[Certificate of Approval goes here.]

Applicability of International Disaster Standards to Displaced Population Care in the United States

BY

ERIC N. GEBBIE
M.A. (Hons.), St Andrews University, Scotland, 1998
M.I.A., Columbia University in the City of New York, 2001

THESIS

Submitted as partial fulfillment of the requirements
for the degree of Doctor of Public Health
in Public Health Sciences
University of Illinois at Chicago, 2011

Chicago, Illinois

ACKNOWLEDGMENTS

I would like to thank my thesis committee for their guidance and support: Bernard J. Turnock, Steven F. Boedigheimer, Timothy Johnson, Louis Rowitz, and Richard H. Sewell. I would also like to thank the director of the Doctor of Public Health in Leadership program, D. Patrick Lenihan, for his instruction throughout my doctoral studies and his dedication to this unique public health leadership program.

ENG

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

CHAPTER PAGE

TABLE OF CONTENTS (continued)

LIST OF TABLES

LIST OF FIGURES

SUMMARY

Emergency preparedness planners confront a variety of hazards to which growing populations are increasingly exposed, and which may increase the need for large-scale humanitarian aid. However, planners have made little use of sophisticated international humanitarian response guidelines designed to address similar issues. The purpose of this study was to produce an initial policy evaluation of the applicability of the internationally recognized Sphere disaster response standards to the care for displaced populations in the US. The project utilized a Web-based opinion survey of a targeted sample of public health, emergency management, and other professionals responsible for disaster planning and response at the local, state, and federal level. The survey gathered opinions about the risk of population displacement, existing plans, and the benefits and challenges that the international standards could present.

Completed surveys were received from 729 individuals throughout the United States in public health, emergency management, and other professionals responsible for disaster planning and response at the local, state, and federal level. The analysis combined qualitative and quantitative data and methods to summarize the participants' opinions related to the three key factors under study and inform the policy findings. In addition to the substantive data collected, this project examined the usefulness of the selected methods for policy evaluation by examining the activities and outputs as the number of responses, quality of responses, invitees' reactions, resources required to carry out, and the ability to develop intended findings.

Approximately half (51.9%) of the participants said their jurisdiction might host a displaced population of crisis levels every five years or more frequently. Half of all respondents (49.7%) characterized their existing plans and resources for dealing with displaced populations as low quality. Opinions of the potential use of standards were overall positive, but carried

concerns about the challenges of adopting and implementing standards in concert with their many stakeholders. The method was effective, in that the survey recruited a large participant pool, willingness to participate was high, and the quality of responses was excellent for defining the range of values that could inform later policy discussions. The method was effective, inexpensive, and with little burden on participants, but did require moderate time commitment for development, testing, and implementation.

The study concludes that the Sphere standards should be used as guidelines in the US to assist planners with no displaced population care experience, as well as review the multiplicity of plans and guidelines already in use in an *ad hoc* manner. For future policy analyses, this study shows that a properly developed and implemented Web survey can supply a highly cost effective base from which to make initial policy evaluations where inputs from a dispersed stakeholder is necessary.

I. INTRODUCTION

A. Overview

The study was driven by the potential increased need to provide large-scale humanitarian aid in coming decades due to population growth in areas most vulnerable to hurricanes, floods, and earthquakes. The number of people displaced internationally has been and continue to be massive, numbering in the millions. Consequently the international community has developed specialized organizations, professionals, and policies that address the needs of large displaced populations. International standards for the care of large displaced populations are overdue for consideration for application within the US, as they have been developed through very strong peer-review processes and draw on decades of experience providing humanitarian aid to millions of people. Unfortunately, the lack of use of these international standards within the US – besides simply overlooking broadly accepted standards and a great deal of experience gained in other countries – is made up for by planning that relies on ad hoc use of disparate and separately developed standards from different disciplines. Applying internationally developed, accepted, and tested displaced population standards may provide US planners and responders with comprehensive and equitable target levels of services to provide to displaced populations.

The study examined one set of internationally accepted disaster response standards, the Sphere Project Humanitarian Charter and Minimum Standards in Disaster Response, to provide an initial review of their applicability in the US. The project utilized a Web survey of a targeted sample of professionals in public health preparedness and emergency management in local, state, and federal government agencies, as well as disaster relief personnel in non-governmental organizations. In addition to the substantive data collected, this project examined the usefulness

of the selected methods for policy evaluation by examining such activities and outputs as the number of responses, quality of responses, invitees' reactions, resources required to carry out, and the ability to develop intended findings.

Following this introduction, Chapter II presents the problem under study by reviewing the background of displaced populations in the US, including historical events, projected hazards, and resources currently in place. It further presents a proposed solution to address the problem, covering the background and rationale for considering the application of the Sphere standards in the US. Chapter III outlines the research used to conduct an initial assessment of that proposed solution. Chapter IV provides the substantive results of the study, as formatted for submission to a peer-reviewed journal. Chapter V presents the assessment of the Web survey methods used for conducting an initial policy analysis involving dispersed stakeholders. Chapter VI presents summary conclusions and potential impacts for the entire study. Note that the chapters providing the papers to be submitted for publication were developed to stand alone, and thus may repeat information provided elsewhere in this larger document.

B. Leadership Implications and Significance of the Study

For the field of study and practice, the research process and products may help introduce US disaster response personnel to valuable international guidelines and the great experience gained in international disaster response. More importantly, the project presents many opportunities for professional development. It required networking with practitioners in the field, as well as supported the demonstration of competency in several areas, such as technical knowledge of public health preparedness issues in both domestic and international settings. Further, the project falls under the critical public health function of policy analysis: it involves decisions about a problem, identifying goals and proper means to reach those goals, handling

conflicting views about solutions, and allocating resources.[1] Following the adopted proactive policy evaluation framework, it follows the recommendation that public health leaders take an active role in policy development, rather than allowing problems to continue or other forces to guide outcomes.[2] The research design also attempts to emulate an applied research approach that might be used outside the project's current academic context as a thesis project. In its examination of an interesting but as of yet unexamined proposal to use the Sphere standards in the US, the project emphasizes the value of practitioners' input and looks ahead to implementation issues. It willfully uses a study design that is imperfect from the point of view of basic research, but nonetheless could rapidly inform valuable policy findings without excessive burden on participants or the researcher.

II. LITERATURE REVIEW

A. Background of Displaced Population Care in the US

Planning for the care of large displaced populations has increased in the wake of recent events that have displaced populations, such as Hurricane Katrina, and in expectation of other hazards that may displace populations or require congregate sheltering, such as earthquakes or weapons of mass destruction. This chapter begins by examining the nature of displaced populations and distinguishing them from other types of groups that require attention. The following section argues for the need to prepare for large population displacements in the US by presenting a brief history of large population displacements in the US and the predictions for future such displacements. The section concludes with an overview of the resources and policies that currently exist in the US to serve displaced populations.

1. Definition and characteristics of displaced populations

Displaced populations are defined by both their origin and needs. The cause of population displacement is often, but not always, a disaster. While the precise definition of the term disaster is often revisited by academics, Noji's pragmatic definition will serve:

> A disaster is the result of a vast ecological breakdown in the relation between humans and their environment, a serious and sudden event (or slow, as in a drought) on such a scale that the stricken community needs extraordinary efforts to cope with it, often with outside help or international aid.[3]

Those affected by disaster are of concern to this study when they become displaced from their community, from their regular homes, or from their neighborhoods within their community. A displaced population is in some aspects simply the aggregate of many displaced persons, defined by the Federal Emergency Management Agency (FEMA) as "an individual unable to return to

his/her place of residence due to an emergency or major disaster."[4] Yet a displaced population has far greater needs and far greater impact on a host community. For the purposes if this study, displaced populations are defined by the following key characteristics. A displaced population is:

(1) A large group of people who have relocated from their primary community of residence to another location;

(2) Considered a single population due to their common physical proximity at their community of origin or destination, or by sharing a common cause of displacement;

(3) Relocated against their usual preferences in order to avoid immediate harm, illness, or death, whether caused by a change in the usual conditions of housing, supplies, services, safety, laws, or government authority.

The use of the term "large" to describe group size is intentionally unquantified and subjective. It describes a group of such relative size in their destination that the receiving location believes the displaced people place a unique burden on local resources that must be addressed through special measures. In the smallest communities in the US, a group of less than 100 displaced persons might qualify as large, though realistically they might be quickly relocated to a larger town or city in the region that could easily care for them with existing services. The greater concern, it is presumed, is with groups numbering from one to 100 thousand. Though somewhat arbitrary, groups of smaller size could be divided and/or redirected to large cities that could easily absorb them with existing services. (See below for discussion of the capacity of the US hospitality industry and market.) Groups numbering in the tens of thousands might seem unlikely or unmanageable, but experiences in the US and around the globe show they are

common and indeed manageable. They are so ubiquitous that the basic handbook for the United Nations High Commissioner for Refugees lists standard staffing levels for refugee populations of 10-20,000 in its appendix.[5] Groups larger than 100 thousand go far beyond what might seem manageable by even the largest US cities, and thus would be divided into manageable sizes and redirected to different locations. Situations in which they could not be redirected are imaginable, but would require the breakdown of the US road, rail, and air travel networks and perhaps enter the realm of catastrophe planning, which is not directly considered here.

Displaced populations are vulnerable because they have lost the physical, social, governmental, and other systems that protect people from physical hazards, communicable disease, violence, and many other threats to individual and community health and well-being. The services a displaced population requires falls under the term humanitarian assistance. Humanitarian assistance is here defined as a slightly modified version of the United Nations High Commissioner for Refugees (UNHCR) definition of a refugee emergency: the response to any situation in which the life or well-being of a population is threatened unless immediate and appropriate action is taken, and which demands an extraordinary response and exceptional measures.[6] The specific services needed may range from only monitoring, if they are completely self-sustaining, to complete care including basic physiological needs (shelter, food, sanitation, healthcare), psycho-social supportive services, livelihood support (e.g., jobs, job search assistance, agricultural supplies, livestock), and legal assistance (e.g., filing for disaster assistance or change of legal status in order to gain access to local services). In the US, some organizations and experts divide the stages of support into emergency shelter (mass sheltering such as a stadium or church that meets immediate needs for up to 6 weeks) and temporary housing (provides more long-term needs and regular routines for months or years before moving

to permanent housing).[7] Note that the term "refugee" is avoided in this study because it is precisely defined in international law and international disaster response literature as a person who is unable or unwilling to return to their country of residence due to fear of persecution, as opposed to the vernacular usage of the term to refer to a person fleeing for safety under any variety of circumstances. [8,9]

Population displacement should be distinguished from migration or other large-scale human movement. Population displacement is sudden, unexpected, involuntary, and poorly planned. Displacement occurs to a place where the displaced people have made limited or no arrangement to sustain themselves, they are considered a burden, and they are grouped together physically and/or administratively. In contrast, while human movement or migration may be involuntary to some extent, it is often carried out willingly by individuals or small groups of people seeking better living conditions (e.g., job opportunities, joining family). Migrants bring with them skills, financial resources and social capital, and more often than not have a positive impact on the economy of their destination.[10] Further, while migrants may move in smaller groups than displaced populations, in total migrants far outnumber people involuntarily displaced by conflict or insecurity who, in one estimate, comprise only seven percent of all international migration.[11]

Humanitarian aid given to displaced populations should also be distinguished from development aid. The blurry boundary between the two activities is one of the greatest challenges of both planning and studying the care for displaced populations. One often follows the other, and frequently in cycles. Impoverished or disempowered communities are more vulnerable to disasters and displacement, or disasters and displacement lead to disruption of household and community economies, poverty, and ongoing vulnerability crises. For that reason,

for over a decade most humanitarian assistance around the world has been directed at countries that are chronically poor.[12] Nonetheless, a distinction is often drawn in theory as well as practice. Governmental and non-governmental organizations distinguish emergency aid from development aid in their accounting systems and in their actual procedures. Humanitarian assistance is short-term, immediate, and the lack of it would result increased death, disease, or insecurity because the population cannot feed, care for, or protect itself. Development assistance is harder to define because it has varied with different contexts, and has had a host of alternative phrasing bound up in colonial and post-colonial global relations.[13] Yet development assistance, generally, either provides directly usable resources in a limited fashion to augment locally produced resources (e.g., cash or food supplements, not the entire diet), or augments the systems that a community uses to produce those resources locally (e.g., improve markets, economies, skill sets, industries.) In contrast to emergency humanitarian aid, development assistance is long-term and the lack of it would only maintain the status quo of a population, not release it into free fall.

2. Past population displacements

Large evacuations and population displacements have been numerous in US history, are frequent in current events, and expected in future emergencies. Many have occurred in recent history and memory. Some high profile displacements stand out to such an extent that they hardly need to be mentioned. The 1906 San Francisco earthquake and fires left approximately 250,000 people (over half the city population) homeless.[14] They were displaced temporarily and permanently to nearby army-built encampments, as well as other towns, cities, and states (e.g., Portland, Oregon, where 4,300 arrived by train).[15] Hurricane Katrina initially displaced around 1

million people, and 100 days afterwards there remained 400,000 thousand people displaced among approximately 45 states.[16,17] In 2008 Hurricane Gustav became the largest evacuation operation for a single city in US history, when over 90 percent of New Orleans was evacuated.[18]

Unfortunately, summary research on displaced populations and evacuations in US history is limited. FEMA's database records disaster declarations going back decades, but does not include the number of people that evacuated in those disasters. Rather, FEMA only generally states that evacuations occur hundreds of times each year.[19] Media outlets remain a key source, though evacuation numbers reported during an event vary a great deal and are rarely summarized retrospectively. When wildfires approached Los Angeles in 2007, news outlets reported that as many as 1 million people had been ordered to evacuate, and authorities estimated that 513,000 people were ordered out of their home, but only 27,000 people were registered in shelters.[20] The official state fire database summary statistics for that year report only the number of buildings and acres affected (3,238 and 1,520,362, respectively).[21] In academic sources, a great deal of research examines evacuation order compliance related to specific events, such as hurricanes.[22-25] A large body of evacuation research from a transportation planning perspective has grown since Hurricanes Georges in 1998 and Floyd in 1999 revealed that emergency management planning alone was insufficient.[26,27] In preparation for expected large-scale terrorism attacks, some researchers and government programs have reviewed cross-cutting organizational, sociological, communication, logistical, and other issues related to evacuations, but focus on a population's egress from a threatened area and pay little attention to issues in a receiving location.[28] Another limitation is the fact that so many large evacuations do not result in displaced populations, as many evacuees are able to return to undamaged or moderately damaged homes.

While government databases and academic literature on population displacements in the US are limited, literature on disasters written for general audiences abounds. **Error! Reference source not found.** highlights historical events in the US that left large numbers of people displaced or homeless, as distilled from Campbell's general audience history of catastrophes in the US, except where otherwise noted.[29] Fairly precise statistics on the number of people that were displaced is available for some events. For other events only crude estimates of the displaced or related statistics are available (e.g., acres of land or homes destroyed), but they nonetheless testify to the scale of the event and population displacement caused.

TABLE I
SELECTED EVENTS IN US HISTORY INVOLVING DISPLACED POPULATIONS

Year	Event	Population Displacement	Deaths	Buildings/Land Affected
1871	Peshtigo Fire, Wisconsin	Undefined numbers fled to Green Bay, ~10,000 people received aid in months after	1,200-2,400	2,400 square miles of forests and homes destroyed
1871	Great Chicago Fire	90,000 made homeless	(Not found)	18,000 buildings, 2,000 acres destroyed
1872	Great Boston Fire	Thousands made homeless	30	776 building, 65 acres destroyed
1874	Mill River Dam collapse	740 made homeless	139	(Not found)
1889	Johnstown Flood (east of Pittsburgh)	~30,000 residents affected; Red Cross aided disaster victims for the first time	2,209 official deaths	1,500 homes destroyed
1900	Galveston Hurricane	(Not found)	10,000 (6,000 in Galveston)	~ 3,600 houses in Galveston destroyed
1906	San Francisco earthquake and fire	225,000 of 400,000 residents made homeless, Army helped with 20+ refugee camps that remained for over a year	664 (officially), 3,000 estimated by researchers	City center destroyed by fire and blasting: 4.11 square miles, 28,188 buildings
1919	Chicago race riot	1,000 made homeless	(Not found)	(Not found)
1926	Miami Hurricane	~50,000 made homeless	373	(Not found)
1927	Mississippi River flood	1 million lost homes and livelihood, Red Cross fed 700,000 and sheltered in tent cities	246	137,000 homes damaged/destroyed, 28,500 mi^2 of cropland flooded
1928	St Francis Dam	Thousands evacuated	450	Thousands of homes destroyed
1948	Vanport City, Oregon destroyed after dike breach[30]	18,000 made homeless	(Not found)	Entire city destroyed and never rebuilt
1972	Rapid City Flood	3,057 injured	238	1,335 homes destroyed
1979	Three Mile Island accident	144,000 evacuated	(Not found)	(Not applicable)
1980	Mt St Helens eruption	(Not found)	57	123 buildings destroyed, 230 mi^2 of forest destroyed
1980	Heat wave in central and eastern US	Unknown. (High potential in similar events, such as to cooling centers.)	10,000	(Not applicable)
1980	Mariel Boatlift Exodus	125,000 undocumented people arrived from Cuba	(Not found)	(Not applicable)
1989	Loma Prieta Earthquake	(Not found)	(Not found)	27,000 buildings damaged/destroyed, 1,300 completely, 11,500 residences uninhabitable
1993	Mississippi River Flood	(Not found)	(Not found)	10,000 homes destroyed, 100,000 damaged
2005	Hurricane Katrina and flood	New Orleans: 80% evacuated, 30,000 sought shelter in Superdome and convention center, population fell from 455,000 before event to 211,000 in 2006[31]	~1,400	250,000 buildings lost

3. Future population displacements

Population displacements equal to or worse than those listed above are expected to occur again. It may be difficult to accepting such predictions because of recent advances made in the areas of engineering (e.g., levees), regulation (e.g., building codes), and hazard analysis (e.g., weather tracking systems). Therefore, before presenting any technical predictions of population displacements in the future, this section presents barriers to accepting and preparing for large populations displacements and other disasters that need to be acknowledged. Part of the perception that large disasters and population displacements are unlikely is due to the limited history of settlements in what is now the US. There are also major psychological and political challenges in planning for these events. Regardless of these barriers, there are powerful settlement and development policies and programs that have contributed to large disasters and populations displacements in the past, and which contribute to ongoing risks. Finally, this section closes with a review of specific hazard predictions for the US which include large population displacements.

a. Awareness and other psychological barriers

The historical events presented above may seem to be calamities of the past that are either incredibly unusual or are unpredictable. Awareness of disasters that regularly occur in very long cycles is limited in the US because its settlements and recorded history are young on a historical and geological scale. For instance, prior to its massive eruption in 1980, Mt St Helens in Washington State had been relatively silent since 1857 -- a year when 19 states had yet to be admitted to the Union. Hence Schiermeier defines catastrophes as "great exceptions" which occur less than once a generation or once a millennium.[32] In contrast to the US, the experience

and record of local disasters in some communities in the Old World is much more extensive. There are documents about the eruptions of Mt Etna stretching back 2,750 years, chronicles and stone monuments providing local flood history in China dating back 2,000 years, and records covering tsunamis on the Turkish coast dating to 1410 BCE.[33-35] Such an extensive record is impossible in what is now the US, where the oldest continuously occupied city with a written historical record is less than 500 years old (Saint Augustine, Florida, founded 1565). Even allowing for oral history to suffice, most indigenous societies or communities that existed before the Euro-American era suffer from great inter-generational discontinuity. The only arguable exception might be a handful of pueblos in the Southwest, occupied continuously for 800 or 900 years.[36-40]

Steinberg argues that large disasters are hard to address factually because they undergo "historical-geographic compression" in which they become archetypes of disaster and very much define calamity in the popular imagination.[41] In fact, many such large events are not retained in popular memory without being transformed into such archetypes. These large events present the psychological elements of Posner's definition of catastrophe: they combine a low or unknown probability of occurring with an extraordinary high impact, and thus challenge rational planning and discussion.[42] These issues of historical awareness and risk perception cannot be easily remedied. However, they were considered in the research design and included as factors that might affect acceptance of new guidelines for the care of displaced populations.

b. Political barriers

Other barriers to addressing large population displacements and other disasters are avoidance, denial, and distortion. Large population displacements and other disasters may

undergo political interpretation immediately after the event. There was active re-interpretation of the 1906 San Francisco disaster as a fire, not an earthquake, because it was thought that a reputation for earthquakes might limit the return of people and businesses, as opposed to fires which were much more common in large cities. [43] In the wake of Hurricane Katrina, federal elected officials and administrators were quick to highlight the role of weather, nature, and surprise in causing the damage, even though such a large storm and loss of life has rarely been so well predicted.[44] Napier et al. examine how Americans witnessed the affects of Hurricane Katrina yet found ways to justify the consequences in order not to confront the shortcomings in our social order and government services which the event exposed.[45] Such avoidance can temporarily satisfy people, but it also paralyzes the innovation of new solutions and preserves an inadequate system.

c. Ongoing settlement and development policies and phenomena

Many of the historical events that have caused large population displacements in the US were the result of human phenomenon that continue to place populations at risk today, regardless of engineering and other technological advances that offer some protection. Many disasters have been made possible by migration and settlement patterns. Beginning in the late 19th century, migration increased to disaster-prone urban areas such as the hurricane-prone Gulf Coast, the seismically active West Coast, and the western and Midwestern cities with moderate to high tornado risk. [46] The consequence has been increased exposure to hazards, leading to Rodriguez's definition of disasters as "the conjunction of adverse natural phenomena and specific vulnerable communities."[47] The increasing exposure to coastal hazards is a well-studied example. Most North American cities are on coastal water, tidal water, or rivers.[48] The National Oceanic and

Atmospheric Administration (NOAA) reports that 53 percent of the US population is contained in coastal counties, though those counties account for only 17 percent of US land area.[49] The coastal population continues to grow, increasing by 33 million (28 percent) from 1980 to 2003. Some regions exhibited much greater growth, such as the Southeast which increased 58 percent during that same time period, likely due to migration for retirement and job-seeking.

