

**NATURAL DISASTERS, GENDER AND HEALTH:
MAXIMIZING THE ROLE OF WOMEN IN DISASTER RESPONSE AND RECOVERY**

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This paper explores the intersection between public health and disaster from a gendered angle. The health of women and men is affected differently during disasters due to factors which intensify individual, social and economic vulnerabilities. As illustrated by the 2004 Indian Ocean tsunami's impact on Sri Lanka and Indonesia, the resulting humanitarian response as well as specific NGO programming, women are essential to the improvement of health outcomes for themselves and their communities in the aftermath of disaster. Public health and disaster response systems should be strengthened by adopting a gendered perspective and incorporating nutritional interventions within existing programming, such as by designing sensitive health and hygiene kits and organizing their distribution by female community health workers. Targeted attention to nutrition would enhance effectiveness and transferability from disaster to development, thereby improving health and achieving lasting change for disaster-affected lives. There is a pressing need for public health and development professionals to explore realistic, innovative and sustainable solutions to the conundrums that characterize natural disasters; women play a critical role in improving disaster response systems and subsequent health outcomes of individuals, families and communities. Gender-sensitive disaster response and recovery activities containing a nutritional component will comprehensively improve health outcomes and are of vital public health significance.

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PREFACE

The Indian Ocean tsunami of 2004 was a major turning point in my life. Following the disaster I spent several months in Southeast Asia and Sri Lanka, and the things I encountered there – both good and bad – led me to pursue graduate work in public health and international development. This thesis was born from my academic and personal experiences. It represents a fusion of several ideas and themes, and strives to connect theory with practice. Additionally, it aims to provide a link between current and future strategies for disaster response and recovery.

This work owes much to the support and encouragement of several people in my life. Many thanks to my thesis advisory committee: Dr. Terry, whose patience and sage advice saw me through not only my thesis, but my entire graduate academic career; Dr. Stebbins, whose expertise and kind yet brilliant criticism made all the difference; and Dr. Themudo, whose unparalleled support saw me through some significant challenges over the past three years. A million thanks to my friends near and far: Dr. Robbie Ali, a friend, mentor and constant inspiration; Johnny Lee Park, Chetna Nuni, and Jun “Waterboy” Watanabe for their wisdom, compassion and inspiration throughout my tsunami experiences; and Ashish Gupta for his steadfast support and friendship. Last, but not least, this work is dedicated to a friend and personal hero, Scott Neeson, whose work with vulnerable populations in Cambodia inspires me on a daily basis.

Finally, I am grateful to my family. Thank you to my parents, Chris and Diane Martin, for raising me to be compassionate, believing in me permanently, and for always encouraging me to deviate from my comfort zone and challenge myself; to my brother and sister-in-law, Colin and Jen Martin, for their constant love and humor; and to my parents-in-law, John and Maggie Wood for providing unparalleled support, especially Maggie, without whose help I would likely perish under the strains of motherhood and graduate school. And to my husband, Andy, and our son, Phineas: no words will ever suffice to convey my love and gratitude to you both.

ACRONYMS AND ABBREVIATIONS

ALNAP: Active Learning Network for Accountability and Performance in Humanitarian Assistance

APWLD: Asia Pacific Forum on Women, Law and Development

CDC: Centers for Disease Control and Prevention

CFW: Cash-For-Work

CHW: Community Health Worker

CMR: Crude Mortality Rate

COHI: Circle of Health International

GBV: Gender-Based Violence

GDN: Gender and Disaster Network

GRIP: Global Risk Identification Program

HAP: Humanitarian Accountability Project

HEB: High-Energy Biscuit

HKI: Helen Keller International

IFRC: International Federation of Red Cross and Red Crescent Societies

ILO: International Labor Organization

IOM: Institute of Medicine

IRIN: Integrated Regional Information Networks

MDG: Millennium Development Goal

MISP: Minimum Initial Service Package (for reproductive health)

NGO: Non-Governmental Organization

PTSD: Post-Traumatic Stress Disorder

PAHO: Pan American Health Organization

RHRC: Reproductive Health Response in Conflict Consortium

RUF: Ready-to-Use Food

SEARO: Regional Office for South-East Asia (WHO)

TEC: Tsunami Evaluation Coalition

UN: United Nations

UNDP: United Nations Development Programme

UNFPA: United Nations Population Fund

UNICEF: United Nations Children's Fund

UN-OCHA: United Nations Office for the Coordination of Humanitarian Affairs

WB: World Bank

WFP: World Food Programme

WHO: World Health Organization

1.0 INTRODUCTION

Human beings have been subject to nature's wrath since the beginning of time. Our earliest written documents recount natural disasters – storms, floods, earthquakes, hurricanes, tornadoes, fires, volcanoes, tsunamis, drought, famine, and landslides – and remind us that despite our evolving nature as humans, we remain a most vulnerable species.

Disasters present a growing public health and development challenge for the 21st century. In the past few decades, the world has seen an increase in the recorded number of disasters, especially in developing countries (WHO 2007; EMDAT 2009). Natural disasters have a tremendous impact on vulnerable populations by dislocating families and disrupting communities, causing injury and death, and displacing people from their homes (Carballo, Heal et al. 2005). The impacts of disasters differ from one context to the next, as do the needs of specific populations and, as a result, subsequent disaster response efforts. Moreover, attention to gender is often limited and must be addressed (Oxfam 2005).

Men and women have different health needs. Their exposures to situations that affect health and access to health care differ accordingly. They also have differential power to influence decisions regarding the provision of health services (Palmer and Zwi 1998). For women, the right to health and well-being is crucial to their psychological, reproductive, and nutritional welfare, and is often severely impacted during crises. Furthermore, the health and well-being of women is a crucial determinant of outcome and resilience. The role of women in

pre-disaster planning and post-disaster response is imperative to the provision of effective, efficient, and sensitive health care to affected populations.

When the Indonesian earthquake of December 26, 2004, triggered a massive tsunami, women were disproportionately affected, and many of their needs were overlooked in the immediate response and the longer-term recovery. The crisis required governments, multi-lateral agencies, civil society and non-governmental organizations (NGOs) to respond on an unprecedented scale (WHO 2010). Post-disaster response and recovery activities became a serious challenge of logistics, coordination, communication, and collaboration amongst all parties, including the vulnerable groups whose welfare was at stake. Targeted strategies and interventions should have been foremost in dealing with specific populations, particularly women.

Women's health outcomes are at the root of many if not most of the issues within the larger population, including children, families and communities. Attention to factors that influence health outcomes consequently improves program efficiency, coverage, and equity (WHO 2007). Therefore, by integrating gender perspectives into all stages of disaster response, public health and development professionals are forced to consider gender differences and respond appropriately.

This paper explores the intersection between public health and natural disaster from a gendered perspective and highlights the importance of a gender-sensitive approach to achieving the goals of disaster response and recovery efforts. Chapter Two presents a general overview of natural disasters and introduces the tsunami as the primary case for illustration throughout the paper. Chapter Three describes the methodology behind the literature search and includes search

terms as well as inclusion and exclusion criteria, followed by a set of several general definitions of terms and concepts used throughout the paper.

Chapter Four provides a synthesis of literature, beginning with a description of how disasters vary depending from one context to the next, how needs of populations differ between these contexts, how disaster management varies accordingly, and how resulting attention to gender is often inadequate. The next section describes the population of focus, women, followed by an extensive review of how factors increasing women's vulnerability function within a larger physiological, socio-cultural, and economic scope. This is followed by a brief exploration of the far-reaching implications of women's health in the larger context.

Chapter Five narrows the focus from natural disasters and women in general to the Indian Ocean tsunami's impact on Sri Lanka and Indonesia and, subsequently, the women of these tsunami-affected communities. The next section, Chapter Six, describes the complex challenges faced by the humanitarian sector and examines three strategies employed at different levels to incorporate gender into disaster response. Chapter Seven, the discussion, questions the effectiveness of current "gender-sensitive" approaches to disaster management and argues for ways to improve existing strategies through the foundations of good health: proper diet and culturally-sensitive health care. Micronutrients interventions are discussed and recommended for incorporation into existing women's health programs.

With the aforementioned increase in natural disasters and their resulting complexities, health and development professionals must generate new ideas and explore innovative and lasting solutions. This paper pays special attention to the situation of women in order to enhance effectiveness of disaster and development activities while ultimately improving gender equity and health outcomes for women and their communities.

2.0 BACKGROUND

Over the past few decades, the world has seen an increase in the recorded number of disasters, especially in low- and middle-income countries where disaster preparedness is often inadequate (see Figure 1) (WHO 2007; EMDAT 2009). According to the World Health Organization (WHO), approximately two billion people were affected by disasters during the 1990s, with nearly 600,000 fatalities. And while the number of reported fatalities as a result of natural disaster has declined, the number of people affected has increased exponentially (see Figure 2). In 1999, a third of the world's six billion people were affected by natural disasters, almost 14 million were living as refugees and 20 million people were displaced within their own countries, largely due to conflict (WHO 2010). More than 86 percent of the lives lost to disaster during this period were due to natural events, of which windstorms claimed the largest percentage of lives (35%) and floods accounted for the largest percentage of people affected (75%) (WHO 2002).

WHO estimates that people in low-income countries are four times more likely to die from extreme natural events than those in high-income countries; furthermore, during the 1990s, more than two-thirds of the deaths from disasters occurred in Asia, which was also the continent most frequently hit by disasters (WHO 2010). From another perspective, according to World Bank (WB) data, developing countries account for 95 percent of all deaths caused by disasters and endure losses that are 20 times greater (as a percent of gross domestic product) than those of

industrial countries experiencing similar events (Yonder, Akcar et al. 2005). Indeed, disasters are a growing public health and development challenge for the 21st century.

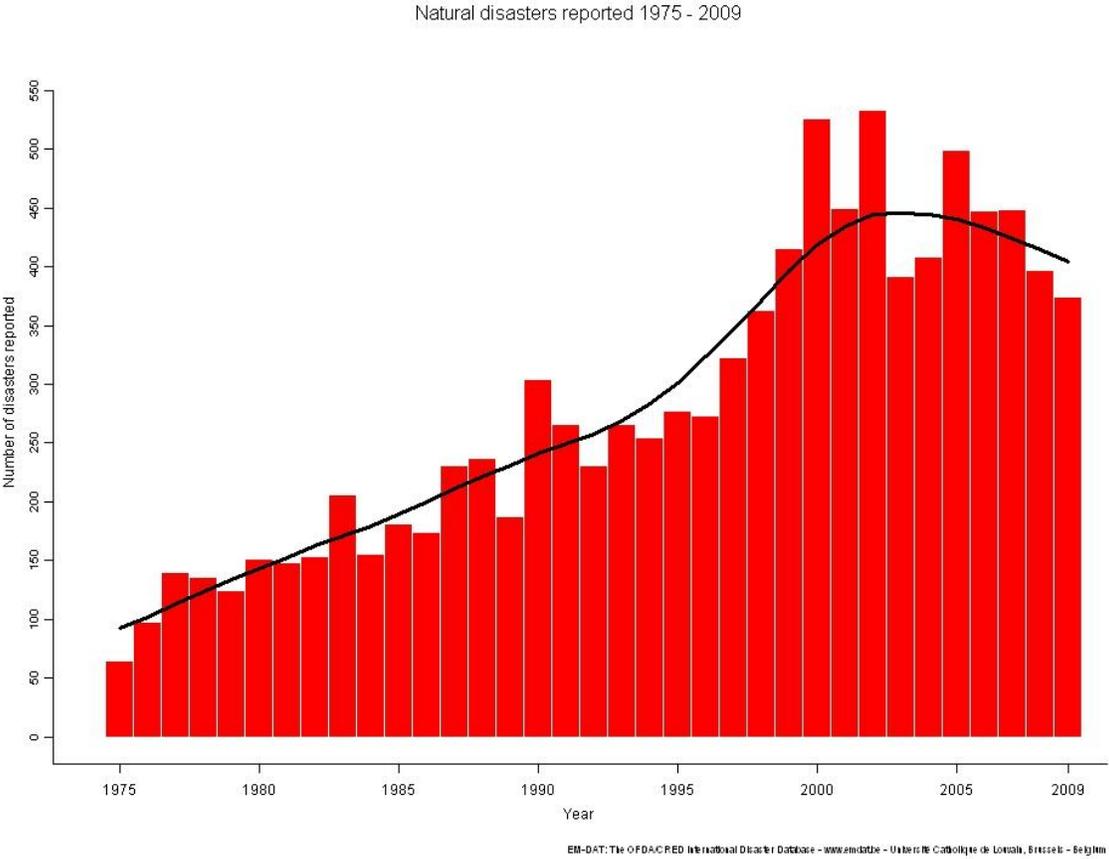


Figure 1. Increasing trend of natural disasters, 1975-2009
(EMDAT 2009)

