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What Does Post-Disaster Trauma Have to Do with Health?

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Abstract: Failed levees, poor evacuation planning, and slow governmental rescue and response efforts differently impacted individuals and groups according to their age, gender, race/ethnicity, language access, education, employment status and income when Hurricane Katrina struck America's Gulf Coast in 2005. In spite of the coast's ecologic vulnerability to hurricanes and floods in the 300 years of its existence, disaster risk mitigation was never prioritized. One of the core principles of the Sendai Framework for Disaster Reduction 2015-2030 suggests that countries adopt a "broader and more people-centered prevention approach to disaster risk"; and that "governments engage with relevant stakeholders, including women, children and youth, persons with disabilities, poor people, migrants, indigenous peoples, volunteers, the community of practitioners and older persons in the design and implementation of policies, plans and standards". The strategies and actions for risk reduction, preparedness and more equitable recovery put forth in New Orleans' Resilient 2015 framework focus primarily on addressing environmental challenges — climate change and rising sea levels, land subsidence and coastal erosion; and physical infrastructure needs, such as transportation, housing. Although the chronic social stressors associated with violence, poverty and inequality are mentioned, there continues to be little focus placed on rebuilding the city's health infrastructure and developing plans to address population and/or individual health needs, physical and/or mental, especially those that are disaster-related. As a result, the city continues to experience high rates of untreated traumatic stress disorders, especially among youth, which might be correlated with high rates of violence. Based on quantitative and qualitative data collected by the Institute of Women and Ethnic Studies, this paper will: 1) problematize the notion of resilience in the context of increased disaster risk and vulnerability along racial/ethnic and other differences; 2) present data collected from 2015 to 2016 from over 1552 youth, which reveals an alarmingly high occurrence of symptoms of post-traumatic stress disorder (PTSD), worries about basic needs and exposures to violence; and 3) discuss community-level mental health programming in the absence off a city-wide youth mental health plan.

Key words: disaster risk, post-traumatic stress, resilience, community-level mental health programs

1. Introduction

On August 29 2005, Hurricane Katrina struck America's Gulf Coast. It was the deadliest hurricane in seven decades to hit the U.S., bringing severe winds and record rainfall into New Orleans for a 24-hour period. Two days of intense storm surge damaged the city's pumping system, rendering it incapable of draining the rising water as major floodwalls failed along multiple city waterways. As a result, 80% of the city was flooded, destroying homes, communities and the urban infrastructure. For weeks, the city was submerged in flood water as high as 5 meters, leaving New Orleans decimated by extensive structural damage; bringing service delivery to a standstill, and hampering emergency and rescue efforts. As a result of the flooding, more than 500,000 people were evacuated, and a minimum of 1800 people died storm-related deaths [1-3]. In 2012, the National Weather Service estimated that there was at least $108 billion in property damage from Hurricane Katrina, making it the costliest natural disaster in U.S. history.

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The expansive magnitude of Katrina demanded attention from national leaders, infusing the catastrophe with political implications of blame and responsibility [4]. Widespread assessment of disaster response and recovery efforts emphasized governmental failures at multiple levels, including the lack of effective leadership within the Federal Emergency Management Agency, which under the authorization of the U.S. Department of Homeland Security coordinates communications across federal agencies in response to disasters. The inadequate rescue and failed governmental response to the disaster has been blamed on poor communication between federal, state and local officials [5] and was decried by human rights experts as "shocking, a gross violation of human rights [6]." A select bipartisan committee of the U.S. House of Representatives investigating the hurricane cited failures at all levels of government. The report, 'A Failure of Initiative' noted that medical care and evacuations suffered from a lack of advance preparations, inadequate communications and coordination; and that the failure of complete evacuations led to preventable deaths, great suffering and further delays in relief [7].

A global panel of experts on disaster and mass violence identified five key intervention principles that should be used to guide and inform intervention and prevention efforts at the early to mid-term stages of the event. These principles promote a sense of safety, calm, self and community efficacy, connectedness and hope all of which restore social and behavioral functioning after a disaster [8]. As noted in the Congressional report, governmental leadership did not steward these principles. Instead of promoting safety, sporadic stress-induced violence was sensationalized, which increased the perception of threat. Instead of calm, fear was promulgated which served to heighten individual and community stress. Similarly, self and collective efficacy was not encouraged, leaving the most vulnerable disempowered in their belief that they had the agency and capacity to do what was necessary to recover and thrive. Likewise, creating an infrastructure to promote social connectedness was not prioritized, and as a result anomie ensued and worsened the disintegration of community norms. And finally, the willful destruction of public housing by the New Orleans Housing Authority immediately after the storm to make way for mixed-income housing left the most socio-economically disenfranchised survivors with little hope of returning home and reestablishing their livelihood [9].

