAs for fully trained nurses, but while the support for TBAs has been stopped there were nowhere near enough nurses to replace them in the short term, and it is difficult to see how enough nurses would be trained even in the medium term.[59] This leaves the population with a current critical shortfall in health care personnel.

6) Cultural tradition of home births

In Juba, several of the older women appeared proud that they had given birth by themselves during the war, and for example told me how they had had to cut the umbilical cord alone. In Magwe there was a slight tendency for the older women to seem more sceptical of the maternal health care at the clinics compared to the younger women I talked to. As far as I could ascertain the younger women had more often gone for antenatal check ups and delivered in a clinic. An explanation is clearly the lack of services during the war, but interestingly it also seemed to reflect a change in attitudes. The older women were voicing their scepticism more clearly, with some stating that they believed fistulas came in the clinic. Although one should be careful to draw any strong conclusions from such a small number of interviewees, hopefully this was a sign of changing attitudes among the younger cohorts.

Tied to this are cultural beliefs that still were important, but changeable over time. Some of the older women said that if you wanted to go to the clinic before the war you were told that you were weak and fearing delivery. Several health care workers confirmed that there were such attitudes in the community, but again the younger women seemed somewhat more positive towards giving birth in a clinic. Men appeared to be more ambiguous than women. Some replied that they would prefer births in a clinic, but when I asked more questions, their own wives had given birth at home. Overall there was a lingering preference for starting the birth at home, and only going for help if the birth dragged on or there were complications. It appears that the conflict's impact on poverty, lack of facilities and transport problems together with low expectancies of the quality of maternal health care combined with and *reinforced* a cultural tradition of home births, and therefore still stopped many women in Magwe from receiving necessary and potentially lifesaving aid.

Conclusion

It is not possible to draw any conclusions about the *overall* number of women who went or did not go for antenatal check ups or give birth in clinics from this small sample. Nonetheless I think this approach has allowed me to understand what were common problems experienced by many women in the local communities in Magwe and parts of Juba. When even women in relatively well off areas of Juba stated that they could not afford to pay for the services, it indicates that this posed a serious problem. Many of the findings mirror those of the SHHS 2006, although the interview sample here was relatively small.

A weakness of the accounts, at least for planning purposes, is that it is not clear which health centre the interview subjects are referring to. I have used the terms 'health care clinic', 'health care facility' and 'health care centre' interchangeably, mostly because I have tried to prevent identification of those who were critical of the services. Similarly, since a goal of this article is to explore individual's perceptions of barriers to accessing maternal health care, what they *think* is more important than how the healthcare system really works. Furthermore there is no use in pointing fingers criticizing any one particular health care centre - the problems discussed here have to be addressed at a systemic level.

Future research on this issue should take these limitations into account. In addition, more interviews with health care *workers* would help understanding the challenges they meet. With the global crisis in the healthcare workforce in mind it is also vital to deepen our understanding of the factors that will help the situation of health care workers in a place like South Sudan.

The impacts of the long war with the north were still felt even as the country was achieving independence. South Sudan probably has the world's highest maternal mortality ratios, and in this article I have highlighted the difficulties in obtaining appropriate health care during pregnancy and birth. Focussing on local people's perceptions of the services has revealed that paying for the services and transport were some of the most serious obstacles they met, linked to the quality of the treatment they receive. It was easier to trace the long civil war's impact on factors related to the supply of maternal health care services (destruction of health care centres and roads; quality of care; lack of educated health personnel; all exacerbated by poverty and a

poor national economy) than to trace the exact impact on factors related to demand (awareness of the services; allocation of money within the family). My conclusion is that all these factors interacted with and contributed to reinforcing a cultural tradition of having home births, with the risks that follow for both mother and child.

In many ways, the last civil war in Sudan amounted to extreme human costs and 22 years of lost development opportunities. In the transition period after the conflict, the legacy of those lost decades remained, and in addition new problems caused by the transformation of the country became apparent. In Magwe there was a profound lack of obstetric care during the war, which to some extent continued into the transition period after the second civil war. Within Juba the government in conjunction with international NGOs had ensured that some care was available even during the war time. By the time I did the interviews the extent and quality of care had improved markedly in both areas, but access was now prevented by direct charges and the prohibitive cost of transport from outlying areas especially to referral hospitals. Specifically, I could see a lingering detrimental effect of the war in: the lack of any more than basic primary care in Magwe; the absence of cash among people to pay for care in both areas; and the need for the government of South Sudan to continue allocating significant portions of the budget to security. Since fees for health care use and transport have been shown to be such clear barriers to the provision of maternal health care, one way for international donors and the government of South Sudan to reduce female mortality would be to prioritise free maternal health care when the current conflict eventually dies down.

At the time of writing, it was extremely difficult to predict the outcome of the new outbreak in fighting or the toll it would eventually have on the population. In the short term fighting might directly stop women from accessing health care, and a high risk of malnutrition would mean increased risk for pregnant women as well as their children. There is currently a very real risk that improvements in maternal health care services in both Juba and Magwe could be in jeopardy.

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Endnotes

1. For example Ghobarah, Huth and Russett, ‘Civil wars continue to kill’; Plümper and Neumayer ‘The unequal burden of war’; World Bank, *World Development Report 2011*.

2. Mavalankar and Rosenfield, ‘Maternal mortality in resource-poor settings’.

3. O’Hare and Southall, ‘First do no harm’; special issue of Reproductive Health Matters in 2008 with focus on conflict impact on reproductive health, including Kottegoda and Mullany.

4. New maternal mortality estimates were presented in the Lancet in 2014; Millennium Development Goal report 2012.

5. Several United Nations Millennium Development Goal reports have claimed this.

6. Mavalankar and Rosenfield, ‘Maternal mortality in resource-poor settings’.

7. Nanda, Switlick and Lule, *Accelerating Progress*.

8. United Nations Millennium Development Goals summit outcome document in 2010, which recognized violence as an impediment to reaching the MDGs.

9. World Bank, *World Development Report 2011*.

10. For example Ghobarah, Huth and Russett, ‘Civil wars continue to kill’; Plümper and Neumayer ‘The unequal burden of war’.Coghlan et al. in their study from the DR Congo document that men are more targeted by direct violence and women mostly by indirect effects (even though there are questions regarding the total mortality calculated from this study).

