Many non-medical policy makers, planners and response teams have in the past assumed the mass post-disaster population to be homogenous, and have staged disaster shelters and services that overlooked the specific needs of women. This has led to unnecessary suffering, discomfort and slower recoveries for female disaster victims. This research seeks to not only identify gender disparities in disasters, but also socially constructed and biological differences in health and behavior, and to emphasize interventions that could significantly reduce long-term care costs and recoveries. It is the authors’ contention that proactive “Gender-Aware Disaster Care”—coupled with supplies, services, triage and treatment—would facilitate more efficient interventions in mitigation, needs assessment, care and recovery for women and their families. Thus this work can make significant contributions to gender-aware disaster care and policies, especially among first responders, emergency managers, EMS crews and volunteer organizations that stage and provide shelter and services to evacuees.

Keywords: Gender, disaster, women

Introduction

As Emergency Medical Service (EMS) providers, we have worked in refugee emergencies and international aid efforts in Africa and Central America, and also natural disasters such as Hurricane Ike and Katrina in the U.S.A. In these emergencies, we’ve witnessed firsthand how many special populations' needs are taken into account in the event of a disaster - infants, the elderly, the deaf, the disabled, and so on—however we
must be more cognizant of women's needs, which are based not only on their physiological, their psychosocial makeup. It's all too easy for disaster aid workers (especially those of us in medical services), to focus a narrow view on women's physiological, reproductive, and maternal functions during a disaster, without looking further into gender-based biology and engendered aid and health issues.

The World Health Organization (2002) has found that there is a pattern of gender differentiation at all levels of the disaster process—in preparedness, response, physical and psychological impact, risk perception, risk exposure, recovery and reconstruction. Indeed, gender is a “central organizing principle of all societies and the basis of the everyday routines and social interaction of women and men, boys and girls around the world. This social fact makes gender inescapably part of the social fabric made visible in disasters” (Enarson 2008, p. 8).

Despite these observations, gender-based disaster research, planning and aid remains a fledging science, struggling for widespread acknowledgement and implementation among the more veteran “special needs” groups and limited resources in disaster aid. But when half of a community (i.e. women) is less visible or invisible in planning and relief efforts—it isn’t half of the “whole vision” of response absent? Consider the tremendous untapped potential that awaits any program gender-savvy enough to plan, strategize and manage relief efforts with women rather than for them.

Many non-medical disaster planners and response teams have assumed in past years that the post-disaster population is a homogenous group, and thus have staged disaster shelters and supplies that overlooked the specific needs of women. This has led to unnecessary suffering, discomfort and slower recovery times for female disaster victims. The purpose of this article is to not only identify gender disparities in disasters (causes and consequences of vulnerability), but also socially constructed (gender) and biological-based (sex) differences in health and behavior, and to emphasize feasible interventions that could significantly reduce pain, suffering, long-term post-disaster care costs, and recovery time. It is the authors’ contention that proactive and practical Gender-Aware Disaster Care—coupled with gender-specific supplies, services, triage and treatment—would allow disaster practitioners to facilitate more efficient interventions in mitigation, needs assessment (preparedness), care (response), and recovery for women and their families. Thus, this work can make significant contributions to gender-aware disaster care, planning and policies—especially among first responders, emergency managers, EMS crews, and volunteer organizations that stage and provide shelter, supplies, and services to evacuees.

Before delving deeper into this topic, perhaps we should emphasize these two fundamental points. First, gender-based disaster research is not a zero-sum game, in which every word written on female suffering leads to one less word written on male suffering, or vice versa. At its core, this work hopes to highlight sex- and gender-based differences that might be more effectively harnessed in disaster mitigation, preparedness,
response, and recovery efforts. Second, this article does not condone nor suggest that men remain unaffected by disasters. Rather it serves as a filtered “gender lens” that shows how men and women are constrained by their socialization and differentially impacted by disasters.

**Gender Does Matter**

When disasters strike, their path of destruction may be indiscriminate, but the consequent damage is not. Social injustices and structural violence create inequalities, and those already denied an equitable share of resources find themselves disproportionately affected by a disaster’s destruction. Women are disproportionately affected by natural disasters, usually as a result of their gendered status in society and women are “made more vulnerable” to disasters through their socially constructed roles (Pan American Health Organization 2004).

