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Armed Conflict Deaths Disaggregated by Gender

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Executive Summary

When Florence Nightingale in the early 19th century went to the Crimean Peninsula to care for the wounded of that war she discovered to her horror that soldiers more frequently died from the infections gotten at the primitive army hospitals than from combat or their war inflicted wounds. The infrastructure at the hospitals as well as the hygienic conditions were abominable. She changed these, and she began collecting reliable statistics on the causes of death and chronic war inflicted damages. Contemporary wars are usually fought in regions not unlike those she encountered, with insufficient infrastructures, such as health facilities and procedures for the collection of statistics and data on the war related casualties.

The original purpose of this project was to analyze existing data collections such as the PRIO battle death data and the Uppsala data on armed conflict to see whether they could be disaggregated according to gender and age as well as to causes of death. Our point of departure was the increasing attention on the consequences of contemporary wars on women and children, including the landmark UNSCR 1325 on “Women, peace and security” which was passed in the year 2000, as well as the three following UN resolutions, 1820(2008), 1888 and 1889,(2009) which in part focused on Gender based violence in war and in part reasserted the main message of resolution 1325. That message, repeated in SCR 1889 (2009), was that the plight of women could only be ameliorated if they were given a voice in all the arenas and decision making processes that affected their lives. The causal relationship between powerlessness and violence has been repeated in the resolutions 1820(2008) and 1888(2009). Furthermore Resolution 1325 in its Preamble states “Noting the need to consolidate data on the impact of armed conflict on women and girls”, and bullet point 6 of 1889 “Request the Secretary General to ensure that relevant United Nations bodies, in cooperation with Member States and civil society, collect data on, analyze and systematically assess particular needs of women and girls in post-conflict situations, including inter-alia, information on their needs for physical security and participation in decision making and post conflict planning, in order to improve system-wide response to those needs.”

With this as background we wanted to explore both data as well as the existing research literature to find out what documentation there was about male vs female mortality in armed conflict. We discovered quickly that the existing data resources when it comes to global data

could not be used for our purposes. *Our first finding was that there are practically no global data available that allowed us to investigate conflict mortality disaggregated by gender.* When one looks further into this a number of methodological challenges to documenting conflict mortality more generally become evident, including distinguishing between direct and indirect conflict deaths, but we discuss these only briefly in the report. A part of the problem is that data exist on different levels. Very little information is available on a global scale, whereas good information can be found about the gender differences in smaller, intensively studied conflict areas. There are particularly many surveys coming from the medical/relief agency sphere where data on gender is routinely collected. The great problem is how to aggregate these findings up on a larger scale, and this is not fully resolved. The reader may be familiar with the debates surrounding estimates of deaths in Iraq and DRC. We will touch briefly on these issues but the purpose of this report has not been to discuss all the issues involved in estimating conflict mortality; we concentrate on the availability of data.

The research we have explored uses different datasets and investigates different conflicts and time periods, so it is difficult to say whether more men or women die overall from conflict. One general conclusion can however be drawn: *men are more likely to die during conflicts, whereas women die more often of indirect causes after the conflict is over.* Data on violent deaths (mostly survey data) confirm that men are more often victims of violence during wartime, whereas several studies that also take into consideration the post conflict period report a high number of female deaths after the conflict is officially over. It is still unclear what it is about these post conflict situations that leads to all these female deaths and this is a research area that merits more attention.

The spirit of this study is based on the conviction that gender-specific casualty data, when properly collected, interpreted and used, provide an important empirical framework with which to assess the impact of armed conflict and to act on behalf of populations in crises. The report as it stands now is in part based on available data and in part on a literature survey of relevant articles in the field. We return to the problem of lack of available data in the Conclusion.

This report is a final follow-up of the PRIO Policy Brief entitled *A Gendered Perspective on the Direct and Indirect Causes of Death in War and Armed Conflicts* (October 2006) by Patrick Meier in collaboration with Helga Hernes.

1) Introduction

“If we are to envision a less violent world, we must first understand how violent the world is” (Hynes 2004). However, while the case for evidence-based policy is clear, we are still far from having the full picture of conflict mortality - not to say conflict mortality disaggregated by gender. Such data, if available, would generate a lot of interest. Direct and indirect casualty data serve as key impact indicators of armed conflict (Lacina and Gleditsch 2005). Furthermore, “cause-of-death data can provide invaluable insights as to what services need to be bolstered, and are a key quality control measure for health-related programs... [Otherwise], conducting a relief program without any evidence of the extent and causes of mortality, or how these evolve over time, may be inefficient, not cost-effective and, ultimately, ethically questionable” (Chechhi and Roberts 2005). An example of incorrect use of data is that for over a decade the ratio of indirect to direct conflict deaths was quoted as 9:1, without any reported empirical basis for this figure (Murray et al. 2002; Levy and Sidel 1997). A policy that isn’t guided by scientific evidence is unlikely to insure a course of action that does no harm. Action based on incorrect science can even cost human lives, if it makes agencies or donors stop life-saving programs or allocate resources in an ineffective way (Checchi and Roberts 2005).

In contrast, reliable, gender disaggregated data on conflict mortality can help prioritizing interventions in post conflict countries and help efforts to rebuild devastated health care systems. In addition, such data would assist researchers in identifying characteristics of conflicts to help explain why some conflicts are apparently more damaging to women than others (Plümper and Neumayer 2006). This is important because drawing political attention to the human cost of conflict, and the different consequences for men and women, may influence policies affecting future conflict. To this end, more efforts are needed in collecting and assembling data from conflict areas.

The purpose of this report is to explore the availability of gender disaggregated conflict mortality data and estimates. We will use the words ‘war’, ‘armed conflict’ and ‘conflict’ interchangeably. In the next section we discuss the availability of data, before we highlight some methodological constraints in gathering data in section three. In sections four and five

we go through selected quantitative and qualitative studies respectively. In section six we summarize the main findings, before we discuss future research in section seven.