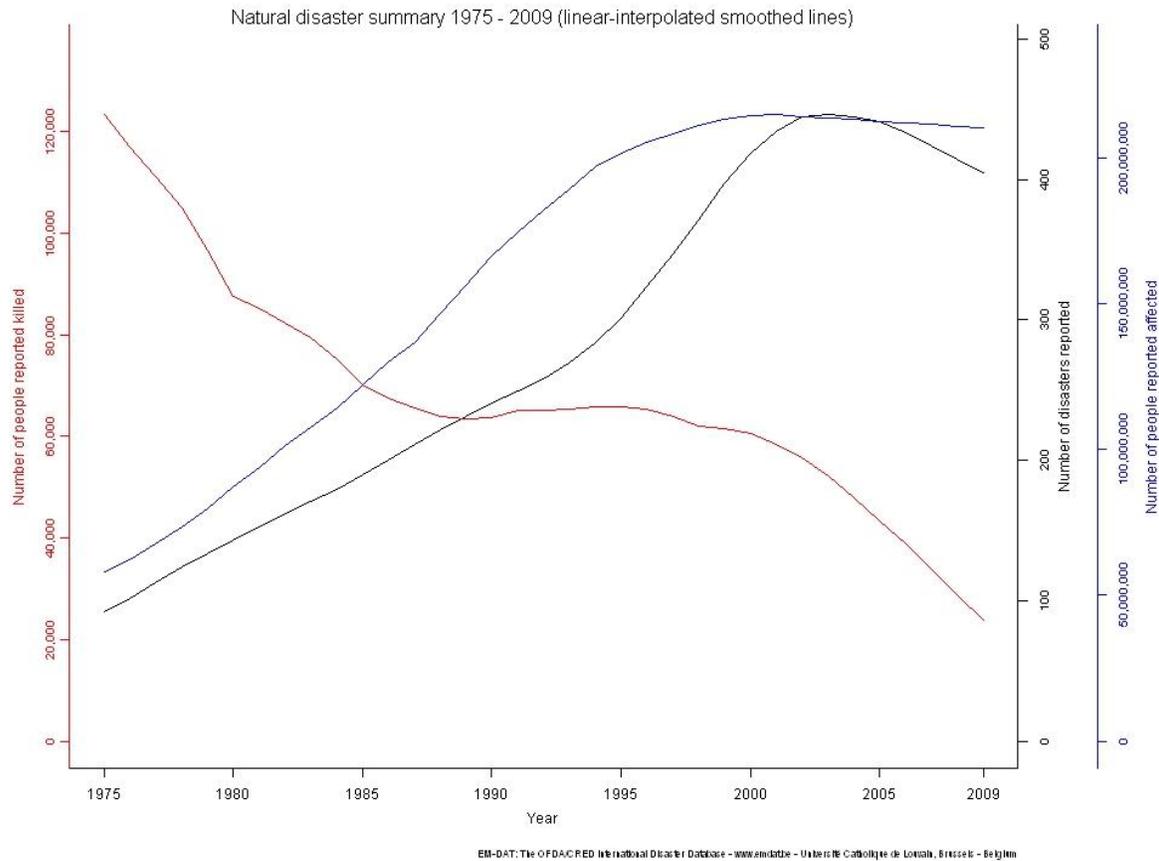


Figure 2. A summary of natural disaster, 1975-2009
(EMDAT 2009)

Consider just a handful of natural disasters from the past decade (2000-2010), which include the Indian Ocean tsunami (2004), the Kashmir earthquake (2005), Hurricanes Katrina and Rita (2005), the Sichuan earthquake (2008), Cyclone Nargis (2008), the Pakistan floods (2010), and the recent earthquakes in Haiti and Chile (2010). These disasters occurred in different places and among different populations. Each disaster differs according to pre-existing structures and social conditions (Oxfam 2005); the differences in context indicate a lack of generalizability about the needs of a population and subsequent response efforts. However, they

share a common factor: during and afterwards, women and children suffer most (Chew and Ramdas 2005).

On December 26, 2004, an earthquake measuring 9.0 on the Richter scale off the western coast of northern Sumatra triggered an intensely destructive tsunami which affected 12 countries (see Figure 3) and took roughly 200,000 lives (UN 2008). Hundreds of thousands of individuals were displaced, and over three million were affected, half of whom lost their sources of livelihood. Economic losses were estimated to range between USD 10 billion (WB 2005) to USD 13.5 billion (Batha and Irwin 2006). The tsunami had the greatest impact on rural coastal communities, many of which were already poor and vulnerable and had limited livelihood options. The hardest hit and most severely affected countries were India, Indonesia, Maldives, Sri Lanka, and Thailand. Malaysia, Myanmar, Seychelles, Somalia, and the United Republic of Tanzania were also affected (UN 2008). The crisis required governments, civil society, humanitarian actors (including non-governmental organizations and donors) and the United Nations (UN) to respond on a scale that had never been seen before (WHO 2010).



Figure 3. Map of countries affected by the 2004 Indian Ocean Tsunami

(Caruso 2005)

Natural disasters increase vulnerability by dislocating families and disrupting communities, causing injury and death, and displacing people from their homes (Carballo, Heal et al. 2005). Natural disasters have a tremendous impact on populations living in precarious conditions, making them more vulnerable than others in the pre-disaster phase and at a greater risk during disasters. Such conditions include geographically precarious settings such as coastal or low-lying areas, tropical climates prone to violent storms, and environmentally unstable areas such as those along fault lines. Furthermore, the poor comprise society's most vulnerable, a

population which typically resides in ill-constructed homes in areas at risk for landslides, floods, or other natural disasters (Carballo, Heal et al. 2005; Oxfam 2009). The poverty of certain communities also means that access to good quality care is always in a precarious state and is often reflected by high maternal and infant mortality rates (Carballo, Hernandez et al. 2005). These pre-disaster conditions put vulnerable people, including women, at further risk when extreme environmental situations transpire. Women's vulnerability to disasters is due to and increased by their dependency on others within the family, their restricted mobility, and their lack of access to external or public information, as well as from engaging in socio-economic roles outside the household (Nowak and Caulfield 2008). It is important to remember that when any one group is at risk, it is likely that others will also be threatened (Sphere Project 2004). Therefore, a public health imperative in disaster management is to understand vulnerable social groups, why they are at risk, and their capacity for survival and recovery in order to fully and effectively respond to their needs (Carballo, Hernandez et al. 2005; WHO 2005).

The task facing the international community as it attempts to provide relief is extraordinary. Natural disasters vary in origin, suddenness, scope and predictability, and short- and long-term needs vary significantly as a result (Yonder, Akcar et al. 2005). Typical short-term public health needs include water, sanitation, food, shelter, and appropriate medical care (VanRooyen and Leaning 2005). Long-term public health needs extend beyond the immediate situation and require innovative solutions to link relief activities to sustainable development activities. Post-disaster response and recovery activities represent a dynamic challenge of logistics and coordination; it is therefore crucial that relief organizations cooperate, communicate, and collaborate with local governments and communities, as well as with vulnerable groups (VanRooyen and Leaning 2005).

3.0 METHODOLOGY

My research entails a compilation of general knowledge of public health and disaster response from a gendered angle. I did this primarily to identify and examine the ways by which women's health outcomes are impacted by disaster. I conducted an extensive literature search and review related to women and disasters, particularly with regard to health, in order to analyze and identify problems and best practices in the field.

My initial research began as a quest to determine how communities are affected by disaster, what their needs are, how governments and organizations in the field respond, and what kinds of issues need to be improved. Due to the broad and ambitious nature of this quest, I quickly realized the importance of concentrating my efforts. In response, I narrowed the population of focus to children, but their vulnerabilities and health outcomes kept coming back to women: women's health outcomes are at the root of so many problems within the larger population, including children, families, and communities. All research consistently establishes that women play a pivotal role in both disaster and development. For this reason, my focus shifted to include women and their role in improving health outcomes for themselves as well as their communities in the aftermath of a natural disaster.

In keeping with my fields of health and development, I excluded high-income countries from my literature search. I also reduced my focus from disasters in general, which include complex humanitarian emergencies such as the ongoing crisis in Darfur, to natural disasters.

Natural disasters present a growing challenge to health and development activities. Since each natural disaster varies significantly according to context, I further whittled my focus to the 2004 Indian Ocean tsunami and later to specific locations within that context. My original cases for illustration were Sri Lanka, Indonesia and Thailand. Thailand would have been an ideal context to contrast with the others, as the difference in demographics of the affected population, governance, infrastructure, aid, and disaster management made Thailand a unique case. However, from a gender standpoint, there were not enough data for comparison, so Thailand was omitted. Continual narrowing of scope and detail of subsequent literature searches is reflected by my literature review.

As mentioned, the data collection process took place as a literature search. I compiled information from international NGOs, government publications, databases, and periodicals, and employed the following search engines: PubMed, Google, Google Scholar, and the University of Pittsburgh's library databases, PittCat and Health and Sciences Library Services (HSLs). Search terms used for early searches were gender, health, disaster, women, tsunami, public health, disaster response, disaster management, humanitarian, emergency, and a combination of these keywords, including 'gender and disaster,' 'health and disaster,' 'disaster and response,' 'women and disaster,' 'women and disaster and emergency,' 'women's health and tsunami,' 'women's health and natural disaster,' 'public health and tsunami.'

The most relevant literature searches resulted from Google and Google Scholar and contained "tsunami + women + health" and produced 20,500 results. Of these results, I focused on the most recent publications to determine current issues plaguing disaster response and recovery, as well as subsequent strategies employed in the field. PittCat searches yielded several books; however, because of the relatively dated nature of these results, I excluded most books

and relied almost exclusively on recent digital publications such as reports and journal articles. PubMed primarily yielded literature on the subject of mental health, which was not my focus; however, due to the importance of mental health in female survivors of the tsunami, I decided to keep the theme in mind as I continued my search of the literature.

Other key resources for data were websites containing recent and relevant reports and publications relating to work being done in the field, best practices, and lessons learned. These include ReliefWeb, WHO, UN, the Gender Disaster Network, the Tsunami Learning Project, the Sphere Project, SEARO, and BRIDGE. Throughout my review, I was directed to additional resources by sifting through references of the most useful and relevant publications, as well as by persistent navigation through links to resources and publications via websites. For example, I sifted through the list of links to WHO resources and non-WHO resources at the conclusion of the “Southeast Asia earthquake and tsunamis” page, within the “Health action in crises” page of the WHO website, which yielded another wave of results.

A major difference between early literature searches and subsequent ones was the criteria by which I decided to include and exclude information. For example, ‘family and community’ were later added to existing search term combinations in order to gain a better perspective of the larger context, the role of women and effects of women’s health, on the community at large. This was done in part to examine how women can be part of the solution. For this reason, my search extended to include ‘livelihoods,’ ‘coping’ and ‘resilience. Another set of terms that came up frequently in the later searches was ‘nutrition and natural disaster,’ ‘nutrition and tsunami,’ ‘micronutrients interventions in disaster,’ ‘disaster relief and micronutrients,’ and ‘Sprinkles.’ While I focused mainly on Indonesia, Sri Lanka and Thailand, I sought all tsunami-relevant literature; these three countries were added as terms to existing searches throughout the

review. As noted before, in the later stages of composition I opted to omit Thailand from the paper.

Finally, I think it is noteworthy to mention my strategy for putting myself “back” in Asia following the tsunami. Throughout the literature search, and again several times during my discussion, I created proximity by returning to my journal where I had documented my relief experiences following the tsunami in great detail. I revisited the travelogues and photos I posted in an online blog during my adventures in Southeast Asia and Sri Lanka from December 2004 through April of 2005. I perused media stories and images of the tsunami disaster, which, while skewed to portray women as helpless victims, were nevertheless effective in igniting the passion necessary to conduct my research and write this paper. These techniques proved invaluable in creating and maintaining relevance, urgency and focus in my broad quest to discover ways in which to improve disaster relief, while specifically focusing on the health of women.

3.1 DEFINITIONS

Terms are often adapted to context, situation, and perspective, and are associated with the individual or discipline employing the term. Since none of these definitions is universal, it is important to explain how these terms will be used in this paper for the sake of both clarity and consistency.

Demographic and Epidemiologic Transitions: Changes in the pattern of disease occur in two steps. The first is a demographic transition, which is characterized by a decline in mortality from infectious disease and malnutrition. This is marked by a reduction in fertility and a decline in mortality of children under five (Merson, Black et al. 2006). The demographic

transition was once thought to be related to technologic change and industrialization; however, it is likely more directly related to female literacy and the status of women than to any other factors (Last 2001). The second is an epidemiologic transition, reflecting a change in disease pattern. With an aging population, non-infectious diseases such as cancers, diabetes and cardiovascular diseases become the main causes of poor health. Health patterns in the developing world are currently experiencing these transitions (Merson, Black et al. 2006).

Disaster: The WHO's Health Action in Crises Department website offers the following definition of disaster: "Any occurrence that causes damage, ecological disruption, loss of human life or deterioration of health and health services on a scale sufficient to warrant an extraordinary response from outside the affected community area" (WHO 2002). Disasters can be classified by cause, either natural or human-made, though to a large extent all disasters are determined by human action or lack thereof. Natural hazards comprise phenomena such as earthquakes, volcanoes, landslides, tsunamis, severe storms, floods, wildfires, droughts, famines, sand/dust storms, and infestations (WHO 2010). The focus of this paper is disaster associated with natural hazards, recognized henceforth as 'natural disaster.' While civil strife and armed conflict require similar public health services and relief strategies, these aspects of disaster and their associated challenges remain beyond the scope of this work.

Disaster Management Stages: According to the Introduction to International Disaster Management (Coppola 2007), the disaster management cycle consists of four components:

- a) Mitigation "involves reducing or eliminating the likelihood or the consequences of a hazard, or both" (Page 8).
- b) Preparedness involves "equipping people who may be impacted by a disaster or who may be able to help those impacted with the tools to increase their chance of survival and to minimize their financial and other losses" (Page 8).

- c) Response involves “taking action to reduce or eliminate the impact of disasters that have occurred or are currently occurring, in order to prevent further suffering, financial loss, or a combination of both. Relief, a term commonly used in disaster management, is one component of response” (Page 8).
- d) Recovery involves “returning victims’ lives back to a normal state following the impact of disaster consequences. The recovery phase generally begins after the immediate response has ended, and can persist for months or years thereafter” (Page 8).

These stages of disaster management will be referred to throughout this paper, with particular attention to response and recovery. The response stage of disaster management consists of post-disaster relief efforts, including search and rescue as well as immediate relief. The recovery stage encompasses all recovery and reconstruction efforts, and comprises long-term development.

Disaster Risk Management: The Global Risk Identification Program’s (GRIP) website defines disaster risk management as systematically employing administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of societies and communities to reduce the impacts of natural hazards and related disasters. This encompasses all measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of disasters (GRIP 2009).