In addition to migration, the development of infrastructure and regulations may ultimately increase the threat of population displacements and other disasters. Many argue that the federal government has played a large role in increasing risk to disasters by subsidizing disaster insurance (i.e., the National Flood Insurance Program), response, and infrastructure. Federal programs and subsidies increased a great deal after World War II, especially in disaster-prone areas such as Florida where developers and customers have been eager to acquire ocean-front properties.[50,51] Steinberg argues that Federal government intervention has effectively transformed natural disasters from a localized problem into a national problem, where costs are born among the entire nation's taxpayers. A negative consequence is that risk and space diverge to the point that it is hard to locate blame and harder to see that the federalization of risk has not benefited everyone equally. [52] These actions increase the exposure to natural hazards, or even create supposedly "natural" hazards which did not really exist before humans settled certain areas. Even though preparedness and infrastructure may reduce the loss of life from hurricanes, economic loss grows.[53] Nor are population displacements reduced. Evacuation in the face of large hurricanes is often preferred by emergency managers over ordering residents to shelter in place. Evacuation avoids potential direct damage from a storm and removes the challenge of re-entering damaged areas to deliver relief supplies.[54]

d. Specific predictions for population displacement

Looking ahead, population displacements are expected to occur again in the US. They feature prominently in the National Planning Scenarios.[55,56] That set of 15 high-impact emergency scenarios was developed by the inter-agency Homeland Security Council in response to the Homeland Security Presidential Directive-8. They serve as a common basis for governmental and private sector emergency preparedness planning at all levels nationwide, and reflect some of the greatest expertise and analysis in the area of threat and consequence analysis. Large population displacements feature in eight of the scenarios, as listed in Table II. Needless to say, many emergency management and public health agencies might exempt themselves from planning for these scenarios due to their roles, resources, and location, and others might simply reject them as farfetched. Yet for many governmental agencies, planning for these scenarios and population displacements is, strictly speaking, obligatory. All recipients of federal emergency preparedness funds are expected to utilize these scenarios along with other requirements attached to their federal funding (e.g., the National Incident Management System), and therefore plan for their role in such scenarios as appropriate to their agency and community.

TABLE II
POPULATION DISPLACEMENTS IN THE NATIONAL PLANNING SCENARIOS

Scenario #	Scenario	Evacuations/Displaced Persons
1	Nuclear Detonation – 10-kiloton Improvised Nuclear Device	100,000 in affected area seek shelter in safe areas (decontamination required for all before entering shelters) 250,000 instructed to shelter in place as plume moves across region(s) 1 million+ self-evacuate from major urban areas
2	Biological Attack – Aerosol Anthrax	25,000 seek shelter (decontamination required) 10,000 instructed to shelter-in-place in each city 100,000+ self-evacuate out of affected cities
5	Chemical Attack – Blister Agent	More than 100,000 evacuated 15,000 seek shelter in immediate area (decontamination required)
6	Chemical Attack – Toxic Industrial Chemicals	10,000 evacuated 1,000 seek shelter in safe areas 25,000 instructed to temporarily shelter-in-place as plume moves across region 100,000 self-evacuate out of region
8	Chemical Attack – Chlorine Tank Explosion	100,000 instructed to temporarily shelter-in-place as plume moves across region 50,000 evacuated to shelters in safe areas 500,000 self-evacuate out of region
9	Natural Disaster – Major Earthquake	300,000 homes destroyed 250,000 seek shelter in safe areas 250,000+ self-evacuate the area
10	Natural Disaster – Major Hurricane	1 million evacuated 150,000 seek shelter in safe areas 200,000 homes destroyed
11	Radiological Attack – Radiological Dispersal Devices	10,000 evacuated to shelters in safe areas (decontamination required prior to entering shelters) 25,000 in each city are given shelter-in-place instructions Hundreds of thousands self-evacuate from major urban areas in anticipation of future attacks

Aside from those extremely high impact events expected by the most worried of federal planners, other analyses project serious hazards and population displacements throughout the US. The Intergovernmental Panel on Climate Change (IPCC) has made a strong case for the likely increase in extreme weather events.[57,58] High latitudes are expected to receive increased precipitation and intensified rainfall events, such as flash floods and large-area floods. Wildfires are expected to increase in intensity and frequency due to increased warm periods, water stress, and drought. Tropical cyclones are expected to increase their intensity alongside rising sea levels, more intense storm surges, inland rainfall, and wind.[59] A great deal of analysis and planning has already been carried out to deal with the increased risk from climate change and sea level rise in major cities such as New York and Los Angeles.[60] Some changes may have already occurred. The 2008 Atlantic hurricane season set a variety of records for hurricane frequency and intensity, and was the tenth season out of the previous fourteen to produce above average hurricane activity.[61,62] It should be recalled that such threats drive increased planning in directly impacted communities, as well as inland communities that receive displaced coastal populations.[63]

In addition to hazard analyses, environmental sciences and climate change discussions contribute conceptually to the planning for population displacements and other disasters. Scientists and policy analysts in those fields argue that to deal with the climate change, societies must utilize mitigation and adaptation. Mitigation includes the reduction of greenhouse gas emissions that cause climate change. Adaptation, on the other hand, modifies the physical and social environment to minimize the negative impact of unavoidable hazards.[64] The ultimate goal is resiliency, a concept adopted for policy and human systems from ecosystems theory. The IPCC defines resiliency as "the ability of a social or ecological system to absorb disturbances

while retaining the same basic structure and ways of functioning, the capacity for self-organisation, and the capacity to adapt to stress and change."[65] In the long-term outlook of climate change, resiliency may be improved by adapting settlements and infrastructure to deal with rising waters. However, for the shorter-term crises that threaten populations -- whether they are caused by climate change or man-made -- resiliency can be strengthened through improved policies and resources that care for displaced populations. The following section examines the state of current resources that do so.

4. Current resources used for displaced populations in the US

The US has substantial emergency and non-emergency resources and policies that support the care for displaced populations, including emergency management organizations, earmarked emergency response funds, non-emergency infrastructure and systems, and an array of policies in the form of codes and guidelines. This section reviews these resources and policies, as well as their limitations.

a. Non-emergency resources

Related to the belief that the displacement of large populations in the US is simply unlikely, it may be tempting to assume that the existing infrastructure and systems can deal with displaced populations. The US also has immense wealth and advanced infrastructure, industries, and markets that can aid displaced populations. Private vendors, such as commercial catering companies, can rapidly produce meals for thousands of people. Private companies and supply chain managers that do not normally operate in emergency conditions have been recognized for their robust disaster response planning and performance (e.g., Wal-Mart and Waffle House.[66-68])

The US hotel industry offers enormous capacity to provide temporary shelter to large numbers of people. To illustrate, Table III lists the capacity of the hotel industry in several major US metropolitan areas, as well as a brief analysis to provide a sense of scale. The table provides the number and percentage of US counties that have fewer households than the total number of hotel rooms in each city. For example, Atlanta's 93,000 hotel rooms number more than the households in each of 91 percent of US counties. Corresponding percentages are listed for each of the other major metropolitan areas listed. If, in a hypothetical scenario, any one county was completely evacuated and one displaced household was placed in one hotel room, the entire displaced county could be housed in the hotels of any one of several major cities. This may not be a realistic scenario or calculation, but rather an illustrative analysis that demonstrates the enormous size of the temporary housing service that continuously operates in the US.

TABLE III

CAPACITY OF HOTELS IN MAJOR US METROPOLITAN AREAS

Metropolitan Area	Hotel Properties[69]	Hotel Rooms	US Counties with Households Numbering Less than Rooms in City Listed[70] # of Counties	% of Counties [a]
Atlanta, GA	776	93,012	2,851	90.7%
Boston, MA	351	50,615	2,648	84.3%
Chicago, IL	721	107,637	2,895	92.1%
Los Angeles-Long Beach, CA	984	96,113	2,860	91.0%
New York, NY	466	88,350	2,841	90.4%
San Francisco/San Mateo, CA	396	51,750	2,657	84.6%

[a] Percentage of all 3,142 counties (US Census Bureau).

Building codes are another element of existing non-emergency infrastructure that is highly relevant to population displacement. Today the most important single set of building codes is the International Building Code, which was created in the 1990s by the three organizations whose model building codes had dominated since the end of World War II.[71,72] Architects, engineers, and federal, state, and local laws and inspections help guarantee high quality conditions in so much of the built infrastructure in the US. Ramroth argues that the history of building codes is the history of citizens and governments responding to and trying not to repeat disasters.[73] The first comprehensive set of building codes in the US was passed in Chicago in 1875 in response to the 1871 fire and the rebuilding boom that followed. The purpose of building codes is to protect the health and life safety of the public by regulating all materials and systems of buildings to reduce risk of accident and injury, encompassing structural systems, emergency exits, sanitation, lighting ventilation, fire protection, controls, and alarm systems. Even the first tenement housing law, passed in New York City in 1867, regulated many health-related issues, such as requiring one toilet connected to plumbed sewers for every 20 residents. Building codes are relevant to population displacement in both the prevention and response phases. Building codes help prevent disasters which might displace populations by decreasing such hazards as building collapse, fire, and disease outbreak. Building codes also contribute to living conditions in shelter in which displaced populations arrive. Individuals made homeless by a disaster can take advantage of the high quality housing and hotels in the US, which do serve many basic needs for shelter and have access to food and other services, in part due to building and other planning codes. However, while building codes are enormously beneficial to populations, they are not comprehensive enough to account for the needs of large displaced populations. They do not encompass many health and social issues that great

experience in caring for displaced populations overseas has shown are critical, as discussed in the following chapter.

Another limitation in relying on building codes is that large displaced populations are often put in temporary shelter (e.g., tent structures) or in structures not designed to serve as housing. Large sporting venues can be found in many disaster plans as shelters of last resort. The affiliated private industry group recognizes this role and has contributed to improving such large venues' ability to shelter large groups.[74] Those facilities are well-suited in some ways because they are designed and utilized for serving tens of thousands of people for certain periods of time. Yet these venues are of course limited in their sleeping, feeding, sanitation, and social infrastructure compared to regular housing and hotels.

b. Free market

The market, in the broadest sense as a system for exchanging goods and services, is a major component of existing non-emergency resources in the US that can be brought to bear for disaster response. The US arguably has one of the largest and best currency-based commercial systems and economies in the world, if not history. The open market is in fact utilized to a great extent by disaster response agencies when disaster-affected persons are given cash payments. For example, after Hurricane Katrina FEMA provided debit cards worth $2,000 each to more than 900,000 victims, and also used direct payments to provide $1.2 billion in rental assistance to more than 500,000 applicants.[75] Cash payments are preferred in many situations because they allow the disaster-affected persons to make their own decisions about their relative needs for different goods and services, as well as support the restoration of commerce and other social interactions.

Relying on cash payments and the free market has limitations, hence the development of dedicated governmental and non-governmental disaster aid organizations that provide direct services. Hurricane Katrina highlighted many failures of the free market in disasters, both in terms of the large scale unmet needs as well as issues of fraud and mismanagement involved in cash payments.[76,77] Some of the unmet needs are due to the tendency of disasters to disable existing institutions and systems. Because of that breakdown, the market is unable to function properly in areas in which it would normally be able to match potential customers' demands with potential suppliers' goods and services. Further, many needs may not be well defined or commoditized. Hence many of the support services needed by displaced populations are, in non-emergency situations, not provided by private vendors but by public entities. Further, as Chinni points out, turning from the government to the private sector to lead disaster response overlooks the fact that while private companies do have some great successes, they also have great failures.[78] Hence one goal of putting disaster response in government hands is to increase accountability. Assistance to displaced persons is also, simply, a public good. None can, arguably, be excluded from receiving it for ethical, legal, and factual reasons. Yet like many public goods, if disaster assistance is not provided and overseen by public entities, perhaps no other person or entity would adequately deliver it.

c. Dedicated emergency response resources

The US makes substantial planned and emergency expenditures for emergency response services, more than can be comprehensively reviewed here. FEMA is perhaps the most visible organization. Since its creation in 1979, FEMA's resources had grown in 2008 to include $11.6 billion and 2,322 full-time equivalent (FTE) staff for disaster assistance, $223 million and 791

FTEs for disaster operations, and $171 million and 298 FTEs for logistics management.[79,80] On the ground, this meant that for Hurricane Gustav in August 2008 FEMA delivered 4 million meals, 2.4 million liters of water, 478 emergency generators, 267 truckloads of cots and blankets, and 141 truckloads of tarps.[81] At the state level, the emergency management agencies for the 50 states and District of Columbia had budgets totaling approximately $282 million and approximately 4,600 FTEs for fiscal year 2008.[82] In the non-governmental sector, one of the major registries of non-governmental organizations that conduct emergency response, National Voluntary Organizations Active in Disaster (NVOAD), has approximately fifty major disaster response organizations active at the national level.[83] Those organizations include massive high profile organizations such as the American Red Cross and the Salvation Army. The American Red Cross fielded approximately 48,000 employees and volunteers in disaster relief operations in 2008. The Salvation Army provided approximately 1.6 million people with disaster assistance in the same year.[84,85] Even the least known member organizations are substantial: the Billy Graham Rapid Response Team boasts a roster of 3,200 personnel.[86]

While the above disaster response organizations are substantial, this research to some extent assumes that they provide inadequate and inequitable services to displaced populations. It is in fact difficult to judge whether the disaster response services received by displaced populations has been adequate, as there are few comprehensive evaluations and no common standards in use. However, Garrett and Sobel demonstrate numerically that FEMA disaster expenditures and the rate of presidential disaster declarations have been affected by presidential and congressional influences, as they are higher for states that have representation on FEMA oversight committees.[87] Below the federal level, small local resources may provide adequate care for evacuees from small events, such as apartment complex fires or neighborhood

evacuations, but clearly these resources can be overwhelmed by much larger events. Even when disaster response organizations are not overwhelmed by the scale of an event, the services they intend to provide is often inadequate because of structural and systemic issues. As the European Community Humanitarian Aid Organization (ECHAO) argues, many humanitarian aid organizations provide inadequate services and goods for several systemic reasons. Many humanitarian aid organizations are specialized or limited in scope (e.g., food, health care, etc.), they are dependent on donors for the goods they can deliver, or in reality they only seek a sense of altruism rather than results for their beneficiaries.[88] When humanitarian aid organizations receive funds, they often receive a certain amount of earmarked funds that is not necessarily set by beneficiary needs, and then dispose of the money as they see fit. The aid provided may also be dependent on donations which the humanitarian organization must first collect. Often those donations are not driven by needs assessments or standards, but by the media coverage of the event. Hence many donations may arrive for minor but very news-worthy needs, such as those of children, but not for major but less dramatic needs, such as construction materials.[89] All together, without strong needs assessments, guidelines, or evaluations, the ECHAO argues that there is no reason to assume that the allocation decisions made by humanitarian aid organizations and the goods and services provided by private donors or private agencies match the needs of their beneficiaries.

d. Current US policies for displaced populations

In addition to the disaster-specific emergency resources that to some degree address the needs of displaced populations, there are several relevant sets of policies. These policies take the form of grant guidance, professional standards, inter-disciplinary guidelines, and other forms.

This section examines the extent and limitations of many of those policies, including those from the Centers for Disease Control and Prevention (CDC), inter-agency policies spearheaded by the Department of Homeland Security, and recent policies developed specifically for displaced populations under the leadership of FEMA.

For health and public health agencies, one of the largest sources of emergency preparedness funding and policies comes from the federal government via the Centers for Disease Control and Prevention (CDC). The guidance and funds do support agencies and systems that are involved in the care for displaced populations, and the precision of the guidance has grown since 2004, when the CDC began organizing the funding around performance goals and performance measures.[90-94] The CDC has also funded a limited number of academic projects that have developed displaced population care guidelines, primarily for evacuees in rural communities.[95] However, all of these guidelines remain at the programmatic level -- appropriately, many would argue -- by specifying types of plans to prepare and test (including mass care) not the exact activity or level of service to be provided. Also in the health and public health sector, there are many profession-specific competency sets or performance standards that could come into play during population displacement. Examples include disaster nursing competencies and emergency medical technician (EMT) planning guidance for extremely large gatherings such as sporting events.[96,97] Yet, as intended, they are concerned with specific functional roles within the total response effort and do not encompass the totality of services that a displaced population may require.

More relevant policies have come from the Department of Homeland Security (DHS). Since the release the Homeland Security Presidential Directive-8 in 2003, DHS has led the development of coordinated all-hazards preparedness goals and planning tools. The

Department's Target Capabilities List (TCL) is the most comprehensive, interdisciplinary catalog of the federal, state, local, and tribal emergency preparedness benchmarks.[98] The TCL covers 37 areas of emergency preparedness and response activities, from bomb disposal to epidemiology and animal disease outbreaks (in 578 pages, no less). The TCL is unique and valuable in this arena because it focuses on outcomes, not activities, and emphasizes multi-agency and -jurisdictional planning and operations. Care for displaced populations is partially addressed in the TCL under the Mass Care capability, which it defines as "provide immediate shelter, feeding centers, basic first aid, bulk distribution of needed items, and related services to persons affected by a large-scale incident."[99] However, it only outlines the capability with 31 statements of performance measures and metrics, a sample of which are listed in Table IV. These activities and measures provide broad outlines of activities, but are lacking in the detail of what exactly is to be provided to a sheltered or displaced population. This study argues that a full capability to care for large displaced populations requires recognizing that displaced populations have more needs (e.g., more than basic first aid), and that planning and evaluation guidelines need more specificity about the services that beneficiaries can expect to receive (e.g., amount and quality of shelter, food, etc.)

TABLE IV
SELECTED PERFORMANCE MEASURES FOR MASS CARE FROM THE TARGET CAPABILITY LIST

Performance Measures	Metric
Time in which the initial mass care needs assessment is completed (sheltering, feeding, and bulk distribution)	Within 4 hours from notification of need for mass care services
Time in which to determine availability of shelter and staff within jurisdiction	Within 4 hours from activation of mass care plan
Time in which shelters are opened with appropriate staff	Within 6 hours from activation of mass care plan
Time in which shelter is able to provide 2 meals per day	Within 24 hours from shelter opening
Percent of companion animals sheltered and/or referred to appropriate responsible authority	100%

More specific policies related to displaced populations were developed after Hurricane Katrina, but shortcomings remain and the greatest criticism is directed at FEMA. The GAO conducted one of the most recent and significant reviews in this area. For one, it noted that FEMA's policies on the use of travel trailers as temporary housing became vague after the criticism of trailer living conditions following Hurricanes Katrina and Rita.[100] FEMA has historically relied upon trailers, but it has made contradictory statements to Congress and other audiences about whether trailers will be available to states at all in future disasters. Further, the GAO found that the FEMA has few effective programs for supporting and measuring the transition from temporary to permanent housing. At the management and coordination level, the GAO also issued serious criticism of FEMA's short and long-term management. It noted that

FEMA has no effective strategic management plan and behaves "somewhat like a volunteer fire department" with staff available for disasters but not dedicated to day-to-day activities.[101]

After Hurricane Katrina and the political furor that followed, Congress sought to support the development of long-term solutions for displaced populations and mandated that FEMA and partners develop a National Disaster Housing Strategy as part of the Post-Katrina Emergency Management Reform Act of 2006.[102] A great deal might be expected from the Strategy documents because of FEMA's high profile, the number of organizations consulted, and the broad expectations for leadership from federal agencies, as well as the fact that these plans were developed in response to such a visible failure. However, while the Strategy development process and resulting documents have addressed many issues of displaced populations, there are many limitations. The Strategy devolves primary responsibility to care for disaster-affected persons to other entities through statements about universal "baseline capabilities" that it assumes exist outside the federal agencies. One such capacity it assumes exists is that "individuals and heads of household develop and implement personal emergency response plans to meet their sheltering and personal needs (e.g., food, clothing, medications, important documents, and identification) during the first 72 hours following a disaster." There is no reason to assume such preparations are a universal capability. Further, the Strategy's first "key principle" is that "shelter operations are primarily conducted at the local level."[103] The solutions for the needs of displaced populations that it does provide are for the most part concerned with identifying and coordinating the many federal agencies, resources, and laws (e.g., FEMA's Individual Assistance Program, the Department of Housing and Urban Development's National Housing Locator, and the Department of Agriculture's Housing and Community Facilities Programs). The Strategy does not specify what exactly should be provided for housing, nor

address many needs beyond housing. The provision of housing is assumed to account for nearly all of a displaced population's needs, as housing is expected to include basic utilities that are part of any American household (water, sewer, electric). However, displaced populations need more than housing. The most the Strategy goes beyond addressing simple shelter is to suggest that group shelter sites be located where needed utilities and potential employment are available.

Even the portions of the National Disaster Housing Strategy documents that have the most potential to specify detailed needs and services to be provided to displaced populations are limited. Annex 4: Disaster Housing Community Site Operations, remains a fairly high level outline of how large group housing sites should account for needs, host community interests, emergency services (police, fire, etc.), utilities, zoning laws, social services, and others issues, in the most general sense.[104] The community needs are mentioned as broad categories to consider, not quantifiable elements that any even moderately competent planner would need to site a displaced group of people. For detailed operational guidelines, the Strategy refers planners to the American Red Cross "Shelter Operations Management Toolkit: Operational Tips, Checklists and Best Practices for Shelter Managers." These guidelines may be fine strategies, but they are limited in detail as to what a sheltered population needs. For example, the guidelines make not one mention of water. The Strategy also endorses two similar documents by the American Red Cross and the trade association for large sporting venues that, while they may provide excellent strategies and methods for shelter managers to address categories of issues, they again contain limited detail regarding the specific needs of a displaced population beyond shelter.[105,106] Additionally, in FEMA's Evacuee Support Planning Guide, the only standards referenced are those for pet care and disabled access. Otherwise the Guide follows the simpler strategy of outlining categories of needs that should be assessed and addressed.[107,108]

5. Strategic limitations and absence of standards

The above resources and policies attest to the maturation of disaster planning in the US, but none address the breadth or detail of services needed by large displaced population on par with the international standards to be examined in the proposed research. The current inadequacies stem from the policies' foundation in emergency management and free market models for disaster response. As a result there are shortcomings in the goals of current policies, as well as the strategies used to reach those goals.