11. Ghobarah, Huth and Russett, ‘Civil wars continue to kill’.

12. Plümper and Neumayer, ‘The unequal burden of war’.

13. Li and Wen, ‘The immediate and lingering effects of armed conflict’.

14. Ghobarah, Huth and Russett, ‘Civil wars continue to kill’.

15. Kottegoda et al., 'Reproductive health concerns'.

16. Mullany et al., 'The MOM project'.

17. Chandrasekhar et al., 'Maternal Health Care Seeking Behaviour'.

18. RAISE, *Funding for reproductive health.*

19. McGinn, 'Reproductive health'.

20. Internal Displacement Monitoring Centre, *Sudan: durable solutions elusive*.

21. Rolandsen, *Land, Security and Peace Building*.

22. Internal Displacement Monitoring Centre, *Sudan: durable solutions elusive.*

23. Rolandsen *Land, Security and Peace Building*; Schomerus and Allen, *Southern Sudan at odds with itself.*

24. Guli and Salahub, 'Women's perspectives'.

25. Schomerus and Allen, *Southern Sudan at odds with itself* :12.

26. Department for International Development, *Sudan: Overview*.

27. Southern Sudan Commission for Census, Statistics and Evaluation, *Poverty in Southern Sudan.*

28. Southern Sudan Commission for Census, Statistics and Evaluation, *Key indicators.*

29. Department for International Development, *Sudan: Overview*.

30. See for example Taylor-Robinson, 'Operation Lifeline Sudan'.

31. According to BMB Mott MacDonald, which is contracted to deliver primary health services (including maternal health care services) to a large part of the population in South Sudan. Their quarterly reports give a good overview of attempts to make progress in this area.

32. New Sudan Centre for Statistics and Evaluation (NSCSE) in association with UNICEF, *Towards a baseline.*

33. Kassebaum et al.,*Global, regional and national levels of maternal mortality*.

34. Ibid.

35. BMB Mott MacDonald, *Quarterly Progress Report*.

36. Government of South Sudan, Ministry of Health website. Last accessed 22 February 2013. Another part of this policy statement promotes equitable health care, but in reality there are great differences depending on people's purchasing power, as documented in these interviews.

37. Rubin and Rubin, *Qualitative Interviewing.*

38. Southern Sudan Commission for Census, Statistics and Evaluation, *Statistical Yearbook.*

39. Ibid.

40. For example Gage, 'Barriers to the utilization of maternal health care'; Chandrasekhar et al., 'Maternal Health Care Seeking Behaviour'.

41. Interview in Juba 08.03.10

42. Interview in Magwe 12.03.10

43. Interview in Magwe 12.03.10

44. Interview in Magwe 16.03.10

45. Interview in Magwe 13.03.10

46. Interview in Juba 08.03.10

47. Interview in Magwe 12.03.10

48. Interview 16.03.10

49. Interview in Juba 16.03.10

50. Interview in Juba 08.03.10

51. Interview in Juba 09.03.10

52. Interview in Magwe 12.03.10

53. Interview in Juba 22.03.10

54. Interview in Magwe 12.03.10

55. Sudan Household and Health Survey 2006.

56. For example World Health Organization, *Antenatal care in developing countries.*

57. Interview in Juba 09.03.10

58. Interview in Magwe 15.03.10

59. Interview 22.01.10

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13 Article 4: Civil conflict, inequality and inequity in health

Abstract

Civil conflicts typically are not fought in equal measure across a country's territory, and it follows that the consequences of the conflict are very unlikely to be equally distributed geographically. This inequality may further be increased by an unequal distribution of impacts across different population segments. Inequalities that are perceived as unfair might be discussed in terms of inequity, and this may be one reason why horizontal inequality between population groups has been linked to conflict onset. Maternal mortality is particularly unequally distributed across the globe, and I discuss whether new policies aiming at promoting greater equity in maternal health may have any practical value in the concrete setting of South Sudan.

Introduction

> "In fact, equality, as an abstract idea, does not have much cutting power, and the real work begins with the specification of what it is that is to be equalized." (Sen 2002: 660)

Civil conflicts typically leave a legacy of poverty and destruction (Collier et al. 2003), and the health sector is no exception. Fighting in a civil war usually does not take place across the whole country's territory to the same degree (Buhaug and Gates 2002, Østby et al. 2011). A corollary of these combined statements is that conflict *impacts* cannot be expected to be equally distributed across the whole population. Most academic work on civil conflicts has been concentrated around identifying the factors that increase the risk of conflict outbreak, with less work dedicated to investigating the impacts on civilians. Of the latter, even less has concentrated on health impacts of civil conflicts, or the distribution of these.

Health is central to human wellbeing, and several of the Millennium Development Goals are health-related. While the Millennium Development Goals with their average targets have been criticized for targeting 'low-hanging fruit' instead of reaching out to populations with more intractable problems (Melamed and Samman 2013:1), there is now a new focus on equity and inequality in discussions about what should be prioritized after 2015. Health, together with education, is emerging as a key theme on the post-2015 agenda (Kjørven 2013).

Inequality is here simply understood as 'inequality in some aspect', for example access to maternal health care, without further definition. We will discuss the consequences of having a strong equality principle (where no inequality is permissible) against a weak equality principle. *Inequity* however involves a judgement of whether said inequality is also unfair or unjust. Importantly, equity in health can be interpreted in several different ways that are not mutually compatible (Culyer and Wagstaff 1993), and may further clash with (different) notions of justice. It therefore follows that if a policy of 'equity in health' is not specified further its interpretation will have to depend upon different policy makers, with unequal results as an almost guaranteed outcome.

In health policy discussions on different levels there is similarly a renewed focus on achieving greater equity, and it is generally accepted as a policy goal in the health field (Culyer and Wagstaff 1993). In this article I will use maternal health as an example, because it is an issue where it has been recognized that inequity is particularly salient, even in countries not affected by armed conflict (IFRC 2011).

The focus on inequity is warranted because maternal morbidity and mortality are extremely unevenly distributed globally. Millennium Development Goal (MDG) 5 aims to reduce maternal mortality by three-quarters from its 1990 levels by 2015, and access to adequate antenatal care and having skilled attendance at birth are two of the concrete targets that are being followed (UN 2012). Developing nations have an estimated maternal mortality ratio 15 times that of the developed countries (WHO 2012). Sub-Saharan Africa is the region with the highest average maternal mortality (ibid), but there is great variability between countries in this region. Within countries there is also variability, with richer, more educated women in urban areas usually having better health outcomes than their poorer, less educated and rural sisters (WHO 2005). Most of the difference in mortality levels is usually attributed to differentials in access to adequate maternal health care services (WHO 2005; Ki-moon 2010).