Disaster Risk Reduction: Disaster risk reduction is the conceptual framework of elements considered with the goal of minimizing risks and vulnerabilities throughout a society by prevention, mitigation and preparation against the adverse impacts of disasters, within the broader context of sustainable development. The framework consists of risk awareness and assessment, for example hazard analysis and vulnerability/capacity analysis; knowledge development, which consists of education, training, research and information; public commitment and institutional frameworks, including organizational, policy, legislation, and

community action; application of measures, such as environmental management, land use, and urban planning, protection of critical facilities, application of science and technology, partnership and networking, and financial instruments; and early warning systems, including forecasting, dissemination of warnings, preparedness measures, and reaction capacities (GRIP 2009).

Gender and Sex: ‘Sex’ refers to the biological differences between males and females, while ‘gender’ refers to the roles and responsibilities that are socially constructed and therefore learned by individuals regarding the biological sex to which they are assigned (Moser 1993; LaFont 2003). While sex is a term that implies a biological determination, gender is a word that is often used to refer to cultural and social roles and responsibilities, with differences shaped by ideological, historical, religious, ethnic, economic, and cultural determinants (Oakley 1972; Moser 1993). This set of socially-constructed assumptions is what creates gender identities and in turn gender-based inequality (UNICEF 2004).

Gender-based Inequality: Being a social construction, gender is a very fluid concept, changing temporally, between and within cultures. For this reason, gender roles, inequities and power imbalances are not a ‘natural’ result of biological differences but are determined by the systems and cultures in which we live (UNICEF 2004). Gender-based inequality increases as a result of contextual factors, including natural disaster, thereby contributing to the heightened risk of domestic and sexual violence, economic discrimination, exclusion from decision-making, psychological distress, poor health, and even death (UNICEF 2004; Pittaway, Bartolomei et al. 2007).

Gender Mainstreaming: According to the UN system, mainstreaming a gender perspective is the process of assessing the consequences for women and men in every aspect of any planned action, including legislation, policies or programs. It is a strategy for making both

women's and men's concerns and experiences an integral component of the design, implementation, monitoring and evaluation of policies and programs in all political, economic and societal spheres so that women and men benefit equally, thereby curtailing the cycle of inequality (UN 1997).

Health: According to the WHO (website, 2010), “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity,” and “the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition” (WHO 2010).

Public Health: The term ‘public health’ has several definitions. According to the Essentials of Public Health (2007), it is a broad social system that seeks to extend the benefits of current knowledge in ways that will most impact the health status of a population, ultimately striving to prevent disease, prolong life, and promote health and efficiency. Public health is unique because of its interdisciplinary approach and methods, its emphasis on prevention, its relationship with government and policy, and its dynamic adaptation to new challenges. Most of all, public health is a collective effort to effectively manage the undesirable realities that result in preventable and avoidable health and quality-of-life outcomes (Turnock 2007).

Public health is an approach concerned with the health of the community as a whole, whereas medical health concentrates primarily on the health of the individual. Many disaster-oriented public health programs focus on population-based health interventions, such as immunization, reproductive health, and control of communicable and non-communicable diseases (VanRooyen and Leaning 2005). The Institute of Medicine (IOM) characterized the

mission of public health as “fulfilling society’s interest in assuring conditions in which people can be healthy” (Turnock 2007).

Public Health Services: Essential Public Health Services provide the fundamental framework for the responsibilities of public health systems. The framework describes the public health activities that should be adapted to all communities:

- Monitor health status to identify and solve community health problems
- Diagnose and investigate health problems and health hazards in the community
- Inform, educate, and empower people about health issues
- Mobilize community partnerships and action to identify and solve health problems
- Develop policies and plans that support individual and community health efforts
- Enforce laws and regulations that protect health and ensure safety
- Link people to needed personal health services and assure the provision of health care when otherwise unavailable
- Assure competent public and personal health care workforce
- Evaluate effectiveness, accessibility, and quality of personal and population-based health services
- Research for new insights and innovative solutions to health problems

(CDC 2008)

Resilience: Resilience is best explained as the capacity of a system, community or society to deal with adverse circumstances. This is done through resistance and adaptation in order to achieve and maintain an acceptable level of functioning and structure. Resilience is determined by the degree to which the social system is capable of organizing itself to learn from past disasters so as to improve risk reduction measures and effectively prepare for future disasters (GRIP 2009).

Risk: Risk, according to the GRIP website, can be understood as “the probability of harmful consequences or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between disaster and vulnerable conditions” (GRIP 2009). While risk is conventionally expressed by the notation $\text{Risk} = \text{Hazards} \times \text{Vulnerability}$, some disciplines, including public health, also include the concept of ‘exposure’ to refer particularly to vulnerability’s physical aspects. It is important to keep in mind that risks are inherent to social systems and not purely an expression of possible physical harm; it is therefore essential to consider the social contexts within which risks occur, recognizing that people therefore do not necessarily share the same perceptions of risk and their underlying causes (GRIP 2009). The research on women and their exposure to different types of risk demonstrates that gender influences vulnerability in disasters and exposure to risks (Fothergill 1998).

Risk Assessment/Analysis: Risk analysis is a method to determine the likelihood for potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment upon which they depend. Risk assessment is based on clinical, epidemiological, toxicological, environmental, and any additional pertinent data, including the social and economic dimensions of vulnerability and exposure, while taking particular account of the coping capabilities pertinent to risk scenarios (Last 2001; GRIP 2009). The Disaster Assessment Portal offers a breakdown of the stages of the disaster risk assessment process (UN-HABITAT 2010). These include:

- a) Hazard identification to identify the nature, location, intensity and likelihood (probability or frequency) of a threat;
- b) Vulnerability analysis to determine the existence and degree of vulnerabilities and exposure to a threat(s);

- c) Capacity analysis to identify the capacities and resources available to reduce the level of risk, or the effects of a disaster;
- d) Risk analysis to determine levels of risk; and
- e) Risk evaluation to make decisions about which risks need countermeasures and priorities.

Vulnerability: Vulnerabilities are conditions determined by physical, social, economic, and environmental factors or processes which increase populations' susceptibility to the impact of hazards (GRIP 2009). According to Nowak and Caulfield (2008), vulnerability is not an intrinsic human quality; rather, it is a consequence of contrasting structures and systems which translate differences into inequalities. The complex interactions between these structures and economic and cultural inequalities perpetuate social conditions in which different groups are situated during disasters (Nowak and Caulfield 2008).

4.0 LITERATURE REVIEW

4.1 CONTEXTS

A population's health depends on myriad different yet interacting factors. Understanding the contexts in which disasters occur is imperative for the identification of and response to health needs of the population(s) in question. Responders must take into account the effects of economic, social, cultural and political factors, as well as the interaction of these factors, in order to properly address subsequent needs, especially those of a health-related nature. Following a disaster, survival is the initial and foremost priority of a population. Shortly thereafter, however, in the recovery stage of disaster management, individual and community needs become more complex. For this reason, public health services must strive to evaluate and encompass the individual and collective needs of any population.

Priority public health interventions include adequate supplies of safe water, sanitation, food and shelter, infectious disease control, basic clinical care and disease surveillance (VanRooyen and Leaning 2005). Expanded clinical services, such as trauma care, are given higher priority following disasters that are associated with large numbers of injuries (Sphere Project 2004). Post-tsunami needs included both surgical and primary care (Redwood-Campbell and Riddez 2006); causes of death were drowning and blunt trauma, and the injuries sustained arose from complications of near-drowning and trauma (VanRooyen and Leaning 2005). Other

medical problems were found to be chronic and were perhaps indicative of the lack of pre-tsunami healthcare infrastructure (Redwood-Campbell and Riddez 2006). Needs assessments revealed a variety of health problems and medical needs for which responders were forced to consider not only the biological risk factors but also the environmental, social, and behavioral contexts within which these individuals and populations operated.

A disaster assessment (see Definitions), which includes hazard identification, vulnerability analysis, capacity analysis, risk analysis, and risk evaluation (UN-HABITAT 2010), is imperative for understanding and responding to the needs of an affected population following a disaster. To know exactly who is being served, the issue(s) being addressed, the positive and negative implications of the problems and solutions, as well as effectiveness, equity, feasibility and cost-benefits is the best way of analyzing all facets of the situation and making informed decisions about how to proceed. Steps in a successful needs analysis include: (1) identification of users and the uses of the need analysis; (2) description of the target population and service environment; (3) the actual identification of needs (description of problems/solutions); (4) assessment of importance of needs; and (5) communication of results (McKillip 1987). Since a community's health is determined by interactions among multiple determinants that will affect health status and outcomes, comprehensive rather than disease-specific solutions that take entire populations into account are preferred (Gilmore and Campbell 2005; Myers and Stoto 2006).

Community needs in a disaster context resemble but are different from those in a regular development context. Disaster needs assessments are important tools for the allocation and distribution of resources. During the immediate relief phase, a component of the response stage of disaster management, health assistance programs take on many aspects of long-term health

development programs. Effectiveness of programs and transferability to long-term, sustainable development work must therefore be kept in mind while assessing needs and designing programs. The entire community and its resources are affected by disasters, with hospitals, clinics, schools and community structures and essential services disrupted, supplies often looted or withheld and outside help denied or slowed significantly (ReliefWeb 2009).

Moreover, the provision of resources and services to specific populations in the aftermath of a natural disaster can vary substantially depending on the context; attention to gender is often limited and must be addressed. For women, the right to health and well-being is crucial to their psychological, physical, and social well-being and is often severely impacted during crises such as the Indian Ocean Tsunami.

4.2 WOMEN

Women are a unique population, for the outcomes and survival of entire communities are inextricably linked to their health and well-being. Women are integral members of functioning societies, with established rules and roles (Weist, Mocellin et al. 1994). Besides being primarily responsible for domestic duties such as care for children, the elderly and the disabled, women play a special role in community cohesion. And while often less visible in society, they are key stakeholders in the health of the communities in which they live. However, women suffer from several social and economic limitations, which severely impair their individual and collective health. Additionally, women are more vulnerable to disasters due to social and biological factors (WHO 2002; WHO 2005).

Social structures provide the context, form and meaning for disaster response, and they are also critical components of vulnerability. The organizational avenues through which people gain access to resources, social status, and even psychological well-being have an important bearing on the stages of disaster management (Weist, Mocellin et al. 1994). At the time of disaster, women are often categorized along with migrants, children, the disabled, elderly, and particular ethnic and social groups; however, restricting women to these categories of vulnerability inaccurately de-genders interrelated identities and social relationships (Enarson and Morrow 1998; Nowak and Caulfield 2008). This lends to the portrayal of women as passive victims and often results in humanitarian interventions that address women's immediate practical needs in limited ways (Enarson and Morrow 1998; Clifton and Gell 2001). Gender-sensitive emergency relief has come to mean increasing the role of women in aid distribution, providing sanitary items, and ensuring safe, private health services for women (Clifton and Gell 2001). While these are very important considerations, they fail to account for social relations and power dynamics within specific socio-cultural contexts (Clifton and Gell 2001; Nowak and Caulfield 2008).

Focusing solely on women's vulnerability distorts the actual experiences of both women and men, which can negatively impact disaster management as a whole by overlooking women's capacities, resources, and long-term interests (Enarson and Morrow 1998; Clifton and Gell 2001; Nowak and Caulfield 2008). Gender vulnerability is dynamic and complex, and it reflects different historical and socio-cultural structures of communities and individuals. While it is essential to identify the diverse vulnerabilities of women and men to disasters, it is imperative to understand their situation in terms of their different capacities and coping strategies. This will prevent further marginalization of women during disaster relief (Nowak and Caulfield 2008).

A focus on women as a population is not a dismissal of men, nor should it imply that relief efforts exclude men or play down their needs. Gender is often associated with ‘inequality’ or ‘vulnerability’ in disasters; however, none of this can be assumed for men or for women. Men comprise a share of the vulnerable population, with high-risk groups such as orphans, migrants and the homeless often dominated by males. Experience indicates that gender norms can increase risk to boys and men in disasters, influencing health outcomes for both sexes. In fact, gender norms related to men’s reduced risk perception and increased risk-taking can endanger men and their families. On the other hand, men can capitalize on their gendered position in society to control resources in ways that benefit themselves, their families and their communities following disasters. Their leadership and employment can bring essential skills and expertise to disaster management. Men, like women, must adapt to post-disaster circumstances by assuming new roles and responsibilities (GDN 2009). Post-disaster interventions need to recognize and build on the roles and resources that both men and women bring to coping with disaster, and address their longer-term needs and interests (Clifton and Gell 2001).

A gendered approach to disaster requires a focus on both women and men, and cooperation with both to achieve gender-fair outcomes. Despite the fact that men still die at significantly younger ages than women across all societies, the fact remains that women start from a relative position of greater suffering, poverty, and disempowerment (Clifton and Gell 2001; WHO 2010). This paper gives special attention to the situation of women with a goal to improve gender equity and health outcomes for disaster-affected women and therefore their communities at large.

4.3 FACTORS THAT INCREASE WOMEN'S VULNERABILITY

The WHO (2002) reports a general lack of research on sex and gender differences in vulnerability to and impact of natural disasters. Limited information available from small scale studies suggests that a pattern of gender differentiation exists at all levels of the disaster process: mitigation, preparedness, response, and recovery (WHO 2002). Nevertheless, present data, even when disaggregated, may not fully depict the scope or nature of women's economic and social roles due to the choice of conceptual categories used in data collection. For instance, supplemental income-generating activities such as sewing, farming, or fishing are not usually recorded in national statistical data. Considering the large proportion of women involved in the informal economy, it is important to keep this in mind when assessing disaster (Deare 2004).

Still, evidence does indeed demonstrate that men and women suffer different health consequences as a result of disaster (WHO 2002). This is perhaps due to biological differences, socially determined differences in gender roles, or even an interaction of these and other gender associated factors (WHO 2005). By integrating gender perspectives into all stages of disaster response, public health and development professionals are forced to consider gender differences and respond appropriately. Attention to factors that influence health outcomes consequently improves program efficiency, coverage, and equity (WHO 2007).