1.1 The Disproportionate Impact of Disaster

The United Nations Office of Disaster Risk reduction defines disaster risk as the "likelihood of loss of life, injury or destruction and damage from a disaster in a given period of time, and a product of the complex interactions that generate conditions of exposure, vulnerability and hazard" [15]. Racial and ethnic minorities in the United States have been shown to have an increased vulnerability and risk to disasters, due to links between racism, vulnerability and economic power, based on disadvantage in each of the eight disaster stages: 1) lessened perception of personal disaster risk; 2) lack of preparedness; 3) less access and response to warning systems; 4) increased physical impacts due to substandard housing; 5) poorer psychological outcomes; 6) cultural insensitivity on the part of emergency workers; 7) marginalization, lower socio- economic status and less familiarity with support resources leading to protracted recovery; and 8) diminished standard of living, job loss, and exacerbated poverty during reconstruction and community rebuilding [16].

Hurricane Katrina affected hundreds of thousands of families along the Gulf Coast in Louisiana, Mississippi and Alabama, yet had differing impacts on various segments of the population [17]. The storm, followed by a slow government response, most profoundly impacted residents who were poor and/or African American. Seventy-five percent of the residents in the most severely damaged areas in New Orleans were

African American, 30% of whom were living below the poverty line at the time of the hurricane [18]. For the many thousands who were trapped in the city by the flooding, rescue did not arrive for several days. In a survey of evacuees in emergency shelters, African Americans reported waiting a mean of 4.7 days to be rescued, compared to whites who reported waiting a mean of 2.9 days [19]. In their desperation, the residents who were left behind took refuge atop roofs and elevated highways where they were without food, water, medical care or protection for several days in blistering heat. They witnessed acts of violence, destruction, and death at the hands of other citizens and law enforcement. Additionally, during the evacuation, African American evacuees were branded as "refugees and criminals" with little sympathy for having encountered and survived a horrific disaster [20]

New Orleans culture is unique in that it is much more collectivist than the dominant individualistic "I" American culture, perhaps due to the strong concentration and retention of African culture during and post-slavery. New Orleans has a culture in which "we" consciousness is emphasized, as are belonging, harmony, and relationships [10]. The chaotic nature of the Katrina evacuation disrupted the strong ancestral and familial bonds among many long-time residents, including multiple instances of parent–child separations during the evacuation from New Orleans, and families relocated to distant and unfamiliar states. And, even though the entire city had to be evacuated, African Americans were more likely than non-blacks to be living elsewhere one-year post-Katrina [11].

African American survivors were not afforded the protections of the U.N. Guiding Principles on Internal Displacement, which prioritize emergency assistance and relief measures. Their basic rights — the right to return home, the right to adequate housing, and the right to health services — became topics of debate. As a result, African Americans have been the most affected by the out migration, slow recovery, and displacement [21].

1.2 Disaster Mental Health

Disasters reflect an encounter between a hazardous force and a human population in harm's way; which, within the ecological context can create demands that exceed the coping capacity of the affected community [22]. A disaster's forces of harm (loss and change) are a complex interplay of the interrelationship and interdependence of social and ecological factors — the individual/family context, the community context and the societal/structural context.

A survey conducted two months post-Katrina by the Center for Disease Control (2005) and the Louisiana Office of Mental Health found that 45% of those sampled were suffering from PTSD [23]. A longitudinal survey of adult Gulf Coast residents (n=1043) who were directly affected by Hurricane Katrina found the prevalence of PTSD six months post-Katrina was twice as high as the prevalence estimates for the population in the years prior to the hurricane [24]. In this study, the poor, racial and ethnic minorities, and those with fewer years of formal education more commonly reported stressful experiences post-evacuation. Notably, PTSD symptomatology was most common among those who lived in New Orleans — 49.6% of these respondents reported nightmares; 52.8% reported being jumpier or startling more easily, and 79.4% reported being more irritable or angry than usual.