In January of 2010, the strongest earthquake in more than 200 years (7.0 on the Richter scale) struck Haiti, a nation where women already suffered from deep-seated inequalities and vulnerabilities such as sexual violence and low prosecution of rape, low socio-economic status, enslavement and human trafficking (WHRDIC 2010). Haitian women’s high HIV infection rates (pre-disaster rates as high as 60%) and estimates of 37,000 pregnant women among the earthquake survivors placed many Haitian women at high risk for medical emergencies and need for EMS intervention (WHRDIC 2010). One innovative gender-based initiative to spearhead recovery and reconstruction efforts among Haitian women is the Myriam Merlet, Anne Marie Coriolan and Magali Marcelin Feminist International Camp, named after three Haitian feminist activists killed in the quake. Just weeks after the disaster, the camp was established in Jimani, at the Haiti-Dominican Republic border and opened a resource distribution center, a health clinic for women and children, and a communications center (WHRDIC 2010). Among the first of its kind to gain international attention, it was organized by several women’s groups to scrutinize and demand legal action regarding any violations of women’s human rights, such as rape, aid issues, etc., during the earthquake and its aftermath. The critical provision of a principal point of contact for women to network with other women and gather any gender-aware information, services, supplies and support that are available (such as childcare, lactation assistance, sexual and domestic abuse counseling, etc.) should not be overlooked and is included later in the author’s “Gender-Aware Disaster Support and Services Checklist” (see below).

But gender-based initiatives like the Merlet camp in Haiti and gender disaster research can prove unwieldy, as gender is a “cross-cutting principle interacting with all other social markers such as economic status, age, ethnicity, and ability” (Enarson 2008). Current research finds that these social markers point to particular groups of women, especially single mothers, the disabled, and the impoverished, and that they are less able
to anticipate, prepare for, cope with and recover from the effects of a disaster (Neumayer and Plümper 2007). Neumayer and Plümper also report that low socio-economic status renders women more vulnerable to the mortal impact of natural disasters, and the more adverse an impact of a disaster is “clearly contingent” on the extent of socially constructed vulnerability so there is “nothing natural” about the socially constructed (i.e. man-made) aspects concerning the gendered impact of disasters on life expectancy.

Yet another issue to be addressed in gender-based research is disaster type, with each manner of disaster holding a range of differing impacts and implications for women. In broad-based terms and addressing a variety of major disaster types, research has found that especially (1) in epidemics women can bear disproportionate caretaker burdens; (2) in refugee emergencies women, as primary caregivers, can suffer extreme social and familial disruption, increased work demands, sexual violence and psychosocial trauma; (3) in armed conflict women tend to suffer more profound psychological trauma than in natural disasters; and finally, (4) in floods a women’s social position and authority can be negatively impacted if the home is destroyed (Mocellin, Motsisi and Wiest 1994). It is important to note that these impacts are not limited to these particular disaster types and that women can bear these burdens across all disaster types. Women’s issues, of course, vary in degree and intensity throughout every disaster type, and their vulnerabilities are impacted by social factors such as economic imbalance, disparity in power among social groups, knowledge dissemination and discrimination in welfare and social protection, as well as biological factors such as pregnancy, pre-existing health conditions, and more.

There are many examples of engendered disaster issues and fatalities. For instance, a disproportionate number of female fatalities occurred during a 1991 cyclone in Bangladesh in that many women died in their homes with their children because they had to wait for their husbands or male relatives to make evacuation decisions. During this cyclone one report described a father who, when unable to hold onto both his son and his daughter from being swept away by a tidal surge, helplessly released his daughter, because “… (this) son has to carry on the family line” (WHO 2002). Excessive female deaths also occurred in India during flooding as boys were viewed as “more valuable” than girls (Mocellin et al. 1994). Other examples come from the 2005 South Asian tsunami, where women’s cultural barriers—such heavy clothing, an inability to swim or climb trees, loss of head covering, and a fear of public nakedness—all contributed to an overabundance of women’s deaths (UNIFEM 2005). The emergent field of sex-based “mortality vulnerability” disaster research is helping to examine and explain men and women’s unique experiences. Neumayer and Plümper (2007) point to three main causes for gender differences in mortality vulnerability to natural disasters: biological and physiological differences, social norms and role behavior, and a shortage of resources and a breakdown of social order (2007). These causes do not function independently of one another and can lead to fierce individual competition and exacerbate existing forms of gender discrimination. In their research they also reported that natural disasters lower the
life expectancy of women more than that of men and that socially constructed gender-specific vulnerabilities lead to the relatively higher female disaster mortality rates in comparison to men.

**Gender-Based Risks**

Though there are often many risks that coexist during a disaster, recent gender-based disaster research points to several specific critical and pervasive conditions. The following is an abbreviated list of thirteen fundamental gender-based risks, which have been sub-divided into causes and consequences of vulnerability.