4.3.1 Individual factors

Generally speaking, complications related to pregnancy and childbirth are significant causes of morbidity and mortality among women of childbearing age (WHO 2010). Adverse outcomes resulting from reproductive complications include miscarriages, premature deliveries, stillbirths,

delivery-related complications, and infertility (Kramer 2003; Gill, Pande et al. 2007). The WHO estimates that approximately 358,000 women die each year in childbirth or from pregnancy-related causes (WHO 2010). An estimated 99 percent of these maternal deaths occur in developing countries (Kvale, Olsen et al. 2005; WHO 2009; Paruzzolo, Mehra et al. 2010). The vast majority of maternal deaths, around 80 percent, are due to complications during pregnancy, at delivery or within the first few weeks post-delivery (WHO 1999; Paruzzolo, Mehra et al. 2010). For every woman who dies from pregnancy, between 15 and 30 women suffer from chronic illness and disability (Kvale, Olsen et al. 2005; Paruzzolo, Mehra et al. 2010). Given these numbers, it is unsurprising that women in the aftermath of disasters are identified as a particularly high-risk group.

The trauma and displacement associated with disaster imposes an especially heavy psychosocial and physical burden on women. This is particularly true for those who are pregnant; rates of spontaneous and induced abortion increase, as does the risk to maternal health (Carballo, Hernandez et al. 2005). Exposures to environmental contaminants, psychological stress, and lack of access to health care and medications during a disaster have potential serious consequences for pregnant women and infants (Callaghan, Rasmussen et al. 2007). Babies are often born preterm or are small for gestational age (Carballo, Hernandez et al. 2005). Roughly 15 percent of women following disaster will develop problems that require obstetrical care, and up to five percent will require some kind of surgery, including cesarean section (Miller and Arquilla 2007). Inadequate diet, especially for pregnant and nursing mothers, is a common cause of malnutrition and, consequently poor health, especially for those who have been displaced. Studies have also shown an increase in levels of domestic and sexual violence in the aftermath of disasters, the implications of which are many; victims of sexual violence suffer physical and

psychosocial damage, which can lead to more serious health problems such as sexually transmitted diseases, unwanted pregnancy, schizophrenia, self-destruction, violent behavior, substance abuse, psychosomatic illness and severe depression (Martin 1991; MacDonald 2005; UNFPA 2005; Ghodse and Galea 2006; Pittaway, Bartolomei et al. 2007; Katz and Mauery 2010).

About 150,000 women in the most severely tsunami-affected countries were estimated to have been pregnant at the time of the disaster, with roughly 50,000 in the third trimester (Carballo, Hernandez et al. 2005; Lalasz 2005). Even under normal circumstances, in countries where maternal and neonatal health was a challenge before the tsunami a substantial proportion of these women could be expected to experience complications with pregnancy and delivery (Carballo, Hernandez et al. 2005). Lack of access to emergency obstetric care, inadequate training of midwives, septic abortions, unsanitary conditions during birth, septic instruments, poor lighting during deliveries, increased risk of malnutrition and epidemics, and increased frequency of pregnancies all present challenges to post-disaster healthcare services and delivery (Martin 1991; RHRC 2010). Furthermore, the risk of sexual violence may increase during social instability and displacement, thereby increasing sexually transmitted infections and HIV transmission in areas of high population density (RHRC 2010). Lack of food, clean drinking water and shelter, combined with the destruction of clinics and hospitals and the injury and deaths of doctors, midwives and other key staff can make the birthing experience dangerous and intimidating (Circle of Health International 2009).

Proper nutrition is one of the most crucial factors for good health. Women's lower status relative to men and their biological reproductive role often puts them at high risk for nutritional problems (Momsen 2010). In developing countries, poor rural households may spend as much as

90 percent of their income on food and yet may lack a proper diet (Momsen 2010). Women work long hours and will often eat last and less than others in their family; they are therefore often overworked and underfed, thereby increasing their susceptibility to disease (Momsen 2010). Combine an already dire nutritional situation with a natural disaster, and nutritional status of family members is at its lowest and meals are often omitted completely.

Many of the illnesses that women suffer result from malnutrition caused by both insufficient food intake and inadequate vitamins and minerals in the diet. Women are particularly affected by deficiencies in iron, calcium, iodine, and vitamin C (Kelley 1988). According to the International Center for Research on Women (ICRW), between 20 and 45 percent of women of childbearing age in developing countries lack the 2,250 daily calories recommended by the WHO, let alone the additional 300 calories necessary for pregnant or lactating women (Momsen 2010). Deficiencies of micronutrients such as iron, vitamin A, iodine, zinc, and folate in particular can cause a range of health and developmental problems, such as birth deformities, mental retardation, blindness, and death (Markle, Fisher et al. 2007). Each year, an estimated 136,000 women and children die because of iron-deficiency anemia; 18 million babies are born mentally impaired due to maternal iodine deficiency; and 150,000 babies are born with severe birth defects as a result of inadequate maternal folate intake (Micronutrient Initiative 2009; Project Healthy Children 2010).

Trauma born from social chaos increases the risk of mental health consequences (Ghodes and Galea 2006). Research has shown females to be at a much higher risk for post-traumatic stress disorder (PTSD) than males (Ranasinghe and Levy 2007), and tsunami exposure undoubtedly contributed to PTSD and depressive symptoms among mothers (Wickrama and Wickrama 2010). Mental health risks of tsunami-exposed mothers in traditional societies could

be relatively high due to poor working conditions, high levels of familial responsibilities, and potential gender inequality in accessing and receiving post-disaster services (Enarson 2002; Wickrama and Wickrama 2010). Moreover, prolonged displacement increases mental health risk in mothers due to the increased burden of caring for both children and parents (Wickrama and Wickrama 2008).

At a minimum, women face emotional difficulties and find trouble adjusting as a result of the loss of family and community support (Martin 1991). Pregnant women presented a greater risk for psychological issues due to fears for their unborn children, as well as increased strain/responsibility of eventually caring for the child (Carballo, Heal et al. 2005; Ghodse and Galea 2006). More severe mental health problems can arise from abuses, including sexual exploitation, experienced prior to or after the disaster. The depression and PTSD resulting from disasters often manifest in survivors as anxiety, intrusive thoughts, disassociation or psychic numbing, hyper-alertness, and eating and sleeping disorders (Martin 1991). The most serious mental health problems may manifest themselves in severe depressive, self-destructive, violent or disruptive behavior, substance abuse, and a high degree of psychosomatic illness (Martin 1991). Prevalence of PTSD and sex disparities in affected populations indicates a significant long-term public health burden (Ranasinghe and Levy 2007).

4.3.2 Social factors

As mentioned previously, in addition to biological factors, women's vulnerability to disasters increases due to their socially-constructed roles. And, while a natural disaster does not differentiate between people, societal norms do (Felten-Biermann 2006). Social exclusion and

lack of social protection experienced by women and girls prior to natural disasters are exacerbated in the aftermath. Disasters create unequal power relations, from which abuse almost always arises (MacDonald 2007). Studies have found a correlation between the increased rate and fear of sexual assault with the lack of protection from male relatives for widows and other women following South Asian cyclones and floods (Meher 2007). In addition to loss of protection from family and justice systems, women are more vulnerable to disadvantage and abuse following disaster because the context itself often generates an environment in which gender stereotypes flourish, causing people to cling to familiar patterns of behavior (Pittaway, Bartolomei et al. 2007).

Men and women have different exposures to situations that affect health and access to health care; they also have differential power to influence decisions regarding the provision of health services (Palmer and Zwi 1998). Women generally have limited access to resources and less representation at all levels of decision-making (Momsen 2010). In the predominantly Muslim society of Bangladesh, for example, many women are forbidden to speak to strange men or be in public without a male relative. In this society it is also a woman's duty to protect her children and home. Therefore, during the regularly occurring floods, women may not leave their homes to go to shelters for fear that they will be accused of neglecting their homes (Momsen 2010). One study of a 1991 cyclone in Bangladesh found that many women and children perished at home as they were required to wait there for their husbands to return to make an evacuation decision (WHO 2005).

There are numerous accounts of women being made more vulnerable during disaster by their socially-prescribed domestic roles as well. For example, the WHO reports excess deaths among females in the aftermath of an earthquake in Maharashtra, India, due to women having

been confined to gendered activities such as cooking or cleaning within their homes, which were subsequently damaged by the earthquake (WHO 2005). Many women and girls were killed in the 2004 Asian tsunami in India and Sri Lanka for similar reasons, as well as their attire. Many women of fishing communities did not know how to swim. Traditionally long hair and excess cloth from their saris prevented women from moving quickly to safety, and caught them on debris and drowned them (Oxfam 2005).

4.3.3 Economic factors

Poverty, both a cause and a consequence of vulnerability, varies considerably with occupation and social characteristics such as gender, age, ethnicity and disability (Momsen 2010). Carballo et al. (2005) note that the poor comprise society's most vulnerable because they typically reside in ill-constructed homes in areas at risk for natural disasters. Furthermore, their land rights and access to financial compensation are limited. Also, their capacity for reconstruction remains low due to inadequate savings to fall back on, and most lack knowledge about how to navigate the administrative systems that might assist them (Carballo, Heal et al. 2005).

Indeed, women and children comprise the majority of the poor, and therefore vulnerable, population (MacDonald 2005). The Pan American Health Organization (2010) suggests that with less access to resources, including social networks, political influence, transportation, information, skills such as literacy, control over land and other economic resources, personal mobility, secure housing and employment, freedom from violence, and control over decision-making, women face myriad challenges in disaster preparedness, mitigation, and rehabilitation. Because women are primarily responsible for domestic duties, they are not free to migrate in

search of work following a disaster. They sometimes turn to high-risk activities like prostitution in order to feed their children (Momsen 2010).

The long-term effects of economic losses can be devastating. The loss of tools for work such as fishing boats and sewing machines made recovery difficult for both men and women following the tsunami. The depletion of household assets is a common survival strategy and indicator of social crisis (Meher 2007). Assets such as jewelry, cooking utensils and poultry happen to be those commonly owned and controlled by women, but are often sold by men in times of crisis (Meher 2007; Momsen 2010). When women's economic resources are taken away, their bargaining position in the household is adversely affected (PAHO 2010).

Women are frequently overlooked during the distribution of aid. It is more difficult for women to access money and emergency supplies because in some areas only men are recognized as head of household; therefore, women are often unable to collect relief to which they are entitled, have difficulty accessing finances or property that the family owned, or have trouble obtaining welfare (Carballo, Hernandez et al. 2005; MacDonald 2005). Women's risk can also increase during the distribution of aid; for instance, remote location of water-points, latrines, health services, and resources often increases women's vulnerability. Furthermore, the temporary and/or permanent displacement of women and children following a disaster increases their vulnerability to exploitation and abuse. During displacement, including to shelters and sites for the internally displaced, children may be at risk for trafficking, while girls also face the risk of early/forced marriage. This pressure to marry earlier and to have children closer together has significant implications for female education, livelihoods, and reproductive health (MacDonald 2005).

Finally, a gendered division of labor results in an over-representation of women in agriculture, self-employment and the informal economy, in underpaid jobs with little security and lacking benefits, such as health care and union representation. The informal and agricultural sectors are usually the most impacted by natural disasters. For this reason, as well as their lower educational and literacy levels, women become over-represented among the unemployed following a disaster (Chew and Ramdas 2005; Global Fund for Women 2010; PAHO 2010).

4.4 WOMEN'S HEALTH AND THE LARGER CONTEXT

It is clear that women's needs and vulnerabilities are indicative of women's short term health outcomes following a disaster. Correspondingly, the long-term public health of a community depends largely on the well-being of women. The far-reaching implications of women's health make it a crucial focal point in public health, development, and disaster management. Designing culturally sensitive, gendered health care in the aftermath of disasters helps to ensure that women's specific needs are met while enhancing the well-being of the family and often, the communities in which they reside (Kelley 1988).

Women's health status can lead to increased negative or positive outcomes in the greater context. Very simply, a woman's health is a crucial determinant of the health, education and survival of her children (Momsen 2010). This is particularly true for pregnant and lactating women, as their malnourishment will result in their infants' malnourishment (Kelley 1988; APWLD 2006). However, this is also true for women who are in charge of the family's purchase and preparation of food, diet, and personal and household sanitation. A woman may unintentionally become the agent of illness among her family and community if she is

unacquainted with nutritional requirements or is unaware of ways to prevent infectious diseases such as through sanitation, water collection, and proper food preparation and storage methods (Kelley 1988; Momsen 2010). Moreover, women often provide care to others in the community, and, while not officially recognized as health workers, are responsible for 70 to 80 percent of total health care in developing countries (Momsen 2010). An unhealthy mother or midwife who cannot properly provide for herself cannot possibly attend to the needs of others (Kelley 1988).

On the other hand, women can be pivotal agents of good health and resilience for family and community. Social relationships have a powerful influence on health status, health behaviors, and health outcomes (Heany and Israel 2002; Wenzel, Glanz et al. 2002). Research indicates that social coping resources, which include family and community support, cultural and religious resources, and personal control, are potential factors for resilience (Wickrama and Wickrama 2010). Social units are the strongest resources for coping; people in all societies turn to family and close kin in times of special need (Weist, Mocellin et al. 1994). Likewise, in a disaster the primary means of support are the social units; families first help their own family members, then relatives, then neighbors. During the immediate aftermath of a disaster, providing comfort to one another is among the most important aspects of coping. In the response and recovery phases of disaster, the social unit is most important for emotional recovery. During reconstruction, family and friends offer physical and financial support to one another to assist in the restoration of homes and livelihoods (Cuny 1983). Social coping resources, such as collective family functioning, high levels of mutual support, and collective recovery efforts among family members can protect mothers from the negative outcomes associated with stressful and traumatic situations by directly diminishing psychological symptoms (Wickrama and Wickrama 2008; Wickrama and Wickrama 2010).