The absence of reported suicidality (suicidal thoughts, plans and attempts) among Katrina survivors in this longitudinal study was linked to a pervasive optimism regarding the likelihood about being able to rebuild their lives, and part of a larger pattern of resilience, referred to as "post-traumatic personal growth". Eighty-five percent of respondents said that they felt a deeper sense of meaning in their lives since the disaster; 83.8% said they realized that they had greater inner strength than they thought they had; and 83.4% felt that they had a greater ability to rebuild their lives than they first thought. However, the researchers warned of the tenuous nature of this optimism — "It is

not clear, though, how stable these beliefs will be over time, especially if personal success in rebuilding lives does not keep pace with the high expectations of the respondents. It is conceivable that the low rates of suicidal ideation, plans, and attempts found in the sample will become much higher if these positive beliefs and feelings erode."

The follow-up survey conducted a year later confirmed the researchers' concerns. Anxiety or mood disorders persisted and increased slightly from 30.7% to 33.9%; and, the prevalence of PTSD had almost doubled among those residents who remained displaced. Similarly, suicidality was significantly higher with regard to suicidal ideation and suicide plans [25]. Similarly, a longitudinal study of low-income African American mothers pre and post-Katrina found that even though post-traumatic stress symptoms (PTSS) declined over time after the hurricane, they remained high — 33% of the sample showed scores suggesting probable PTSS 43-54 months after the hurricane. The study also found that there was in increase in psychological distress from 26% pre-Katrina to 30% 43-54 months after the hurricane. The study found that home damage was an important predictor of chronic PTSS [26]. These data differ from the typical post-disaster circumstances where mental disorders significantly decrease with time, and up to 50% typically resolve within a year [27]. For example, the doubling of PTSD levels noted two months after the September 11 attacks retuned to baseline 4-6 months later [28]. These data illustrate the more severe adverse psychological effects of Hurricane Katrina compared to other disasters, and emphasize the disproportionate mental health impacts of disasters on socio-economically disadvantaged racial and ethnic minority groups.

The mental health effects of disaster may be particularly prominent for young people. In addition to the loss of property and the traumas associated with the disaster itself, disrupted family bonds have been shown to exacerbate biologic vulnerabilities and lead to aggressive behaviors in children [12]. And, low-income youth are also predisposed to experiences of abuse and neglect, which also increase the likelihood of aggression. Neglected and/or unattached children have been found to exhibit challenges developing empathy for others, have difficulty reaching higher states of moral judgment [13]. They do not cope well with stressful situations and have difficulty regulating the intensity of their affect [14]. However, there are extremely limited data examining youth mental health following Hurricane Katrina.

1.3 Inadequate Health Infrastructure

In the aftermath of Hurricane Katrina, New Orleans lacked the leadership and infrastructure to adequately respond to the vast and disaster-related emerging and escalating mental health needs of the community. Pre-Katrina in August 2005 there were approximately 134 adult mental health hospital beds, 30 child and adolescent beds, and 9 outpatient mental health clinics. Two years later, the prevalence of reported serious mental illness increased 13% in Orleans Parish, however, there were only approximately 20 adult beds, 15 child and adolescent beds, limited alcohol and substance abuse services, and restricted outpatient mental health clinics. In addition, there were no emergency mental health or crisis services and many of the acutely mentally ill were housed in the parish jail [29]. A 2007 Kaiser Family Foundation survey conducted around the second anniversary of Katrina found that 43% of adults reported at least one health care access problem post-Katrina, and that the public mental health system only provided services for the serious and persistently mentally ill [30]. In October 2007, the local newspaper described the public mental health agency as 'unfit', claiming that the city services for the mentally ill were in the hands of a district in crisis and unable to govern with oversight and accountability [31]. In 2009, the mental health facility that served adolescents was closed and the services have not been replaced.

The lack of evidence-based trauma-sensitive psychological services for youth is of particular concern, given the negative impact of trauma on the developing brain, particularly dysregulation of the hypothalamic-pituitary axis [32]. Untreated traumas in children, in particular complex traumas, can result in increased levels of basal cortisol levels and more pronounced cortisol dysregulation and reactivity, making them more prone to exaggerated and behaviorally aggressive "fight or flight" reactions in situations of real and/or perceived threats [33].