In comparison with other aspects of health, good maternal health thus relies heavily on the health sector. Where inborn health differences might be assumed away as "natural goods" in Rawlsian terms, the most effective strategies to prevent maternal deaths all involve contact with a well-functioning health care sector (WHO 2005). Access to adequate maternal health care may therefore be seen as a matter of *social* justice rather than natural justice, and hence an issue open for debates regarding equity.

The article is illustrated with examples from field work in South Sudan concerning access to maternal health care services, in order to give the theoretical discussion some concrete input. South Sudan has a policy of delivering equitable health care services to its population. I will discuss Norheim and Asada's (2009) approach to linking equity in health with theories of justice in this context, to assess whether it can help policy making in a concrete setting like South Sudan.

These questions are intrinsically interesting from a development perspective, and the UNDP's Human Development Reports with the Human Development Index (HDI) has recently been amended to include also an inequality-adjusted HDI. The Gender Inequality Index employed in the Human Development Reports uses reproductive health as a measure of health inequality (between women and men).

I will first discuss the links between inequality and conflict, before considerations of equity are brought up in the latter part. The aim of this paper is threefold. Firstly, to revisit some of the links that have been made between inequality and civil conflict; secondly to discuss how this relates to discussions of equity in health; and thirdly to point out some dilemmas that arise when a policy of 'equity in health' is to be carried out. In doing so, I will bring together insights from different research fields that currently are not well integrated.

Inequality as a cause of conflict

Inequality has been investigated as a possible cause and outcome of civil conflict, and is therefore also linked to the possibility of renewed conflict outbreak in the aftermath. Different researchers have examined the connection between inequality and conflict onset with different concrete measures of inequality. I will here briefly present some opposing approaches, with an emphasis on the theoretical differences.

Collier and Hoeffler have perhaps been the most cited – and controversial – writers in this literature, with their division of causes of civil conflict onset into 'grievance' (based on e.g. inequality) or 'greed' (opportunity for rebellion). These aspects are considered either as *motives* or *opportunities* for rebellion. Collier and Hoeffler have elaborated and amended their theory over the years, and examined grievances in different terms. In their 2004 paper they present four different sources of potential grievances: ethnic or religious hatred, political repression, political exclusion or economic inequality (Collier and Hoeffler 2004). Two measures of income inequality, the Gini coefficient and a ratio of the top-to-bottom income quintile are used, as well as a Gini coefficient of land ownership. The authors find that their measures of grievance are not significantly different from peaceful and conflict-affected countries, and therefore conclude that they cannot be the reason why civil conflicts break out in

some countries and not in others. Instead they find support for the 'greed'-based measures of conflict onset.

Part of the controversy generated by Collier and Hoeffler's analyses is linked to the way they are portrayed as undermining the rebels' claims of legitimacy. Rebel fighters seem to share some motivation with rent-seeking criminals in their analyses, rather than to be fighting for a just cause. One outspoken critic is Cramer (2003, 2005) who has challenged Collier and Hoeffler's analyses through an attack on changes in their explanations in different papers, use of poor inequality and civil conflict data, as well as on a theoretical level. Cramer argues that it may not be possible to find sweeping generalizations regarding the link between inequality and conflict occurrence (Cramer 2003: 400), and furthermore argues that such general claims have limited interest. Rather, he asks for more investigation into specific cases where inequality may play a part, in order to give a more detailed account of *how* inequality affects conflict potential. "One possible avenue of research and explanation into the consequences of inequality is to ask what kind of inequality prevails, what form it takes, and within what mould of relations inequality is cast" (Cramer 2003: 404). Cramer argues that is that it is not necessarily the extent of inequality in itself, as measured by an aggregated measure like the Gini coefficient, but rather the ways that inequality is managed and perceived in a society that may be of importance. Furthermore, national measures of inequality may disguise specific, local inequalities, which may be just as important in the origination of rebellion (Cramer 2003: 405) thus pointing to the importance of level of analysis of these issues. Finally he argues that if injustices are to be regarded as reasons for conflict, they need to be linked with some transmission mechanism, for example a shift in ideology (Cramer 2003: 409). The dynamics of inequality – whether it is seen as increasing or decreasing - must also be taken into account.

Following the lead of Frances Stewart, and reflecting Cramer's (2003) notion of "categorical inequalities," another strand of this literature has focussed on how systematic inequality between groups that coincide with identity-based cleavages (so-called *horizontal* inequality) may provide a more interesting and fruitful line of inquiry. These researchers argue that it is not country-level inequality (called vertical inequality) that is of prime interest, but rather inequality that aligns with other group

aspects. This also provides a more reasonable explanation for how the inequalities might be translated into violent collective action. Contrary to Collier and Hoeffler's findings, several quantitative studies with this focus have found support for the claim that inequality between groups within a country increases the risk of conflict onset (Østby 2008; Østby et al. 2011; Buhaug, Cederman and Gleditsch 2013).

These results are important in directing further research. It appears that rather than just investigating inequality measured from top to bottom within a country (vertical inequality) using the Collier and Hoeffler approach, these inequalities need to align with some other aspects of identity in order to be used for conflict mobilization. The following questions need to be asked: Is there any potential for social and economic mobility in these societies? How is identity manipulated? How is inequality legitimized? Some inequalities will always exist within societies, the important issue is perhaps rather how all of these factors are related to people's perceptions of justice. In other words, where Collier and Hoeffler relate to a measure of *inequality*, the real issue may be perceptions of *inequity* as will be discussed later.

Unequal distribution of conflict impacts

An interest in more local-level factors in civil wars has been accompanied by a growth in disaggregated data on conflicts (usually measured as local battles) and conflict impacts (use of e.g. survey data on health and other issues). This has made it possible to study more in detail where the fighting takes place in civil wars and what the local-level effects are.

Civil conflicts could in theory have similar impacts across an entire country's territory, but to the best of my knowledge this has never happened in reality. This would almost certainly have to imply levelling everything *down*, and as a thought experiment one could imagine that the tactics of scorched earth had been employed across an entire country. However, in real life there will be areas protected by the winning (and also by the losing) party that will escape some of the conflict's worst consequences. Whether or not aspects of inequality have contributed to the start of a civil conflict, the war is likely to be fought more in relation to strategic objectives than to initial positions (Balcells 2008). Military leaders have always known this, and adjusted their tactics according to the terrain, military strength, desired objectives and

so forth. Given such concerns, a war will rarely be fought equally hard across a country's territory (Buhaug and Gates 2002, Østby et al. 2011). Wars may often cover only a small part of a country's area, and although civil wars will necessarily have some effects on state level (e.g. redirection and probably depletion of state resources) the battle effects locally may reasonably be expected to vary considerably.