2) Availability of Data.

High-quality and continuous information gathering has been called “the nervous system of the humanitarian enterprise”; enabling us to take principled action (World Disaster Report 2003). However, the relative paucity of evidence-based research on gender and armed conflict has meant that broad-based surveys and data production from which to draw concrete conclusions are of limited availability (Farr 2006). The first question we may ask is who collects this type of data?

One of the institutions that functions best during wartime is the military. They often collect wartime casualty figures, which primarily include the “direct effects of combat and combat-related exposures on combatants and less frequently on civilians” (Hynes 2004). The Iraq Body Count organization, for example, was established because the military refused to collect data on civilian casualties. One primary source of information on casualty data for the military (and other groups) is field hospitals operating in or near conflict zones. Hynes (2004) claims that this often leads to a bias towards reporting primarily injuries and deaths caused by military weapons and equipment. While the military will of course know the gender of their own personnel killed in combat, the gender of combatants and civilians they kill in return is not always reported (at least not openly).

In addition to the military, relief agencies often undertake their own investigations where they are present. In these medical and humanitarian communities, gender disaggregated information is routinely collected. Common forms of data gathering include surveys (where a selection of the target population is measured, and the results are estimated for the whole target population afterwards) and surveillance (usually meaning the active detection of all cases as they occur). These are information-intensive forms of data gathering, and common e.g. in refugee camp settings. The problem is that such data is usually only available for a small proportion of the whole population affected by conflict, and it is not always clear how representative this proportion is of the whole population of a country. In addition, it can be

difficult to establish a proper baseline in conflict settings since acute emergencies often are superimposed on populations enduring more chronic crises (Chechhi and Roberts 2005). We will touch upon some of these discussions in the next section. A lack of basic infrastructure may also explain why data availability in conflict or post-conflict environments is rather poor if at all existent. This is particularly problematic from a gender perspective since men and women are thought to die disproportionately in conflict versus post-conflict settings.

Of equal concern is the fact that where reasonably good access does exist, resources for data collection are often allocated too late, and relief agencies do not always know exactly what kind of data is needed (Chechhi and Roberts 2005). According to the two authors, failure to collect casualty data and causes of death can also be attributed to the sub-division of health sector responsibilities between several agencies and a wish by belligerents or donor nations not to make the available data public.

A special case of data collection is where graves have been exhumed in order to count the number of war victims or establish their identity. Such processes have been used e.g. after conflicts in former Yugoslavia and Rwanda by the International Criminal Tribunals in those countries respectively (Juhl 2005). Under such circumstances it is usually customary to establish the gender of the victims (Brunborg 2003). However, this method is only useful for studies of very localized conflicts.

We thus have a situation with much gender disaggregated information available from localized survey and surveillance data gathering (in addition to exhumation). The problem is how this information should be aggregated up on a higher level. On the other hand there are very few global mortality datasets that contain information on the gender of the victims. The data that have been used in the research which we present later have most often been collected with other purposes in mind. Some datasets do not contain specific information related to conflict casualties (e.g. the dataset on life expectancy used by Plümper and Neumayer). Where casualties are attributed specifically to conflict it has usually been reported by the governments themselves (we believe this to be the case with the WHO data) which may in itself be problematic. We thus have very specific gender disaggregated information from some local areas, but we lack the overall picture.

3) Methodological Considerations.

It is common to distinguish between *direct and indirect effects* on populations in war-affected countries. This is particularly interesting in our case, since the evidence points towards different direct and indirect effects for men and for women. However, while this distinction makes sense intuitively, it is very difficult to determine where to draw the line in reality. One of the first datasets developed to document the number of *battle deaths worldwide* (i.e. a measure of direct deaths) for a larger time period was created by Lacina and Gleditsch, in 2005. The authors discuss how difficult it is to separate out the deaths sustained in battle from those sustained in other situations because of the war, as illustrated in the figure below:

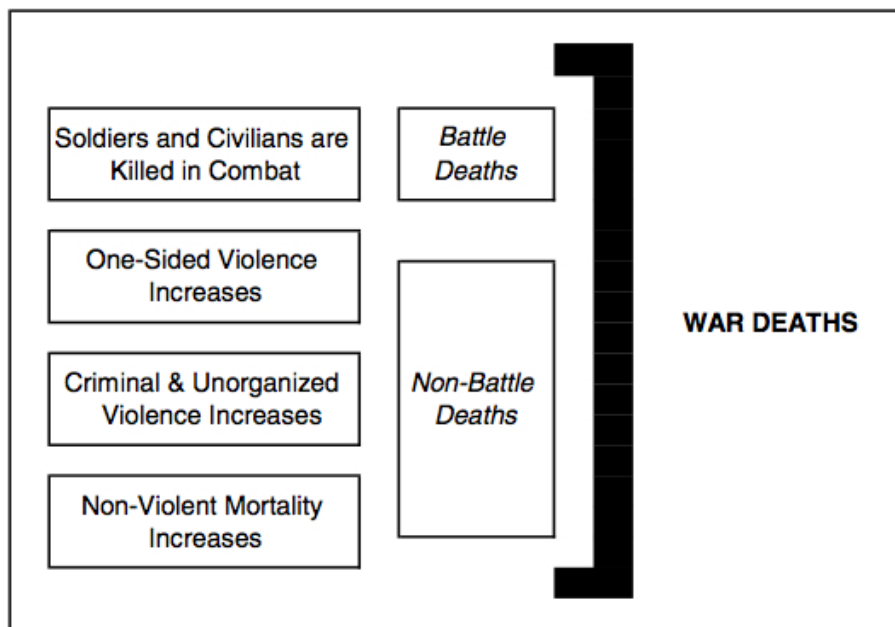


Figure 1: Sources of war deaths (Lacina and Gleditsch 2005).