**Causes of Vulnerability**

*Less Access to Resources.* Globally, women have less access to resources that are essential in disaster preparedness, mitigation and rehabilitation. These include transportation, social networks and influences, and decision-making skills (PAHO 2004). In addition, government-sponsored sex-based discrimination can render women unequal before the law, restricting women's legal authority, “public life” access, and participation in disaster preparedness, evacuation, mitigation and recovery efforts.

*Gendered Division of Labor.* Worldwide, women predominantly hold underpaid jobs in agriculture, self-employment, and the informal economy. These sectors are the ones most severely impacted by natural disasters, which leaves women over-represented among the unemployed after a natural disaster (PAHO 2004).

*Less Able to Migrate for Employment.* The need to care for the home and children, elderly, or disabled family members oftentimes renders women less able to seek out employment opportunities or relocate for employment (Enarson 2003).

*Increase in Women’s Domestic Chores.* Inadequate post-disaster settings and refugee shelters increase women’s traditional household chores such as providing adequate resources for cooking, bathing, etc. These demands leave women even less freedom and mobility to look for work (PAHO 2004).

*Most Likely to Be or Become Sole Economic Providers.* Following a disaster, women are more likely to be left responsible for elderly or disabled family members and children (Enarson 2003). Some agencies have referred to this as the post-disaster “flight of men”.

*Social Taboos and Isolation.* Globally, women can suffer from less personal autonomy, as well as a lack of knowledge of how to access emergency assistance or the capacity to do so. But as noted by WHO (2002), women suffer different social taboos (menstruation and nudity), psychological issues (lower value status for help, more stress), patriarchal/religious/cultural restrictions (female receipt of medical care from male-only staff, loss of head and body covering), and medical complications (pregnancy loss, vaginal infections).
Lack of Gender-Disaggregated Data. Statistics-gathering remains weak and fragmented in many low-income countries and vital statistics on gender are non-existent in 90 percent of the developing world (World Bank 2009). According to Mayra Buvinic, Sector Director, Gender and Development, with the World Bank’s Poverty Reduction and Economic Management Network, “The fact that we still have not fully mainstreamed gender issues amounts to exclusion of women...For data that is fundamental to promote growth and poverty reduction, we need to make women more visible in statistics” (2009). The current lack of gender-disaggregated data serves to keep women “invisible” among special interest group initiatives and (ultimately) leads to the exclusion of women’s issues in planning and aid.

Underrepresentation. Low gender representation and decision making in high-level emergency management and planning organizations, roles, and professions can leave women’s issues less visible in the mainstream “malestream” (Richter 2007). There also remains a great need for family-friendly emergency workplaces so that women can expand their career and volunteer opportunities, and single mothers and two-career “response role” households can meet daunting post-disaster childcare challenges.

Disproportionate Health Issues. Due to inadequate or nonexistent OB/GYN healthcare, female physicians and limited reproductive control, women suffer from limited healthcare access, infections, premature births, malnutrition, unwanted pregnancies, and pregnancy losses (WHO 2002). “Due to their reproductive roles, women are particularly negatively affected if the basic healthcare infrastructure is severely damaged or health expenditures are reduced to re-allocate funds for immediate disaster response purposes” (Neumayer and Plümper 2007). Plus, a lack gender-aware supplies and services can place women at higher risk for illness, increase morbidity and/or mortality rates, and increase other long-term medical interventions such as multiple emergency room, physician and therapist visits (Richter 2007). Richter (2007) also found that the majority (53%) of surveyed female Hurricane Katrina evacuees reported that, not only had their specific healthcare needs not been met, but that they had inequitable access to resources (54%), especially in aid.

Consequences of Vulnerability

Loss of “Bargaining Position” in Household. When a woman’s economic resources and household are taken away, her social position and authority is adversely affected (PAHO 2004).

Heightened Perception of Risk. Women perceive disaster threats as more risky than men, and women suffer more distress and emotional disorders in disasters. However, overall declines in emotional well-being may be due to expanded post-disaster caregiving roles (WHO 2002).

Increase in Domestic and Sexual Violence. In the wake of loss of social authority (such as a police force), women are left unprotected from crimes such as rape, violence,
theft and other forms of exploitation. One recent example of this was a 2007 report where one in six of surveyed females reported domestic abuse after Hurricane Katrina (Whoriskey 2007).