Buhaug and Gates (2002) investigated how a conflict's strategic objectives coupled with more local-level factors influenced the location and scope of civil conflicts in general. First, they found that battles were more likely to be fought far away from the capital in secessionist and identity-based conflicts than in conflicts over state control. Second, conflicts of longer duration, close to a border or where natural resources were present tended to cover a larger area than other conflicts. Later research has included differentials according to the type of resources available and the population density (e.g. Buhaug and Rød 2006). One implication of these and other research results concerning the geography of civil war are that conflict impacts are not likely to be felt equally across the territory in civil wars.

At the time of writing fighting has broken out in South Sudan anew, but for the purpose of this article I will consider the war up until the signing of the comprehensive peace agreement (CPA) in 2005, before the field work was carried out. When I write about the 'war' or the 'conflict', it is therefore the second civil war from 1983-2005 that is referred to. In Sudan, the fighting in the second civil war overwhelmingly took place in the southern part, within what is now South Sudan. Across the vast Southern territory there were large differences in the fighting patterns. Douglas Johnson has argued that the war to a large degree was fought as a war over resources (Johnson 2011: 151). He claims that resources like the population, oil and foreign aid in addition to territory itself came to constitute the battleground to be won (ibid). Such concerns therefore guided where the fighting took place. Furthermore, when Mengistu in Ethiopia was overthrown in 1991 and the Ethiopian camps were rapidly emptied of Sudanese refugees another war dynamic was created, and this was further changed by the split into two SPLA factions that took place shortly after. In the later war years, apart from a few garrison towns, the re-united SPLA possessed almost complete control of the countryside, and this control pattern dictated the war

effort. The war fronts were moved several times due to different concerns, and were far from distributed equally across the South.

In addition to the unequal geographical distribution of the fighting, the impacts on assets and income are likely to be unequally distributed among the population. Several authors have claimed that civil conflicts are likely to affect the poorest and most vulnerable people the most (e.g. Collier et al. 2003; Gutiérrez-Sanín 2009). There are several reasons why conflicts might take the greatest toll on the poor: they are less able to protect their assets (through e.g. private security or fleeing) than the rich; the state is too preoccupied fighting to conduct egalitarian policies (like distributing health care); and the disruption of social institutions and implementation of "the law of the strongest" is likely to hit the poor hardest (Gutiérrez-Sanín 2009: 2).

However, claiming that the effects of conflicts are unevenly distributed across the population is not the same as claiming that there cannot be any positive externalities or equalizing effects of conflict. Gutiérrez-Sanín further argues that the literature on conflict impacts is often very unsophisticated, and in fact mixes up three different research questions: first, the costs of conflicts may be assessed as the sum of the costs of waging war plus the destructive effects. This is different from assessing, second, the costs of conflict against the counterfactual situation with no conflict, e.g. what would the economic growth have been without conflict. Third, conflict impacts may be assessed as the distributive consequences of conflict (Gutiérrez-Sanín 2009), which is the question I focus on in this article. This question can further be approached from different angles, and must also include an examination of either positive (from rich to poor) or neutral (from rich to rich or from poor to poor) transfers (ibid).

One additional factor which is relevant to the last point is that humanitarian assistance will benefit some but not all areas (known as 'aid bias'). This may inadvertently increase inequality further. Where the aid is delivered for free or reaches the most vulnerable it may have an equalizing effect locally. On another level, if aid is distributed more in the peaceful areas within a conflict-affected country – which may be the case if distribution in areas with active fighting is too dangerous – it may enhance even further the inequality between peaceful more and conflict-affected areas within the country. Internationally there is much focus on refugees and internally

displaced persons and their plight. However, in the case of health care, displaced populations living in camps may have better access to health care than resident populations in conflict zones (Guha-Sapir and d'Aoust 2010). People who have fled and lost their homes may in that case be better off in terms of another good (health care), which underscores the point that inequality may be assessed in many dimensions.

Within conflict countries the patterns of inequality may vary in relation to the factors described above. As for variations in access to health care and maternal health, several researchers have shown examples of conflict-induced inequality. Mullany et al. (2008) showed evidence of raised maternal mortality and poorer access to adequate maternal health care in conflict-affected zones of Burma (Mullany et al 2008). Vije and Ratneswaren (2009) concluded that the fighting in Sri Lanka, pitting the Singalese against the Tamil population, had resulted in large inequalities in health. While improvements had been made in reducing maternal mortality in the rest of the island, the maternal deaths had been increasing in the north-eastern area where most of the fighting took place (Vije and Ratneswaren 2009:3). On the other hand, Ormhaug, Aas Rustad and Tollefsen (2013) found that sub-Saharan African civil war countries had overall lower use of maternal health care services than peaceful countries in the same region, but that *within* the conflict countries the most battle-affected areas actually had a *higher* use of adequate antenatal care and professional assistance at birth. The nexus between conflict and maternal health is therefore perhaps more complicated than expected.

Maternal health and inequality in South Sudan

In Sudan, the large Operation Lifeline Sudan could not reach out to all the war-affected inhabitants (Shanmugaratnam 2008). This inadvertently exacerbated inequality in access to maternal health care for the population in the South. Almost all the health care that was provided in the South during the war years was supported by international aid agencies (Decaillet, Mullen and Guen 2003), but these actors had to negotiate with the North and with the SPLA in order to deliver aid (Johnson 2011). Food supplies and medical aid had to be flown in by costly air transport because of the security situation and a lack of transport means on the ground (Decaillet, Mullen and Guen). Despite these efforts, it was estimated that by the end of the war only 60%

of the population in the South had access to any health care at all (ibid). Avoiding maternal death and disability, which is so heavily dependent upon access to adequate health care (WHO 2005), was thus not possible in equal measure across the Southern territory.

Field work and interviews were carried out in South Sudan during three trips in 2010, and have been followed up by information exchange and policy review later. Sudan (as the country was still named) was chosen in order to be able to explore variation within maternal health care and in fighting patterns, in a country that had experienced civil conflict relatively recently. South Sudan cannot be seen as representative for the whole region of sub-Saharan Africa, nor can the two interview sites Juba and Magwe represent the whole of South Sudan. They were chosen in order to explore some important variation in conflict impact on access to and use of maternal health care services. The aim of the interviews was to explore access to and use of maternal health care services during and after the war (defined as the conflict up until the signing of the CPA in 2005). Participants were selected for their knowledge about the research subject; they should be willing to participate in the interviews; and if there were different perspectives on this subject the interviewees should represent the full range of views (Rubin and Rubin 1995).