Emergency management agencies have been made the leader in preparedness for displaced populations, at the federal level in the form of the National Disaster Housing Strategy and at the state and local level as well. That lead role is appropriate in many ways because there is a need for a coordinating entity for all of the organizations involved, and simply because the response involves a great deal of logistics, which is one of the specialties of emergency management. However, comprehensive care for a displaced or any other population is, it is to some extent assumed here, beyond the topical expertise of emergency management professionals, as they do not possess advanced knowledge of human health, social, and other needs. One consequence is that the goal of current displaced population strategies is to provide displaced persons with shelter and cash payments, with the belief that their well-being will flow from the combination of shelter, cash, the free market, moderate oversight, and their own initiative. This is inadequate because of a false assumption about the effectiveness of the free market and the ability of displaced, vulnerable populations to operate in the market.

In fact emergency management prefers not to take a lead or directive role in any emergencies, but rather seeks only to manage the application of resources which other managers

control.[109] Emergency management takes a flexible problem-solving approach, and is driven by ad hoc requests for resources from many different front line response agencies and ensures the delivery of those resources to the requesting entity. Conditions may be chaotic, disasters are not identical, emergency management is not in the lead, and therefore dogmatic and unresponsive protocols would be inappropriate. This is an outlook and strategy that emergency managers appear to have adopted -- like many of their practices and language -- from military organizations. The strategy of selecting resources and tactics appropriate to actual battlefield conditions, rather than simply following predetermined principles and formations, has been seen as one of the most important changes in military strategy that occurred in the wake of modern warfare and weaponry.[110] However, the results for displaced populations guidelines is that the services to be provided to displaced population are weakly defined only as categories of needs to be addressed as they arise. That strategy holds true at both the higher incident-wide management level which emergency management is accustomed to, as well as at the level of shelter management. Hence the shelter guidelines' details are limited to listing categories of needs and directing a shelter manager to try to identify needs or problems, explore causes and possible solutions, and develop and carry out plans to resolve the needs or problems.

Such adaptability to current conditions is needed, yet this study explores the possibility that identifying the needs of displaced populations does not need to be left until a disaster unfolds. Rather, very detailed minimum standards for the care of displaced populations have been developed and should be considered for use in the US, as is proposed in the following section. Doing so utilizes a stronger health and public health approach which can more specifically identify individual and community health issues, as well as articulate those needs with guidelines and measures to support stronger program management.

B. Proposed Standards

A great deal of experience serving displaced populations has been gained by international disaster response organizations outside the US. That experience has led to the development of numerous methods and policies, including the Sphere standards. Yet US disaster response planning, operations, and evaluations make little or no use of the Sphere standards. The Sphere project organization, in dozens of reports on the use of the standards around the world, does not report any use of the standards within the US.[111] The greatest, and perhaps only, use of the Sphere standards within the US is in university courses on international humanitarian assistance.[112-116] Yet there have been several recent calls for standards, guidelines, metrics, and other quality improvement tools for emergency preparedness in the US. The GAO put it simply with its 2009 report entitled "FEMA needs more detailed guidance and performance measures to help ensure effective assistance after major disasters."[117] In 2008, the Committee on Research Priorities in Emergency Preparedness and Response for Public Health Systems noted the need for criteria and metrics to evaluate emergency preparedness, response, and recovery.[118] The CDC calls for the development of outcome measures for emergency preparedness and response in its catalog of current public health research needs.[119] Given the calls for reform of US disaster response generally, the specific criticisms of the capabilities to care for displaced populations within the US, and the great experience and resources of international humanitarian aid organizations, the Sphere standards merit serious consideration for use in the US.

To provide a basis for that argument, this chapter first presents a brief overview of the content of the Sphere standards. Next, a brief history of international disaster response organizations and their experiences which led to the development of the Sphere standards is provided. Following that, a summary of the potential benefits of using standards in disaster

response and other complex organizational settings is presented. Finally, some of the factors that might potentially affect the use of the Sphere standards in the US are offered in preparation for the following chapter's proposal for a more detailed evaluation.

1. Brief review of the Sphere standards

The Sphere standards are intended to be used in any country or setting where humanitarian assistance is required as a consequence of natural disaster, armed conflict, or other situations that trigger population movements and need for humanitarian assistance. The document is comprised of 63 standards in total, grouped into five life-sustaining sectors: Standards common to all sectors (8 standards); Water supply, sanitation and hygiene promotion (11 standards); Food security, nutrition and food aid (17 standards); Shelter, settlement and non-food items (11 standards); and Health services (16 standards). The complete list of standards is shown in Table V. All of the standards are associated with quantitative and qualitative "key indicators" that help measure whether the standards have been attained (not shown in table). For example, a minimum standard for hygiene promotion is "Toilets are sited, designed, constructed and maintained in such a way as to be comfortable, hygienic and safe to use," and one of the key indicators for that standard is "users (especially women) have been consulted and approve of the siting and design of the toilet."[120] Other indicators are much more specific and quantitative. For example, the standards require that the water supply be at least 15 liters per person per day, no more than 500 meters from any household, have a waiting time of no more than 15 minutes at a water supply point, and requiring no more than three minutes to fill a 20-liter container.[121]

TABLE V

SPHERE MINIMUM STANDARDS IN DISASTER RESPONSE

Sector	Sub-sector (if applicable)	Sub-sector
1. Common Standards		1. Participation 2. Initial assessment 3. Response 4. Targeting 5. Monitoring 6. Evaluation 7. Aid worker competencies and responsibilities 8. Supervision, management and support of personnel
2. Water Supply, Sanitation and Hygiene Promotion Sector	**A. Hygiene Promotion**	1. Programme design and implementation
	B. Water Supply	1. Access and water quantity 2. Water quality 3. Water use facilities and goods
	C. Excreta Disposal	1. Access to, and numbers of, toilets 2. Design, construction and use of toilets
	D. Vector Control	1. Individual and family protection 2. Physical, environmental and chemical protection measures 3. Chemical control safety
	E. Solid Waste Management	1. Solid waste collection and disposal
	F. Drainage	1. Drainage works
3. Food Security, Nutrition and Food Aid Sector		1. Food security assessment and analysis 2. Nutrition assessment and analysis
	A. Food Security	1. General food security 2. Primary production 3. Income and employment 4. Access to markets
	B. Nutrition	*i. General nutritional support* 1. All groups 2. At-risk groups *ii. Correction of malnutrition* 1. Moderate malnutrition 2. Severe malnutrition 3. Micronutrient malnutrition
	C. Food Aid	*i. Food aid planning* 1. Ration planning 2. Appropriateness and acceptability 3. Food quality and safety *ii. Food aid management* 1. Food handling 2. Supply chain management 3. Distribution

TABLE V (continued)

SPHERE MINIMUM STANDARDS IN DISASTER RESPONSE

Sector	Sub-sector (if applicable)	Sub-sector
4. Shelter, Settlement and Non-Food Items Sector	**A. Shelter and Settlement**	1. Strategic planning 2. Physical planning 3. Covered living space 4. Design 5. Construction 6. Environmental impact
	B. Non-Food Items: Clothing, Bedding and Household Items	1. Clothing and bedding 2. Personal hygiene 3. Cooking and eating utensils 4. Stoves, fuel and lighting 5. Tools and equipment
5. Health Services Sector	**A. Health Systems and Infrastructure**	1. Prioritising health services 2. Supporting national and local health systems 3. Coordination 4. Primary health care 5. Clinical services 6. Health information systems
	B. Control of Communicable Diseases	1. Prevention 2. Measles prevention 3. Diagnosis and case management 4. Outbreak preparedness 5. Outbreak detection, investigation and response 6. HIV/AIDS
	C. Control of Non-Communicable Diseases	1. Injury 2. Reproductive health 3. Mental and social aspects of health 4. Chronic diseases

Among the materials produced from the professional humanitarian experience, the Sphere standards stand out for the broad participation that has gone into their development and adoption. The Sphere standards are the current, best distillation of the international disaster response community's experience and opinions. Over 400 organizations from 80 countries have contributed to the development of the standards since the first edition was published in 1998.[122] A third major revision is under way in 2010.[123] Dissemination and adoption of the Sphere standards has continued apace, with 5,000 – 10,000 individuals in over 70 countries receiving training on use of the Sphere standards in 2008 alone.[124] The Sphere organization and many partner organizations have developed tools to disseminate and implement the standards, such as training events, training materials, and tools for operations managers.[125-127] The standards continued to receive high level and wide-spread support. Since 2005 the International Committee of the Red Cross (ICRC) has housed the Sphere project staff.[128] The United Nations High Commission for Refugees (UNHCR) suggests that its own standards apply more to protracted situations and long-term settlement issues (e.g., education and legal status), and points to the Sphere standards as globally accepted standards for addressing urgent survival needs of people currently affected by disaster.[129] Some individual countries' international disaster assistance policies officially recognize the standards, and the European Community – which provides approximately half of international disaster aid – supports the use of the Sphere standards.[130,131]

Criticisms of the Sphere standards are limited in number and scope. One of the few post-incident evaluations examined the use of the Sphere standards during the Sudan famine of 1998. The authors argued that the standards led the humanitarian aid organizations not to take a comprehensive view of the situation, neglect more cost-effective interventions, and allow corrupt

governments to blame humanitarian organizations for shortcomings outside their control.[132] Others in the international disaster response community have felt that the Sphere standards utilize too many Anglo-American business concepts (e.g., "stakeholders" and “clients”), over-emphasize technicalities of service delivery, neglect the need to bear witness to injustices, and could never encompass the unique needs of every disaster.[133] The limited, but more effective, counter-arguments in the literature have admonished such critiques for overlooking the fact that humanitarian aid organizations do have programmatic shortcomings that cause unnecessary deaths.[134] Therefore, they argue, aid organizations must be held accountable with some form of common benchmarks. Further, those who complain that the Sphere standards' quantitative measures are too restrictive appear to have overlooked the standards' equally strong emphasis on qualitative measures and the need to heed beneficiaries' preferences.

2. International humanitarian assistance organizations

The Sphere standards and many other practices, tools, and organizations grew from the enormous amount of experience in humanitarian assistance that has been gained in other countries. Historically, that experience and the methods and documents produced are the result of the massive increase, professionalization, and globalization of international disaster response efforts that has occurred since World War II. In that time an increasingly connected globe has witnessed large population growth and migration. The same period has seen the growth of the United Nations Organization, other international non-governmental organizations, as well as the increased globalization of information, transportation, law, and societies' expectations. The methods and standards used to serve displaced populations are grounded in those developments.

Looking at the organizational history of international humanitarian assistance, within the current international system such aid was once only provided by ad hoc acts of legislatures. In Europe, large outpourings of international disaster assistance were unprecedented before the 1755 earthquake that destroyed Lisbon. The death of over fifty thousand people and the demolition of the city drew large donations of cash and materials from the parliaments and courts of Europe's increasingly interconnected neighbors.[135] The United States' first official act of humanitarian assistance to a displaced population was in 1794, when Congress voted to provide aid to refugees that fled present-day Haiti after a slave revolt.[136] The oldest significant standing, professional humanitarian organizations are the national and international Red Cross organizations. The mission and capacities of those nearly 200 organizations grew out of a reaction to the 30,000 casualties produced in one day of battle in Italy in 1859.[137,138] Since that time history has provided ample need and opportunity for Red Cross organizations and many others to develop permanent and professional services for dealing with large displaced groups of people. Industrialization and firearms, which became increasingly powerful in the late 1800s, combined with out-of-date tactics produce the incredible casualty rates seen in such wars as the Franco-Prussian War, the US Civil War, and World War I.[139] The First World War also saw the mass mobilization of peoples for war and the introduction of now common international migration controls (e.g., the passport).[140] By World War II, military methods and materials may have adapted to reduce the single-day battlefield casualty rates, but immense population flows occurred due to the combination of nationalist trends, the targeting of civilians, more advanced transportation infrastructure, and ever-growing and -cheapening industrialized military production systems. The World Wars also resulted in the creation of the first inter-governmental humanitarian organizations. Consequently the League of Nations (approximately 1919-1946)

created the NANSEN Organization, followed by the successor organizations of the United Nations Organization and the United Nations High Commissioner for Refugees (UNHCR).[141]

The scale of global humanitarian disaster operations today is immense. The UNHCR remains a lead actor due to its unique status and experience, as well as the professionalization of its staff and contractors. Since its founding in 1950 with a budget of $300,000, in 2008 the UNHCR had grown encompass a budget of $1.8 billion and concern itself with an estimated 34.4 million persons.[142,143] That figure includes refugees crossing international borders, persons displaced internally within their home country, and a variety of other persons in refugee-like situations or statelessness. The functions it carries out include legal protection, monitoring, direct life-saving care, and the negotiation of durable solutions.

International humanitarian assistance operations reached such a scale that in 1991 the UN General Assembly passed a resolution creating a single UN Emergency Relief Coordinator and other coordinating bodies and procedures. In 1998 those and other functions were consolidated during a reform process into the present day Office for the Coordination of Humanitarian Affairs (OCHA).[144] OCHA is tasked with overseeing all UN disaster assistance and coordinating all governmental and non-governmental assistance as well. In 2008 OCHA's own resources included expenditures of $209 million and approximately 1,800 employees.[145,146] That same year it monitored a total of $12.08 billion in international disaster response donations to over 700 recipient organizations from 22 donor countries, private donors and general UN operating budgets.[147-149] Another body that monitors international disaster aid estimated the total for 2008 as high as $18 billion.[150] To provide a snapshot of the scale of international humanitarian aid organizations, Table VI lists the ten largest organizations and selected available statistics about their activities. (Note that the UNRWA, serving Palestinian refugees, could be omitted from this

list because it cares for a long-term displaced population. However, it highlights questions regarding dependence and durable solutions which will be discussed in more detail below.)

TABLE VI

MAJOR INTERNATIONAL DISASTER RESPONSE ORGANIZATIONS, BY FUNDING LEVEL

Organization	Funding (reported by OCHA for 2008)	Self-reported Achievements (2008, unless noted)
World Food Programme (WFP)	4,085,001,477	Expenditures: $3.72 billion 62.3 million people in emergency and relief operations Provided food for 102.1 million people in 78 countries[151]
United Nations High Commissioner for Refugees (UNHCR)	1,004,458,451	34.4 million "persons of concern" in 2008.[152] Budget: $1.8 billion.[153]
United Nations Children's Fund (UNICEF)	651,733,310	Total expenditures: $3,081 million[154] Humanitarian assistance: $140.1 million in 2008
United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNRWA)	574,385,782	Expenditures: $807.1 million[155] Average number of people receiving rations and cash subsidies each quarter: 250,024
International Committee of the Red Cross (ICRC)	477,536,484	Personnel: 11,785 Assistance after conflict or other situation of violence: Supplies: $207 million Expenditures: $1,017.5 million Beneficiaries: 3,315,117 receive essential household items; 2,791,628 received food Presence: 80 countries[156]
Food & Agriculture Organization of the United Nations (FAO)	223,986,924	Staff: 3,535 $313 million budget for emergencies (2008-09 biennium) (18% of total budget)[157] 755 emergency projects in 114 countries or regions[158]
CARE International	167,594,528	Care USA emergency preparedness and response program: 11.7 million people reached and $106 million expended in 2008[159] Care UK: £15.2m spent on emergency response; 961,000 sheltered[160] *
Office for the Coordination of Humanitarian Affairs (OCHA)	165,949,092	Staff: 1,585[161] Expenditures: $209 million[162]
World Health Organization (WHO)	155,126,214	Emergency response: $218 million (2008-09 biennium budget)[163]
Save the Children	124,650,272	Emergency response: 3 million assisted in 40+ countries, $345 million in expenditures[164]

[a] CARE International is a confederation of 12 national member organizations. Consolidated reports for the confederation are not available. Sample of two major members presented instead.

3. Methods used by international humanitarian assistance organizations

The methods developed and utilized by international humanitarian assistance organizations are too numerous to review here in full. Their practices draw on the fields of law, logistics, communications, engineering, and many others. However, the care for displaced populations has come to rely greatly on public health sciences and technical methods. Often the populations displaced are extremely large, they are in adverse conditions where infectious diseases and warfare are present, and the pool of resources in the form of wealth, infrastructure and services are limited compared to the US and wealthy Western nations. While the care for displaced populations involves multiple types of professionals and agencies, including security, water, sanitation, construction, etc., they have a common goal of reducing unnecessary disease and death and require epidemiological evaluations to properly investigate and describe the health status of a displaced population and its subgroups.[165] Most of the priority interventions are public health programs, including immunizations, clean water, sanitation, food and nutrition programs, communicable disease control, and oversight of the health care system.[166] The combination of public health analyses and interventions can be very cost effective in an international disaster setting: for the cost of one travel trailer for a displaced household in the US, an epidemiological analysis followed by a targeted immunization or vitamin supplement program can achieve a large reduction in excess morbidity and mortality in an entire displaced population in an international setting.

In addition to utilizing the scientific methods of public health, international humanitarian assistance organizations have also shown a strong interest in program management and implementation issues that US public health practitioners would recognize. Hence the Sphere standards were not a great advancement in the scientific knowledge about the needs of displaced

populations (e.g., how to prevent infectious disease outbreaks) but rather a tool to aid the implementation of interventions. In the decades leading up to the development of the Sphere standards, leaders in the field argued that excess morbidity and mortality in large international refugee camps were not due to lack of knowledge about the need for basic public health programs, but rather due to poor quality aid materials and the inability of aid agencies to reach consensus on practical solutions.[167] Even decisions based on high quality epidemiological or sociological studies can lead to humanitarian aid benefiting only certain groups within a displaced population due to donor requirements and political realities in the field.[168] In an attempt to address inadequacies, inequities, and the supply-driven approaches that focused on humanitarian aid organizations' outputs, the Sphere standards were developed in an attempt to instead directly consider the beneficiaries' needs, rights, and quality of service received.[169]

4. Purpose of standards

Turning to more specific potential benefits of utilizing the Sphere standards within the US, the standards may be useful in the US for the same reason they were developed for international use. For the most part the Sphere standards were created in response to previous failures and changing circumstances. Disasters were seen as becoming more complex and numerous, and simultaneously humanitarian response organizations and their measures of success were multiplying.[170] In a large humanitarian operation where many actors are involved, active monitoring and management tools are needed because good intentions alone do not ensure that assistance is adequate and equitable. As the European Community Humanitarian Aid Organization (ECHAO) argues, "commitment, communication, and consensus are not enough to achieve such a common goal where a public good and large numbers of actors are involved."[171]

Rather, guidelines and standards that can be part of a system of incentives, sanctions, and institutional arrangements are needed to control behavior in situations where individuals or groups may behave selfishly and other safeguards are needed. Further, crises create serious pressure to perform and make it difficult for leaders to get unfiltered information, especially when combined with organizational complexities, delays, and stovepipes, and the nature of some problems to send only "quiet" signals.[172] In that context, standards and other management tools can help provide leaders and stakeholders with independent and objective perspectives.

The UNHCR has increasingly supported the use of standards and indicators such as the Sphere standards since the 1990s in order to monitor an individual operation, compare different operations, and support results-based management.[173] Hallam makes the fullest case for the monitoring and evaluation of humanitarian assistance programs using specific standards.[174] Major benefits include: enhancing transparency and accountability through the use of written reports; improving accountability downwards with beneficiaries in mind; and supporting system-wide evaluations (versus individual project evaluations) to detect duplication, gaps, and strategic deficiencies.[175] Regarding actual service delivery, evaluation and effective measures can help disaggregate data and show that while the totality of supplies going to a group may appear adequate, in fact certain groups within it may not be receiving enough.[176] More internal and indirect benefits include dealing with high staff turnover, examining the effectiveness of relationships in an organization, and helping staff discuss concerns without prejudicing their position.[177]

The general arguments for using standards and performance measurement guidelines within organizations are too numerous to review here. However, selected key sources will be used to guide the proposed research. From the public health field, the Turning Point

Collaborative highlights the use of performance management guidelines in setting goals and objectives, assessing organizational capacity, incentivizing collaboration, assigning accountability, improving quality, tracking progress, and reporting to stakeholders.[178] Poister recommends performance measures to support a variety of management functions, including: monitoring and reporting; strategic planning; budgeting and financial management; program management; program evaluation; quality improvement, process improvement; contract management; external benchmarking; and communication with the public.[179] Turning Point and Poister also provide criteria for effective performance measures that will be utilized in the proposed research to evaluate the use of the Sphere standards, as discussed below.

5. Potential challenges to adopting the Sphere standards in the US

The proposed research will collect opinions about the applicability of the Sphere standards within the US, but some potential obstacles can already be identified. For one, domestic US disaster response organizations differ from the large international humanitarian organizations. Unlike the international giants, many US response organizations have far fewer resources, do not have disaster response as their primary mandate, and therefore may not have the dedicated, experienced personnel, matériel, and management systems comparable to even the smallest international disaster response organizations. Their responsibilities and mandates also do not often include anything similar to the UNHCR's core mandates to foster legal protections and long-term solutions for displaced persons, such as obtaining legal refugee status, and supporting return or resettlement. However, the smaller US response organizations that are not full-time disaster responders may have a relative advantage, in that many of them permanently reside in the communities or region they may serve in an emergency. Even though they may

dedicate the vast majority of their time to non-disaster activities (e.g., communicable disease surveillance by public health agencies, worship and social services by houses of faith, etc.) they have a long-term interest and presence which provides a great opportunity to contribute to a very localized analysis of their communities disaster response needs, resources, and pre-event mitigation (e.g., construction of permanent shelters of last resort, as opposed to stock-piling portable tents which international response agencies must do.)

Another challenge may be the relatively high level of development of the US. Among the many wealth and development indices available, the US has the eleventh highest GDP per capita and is ranked thirteenth in the United Nations Development Program's Human Development Index.[180,181] Disasters affect less developed countries more severely due to different demographics, poverty levels, food insecurity, and poor infrastructure.[182] The Sphere standards were developed in that context and might therefore appear fundamentally inapplicable to the conditions of wealthy countries. Further, the Sphere standards are specifically labeled "minimum standards", and hence may be far too low to serve as acceptable standards in the US. Compare, for example, the National Public Health Performance Standards Program (NPHPSP) which explicitly avoids *minimum* standards because they may not stimulate organizations to improve. Instead the NPHPSP prefers higher, optimal levels that will drive continuous quality improvement and higher achievement.[183] While human physiology has universal elements, the proposed research will have to address to what extent those common physiological requirements are preempted by cultural differences or local preferences.