Higher Dependence on Social Services. Women rely more on social services and facilities such as schools, clinics, childcare centers, public services, as well as water, fuel (wood), crops and other natural resources (Enarson 2003). Conversely, there may be gender-based behavioral differences in disaster behavior that can be positively exploited. For instance, Richter (2008) noted that the majority of female Hurricane Katrina evacuees (51%) reported that they had been the primary decision-maker in the evacuation process. This was a pivotal finding in itself, as some disaster researchers have reported significant differences in risk perception and evacuation behaviors between men and women. One such researcher is noted disaster specialist Betty Morrow, Ph.D., a professor emerita at Florida International University’s International Hurricane Center in Miami, who believes that, “If there is a definitive gender difference in disasters, women are more likely to evacuate and weigh risk more heavily than men. I can’t tell you how many men I’ve interviewed in FEMA trailers and shelters who said, ‘I wish I’d listened to her’” (Richter 2006, p. 44). This gender-based evacuation behavior should be positively exploited, with women becoming a targeted focus in disaster preparedness training and evacuation notification—an effort that could facilitate more timely evacuations. Richter’s research also showed that that the key determinant to a woman being a primary decision-maker in her household’s evacuation was her level of education, a more significant factor than either her race or even marital status.

Gender, Sex, Health and Disease

Having outlined a few gender disparities and differences in disasters, let us uncover socially constructed (gender) and biological-based (sex) differences in health and disease first in non-disaster settings, and then show how these differences might impact women in disasters. The intention is to illustrate which of these changes are physiological, which are socially constructed, and to identify how disaster planners, policy makers, first responders and EMS crews can implement this knowledge to better serve disaster victims.

A watershed 2001 Institute of Medicine report asserted that “studying sex differences, like other biological variations, can yield greater insight into understanding biological disease mechanisms, leading, in turn, to improved treatments and outcomes” (Levy and Sidel 2006, p.77). An emerging field of interest, gender-based biology, is a newcomer on the scene in medical sciences, tracing its conceptual launch to the late 1980s. This fledging arena of science identifies “physiological, cellular, tissue, organ, and system level and the effects of pharmaceutical agents on males and females” (Langley 2003, p.ix).
Several basic points can be made about male to female biological differences. First, women tend to suffer from more illness, nearly always suffering more disease and utilizing more health services than men (Langley 2003, p. X). As for life expectancy, in the United States the average life expectancy of men is approximately 75.5 years and women 80.4 years (WHO 2006). This trend for increased longevity among women seems to be universal. However, the greater the socioeconomic affluence, the greater the disparity in female to male life expectancy rates, with female rates remaining higher. In countries that are less affluent, the female advantage in life expectancy is narrower (WHO 2006).

Biological Complexities

Women’s physiology is more biologically complex than men’s. This is because women experience more lifelong fluctuations in hormones due to the menstrual cycle, pregnancy, and menopause. In addition, women also undergo more alterations in body weight during their lifecycle than men. These fluctuations can lead to compromised immune systems, which can manifest symptoms of disease that lead to females’ greater use of medical services. It has also been observed that intense stress weakens a person’s immunity and that women are much more susceptible to autoimmune disease than men (Mark 2005). Mark also notes that these gender differences decline with age, but persist until at least age 65.

Pain perception in women fluctuates with their hormonal state. During the latter stages of pregnancy, women have higher pain thresholds than at other times. Also pain thresholds are lower during the luteal, or latter, phase of the menstrual cycle when compared to the follicular (or proliferative) phase, during which follicles in the ovary mature—although overall women show more pain sensitivity than men (Wiesenfeld-Hallin 2005). Some psychosocial factors specific to women have been identified that may also increase their sensitivity to pain, including hypervigilance (increased perception of threats), greater body monitoring, and increased incidence of anxiety and depression (Wiesenfeld-Hallin 2005). These pharmacological, toxicological and hormonal issues are necessary for disaster response crews to keep in mind so they can assess pain acuity and presentation and can administer treatment more effectively to women.

Pharmacological and toxicological differences on how the sexes respond to medications or environmental agents are probably more significant than is generally recognized. Even the half-life of a drug may differ when administered to a male or female. Awareness of these biological differences is important in both the triage and treatment of healthcare patients in post-disaster settings. Langley (2003) noted that anatomic and physiological reasons for these differences include factors that can affect the absorption, distribution, and metabolism. For example, women and men differ in gut transit times (44.8 hours in men and 91.7 hours in women), total body water (42 liters in
men and 29 liters in women), gastric acid pH (1.92 in men versus 2.59 in women), and body fat percentages (21% in men and 32% in women). When you review these differences, you can see that average woman has 40% less body water than the average man, and men also have a higher basal metabolic rate. All of these factors make women’s absorption and metabolism of drugs very different from that of men. For example, since a woman’s body content of fat is higher than a man’s, drugs that are fat soluble will be stored in the fatty tissue. Toxins and drugs stored in the fat persist longer in the body. Women tend to have more cycles of fat loss and gain because of dieting and pregnancy, so toxins stored in the fat may be released during these cycles and cause disease (Langley 2003). Additionally, there are also biological disparities in the activities of certain detoxifying enzymes in the liver that are affected by male and female hormones. Consequently, “women tend to have greater bioavailability and slower clearance of drugs compared to men, the consequence being that the correct dose for males may be relatively high for females” (Langley 2003, p.308).