I was focusing on people who had lived in the area during the war time, and since there was no population register I could use in order to identify them I had to use a form of purposive sampling (snowball sampling). People in Juba were approached and asked if they would participate and also identify neighbours who had stayed there during the war. In Magwe a local pastor approached to communities and informed them about the interviews, and people who were willing to participate showed up at a designated meeting point. The problem with this approach is that the information can depend a lot on the initial contact point. While I started sampling several times in Juba so that this potential problem was minimized (i.e. starting over again and asking different women to find suitable neighbours), this might potentially have affected interviews in Magwe to a greater degree. However, as the stories from Magwe were all very similar and confirmed by other sources, I did not think that it turned out to be a problem in real terms.

In total 53 women and 21 men were interviewed in Magwe, and 32 women and 7 men in Juba, using group interviews. Since I had a relatively clear idea about the research questions I wanted to investigate (typical of topical interviews, Rubin and Rubin 1995), the interviews were semi-structured. I first conducted a round of pilot interviews to test my interview guide. Based on this and on previous literature I concentrated on the following factors related to seeking maternal health care: perceived usefulness of the services; transport; payments; whether they were allowed by their husbands to attend, what they thought of the quality of the services and whether they preferred to give birth at home. I also always asked open questions in the end, to see if there they had any other barriers to add. I collected the same background information from all participants in order to assess e.g. whether there were differences between richer or poorer women, as the literature often indicates. In addition I interviewed some key health care workers and people in administrative positions, and investigated numerous written sources. Information was sought from different sources and checked against multiple types of information whenever possible.

The information from Juba was much more varied than the information from Magwe. In Magwe people essentially told the same story, and I therefore had the impression of reaching saturation quite quickly. In Juba the stories were more varied, probably reflecting a reality of much greater variability in the access to maternal health care services during the war time.

In the Juba and Magwe the inequality in access to maternal health care during the war was large. Juba, which was a central garrison town in the South and is the capital of the new South Sudanese state, was one of the few places that the SPLA did not manage to capture during the protracted civil war. Despite heavy shelling the government forces defended the town. Staying on government hands meant that resources were invested in Juba, although most of the health care was provided by international agencies. There were however numerous aid agencies involved over the war years (Decaillet, Mullen and Guen 2003), and residents interviewed during field work had access at least to some form of antenatal care and professional assistance at birth during the war years. The situation regarding maternal health care in Juba was markedly better than in the remote town of Magwe, where the local health centre was

destroyed at the start of the second civil war and not rebuilt until after it was over. The local women therefore had to rely on traditional birth attendants during the war years. Travel and contact with other health services were largely prevented by security fears. Around Juba the fighting was characterized by repeated attacks but no change of control between the government and SPLA. Magwe however changed hands several times, from the government to SPLA, back to the government, over to SPLA factions before the reunited SPLA took control, although without preventing the Lord's Resistance Army (LRA) from attacking the inhabitants until well after the signing of the peace accord in 2005. Fewer resources were invested in keeping and securing Magwe, and fewer resources including health care were made available to the residents there than in Juba. The civil war and the unequal access to resources therefore likely contributed to a strong inequality in maternal health.

During the war there was probably greater equality in access to maternal health care within Magwe, through the 'levelling down' effect that made local access impossible when the health centre stopped functioning. There are therefore good arguments against *strong* equality of health if it is achieved through levelling down someone who is better off, as we will discuss in the section on Norheim and Asada's (2009) framework.

One further point is that some forms of inequality may tend to reinforce each other. At the time of doing fieldwork, women in Magwe still had less access to potentially life-saving maternal health care than women in Juba, for several reasons. First there was the lack of secondary and tertiary health facilities within Magwe itself, which limited the type of care which would be immediately available in an emergency. This alone might have disastrous consequences if access to such care is delayed. Further, where an assessment was made locally and referral to the hospital in Nimule was advised, the women faced a practical problem of getting transport there. They were required to pay the fuel for the transport themselves, but this was a sum the women I interviewed simply could not afford. Magwe's remote location further means that it had not seen the same level of business and foreign investment as Juba has, thereby providing fewer economic opportunities for the inhabitants. The greater levels of poverty among interviewees in Magwe was reflected in the fact that many argued that they could not pay the fees that were charged for attending maternal health care services at all.

Women without partners would be even more vulnerable in these terms. Compounding the problem is the general tendency of health care workers to be clustered in urban compared to rural areas (WHO 2006). In sum, the different inequalities may reinforce the difference in health care availability between places like Juba and Magwe, as well as between richer and poorer households within those two locations. Although the situation regarding access to maternal health care improved on average in both places after the second civil war, there was possibly greater inequality *within* each location at the time of conducting field work. This is an example of what Sen has described as the difference between aggregative and distributive concerns (Sen 1992).

Inequality and social justice – policy making in environments of scarce resources

> "The demand for equality in terms of one variable entails that the theory concerned may have to be non-egalitarian with respect to another variable, since the two perspectives can, quite possibly, conflict."
> (Sen 1992: ix)

So far I have discussed inequality and its relation to conflict. Inequality is here simply seen as an unequal distribution of something, in this case access to maternal health care services (which will lead to inequality in maternal health). The question I want to explore below is when inequality will amount to *inequity*? Taking this step requires bringing in notions of justice. When it comes to notions of equity it is important to note that several different interpretations might be seen as *valid*, and it is therefore in reality insufficient to state in a policy document that one wants 'equity' in some health-related aspect. Most likely this will lead to a situation where this policy is interpreted differently, with unequal results as the most likely outcome.

Culyer and Wagstaff (1993) discuss different interpretations of equity in health and health care in a widely cited paper. They distinguish between equality of utilization (of health care); distribution according to need; equality of access; and finally equality of health. One of their main points is that when they are investigated more in depth these four definitions are largely *mutually incompatible*. Because people are different

in many aspects, equality of access to health care will only very rarely lead to equality of use. Distribution according to need (which additionally is very difficult to define) will have to imply a very unequal distribution of health care utilization. Equality of health care utilization may lead to differences in health depending on a person's capacity to benefit, and so forth. All in all Culyer and Wagstaff (1983) conclude from their discussions that the guiding principle should be to work to advance equity in *health* as the outcome. This will in reality entail an unequal distribution in the three other dimensions pertaining to health care.