Moreover, community participation, either real or perceived, captures objective and subjective dimensions of social support, which in turn reduces mothers' depressive and PTSD symptom levels. Day-to-day work with informal grassroots collectives and involvement in such activities as water and firewood collection, emergency relief distribution, construction of homes and roads, and microfinance activities may help develop and reinforce social connection, mutual understanding, interdependence, reciprocity, trust, and social responsibility (Wickrama and Wickrama 2010). Research suggests that coping mechanisms which exist at individual and community levels show promise in enhancing resilience in the face of adversity, enabling normal functioning in the majority of those affected (Rajkumar, Premkumar et al. 2008).

Women can and should be seen as part of the solution to adversity resulting from disasters. They can play a vital role as participants in disaster response and recovery, as well as pre-disaster planning. Just as women's participation is important for effective community development, it can also enhance the potential effectiveness of disaster prevention or mitigation, measures which should, in fact, be perceived as part of the development process (Weist, Mocellin et al. 1994).

Women can contribute to the process of assessing needs, vulnerabilities and capacities; they can also identify measures that could strengthen community capacity. Women often group together to adapt to circumstances by allocating and sharing limited resources. Cash-for-work (CFW) programs allow women to supplement family income, empowering and giving them value. Women are often the nearest and most dependable counselors to which a family has immediate access, which eliminates or prolongs the need for mental health services. Many women become trained as community health workers (CHWs) and midwives, which strengthens health systems in the wake of disaster. Enabling women to participate in post-disaster activities

allows them to build the skills and capacities necessary to sustain their involvement, thereby initiating long-term social change and development, and increasing individual and community health and welfare (Yonder, Akcar et al. 2005).

5.0 INDIAN OCEAN TSUNAMI: 26 DECEMBER 2004

The impact of natural disasters and subsequent recovery efforts are dependent on geographic and demographic factors of the affected areas and will require different approaches to and results of disaster management efforts. The Indian Ocean Tsunami of 2004 had a severe impact on rural coastal communities, many of which were poor with few livelihood options. In addition to the loss of life and belongings, local economies and infrastructures were devastated. Health effects and subsequent needs were numerous and varied throughout the different stages of the disaster cycle (see Figure 10).

The tsunami affected 12 countries from East Africa to Southeast Asia, killing over 200,000, displacing hundreds of thousands, and affecting over three million people (UN 2008). The tsunami devastated over two-thirds of Sri Lanka's coast and resulted in more than 35,000 fatalities. Indonesia, the worst-affected country, suffered extensive physical destruction; the tsunami killed more than 130,000 people and affected the livelihoods of half a million (UN 2008).

Because tsunami statistics were not separated by gender, we do not know the exact number of women who died; however, it has been estimated that in some areas, up to three times as many women as men perished (Chew and Ramdas 2005; Oxfam 2005; Shaw 2006). Despite the lack of gender-disaggregated data, it became apparent in the immediate aftermath that among the survivors, the special needs of women were being overlooked (Campbell 2005). According

to various United Nations Population Fund (UNFPA) staff deployed to affected areas, the majority of assistance was being distributed by men to men, with inadequate attention to targeting the most vulnerable or reducing the possibility of abuse and exploitation. Furthermore, vulnerabilities unique to women, such as pregnancy, the need for sanitary supplies and locally appropriate clothing, and increased risk for rape, trafficking, exploitation and domestic violence, are often overlooked in response and recovery (UNFPA 2005).

5.1 SRI LANKA

5.1.1 Country Brief

Sri Lanka is an island nation located in the Indian Ocean, directly south of India (see Figure 4). The majority of the population (around 69%) is Buddhist, followed by Hindu, Muslim and Christian. Sinhalese (around 74%) comprise the ethnic majority, while the largest minority group is Tamil (around 18%). Sri Lanka is among the wealthier countries in the region; however, poverty remains an issue, particularly in the estate sector in and around the central highlands (WHO 2006). Social indicators include high literacy rates, including women's literacy, and low infant and maternal mortality rates (see Table 1) (Ariyabandu 2006; WHO 2006). The country's economy is market-oriented, with a notable recent shift from agriculture to manufacturing. Two decades of civil war have destroyed infrastructure and hindered socioeconomic development in the north and east. While the country enjoys occasional reconstruction in the wake of periodic ceasefires, civil strife continues. Natural disasters, such as

landslides and floods in 2003, as well as the tsunami in 2004, have further devastated Sri Lanka's infrastructure and development (WHO 2006).



Figure 4. Map of Sri Lanka
(Geology.com 2007)

Table 1. Sri Lanka: Health and Development Indicators

Total population (2005)	20 743 000
% under 15 (2005)	24
Population distribution % rural (2005)	79
Life expectancy at birth (2004)	71
Under-5 mortality rate per 1000 (2004)	14
Maternal mortality ratio per 100 000 live births (2000)	92
Total expenditure on health % GDP (2004)	3.6
General government expenditure on health as % of general government expenditure (2004)	7
Human Development Index Rank, out of 177 countries (2003)	93
Gross National Income (GNI) per capita US\$ (2004)	1 010
Population living below national poverty line % (1990-2002)	25
Adult (15+) literacy rate (2003)	90.4
% population with sustainable access to an improved water source (2002)	78
% population with sustainable access to improved sanitation (2002)	91

(WHO 2006)

Health is a long-standing government priority of Sri Lanka, and the UN Millennium Development Goals (MDGs) have been attained nationwide, although regional disparities persist. The Ministry of Healthcare and Nutrition (MHN) redefined its strategic direction in a 1996 National Health Policy, which formed the basis for the 2002 Health Sector Master Plan and the 2003 Strategic Framework for Health Development in Sri Lanka. Demographic and epidemiological transition is taking place, altering health priorities and increasing challenges for the health system (WHO 2006).

Sri Lanka's extensive network of public health clinics and hospitals makes health facilities accessible (within 5 km) to most people. However, partial decentralization has resulted in excessive reliance on tertiary and secondary level hospitals, as well as under-utilization of primary care facilities, which often lack staff and service quality. Information systems and laboratory services are poorly developed, and quality control for pharmaceuticals is questionable. The shortage of nurses and paramedical personnel and concentration of medical staff in urban

centers create additional stress on the system. Health care, while provided free of charge, has become difficult to sustain (WHO 2006).

Communicable diseases, notably malaria, tuberculosis, dengue, Japanese encephalitis, diarrheal diseases and acute respiratory infections remain important causes of morbidity and mortality. Tuberculosis has a high incidence in and around Colombo, and malaria is still prevalent in a few districts in the north central and eastern parts of the country. The incidence of vaccine-preventable and vector-borne diseases has been significantly reduced but regional variations exist. Sri Lanka is considered a low prevalence country for HIV/AIDS (WHO 2006).

Non-communicable diseases have increased and consist of cardiovascular and cerebrovascular diseases, cancers, diabetes, and tobacco, alcohol and substance abuse. Mental health disorders are common and Sri Lanka's suicide rate is among the highest in the world, around 6,000 per year. Poisoning with pesticides, both suicidal and accidental, is a long term problem. Another major cause of hospital admissions are injuries, including traffic accidents. Malnutrition is prevalent among children in disadvantaged populations (WHO 2006).

5.1.2 Post-tsunami Sri Lanka

The Indian Ocean tsunami of December 2004 caused more than 31,000 deaths, destroyed 92 health facilities and displaced about 850,000 people in Sri Lanka (WHO 2006). With the exception of Indonesia, Sri Lanka sustained more of the tsunami's impact than any other affected country, with over 100,000 homes damaged or destroyed along with crops and fishing boats. The International Labor Organization (ILO) estimates that over 400,000 people lost their jobs as a result, mostly in the fishing, hotel and tourism industries (BBC 2005). Nearly 60% of the

country's coastline was affected (see Figure 5), with extensive damage suffered by Jaffna in the north, Trincomalee, Batticaloa and Ampara in the east, and Galle, Matara and Hambantota in the south (Ariyabandu 2006).



Figure 5. Aerial view of the tsunami at Kalutara, Sri Lanka
(DigitalGlobe 2010)

As in other countries, the tsunami's impact on Sri Lanka's women was disproportionate. According to statistics from Ampara, the only district for which gender-disaggregated data are available, women comprised approximately 66% of the dead (Ariyabandu 2006). There are many possible reasons for the gendered imbalance of reported fatalities and associated vulnerabilities, including cultural, temporal, and physical factors. Entrenched in Sri Lanka's patriarchal society, and because of gender roles, women are confined to activities in and around the home. When the tsunami struck early on a Sunday, many women who died in their homes were presumably tending to family, breakfast preparation and morning chores. In addition to

their conservative traditional attire and long hair impeding their flight to safety, women were unable to climb trees or swim. These gender-specific activities were instrumental to the survival of men and boys after the tsunami.

Specific regional factors also affected the tsunami's impact on women. For example, the majority of the dead in the district of Hambantota, Sri Lanka, were women from the surrounding area who drowned while doing their weekly shopping at the seaside market. In the Batticaloa district, the tsunami hit during the hour when women there typically bathed in the sea (Oxfam 2005).

Post-tsunami disaster assessments by Oxfam and UNFPA in Sri Lanka revealed long- and short-term gender-specific problems created by the tsunami, many of which relate to the difficulties encountered by women when residing in temporary shelters or trying to receive equal access to aid (Oxfam 2005; UNFPA 2005). Although a limited number of cases of domestic violence and sexual abuse were reported, assessments emphasized the need for close monitoring. According to the UNDP, many women in Sri Lanka were abused for their resistance to husbands selling their jewelry, disputes over use of tsunami relief money, and mothers were often blamed by fathers for the deaths of their children (UNDP 2010). The Health Ministry reported that targeted psychological interventions would be necessary for about five to ten percent of the affected population. This is significant; while the estimate is relatively modest, acknowledgment of mental health needs is a step in the right direction.

Sri Lanka's health infrastructure sustained extensive damage, resulting in many health facilities and services being partially affected or completely destroyed. In the wake of destruction of hospitals providing essential and emergency obstetric care services, some were reportedly forced to deal with three times the pre-tsunami volume of patients. Moreover, many

primary health care services for women and children were damaged, causing many women to discontinue their family planning methods (UNFPA 2005).

5.2 INDONESIA

5.2.1 Country Brief

The Republic of Indonesia is the world's largest archipelago, consisting of approximately 17,000 islands between Asia and Australia (see Figure 6). It is one of the world's most populous nations, with approximately 234 million people (US Department of State 2010). Indonesia is extremely ethnically and religiously diverse; it includes a variety of distinct yet related cultural and linguistic groups, many of which are ethnically Malay (Goebel 2008; US Department of State 2010). Other ethnicities include Javanese (around 45%), followed by Sundanese (around 14%), Madurese (7.5%), coastal Malays (7.5%) and various others (26%). Constitutional guarantees of religious autonomy apply to the six religions recognized by the state, namely Islam (86.1%), Protestantism (5.7%), Catholicism (3%), Hinduism (1.8%), Buddhism (about 1%), and Confucianism (less than 1%) (US Department of State 2010).

Current issues include addressing corruption, poverty alleviation, unemployment, separatist movements in Aceh and Papua, and fuel subsidy; health sector concerns include malnutrition, the spread of avian influenza and rebuilding Aceh following the tsunami (UNFPA 2005). The Indonesian Government's commitment to the UN's MDGs is illustrated by its national development plan (Propenas) and through national poverty reduction strategies; the

proportion of population living in poverty was reduced dramatically from 60% in 1970 to roughly 17% in 2007 (WHO 2010).



Figure 6. Map of Indonesia

(Geology.com 2007)

Indonesia has made substantial progress in health and development, but there is room for improvement (see Table 2). Indonesia is generally regarded as having relatively adequate levels of health service provision, with one public health center for approximately 30,000 people (WHO 2010). Unfortunately, these averages obscure disparities in geographic access; for example, people in remote interior or small island locations often have poor or limited access to health services. Health services are characterized by deficiencies in numbers of health personnel, distribution and quality of the health workforce, and low productivity. The Indonesian Ministry of Health and its partners continue their effort to build a sustainable, nationwide system of emergency preparedness and response, at the heart of which are regional crisis centers (WHO 2010).

Table 2. Indonesia: Health and Development Indicators

Total population (2010)	234 200 000
% under 15 (2010)	26.7
Population distribution % rural (2010)	53.7
Life expectancy at birth (2008)	70.5
Under-5 mortality rate per 1000 (2007)	44
Maternal mortality ratio per 100 000 live births (2007)	228
Total expenditure on health % GDP (2005)	2.7
General government expenditure on health as % of general government expenditure (2005)	5.0
Human Development Index Rank, out of 177 countries (2009)	111
Gross National Income (GNI) per capita US\$ (2008)	1 880
Adult (15+) literacy rate (2000-2007)	92.24
% population with sustainable access to an improved water source (2009)	47.63
% population with sustainable access to improved sanitation (2009)	51.02

(WHO 2010)

Communicable diseases are a significant cause of morbidity and mortality in Indonesia, with nearly 250 people dying of tuberculosis each day and over half a million new cases estimated to occur each year (WHO 2010). Vector-borne diseases such as malaria and dengue hemorrhagic fever remain problematic in large parts of the country. Although leprosy has been eliminated nationally, Indonesia ranks third in terms of the global burden. In 2008, case fatality rates for avian influenza were high (81%); significant investments are being made to prevent and control emerging infectious diseases, with pandemic preparedness at the core of these efforts.

The epidemiological transition toward non-communicable diseases, as in most developing nations, presents a challenge for Indonesia (WHO 2010). Chronic conditions such as cancer, cardiovascular diseases, metabolic disorders, and tobacco abuse represent a significant burden to the country in terms of cost, suffering, and lives. Mental health is another issue; an estimated 12.3% loss of productive days resulted from mental and neurological disorders. This

situation was exacerbated by the Indian Ocean tsunami which significantly impacted the mental health of those affected (WHO 2010).