2. Findings

In the absence of a functioning governmental mental health authority, the Institute of Women and Ethnic Studies (IWES) expanded its mission in 2007 to create a Post-Disaster Mental Health Division to address the trauma-related needs of vulnerable communities. Under the leadership of IWES' Chief Executive Officer — a board-certified psychiatrist, trauma expert, and public health practitioner — this division has conducted exploratory studies collecting primary data reflective of the persistent mental health impacts of the disaster — from evacuation to recovery. Survey data collected in 2007 from 80 adult African American Katrina evacuees who had returned to New Orleans within 2 years revealed that 72% reported irritability and depression, 60% reported appetite changes, 54% reported sleep disturbances, and 50% reported difficulty concentrating. Regarding symptoms of PTSD, 20% reported flashbacks, 33% reported avoidance of stimuli and 27% reported startling more easily [34].

Analysis of qualitative data collected from more than 100 African American adults participating in story circles over 2007 and 2008 reflected a theme of stress resulting from participants' perceptions of the loss of their locus of control and efficacy [35]. One participant reported, "For a long time I would not say that I had family who had been to the Superdome (the public shelter of last resort), because I felt it was a reflection of something that I did not do." The vast majority of participants reported feelings of government abandonment, hostile desertion, brutality, and neglect. As was stated by another participant, "They were saying that we would not be able to come home for six months. It was unreal. What do you mean we can't come home?"

In 2010, when IWES began implementing an evidence-based teen pregnancy and HIV prevention program targeted to African American and Latinx youth in New Orleans, permission was obtained from the federal granting agency to utilize a trauma-informed lens and adapt the curricula to address the mental health needs of the participants. Four psycho-educational modules on the biology of stress, coping skills, cognitive reframing, and positive character qualities were added to eight lessons on sexual health. IWES also began assessing youth for symptoms of PTSD and depression based on criteria from the American Psychiatric Association's Diagnostic and Statistical Manual Fifth Edition [36] and screened for exposures to violence and worries about their basic needs. Youth reporting suicidal ideation receive psychosocial assessment from an IWES social worker and are referred for more intensive clinical services if needed. Participants are primarily African American (93%) and attend public schools where the majority of students receive free or reduced price lunch (i.e. their family income is at or below 185% of the Federal Poverty Line, which was equivalent to $40,793 for a family of four). This program has been implemented in two phases, the first of which concluded in June 2015. The second phase of the program (which began in July 2015 with expanded geographic and demographic targeted reach) is currently being implemented, and data collection via emotional wellness assessments continues to be collected from youth participants (Table 1).

Twelve years after the disaster, psychosocial screenings show extremely high prevalence of traumatic stress and mental health disorder symptoms

among youth age 11-19 in New Orleans (Table 2). According to data from the National Comorbidity Survey Replication Adolescent Supplement the 12-month prevalence of PTSD in adolescents is 3.9% [37]. These data show symptoms of depressive disorders and PTSD well above national rates. Youth also reported high levels of exposure to violence and high levels of anxiety related to safety and stability in their homes and neighborhoods (Table 3).

Stark gender disparities are represented in these data (Table 4). Girls who report worries about their basic needs are at risk for a range of health issues with long-term implications, as research has shown that higher interpersonal stress is associated with increased risk behaviors among African American female adolescents, placing these young people at greater risk for poor mental health outcomes and reproductive health risks, such as STIs and unintended pregnancy [38]. In comparing proportions of worries in the sample, girls are much more likely than boys to report that they are worried about sexual assault, access to stable housing and food, exposure to violence, and not being loved. Girls are also significantly more likely to meet criteria for symptoms of PTSD, depression, and suicidality than their male counterparts. Data indicate that all youth in the sample have been exposed to high levels of violence but girls are particularly vulnerable to chronic stress, economic instability, and an overall lack of resources.

Table 1 Age group categorization of IWES emotional wellness survey respondents sampled 2015-2017 (N = 1552).

AGE[a] Group	N	%
11-12	385	24.81
13-15	904	58.25
16+	155	9.99
Not reported	108	6.95

[a] Range: 11-19, Mean: 13.5, St. Dev.: 1.51

Table 2 Symptoms of PTSD and Depressive disorders among respondents of the IWES Emotional Wellness Survey sampled 2015-2017 (N = 1552).