For a thorough discussion of the methodology employed, see Lacina and Gleditsch 2005. The dataset has recently been updated, and it now covers all wars worldwide between 1946-2008. The sources that this dataset builds on do not present gender disaggregated information, so as a consequence that information is not available in the dataset. We include these data here merely as a way of introducing the distinction between battle-deaths and non-battle deaths and looking at the overall trends of war deaths. If we concentrate on the number of battle deaths presented in these data, there is a relatively clear downward trend in

the period after the cold war. This was a main point presented in the first Human Security Report in 2005. The downward trend in violent war deaths has later been disputed by other authors (Obermeyer, Muray and Gakidou 2008) who collected survey data from 13 conflict countries. They do however look at a different time period, and it does seem a little premature to extrapolate results to the global level from only 13 conflicts, and Spagat, Mack, Cooper and Kreutz counter the critique by Obermeyer et al in an article forthcoming in *Journal of Conflict Resolution* later in 2009.

A new Human Security Report is about to be issued, with a focus on health consequences of conflict and indirect deaths, but the previous Human Security Report from 2005 presented a preliminary comparison between estimated battle deaths and ‘total war deaths’ (also including indirect or excess deaths) for nine selected major armed conflicts in Sub-Saharan Africa:

Figure 2 Battle-deaths versus total war deaths in selected sub-Saharan African conflicts

Country	Years	Estimates of total war deaths	Battle-deaths	Battle-deaths as a percentage of total war deaths
Sudan (Anya Nya rebellion)	1963–73	250,000–750,000	20,000	3–8%
Nigeria (Biafra rebellion)	1967–70	500,000–2 million	75,000	4–15%
Angola	1975–2002	1.5 million	160,475	11%
Ethiopia (not inc. Eritrean insurgency)	1976–91	1–2 million	16,000	<2%
Mozambique	1976–92	500,000–1 million	145,400	15–29%
Somalia	1981–96	250,000–350,000 (to mid-1990s)	66,750	19–27%
Sudan	1983–2002	2 million	55,000	3%
Liberia	1989–96	150,000–200,000	23,500	12–16%
Democratic Republic of the Congo	1998–2001	2.5 million	145,000	6%

The indirect impact of war in sub-Saharan Africa is revealed by the comparison of battle-deaths with estimates of war deaths from all causes—primarily disease and malnutrition.

Source: Lacina and Gleditsch, 2004.

As is evident in the table above, the battle-related deaths accounted for a very varying proportion of the total deaths, from less than 2 % in Ethiopia 1976-91 up to possibly 29 % in Mozambique 1976-1902. It is therefore not straightforward to extrapolate these figures to other countries, even within the same region. What appears evident in all these cases however is that the battle deaths only account for a certain proportion of the total number of deaths, and that by missing out these other or indirect deaths we are nowhere near accounting for the full mortality.

The Uppsala Data Conflict Program has recently started to collect global data on deaths in non-state conflict (i.e. where none of the parties is a government) and on attacks on civilians, so-called one-sided violence. These data cover a much shorter period and it is perhaps premature to say what the trends are, but the number of these deaths are probably also going down (Human Security Briefs in 2006 and 2007). These data are not disaggregated by gender either but will provide a fuller picture of conflict mortality than only data from state-based conflicts, and are a valuable contribution to research on conflict mortality in general.

An additional complicating factor is that refugees, internally displaced persons and resident populations may not face similar consequences during conflicts. The Centre for Research on the Epidemiology of Disasters (CRED) has gathered extensive survey data on the mortality and nutritional status of populations during conflicts. Preliminary analyses of these data suggest that populations that flee and those who stay fare differently in conflict times, but the picture is complicated. Many of the available surveys do not report properly how the selection criteria were employed, and since some conflict areas are covered by many surveys and other areas not at all it is difficult to assess the full consequences of even one conflict. Guha-Sapir and van Panhuis (2002), reviewing several of the available mortality and morbidity surveys, concluded that much more was known about refugee camp populations than about internally displaced and resident populations. Since these populations make up a substantial part of all conflict afflicted people, further studies should aim at closing this knowledge gap (Guha-Sapir and van Panhuis 2002).

Some of the confusion and discussion seen in later years concerning estimates of conflict deaths comes from a lack of distinction between direct and indirect deaths, and other discussions stem from use of survey methodology and cluster sampling and use of baseline mortality. Readers may be familiar with the debate surrounding the high estimate of violent deaths in Iraq following the American invasion in 2003. Some authors estimated through cluster surveys that a total of 601 000 deaths were due to violence in the period from 2003 to 2006 (Burnham et al 2006). This was much higher than the estimates from e.g. the Iraq Body Count (based mainly on information from news sources) and a following study by the Iraqi Family Health Survey Study Group. The last source, also using a cluster survey, arrived at an estimate of 151 000 violent deaths for the same period (Alkhuzai et al 2008). A lot of criticism has been directed towards the Burnham survey later, much of it focusing on the survey selection method. A study from the Democratic Republic of Congo estimating a total of 5,4 million deaths due to the war (including indirect deaths) has also been criticized (Coghlan et al 2008). Some of that discussion has focused on the use of baseline mortality in the area (i.e. what is the normal death rate in a country where very little health information has been gathered for many years?). It is however not our intention to cover the whole debate on mortality estimation here. Readers interested in the debate concerning the Burnham study can for example look up the Alkhuzai study on the web pages of the New England Journal of Medicine (<http://content.nejm.org/cgi/content/short/358/5/484>).

4) Attempts at quantifying gender differences in conflict casualties.

We will here present a few studies that have tried to disaggregate conflict related deaths by gender. We have explored the literature but not aimed at a full literature review. The studies mostly involve different datasets, study different time periods and different conflicts. We will start by some information from the go cluster surveys described in the previous section, and then go through other selected studies in turn before we discuss briefly the conclusions that can be drawn.