Pregnancy Exposures and Complications

The pregnant state adds its own set of variables to the ones noted previously. During pregnancy, gastric emptying and gastric acid production are reduced, the plasma volume increases by 50%, total body water increases by 7-8 liters, and body fat increases 20-40%. Serum proteins such as albumin, which often bind to drugs and circulate them throughout the body, are reduced. By contrast, renal function and clearance rise, increasing the elimination of many drugs and reducing their plasma concentrations (Langley 2003).

Depending on the nature, impact, and length of a disaster, women can develop high rates of premature births, vaginal infections and pregnancy losses due to the disruption of public healthcare infrastructures that are critical for proper prenatal, intrapartum, and postpartum care. Under normal circumstances approximately 15% of pregnant women require emergent obstetrical treatment, but in disasters this number rises significantly. For instance, following 2005’s Hurricane Katrina, some 56,000 pregnant women and 70,000 infants were directly affected by the storm out of more than 1.1 million women of reproductive age (15-44 years) residing in the affected areas before the storm (Callaghan, Rasmussen and Jamieson 2007). Callaghan and his colleagues’ research also noted that disruptions in clean water supplies for drinking and bathing, inadequate access to safe food, exposure to environmental toxins, interruption of healthcare, crowded conditions in shelters, and disruption of public health and clinical care infrastructure were all factors that posed threats to these vulnerable populations.

Aside from the obvious need for specialized obstetrical medical care, pregnant and lactating women should be provided supplementary supplies and services, such as private breastfeeding and OB/GYN exam areas, daily prenatal nutritional advocacy, sterile
delivery supplies, prenatal vitamins, pregnancy testing supplies, ultrasound and OB/GYN services, and breastfeeding pumps (see the complete Gender-Aware Supplies and Services Checklist later in this article). The critical nature of daily post-disaster prenatal nutritional advocacy was reported in Jamaica after Hurricane Gilbert when maternal diets were shown to be deficient in folic acid and the incidence of neural tube defect births increased significantly (Buekens 2006). It should also be noted that religious and patriarchal practices may preclude a woman’s receipt of life-saving obstetrical and gynecological care due to a lack of female physicians for necessary pelvic exams (Mantilla 2005). Therefore it is imperative that female gynecologists be available in post-disaster areas where these traditions are practiced.

In the high stress environment of post-disaster shelters, breastfeeding can become an unmanageable and time-consuming challenge. Researchers found that only 7% of infants in Hurricane Katrina-affected states were breastfed the recommended 12 months, compared with 17.8% nationally, so the hurricane might have affected a large number of pregnant women and infants already at high risk for adverse outcomes (Callaghan, et al. 2007). A significant concern lactating women have in post-disaster settings is their exposure to contaminated and dirty flood waters, unsafe foods and unclean water. The Centers for Disease Control and Prevention (CDC) continues to advocate breastfeeding despite the potential presence of chemical toxins. The agency’s position is that, for most women and their babies, the benefits of breastfeeding outweigh the risks, though the toxicity of chemicals may be most dangerous during the prenatal period and the initiation of breastfeeding. The CDC notes that the effects on the nursing infant “have been seen only where the mother herself was clinically ill from toxic exposure” (CDC 2007). It should be noted that unknown environmental exposures can take years to assess and manifest themselves in causality and toxicity. One study by Janerich and his associates (1981) examined suspected environmental hazards by tracking leukemia, lymphoma, and spontaneous abortions following floods in New York. Their findings concluded that the median interval between a disaster and a confirmed diagnosis was over one year. For now, disaster practitioners should follow current CDC recommendations. However, this example illustrates how the current lack of gender-disaggregated data and pregnancy exposure data are impediments. It should be noted that the authors recommend the creation of a pregnancy registry at disaster onset (at triage) in order to collect data on pregnancy complications, miscarriages, and adverse birth outcomes (see the Gender-Aware Disaster Support and Services Checklist).