Equity is linked to perceptions of justice as well as equality. Deutsch linked perceptions of distributive justice to 11 different underlying principles, most of them mutually incompatible (Deutsch 1975: 139). Later writers on the connections between equity, equality and justice have simplified these into broader categories, and Cook and Hegtvedt (1983) discuss different forms of justice and the interplay between them. First of all, even though the distribution of outcomes may be perceived as just, people may evaluate the allocation process that led to this distribution as unjust. In other words, even with perfect health equality as the result, people might still protest if the process that led to it was seen as unjust; distributive justice may be unpopular if it comes at the expense of procedural justice. Secondly, and inversely, an allocation procedure that is perceived as just (they use the example of drawing lots) may lead to distributive outcomes that are seen as unjust. Thirdly, in what might be called restorative justice, actors are concerned about for example the level of compensation for victimization (Cook and Hegtvedt 1983). This third type of justice might be particularly important in a post-conflict situation, where many people have lost assets and been victimized in various ways. In our context, it means that people could be concerned with war reparations and/or restoration of pre-war levels of health. If people who had suffered more during the war received more help in the aftermath it could still be perceived as fair, although the outcome could very well be increased inequality. Similarly, a concern for restoring people to pre-war levels of health (or access to health care) might be seen as just, even though it would very likely not lead to an equal health outcome. This means that in a post-conflict context there may be competing perceptions of justice that go contrary to concerns for equality, which may complicate the picture when resources are to be allocated.

As opposed to inter-state wars, civil conflicts are different in that the conflict parties who often participated in creating destructive effects during the war also are responsible for distributing the health care *after* the war has finished – this may add another layer of complexity to questions of distributional justice and equity.
From the arguments above it seems reasonable to assume that access to maternal health care will most likely be unequally distributed in a post-conflict situation (due to pre-war inequality, unequal distribution of conflict impacts and unequal distribution of health aid). The following discussion relates to such a scenario. The central question is when *inequality* in the provision of maternal health care services amounts to *inequity*? I use Norheim and Asada's (2009) framework because it brings up central aspects of what we mean by equity as well as link it with theories of justice, which is particularly relevant in post-conflict contexts. In circumstances of severely limited resources, how should efforts be targeted? (It bears repeating that although Norheim and Asada evaluate aspects of inequality in *health* I use their discussion to talk about (maternal) *health care services*, because these are so closely linked to improving maternal health.)

Norheim and Asada 2009 start out by citing the Whitehead/Dahlgren definition of inequity in health: "Health inequalities that are avoidable, unnecessary and unfair are unjust" (cited in Norheim and Asada 2009: 2). They then argue that this definition lacks some clarification especially in terms of how equity in health relates to overall justice, and set out to link this definition with broader theories of social justice. In a post-war setting policy makers face many difficult choices regarding resource prioritization, perhaps with little concrete guidance on how to make the difficult decisions. I will discuss the Norheim and Asada framework for equity in health, first by examining what adopting the principle of *weak* equality means for maternal health care in South Sudan; and secondly by discussing how the principle of equity in reality has to be adjusted through trade-offs in terms of overall social justice in the same setting. South Sudan was used as a case of a post-conflict country when the field work was undertaken, but since December 2013 a conflict has flared up again. Nonetheless it is interesting as a case in this setting.

Norheim and Asada espouse a *weak principle of health equality*, arguing that four possible objections can be levied against a strong principle of equality (Norheim and

Asada 2009). First of all, adopting a strong principle of equality is often subject to the criticism that one way of achieving this would be to 'level down' those who are better off in terms of health care. Arguments for greater equality must therefore often be qualified by statements against creating worse health for those who are better off health-wise (e.g. Culyer and Wagstaff 1993). This common objection against equality can be avoided by adopting a *weak* principle of equality instead (Norheim and Asada 2009). This principle would not condone greater equality of maternal care if it amounted to taking existing resources away from better-served women. The women in Magwe experienced a levelling-down effect because they all lost access to professional maternal health care when the local health centre closed at the start of the war, yet nobody would argue that this situation was better although it was more equal. This is thus a principle that is seemingly easy to agree upon (although the specific distribution of *future* resources would have to be subject to the trade-off concerns discussed later).

Secondly, it can be argued against a strong principle of equality that only those inequalities that are socially and not naturally created can be subject to discussions of equity, which is a distinction dating back to Rawls and his division between social and natural goods (Norheim and Asada 2009). In Rawlsian terms, health is simply categorized as a "natural good" and hence defined outside of the realm of discussions about equity. In other words, health cannot be distributed evenly in the same way as for example political freedoms. However, as Norheim and Asada (2009) argue, very many differences in health today are linked to differences in the social determinants of health, which may themselves be subjects of discussions regarding equity, and further it is often difficult to distinguish properly between natural and social causes of illness (ibid). I argue that this is particularly the case for maternal health (including in a post-war context), where the greatest differences in mortality outcomes are normally attributed to differences in access to appropriate health care services (WHO 2005). The objection against treating maternal health as a subject of equity discussions is therefore not particularly relevant.

Thirdly, an objection that is levied against strong health equality is that individuals should bear responsibility for their health to some degree, linked to the choices they make (Norheim and Asada 2009). Since egalitarians also argue for creating equal

opportunities for all, this boils down to holding individuals who make the same choices under equal circumstances responsible. Norheim and Asada argue against this objection by stating that the principle of individual responsibility only applies to people's choices, and not the *consequences* of these choices, thus holding that this objection against strong equality has limited practical value (Norheim and Asada 2009). When it comes to providing maternal health care services in a post-war context, matters of choice and accountability become complex. For example, women in conflict-affected countries do not necessarily make conscious decision about becoming pregnant; they do not always have full power over household decisions, including when to have intercourse and whether they can use contraceptives. In a situation where marital rape is still not outlawed in many countries, and with high unmet needs for contraception e.g. in South Sudan (SHHS 2006), I argue that the women should not be held fully responsible for becoming pregnant. Furthermore, outside the household it is widely acknowledged that rape is used against women as a tactic of war (e.g. UNSCR 1820) with a concomitant risk of pregnancy. I would therefore hold women in post-conflict societies responsible for becoming pregnant only to a very limited degree. In the context of maternal health,, therefore, accountability is not a strong argument against strong health equality.