Cluster surveys; Iraq Body Count

The few attempts at estimating conflict mortality for a whole country through the use of cluster surveys have been debated, as we described briefly above. However this does not

mean that we cannot derive some information from them. For our purposes, a few things are worth noticing: Alkhuzai et al estimate that deaths due to injuries of armed conflict in Iraq are most common amongst men age 15-59, becoming the most frequent cause of death in that age group after the invasion. The Iraq Body Count, which relies mostly on information from news sources, also presents some gender disaggregated information where it is available. In a dossier they reported that out of the 24 965 civilian casualties they had counted by 19 March 2005 they knew the gender of 13 811; 82 per cent of which were adult males (Iraq Body Count 2005). Obermeyer et al also report a much higher rate of violent war deaths amongst men in the 13 countries they have survey data from (Obermeyer et al 2008). Lastly, in the survey from DRC the deaths due to violence were also most common amongst men (Coghlan et al 2008). Interestingly, this study which unlike the others also takes into account indirect deaths after the war, appears to indicate that more men than women die overall (ibid). This result is in contrast to some of the other studies we will present below. It appears to be difficult to say whether more men or women die from conflict conditions overall.

Direct war deaths - Reza, Mercy and Krug 2001

Reza, Mercy and Krug performed a study of direct war deaths using data from 1990 from The Global Burden of Disease series and the US National Center for Health Statistics. The definition of war deaths was taken from the first volume of The Global Burden of Disease series, and they were defined as ‘fatal injuries to military personal and civilians caused by war and civil insurrections and occurring during the time of war and insurrection’ (Reza, Mercy and Krug 2001: 105).

An estimated 211 000 females were killed as a result of war in 1990, compared with 291 000 males. The male to female ratio of war related death rates in the world was thus 1.3 that year, and this ratio varied from 1.3 up to 1.5 did not vary very much across the regions which experienced war: 1.3 in Formerly Socialist Economies of Europe; 1.5 in China, other Asia and islands; 1.4 in sub-Saharan Africa; 1.5 in Latin America and the Caribbean; and 1.3 in the Middle Eastern crescent (Reza, Mercy and Krug 2001: 107).

The highest death rates for females were found among 0-4 year olds, with 16.2 deaths per 100 000. The very highest rates for children were in sub-Saharan Africa (57.5 per 100,000). By contrast the highest death rates for males were found in the group of 15-29 year olds,

with a world average of 16.7 per 100 000. The highest rates for males in this age group were again found in sub-Saharan Africa (97.0 per 100 000). However, all age groups compared, both sexes experienced the largest increases in the war related death rates for the 0-4 year olds, the 15-29 year olds and the 60-69 year olds (all figures from Reza, Mercy and Krug 2001: 107). The authors underlined that these data were from 1990 only, and that the patterns observed for the gender ratio and death rates for different age groups might well be different in other years.

Armed Conflict as a Public Health Problem – Murray et al 2002

Another study that used deaths directly caused by conflict was done by Murray, King, Lopez, Tomijima and Krug, who cited WHO data used in the World Health Report 2001 to highlight the public health impacts of armed conflict. The data were from 2000, and that year it was reported that 310 000 deaths were directly caused by conflict. Since these data are from another source it is not immediately clear whether they are directly comparable to the data used by Reza et al., however the decline in total from 510 000 in 1990 to a reported 310 000 in 2000 corresponds to the downward trend in war deaths also reported by Lacina and Gleditsch in that same period. Breaking the numbers down by age and sex, male conflict mortality was found to be substantively larger than female conflict mortality for all age groups, with female mortality accounting for about a quarter of all such deaths (Murray et al 2001). They noted particularly the excess mortality in men between 15-44 years. The male to female death ratio is thus very different from the one reported by Reza et al, and it might be due to use of different data sources (or the ratios could vary much from year to year). It is difficult to compare the death rates found in different age groups since they are grouped so differently. Murray et al also reported on disability due to armed conflict, since in addition to lives lost, armed conflicts cause substantial non-fatal injuries. The authors noted that WHO estimated that a total of 0.70% of the global burden of disease in the year 2000 was due to conflict, including years of life lost and years of life lived with disability. The study concluded that the ratio of years of life lost due to premature mortality caused by conflict to years lived with disability from conflict was 4.75. In other words, every 4.75 years of life lost due to direct armed violence costs a year of life with disability due to conflict. That burden was distributed across regions in proportion to the amount of direct conflict deaths (Murray et al.

2002). The disability figures were not broken down by sex, and the limited data available meant that the authors were not able to include an estimate of indirect mortality from conflict (all figures from Murray et al. 2002).

Lingering Effects of Armed Conflict on Adult Mortality – Li and Wen 2005

This article examined effects of armed conflict on mortality for the population aged 15-64, broken down by sex. In contrast with the previously cited authors Li and Wen used WHO mortality data covering the years 1961 to 1998, which allowed them to study both immediate and long term effects. They investigated different patterns according to conflict type and intensity. Briefly, they found that the immediate effects of conflict were higher for men than for women. The immediate effect of a conflict was typically to elevate the male mortality rate by 19% and the female mortality rate by 14% (Li and Wen 2005: 481). Civil wars had a larger immediate effect on both women and men than conflict between states. When the results were inspected for conflict intensity, it was found that only severe conflicts increase the adult mortality rate immediately, whereas the short term effects for minor conflicts then became insignificant (Li and Wen 2005: 486). Severe conflicts increased male mortality both in the short and long term, whereas the effects for women accrued rather in the long term. This lends support to the idea that men are more often involved in fighting whereas the majority of women will be affected by the conflicts in less direct ways. Since they found such a difference between smaller and larger conflicts, the authors ended their article by asking the international community to do its best to stop conflicts from escalating, since just keeping conflicts on a smaller scale will save many lives.