5.2.2 Post-tsunami Indonesia

Natural disasters have devastated many parts of Indonesia over recent years. Indonesia's location near the intersection of shifting tectonic plates makes it especially prone to natural disasters, including earthquakes, landslides, floods, volcanic eruptions, and tsunamis (WHO 2010). On December 26, 2004, the earthquake and resulting tsunami killed over 130,000 people and left more than 37,000 missing in Aceh and North Sumatra (US Department of State 2010). Indonesia sustained the worst physical damage and human losses in the disaster, as it was the country located closest to the earthquake's epicenter. Some coastal villages were estimated to have lost more than 70 percent of their population (BBC 2005). Parts of Aceh, the northernmost province on the island of Sumatra, were devastated (see Figures 7 - 9). The tsunami had a massive impact on people's livelihoods, with fishing and agriculture most severely affected (UN 2008).



Figure 7. Aerial view of tsunami's damage at Gleebruk, Indonesia
(DigitalGlobe 2010)



Figure 8. Aerial view of the tsunami's damage at Banda Aceh, Indonesia
(DigitalGlobe 2010)



Figure 9. Aerial view of the tsunami's damage at Meulaboh, Indonesia
(DigitalGlobe 2010)

The tsunami killed far more women than men, with an estimated male-to-female survival ratio of almost three-to-one in Indonesia. In four villages in Aceh, 284 out of 366 deaths were females, which accounted for 77 percent of all tsunami-related deaths there. In the worst affected village, Kuala Cangko, four females died for every male, representing 80 percent of total deaths (Oxfam 2005). The causes of Indonesia's disproportionate death toll amongst women are similar to those of Sri Lanka. When the tsunami struck on a Sunday morning, many men were out fishing at sea, working in the fields or taking produce to markets while women were home with children. As in other locations, women and children drowned from exhaustion while attempting to escape the waves (Oxfam 2005). The instinctive urge of mothers to protect their children led many of them to return to beaches to look for their children just as the next waves came in (Carballo, Heal et al. 2005).

This was no different than a mother in India, Thailand, Malaysia or the Maldives. However, Aceh's history of conflict and strong Islamic tradition has given it an identity different from any other community affected by the tsunami (Nowak and Caulfield 2008). The impact on Acehese women was disproportionate for many reasons, many of which resulted from Islamic inheritance laws and Acehese tradition. Shari'a law, which was officially recognized in Aceh in 2002, defines men's and women's roles and behaviors. It restricts women's movements, including economic and social participation. Husbands are designated as household leaders, economic providers and primary decision makers. From an Islamic standpoint, men and women are perceived as responsible for different things; the women are responsible for maintaining the domestic sphere (Nowak and Caulfield 2008). As noted by the Asia Pacific Forum on Women, Law and Development (APWLD) (2006), according to Shari'a law, Acehese women were prevented from registering as potential beneficiaries of housing assistance; consequently, widows were made vulnerable to eviction and poverty (APWLD 2006). The law contributed to an imbalance that not only made it more difficult for women to access aid and collect relief to which they were entitled, but it also decreased their opportunities to take part in the planning and reconstruction of their communities (Nowak and Caulfield 2008).

Immediate assessments by UNFPA noted the demographic changes caused by the overwhelming numbers of females killed by the tsunami; the change in household structure created implications for assistance planning, especially to single-parent households. Only one of Aceh's three provincial hospitals remained capable to perform cesarean sections, and surviving health personnel were overwhelmed and suffering their own losses. Reproductive health needs were high, and commodities were unavailable for foreign medical teams. For instance, the Singapore military contingent approached UNFPA requesting reproductive health kits for its

disaster response team as it had failed to account for reproductive health issues and needs when planning its response. Women's needs were immense, and assessments reported restricted mobility due to lack of headscarves and underwear, a scarcity of water for women to do chores, lack of antenatal care for pregnant women; the need for women physicians for gynecological services; exclusion from camp management issues; nighttime fear of latrines due to lack of electricity; and extra burden due to lack of humanitarian attention to the needs of the elderly. Finally, many traumatized survivors expressed the desire to pray but were prevented from doing so due to the aforementioned lack of headscarves as well as Korans (UNFPA 2005).

6.0 DISASTER RESPONSE AND RECOVERY

The objective of humanitarian response is to save and protect lives quickly and effectively in the event of disaster so as to reduce deaths, illness, deprivation and overall suffering. Underlying these goals are fundamental principles based on human rights and dignity, which are reflected by the various macro- and micro-level strategies employed by the international community responding to disaster. As such, a gender-sensitive approach is essential to fulfilling the principles and aims of disaster response and recovery efforts (Clifton and Gell 2001).

6.1 NGO CHALLENGES TO DISASTER RESPONSE AND RECOVERY

NGOs, government agencies and civil society have a significant role to play in reducing vulnerability to natural hazards (Oxfam 2009). NGOs encounter myriad challenges to disaster response and recovery. Even in the absence of an emergency context, many management impediments exist. Typical NGO challenges include the maintenance of clarity regarding the goals and purposes of the organization; managing accountabilities to clients, government, and donors; decision-making and record keeping; achieving a balance between participation and intervention; limiting hierarchy to maintain overall values and collegiality; management of irregular resource flows; and the complexity and unpredictability of operating contexts (Lewis 2007). Certainly none of these challenges is unique to NGOs; however, it is their blend that

makes them atypical. Add the dimension of a disaster and these NGO challenges become quickly complicated.

The challenges encountered by NGOs will vary according to context. The level, type and duration of strategies that are employed will also vary in every emergency (Frandsen 2002). The erratic nature of relief work requires different approaches than development. Operational issues are characterized by funding dynamics, logistics of emergency preparation (including decision-making and legality), inadequate coordination exacerbated by chaos, and competition of resources and control of emergency operations (Lindenberg and Bryant 2001). Coordination between NGOs is crucial; information and resource sharing minimizes duplication and waste and allows NGOs to be seen and heard by others, particularly national governments, donors, and UN agencies (Fowler 1997). This need for cooperation and joint action is ongoing in a humanitarian context; with more actors responding to disaster, the result is profound inter-organizational coordination challenges and pressures. Moreover, each aid project is brief with a changing configuration of responders (Faulkner and Foster 2004). Ideally, organizations should coordinate their efforts, learning from each other in practical ways. Coordination should also prevent the poor use and distribution of resources, a common accusation of NGOs in the field.

Post-disaster response and recovery activities represent a dynamic challenge of logistics and coordination. In addition to information sharing and management, coordination challenges include the procurement, transportation, and distribution of resources (VanRooyen and Leaning 2005). Geographical and cultural logistics also affect the coordination of resources. Identifying and meeting needs during the disaster recovery stage present a greater challenge than during the response stage, as a transition from relief activities to sustainable and meaningful reconstruction activities is required. Furthermore, while immediate relief activities represent a challenge of

logistics and coordination, the long-term challenges are more strategic in nature (VanRooyen and Leaning 2005).

Disaster and development have a special relationship. Disaster risk reduction has been referred to as the link between emergency relief operations and long-term development policies, as it impacts all areas of development, including governance, poverty reduction, health, and the environment (IRIN 2005). Post-disaster recovery is an opportunity to channel and leverage investments to improve the living standards of the poor, to enable participation of marginalized populations, and to establish communication between affected citizens and governments to increase accountability. It is a chance to ‘build back better’ by applying principles of sustainable development and risk reduction to communities and regions susceptible to future disasters (Yonder, Akcar et al. 2005). Following a disaster, recovery should optimally resemble accelerated development, ultimately reaching a state of sustainable growth. But the transition from relief to development is difficult, with challenges such as local market failings, social network disruptions and aid dependency often hampering necessary recovery and growth (Chakrabarti and Bhat 2006).

Despite the high-profile coverage of the tsunami, which resulted in fast and generous funding, agencies felt enormous public pressure to disperse funding quickly and visibly; formal needs assessments were therefore often neglected and the complexities of post-disaster recovery were underestimated. In a report by the Tsunami Evaluation Coalition (TEC), an international multi-agency effort to enhance humanitarian aid, international agencies were strongly criticized for excluding local organizations and disregarding their expertise (Batha and Irwin 2006). It is imperative that relief organizations transcend their independent and individualistic perspectives to effectively communicate and collaborate with other NGOs, local governments and

communities in the reconstruction and reestablishment of homes, municipal services, health systems, and livelihoods (VanRooyen and Leaning 2005). Short- and longer-term emergency interventions must be tailored to provide relief to all disaster-affected populations in a non-discriminatory manner, while recognizing and supporting the coping skills and capacities these populations acquire and possess (Sphere Project 2004) .

6.2 INCORPORATING GENDER INTO DISASTER RESPONSE

One of the challenges to effective delivery of resources, distribution of aid, and provision of health services in disasters has been defining what to do, when and with what level of priority (Carballo, Hernandez et al. 2005; Yonder, Akcar et al. 2005). The Indian Ocean Tsunami of 2004 was unprecedented, thereby presenting new and unique challenges to humanitarian aid workers. A comprehensive approach was crucial. However, within that comprehensive approach was a critical need for targeted strategies and interventions, especially when dealing with specific populations.

Three detailed efforts that have effectively incorporated gender into their design and have shown success in improving women's health outcomes in the field are the creation of international guidelines for disaster response, the supply and distribution of health and hygiene kits, and the training and deployment of community health workers. These efforts represent three interconnected yet very different levels of action, from international to community, and have been instrumental in addressing and improving the care of vulnerable groups in the aftermath of disasters.

6.2.1 International standards for disaster response

In response to blatant and exigent post-disaster needs such as coordination, quality, and accountability, several sets of voluntary self-regulating international guidelines for disaster response have been established. These international guidelines are a collection of minimum standards and best practices developed by actors representing all aspects of disaster response: UN agencies, government representatives, NGOs, civil society and a conglomerate of these groups. This broad collaboration shows a sector-wide commitment to the needs of affected populations in a humanitarian context, and are gleaned from lessons learned during previous large-scale humanitarian crises about the provision of aid and the mitigation of epidemics (VanRooyen and Leaning 2005). Despite efforts to incorporate gender into disaster response, NGOs have struggled to implement such ideas into the working construct of active relief efforts. The development of codes of practice is one means by which the international community has attempted to address and improve health outcomes for women following disasters (Miller and Arquilla 2007).

The Code of Conduct for the International Red Cross and Red Crescent Movement and NGOs in Disaster Relief was developed in 1994 by eight of the world's largest disaster response agencies. It is a code of ten principles (see Table 3) that guide humanitarian disaster response work and lays the foundation for relief delivery and sector-wide standards. The Code of Conduct also describes the importance of NGO relationships with donor governments, host governments and the UN system. NGOs around the world have publicly signed and voluntarily adopted the Code of Conduct, which has become something of a benchmark against which governments and disaster-affected communities can measure the actions of agencies in the field (IFRC 1994).

Table 3. Red Cross Code of Conduct for NGOs in Disaster Relief

Principles of Conduct for the International Red Cross and Red Crescent Movement and NGOs in Disaster Response Programs
1. The humanitarian imperative comes first.
2. Aid is given regardless of the race, creed or nationality of the recipients and without adverse distinction of any kind. Aid priorities are calculated on the basis of need alone.
3. Aid will not be used to further a particular political or religious standpoint.
4. We shall endeavor not to act as instruments of government foreign policy.
5. We shall respect culture and custom.
6. We shall attempt to build disaster response on local capacities.
7. Ways shall be found to involve program beneficiaries in the management of relief aid.
8. Relief aid must strive to reduce future vulnerabilities to disaster as well as meeting basic needs.
9. We hold ourselves accountable to both those we seek to assist and those from whom we accept resources.
10. In our information, publicity and advertising activities, we shall recognize disaster victims as dignified human beings, not hopeless objects.

(IFRC 1994)

A derivative of the Code of Conduct and an ongoing effort to quantify and standardize the provision of aid in large-scale public health emergencies is the Sphere Project, which has resulted in the Sphere Standards for Humanitarian Assistance (Sphere Project 2004; VanRooyen and Leaning 2005). The Sphere Project was launched in 1997 by a group of humanitarian NGOs and the Red Cross and Red Crescent as a way to define and uphold the global standards for disaster response. It is a set of guidelines that governs humanitarian action and emphasizes the

right of disaster-affected populations to dignity, protection and assistance. It is guided by international humanitarian, human rights and refugee laws as well as standards represented by the Codes of Conduct for the International Red Cross and Red Crescent Movement and NGOs in Disaster Relief. The Sphere Project has outlined a set of measurable minimum standards in five priority areas of disaster management: water supply and sanitation, nutrition, food aid, shelter, and health services. These standards and indicators are not exclusive to Sphere, but rather represent a compilation of best practices in the sector and a practical expression of these core principles (Sphere Project 2004).

Another set of international guidelines developed by a consortium of UN agencies, NGOs, and government representatives, the Minimum Initial Service Package (MISP) for Reproductive Health, was established in 1995 to address reproductive and maternal health needs in emergency situations (see Figure 11) (Carballo, Hernandez et al. 2005; Lalasz 2005). In the early phase of disaster response, the risk for complications of pregnancy and delivery is extremely high; therefore, certain aspects of reproductive health must be addressed immediately to reduce morbidity and mortality, particularly among women. The MISP is a coordinated set of priority activities intended for the early stages of conflict or natural disaster, assuring the delivery of basic, limited reproductive health services to affected populations as soon as possible. The MISP strategy includes coordination of reproductive health activities, essential medications, supplies and equipment, as well as planning for the provision of comprehensive reproductive health services. Because documented evidence justifies MISP's use, it can be implemented without a new needs assessment by appropriately trained staff. The MISP's importance and effectiveness has made it a standard in the 2004 revision of the Sphere Humanitarian Charter and Minimum Standards in Disaster Response (RHRC 2010).

While the Code of Conduct, the Sphere Project, and the MISP are widely recognized and accepted standards and principles for disaster relief, there are other collaborative agreements, including the Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP); the Oxfam Code of Conduct for NGOs; the People In Aid Code of Good Practice; *Projet Qualité*; *Synergie Qualité*, and the Humanitarian Accountability Project (HAP) (Coppola 2007). The common denominator of all the international standards and principles are the ideas of quality, impartiality and accountability, requiring the provision of aid to be delivered on the basis of need and regardless of race, faith, or nationality of the recipients and without discrimination of any kind (Oxfam 2009). This implies that humanitarian response to disaster must apply equally to women and men, requiring that interventions support and not diminish the role of women in disaster-affected populations (Clifton and Gell 2001).