The foreign origin of the Sphere standards should not present an insurmountable barrier to adopting them in the US. Attempting to utilize such a set of standards would set no precedence for complicated, multi-organizational or public health endeavors in the US. In fact

the international organizations are essentially Western organizations like US disaster response agencies, grounded in the last century of US-European management processes, financial structures, and intellectual history. All of these organizations are rooted in Western law, medicine, public health, financial systems, labor compensation methods, dependence on literacy, and stakeholder structures that include employees, supervisors, external auditors, and political officials. Within both the US and international organizations, standards and indicators such as the Sphere standards are not at all alien, but simply yet another management document among many others. Many US organizations have a similar interest in results-based management, whether they have formally adopted a specific system. For example, the ongoing iterations of the Healthy People program aims to set national health objectives useable by health initiatives nationwide.[184] The National Public Health Performance Standards Program (NPHPSP) sets performance standards for state and local public health systems and governing bodies.[185] The Turning Point Collaborative made a strong, widely disseminated effort to educate public health practitioners about how to develop and use performance measurements in a public health agency or system.[186] Within the multi-sectoral disaster response community, the Department of Homeland Security promotes and mandates use of the standards presented in the Target Capability List (reviewed in the previous chapter).

A remaining challenge to the adoption of disaster response standards is, simply, resistance to being judged. Many front line and political actors involved in the response to a disaster may not want a critical evaluation of their service delivery or comparison with other such operations nationwide or internationally. A lack of common standards makes it easier to evaluate a disaster response operation by low local community standards or currently low political expectations (e.g., in poor communities or when the community affected is politically weak and receiving

little attention from the news media or advocates). However, it is assumed that enough stakeholders may have an interest in objective standards that could help remove local biases from evaluations and improve services to disaster-affected populations.

A related challenge may be that proposing to use standards and indicators implies that there is a larger quality improvement process already in place. Population displacement may be so infrequent that quality improvement processes are absent or weak in many organizations or jurisdictions. If so, then standards and indicators might appear to be aspirational nuisances, not constructive programmatic tools. However, the urgency of a humanitarian emergency does not eliminate the need for initial appraisal, monitoring, and evaluation if the response efforts are to be of any service at all.[187] Further, as discussed in the following chapter, the proposed research uses a policy evaluation framework that asks not only if the Sphere standards are useful but also if they address an existing problem (population displacements) and what systems are already in place to address it.

Arguing for greater disaster response and recovery services is also challenged by notions that it creates dependence or too great a welfare system. Some would argue that disaster-affected individuals and communities should be self-reliant. The UNRWA, cited previously, in its service to Palestinian refugees provides an extreme example of this concern from the international experience. It is assumed that humanitarian aid organizations care for recently displaced populations, not populations that have been displaced and resettled as long as the Palestinian refugees have been. The Palestinian population is technically quite settled, but politically and legally quite displaced, and at times undergoes warlike conditions. The organization's finances reflect this mix of long-term development and emergency programming: $298 million or 60 percent of its regular budget was dedicated to education in 2008 and only 22 percent of its

expenditures was for emergency appeals. While such a situation may be unlikely in the US, it does raise the issue of how much care a displaced population should be provided, as well as the challenge of distinguishing between short-term emergency care and long-term development assistance or welfare. Internationally, and perhaps even more so in the US, there is little interest in having displaced populations become wards of humanitarian aid organizations. In 2001 the FEMA administrator, in Congressional testimony, confronted the view that federal disaster assistance programs were "an oversized entitlement program and a disincentive to effective state and local risk management."[188] To acknowledge such concerns, the proposed research will consider the questions about at what point disaster services are excessive and whether high standards (such as the Sphere standards) seem to be too broad of a welfare program for US audiences to accept. Certainly use of the Sphere standards could identify shortcomings and provide a basis for expecting or demanding more services from US humanitarian aid organizations. However, the adoption of standards such as the Sphere standards cannot be assumed to require the provision of new governmental services. On the contrary, US stakeholders concerned with the growth and capacity of government agencies, non-profit organizations, and private sector organizations might actually appreciate a rigorous set of standards that could be used to evaluate and streamline disaster operations.

6. Proposed adoption of international methods in the US

Many of the problems in international humanitarian assistance that led to the creation of the Sphere standards have parallels in the US. As in the international experience, utilizing these standards in the US would in some sense propose a more comprehensive public health approach to the management of displaced populations, in terms of both the understanding of technical

issues about their needs as well as the implementation of solutions. There are already many tools from the domain of public health that go unused in dealing with displaced populations in the US, such as the Behavioral Risk Factor Surveillance System (BRFSS) data, which some have shown could be used to forecast the special medical needs of evacuees from a region.[189] Yet displaced population planning is dominated by an emergency management approach. That approach, as presented in the previous chapter, relies on generic needs assessments along broad categories of needs, concentrates on the provision of housing, and expects the free market and displaced persons' initiative to remedy other needs. However, rather than waiting to conduct generic, categorical needs assessments after an incident has occurred, standards can provide a baseline, universal needs assessment that can be brought to bear from the outset of an emergency. Further, as a management tool, though standards cannot account for the specific situations of all disasters, they can reduce the amount to which disaster aid is determined by a humanitarian aid organization's own needs over the interests of beneficiaries.[190] Displaced populations have needs that can be predicted, measured, and specified, and organizations serving those needs can and should be managed and evaluated in terms of how they address those measurable needs. As reviewed in this chapter, there are many factors that could support or hinder the usefulness and adoption of the Sphere standards in the US. The following chapter presents a summary conceptual model of the US system and these potential factors, and proposes an initial assessment of whether the Sphere standards might address outstanding needs in that system.

III. METHODS

The research further examined the applicability of the Sphere standards and indicators to the problem of population displacement in the US (presented in Chapter II). The policy evaluation research used a targeted Web survey of, primarily, public health preparedness and emergency management personnel in governmental public health agencies and nongovernmental organizations who are responsible for disaster planning, response, and evaluation at the local, state, and federal level. This chapter presents the conceptual models, methodological approaches, and project activities planned for the investigation. Many additional details about how the research activities and outputs are presented in the second paper which was a product of the study (see Chapter V).

A. Purpose and Objectives

The purpose of the research was to examine whether the Sphere standards and indicators could be useful for improving the care for displaced populations within the US. The objectives were to produce:

1. An initial critical evaluation of the Sphere standards' applicability to displaced population care in the US; and
2. Recommendations regarding further consideration of these standards.

B. Conceptual Framework and Assumptions

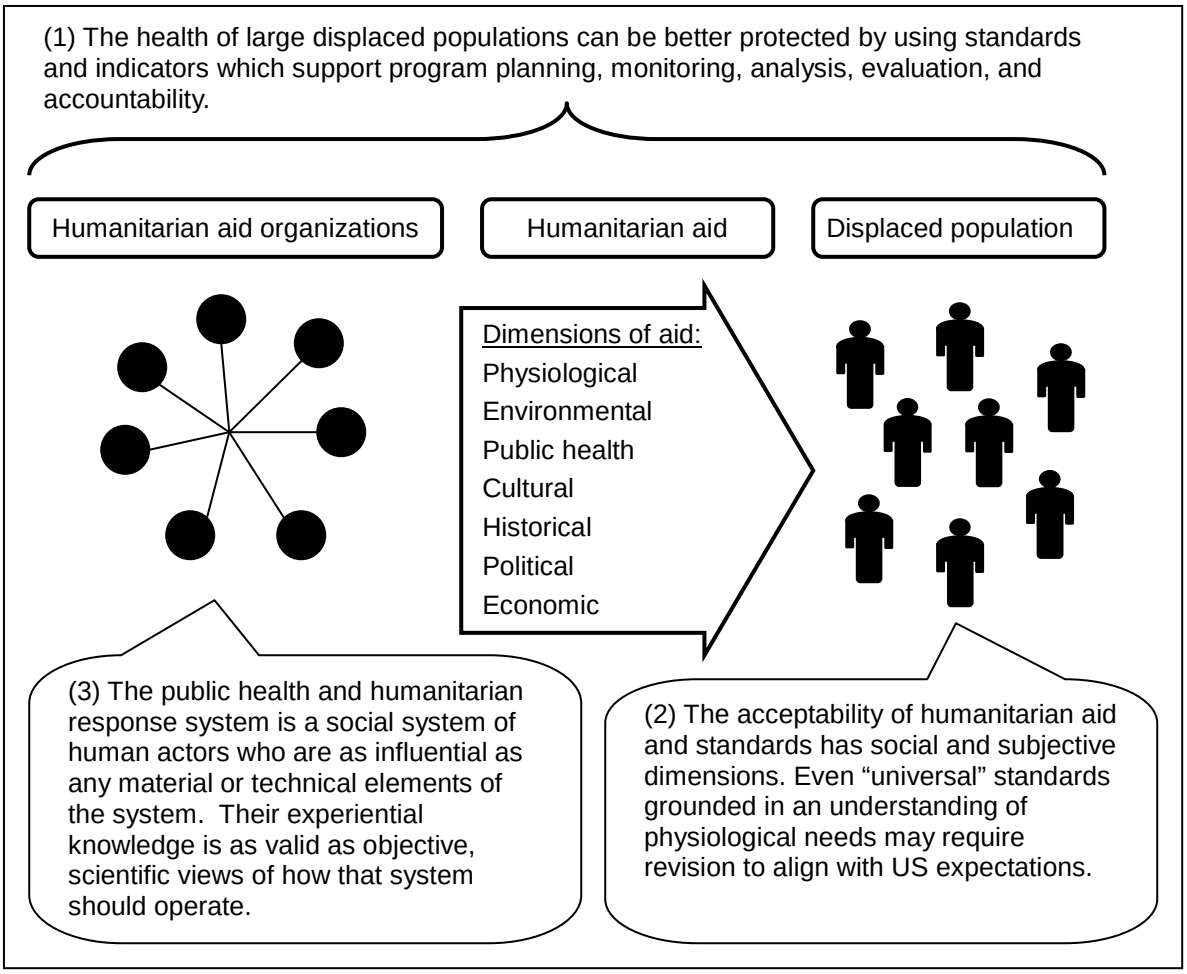
The study is set in a conceptual framework based on the previous chapters' interpretation of the problem under study and the existing system in which solutions to that problem must be applied. That conceptual framework of this project is summarized with the following three assumptions (also shown in Figure 1):

(1) The health of large displaced populations can be better protected by using standards and indicators which support program planning, monitoring, analysis, evaluation, and accountability.

(2) The acceptability of humanitarian aid and standards has social and subjective dimensions. Some standards may appear objective or universal, such as the minimum quantity of water necessary to sustain life. Yet most standards in fact fall under what the Sphere standards consider necessary for "life with dignity," and therefore require review and revision to align with US expectations. For example, US stakeholders are likely to set higher standards for water and food than those set for international refugee camps, but lower levels (if any) for reproductive health services.

(3) The public health and humanitarian response system is a social system of human actors who are as influential as any material or technical elements of that system. Those actors have an experiential knowledge that is as valid as objective, scientific views of how that system should operate. Further, their support is essential to successful implementation of any standards. Consulting those actors early in the process can improve the standards, identify appropriate methods for implementation, and increase acceptance and motivation through respectful consultation with those actors as peers.

Figure 1. Conceptual model and assumptions



C. Analytical Approach

The study approached the problem as a matter of policy development and analysis. As the Institute of Medicine describes, policy analysis is a core public health function that involves decisions about a problem, identifying goals and proper means to reach those goals, handling conflicting views about solutions, and allocating resources.[191] As a general guidance for how to proceed with policy analysis, the project adopted Patton and Sawicki's model:[192]

1) Verify, define, and detail the problem
2) Establish evaluation criteria
3) Identify alternative policies (return to step 1 if needed)
4) Evaluate alternative policies (return to steps 1 or 2 if needed)
5) Display and distinguish among alternative policies
6) Monitor the implemented policy (repeat from step 1 as needed)

The study began in step four, evaluate alternative policies, in that the Sphere standards and indicators appeared to be a valuable tool for addressing the problem of displaced populations. As suggested by the model policy analysis process, the proposed research also returned to the first step of verifying the problem, as well as the second step of establishing evaluation criteria. These steps directly translate to the following research questions.

D. Research Questions

1. Are large population displacements a major concern for disaster planners in the US?
2. Are there existing policies that guide the care for large displaced populations?
3. Are the Sphere standards and indicators applicable to displaced population care in the US?
    a. Are they appropriate for the US population?
    b. Can they be applied by US response agencies?

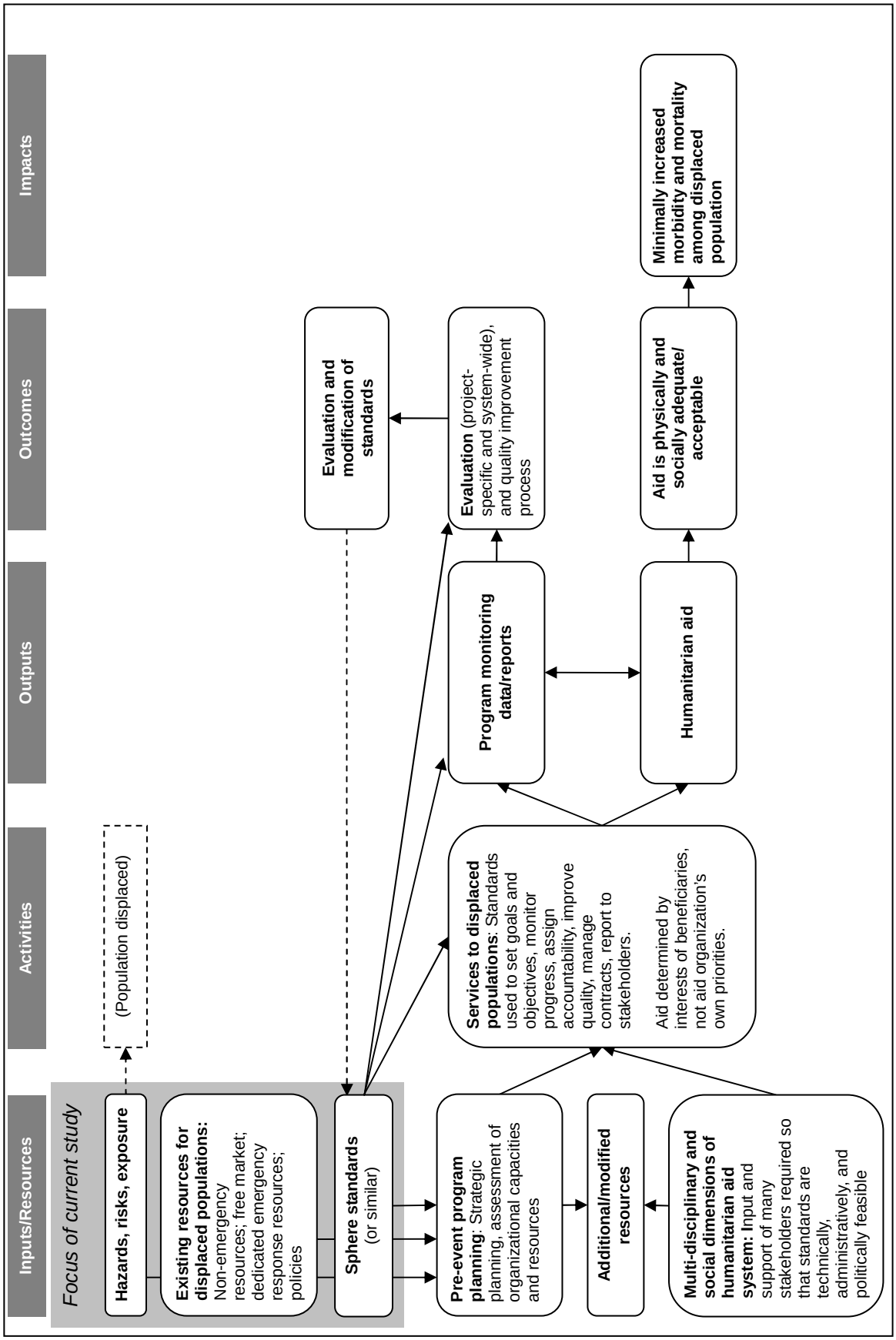
E. Research Design

To conduct the policy analysis, the study used an evaluation research design that falls under what Miller and Salkind define as *proactive evaluation research* in terms of its orientation, issues addressed, approaches used, major focus, timing, and assembly of evidence.[193,194] Therefore a major focus of the research is the program context, which was studied by collecting information from appropriate preparedness program personnel. As in most proactive evaluation research, the study examined whether there is a need for a program, what is known about the problem, what are recognized as best practices for dealing with that problem, and whether other solutions have been sought. In the study, those activities take the form of an examination of the risk of population displacement, current displaced population care resources, and quality of the Sphere standards and indicators.

To guide the evaluation, the study draws on literature about the development of standards and quality improvement systems. Poister, whose text will be a primary source of evaluation criteria, and other sources emphasize the importance of attending to the process used to develop performance standards. First, Poister recommends working directly from a program logic model.

Figure 2 presents a preliminary logic model which integrates many elements from the literature review and conceptual model above, as well as the research design presented in this chapter.

Figure 2. Logic model for displaced population care using Sphere or similar guidelines



The proposed study integrated aspects of the processes recommended for developing performance measurement systems. Research shows that a performance measurement system is more likely to succeed when it is enabling, not coercive, and attends to users by building on existing performance measurement experience, allowing for experimentation with measures, and maintaining transparency of the development process.[195] While the study could follow a process to develop new standards and indicators, it drew on Poister's suggested process for developing a performance measurement system and integrated it in the evaluation of the already existing Sphere standards and indicators.[196] An alternative approach would have been to conduct a technical review of the Sphere standards and indicators, comparing, for example, the Sphere standards' recommended levels of micro-nutrients to the requirements of the US Food and Drug Administration's dietary guidelines. However, that approach would seriously ignore the complex stakeholder and implementation issues that the literature suggests are paramount. Instead, the research design accounted for many of the recommended steps in the development process, as shown in Table VII. The later steps in the recommended process were beyond the scope of the current study and were intentionally set aside. A later full review of the applicability of the Sphere standards might conduct or otherwise account for those steps.

TABLE VII

INTEGRATION OF A PERFORMANCE MEASUREMENT SYSTEM DEVELOPMENT PROCESS IN THE RESEARCH DESIGN

Performance measurement system development activity (from Poister)	**Representation in current study**
1) Secure management commitment	Involve personnel who would perform managerial roles in the care for displaced populations.
2) Organize the system development process	Recognize value of collaborative development process over a technical review conducted in isolation by the researcher.
3) Clarify purpose and system parameters	Collect opinions about the likelihood of population displacements, existing resources, and the applicability of standards to deal with population displacements.
4) Identify outcomes and other performance criteria	Ask subjects to review portions of the Sphere standards according to specific criteria (valid, balanced, actionable, etc. See Table VIII)
5) Define, evaluate, and select indicators	(Same as previous.)
6) Develop data collection procedures a) Provide for quality assurance	Nominally addressed by collecting participants' opinions about the feasibility of actually using the Sphere standards and indicators
7) Specify the system design a) Identify reporting frequencies and channels b) Determine analytical and reporting formats c) Develop software applications d) Assign responsibilities for maintaining the system	*Remaining steps are beyond scope of project.*
8) Conduct a pilot and revise if necessary (optional)	-
9) Implement full-scale system	-
10) Use, evaluate, and modify the system as appropriate	-

F. Research Methods

The study collected opinion data via a Web survey targeted at public health and emergency management practitioners responsible for preparedness planning at the local, state, and federal level, as well as disaster response workers in nongovernmental organizations. The analysis centered on the evaluation of three key factors using quantitative and qualitative methods. The rationale for selecting the data of interest, population of interest, data collection methods, and analysis methods are outlined below using the basic survey design structure recommended by Schonlau and RAND.[197]

1. Survey objectives

a. Population of interest

The study targeted professionals working in public health preparedness, emergency management, and disaster response at local, state, and federal government agencies, as well as nongovernmental sector. A full evaluation of the applicability of the Sphere standards in the US might include many sectors and stakeholders involved in displaced population care (see background discussion). However, public health personnel were prioritized in this initial evaluation after weighing the costs and benefits of recruiting these personnel over personnel in other sectors. The public health sector has unique technical roles, an inherently multidisciplinary approach that acknowledges other sectors, as well as a demonstrated ability to coordinate or convene complex multi-sectoral preparedness initiatives in the past decade (e.g. bio-terrorism or pandemic influenza preparedness). Public health perspectives can encompass disease, physical safety, shelter, hygiene, mental health and social issues, whereas other individual sectors are more narrowly focused on their own interests, such as water, security, or logistics. The value and

role of the public health sector is such that if public health personnel reject the Sphere standards, there is a high likelihood other sectors would have serious reservations as well.

The public health sector was also selected in part because of the researcher's access to and familiarity with it relative to other sectors. In line with the social exchange theories adopted by the research (see below), public health personnel were expected to be more willing to participate in and thoughtfully complete the proposed survey because they might be familiar with the researcher, the researcher's institution, or the sponsoring institution (University of North Carolina School of Public Health). The researcher's personal network included contacts in the network of approximately 30 Centers for Public Health Preparedness, some of which had offered support and were asked to assist with participant recruitment in their region. To achieve similar levels of interest and participation from individuals in other sectors would require much greater recruitment efforts.

b. Type of data to be collected

In the interaction with preparedness personnel, the study collected opinions related to three key factors identified by the research questions. The data included views, interpretations, and preferences that were both subjective and objective, but they were all categorized as opinions in order to emphasize the value and treatment of the information collected. These opinions were valuable because of the important social dimensions of the humanitarian response system (Figure 1), and the need for broad participation in quality improvement system development. The data were treated equally whether they were highly subjective (e.g., ideological views of government-citizen obligations) or highly objective (e.g., opinions based on scientific or historic facts). Opinions that include ostensibly objective facts were not evaluated

or verified through secondary literature review or such techniques as the Delphi method, as the research was not conducting a technical validation of the Sphere standards. Such approaches would be out of line with the conceptual model's priorities, would burden the research effort, or would expect unrealistic commitments from participants. For example, opinions that the Sphere standards require too little water to survive would be accepted as valuable opinions, and not subsequently reviewed with third parties or in light of clinical research about the minimum volume of water required by a human body. Nor would participants' views of historical population displacements be examined through secondary historical research, but rather accepted as inherently valuable opinions of actors in the humanitarian assistance system. As an initial evaluation, the study valued participants' opinions because those opinions have objective and political weight that might inform any decision to further consider use of the Sphere standards in the US.