Indirect deaths and disability – Ghobarah, Huth and Russett 2003

The importance of factoring in the whole conflict cycle and also include indirect deaths and disability was emphasized in a study which contended that civil wars kill and maim people long after the conflict is officially over (Ghobarah, Huth and Russett 2003). Using a cross-national analysis of 1999 WHO data on death and disability, broken down by age, sex, and disease or disability, the study found substantial indirect and lasting health effects on people who had survived civil wars in the years 1991-1997. The authors estimated that the additional burden of death and disability incurred in 1999 due to indirect and lingering

effects of civil wars in the years 1991-97 was approximately equal to that incurred directly and immediately from all wars in 1999. “This impact works its way through specific diseases and conditions, and disproportionately affects women and children” (Ghobarah et al. 2003). Their results were strongest for infectious diseases and traffic accidents, and overall, the authors concluded that women and children are the most common long-term victims of civil war. These findings are in line with other studies on the subject which caution that neglect of vaccination and disease control efforts in post-conflict settings can lead to devastating epidemics and further fatalities (Checchi and Roberts 2005; Conolly et al. 2004; Hynes 2004; Murray et al. 2002).

Effect of Armed Conflict on Life Expectancy - Plümper and Neumayer 2006

In this study, armed conflict was demonstrated to have a statistically significant and adverse effect on women as measured by the decline in the ratio of female to male life expectancy (Plümper and Neumayer 2006). Normally women live longer than men in almost all societies, so a decrease in the gender gap is interpreted as suggesting that the direct and indirect consequences of conflict combined either kill more women or that the killed women are younger on average than the men killed. The authors therefore concluded that wars negatively affected women more than men when taking into account the entire conflict cycle. In researching which types of conflict have different effects, the authors found that ethnic wars were particularly damaging to women, and even more so if they occurred in ‘failed states’.

A study of Kosovo – Spiegel and Salama 2000

Lastly we present a study of one particular conflict, in Kosovo, where the authors tried to quantify the differences in mortality found in different age and gender groups. In a widely respected study on war mortality in Kosovo, Spiegel and Salama (2000) found that men were 8.9 times more likely to die from war-related trauma than women, which coincides with men being systematically targeted. In addition, they:

“... compared sex-specific rates within the age strata and found that men and women aged 0–14 years had a similar mortality rate from war-related trauma, whereas men of military age (15–49 years) and men 50 years and older were 10.8 (2.7–42.2) and 9.6 (2.4–37.6) times more likely to die of war-related trauma than were women in their respective age-groups.”

The authors used data collected during a two-stage cluster survey among the Kosovar Albanian population in Kosovo. As expected, older men and women made up the majority of deaths attributed to other causes during intense periods of conflict. “The increased vulnerability of older civilians in populations under siege has been suggested previously in the Balkans, as well as in the current conflict in Chechnya, and deserves further investigation” (Spiegel and Salama 2000).

5) Why do we expect to see gender differences in casualty figures

While the quantitative studies give us an estimate of the magnitude of deaths and disability involved, qualitative studies might be better at identifying the specific mechanisms underlying these effects. The World Health Organization 2002 World Report on Violence and Health suggested that the direct health impact of collective violence (including armed conflict) works through the channels identified below:

Examples of the direct impact of conflict on health	
Health impact	Causes
Increased mortality	Deaths due to external causes, mainly related to weapons Deaths due to infectious diseases (such as measles, poliomyelitis, tetanus and malaria) Deaths due to noncommunicable diseases, as well as deaths otherwise avoidable through medical care (including asthma, diabetes and emergency surgery)
Increased morbidity	Injuries from external causes, such as those from weapons, mutilation, anti-personnel landmines, burns and poisoning Morbidity associated with other external causes, including sexual violence Infectious diseases: — water-related (such as cholera, typhoid and dysentery due to <i>Shigella</i> spp.) — vector-borne (such as malaria and onchocerciasis) — other communicable diseases (such as tuberculosis, acute respiratory infections, HIV infection and other sexually transmitted diseases) Reproductive health: — a greater number of stillbirths and premature births, more cases of low birth weight and more delivery complications — longer-term genetic impact of exposure to chemicals and radiation Nutrition: — acute and chronic malnutrition and a variety of deficiency disorders Mental health: — anxiety — depression — post-traumatic stress disorder — suicidal behaviour
Increased disability	Physical Psychological Social

Table copied from WHO 2002: 222.

Some of the diseases in this table would lead to higher mortality later (e.g. malaria in children) but whether this should be counted as mortality due directly to conflict is not easy to say. While this table tells us a lot more than the studies mentioned before about *how* collective violence impacts health, the WHO study does not rank these consequences in

terms of importance (or sort out the gender specific impacts). An attempt at ranking the most important death causes is presented next.

Human Security Workshop, ranking of causes of death in armed conflict

As we finalize this report, the next Human Security Report will be issued in a few weeks. It will focus on conflict and health and the indirect loss of lives. As a preparation for the forthcoming report, the Human Security Center organized a workshop in 2006 on “Conflict, Health and Security” to review what is known about the extent of indirect deaths worldwide, the major diseases that cause them, and the drivers of those diseases,¹ since these alone, “or in combination with malnutrition, account for most deaths in complex emergencies” (Connolly et al. 2004). During the meeting use of different epidemiological datasets was discussed.² While the data sources recommended included the World Health Organization (WHO), the World Food Program (WFP), and the United States Agency for International Development’s (USAID) Demography and Health Survey (DHS), the latter two did not meet all the criteria sought by the report. The WHO Mortality Database comprises deaths registered in national vital registration systems, with underlying cause of death as coded by the relevant national authority. Underlying cause of death is defined as “the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury” in accordance with the rules of the International Classification of Diseases.³ The database contains number of deaths by country, year, sex, age group and cause of death, although not all countries are represented. The WHO data lists some 200 distinct causes of death per country-year. To identify which factors were related to armed conflict, a public health expert was consulted.⁴ The 200 causes of death were subsequently divided into three clusters (High, Medium and Low) with respect to the association with armed conflict. Each cluster was further sub-divided into several

¹ www.humansecuritycentre.org/index.php?option=content&task=view&id=217

² The public health experts consulted were: Dr. Debarati Guha-Sapir, Jon Pedersen, Dr. Gregg Greenough and Dr. Alexandra Mihaelovic.