6.2.2 Health and Hygiene Kits

The provision of gender-sensitive relief supplies is an effective and tangible method of gendered disaster management. Agencies have acted quickly in the early stages of emergency to distribute health and hygiene kits to disaster-affected women. Midwife supply kits and rudimentary delivery kits tend to include supplies for safe child delivery such as soap, plastic sheeting to lay on the ground, a clean razor blade for cutting the umbilical cord, a piece of string for tying it, and cloth to swaddle the baby immediately following delivery (Lalasz 2005).

Cultural sensitivity is important when preparing services and equipment, compiling clothing and designing health and hygiene kits for disaster relief. In conservative and patriarchal societies, cultural expectations require modesty; therefore, appropriate outerwear, underwear, head covering, and draping to limit exposure during medical examinations is crucial (Miller and

Arquilla 2007). Loss of privacy is another major issue, and female doctors are crucial to culturally-sensitive relief efforts since many women refuse to be seen by male doctors (Lalasz 2005; Miller and Arquilla 2007; Momsen 2010). Furthermore, a lack of headscarves has been cited as a significant impediment to women's mobility in conservative societies such as Aceh, further preventing their access to resources, services, and coping mechanisms such as public prayer (UNFPA 2005).

After the tsunami, UNFPA collaborated with local and national NGOs to provide and distribute 18 tons of hygiene kits, medicines, medical equipment and supplies to displaced women in Indonesia (UNFPA 2005). CARE, World Vision, and Oxfam responded similarly by delivering and distributing supplies for women and youth, keeping in mind the specific needs of pregnant women. Counseling and other psychosocial services were coordinated by UNFPA, the Indonesian Ministry of Health, and the Indonesian Psychologist Association and implemented through community support centers. In an effort to protect women from violence, UNFPA promoted safe access for women to basic services and provided gender-sensitivity training to government officials and community leaders in temporary settlements (UNFPA 2005).

6.2.3 Community Health Workers

At the ground level, participation of locals is essential to disaster response and recovery activities. The active involvement of women can enhance the potential effectiveness of disaster management. Women's experience can contribute to the process of assessing vulnerabilities and capacities as well as mobilizing communities for recovery. Empowerment is the only sustainable means for disaster victims to overcome their marginalized status, as it allows them to fulfill their basic human and economic developmental goals as defined by their families and communities.

Through their participation in planning, design, implementation, monitoring and evaluation, the process of recovery and reconstruction can transcend the provision of basic needs (Weist, Mocellin et al. 1994).

A way to empower women following disaster is by involving them as community health workers (CHWs). CHWs assist patients overcome barriers to people seeking medical care, including social stigma, lack of information, discrimination by medical personnel, and time constraints. Even when treatment is available, these and other barriers often prevent women from accessing much needed health care. CHWs accompany women through treatment, help monitor their needs, lead education campaigns, and empower other women in the community to take charge of their personal health. They often discover serious conditions of their patients at early stages, thereby making treatment more viable and less expensive. They can also strengthen health infrastructure and stimulate the local economy by creating income. CHWs are vital members of the community they serve (Partners In Health 2010).

After the tsunami, many organizations, including CARE (see Table 4), COHI, Oxfam and UNFPA, trained and employed women to administer health needs assessments, assist mobile health clinics, and offered support to female patients and doctors. Women helped to alleviate patient fears and anxiety by staying present during medical interactions or by translating medical histories (Miller and Arquilla 2007). In a place like Aceh, where vast numbers of health personnel died or were traumatized,¹ CHWs provided invaluable support to the health system and female patients (UNFPA 2005).

¹ According to the Indonesian Midwives' Association, 30 percent of its 5,500 members died in the tsunami (UNFPA 2005)

Table 4. An Illustration of CARE's Gender-based Tsunami Response in Indonesia

Women Helping Women after the Tsunami

ACEH BESAR, Indonesia - Having a baby is supposed to be a time of joy, but for Asnawiyah, it's a time of uncertainty, fear and shame. When the tsunami hit, Asnawiyah, eight months pregnant with her first child, struggled to run with the rest of her village to escape the deadly waves.

For two days she walked, barefoot, seeking shelter, sleeping on the open ground. Now, she lives with 900 other people in a temporary camp where women's rights and needs are far at the bottom of the list of priorities.

"I'm very happy I'm going to have a baby. I've waited so long," said Asnawiyah, 35, "but I can't be as happy as I should be because of these conditions. How can I have a baby here? How will I breastfeed in front of all these people?"

The tsunami that surged through the coastal villages and cities of Indonesia took more than 250,000 lives. But for women, it took their dignity as well.

Most women in Aceh province, where Asnawiyah is from, are conservative Muslims. They cannot appear in public without a headscarf, and staying with men who are not from their own family is taboo.

How, then, does a woman in a temporary camp live in a tent with six other families — including men?

CARE, one of the many international agencies delivering emergency relief and rehabilitation in the more than 75 temporary camps in Aceh, is working to address women's issues in the camps.

In addition to distributing food, water purification kits and emergency supplies, CARE has assembled a team of health workers to deal specifically with women in the aftermath of the disaster.

Led by Dr. Nuretha Hevy Purwaningtyas, female CARE workers go from camp to camp to deliver prenatal care, teach women about reproductive health and nutrition in emergency situations, and deliver hygiene kits, condoms and oral contraceptives.

"When an emergency happens, you think mainly about the immediate needs: food, water, shelter. But for women, there are so many other things you have to consider, that are also extremely important," said Dr. Nuretha.

While men simply go down to the river and strip naked to bathe, women step into the water fully clothed, headscarves on, and try to wash themselves under their clothes.

They then walk back up the riverbank, sopping wet, and step into the tent to change — putting their dry clothes on over top of their wet ones, then pulling off the garments from underneath.

The whole process takes more than an hour, and the result is that the women are clean, but their new clothes are now wet, too. In this humid tropical climate, being wet for so long has caused women to develop an itchy rash all over their bodies.

Table 4. Continued

"It never goes away," says Asmawati, who fled to the camp with her two children. She rolls up her sleeves to reveal her affected arms. "It is from being wet all the time. Our clothes are never dry."

The women in this camp have tried to make things as organized as possible. They strung sarongs from the poles in the tent, sectioning off separate areas for each family.

Their bed rolls and pillows are stacked neatly at the sides, the bags of donated rice and plastic cups and plates carefully cleaned and stored.

But some aspects of a women's life are not so easily organized. When the tsunami hit Asmawati's village, the women fled with nothing but the clothing they wore, not even shoes. Three of the women with Asmawati were menstruating.

"They had no sanitary napkins, and we had no rags to give them," she said. "The women were very ashamed. They cried, but there was nothing we could do."

In the first month of the emergency, Dr. Nuretha and her team have distributed hygiene kits to about 1,500 families in the camps. The kits include toothpaste and toothbrush, shampoo, underwear, clothing, washing pail — and a month's supply of sanitary napkins.

Today, Dr. Nuretha gave Asnawiyah and the two other pregnant women in the camp delivery kits with a large plastic sheet, towel, swaddling blanket and antiseptic soap. The women will take the kits to the local midwife when they go into labor.

It doesn't resolve Asnawiyah's worries about where her family will live in the future, but at least she knows the delivery of her baby will be that much safer.

"It is hard to be a woman in the camps. There are so many things I used to take for granted," she said, looking around the crowded tent that is now her home. "So you can't understand until you're here how much it means to us that other women are looking after us."

(Brooks 2005)

7.0 DISCUSSION

In theory, incorporating gender into disaster management is an ideal way to improve health outcomes. Unfortunately, gender-blind disaster management is much easier than a gender-sensitive approach. There is no doubt that the large-scale efforts to incorporate gender into disaster response have been effective; the adherence to international guidelines and principles, distribution of health and hygiene kits, and involvement of women as community health workers (CHWs) all helped to minimize the tsunami's impact on women, thereby indirectly improving individual, family and community outcomes. The question remains: just how much of an effect did they have?

Effectiveness of interventions is hard to measure. According to a sector-wide standard, effectiveness of emergency interventions should be reflected by the prevention of epidemics as well as the reduction of excess mortality. If we apply these criteria, then the aforementioned interventions can probably be considered effective. More explicitly, effectiveness could be assessed by the aversion of a humanitarian crisis, the basic measure of which is a crude mortality rate (CMR) of more than one per 10,000 per day. The real challenge in measuring CMR in Indonesia and Sri Lanka following the tsunami involved the estimation of the denominator, or the total population at risk. In addition to a reduction of mortality and disease, another gauge of effectiveness could be the speed with which relief agencies are able collect and report this data, perhaps indicating that agencies have reached and accounted for at-risk populations and are able

to sustain an ongoing assessment of the impact of their interventions (VanRooyen and Leaning 2005).

Despite the relatively vague information available documenting the direct effects of each of these different, yet interlinked gender-sensitive efforts, it is reasonable to accept that these three measures were effective in improving health outcomes following the tsunami. Indeed, without international guidelines, health and hygiene kits, and CHWs, women and their families would have endured greater suffering. Still, there is a lack of information about post-tsunami health in general, save for a handful of studies on mental health and PTSD, clinical observations such as types of wounds, and epidemiological profiles, the latter two of which are largely short-term concerns. This is not surprising considering their relation to displacement camps, the very conditions of which are often worse than the disasters themselves, and where the attention to needs is critical. Displacement camps are spaces where communicable diseases spread, violence thrives and health suffers. However, they are also places of great potential, where large numbers of people can be reached, immediate needs can be met, and long-term problems averted. Scale and efficiency of interventions such as distribution of health and hygiene kits are increased by the conveniences afforded by the camps. Unfortunately, interventions focusing on short-term needs of displaced populations often fail to effectively transition to long-term development activities.

7.1 NUTRITION: A SUSTAINABLE OPPORTUNITY

There is a general dearth of literature addressing the importance and potential of nutrition in disaster response. International guidelines allude to the importance of access to ‘adequate’

nutrition (Sphere Project 2004), and limited studies mention the opportunity for vitamin supplementation, especially for short-term interventions within displaced populations (VanRooyen and Leaning 2005; Miller and Arquilla 2007). There are also references made to the distribution of certain enriched/fortified food commodities following the tsunami (UNDP 2007; SGHI 2009; WFP 2010), though detailed information is vague and spotty. More research on the outcomes of nutrition interventions is definitely warranted, as nutritional needs following the tsunami were significant (see Table 5). Targeted attention to nutrition within existing interventions is important; nutrition presents the opportunity to address the short-term needs of a variety of people in a way that could make a substantial difference for health and development in the long term.

Table 5. Case from Aceh Highlighting Gender-sensitive Nutritional Problems

In the first three months after the tsunami, the supply of food and other basic needs was one of the major problems. Women first fed their children and very often went hungry so many of them suffered from malnutrition and hunger. Malnutrition of pregnant and breastfeeding women led to malnutrition and morbidity of their babies. In addition to insufficient supply, food distributed by various international and national agencies was mainly instant noodles. Majority of evacuees living in makeshift tents and barracks lacked appropriate kitchen utensils to cook instant noodles. Other food supplies were biscuits, canned food or rice without any accompanying side dishes and there were frequent incidents of expired food products.

Tsunami Aftermath: Violations of Women's Rights in Nanggroe, Aceh, Darussalam
(APWLD 2006)

Proper nutrition is imperative for good health. Many of the illnesses that disaster-affected women suffer result from or are worsened by poor nutritional status and/or starvation. Currently, nutrition in disaster response appears to focus primarily on the supply and distribution of food commodities. However, food aid generally fails to take women's greater nutritional

requirements into account. Moreover, discriminatory food distribution practices favoring men often leave women without enough food to sustain good health (Kelley 1988). Providing food aid is important; however, it is not simply the provision of food that matters, it is the quality of those provisions, especially in the long term. While we tend to consider malnutrition to be a shortage of calories, it is equally a dearth of micronutrients in the diet.

Micronutrients are important vitamins and minerals essential for human growth and survival. Micronutrient deficiencies are a significant public health problem in developing countries. The underlying cause of micronutrient deficiency is related to diet, as the majority of the poor consume insufficient amounts of nutrient-rich foods such as meat, eggs, fish, milk, legumes, fruits and vegetables. This problem is exacerbated by inadequate health care and sanitation, disease, and lack of education in maternal and infant health. (Micronutrient Initiative 2009). The results of billions of people around the world living with vitamin and mineral deficiencies are significant:

- 1.1 million children under age five die due to vitamin A and zinc deficiencies;
- 136,000 women and children die because of iron-deficiency anemia;
- 18 million babies are born mentally impaired due to maternal iodine deficiency;
- 150,000 babies are born with severe birth defects as a result of inadequate maternal folate intake;
- 350,000 children become blind due to vitamin A deficiency; and
- 1.6 billion people suffer reduced productive capacity due to anemia.

(Micronutrient Initiative 2009).

When large populations suffer effects of malnutrition, entire nations fail to reach their potential, leading to an increase in health care costs, a reduction in productivity, and a decrease in economic activity; nearly 2% of a developing nation's gross domestic product is lost through

these drains on the healthcare system and from lower productivity (Project Healthy Children 2010).

Micronutrient interventions are among the cheapest, effective, and most sustainable forms of foreign assistance. Providing these vitamins and minerals through fortification, bio-fortification, or supplementation is a cost-effective and proven solution in development; it has been shown to improve the health of the world's most vulnerable citizens, especially women and children, who struggle to gain access to nutritious food (Micronutrient Initiative 2009). Since malnutrition including vitamin and mineral deficiencies have been linked to increased risk of infection and to about half of childhood deaths, it is vital to provide foods adequate in essential vitamins and minerals to the vulnerable population groups such as mothers and young children (SGHI 2009).