**Menstruation and Contraception**

In addition to reproductive issues, women also have menstruation and contraception issues. These issues impact not only supply planning, but services and medical interventions. For instance, women who have been forced to wade through water
contaminated by corpses, chemicals, and sewage are anatomically vulnerable to genital rashes and vaginal infections. When there are any breaks in the skin or parts of the body covered by mucous membranes (which are less protective than skin), such as the mouth or vagina, a person’s susceptibility to disease from such an exposure increases. It is not only the corpses of humans and animals in the water that can cause these irritations and rashes, but also stress, and spills of oil, gas (from submerged cars), as well as residential and commercial pesticides, cleaning supplies, as well as other chemicals.

If a menstruating woman with an inserted tampon wades through contaminated water, it is possible for toxic substances to be absorbed through the tampon into her vagina, possibly leading to infections, and even toxic shock syndrome (Richter 2008). In effort to more effectively meet the needs of women, disaster planners and responders must plan for the provision of a range of feminine antifungal and hygiene products (varieties of types and sizes of sanitary pads and tampons), as well as a selection of new undergarments. Information on vaginal infections, toxic shock, and environmental contamination could be addressed through the distribution of “fact sheet” to female evacuees of menstruation age. The distribution of these “fact sheets” could fall under the responsibility of the emergency manager(s) authority. Time and again in disaster response, we have witnessed post-disaster vaginal infections and many women who “suffer in silence” due to perceived or real social stigmatization, a lack of knowledge concerning gynecological issues, and insufficient or non-existent menstrual, antifungal and feminine supplies.

In those disasters where there is a breakdown of normal social authority, women can find themselves vulnerable to physical and sexual threats, including rape. According to Fothergill (1996), accounts of assaults should be viewed within the framework of the “gendered nature” of disasters and risk exposures that some women experience as a result of gender inequality, lack of resources, lack of mobility, and a loss of social support structures. In post-disaster settings, the interruption of normal healthcare (clinic or hospital) and emergency (police, fire, EMS, etc.) services makes the prevention, treatment and reporting of these crimes more difficult. In other words, “In the chaos and social breakdown that accompany natural disasters, women become uniquely vulnerable to sexual abuse, including rape and gang rape” (Chew and Ramadas 2005, p.2). In their disaster rape research (post-Hurricane Katrina), Thornton and Voigt (2007) noted that normal crime reporting was nonexistent and that the evacuees’ relative lack of status, power and resources put many women at risk of being sexually assaulted. There are many causes that can contribute to sexual violence, and several that have been reported by the United Nations High Commission for Refugees (UNHCR 1995) include: male perpetrators’ power and domination over their female victims; psychological stress of refugee life; absence of communal support systems; crowded facilities or shelters; lack of physical protection; general lawlessness in facilities and shelters; alcohol and drug use;
politically motivated violence against displaced persons; and single female separated from male family members.

For many reasons, women in post-disaster settings may feel or become unable to carry on their pregnancies, so family planning support is imperative. Family planning can be an important part of disaster planning, and according to the World Health Organization, over 123 million women from around the world have expressed a desire to control, space, or limit their births (Campbell 2005). In order to meet this need, different types of contraceptives (including “morning after” pills, condoms, and oral contraception choices), pregnancy testing kits, rape kits, on-site (or readily accessible) sexual/domestic violence counselors, and sexually transmitted infection (STI) testing and treatment should be made be provided.

**Gender and Stress**

Having reviewed some of the primary concerns in women’s health and disease, let us examine some psychosocial differences between man and women and their impacts in post-disaster scenarios. Posttraumatic stress disorder (PTSD) from disasters can lead to profound long-term effects, affecting a person’s immunity, health and quality of life. Components of a disaster experience that are believed to be more likely to cause PTSD include any situations that evoked feelings of intense fear, helplessness and/or hopelessness. These include natural disasters, wars, near-death experiences, witnessing a traumatic death or severe injury, rape, or other assault.