The study collected opinions regarding three key factors that informed the findings about the applicability of the Sphere standards and indicators in the US. The three factors are: risk of population displacement, adequacy of existing solutions, and quality of the Sphere standards and indicators. These factors mirror the research questions (page 56), which in turn are grounded in the policy evaluation process adopted (page 55). The factors are also reflected in the logic model (Figure 2, page 58), structure of the draft survey guide (Table XI) and data analysis (page 80).

i. Factor 1: Risk of population displacement

In order to examine whether the Sphere standards could be applied to a problem that actually exists, the study collected opinions about the risk of population displacement in the US. Specific issues to probe were drawn from the literature review, including knowledge of past

population displacements, likelihood or frequency of future population displacements, time of residence or employment in current community (which may qualify other opinions), and other component factors.

ii. Factor 2: Adequacy of existing solutions

Continuing the process of policy evaluation, the survey investigated participants' opinions about existing solutions to the problem of population displacement, including the existing solutions reviewed in the preceding background chapters (from page 19). The existing solutions include both resources (e.g., emergency response organizations, hotels, the free market) as well as policies (e.g., local disaster plans, building codes, the National Disaster Housing Strategy.) The evaluation reviewed such characteristics as breadth of needs addressed (e.g., shelter, food, health, social services) and level or quality of services provided by those resources. Note that, as discussed below, the final survey instrument reviewed only the highest priority resources in order to limit the burden on the participants and prevent reduced response rates.

iii. Factor 3: Quality of the Sphere standards and indicators

To examine the possible use of the Sphere standards as a solution for dealing with the problem of population displacements in the US, survey participants evaluated one subset of the Sphere standards and indicators according to criteria recommended by the literature on disaster response and quality improvement systems. The choice to use only a subset of the Sphere standards is discussed in the next section. The evaluation criteria used were drawn from the Sphere Project's supporting documentation, Turning Point's basic criteria for public health contexts, and Poister's more detailed criteria for business settings, as summarized in Table

VIII.[198-202] Only a limited number of high priority evaluation criteria could be used in order to limit the burden on respondents and achieve high response rates.

TABLE VIII
CRITERIA FOR EFFECTIVE PERFORMANCE MEASURES

Criteria		
• Valid • Resistant to goal displacement • Lack of internal resistance • Reliable • Cost-sensitive (non-redundant) / Cost-effective • No tenuous proximate measures • Meaningful • Clearly defined data sources and collection procedures	• Limited under- or over-reporting • Understandable • Leadership support • Good instrument design • Balanced • Key stakeholder support • Limited observer bias • Comprehensive • Training provided • Limited nonresponse bias • Clear regarding preferred direction of movement	• Adequate performance indicators (not just standards) • Resources adequate to deal with problems identified through measurement • Timely Resource requirements • Audience for results receptive • Actionable • Useful

c. Precision of the results

Regarding sample size, the study design required only 50 completed surveys, seeking a small number of high quality responses for this initial policy evaluation. The study did not seek a representative sample of the entire population of stakeholders whose work relates to displaced population care, or even of the population of public health preparedness personnel. The research focused on the Sphere standards as informed by the opinions of practitioners, not on the opinions of practitioners themselves. Were the Sphere or similar standards seriously considered for use in the US, the decision to adopt them might not come from a strictly representative process. Rather, such a policy decision might come from a variety of authorities, such as a state or federal

legislature, a professional association or body, agency administrators, or an appointed committee. Further, it was not feasible or worthwhile to seek a representative sample of those individuals, or of their agencies should the unit of analysis be shifted to organizations (i.e., a representative of each state public health preparedness program.) Doing so would have required significant recruitment efforts and prestige that did not exist in this project, such as the official support of a major governmental or academic sponsor that would motivate or require participation. Instead, the results were intended to explore the range of possible issues in the Sphere standards and indicators as identified by an informed, relevant pool of professionals. The findings were intended to suggest whether the Sphere standards and indicators have value to disaster preparedness in the US and perhaps whether a larger, more comprehensive review of the entirety of the Sphere standards carried out by a larger or more authoritative body would be worthwhile.

As an additional facet of the rapid, preliminary approach of the research, each participant reviewed only one subset of standards and related indicators. A complete review of the Sphere standards and indicators was not feasible or sought at this time. A technical review of the entire set of standards by the researcher was possible, but doing so would ignore the conceptual model's appreciation of the actors that would theoretically use the standards and indicators. Nor was it feasible within the proposed project to ask participants to review the entire set of standards and indicators, as it would take hours and likely reduce data quality due to incomplete or hastily completed reviews. In fact many of the standards are so similar that reviews of some standards can serve as analogs for reviews of others. Also, some of the participants' time had to be yielded to the examination of the other two major factors (risk of population displacement and adequacy of existing solutions). Ultimately the survey used participants' limited time to gather qualified

opinions on a subset of standards and indicators that informed the findings regarding the applicability of the Sphere standards.

2. Population to sample

a. Sampling frame

While it may be unnecessary to define a sampling frame, as the survey did not seek a representative sample of the target population of public health preparedness personnel, it is helpful to approximate the size of the population from which the survey participants were drawn. In local public health agencies, the most recent national survey estimated that there were 1,300 to 1,500 emergency preparedness coordinators nationwide.[203] There is no comparable data published for state health agencies. However, an estimate of 1,475 to 4,425 qualified preparedness program staff in that setting is suggested, based on an estimate of 25 to 75 such individuals in each of the 59 state and territorial public health agencies that receive CDC emergency preparedness grants.[204] At the federal level, the CDC's preparedness program directory lists 860 people.[205] These estimates are crude and debatable. Further, additional personnel may work in preparedness programs or be funded by preparedness grants, but many have only supportive roles or minimal experience that do not make them valuable informants for this project.

b. Sampling method and sample selection

To achieve the necessary quantity and quality of responses, recruitment targeted public health preparedness personnel in communities that possessed selected characteristics that affect disaster preparedness. Those characteristics include types of hazards, past population

displacements, existing disaster resources, and other characteristics presented in the background discussions. The goal was to achieve a defensible mix of respondent characteristics that an audience for the findings would accept. For example, the findings had to include the opinions of respondents in major earthquake zones, as that hazard has cultivated a great deal of preparedness and leadership and, therefore, valuable information and credibility. While the sample of respondents from earthquake zones will not be intended to be statistically representative of all opinions in earthquake zones, the value and credibility of the findings would be undermined if respondents in earthquake zones were conspicuously absent. Table IX lists the various selection characteristics, rationale for choosing each characteristic, and an example community or region.

TABLE IX

COMMUNITY CHARACTERISTICS TO BE CONSIDERED IN PARTICIPANT RECRUITMENT

Characteristic	**Description/Reason**	**Example**
Hazard predictions	Population displacements are predicted for some communities (both receiving and sending).	New York City in weapon of mass destruction scenario
Historical events	Past population displacement may provide planners with insight and motivation.	San Francisco/Bay Area (1906 earthquake/fire)
Recent events	Incidents in recent memory create political pressure and drive flurries of planning activities.	Communities repeatedly sending or receiving evacuees from Gulf Coast hurricanes
Major natural hazards	Variety of hazard zones needs to be included to account for unique considerations and support acceptability and validity of findings.	Earthquakes, hurricanes, wildfires, terrorism, infrastructure hazards (nuclear power plans, large dams)
Urbanization	Different urbanization levels create different mixes of resources (e.g., hotels, empty land for temporary structures).	Various urban, exurban, rural, and frontier communities.
Access	Eases participant recruitment. Familiarity of participant with researcher may increase motivation to complete survey.	Networks of the researcher and sponsoring organization (UNC NCPERRC)
Geographic region	Symbolic/political value of including all regions of the US. Serves as proxy for hazards, resources, culture, and other factors.	Northwestern, Southwestern, North Central, etc.
Profile	Some communities feature so prominently in national discussions of large disasters that failing to include them would be inexplicable.	Los Angeles (combination of hazards, response complexities, leadership in preparedness)

For specific communities from which to recruit participants, Table X provides a sample list of priority sites and their characteristics of interest. As a detailed example, the health departments in central New York State will be priority recruitment targets because they possess several characteristics. Access was strong because the researcher has worked with the region's 17-county emergency preparedness committee. The region is a special concern because for over a century it has served as an overflow and "backyard" for New York City, to which it is connected by river, rail, and road. Participants in the region may have special insights, as the region experiences massive summertime population influxes which have led public health and other agencies to provide services to populations much larger than their normal population and resource base, including medical care, vaccination programs, and environmental health inspections for swollen summer camps (Franklin County Department of Public Health, 2006-2007, personal communication). Some emergency planners consider the region a likely refuge for New York City residents after any number of large incidents, such as an influenza pandemic, large biological, chemical, or radiological attack. All together the characteristics of this region suggest that its public health preparedness personnel might provide valuable insight into the key factors under study.

TABLE X

SAMPLE LIST OF COMMUNITIES TO TARGET FOR RECRUITMENT AND CHARACTERISTICS OF INTEREST

Location	Geographic [a]	Urbanization	Recent experience	Historical	Profile	Hazards	Contact strength (0-3)	Other
Los Angeles, Cal.	SW	Urban	X	X	X	Earthquake, wildfire	1	
San Francisco, Cal.	SW	Urban		X		Earthquake	1	
Illinois state	NC	Various					2	
Chicago, Ill.	NC	Urban				Flood	3	
Cook County, Ill.	NC	Urban, Ex-urban					3	
Portland, Ore.	NW					Earthquake, volcano	2	
Alaska State DOH	NW					Earthquake, tsunami	2	
California State DOH	SW					Earthquake, wildfire	1	
Washington State DOH	NW					Earthquake, volcano, tsunami	1	
Montana state	NW	Rural					1	
Iowa state	NC	Rural & Urban	X				2	
Arkansas state DOH (includes local units)	SC		X			Hurricane evacuee destination, neglected earthquake risk	3	
North Carolina state	SE		X			Hurricanes and evacuations	3	Special interest to sponsor
New York City	MA		X		X	Terrorism	3	
Central NY (17 counties)	MA					Regular & emergency destination for NYC population	3	
Westchester Co, NY	MA	Ex-urban					2	

[a] Geographic regions: Northwestern (NW), Southwestern (SW), North Central (NC), South Central (SC), Middle Atlantic (MA), Southeastern (SE), New England (NE).

The study opted for a national survey in order to capture diverse views as well as acknowledge the scale of population displacements. States and regions have very diverse hazards, laws, resources, and political and professional outlooks that drive preparedness. It is also important to recognize that population displacement occurs on a national scale. An alternate approach that was rejected would have been to focus the survey on one high-hazard city and surrounding communities to which the urban population might evacuate after a large disaster, almost as a case study. However, a simple, restricted model of urban flight to the surrounding countryside is not supported by history or current research which shows that population displacements are not limited by geography. Evacuees may pass over adjacent communities due to lifestyle preferences, social connections in more distant communities, information about available shelter and resources, or direction by authorities. Among the many historical examples, extraordinary documentation shows how residents fled to communities and relatives throughout Britain during London's plague of 1664-65.[206] More recently, Hurricane Katrina rapidly displaced people to approximately 45 different states.[207] Looking ahead, a survey of 800 households in the Washington, DC metropolitan area found that only 32 percent of respondents expected they would evacuate to surrounding states in a major disaster, compared to the 27 percent that would travel to the Northeast, 18 percent to the Southeast, and 24 percent to the central and western US.[208] Given the scale of past and expected population displacements, as well as the diversity of experiences that can be surveyed nationally, the study would have little reason to naively limit the data collection to a single region.

3. Creation and testing of survey instrument

a. Response mode (Web)

The study utilized a Web survey in order to take advantage of the access via the Internet to the population studied, as well as the advantages of Web surveys such as speed, cost, convenience, and powerful programming. The programming allowed significant tailoring of questions to individual respondents through complex skip patterns and personalized wording of questions based on previous responses (e.g., geographic, demographic, grammatical variables.) Such customization helped emulate the recommended conversational style, improve engagement, and reduce the abstract nature of some topics presented (e.g., by inquiring about specific hazards that a participant previously selected rather than simply discussing "a disaster").

Internet access is ubiquitous among public health preparedness program personnel in government. Governmental preparedness programs constantly use the Internet to support emergency response and program management, as required by both professional expectations and federal grants. The Internet is used in all communities and types of agencies (rural, urban large, small) to overcome isolation and consult with peers on emergency threats and preparedness initiatives. For example, emergency preparedness coordinators in most public health agencies subscribe to the very active Strategic National Stockpile (SNS) federal list-serv.

b. Survey construction

The design of the Web survey instrument followed the best practices in the field as compiled by Dillman et al. in their most comprehensive review of the field.[209] For technical elements of survey design, that source served as the primary guide for detailed construction of questions, answer format (open-ended, construction of scales), question ordering (accounting for

grouping of similar topics, order effects, priming), creating a common visual stimulus (consistency, color contrast, emphasis on certain types of information), and Web survey technical issues (software compatibility, connection speeds, collection of paradata such as response time per item). The survey was administered via the commercial Web survey company SurveyGizmo.com, which had the necessary features for administration of the survey, including variety of question types (e.g., choice options, open-ended formats, randomization of choice options), logic/direction tools (branching, piping, extraction), as well as data collection and basic analysis features.

The construction of survey items accounted for current limitations of the field under study, as well as the psychological effects that question response scales can produce. For example, as discussed in the literature review, there has been little systematic study or characterization of population displacements in US history, and forecasts are rudimentary, as in the National Planning Scenarios. Therefore care had to be taken when presenting specific scenarios to participants (e.g., 5,000 people are displaced within a community for 6 months), and many questions about the potential for population displacement had to be open-ended in order to allow participants to characterize the risks in their own terms. Also, because so much of the study and survey is about risk perception, the construction of questions attended to psychological and psychometric studies of risk perception and characterization. For example, studies show that people deal better with probabilities when they are stated as frequencies ("one time in ten years") instead of straight probabilities ("one in ten chance").[210]

Questionnaire construction also drew on the "tailored design" approach and application of social exchange theory recommended by Dillman et al.[211] Those methods emphasized the use of many motivational features to encourage high quality and quantity of survey responses. The

fundamental considerations are a scientific approach that aims to reduce the four types of survey error (coverage, sampling, nonresponse, and measurement), use of effective procedures that encourage response (e.g., contact communication), and use of procedures that seek positive social exchange and consider the respondent's perspective of the researcher. In the study, participants' motivation was expected to be supported by the relevance of the issues addressed, appreciation for being asked to participate in guidance review, recognition of the associated organizations (UIC and UNC schools of public health), and the brevity of the survey. Successful use of those methods was expected to produce not only high quality and quantity of responses, but encourage some additional collegial communication about displaced population risks after completing the survey.

The final survey instrument included only items that were of the highest priority in addressing the research questions and factors under study. The literature review has identified many issues that could inform a decision about the applicability of the Sphere standards in the US, yet many had to be excluded in order to reduce the burden on participants and achieve high completion rates. Table XI provides a draft survey guide that was used to prioritize and triage survey items by ensuring that each item was relevant and the total survey length was not excessive. The survey instrument was also submitted to the Institutional Review Board (IRB) along with the research protocol.

TABLE XI

DRAFT SURVEY GUIDE AND SAMPLE QUESTIONS

Policy Evaluation Step	Research Question	Factor	Factor detail	Draft survey item
Verify problem	1. Are large population displacements a major concern for disaster planners in the US?	Factor 1: Risk of population displacement	Future events	How likely do you think your community is to be affected by mass displacement?
			Past risk	Has your community been affected by mass displacement before? If yes, how?
			Personal role	Do you think you would have a role in dealing with a large displaced population? Or, what would have been your role in your previous relevant job?
Identify alternative solutions	2. Are there existing policies that guide the care for large displaced populations?	Factor 2: Adequacy of existing solutions	-	Are there other relevant standards, guidelines, regulations, or other policy and regulatory documents that apply to caring for a displaced population? Will you share any proprietary documents (e.g., plans)? Have you already done planning for dealing with a displaced population? If yes, what have you done? Do you have a specific plan? If yes, can I contact you about it later?
Evaluate alternative solutions	3. Are the Sphere standards and indicators applicable to displaced population care in the US?	Factor 3: Quality of the Sphere standards and indicators	Services to provide	How long should displaced persons receive care and services? What services should they receive? Is this standard accurate? (Example provided.) Is this standard acceptable? (Evaluation criteria and scales developed from the combined criteria selected from the literature. A limited number of criteria selected by balancing criteria priority with survey length and burden.) Is this standard feasible?
-	-	Context	-	Who else would be involved in managing a displaced population in your community?
-	-	Subject demographics to qualify findings	-	Gender Type of organization employed in Education Age/year of birth
Verify problem	1. Are large population displacements a major concern for disaster planners in the US?	Factor 1: Risk of population displacement	Past risk	Length of residence in current community (Related to research questions, but in survey flows better under demographics.)
-	-	Participant recruitment	-	Who else in your community/network should I ask to take this survey? (Organization, individual, position.)

c. Pretesting and revision of survey instrument.

i. Refinement of the survey instrument

After the draft Web questionnaire was programmed, volunteer colleagues were asked to pre-test the questionnaire to ensure it was understandable, navigable, and correctly recording data.

ii. Pilot survey data collection

To determine if the survey instrument was adequate for the larger study, the survey was to be distributed to approximately fifteen colleagues for a full pilot test. The participants were to have a mix of ages (approximately ages 25 to 70) in order to include different levels of comfort with Web surveys, an important factor which may affect response quality, completion rates, and willingness to recruit other participants. The majority of pilot testers were to be public health personnel who do not work in preparedness programs, ensuring enough similarity to public health preparedness personnel without expending the responses of preparedness personnel on discarded pilot data. A number of pilot testers were to be public health preparedness personnel, including colleagues who would be excluded from the final survey data collection because their long-standing familiarity with the researcher might introduce a bias into their responses (e.g., a tendency to be especially approving or challenging). Additionally, approximately 30 volunteer graduate students or recent graduates, regardless of experience, were to be asked to complete the survey in order to test the Web survey software's performance with larger amounts of data.

iii. Analysis and findings of pilot survey data

As recommended by Dillman et al., the pilot study data was examined for a variety of problems experienced by participants, such as nonresponse problems and issues related to the respondents' setting (e.g., operation of Web surveys on governmental computer platforms). Separate follow-up discussions about the survey or specific responses were held with participants via e-mail or telephone. The Web survey software metadata provided an accurate estimate of the time needed to complete the survey that could subsequently be provided to prospective participants. Finally, the data collected provided a small preliminary data set that was used to examine the effectiveness of question formats, response categories, and analysis methods.

4. Contact respondents

Following the criteria for prioritizing communities to target, a variety of sources were consulted to identify individual public health preparedness personnel to recruit. For direct recruitment, individual target participants were identified from the researcher's personal contacts, conference and meeting rosters and proceedings, subject- and audience-specific electronic mailing lists or Internet groups (e.g. the Strategic National Stockpile list-serv, linkedin.com groups), and organizations' public directories. For additional indirect or open recruitment, participants were encouraged to invite colleagues, program directors and regional coordinators were asked to invite subordinates or peers, open invitations were placed in mailing lists, and announcements were posted in Internet fora.

Participant recruitment used a combination of personal e-mail correspondence and form e-mail messages that followed the best practices identified by Dillman et al.[212] For example, initial contact with many target respondents was completely personalized. The more effective –

but time-consuming – personalized effort was directed at potential respondents who were likely to complete the survey as well as recruit additional participants. High priority individuals included long-term colleagues who had already committed their support, department leaders, prominent individuals with large personal networks, mailing list moderators, newsletter editors, and Web site coordinators. Less personalized electronic invitations followed the best practices regarding brevity and clarity. Contact attended to timing issues in the respondents' environment (e.g., major federal grant deadlines) and answered all respondent inquiries. In total, the aim was both to support high completion rates and to humanize the respondents and researcher, avoiding the flavor of form letter e-mail that is bothersome or easily ignored. Response rates were monitored to evaluate the effectiveness of the different recruitment efforts.

To help motivate potential participants, the recommended token of appreciation was provided in the form of a donation to a public health or disaster response charity of each respondent's choosing. Research, and the social exchange theory adopted, show that such a token is an important factor in increasing survey completion rates and creating a sense of positive social exchange with the researcher. While research argues that a cash payment might be most effective, the limited project budget and many of the respondents' employment in government agencies restricted cash payments. Instead, respondents were asked to select one of approximately ten suggested charities (e.g, American Red Cross, American Public Health Association) to which the researcher would donate a small amount for each valid survey completed. Participants, in effect, voted on the allocation of cash donations among the charities. No published research has evaluated this exact method, but it followed the findings of research and has been utilized by private companies to solicit customer feedback.