³ www.who.int/whosis/mort/en/index.html

⁴ The public health expert consulted was Dr. Alexandra Mihailovic, who also participated in the Human Security Workshop referred to earlier. See www.hctp.utoronto.ca/PeopleFellowDetails.asp?pRid=30

“causes of death categories”. For example, the High cluster includes the following five categories and underlying causes of death:

1. Sanitation/Crowding/Poor living conditions due to displacement or poverty:

There is both an increased vulnerability to disease as well as increased risk of death due to inability to seek treatment for disease. This category includes the following causes of death: Typhoid fever; Other intestinal infectious diseases (especially Cholera); Tuberculosis of respiratory system; Meningococcal infection; Septicaemia; Malaria; Acute upper respiratory infection; Acute bronchitis and bronchiolitis; Pneumonia; and Meningitis.

2. Malnutrition related due to poor food supply, inability to provide own food:

There is an increased vulnerability to these diseases as well as increased risk of death from inability to treat them. This category includes: Anaemias; Avitaminoses; Kwashiorkor; Nutritional marasmus; and Other protein-calorie malnutrition.

3. Sexual Disease: There is an increased vulnerability to these diseases directly due to conflict (i.e. rape, early sexual encounters by soldiers etc.,) as well as an increased risk of death due to inability to seek care or diagnosis of disease. This category therefore includes the following causes of death: HIV; and Sexually transmitted and other infectious and parasitic diseases.

4. Obstetrical/Pregnancy Related Disease: There is a very high risk of death due to these diseases due to the inability to acquire emergency surgical care during childbirth or after the child is born. This could either be due to insecurity in the region making quick transport difficult or lack of facilities, doctors or resources due to the post or during conflict state. This category includes: hemorrhage of pregnancy and childbirth; and birth trauma.

5. **Intentional injury:** Conflict is directly responsible for a higher number of these cases as well as inability to get treated for them. This category includes the following: Suicide and self-inflicted injury; Homicide and injury purposely inflicted by other persons; Other violence; and Mental disorders.

This classification thus tries to rank the most important causes of death associated with armed conflict. In the next section we will present a report that specifically brings up how armed conflict may affect female health.

Women, War, Peace

The first Independent Expert's Assessment on the Impact of Armed Conflict on Women and Women's Role in Peace-Building has a chapter specifically on war and women's health (Rehn and Sirleaf Johnson 2001). The authors traveled to 14 different war zones, interviewing women to present a picture of what their experiences were like. For example they talked to women in a refugee camp in Liberia only hours before it was overrun by militias, they went to the DRC and they talked to women in Bosnia about their grief and sorrows. Rehn and Sirleaf Johnson argue that in addition to the effects wars have on all population segments, women face special problems in war times. They link these to vulnerability in terms of *malnutrition, reproductive health, sexual violence* and the *burden of caring for others*.

Women are particularly vulnerable to vitamin and iron deficiencies in the diet because of their physiology. Rehn and Sirleaf Johnson mention a study of Somali refugees, where up to 70 per cent of women of reproductive age were found to be anemic. Anemia is a serious or even life-threatening condition for pregnant women. Further examples were given from war-ravaged Afghanistan, where women were found to be seriously lacking in vitamin C; and from Mozambique during the conflict, where a food shortage had forced rural people to eat bitter cassava, leading to an epidemic of a type of paralysis (konzo) among women and children (Rehn and Sirleaf Johnson 2001: 38-39).

Reproductive health care in times of crisis is often very poor or non-existing. A simple thing like access to sanitary supplies for menstruation is often lacking, sometime forcing women to

stay home and young women to avoid going to school. Lack of contraception makes family planning even harder at the time when it is most needed, and also increases the risk of contracting sexually transmitted diseases – from both voluntary and forced intercourse. Pregnant women lack basic medical care and have to give birth under dire conditions. A study from Chile found that women who lived in more violent neighborhoods were more likely to experience pregnancy complications than women living in more peaceful areas, suggesting there is even an indirect effect of violence on maternal health. As has been documented lately, especially in the Democratic Republic of Congo, women are also more likely to experience sexual abuse in times of war. Among the many documented effects of sexual violence are injuries, unwanted pregnancies, sexual dysfunction and HIV/AIDS. Mental health consequences include anxiety, post-traumatic stress disorders, depression and suicide (Rehn and Sirleaf Johnson 2001: 39-41). In addition to this, women are traditionally entrusted with most of the burden of caring for others, a burden that increases heavily in times of conflict without giving them any more time or resources to carry it out. Being unable to care for others as well as themselves places additional stress on the women (Rehn and Sirleaf Johnson 2001: 43).

Nepal, World Disasters Report

Finally, a concrete example from Nepal underscores how deadly a conflict can be for women when it interferes with maternal care. In Nepal, one male member of every household was for a long time forced to join the Maoist army. “There has been severe indirect impact on girls reaching the age of giving birth, because there is now work overload on them [...],” and without her husband’s expressed permission required by Nepalese society, “it’s hard for a woman to seek healthcare, because of the travel expenses and hospital bills” (World Disasters Report, WDR 2006; see also Judy El-Bushra 2003). Access to healthcare has always been difficult in Nepal, but the conflict has made it far worse since “the reduced availability of transportation, and curfew due to the conflict have had most impact on the process of accessing services [...] to seek care” (WDR 2006). With Nepal already being one of the world’s most dangerous places to give birth, the extra toll caused by conflict can be counted in lost lives. The World Disaster Report claims that the preventable maternal death toll of 5,000-6,000 fatalities each year is equivalent to killing a woman every 90 minutes. When

armed conflict makes it even more difficult to seek care, the consequences are severe. A district health officer recalls her experience,

“When a buffalo suffers birth complications, the community runs to find a skilled attendant, because a buffalo has a high economic value – it carries luggage, it produces milk,” she says. “If a buffalo dies, they have to pay a high cost to replace it, but if a woman dies, they can find another one without cost” (WDR 2006).