There are numerous reported differences in PTSD’s manifestations (symptoms at triage presentation), risk factors, and rates between men and women. PTSD rates among women have been reported up to twice as often as rates among men, with profound differences in its manifestations (Langley 2003; Yehuda 2001). At the time of patient presentation, men tend to show more aggression and impulsive behaviors and have more substance abuse issues, whereas women often present with symptoms of numbing and avoidance and manifest more mood and anxiety issues. Most men experience PTSD after combat or on-the-job trauma, whereas women are more likely to have a history of rape or physical assault. Other lifelong risk factors that seem to make women more vulnerable to PTSD include past unwanted sexual contact, the responsibility of being the primary caretaker in a household, regard for the community at large, and a history of recent mental and emotional problems (Pulcino 2003). For instance, five to eight weeks after the September 11, 2001, terrorist attacks in New York City, the incidence of PTSD symptoms (in a telephone survey of 988 respondents) revealed an overall incidence of 7.5% of people that met the criteria for PTSD (Galea et al. 2002). In this study, the prevalence of PTSD symptoms among women was 9.9%, whereas 4.8% of the male respondents met the PTSD criteria. Another larger telephone survey conducted six to nine months after the September 11, 2001, terrorist attacks involved 2,752 individuals,
specifically 1,479 women and 1,273 men (Stuber, Resnick and Galea 2006). Stuber, et al. reported that those with PTSD symptoms related to 9/11 comprised 6.5% for women and 5.4% of the men. The difference in the rates for women and men was not statistically significant, but the researchers did note a significantly higher risk for lifetime PTSD among women compared to men (17.2% versus 12.1%). In their discussion of the research, Stuber and his colleagues were surprised at their findings in that many other studies had reported up to twice the risk of lifetime PTSD among women compared to men, whereas their research showed only the risk to be 1.4 times as high.

Some researchers have reported there are marker symptoms that are often apparent early on that may preclude full-blown PTSD, include re-experiencing the traumatic event and hyper-arousal manifested as peri-event panic (Stuber et al. 2006). Peri-event panic is defined as “sudden and unexpected discrete periods of intense fear or discomfort in the hours after a traumatic event” (Stuber et al. 2006, p.55). In studying victims from the September 11, 2001, terrorist bombing in New York City, Stuber and her team noted that women were twice as likely as men to experience peri-event panic within hours of the event. Stuber, et al. reported that these marker symptoms could identify victims more likely to develop PTSD, and that early interventions targeting these people might mitigate their progression. In the end, how all of these complexities in gender-based biology may be applied and implemented into post-disaster settings have yet to be conclusively researched and determined.

Gender-Aware Disaster Support and Services Checklist

In order to produce gender-based policies that work, EMS and disaster planning need to offer gender-aware support and services (Richter 2007) by implementing the following recommendations.

1. Create high gender visibility and input throughout all stages of disaster planning, preparedness, communication, management, response, recovery and reconstruction efforts.

2. Provide a private and enclosed OB/GYN assessment and care area that would also serve as the “principal point of contact” for women to network with other women and seek and gather any gender-aware information, services, supplies and support that are available (such as childcare, lactation assistance, sexual and domestic abuse counseling, rape intake, etc.). As mentioned previously, one such approach to an engendered principal point of contact initiative is the Merlet Feminist International Camp established in post-quake Haiti in February of 2010.

3. Ensure daily prenatal nutritional advocacy (check-ups) for all pregnant and lactating women. In order to successfully reduce infant and maternal death and disease, disaster planners, responders and providers should make provisions for nutritional advocacy for mother, fetus and infant. Local emergency managers
could ensure compliance of daily prenatal nutritional check-ups by EMS personnel or outsource compliance via local NGOs (such as American Red Cross) staff and volunteers. Any nutritional information could be distributed verbally or via written materials at the principal point of contact women’s care area).

4. Start a pregnancy registry (at disaster onset—in triage) to track and collect data on any pregnancy complications, miscarriages and birth outcomes. Local emergency managers should ensure compliance of pregnancy registry by EMS personnel.

5. Train non-obstetrical healthcare providers to effectively triage pregnant women. Training could be provided through FEMA, local EMS corps, or NGOs such as American Red Cross Disaster Health Services.

6. Provide a private and tranquil breastfeeding area for lactating women.

7. Retain several sterile delivery kits and/or emergency delivery supplies (infant ambu-bag, blankets, sterile cord clamps and scissors, etc.).

8. Make provisions for rape intake (rape kits and personnel), as well as on-site (or readily accessible) sexual and domestic violence counselors. Local emergency managers should be responsible for the distribution of information concerning the availability of counseling for these services. Information could be distributed verbally or via written materials at the principal point of contact women’s care area.


10. Provide pregnancy testing supplies, ultrasound and OB/GYN services.

11. Make sexually transmitted disease (STD) testing, information and treatment available. Local emergency managers should be responsible for the distribution of information concerning the availability of counseling for these services. Information could be distributed verbally or via written materials at the principal point of contact women’s care area.

12. Offer breastfeeding supplies (pumps, pads, etc.) and on-site (or readily available) lactation consultants, as well as ready-to-feed infant formulas.