Fourthly, the last objection levied against strong health equality that Norheim and Asada (2009) present is a mix of biological and technological limitations. They argue that biological limitations (to equal health) are in reality difficult to distinguish properly, and that limitations related to technological knowledge should only be considered an issue of equality if the means to address an illness are known. I find it difficult to understand why 'biological limitations' were discussed as separate from the issue of health as a 'natural good' in their second objection to strong health equality, but accept their arguments regarding technological limitations. In terms of maternal health, the technology that is necessary to reduce maternal death and disability is well known (WHO 2005). I therefore think that this objection to strong health equality is not relevant for maternal health, including in a post-war context.

All in all, Norheim and Asada propose the following definition of weak health equality: every person or group should have equal health except when: (a) health

equality is only possible by making someone less healthy, or (b) technological limitations exist to further health improvements (Norheim and Asada 2009: 6-7).

The principles of strong and weak equality are instructive in terms of framing the debate, but in any real-world context they are also extremes. Strong equality, in its purest form, supports the pursuit of equality at all costs, even if it implies zero benefits to all; weak equality permits the pursuit of equality only if nobody – even the most privileged – has to bear any increased burden.

Of great practical concern in conflict-affected countries are the very real resource constraints, and it is to the discussion of *trade-offs* that we now turn. There are strict constraints placed on policy makers who wish to obtain health equity, and this is especially salient in conflict-affected countries where resources have been depleted and the constraints are very real. In the case of South Sudan and very unequal access to life-saving maternal health care, the question is the extent to which resources should be spent on reaching small populations in difficult-to-reach areas compared to increasing service delivery in urban centres with a greater patient take-up at the same cost? Such are the difficult choices that face policy makers.

Norheim and Asada (2009) analyse trade-offs in two categories; trade-offs between weak health equality and overall health; and trade-offs between health and other goods. Firstly, they argue that weak health inequality should be eschewed if it leads to unacceptable sacrifices of average health in the population (Norheim and Asada 2009). What exactly this unacceptable lower health average means in reality is however open for discussion, as they admit. Policy makers will seek to maximize the average healthy life-years of a population at the same time as they strive to achieve health equity. In Sen's terms, they need to weigh *aggregative* versus *distributive* concerns (Sen 1992).

In South Sudan, when the current fighting eventually stops, a judgement will have to be made about how resources are to be divided between areas that have been under-served in terms of maternal health services versus more central locations like Juba, where the same amount of resources might lead to greater patient uptake because of greater population density. In other words, expending resources in Juba might be

more efficient. But given that areas like Magwe have very little service delivery (and virtually no emergency obstetric care), *how* little service delivery should be allowed to exist there? Is there an absolute minimum that service delivery should not be allowed to fall below, that would outweigh the greater number of patients that could make use of the same resources in Juba? This question is moreover complicated by the fact that increasing service delivery in places like Magwe does not depend uniquely on the health sector, but is rather tied in with other sectors, like infrastructure (e.g. better roads are needed in order to reduce travel time to referral services).

Secondly, Norheim and Asada (2009) argue that (weak) health equality has to be weighed against overall well-being in a society. They propose that a reduction in health inequality would not be justified if it led to an unacceptable increase in inequality or reduction in aggregate well-being in other important areas like education or social security (Norheim and Asada 2009: 7). They mention some theoretical work that has been done in order to link health concerns with overall justice (Rawls, Sen) but conclude that further exploration of the *exact* links is necessary.

Although the exact trade-offs between better health and other concerns are not deducible from the present theoretical framework, this trade-off may actually be less difficult to make in a post-war context, where keeping the peace may reasonably be justified as a more important overall concern than achieving greater health equality. Since a continued conflict will most likely lead to worse (health) outcomes for many of the inhabitants, policy makers will often be justified in spending the necessary resources just in order to stabilize the situation. This is exactly what was seen in post-CPA South Sudan, where an extraordinary large amount of the state budget was spent on the security sector (Schomerus and Allen 2010). The failure to keep the peace there is now evident, but probably unrelated to health care spending.

All in all Norheim and Asada's (2009) framework may go some way towards helping policy makers clarify the choices they have to make. Arguments are provided against strong health equality, specifying why that may not always be a feasible goal, but the problem of trade-offs is harder to solve. In places like South Sudan a trade-off where greater health equality is eschewed in favour of keeping the peace might be accepted (and facilitate some trade-offs of health against other goods), but the exact level of

inequality that is acceptable as a trade-off against overall health gains is perhaps harder to judge. The links between health equity and overall perceptions of justice in a society will need further clarification in a practical setting.

Policy examples

The International Federation of the Red Cross and Red Crescent Societies (IFRC) are important players on the health scene, especially in conflict-affected areas. They have issued a publication together with the Partnership for Maternal Newborn and Child Health, where they focus specifically on eliminating health inequities for women and children (IFRC 2011). Since both organizations behind the publication are important in agenda-setting for maternal health internationally this publication is particularly interesting to review in the light of the previous discussions.

First of all, the IFRC presents the following definition of health inequities in their call for elimination of inequities in maternal and child health:

> "Health inequities are "unfair and avoidable differences in health status seen within and between countries". Health inequities are systematic: they usually affect particular groups of people, and they occur across the social gradient. The most vulnerable people have the least access, not only to health services, but also to the resources that contribute to good health."
> (IFRC 2011: 5).

At the same time, they promote the following goal:

> "Governments should ensure universal access to evidence-based public health interventions for all and allocate health resources according to need."
> (IFRC 2011: 7)

One further quotation is worth including, because it includes a reference to equity in other aspects of society as well:

> "Encourage prioritization and informed decision-making
> National Societies should use their status as auxiliaries to government to engage decision-makers to prioritize health equity and equity in all aspects of society and to hold authorities accountable."
> (IFRC 2011: 7)

On an analytical level, in light of the distinctions made by Culyer and Wagstaff (1993) as well as Norheim and Asada (2009), it is easy to point out logical flaws in this policy document and its treatment of the term 'equity'. It is evident that the authors mix notions of health inequity, inequity in access to health care and spending according to need, all of which was presented by Culyer and Wagstaff (1983) as possibly mutually exclusive goals. Further, although social determinants such as income and education will often have beneficial consequences for health, *prioritizing health equity* will not always be easy to reconcile with *prioritizing equity in all aspects of society*.

Nor is there any discussion of what exactly is meant by differences in health status that are 'unfair' and how this is linked to justice. Is it unfair that those who earn more because they work harder have better health? Is it unfair that those who work in less physically demanding jobs have better health? Is it unfair that those who receive support from their families have better health? In sum, the document provides little guidance for policy makers faced with limited resources and difficult health-related decisions.