A woman in Nepal is economically more dispensable than a buffalo. This example confirms the pattern we have seen elsewhere, where men are directly targeted (in this case forces to join an armed group) whereas women lose their lives more to indirect causes, in this case through the increased difficulties in reaching life-saving health care.

6) Discussion.

We have here gone through a selection of the literature focusing on gender specific consequences of war. While some progress has been made in terms of ‘seeing’ gender as an issue in relation to also female soldiers and DDR, notably with the UNSC resolutions, other consequences of war do not appear to have been studied very much. We will briefly recap and compare the findings.

Data on battle deaths indicate that the total number of people killed in combat has gone down (Lacina and Gleditsch), and we are currently waiting for the next Human Security Report that will focus on indirect deaths from conflict.

A few attempts at estimating war deaths for a whole country through the use of surveys have been debated, but we note that they all report much higher rates of violent deaths amongst men than women during the wartime. This picture is corroborated by information from the Iraq Body Count.

Reza, Murray and Krug (2001) used WHO data on direct war deaths from 1990. That year there were about 500 000 war-related deaths, and the male to female ratio was reported as 1.3 for the world overall. This contrasts with Murray et al’s study (2002) with WHO war-related data from 2000, where they found the total number of deaths to be about 310 000

and only about a quarter of those were women (suggesting a male to female ratio of 3). The decline in total deaths corresponds with the trend found by Lacina and Gleditsch, but the change in male to female ratio is staggering. If these figures are due to different definitions used by WHO and the researchers in the two studies it is not reported in a manner that makes it easy to find out, and it highlights the difficulties with comparing these numbers.

Wen and Li (2005) used WHO data from 1961 to 1998. They found that men were generally killed more often in the short and women in the long term perspective.

Ghobarah, Huth and Russett (2003) used WHO data on DALYs for 1999 and conflict data from 1991-1997. They found the indirect consequences of those previous conflicts to be as severe as the consequences of conflicts incurred in 1999, and they found that women and children were generally harder hit by the indirect health consequences (in contrast with Wen and Li who do not claim that more women die overall).

Plümper and Neumayer (2006) concluded that women were more hit by the indirect consequences than men. They tried to distinguish between different types of conflict, and found that ethnically motivated wars and wars in failed states were more severe for women. One key to explain the divergence between Ghobarah, Huth and Russett and Plümper and Neumayer on one side and Wen and Li on the other might lie in this distinction between different types of conflict. Finally, the example from Kosovo where Spiegel and Samala found men to be targeted also fits in the pattern of more direct deaths in the male population.

The Human Security Workshop identified the five major issues in conflict death and disability as being poor living conditions; malnutrition; sexual disease; pregnancy related diseases and intentional injury. Of these factors women are more vulnerable to contracting sexual diseases, apart from pregnancy related disorders that can of course only affect women. The above studies should lead us to expect that men are more often victims of the intentional injury. All in all this corresponds pretty well with Rehn and Sirleaf Johnson's findings from 2002 (where they described women as particularly vulnerable to sexual disease and sexual violence, lack of pregnancy and family planning services in addition to a special vulnerability to disease). Women's special role as caretakers are made a lot worse under poor living conditions so that finding would also serve to underpin the conclusion that men appear to be killed more often in combat, whereas women are more vulnerable to all the indirect effects of conflict.

There is thus a clear gender aspect to the following statement although it is not mentioned by the author: “indirect deaths are rarely the subject of much political attention and are often only evident in changes in mortality statistics for diseases that are already major killers in poor countries. Such shifts can only be determined by epidemiological surveys—which are too rarely undertaken. As a consequence, indirect deaths remain mostly unseen, uncounted, and unnoticed” (Mack 2005).

7) Conclusion.

Let us by way of conclusion repeat the two major findings. The first is the fact that in ongoing wars which occur most often in developing countries, men die more frequently than women in direct armed conflicts, while more women than men die in post-conflict situations of the indirect causes of war. The other finding is the fact that we in general know very little about the conflict related mortality of both women and men in contemporary wars. Both findings hamper policy planning for military and humanitarian assistance. We have no good data on the causes of death in modern wars. Are male casualties a result of deadly wounds or of the lack of medical care or of other war related diseases? What are the causes of female deaths in post-conflict situations?

“Tallying the cost of a war quickly defies straightforward accounting” (Lacina and Gleditsch 2005), which is why “considerably more research is needed on this question before the global results on the indirect effects of conflict on mortality can be assessed” (Murray et al. 2002). Based on the above literature review, it appears that the best methodologies for ascertaining a gender breakdown are the kind used in public health case studies (surveys, demographic analyses, hospital mortality estimates, etc.).

News-based sources are of limited use in computing casualty data by gender. Aside from names, which may be ambiguous and culture specific, the major indicator of gender is the pronoun. However, especially with the plural form, these are unreliable. The real problem lies with the reporting and editing. There is a mindset against “seeing” such phenomena, much less reporting it. In other words, both machine coding and human coding bring problems to the table.

Some recommend that any work done on the study of women in conflict should be of a more qualitative nature. While a contextual approach is necessary, we believe that a quantitative empirical basis for policy formulation is equally important. “International organizations, governments and local authorities must be lobbied to make the institution of such data-collection practices standard and seek out expert assistance in examining them, because recording and analyzing these figures is arguably the most important first step in challenging the indifference and denial that currently attend cases of gender-based violence” (Farr 2006). Despite this, important areas of the literature on conflict analysis still lacks a gender perspective (Thompson 2006). As Cockburn (2004) writes, “gender has a curious way of being both simultaneously present and absent in popular perception.” Clearly, this inchoate area of research requires some structure and organization in order to make maximum use of the available data—especially those disparate datasets that have been tabulated in fields other than our own. Since data collection including gender information is standard practice in the public health and humanitarian fields, we believe this data might be of more importance in determining gender differences in conflict casualties further on. But that requires more agreement on the best methodologies than there is amongst researchers at present.