Three micronutrient interventions designed to target vitamin and mineral deficiencies are fortification, bio-fortification, and supplementation (Micronutrient Initiative 2009). Fortification is the process of adding micronutrients to the commercial food supply, such as adding vitamins and minerals to wheat flour. Fortification is hailed for its quick and effective benefits to populations without requiring behavioral change. Not only is it easy and effective, but it presents an opportunity to improve the quality and delivery of existing food aid following disaster. Bio-fortification is the fusion of agriculture and nutrition. It includes techniques to grow traditional crops, such as the sweet potato, with enhanced micronutrients so that they naturally contain iron, zinc or vitamin A. Bio-fortification is slow, but its impact is significant. However, it is less ideal for post-disaster settings, especially if land has been damaged and requires desalinization. Supplementation involves enhancing the diet by adding vitamins in the

form of capsules, drinks, Sprinkles² or candies, for example, and provides the best return on investment, according to the Copenhagen Consensus 2008; however, reaching dispersed populations can be difficult (Micronutrient Initiative 2009). Furthermore, even if women are provided vitamins, they may resist taking them for fear that they are contraceptive pills. However, supplementation is promising for a post-disaster camp setting, as circumstances may provide a platform for nutritional education and easy distribution.

Micronutrient interventions have been implemented in development settings with great results (Micronutrient Initiative 2009). They have also been included in disaster response, the results of which have been poorly documented. What we do know is that there are cooperative networks of government, NGO and multi-lateral agencies that provide food aid in both development and disaster settings. For instance, the World Food Program (WFP) and its partners deliver and distribute products including ready-to-use foods (RUFs) such as Plumpy'Doz, high-energy biscuits (HEBs), Sprinkles, and compressed food bars in their emergency operations (WFP 2010). Other NGOs such as World Vision, CARE, and UNFPA have collaborated to supply micronutrients to disaster-affected populations. Helen Keller International (HKI) and its partners initiated the 'Supplementation with Micronutrients' program to provide Sprinkles, vitamin A capsules, zinc tablets and iron-fortified soy and fish sauces. Through this program HKI distributed 28 million Vitalita Sprinkles sachets in Indonesia following the tsunami (SGHI 2009).

² Sprinkles are sachets (like small packets of sugar) containing a blend of micronutrients in powder form, which are easily sprinkled onto foods prepared in the home. Any homemade food can be instantly fortified by adding Sprinkles. Coating of the iron prevents changes to the taste, color or texture of the food to which Sprinkles are added. Sprinkles were developed by the Sprinkles Global Health Initiative to prevent and treat micronutrient deficiencies among young children and other vulnerable groups at risk (SGHI 2009).

Increased mindfulness to nutrition and food aid can only improve the benefits of existing programs and interventions. Micronutrient-enhanced food aid would have an important impact on vulnerable populations, especially pregnant or lactating mothers. However, the distribution of fortified food and inclusion of micronutrients in health and hygiene kits is not enough; delivery must go hand-in-hand with training for proper usage. Incorporating micronutrient interventions into existing health programs such as health and hygiene kits and deployment of CHWs shows great promise for future disaster relief.

7.2 MICRONUTRIENT INTERVENTIONS FOR DISASTER RESPONSE

The health and hygiene kits and CHWs were especially effective for improving health outcomes of tsunami-affected populations. Individually, they fit hand-in-hand; as a pair, they overlap to address both short- and long-term needs. While health and hygiene kits dealt more with immediate needs of the displaced population, the impact of CHWs is really more apparent in the long term. Implemented together, as illustrated by CARE's example, they can be especially effective.

One way that success and sustainability of health and hygiene kits and CHWs could be improved is (1) to incorporate a nutritional component into the health and hygiene kits, and (2) to employ CHWs to deliver kits directly to women. CARE showed that a program combining health and hygiene kits with CHWs would ensure that women are involved on both ends. Women-to-women distribution of aid would empower those engaged in participation, while recipients would be guaranteed more equitable access to resources and services. Furthermore, CHWs could benefit from the opportunity to train and educate communities in how to use and

benefit from the nutritional components, thereby increasing their acceptance and effectiveness in the community.

Prioritizing nutrition for a combined CHW and health and hygiene kit program would improve post-disaster and long-term outcomes. The incorporation of both fortification and supplementation would have the greatest impact on women; however, it is most realistic for the health and hygiene kits to include supplementation with Sprinkles or vitamins. Sprinkles seem particularly promising for disaster response and transition programming. Adding Sprinkles to common foods such as salt, sugar, flour and cooking oil is easy, and the increased folic acid, vitamin A, iron and zinc will be effective in reducing birth defects, anemia and diarrhea. While fear of toxicity resulting from the overuse of Sprinkles is a valid concern, explicit instructions would be conveyed by CHWs to prevent misuse. Prenatal vitamins and other supplementation for women and their families show similar potential, and would address many of the aforementioned vitamin and mineral deficiencies. Zinc supplementation, for instance, would be a terrific investment as it would offer prevention and “treatment” for diarrheal diseases, a major cause of death especially in malnourished children.

The results of individual health and hygiene kit and CHW programs have been good, but a comprehensive approach would be better. With the low cost of micronutrients interventions and their high returns in improved health and capacity, the cost-benefit ratio of micronutrient programming is unrivaled by any other comprehensive health or economic intervention (Micronutrient Initiative 2009). Incorporation of micronutrients interventions within disaster and development programming would require strong partnerships, committed funding, large-scale coordination, strategic planning and steadfast cooperation at local and international levels and during all phases of disaster management. Prioritizing nutrition would help reduce poor health

of women, their families and their communities, thereby improving capacity, productivity and quality of life.

8.0 CONCLUSIONS

The health of women and men is affected differently during disasters due to factors which intensify individual, social and economic vulnerabilities. Moreover, women and children were disproportionately affected by the tsunami. In addition to biological differences such as physical strength and pregnancy, women were limited by socially-determined differences associated with gender roles. Health as a human right is crucial to the psychological, reproductive, nutritional, social, and economic well-being of women, and can be severely impacted by disaster. Furthermore, women's health is a determinant of communal health outcomes, including resilience. Since the health of women affects the entire community, sensitivity to gender in disaster response has the dual advantage of ensuring that women's needs are met, while at the same time improving the welfare of their family and often, the community in which they live.

Health disparities for women can be mitigated through proper preparation and prompt, gender-sensitive response. Women must be included in decision-making about response and recovery efforts. However, this goal remains difficult to realize, especially in societies where women may be significantly disenfranchised prior to the disaster. If willing and able, women should participate in community forums, offering input regarding decisions such as temporary living arrangements. Women and girls need access to culturally appropriate clothing, sanitary supplies, contraceptives, security, privacy, and emergency health necessities such as gynecological and obstetrical supplies. Furthermore, women should be included in the

distribution of these supplies. Programs must offer support for pregnant and lactating women, including nutritional food supplements, prenatal vitamins and infant formula. Protection against trafficking for both boys and girls, especially while displaced, is vital. Women must be offered additional income support; economic recovery programs should be gender-sensitive. Finally, as caregivers with expanded responsibilities, women must be offered additional support to tend to the needs of themselves and their families (GDN 2008).

Meeting the needs of disaster-affected women is undeniably complex. The tsunami required the international community to respond in a way that had never been seen before. While many things have been done well, there is definitely room for improvement. The entire sector recognizes this, as reflected by the availability of international guidelines and best practices for disaster response. As the cases of CARE, UNFPA, and COHI in post-tsunami Sri Lanka and Indonesia have illustrated, women's inclusion in disaster response can increase a program's success. Specific, gender-sensitive approaches to women's needs, such as the delivery and distribution of health and hygiene kits and deployment of health workers into the community, are strategies that can make a difference in the immediate and long term.

Gender-sensitive disaster response should be enhanced by simple attention to one of the basic building blocks of good health: nutrition. Nutrition, while significant for development, is perhaps even more imperative in the post-disaster context. Quality, varied diets would resolve most nutritional problems; however, improving the diets of displaced and often poor populations requires well-integrated strategies implemented within various levels of the disaster process. Incorporating micronutrient interventions into existing disaster response programming, in particular the combination health and hygiene kits and CHWs, presents an opportunity for better health outcomes and improved transition into development work. Vitamin and mineral

supplementation could reduce extreme nutritional problems; moreover, their relatively low cost and high return makes micronutrients a terrific investment.

With the aforementioned increase in severity and frequency of natural disasters, their resulting complexities, and the challenges faced by the humanitarian community, new approaches to disaster management are necessary. While disaster response has traditionally concentrated on the distribution of emergency relief and the delivery of urgent services, it is becoming clear that better strategies are required to reduce the individual, social and economic consequences of these emergencies. This requires equal attention to women and their unique needs, as well as an emphasis on their strengths and capabilities. The role of women in disaster response is essential to securing better health and preparing for and managing future disasters. Public health and development practitioners must make a concerted effort to incorporate a gender perspective from the start, while maintaining emphasis on the importance and potential of nutrition in the lives of all disaster-affected populations.

APPENDIX A: HEALTH EFFECTS OF TSUNAMIS

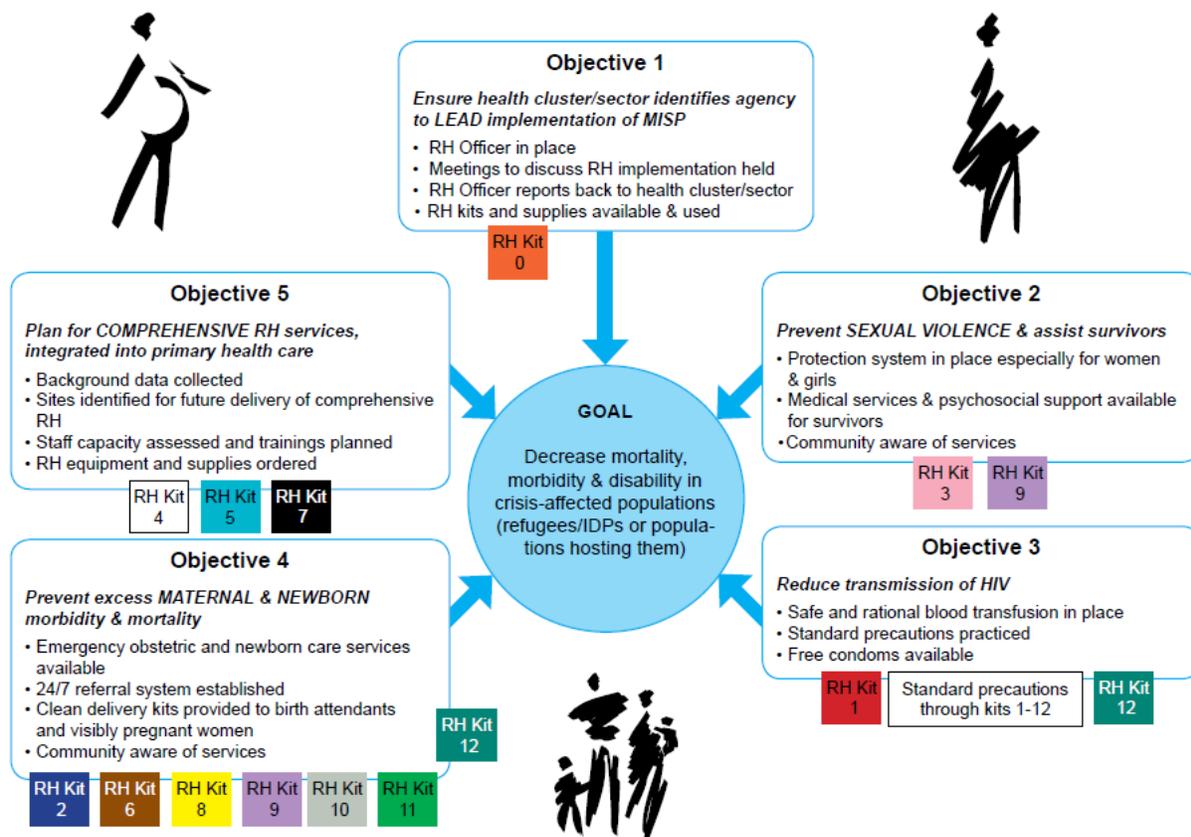
Figure 10. Health effects of tsunamis

Immediate health concerns	<ul style="list-style-type: none"> - After the rescue of survivors, primary public health concerns are clean drinking water, food, shelter, and medical care for injuries - Standing water from flooding can pose health risks such as contaminated drinking sources and food supplies - Loss of shelter renders people vulnerable to heat, insects, and other environmental hazards - The majority of deaths associated with tsunamis are related to drowning; however, traumatic injuries are also a primary concern. Injuries such as broken limbs and head trauma are caused by the physical impact of people being washed into debris such as houses, trees, and other stationary items. As the water recedes, the strong suction of debris being pulled into large populated areas can further injure as well as undermine buildings and services - Medical care is critical in areas where little medical care exists
Secondary effects	<ul style="list-style-type: none"> - Natural disasters do not necessarily cause an increase in infectious disease outbreaks. However, contaminated water and food supplies as well as the lack of shelter and medical care may have a secondary effect of exacerbating illnesses that already existed in the area. - Decaying bodies create very little risk of major disease outbreaks - The people most at risk are those who handle the bodies or prepare them for burial
Long-lasting effects	<p>The effects of a disaster are long-lasting. The greater need for financial and material assistance is in the months after the disaster, including:</p> <ul style="list-style-type: none"> - Surveying and monitoring for infectious and water- or vector-borne diseases - Diverting medical supplies from unaffected areas to meet the needs of the affected regions - Restoring normal primary health services, water systems, housing and employment - Assisting the community with social and psychological recovery when the crisis has subsided

Adapted from CDC: Emergency Preparedness and Response, Health Effects of Tsunamis, online at <http://www.bt.cdc.gov/disasters/tsunamis/healtheff.asp>

APPENDIX B: MINIMUM INITIAL SERVICE PACKAGE (MISP)

Figure 11. Minimum Initial Service Package (MISP) for Reproductive Health



RHRC. (2010). "Minimum Initial Service Package (MISP) for Reproductive Health in Crisis Situations." Available from <http://misp.rhrc.org/>.

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