I shall provide one more example of a policy text. The Government of South Sudan's Ministry of Health has previously articulated its mission as:

> "To improve the health status of the population and ensure a sector wide quality health care to all the people of Southern Sudan, especially the most vulnerable, women and children"
> (GOSS MoH 2013).

The Ministry further had the specific objective to:

> "Strengthen health systems and services to provide effective and equitable health care that is accessible, acceptable, affordable, sustainable, and cost effective"
> (GOSS MoH 2013).

This policy is actually more specific in relation to concerns about equity, as it aims at providing "equitable health care" (GOSS MOH 2013). This is potentially good for expectant mothers and their children. However, the term "equitable healthcare" needs further clarification. Given the large differences in poverty between women in different areas of South Sudan, providing 'equitable healthcare' in terms of equal geographical distance to facilities, equal quality of care, or other specifications of equality, may still be relatively meaningless if the services are payable. Providing 'equitable healthcare' for mothers and children in South Sudan would most likely have to entail providing free services, given the highly unequal distribution of wealth and income.

There is nothing in this short text to provide guidance on how all the other aims are to be reconciled – more specifically, the aims of providing equitable and at the same time cost effective health care may be at odds with each other. At the time of conducting field work the women in Magwe enjoyed far lower levels of health care than women in Juba. How shall concerns about improving health care in Magwe, which will be very costly, be balanced against improving health care in Juba for a much lower price per head? Again, how are distributive concerns to be weighed against aggregative concerns?

Discussion and conclusion

In the earlier sections I have argued that fighting in civil conflicts will probably take place in unequal measure across a country's territory, and that as a consequence, conflict impacts are likely to be unequally distributed geographically. This geographically uneven distribution may come in addition to an uneven distribution of conflict impacts among different population segments, where several authors have claimed that it is the poorest people who are likely to be hardest hit (e.g. Gutiérrez-Sanín 2009). A civil conflict may therefore leave a legacy of inequality in terms of the effects on the population. As such effects are superimposed on pre-existing

distributions of welfare and other goods, they may either equal out or increase existing inequalities. An implication of this is that paying war retributions and restoring pre-war health levels may lead to a more just but not necessarily equal outcome. In such a setting it is therefore insufficient to want 'equality', it is necessary to discuss "equality of what?" (Sen 1992).

I have discussed conflict impact on health more specifically, and in the health sector there are now increased calls for a policy of equity, including in maternal health. Debating 'equity' instead of 'equality' entails bringing in notions of justice. However, there are many different ways of defining 'equity' as regards to health, as discussed by e.g. Culyer and Wagstaff (1993).

Regarding maternal health in the specific location if South Sudan, the policy of providing 'equitable healthcare' can mean different things. I have previously argued that providing 'equal access to health care' in terms of geographical distance and quality of care for example may be meaningless if the health care services are payable. I would therefore recommend providing free maternal health care services as long as the current inequality in poverty exists, as a first step towards reaching equity for expectant mothers. Where free health care may lead to unnecessary consultations for other issues, nobody gets pregnant just in order to attend the health care services, so I argue that they should be kept free of charge if at all possible.

However, questions of trade-offs between overall health, equal health , and minimum health, - as well as health versus other goods – remain difficult to resolve. Policy makers in South Sudan may, for example, face a trade-off between spending more resources on health and spending more resources on factors that may avert a new conflict.

This dilemma points to the problem of putting non-traditional issues on the security agenda in order to increase their importance and the attention they will receive (Hudson 2010), for example by claiming that a failure to deliver health services will destabilize a country and possibly lead to increased violence. In South Sudan, basic service delivery has been couched in terms of 'restoring peace and stability (Joint Assessment Mission 2005). The question is whether this is really warranted? One of

the most thorough assessments to date of the conflict prevention measures adopted in South Sudan failed to find any clear link (at least on state-level) between health service delivery and violence reduction (Bennett et al. 2010). The problem with keeping health couched in these terms is that logically, the result of Bennett et al.'s analysis should be to divert resources away from the health sector and into other violence-reduction efforts, if the funding for the health sector was meant to reduce conflict risks. In a setting with limited resources for many good causes it may be tempting to play the security card, in an unfortunate competition over scarce means, but it may prove to be a risky strategy to bring health issues up on the security agenda. Further, a policy of securitizing health might justify use of undemocratic measures instead of an inclusive approach to decision-making. This may jeopardize progress in health even more, as decision-making when restoring health services in post-conflict countries is already fraught with problems (Macrae, Zwi and Gilson 1996).

The research done on inequality and conflict onset discussed earlier seems to indicate that it is inequality that aligns with some aspect of identity, and is perceived as such – in other words perceived *inequity* rather than just overall *inequality* within a society – which will be most likely to lead to heightened risk of conflict renewal. In South Sudan, when the current fighting stops and rebuilding once more becomes possible, the important question will probably be whether the existing inequalities will be seen as necessary for the time being, while improvements are being made, or as entrenched inequalities perpetrated by a distant elite with little care for marginalized people. In the health sector, the aid community will realistically be responsible for service delivery for a time to come (DFID and BMB Mott MacDonald 2012). It remains to be seen how the population responds if the current levels of inequality (including in health care and maternal health) are not decreased in the time to come. Shanmugaratnam (2008) discusses how health and other issues need to be linked to a wider agenda of livelihood revival in order to have a pacifying effect. Inequality in maternal health, which has been the main subject of discussion here, is probably not enough on its own to instigate civil unrest. Rather, it needs to be seen as a symptom of wider inequalities in order to be used for conflict mobilization.

Going through some examples of policy that promotes 'equity' in health has highlighted how such documents in reality provide relatively little guidance in a

concrete setting. If each health bureaucrat is left to interpret what 'equity' means, the only certain outcome is inequality in different health-related aspects. This lack of specificity in the policy documents can either be due to a lack of awareness about the different possible interpretations of equity, or alternatively it may represent a carefully crafted compromise in order to gain consensus for a common policy, where the alternative was no mention of 'equity' at all. Alkire and Chen discuss such a possibility in debates about getting support for global health goals, where they acknowledge a certain wisdom in reaching agreements that are not completely theorized in order to get support (Alkire and Chen 2004: 1073). However, the real test of whether policy makers really embrace a goal of equity will come when the policy is to be translated into budget allocations and resource use. It is only then that the real will to push this policy, as well as the real interpretations of equity will be evident. While this may be true of any policy making on contentious issues, it is nonetheless ironic that it will likely lead to different outcomes in different settings, when the stated goal is *equality*.

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