Any improvement in the area of data collection would have to come as a result of international cooperation among a variety of actors of which we here name only a few such as the World Health Organization, the Center for the Study of Civil War at PRIO which collects annual battle death data, and the Uppsala Conflict Data Base (UCDP), Harvard University, the World Bank and national central bureaus of statistics, and the Human Security Report Project. Also the financing of such considerable efforts would have to come from several sources which would have to coordinate their contributions. These could be both governments and international organizations.

We would also like to end on a word of caution: our first ambition was to disaggregate global data. We have since come to the realization that collecting data on local, national and regional conflicts, as well as data on specific problems such as maternal health, infant mortality, certain diseases might be more realistic and manageable and still come up with a great deal of useful applicable information.

References

- Alkhuzai A.H. et al (Iraq Family Health Survey Study Group). Violence-Related Mortality in Iraq from 2002-2006. *New England Journal of Medicine* 2008 358: 484-93.
- Brunborg, H. *Needs for demographic and statistical expertise at the International Criminal Court*. 2003 The International Criminal Court Office of the Prosecutor.
- Burnham G., Lafta R., Doocy S., and L. Roberts. Mortality after the 2003 invasion of Iraq: a cross-sectional cluster sample survey. *Lancet* 2006 368: 1421-28
- Chechhi, F. and L. Roberts. Interpreting and Using Mortality Data in Humanitarian Emergencies. *Humanitarian Practice Network* 2005 Network Paper No. 52.
- Cockburn, C. The Continuum of Violence: A Gender Perspective on War and Peace in W. Giles and J. Hyndman (eds.), *Sites of Violence: Gender and Conflict Zones*. 2004 Berkeley, CA: University of California Press.
- Coghlan, B. et al. *Mortality in the Democratic Republic of Congo: an Ongoing Crisis*. 2008 International Rescue Committee and Burnet Institute.
- Conolly, M.A. et al. Communicable Diseases in Complex Emergencies: Impact and Challenges. *Lancet* 2004, 364: 1974-83.
- El-Bushra, J. Fused in Combat: Gender Relations and Armed Conflict. *Development in Practice* 2003, 13(2&3): 252-65.
- Farr, V. Scared Half to Death: The Gendered Impacts of Small Arms. *Contemporary Security Policy* 2006 27(1): 45-59.
- Ghobarah, H., P.H. Huth and B. Russett. Civil Wars Kill and Maim People – Long After the Shooting Stops. *American Political Science Review* 2003 97(2): 189-202.
- Guha-Sapir, D. and W.G. van Panhuis. *Armed Conflict and Public Health: a Report on Knowledge and Knowledge Gaps*. 2002 Centre for Research on the Epidemiology of Disasters.
- Human Security Report Project. *Human Security Report 2005: War and Peace in the 21st Century*. Human Security Centre, The University of British Columbia, Canada.
- Human Security Report Project. *Human Security Brief 2006*. Human Security Centre, The University of British Columbia, Canada.
- Human Security Report Project. *Human Security Brief 2007*. Human Security Report Project, Simon Fraser University, Canada.
- Hynes, P.H. On the Battlefield of Women's Bodies: An Overview of the Harm of War to Women. *Women's Studies International Forum* 2004 27: 431-45.

Iraq Body Count. *A Dossier of Civilian Casualties in Iraq 2003-2005*. 2005 Iraq Body Count in association with Oxford Research Group.

Juhl, K. *The Contribution of (Forensic) Archaeologists to Human Rights Investigations of Mass Graves*. 2005 Report No.: 5 Stavanger: Museum of Archaeology, Stavanger.

Lacina, B. and N.P. Gleditsch. Monitoring Trends in Global Combat. *European Journal of Population* 2005 21: 145-66.

Mack, A. *Notes on the Hidden Costs of War*. Summary Note from a Workshop on “Tracking Health Performance and Humanitarian Outcomes,” 1-2 December 2005 World Health Organization (WHO), Geneva, Switzerland.

Murray, C.J.L, G. King, A.D. Lopez, N. Tomijima and E.G. Krug. Armed Conflict as a Public Health Problem. *British Medical Journal* 2002 239: 346-49.

Obermeyer, Z., Murray, C. J L, and E. Gakidou. Fifty years of violent war deaths from Vietnam to Bosnia: analysis of data from the world health survey programme. *British Medical Journal* 2008 336: 1482-86

Plümper, T. and E. Neumayer. The Unequal Burden of War: The Effect of Armed Conflict on the Gender Gap in Life Expectancy. *International Organization* 2006 60: 723-54.

Reza, A., J.A. Mercy and E.G Krug. Epidemiology of Violent Deaths in the World. *Injury Prevention* 2001 7(22): 104-11.

Spiegel, P. and P. Salama. War and Mortality in Kosovo, 1998-99: An Epidemiological Testimony. *Lancet* 2000, 355: 2204-09.

Thompson, T. Women, Gender and Conflict: Making the Connections. *Development in Practice* 2006 16(3): 342-53.

WHO. *World Health Report 2001*. Geneva: World Health Organization. Available at: www.who.int/whr/2001/en

WHO. “Collective Violence” in *World Report on Violence and Health*. 2002 Geneva: World Health Organization. Available at: www.who.int/violence_injury_prevention/violence/world_report/en/

World Disaster Report 2006. Focus on Neglected Crises. International Federation of the Red Cross and Red Crescent Societies, Geneva, Switzerland.



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