5. Data collection, data reduction, and analysis

a. Data collection

The Web survey was open for data collection for 29 days, following both the constraints of the project and the recommendations of Web survey research. The Web survey software provided unprocessed data and automated analysis immediately. The response rates by direct recruits and by secondary recruits were monitored continuously by providing different Web links to different groups. When shortfalls in the number of responses occurred with different groups of invitees, follow-up communication attempted to determine if there ere other systematic factors interfering (e.g., technical issues, current public health crises, or forthcoming federal grant deadlines).

b. Analysis methods/plan

The data analysis plan focused on the objective of developing an initial policy evaluation of the Sphere standards' applicability to displaced population care in the US. To do so, the analysis combined qualitative and quantitative data and methods to summarize the participants' opinions related to the three key factors under study and inform the policy finding. The specific steps of the data analysis and development of findings were:

i. Clean raw data

After the data collection period was closed, data reduction and processing filtered invalid responses and prepare a data set for analysis.

ii. Code text

The responses to open-ended questions were coded thematically for analysis. Text from open-ended questions with long responses were also examined following Foss and Waters' methods for exploring qualitative data.[213] Briefly, that process consists of identifying the unit of analysis in the text, coding the text with summary statements or appropriately abstracted descriptive labels, and sorting the codes multiple times to develop explanatory schema or narratives. Where possible, open-ended responses were coded with scales or quantitative values (e.g., level of approval or estimates of displaced population sizes).

iii. Combine text codes with scaled data to develop composite scores for each key factor for each respondent

For each respondent, the responses from groups of related questions were combined to create aggregate scores for each of the three main factors under study (risk of population displacement, adequacy of existing solutions, and quality of the Sphere standards and indicators).

iv. Use descriptive statistics to summarize results quantitatively

The analysis used basic descriptive statistics to summarize responses to individual questions as well as the aggregate scores for the three major factors. The descriptive statistics examined variation in responses to each major factor according to respondent demographics, index scores for the other factors, and other issues discovered in the data through thematic coding. The statistical analysis examined basic measures of correlation between different factors and other data, as well as other basic statistical tests such as tests for independence of the variables.

An example of the summary statistics that were used to develop findings is presented in Table XII, which shows a cross-tabulation of the three key factors using mock data. The table highlights the data cell which was expected to be of greatest interest, which shows the percentage of respondents that believe that there is a high risk of population displacement, existing solutions are weak, and the Sphere standards and indicators are of high quality. A high percentage in that cell would support a positive response to the primary research question of whether the Sphere standards and indicators may be applicable in the US and merit further consideration.

TABLE XII
SAMPLE CROSS-TABULATION OF KEY FACTORS

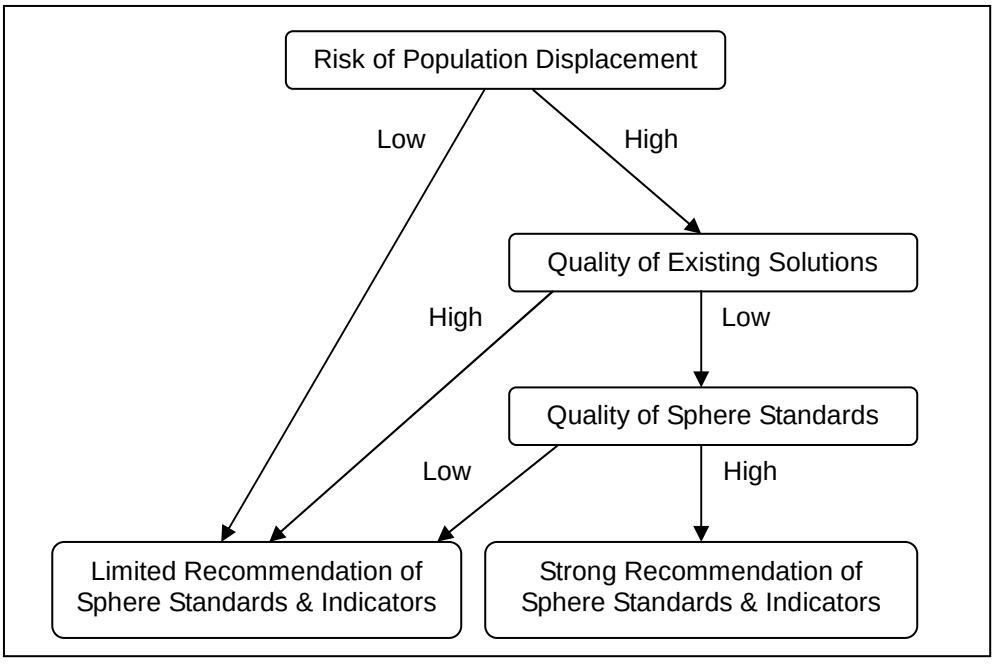
		Quality of existing solutions		
Risk of population displacement	**Quality of Sphere standards**	**Weak existing solutions**	**Strong existing solutions**	**Row total**
High risk		**25.0%**	**25.0%**	**50.0%**
	High quality	12.5% [b]	12.5%	25.0%
	Low quality	12.5%	12.5%	25.0%
Low risk		**25.0%**	**25.0%**	**50.0%**
	High quality	12.5%	12.5%	25.0%
	Low quality	12.5%	12.5%	25.0%
Column total		50.0%	50.0%	100.0%

[b] These cells indicate proportion of responses that would make strongest case for adoption of the Sphere standards. See main text for discussion.

v. Use descriptive statistics combined with text and thematic coding to develop policy findings

Following the adopted policy analysis framework, the summary statistics and thematic coding of the three key factors were used to develop findings related to the research objective of evaluating the Sphere standards' applicability to displaced population care in the US. A conceptual representation of how the analyses would inform those findings is shown in Figure 3, which is adaptation of the general policy analysis process presented previously (page 55).

Figure 3. Development of findings related to use of Sphere standards in US



In the development of finding, it was expected that opinions might be weighted qualitatively or quantitatively according to characteristics of the respondents or their responses. Long analytical responses might be more informative than terse remarks, and the opinions of participants with experience in displaced population care might be more defensible than those of novices. However, in the final analyses there appeared no clear basis for weighting responses differently, as the respondents were all well qualified and valid stakeholders.

The priority of the analysis was to inform policy evaluation findings. While the questionnaire, data, and reported findings used some quantitative components, the analytical approach was primarily qualitative, not quantitative. The analysis did not test hypotheses with statistical tests, as would be productive if the research simply sought to study factors related to opinions about the Sphere standards (e.g., the association of perceived risk of population displacement with favorable view of the Sphere standards). Rather, the descriptive statistics were used to explore the responses and qualify the findings. One reason for not conducting more advanced statistical analysis of the inter-relations between the three key factors is that those factors are assumed to be independent. For example, participants might believe there is no chance of population displacements, yet they could still identify existing displaced population care guidelines and find the Sphere standards and indicators perfectly acceptable. One explanation might be that participants and other stakeholders see practical or political value in the Sphere standards or similar existing policies. Therefore the conceptual model does not assume that a strong relationship between the factors exists. To do so would attribute logical analysis and action to policy development processes that may not exist. However, the research takes in all factors in line with the adopted policy evaluation process, because all three factors

should be considered logically in future discussions about dealing with population displacements.

G. Limitations

As a significant limitation of the study, the responses were not a representative sample of the entire population of stakeholders involved in displaced population care. Even within a single targeted sector, such as public health preparedness personnel, the opinions of the respondents were not generalizable to a larger population, as is desired in many opinion surveys. In a sense this amounted to an intentional coverage error, but it was expected in the survey design and is acknowledged in the findings. The rationale is, as discussed above, that the study is an examination of the Sphere standards as informed by the opinions of public health preparedness personnel, it is not a study of the opinions of public health preparedness personnel per se (page 65). To reiterate, the study and the findings were developed in a proactive policy evaluation framework that seeks a limited number of qualified opinions that can inform an initial assessment of the Sphere standards' applicability.

An additional limitation was that, of the limited sample of stakeholders that participated in the study, none provided a comprehensive review of the entirety of the Sphere standards. As discussed above, this was an intentional decision made after weighing the benefits of a brief partial review against the value, feasibility and burden of a comprehensive review by the participants or a technical review by the researcher alone (page 66).

Other potential sources of error included nonresponse error, measurement error, and processing error. Item nonresponse error was to be minimized through proper construction of survey items and programming of the Web survey. Measurement error is generally considered to be reduced in self-administered surveys, including Web surveys, by the increased privacy and

absence of peers or an interviewer. Computer familiarity limits the usefulness of Web surveys for the general population, but this concern is minimized by the regular use of computers by the targeted population, as well as the increasing user-friendliness of Web survey software. Processing errors can be catastrophic to Web surveys, but were minimized by the quality of the Web survey program as well as the researcher's experience with Web survey administration and electronic data processing.

H. Products

As presented in the following chapter, the study produced two papers intended for publication:

(1) "Potential applicability of international disaster standards to displaced population care in the US: A national opinion survey of preparedness professionals." The results section provides the policy evaluation findings on substantive issues for an audience of US disaster response planners.

(2) "Use of a Web survey for policy analysis among a dispersed stakeholder network: an initial evaluation of proposed performance measurement standards." The paper provides an in-depth discussion of the study's design, implementation, and outcomes. The study used a unique combination of policy evaluation and use of emerging Web survey technology that may be of interest to peers. The intended audience is public sector policy analysts, performance measurement system developers, and Web survey designers and researchers.

The study also developed reports for the organization which provided partial support for the development of the research plan, the University of North Carolina Preparedness and Emergency Response Research Center (NCPERRC).

IV. PAPER 1: SUBSTANTIVE RESULTS

A. Introduction

The coming decades may see an increased need to provide large-scale humanitarian aid within the US due to population growth in areas vulnerable to such hazards as hurricanes, floods, earthquakes, and wildfires. When the local ability to cope with those hazards fails, population displacement may follow. Displaced populations are vulnerable due to the loss of physical, social, governmental, and other systems that protect people from physical hazards, communicable disease, violence, and many other threats to individual and community well-being. A displaced population may require humanitarian assistance when the life or well-being of the population is threatened unless immediate and appropriate action is taken, often demanding an extraordinary response and exceptional measures.[214] The specific services needed may range from only monitoring, if they are completely self-sustaining, to complete care including basic physiological needs (shelter, food, sanitation, healthcare), psycho-social supportive services, livelihood support (e.g., jobs, job search assistance, agricultural supplies), and legal assistance (e.g., filing for disaster assistance, change of legal status, or access to local services). The term "refugee" is avoided here because it has a precise definition in international law and international disaster response literature that is inapplicable. [215,216]

To clarify the use of the term in this study, a displaced population has several defining characteristics. It is a large group of people who have relocated from their primary community of residence to another location. They have relocated against their usual preferences in order to avoid immediate harm, illness, or death, whether caused by a change in the usual conditions of housing, supplies, services, safety, laws, or government authority. Though individuals, they are characterized as a single population due to their physical proximity in their community of origin

or destination, or by sharing a common cause of displacement. Finally, the population is of such need or relative size in its destination that the receiving location believes the displaced people place a unique burden on local resources that must be addressed through special measures.

Large population displacements have been numerous in US history, are frequent in current events, and expected in future emergencies. Table I (page 11) highlights population displacements in US history. Many such events resulted from human phenomena that continue to place populations at risk today, regardless of engineering or technological advances. For example, settlement patterns have situated most North American cities on coastal water, tidal water, or rivers.[217] Coastal counties house 53% of the US population, though they account for only 17% of land area.[218] Federal policies have effectively increased risk to disasters by subsidizing disaster insurance, response, and infrastructure.[219,220] Looking ahead, large population displacements are forecasted. They feature prominently in eight of the National Planning Scenarios.[221,222] The Intergovernmental Panel on Climate Change (IPCC) describes the likely increase in extreme weather events which will increase precipitation and floods, intensify tropical cyclones, and spur wildfires with warming and water stress.[223-225]

While disaster planning in the US has matured, the capacity for displaced population care appears inadequate or, at the very least, deserving further assessment. After Hurricane Katrina, Congress supported solutions for displaced populations and mandated the development of the National Disaster Housing Strategy.[226] However, the Strategy is not a source of new solutions, as it devolves much responsibility to other entities, focuses primarily on physical shelter (as intended), and simply outlines federal agencies' roles and resources.[227] Care for displaced populations is partially addressed in the Target Capabilities List (TCL), but it provides only broad outlines of activities and lacks operational detail.[228] Current displaced population

strategies aim to provide displaced persons with shelter and cash payments, expecting that their well-being will flow from the combination of shelter, cash, the free market, moderate oversight, and their own initiative. Such approaches are inadequate because of false assumptions about the effectiveness of the free market and the ability of displaced, vulnerable populations to operate in that market. None address the breadth or detail of services needed by large displaced population on par with the international standards examined in this research. The health, social, and other needs of displaced populations are weakly defined only as categories of needs to be addressed as they arise, not as measurable service levels around which to plan a complex, multi-sectoral response.

1. International disaster response standards

The international community has developed specialized organizations, professionals, and policies that address the needs of large displaced populations, particularly since the increased globalization of disaster response that has occurred since World War II. International standards for the care of large displaced populations are overdue for consideration for application within the US, as they draw on strong experience, evidence, and peer-review. The *Sphere Project Humanitarian Charter and Minimum Standards in Disaster Response* stands out for the broad participation involved in its development and adoption.[229] The standards and indicators are intended to present comprehensive and equitable services levels that can be used in any country or setting requiring humanitarian assistance. The document includes 63 standards grouped into five sectors: Standards common to all sectors; Water supply, sanitation and hygiene promotion; Food security, nutrition and food aid; Shelter, settlement and non-food items; and Health services. The Sphere standards might be useful in the US for the same reasons they were developed for international use: disasters were seen as becoming more complex and numerous,

and simultaneously humanitarian response organizations and their measures of success were multiplying.[230] Many concluded that in such large humanitarian operations where many actors are involved, active monitoring and management tools are needed because good intentions alone do not ensure that assistance is adequate and equitable. Rather, guidelines and standards that can be part of a system of incentives, sanctions, and institutional arrangements are needed to control behavior in situations where individuals or groups may behave selfishly and other safeguards are needed.

2. Study purpose and objectives

Given the preceding understanding, the Sphere standards might appear to offer some sort of remedy for dealing with population displacements in the US. However, given other preferences and assumptions, the same standards might appear too foreign or otherwise inapplicable. The purpose of this study was to produce an initial critical evaluation of the Sphere standards' applicability to displaced population care in the US.

B. Methods

1. Study design

The study adopted a basic policy analysis framework.[231] A technical review of the Sphere standards was considered but rejected, as it would have overlooked the complex stakeholder issues essential to successful implementation of standards and performance measurement systems.[232,233] Instead, a major focus was the policy context and the perspectives of practitioners in the field, using what has been termed a proactive evaluation research design.[234] The study examined whether there is a need for the proposed policy (i.e., the Sphere standards), what is known about the problem, what are recognized as best practices for dealing

with that problem, and whether other solutions have been sought. These priorities were translated as the following three factors that structured the survey and analysis:

Factor 1: Risk of population displacement (component variables included previous experience, expected frequency of future displacements, size of displaced population that would trigger a special response);

Factor 2: Adequacy of existing solutions (component variables included plans, testing and improvement of those plans); and

Factor 3: Potential application of standards and indicators (component variables included duplication of existing policies, potential benefits, potential challenges).

To engage relevant stakeholders around these factors, the research utilized a commercial Web survey program (SurveyGizmo.com). This mode offered excellent access to preparedness program personnel, as well as advantages such as speed, cost, convenience, and powerful programming (e.g., questions tailored using previous responses). Design and implementation followed the best practices, tailored design approach, social exchange theory presented by Dillman et al.[235] Of many design decisions taken, each participant was asked to review only one sample of the Sphere standards and related indicators (Factor 3). The greater priority was to have participants consider the concept of using standards generally, as well as the other two key factors. The survey instrument and protocol were approved by the University of Illinois at Chicago's Institutional Review Board (IRB). A draft Web survey was programmed, pre-tested and piloted with 57 individuals. The final survey, instrument made available online, asked 37 to 43 topical and demographic questions, varying with each respondent's choices.[236] A companion

article explores the selection and implementation of a Web survey methodology for policy evaluation.[237]

2. Participants

For this initial evaluation, the study sought a targeted sample of professionals in public health preparedness and emergency management in local, state, and federal government agencies, as well as disaster relief personnel in non-governmental organizations. The study design required 50 participants in order to explore the range of opinions, and did not seek a statistically representative sample of the country, individual states, nor any one stakeholder group. The survey had valid submissions from 729 individuals in a variety of industries and sectors (see Table XIII).

TABLE XIII
INDUSTRIES AND SECTORS OF PARTICIPANTS

	Level/sector											
	Local gov't		State/ territorial gov't		Federal /national gov't		NGO		Other /private /multiple /unspecified		Total	
Industry (NAICS code)[a]	#[b]	%	#	%	#	%	#	%	#	%	#	%
Administration of Public Health Programs (923120)	**116**	15.9	**56**	7.7	**32**	4.4			**10**	1.4	**214**	29.4
Emergency planning and management offices, government (922190), Fire Protection (922160), Police Protection (922120)	**114**	15.6	**21**	2.9	**24**	3.3			**8**	1.1	**167**	22.9
Social assistance, Mental health services (621330,621420,611430)	**13**	1.8	**9**	1.2	**10**	1.4	**24**	3.3	**23**	3.2	**79**	10.8
General/Other government/public administration	**21**	2.9	**10**	1.4	**7**	1.0					**38**	5.2
Administration of Human Resource Programs (923130)	**1**	0.1	**14**	1.9	**2**	0.3			**2**	0.3	**19**	2.6
Disaster relief services (624230)							**52**	7.1	**8**	1.1	**60**	8.2
Religious, Grantmaking, Civic, Professional, and Similar Organizations (813)							**22**	3.0			**22**	3.0
Health care									**21**	2.9	**21**	2.9
Colleges, Universities, and Professional Schools (6113)									**20**	2.7	**20**	2.7
Elementary and Secondary Schools (6111)									**8**	1.1	**8**	1.1
Consulting services									**7**	1.0	**7**	1.0
Other mainstream industries (computer, arts, accommodation)									**4**	0.6	**4**	0.6
Unspecified									**70**	9.6	**70**	9.6
Total	**265**	36.4	**110**	15.1	**75**	10.3	**98**	13.4	**181**	24.8	**729**	100.0

[a] The classifications listed used the responses to three open-ended questions about participants' industry, work done, and primary activities to classify participants according to the North American Industry Classification System (NAICS).

[b] Columns marked with "#" indicate the count of responses, and "%" indicates percent of all responses (not percent of row or column).

Personalized E-mail invitations were sent by the researcher to 3,795 individuals between September 20 and October 4, 2010, and data collection closed on October 19, 2010. Individuals were identified from public Internet directories of local, state and federal agencies, major national conferences, the Medical Reserve Corps, Citizen Corps, and national and state Voluntary Organizations Active in Disaster (VOAD). Open invitations were distributed through professional networking websites (e.g., linkedin.com) and the researcher's professional networks. As a motivational token of appreciation, each respondent was given the opportunity to vote on the allocation of donations among several disaster-related charities. The overall response rate among invited participants was 18.5% (AAPOR Response Rate 1), in addition to 32 participants from open recruitment via Web pages.[238]

The study recruited nationwide in order to include participants with diversity in characteristics that affect disaster preparedness, such as local hazards, policies, resources, experience, and level of urbanization. Responses were received from the District of Columbia and every state except Vermont. The number of responses from each state ranged from 1 (Rhode Island) to 53 (Texas), with a median of 9 responses per state. Georgia had a disproportionately large number of responses (45, or 6.2%) due to the recruitment of participants from the Centers for Disease Control and Prevention (CDC). Nearly all participants (95.7%) resided in the state in which they worked (n = 654).

3. Jurisdiction types

Respondents were responsible for, or concerned with, disaster planning at a variety of different levels. Those with local level responsibilities included the 3.4% concerned with a town or village; 15.3% concerned with a city or metropolitan area; 35.9% concerned with a county, parish or borough; and the 11.4% concerned with a multi-county region. A total of 18.0% were

concerned with a state. Above the state level, 6.6% were concerned with a multi-state region; 6.3% with the entire country; and 3.2% with some other type of jurisdiction (n=728). Participants had worked in their jurisdiction of concern for periods ranging from less than one year up to 55 years, with a median value of 16 years. Only 103 (14.2%) had worked in their jurisdiction for less than 5 years (n=727).

The individuals that responded were older and more white than the US population and workforce as a whole, with a median age of 50 years (n = 634) and proportion that was white of 91.5% (n = 648). An estimated 42.0% of participants held some sort of professional licensure, including nursing (11.3%), emergency management (5.4%), social work (5.4%), medicine (1.4%), some sort of other licensure related to health, social services, or education (7.3%) (n = 609).

4. Analysis methods

The analysis combined qualitative and quantitative data and methods to summarize the participants' opinions related to the three key factors under study and inform the policy findings. Basic descriptive statistics and thematic coding of open-ended questions were used to summarize responses to each survey item. For each respondent, the responses from groups of related questions were combined to create aggregate scores for each of the three main factors under study. Descriptive statistics examined frequency and variation in each major factor. The final policy findings synthesized the respondents' views as summarized in descriptive statistics, the qualitative data from open-ended questions, and the researcher's understanding of the issues and acceptable scope of any recommendations.

Note that although the opinion data included both subjective and objective views, ostensibly objective facts were not checked for accuracy (e.g., whether a respondent correctly

stated that their community had never hosted a displaced population). The analysis is underpinned by a conceptual model that recognizes the important social dimensions of the humanitarian response system and, therefore, the inherent value of actors' views regardless of technical or historical accuracy.

C. Results

1. Factors combined

Table XIV cross-tabulates all responses according to all three major factors under study. It presents the crudest analysis of the policy evaluation question at hand: Should the Sphere standards be utilized to deal with displaced populations in the US? The proportion that would make the strongest case for aggressive adoption of the Sphere standards were those respondents that believed that (1) there is a high risk of population displacement; (2) existing solutions are weak; and (3) have a moderate or high opinion of the Sphere standards. A total of 15.7% of respondents fell into those categories (n=548). However, analyses of the individual component factors revealed more meaningful and significant trends.

TABLE XIV
COMBINED ANALYSIS OF RESPONSES TO ALL FACTORS UNDER STUDY

Frequency of population displacements [a]	View of proposed standards	Quality of existing solutions: Low	Medium	High	Row total
High (every 1, 3, or 5 years)		**18.4**	**16**	**19.7**	**54.1**
	Low	2.7	4.2	6.2	
	Medium	9.3 [b]	8.2	10	
	High	6.4 [b]	3.6	3.5	
Medium (every 10 or 20 years)		**14.8**	**8.6**	**4**	**27.4**
	Low	2.4	2.4	1.1	
	Medium	6.6	4.2	2.4	
	High	5.8	2	0.5	
Low (every 30, 50, 75, 100, or more years)		**13.7**	**3.6**	**1.1**	**18.4**
	Low	3.3	0.5	0.2	
	Medium	7.1	2.6	0.7	
	High	3.3	0.5	0.2	
	Column total:	46.9	28.2	24.8	

n = 548

[a] Values represent percentages of all responses.