13. Distribute a fact sheet of information to all pregnant and lactating women on potential effects of vaccines, environmental toxins and exposures on pregnancies and outcomes. Information and these fact sheets could be distributed verbally or via written materials at the principal point of contact women’s care area. Some considerations to take into consideration in the presentation of risk information include the assessment of the audience’s understanding of environmental and health risks, use of language (no jargon, acronyms or technical terms), and the anticipation of possible confrontational tactics by the media or public (Lindell, et al. 2006).

14. Distribute a fact sheet to women and girls on all relevant information concerning post-disaster onset, symptoms and treatment of potential vaginal infections, genital rashes, environmental contamination and toxic shock syndrome.
Information and these fact sheets could be distributed verbally or via written materials at the principal point of contact women’s care area. But the dissemination of information by emergency managers alone cannot ensure that those at risk are receiving, heeding, and understanding the information, so emergency managers can promote dialogue through two-way communication, preferably in small groups rather than public hearings (Lindell et al. 2006).

15. Provide a variety of contraception (including “morning after” pills, condoms and oral contraception choices) and offer information on any available local family planning on-site or readily available resources.

16. Provide feminine hygiene kits that contain choices of feminine (non-irritating) cleansing wipes, panti-liners, sanitary pads and/or tampons, as well as bags for discrete storage and disposal. These kits could be distributed at the “principal point of contact” women’s care area. In more rural areas and developing nations, these women’s and girl's hygiene kits could be produced regionally and from locally resourced and environmentally disposable material.

17. Ensure that female gynecologists and physicians are available in areas where religious/patriarchal/social traditions limit or prohibit non-female physical and/or pelvic exams for women.

18. Have over-the-counter and prescription antifungal yeast infection and genital rash products readily available; and

19. Offer a wide variety (of all sizes) in clean female undergarments.

Research supports the contention that many gender-sensitive supplies and services continue to be either inadequate or nonexistent in many post-disaster settings. Yet the provision of these relatively inexpensive short-term gender-based interventions could mitigate and even prevent acute illnesses, morbidity, pain and suffering, as well as long-term healthcare costs among female post-disaster populations. It can be hypothesized that the stockpiling and provision of these gender-aware supplies and services could serve to decrease the risk for adverse pregnancy and infant outcomes, recurrent healthcare costs and concerns, as well as reducing requirements for multiple medical interventions (ER visits, physician care, etc.). These relatively low-cost, short-term interventions speak to the age-old medical adage, “An ounce of prevention is worth a pound of cure.” Or to coin a new truism, “Take care of them now or see them in the emergency room later.” For instance, without the provision of a private and tranquil breastfeeding area for lactating women, infants can fail to thrive and quickly become dehydrated, so the infant and mother will then be added to the number of patients needing emergency medical attention. Oftentimes it is these early (simple) proactive patient interventions, supplies and treatments that are averted or disregarded that can prove much more acute (complex) and costly in their latter stages.
Conclusions

Now more than ever, disaster planners and responders need to meet the urgent and ever-growing challenge of disasters as fatalities and costs of global disasters soar: In 2008, the global death toll tripled, killing 235,816 people in 321 disasters, and annual costs doubled, totaling $181 billion (ISDR 2009). Clearly, any proactive measures and productive interventions that can be taken to reduce fatalities and long-term costs among special needs populations need to be comprehensively reviewed and seriously considered.

Today’s disaster planners and response teams can no longer assume post-disaster populations are a homogenous group, and should stage disaster shelters, supplies and services that address the specific needs of women. As disaster practitioners and care providers, we must strive to be more cognizant of women's needs, which are based not only on their physiological, but also their psychosocial makeup. Research supports the contention that many gender-sensitive supplies and services continue to be either inadequate or nonexistent in many post-disaster settings. Yet the provision of these relatively inexpensive short-term gender-based interventions could mitigate and even prevent acute illnesses, morbidity, pain and suffering, as well as long-term healthcare costs. The stockpiling and provision of these gender-aware supplies and services could serve to decrease the risk for adverse pregnancy and infant outcomes, recurrent healthcare costs and concerns, as well as reducing requirements for multiple medical interventions.

This article has sought to not only identify gender disparities in disasters, but also socially constructed (gender) and biological (sex) differences in health and behavior, and to emphasize feasible interventions that could significantly reduce pain, suffering, long-term post-disaster care costs, and recovery time. In the end, these proactive and practical Gender-Aware Disaster Care interventions—when coupled with gender-specific supplies, services, triage and treatment—would allow practitioners and care providers to facilitate more effective efforts in women’s needs assessments, treatment options, and recovery interventions.

References