Symptom	N	%
Lifetime PTSD[a]	709	24.81
Current PTSD[b]	417	58.25
Depression	254	9.99
Suicidal Ideation[c]	200	6.95

[a] Symptoms of post-traumatic stress disorder experienced at any point in respondent's lifetime
[b] Symptoms of post-traumatic stress disorder experienced within prior 30 days of respondent completing the survey
[c] Frequency missing (non-response) = 31

Table 3 Exposures to Violence and Worries (relating to safety and stability) among respondents of the IWES Emotional Wellness Survey sampled 2015-2017 (N = 1552).

Exposure/Worry	N	%
Exposure to in-home violence	572	37.07
Witnessed murder	283	18.53
Experienced the murder of someone close	836	54.68
Worry about getting shot/stabbed/beaten	737	48.33
Worry about sexual assault	299	19.62
Worry about having food to eat	188	12.25
Worry about having a place to live	190	12.40

Table 4 PTSD, Depression, Suicidal Ideation, and Worries by Gender among respondents of the IWES Emotional Wellness Survey sampled 2015-2017 (N = 1552).

Symptom/Worry	Gender	%	X^2 Value (*df*)	*p*-value
Lifetime PTSD	Males Females	34.74 53.82	53.03 (1)	< 0.0001
Current PTSD	Males Females	19.31 32.97	34.16 (1)	< 0.0001
Depression	Males Females	9.66 22.30	41.37 (1)	< 0.0001
Suicidality	Males Females	6.00 19.01	52.08 (1)	< 0.0001
Worried about housing and/or food	Males Females	5.85 30.45	136.10 (1)	< 0.0001
Worried about sexual assault	Males Females	14.76 21.22	9.98 (1)	0.0016
Worried about violence	Males Females	43.29 51.91	10.59 (1)	< 0.0001

3. Discussion

Those who experience catastrophic events show a wide range of reactions; some suffer only worries and bad memories that fade with emotional support and the passage of time; others are more deeply affected and experience long-term problems — PTSD, Depression, Generalized Anxiety Disorders, and Substance Abuse are the most common post trauma psychiatric sequelae [39]. PTSD has been shown to be associated with greater property loss, whereas depression is more

associated with adversity post-disaster [40]. In children, frightening and life-threatening events during the disaster, loss-disruption and home damage from the disaster are associated with psychological distress [41-43]. A systemic review of post-traumatic stress disorders following disasters in the past three decades concluded that the burden of PTSD among people exposed to disasters is substantial; and is correlated with factors such as socio-demographic and background factors, event exposure, social support, and personality traits [44].

Before, during or after Hurricane Katrina, the local or federal government did not set the policies needed to create a blueprint for the psychosocial and mental health services necessary in a post-disaster environment. In 2007, a commentary by the National Institute of Mental Health noted that a majority of Hurricane Katrina survivors who developed mental disorders after the disaster were not receiving the mental health services they needed — 19% of the people surveyed said they had developed a mental health disorder after the hurricane and only 18.5% reported receiving any treatment [45].

Pre-Katrina, 4.2% of youth in New Orleans were estimated to be experiencing serious emotional disturbances [46]. A study of parents in the Gulf Coast (Louisiana, Mississippi and Alabama) with children living in the household using the Strength and Difficulties Questionnaire found an increase to 15.1% [47]. There is no data on traumatic stress conditions in youth prior to Hurricane Katrina. However, the quantitative and qualitative data collected by IWES on the mental health symptoms of New Orleans African American youth post-Katrina show an elevated level of post-trauma symptoms in comparison to national rates [37]. Not only have traumatic stress disorders among youth in New Orleans remain elevated above national levels, so too has their worries about basic needs and their exposure to community and domestic violence. As was stated by a youth, "Katrina disoriented my family and I. We had to move back and forth for many months looking for help. I saw someone in a shelter trying to kill himself, and it has made me have nightmares and become paranoid. Katrina took my personality away." This young person's description of his emotional turmoil mirrors Fullilove construct of "root shock", a traumatic stress reaction when all or part of one's emotional ecosystem is destroyed [48].