[b] These cells indicate proportion of responses that would make strongest case for adoption of the Sphere standards.

2. Factor 1: Risk of population displacement

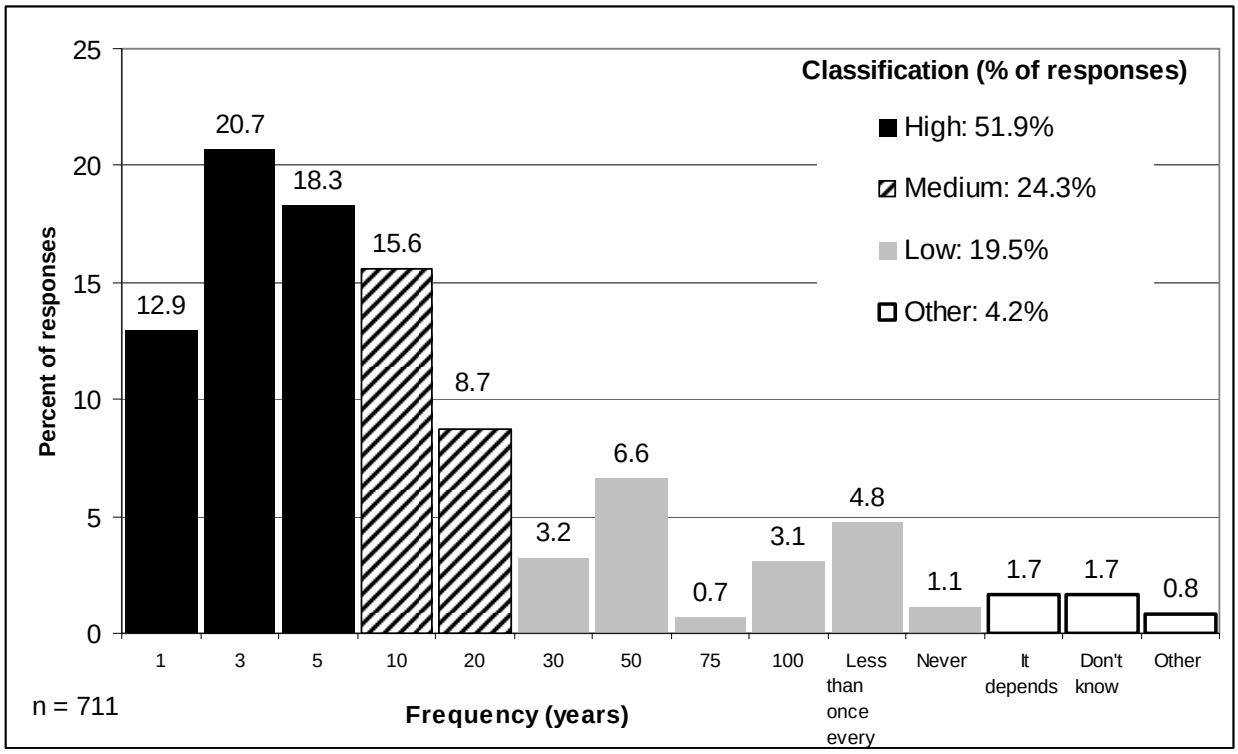
When asked if their jurisdiction had hosted a displaced population in the past, 77.6% of respondents said yes (n=727). Of those respondents, 84.7% cited natural hazards as the cause, including hurricanes (64.2%), floods (18.1%), fires (10.1%), and winter weather (7.1%). Additionally, 9.1% cited a total of 19 different human-caused hazards (e.g., dam breach, industrial incident, conflict, terrorism, economic crises). Of special note, 53.1% (or 39.1% of all respondents to the survey) cited hurricane Katrina.

When asked about their personal experience with displaced populations, 69.5% indicated that they had helped respond to a displaced population (n=659), and 15.0% of participants indicated that they had been part of a displaced population at some point in their life (n=660).

When asked what size displaced population arriving in their jurisdiction would constitute a crisis and require special actions by authorities and/or community groups, the responses ranged from 1 person to 1 million people, with a median value of 100 (P25 = 50, P75=500). The median value was 300 for respondents concerned with states, and 250 for respondents concerned with multi-state regions or the country.

When asked how frequently their jurisdiction of concern might host a displaced population of crisis levels, approximately half of all respondents (51.9%) said every five years or more frequently, and over two-thirds (67.5%) said every 10 years or more frequently (n=711). At the extremes, 12.9% said every year, and only 1.1% said it would never happen (see Figure 4). With respect to type of jurisdiction of concern, the proportion of respondents in the high frequency categories (every 1, 3, or 5 years) rose consistently as jurisdiction type got “higher”: from respondents concerned with a town or village (29.2%), through those concerned with a county, parish, or borough (43.0%), city/metropolitan area (53.8%), multi-county region (58.4%), state (56.6%), multi-state region (60.0%), to country (95.6%) (n = 680; n ranged from 21 to 242 for each category).

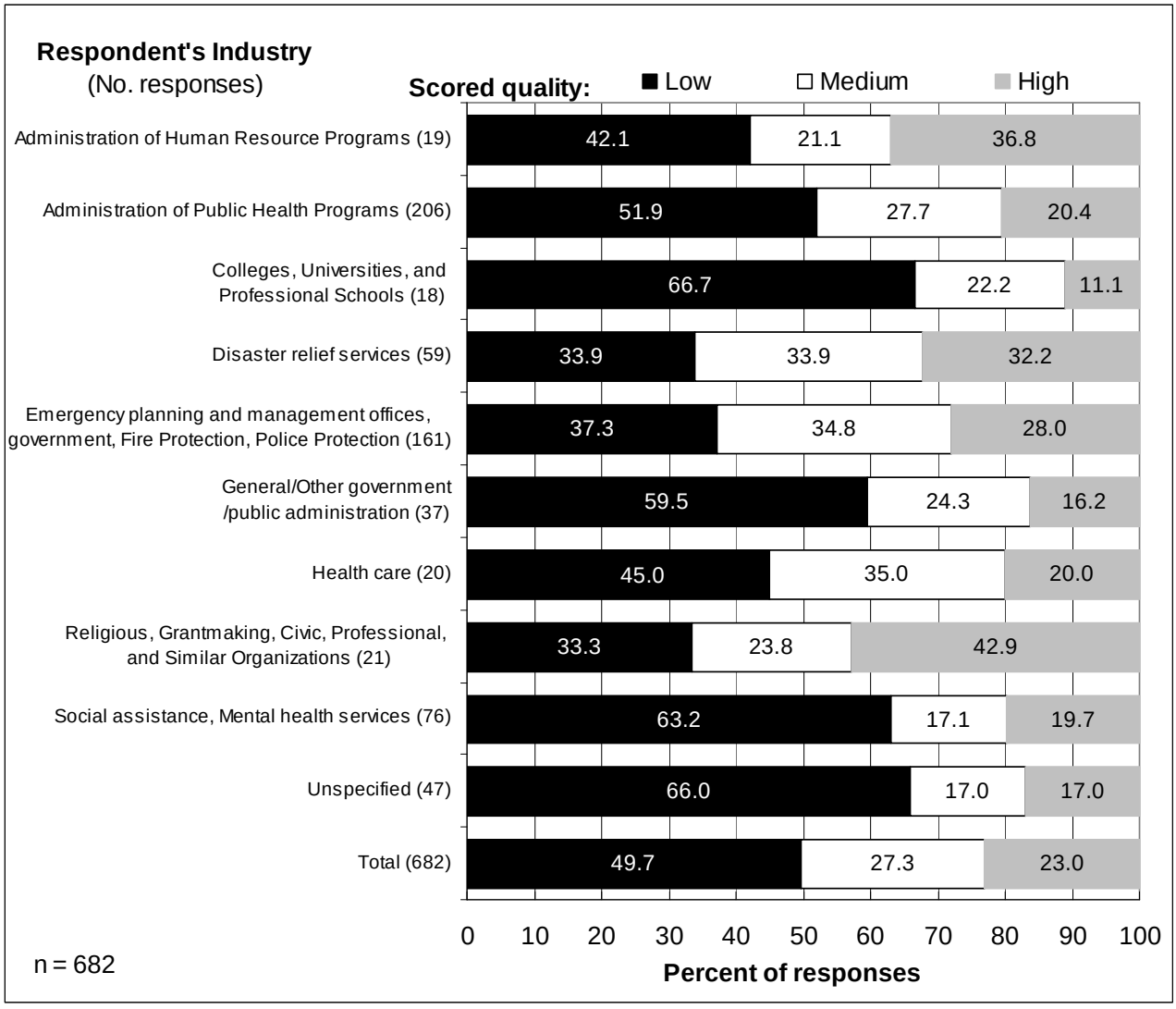
Figure 4. Potential frequency that jurisdiction will host a displaced population of crisis levels



3. Factor 2: Adequacy of existing plans

Overall, according to the respondents' descriptions of their existing plans and resources for dealing with displaced populations, half (49.7%) were scored as low quality, 27.3% as medium, and 23.0% as high quality (n=682). Figure 5 shows the variation among respondents from different industries. Only one-third (33.9%) of those in disaster relief services described plans which were scored as low, similar to the 37.3% of respondents in governmental emergency planning, fire, and police protection which were scored as low. However, 51.9% of respondents working in public health and 63.2% of those in social assistance and mental health services described plans that were scored as low (n=682).

Figure 5. Quality of existing solutions, by respondent's industry



Two-thirds (66.7%) of respondents were certain that there were plans within their own jurisdiction that would help it deal with a displaced population, and 62.8% were certain there were plans from sources other than their jurisdiction that would help (n = 723 and 727, respectively). Of those that were certain plans existed, 55.8% responded that those plans were specifically for the scenario of displaced populations, and 29.3% responded that the plans were

for “closely related scenarios or components of the response, and could be directly applied to displaced populations” (n = 680). Of that same group that was certain relevant internal or external plans existed, 51.2% indicated the plans had been used in one or in multiple major real events. One quarter (22.1%) indicated the plans had been used one or in multiple *minor* real events, 12.9% in exercises, 4.5% in planning activities, and 9.4% in other or unknown ways (n = 662).

4. Factor 3: Potential application of standards and indicators

Approximately one-quarter (23.3%) of responses were scored as having a low view of standards, half (50.4%) as moderate, and one-quarter (26.3%) as high (n = 609). There was little meaningful variation in this distribution when examined by other characteristics (e.g., location, professional background, industry, sector, or the other two factors under study).

A total of 38.5% of all respondents indicated that similar standards already existed (n=729). When asked about the source of those standards, 12.9% of all respondents cited the American Red Cross and 12.8% cited a local, state, or Federal emergency management agency. The remaining 104 (14.3%) responses mentioned approximately 83 other types or sources of plans, such as public health regulations, school plans, CDC guidelines, the military, and fire agency plans. Note that the statistic counts similar types of documents only once, and does not count references to individual documents separately. (E.g., references to “Lincoln County public health regulations” and “Empire County public health regulations” were both counted as public health regulations.)

A majority of respondents had a positive view of the usefulness of such standards for caring for displaced populations: 74.6% said it would be “very useful” or “extremely useful”; 21.1% said “somewhat useful”; and the 4.3% said “not too useful” or “not at all useful” (n =

668). Of the 26 comments generally against the standards, the primary criticisms were that they would be inflexible, unrealistic, too low, too high, a burden on responders, and that responders would do better to "make do" with what they can in a crisis. An additional 452 comments were more favorable. Among them, respondents believed that in the period before an incident occurs, standards might:

- Improve evidence-based planning;
- Identify basic and special needs in advance;
- Limit duplicate planning efforts, especially for inexperienced planners/communities;
- Aid selection of shelter facilities;
- Guide training and exercises;
- Justify funding requests;
- Build consensus or common expectations among stakeholders; and
- Aid evaluation and benchmarking.

Further, respondents believe that once an incident was underway, standards might:

- Limit conflict and discussions;
- Support consistency across different host communities and incidents;
- Improve services and care;
- Increase efficiency and organization of responders;
- Enable more rapid response;
- Aid long-term response;
- Guide goals, objectives and decision-making; and
- Improve resource allocation.

Many respondents simply remarked that disaster response is highly complex and any guidance would be helpful. Finally, several remarked that standards would also provide an ethical statement about the need to provide the highest quality care for people in need.

When asked how difficult it might be to use standards for the care of displaced populations, 52.7% of respondents replied that it would be “not at all difficult” or “not too difficult”, 36.6% that it would be “somewhat difficult”, and 10.7% that it would be “very difficult” or “extremely difficult” (n=645). The major challenges they listed included:

- Delivering and financing the many services specified in resource- and vendor-scarce regions;
- Convening leadership, stakeholder agencies and community groups needed to reach consensus on the standards;
- Implementation in general;
- Monitoring whether standards are actually being followed;
- Politics;
- Potential inflexibility or burden of the standards if they must be met in all incidents regardless of scope;
- Confronting attitudes that people should be self-sufficient;
- Drawing additional evacuees because of improved services;
- Training staff;
- Ground-level resistance if higher authorities mandate standards without buy-in; and
- Educating the public about standards to clarify expectations.

D. Comment

1. Limitations of the study

The study exhibits many limitations expected to accompany this initial evaluation of the policy question. The study only examined opinions collected through a Web survey, and did not examine the details of the factors under study directly (i.e., a scientific review of hazards that could displace populations.) The targeted, nonrepresentative recruitment limits the generalizability of the findings. For example, invitees that believed there is little risk of population displacements may be under-represented in the data because they declined to participate. Regarding the survey instrument itself, brevity supported higher completion rates but limited comprehensiveness. For example, the Sphere standards themselves could only be briefly reviewed by participants. In the analysis, the scoring of responses to each of the three factors under study into low, medium and high categories was, though systematic, rather subjective.

2. Future studies

To better address the three factors under consideration, additional analyses on the data collected in this study will be done. Future studies might utilize technical hazard analyses, a representative sample of local disaster planners, or switch the unit of analyses to jurisdictions or organizations and compel participation (i.e., an official study). A technical review of the acceptability of the details of the Sphere standards to the US population, both physiologically and socially, would certainly contribute to the discussion. However, the implementation challenges raised by the respondents suggest the greatest areas of concern. In addition to more in

depth opinion surveys and analyses around implementation issues, a small demonstration project might produce empirical evidence for stakeholders to consider.

Future studies could test preparedness personnel's knowledge of past disasters in their community. When asked about past instances when their jurisdiction had hosted a displaced population, only 16 respondents mentioned an event that occurred more than ten years prior. While they were not asked to name any and all past instances, it suggests a worryingly limited recall of past disasters. Awareness of disasters that regularly occur in very long cycles is probably limited in the US because settlements and recorded history are young on a historical and geological scale, in contrast to some communities in the Old World where exposure to and records of local disasters date back thousands of years.[239-241]

3. Conclusion

Many of the great hazards that have displaced populations throughout North American history can be confronted with technology and by adapting settlements and infrastructure. Yet they will fail. Allowing for those failures and for major consequences -- such as large population displacements -- the ultimate goal from a societal perspective is not preparedness but resiliency, a term adapted from the ecological sciences. It is "the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change."[242] As existing settlements continue to grow in population and in exposure to major natural and other hazards, complete resistance to those hazards will be limited. Resilience should be expanded through more sophisticated policies for dealing with displaced populations in a manner that allows the communities and society at large to persist.

Within the US, the Sphere standards may have significant potential to assist planners with limited experience hosting displaced populations and review the multiplicity of plans and guidelines already in use in an *ad hoc* manner. The risk of displacements may be high enough to merit programmatic attention, with a high frequency expected by most respondents and low threshold for triggering a crisis response. Existing plans, experience, and confidence in response/hosting capacity is mixed, as seen in the enormous number of different documents cited by respondents for dealing with displaced populations. Such diversity can indicate local adaptations, but just as likely it can indicate indirection, inconsistency, lack of interoperability, or exasperation. Rather than continue or increase such piecemeal planning, well-structured common standards could replace, augment, evaluate, or frame the many local solutions and gaps currently found.

The potential benefits are arguably significant, but must be approached with patience and caution. The majority of respondents expressed high hopes for use of standards in some fashion, but a similar majority spelled out major challenges. Of the surprisingly few negative views of the proposition to use standards, those complaining of being constrained or judged are correct; the purpose is indeed to direct behavior and evaluate. Yet many others highlighted benefits to the contrary. Stakeholders could effectively shift many deliberations from during an incident to beforehand. Service levels and evaluation measures could be pre-determined, agreed upon, and standardized. Doing so would, in effect, constrain judgment of any response effort.

Dealing with displaced populations can be complex, emotive, and political. A potential example revealed in this study is the difference in expected frequency of population displacements. While nearly all respondents concerned with the country as a whole expect regular population displacement, those at much lower local levels expect far fewer (95.6% of

respondents concerned with the country versus 29.2% of respondents concerned with just the town). While they may have excellent reasons, such a difference presents serious policy and leadership implications. National level planners might insist on preparing for displaced populations, but the majority of the people they expect to be involved in the preparedness efforts at the local level will disagree. It is essential, then, to understand the range and variation in such beliefs. In the end, social policy decisions made around such issues are based on value judgments, often requiring social and political actors to choose from among competing values.[243] The intent of this preliminary study has been to help make the range of values explicit. Doing so can enable clearer discussion of what is at stake and, if need be, constructive prioritization of the competing values.

V. PAPER 2: ANALYSIS OF THE WEB SURVEY METHODS

A. Introduction

The evaluation of a proposed policy is challenging when the underlying problem is poorly understood, stakeholder input is required for successful implementation, stakeholders are greatly dispersed, and resources are limited. This study faced such a confluence of challenges in an attempt to examine the applicability of international disaster response standards and indicators to the problem of population displacement in the US. Using a policy evaluation framework, the study opted for a targeted Web survey of professionals in public health preparedness and emergency management in local, state, and federal government agencies, as well as disaster relief personnel in non-governmental organizations. A companion paper presents more detail on the substantive disaster planning issues. This paper presents the research framework, methodological approaches, and outcomes in order to examine this unique application of emerging Web survey technology to a public health policy evaluation problem.

The substantive problem under study is the capacity of the US disaster response system and partners to deal with large displaced populations. Displaced populations are vulnerable and can require extraordinary humanitarian assistance. Large evacuations and population displacements have been numerous in US history, are frequent in current events, and expected in future emergencies. While disaster planning in the US has matured, the capacity for displaced population care is inadequate. International standards for the care of large displaced populations are overdue for consideration within the US, as they draw on strong experience, evidence, and peer-review. *The Sphere Project Humanitarian Charter and Minimum Standards in Disaster Response* stand out for the broad participation that has gone into their development and adoption.[244] Such standards could provide US planners and responders with comprehensive and

equitable target levels of services to provide to displaced populations. The objective of the study was to produce an initial critical evaluation of the Sphere standards' applicability to displaced population care in the US. However, rather than a technical review of scientific evidence about hazards or a technical review of the Sphere standards themselves, the nature of the problem and proposed solution called for heavy involvement of stakeholders. Yet resources were too limited to communicate individually with a meaningful number of the many stakeholders in disaster planning around the country. A Web survey appeared to be the optimal method available.

Though Web surveys are well-studied, there is little published on the use of Web surveys for structured policy analysis or the review of standards. An evaluation and dissemination of these methods is important for other researchers or practitioners who seek to address a variety of similar policy questions. It is especially pressing as collaborative tools on the Internet proliferate, and Web surveys become integrated in professional activities and policy development dialogs. To share the benefits and challenges of this experience, this paper presents the conceptual approach and relevant aspects of the methods, activities, and outputs. In addition to the substantive data collected, the study examined the usefulness of the selected methods for policy evaluation by examining project activities and outputs (e.g., quantity and quality of responses, invitees' reactions, resources required, and the ability to actually develop findings). Many basic research steps and details are not presented here in order to focus on issues related to the melding of methods for the policy questions. The results and discussion section present the overall findings about the value of the methods.

B. System and Methods

1. Study design

The study methods were selected after developing a conceptual framework based on the interpretation of the problem under study, as well as the existing system in which solutions to that problem must be applied. It recognizes the social context of humanitarian relief and emphasizes social actors over technical issues (see Figure 1, page 54). Recognizing that framework, successful use of any standards would require including those actors in the process (and this study) immediately in order to increase acceptance of the standards, improve them, and identify appropriate implementation methods. The process would ultimately be a matter of policy analysis: it would require decisions about a problem, identifying goals and proper means to reach those goals, handling conflicting views about solutions, and allocating resources.[245] To conduct the policy analysis, the proposed research used an evaluation research design, specifically *proactive evaluation research*.[246] Together, these approaches took the form of the policy evaluation steps and research questions shown in Table XV.

TABLE XV
STUDY DEVELOPMENT STRUCTURE

Policy Evaluation Step	Research Question	Factor	Factor detail and topics
Verify problem	1. Are large population displacements a major concern for disaster planners in the US?	Factor 1: Risk of population displacement	Past experience, expected frequency of future displacements, size of displaced population that would trigger a special response
Identify alternative solutions	2. Are there existing policies that guide the care for large displaced populations?	Factor 2: Adequacy of existing solutions	Plans, breadth of needs addressed, testing of those plans, improvement of those plans
Evaluate alternative solutions	3. Are the Sphere standards and indicators applicable to displaced population care in the US?	Factor 3: Value of the Sphere standards and indicators.	Specific issues: similarity to existing documents, expected benefits from using, expected challenges of using

2. Methodology

Research on the development of standards and quality improvement systems emphasizes the importance of attending to the process used to develop performance standards in order to ensure they are enabling, not coercive.[247] While the study could not follow a process to develop new standards and indicators, it could integrate components of the process into the evaluation of the already existing Sphere standards.[248] Consequently the researcher rejected other study methods. A technical review of the Sphere standards and indicators, comparing, for example, the Sphere standards' recommended levels of micro-nutrients to the requirements of the US dietary guidelines, would seriously ignore the complex stakeholder and implementation issues. Semi-structured face-to-face group interviews might allow deep discussion of complex issues, but the cost was prohibitive. Finally, a focused survey of one high-hazard city and surrounding communities to which the urban population might evacuate was considered but rejected. That approach would neglect the diversity of hazard conditions and experiences that can be surveyed nationally, have greater risks from small response rates, and fail to acknowledge that population

displacement occurs on a national scale across enormous distances.[249-251] A Web survey, however, would allow interaction with key stakeholders at an acceptable cost if limitations of the medium could be overcome.