The immediate post-disaster Katrina environment of chaos and anomie became fertile ground for interpersonal and community violence. Additionally, the acute shock was compounded by a long history of chronic adversity due to racism and poverty, all of which are known to contributes to high levels of trauma experienced at the community and individual levels [49]. For example, in 2015, 27% of the New Orleans population was living at or below the national poverty line [50]. Of those living in poverty, 39% were children under the age of 18 [51]. Economic challenges within the New Orleans community include a lack of living wage jobs and access to transportation that ensures stable employment. Additionally, there is a lack of affordable housing, particularly for African Americans. According to the Greater New Orleans Fair Housing Action Center audit of 50 housing providers who were tested for racial discrimination using trained testers posing as home seekers, African American who were otherwise fully qualified were denied the opportunity to rent or received less favorable treatment 44% of the time. [52]. Crime rates have also steadily increased each year, with a 27% increase in assault and 39% increase in rape [53]. Though New Orleans has experienced an economic revival in the last 10 years post-Katrina, many of the city's long-time residents have been left out. Little priority was given to addressing the human recovery and psychosocial needs of vulnerable communities of color, women and their children in particular. Twelve years post-Katrina, African Americans continue to experience high exposure to violence within the home and in the greater community, and unstable living conditions, often

stemming from inadequate financial resources, and loss of family.

The disruption of family stability, the loss of interpersonal and community-level protective factors and the destruction of the ecological environment due to the inadequate disaster response and recovery are evident among vulnerable youth in New Orleans. New Orleans is a community made culturally rich by the retention of the African tradition of strong family bonds and group collectivity. However, the potential protective factor has been greatly diminished by high rates of poverty and crime, and economic, educational and health inequities and disparities.

In spite of data that shows that vulnerable African American youth in New Orleans are showing excessive rates of post-disaster stress-related disorders, access to evidence-based high quality trauma-informed services is very limited. This is particularly true for girls, who are more vulnerable to a range of mental and physical health risks in areas affected by disaster. In 2013 the Rockefeller Foundation named New Orleans one of the 100 Resilient Cities. A core concept of this initiative is that local governments be as attentive to chronic stresses as they are to acute shocks and traumatic events. For, as was pointed out by the Director of Communications and Marketing for 100 Resilient Cities, cities are more often destroyed by the stresses of crime, water shortages or high unemployment rates, than they are by Category 5 hurricanes and inadequate floodwalls [54].

4. Conclusion

The goal of the 2015-2030 Sendai Framework for Disaster Risk Reduction is to "prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, **health,** cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience.' The four priority areas are to 1) understand disaster risk; 2) strengthen disaster risk governance; 3) invest in disaster risk reduction; and, 4) enhance disaster preparedness for effective response and 'build back better in recovery, rehabilitation and reconstruction [55]. A lesson that should be learned from the Katrina experience in New Orleans is that investments in health must also include the provision of mental health services to treat previous and now chronic disaster-related trauma-related mental health disorders.

Psychiatric morbidity is predictable in populations exposed to disasters, and mental health and psychosocial support programs are increasingly a standard part of humanitarian response [56]. Psychosocial and mental health services must be planned and actively integrated components of all disaster relief and broader health care responses [57]. There is growing consensus that in the rescue and immediate recovery phase of disasters, the focus should be on making survivors feel safe and given assistance in decreasing their anxiety by addressing their basic needs and welfare [57]. After disasters, survivors must also be helped to regain their autonomy, and psychiatric help is reserved for those exhibiting dissociative symptoms or with prolonged mental health symptoms that showed no improvement after two months [58]. The World Health Organization recommends a similar approach along a continuum: psychological first aid, community development, skills for psychosocial recovery and trauma-focused cognitive behavioral therapy for medium to long term mental health problems [59].

The world has become increasingly disaster prone. The "failure of initiative" to address disaster risk reduction plus the absence of a humane and equitable response prioritizing health care in the recovery and rebuilding after Hurricane Katrina underscore the importance of global consensus frameworks that affirm that disasters are a health issue. Strong and effective health systems are critical in reducing the risk of disasters and support people to respond to and recover

from disasters [60]. Additionally, structural measures that enhance the economic and social conditions of socio-economically disadvantaged racial/ethnic groups must be prioritized if racial equity is to be achieved [49]. One approach that could meet the expectations of the Sendai Framework, is the securing of public-private partnerships between government agencies and community engaged organizations. In addition to keeping local government accountable to respond to emerging disaster-related needs, this would assure that, in accord with the Sendai Framework, 'a broader and more people-centered prevention approach to disaster risk' is achieved.

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