Disaster preparedness can be a very technical field, involving highly complex scientific analyses of hazards as well as complex multi-organizational response operations. The study design had to account for the large amount of complex and potentially conflicting views that might be received. To that end, the study explicitly sought to collect opinions rather than facts and information. As opinions, the data included views, interpretations, and preferences that are both subjective (e.g., ideological views of government-citizen obligations) and objective (e.g., opinions based on scientific or historic facts). Yet even as opinions, they have objective and political weight that could inform further consideration of the Sphere standards in the US.

The research collected opinions regarding three major factors which mirrored the research questions, which in turn are grounded in the policy evaluation process adopted (Table XV, page 111). Specific issues to probe were drawn from an understanding of the problem and a literature review. For example, specific evaluation criteria with which to examine the Sphere standards were drawn from literature about the development of standards and quality improvement systems. [252-256] Figure 3 provides a conceptual representation of how the findings for each individual factor would be combined to inform the final policy findings.

3. Web survey instrument design

The study utilized a commercial Web survey program (SurveyGizmo.com). This mode was only acceptable because Internet access is ubiquitous among preparedness program personnel. A Web survey offered advantages such as speed, cost, convenience, and powerful

programming that allowed skip patterns and personalized wording of questions based on previous responses (e.g., geographic, demographic, grammatical variables.) For example, the survey asked participants at the outset to specify what level or type of jurisdiction they were most concerned with regarding disaster preparedness (e.g., state, county, city), and then incorporated that response into subsequent questions. Such customization helped emulate the conversational style recommended by survey design literature, improve engagement, and reduce the abstract nature of some topics presented (e.g., by inquiring about specific hazards that a participant previously selected rather than simply discussing "a disaster").

The design of the Web survey instrument followed the best practices in the field as compiled by Dillman *et al*. in their most comprehensive review of the field which advocates the "tailored design" approach and application of social exchange theory.[257] The value of utilizing the best research-based practices in the field of Web surveys cannot be overstated. These practices may differ significantly from what a Web user might assume, what are seen regularly on the Internet, or which are regularly used in casual Web surveys that proliferate. Indeed, much of the feedback from pilot testers echoed the advice of the best practices literature that had been overlooked. These methods emphasize the use of a scientific approach and many motivational features to encourage high quality and quantity of survey responses, thus reducing survey error. They stress the value of effective communication procedures that seek positive social exchange and consider the respondent's perspective of the researcher. These considerations are doubly important for the research hoping to strengthen relationships with the participants as peers and avoid a researcher-subject distance.

The survey items were by no means generic to policy discussions or the consideration of standards and quality improvement systems. The construction of survey items had to account for

current limitations of the field under study as well as relevant psychological or psychometric effects that question response scales can produce. Because there has been little systematic study or characterization of population displacements in US history and forecasts, many questions about the potential for population displacement were open-ended so participants could characterize the issues in their own terms. Or, when answer scales were provided, the construction had to draw on psychometric studies that show how people deal better with probabilities when stated as frequencies ("one time in ten years") instead of straight probabilities ("one in ten chance").[258]

To refine the survey instrument, after the draft Web questionnaire was programmed, 57 volunteer colleagues pre-tested the questionnaire to ensure it was understandable, navigable, and correctly recording data. Pilot survey data were examined for a variety of problems experienced by participants, such as nonresponse problems and issues related to the respondents' setting (e.g., operation of Web surveys on governmental computer platforms). The pilot data also provide a small preliminary data set that was used to examine the effectiveness of question formats, response categories, and analysis methods. The final survey asked 37 to 43 topical and demographic questions, varying based on a respondent's choices, and has been made available online.[259] Even at that length, the survey only asked about high priority items in order to limit the burden on respondents and achieve high response rates. As a result, participants reviewed only one subset of the Sphere standards and related indicators (Factor 3). One subset was deemed sufficient to consider the concept and implementation of standards generally, as well as the other two key factors. Reviewing more would increase the burden, reduce data quality due to incomplete or hastily completed reviews, and limit participant time to consider the other two

major factors under study. The survey instrument and protocol were approved by the University of Illinois at Chicago's Institutional Review Board (IRB).

4. Targeted population and participant recruitment

As an initial evaluation of the policy issues with limited resources, the study had to seek participants who could provide high-value responses relative to the effort expended. The focus became to professionals in programmatic roles who would likely have knowledge of both technical as well as policy matters. While many agencies and disciplines play critical roles in displaced population care, this initial evaluation research targeted professionals in public health preparedness and emergency management in local, state, and federal government agencies, as well as disaster relief personnel in non-governmental organizations. Public health preparedness personnel were a priority because they constitute a major stakeholder group, they offer relatively diverse inter-disciplinary views, the researcher had good access to them and high chance of recruiting participants, and they in turn have strong connections with other sectors.

The target population and participants were in part determined by an understanding of the substantive issue under study. Sample selection reached nationwide in order include the views of communities with a variety of characteristics that affect disaster preparedness, such as local hazards, policies, resources, past events, level of urbanization, etc. The findings needed a mix of characteristics that would satisfy the expectations of an audience of public health preparedness and emergency management professionals. The absence of major characteristics (e.g., respondents from an earthquake zone) would undermine the value and credibility of the findings. Table XVI lists the various selection characteristics and their significance.

TABLE XVI
COMMUNITY CHARACTERISTICS TO BE CONSIDERED IN PARTICIPANT RECRUITMENT

Characteristic	Description/Reason	Example
Hazard predictions	Population displacements are predicted for some communities (both receiving and sending).	New York City in weapon of mass destruction scenario
Historical events	Past population displacement may provide planners with insight and motivation.	San Francisco/Bay Area (1906 earthquake/fire)
Recent events	Incidents in recent memory create political pressure and drive flurries of planning activities.	Communities repeatedly sending or receiving evacuees from Gulf Coast hurricanes
Major natural hazards	Variety of hazard zones needs to be included to account for unique considerations and support acceptability and validity of findings.	Earthquakes, hurricanes, wildfires, terrorism, infrastructure hazards (nuclear power plans, large dams)
Urbanization	Different urbanization levels create different mixes of resources (e.g., hotels, empty land for temporary structures).	Various urban, exurban, rural, and frontier communities.
Access	Eases participant recruitment. Familiarity of participant with researcher may increase motivation to complete survey.	Networks of the researcher and sponsoring organization (UNC NCPERRC)
Geographic region	Symbolic/political value of including all regions of the US. Serves as proxy for hazards, resources, culture, and other factors.	Northwestern, Southwestern, North Central, etc.
Profile	Some communities feature so prominently in national discussions of large disasters that failing to include them would be inexplicable.	Los Angeles (combination of hazards, response complexities, leadership in preparedness)

Regarding sample size, the project sought only 50 completed surveys, seeking a small number of high quality responses for this initial policy evaluation. The intent was to explore the range of possible issues in the Sphere standards and indicators as identified by an informed, relevant pool of professionals. It did not seek a statistically representative sample of the country, individual states, nor any one stakeholder group. It was expected that doing so would require greater recruitment efforts, greater prestige to ensure participation, and/or greater definition of the population of stakeholders to sample. It was only possible to approximate the size of the population from which the survey participants will be drawn. A crude estimate included the

estimated 1,400 emergency preparedness coordinators in local public health agencies, 1,475 to 4,425 preparedness program staff in state health agencies (estimating 25 to 75 such individuals in each of the 59 state and territorial public health agencies that receive CDC preparedness funds), and 860 people listed in the CDC's preparedness offices.[260-262] Ultimately, the sampling frame would to some extent define itself as the survey recruitment progressed.

A motivational token of appreciation was provided in the form of a donation to a public health or disaster response charity of each respondent's choosing. Research, and the social exchange theory adopted, show that such a token is an important factor in increasing survey completion rates and creating a sense of positive social exchange with the researcher. While research argues that a cash payment might be most effective, the limited project budget and many of the respondents' employment in government agencies restricted cash payments.

5. Analysis methods

The analysis focused on the objective of developing an initial policy evaluation of the Sphere standards' applicability to displaced population care in the US. To do so, the analysis combined qualitative and quantitative data and methods to summarize the participants' opinions related to the three key factors under study and inform the policy finding. Several key steps and decisions made deserve examination.

First, open-ended question text was coded thematically with multiple hierarchical categories (e.g., references to hurricane Katrina were coded as "hazards > natural cause > weather > tropical cyclone > hurricane > Katrina", and as "time specified > 2000s > 2005".) Next, thematic text codes were combined with scaled data to develop composite scores for each of the three key factors for each respondent. The component variables for each factor (risk of

population displacement, adequacy of existing solutions, and quality of the Sphere standards and indicators) were used to create a simple “low”, “medium”, or “high” score for each factor and for each response. For example, for the first factor about the risk of population displacements, responses that indicated a frequency of every one, 3 or 5 years were scored as “high”, every 10 or 20 years as “medium”, and every 30 to 100 years as “low”. For Factor 2 (adequacy of existing plans), respondents having no plans, extremely weak plans, or entirely untested plans (not even in an exercise) were scored as “low”. The intent was to condense multiple related variables into a simple, summary score with immediate face value that would suit a policy analysis discussion. Such labeling done according to the researcher’s understanding of the topic may be subjective, but it is nonetheless valuable if well grounded and not taken to extreme conclusions.

Computers were critical to the data collection and the analysis, but had mixed value in dealing with such qualitative opinion data. Because an unexpectedly large number of responses was received (729 rather than 50 required) data-mining software was used to attempt to accelerate analysis of open-ended questions (RapidMiner, Carrot^2, AutoMap). However, manual (human) coding and synthesizing proved more efficient and insightful. The text mining software required significant data structuring and thesaurus construction in order to deal with the unique vocabulary of the preparedness field (organizations, acronyms, policies, hazards, etc.) The more fruitful approach was to use basic statistical and database packages (SAS, Microsoft Excel, and Access) to partially automate parts of the analysis. Numerical values were assigned to each question’s possible response options, and a mathematical formula for each factor was developed that would score the response appropriately into the preferred category. The purpose, however, was to rapidly simulate how the researcher would score responses manually, not generate an

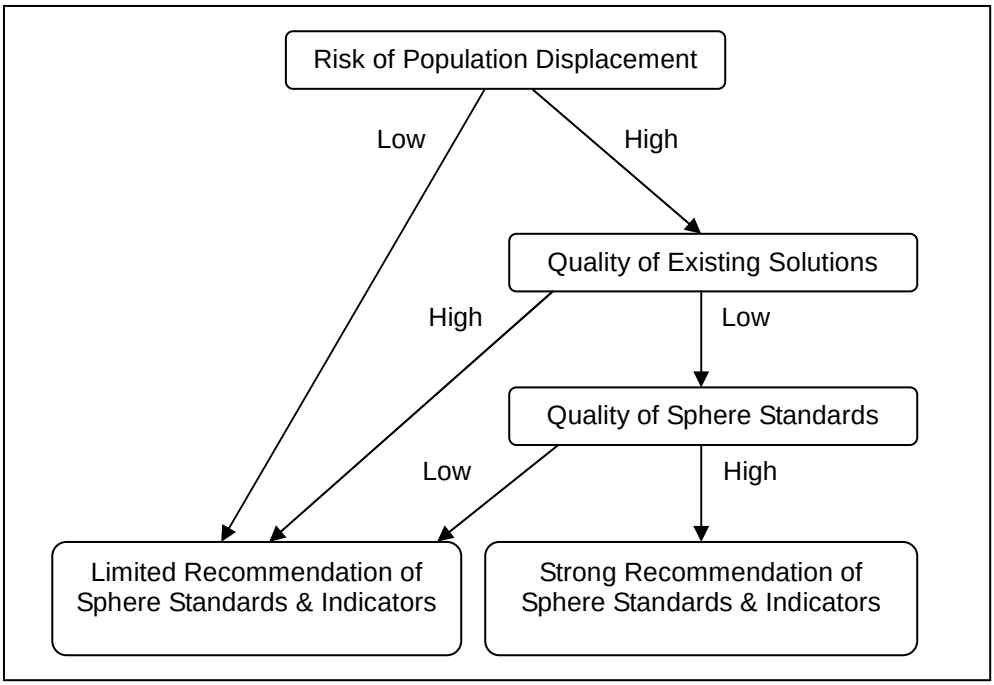
inherently valuable new numerical score. The advantages included speed, consistency, and rapid re-classification of responses if the scoring rubric changed. Table XVII lists the specific steps and an example for this automated scoring process.

TABLE XVII
SCORING STEPS AND SAMPLE

Step	**Example**
1) Select variables to include for the factor	Factor 2: Adequacy of existing plans and resources
2) Manually score combinations of responses in which only one variable changes	Vary only the value of the question about the quality of existing solutions (Q16EXISTPLANS_QUAL): "Extremely weak" produces a score of "low" "Extremely strong" produces a score of "high" Continue for other component variables and values.
3) Assign numerical values to each possible response for each variable	For the same variable, Q16EXISTPLANS_QUAL, the numerical values assigned were: "Extremely weak" = 0.1, "Extremely strong" = 1 (and intermediate values). The values became the new variable PLANQUALITY_SCORE. Repeat for other component variables and values.
4) Construct a mathematical formula (or algorithm) approximating the relationship between the variables and the score	Factor 2 score = ((0.8 * OWNPLANS_SCORE) + (0.2 * EXTERNALPLANS_SCORE)) * SPECIFICYOFPLANS_SCORE * PLANQUALITY_SCORE* HOWPLANSTESTED_SCORE * IFPLANSIMPROVED_SCORE *In plain language, the score is 80% the respondent's jurisdictions own plans, 20% external plans that apply, as modified by the other factors (how specific the plans are to displaced populations, the quality of those plans, how much the plans have been tested, and how much the plans have been improved after testing.*
5) Generate all combinations of the variables	SQL code: Select Question01.*, Question02.* From Question01, Question02; *Where each table contains a list of one question's possible responses and assigned score (from step 3 above). The "broken" SQL code, missing a "join" statement, generates all combinations of the tables' fields and values.*
6) Examine effectiveness of formula at producing preferred score for those combinations. This should not be done with actual data, as that might introduce personal bias into the formula construction.)	-
7) Revise and repeat previous steps as needed.	-
8) When ready, apply scoring formula to actual responses.	-
9) Compare distribution of scores to distribution of scores from all combinations or random sample to examine if actual distribution is different from random.	-

The final policy findings related to the three key factors were developed by synthesizing the respondents' views as summarized in descriptive statistics, the qualitative data from open-ended questions, and the researcher's understanding of the issues and acceptable scope of any recommendations (see Figure 6). The substantive results on the issues of displaced population care policies are presented in the companion article. The results were structured as frequency tables showing the distribution of opinions among all respondents as well as respondents from different locations, industries, and other characteristics, as well as summaries of major themes discussed in open-ended questions. Table XIV (page 97) provides a sample of one of the final analyses that combined both quantitative (frequency distribution) and qualitative measures (key factors according to subjective low, medium, and high categories.) Statistical analyses were limited to descriptive statistics that helped explore the responses and qualify the findings. Some more advanced statistical analyses might not apply because the factors under study had to be assumed to be independent. For example, participants might believe there is no chance of population displacements, yet they could still identify existing displaced population care guidelines and find the Sphere standards and indicators perfectly acceptable for some practical or political rationale. A strong relationship between the factors was not assumed to exist. However, study implicitly argues that all these factors *should* be considered logically in future discussions about dealing with population displacements.

Figure 6. Development of findings related to use of Sphere standards in US



C. Implementation

Identifying appropriate participants scattered among program offices around the nation proved challenging, particularly as the research was based outside any official organizations or channels that could be used to reach and motivate participants (e.g., a federal preparedness program office). Open invitations were posted on professional networking websites (e.g.linkedin.com groups), distributed through the researcher's professional networks, and extended by encouraging participants to invite appropriate colleagues. Far greater numbers of individual participants were identified from public directories on the web sites of local, state and federal agencies, major national conferences, nongovernmental organizations, and quasi-nongovernmental organizations. The largest were the public directories for Citizen Corps (1,230

invitees), a very large disaster preparedness teleconference for human service organizations (864 invitees), Medical Reserve Corps (MRC) (727 invitees), Centers for Disease Control and Prevention (CDC) (316 invitees), and national and state Voluntary Organizations Active in Disaster (VOAD) (285 invitees).[263-266] The national Citizen Corps and Medical Reserve Corps directories were valuable because those programs can be administered from a variety of organizations and levels (public health, emergency management, health care, general government; local, state, nonprofit). Computer scripts extracted E-mail addresses as well as individual names, as recommended by the best practices for form E-mail messages. Addressing individuals by name is intended to single them out from the crowd, humanize the respondents and researcher, avoid the flavor of form letter e-mail that is bothersome or easily ignored, and thus support high completion rates.[267]

Personalized E-mail invitations were sent by the researcher to 3,795 individuals between September 20 and October 4, 2010, and data collection closed on October 19, 2010. The surveys were anonymous. To provide some level of tracking, different survey links were provided to different groups in order to monitor response rates for different mailing lists and invitations. The Web survey server was used to send personalized messages en masse to only the first 900 invitees. Relatively small batches of only 100 invitations appeared to have triggered a security or anti-spam software on recipient servers. Subsequently, all later invitations had to be sent from the researcher's individual professional E-mail account using a PC-based POP3 account program and custom mail-merge (Excel, Eudora 6.0), staggered in batches of 8 to 15 ever minute. This appears to have prevented triggering anti-spam security measures on E-mail servers, and also allowed the researcher to respond to occasional inquiry emails and phone calls at a staggered and controlled rate as well. Unusually, no follow-up reminder invitations were sent. The total

number of responses being received appeared adequate and there was no need to burden potential participants who were, in fact, busy colleagues. Some invitees replied that they were occupied with response to an emergency incident and could not respond for several days or weeks.

Few invitees had overtly negative responses, as documented in a contact log. There were significant, positive exchanges via E-mail with 27 participants, as well as telephone conversations with approximately 15 individuals. Approximately five invitees received the invitation negatively and inquired with the university to verify the validity of the research (one individual) or replied to the researcher with skepticism or questions if the research was fraud or the contact name and information was obtained illegitimately.

In total, the survey had valid submissions from 729 individuals. The overall response rate among invited participants was 18.5% (AAPOR Response Rate 1), in addition to 32 participants from open recruitment via Web pages.[268] The survey reached nationally with surprising ease. Responses were received from the District of Columbia and every state except Vermont. The number of responses received from each state ranged from 1 (Rhode Island) to 53 (Texas), with a median of 9 responses. Though survey recruitment was not intended to produce a representative sample of states, the proportion of participants from each state crudely approached the proportion of the resident population found in each state. Only 13 states were noticeably under-represented proportionally, with the proportion of participants from each of those states being 0.5 percentage points less (or worse) than each state's percentage of the US population. Georgia and the District of Columbia appeared unusual because of the presence of specially targeted Federal agencies. The proportion of participants concerned with the country as a whole (versus just a state, county, etc.) was 43.5% in Georgia and 61.5% in the District of Columbia (n

= 46 and 13, respectively), compared to only 2.7% of all respondents when Georgia and the District were excluded from analysis (n=669).

The direct costs of survey administration were low, but the time commitment over the 29 days of data collection was significant. On average, administering the Web survey occupied approximately four hours per weekday during the data collection period, depending on the number of invitations sent and inquiries precipitated.

D. Discussion

1. Limitations of the method

The survey had one great limitation that had to be accepted from the outset: it did not provide a thorough review of the entirety of the Sphere standards, the proposed policy which began the study in the first place. This was an intentional decision made after weighing the benefits of a brief partial review against the value, feasibility and burden of a comprehensive review by the participants or a technical review by the researcher alone. The technology of Web surveys makes it tempting and easy to build large, repetitive survey instruments. Many (anecdotally) have been seen which ask research participants, review committees, and peers to review statement after statement using the same scales (often a poorly selected “agree-disagree” scale.) While long, homogenous surveys might produce large sets of findings that require little nuanced understanding, they can be monotonous and overlook underlying policy questions such as those addressed here. That is to say, a thorough review of the Sphere standards would have been monotonous, unwieldy, and to great insignificant. It was much greater priority to step back in the policy evaluation process and ask the participating stakeholders whether the policy problem even existed and whether existing solutions were inadequate.

Many common sources of error in survey research had to be addressed in this study as well. Among them, it was hoped that item nonresponse error was minimized through effective pilot-testing and proper construction of survey items. For example, item construction allowed flexibility in responding to difficult questions about policy or risk, such as by offering an "I don't know" response option and comment box to explain. Measurement error is generally considered to be reduced in self-administered surveys by the increased privacy and absence of peers or an interviewer. Computer familiarity was of minimal concern because of the targeted population's regular use of computers, as well as quality of the Web survey software. Computer access and familiarity may limit the usefulness of Web surveys for the general population, but this concern is minimized by the regular use of computers by the targeted population, as well as the increasing user-friendliness of Web survey software. Finally, processing errors were in some sense expected and actively sought out.

Among other potential sources of error in survey research, coverage error was the greatest concern. Seeking the opinions of disaster response personnel did mean that some target recruits would actually be dealing with incidents an unable to participate, potentially creating a coverage error by gaining fewer responses from the most experienced individuals. However, many such individuals did take the time to complete the survey weeks later. Also, it was assumed that the geographic diversity of the invitees meant that while some of the most experienced individuals in one location were too busy to participate, counterparts with equal experience were available in other locations not affected by that same incident. Further, the emergencies are not necessarily all-consuming: some individuals noted that they were in the middle of an incident and were completing the survey from their emergency operations center (EOC).

The targeted sampling limits the generalizability of the results. The responses were not a representative sample of the entire population of stakeholders involved in displaced population care. Even within a single targeted sector -- public health preparedness personnel -- the opinions of the respondents are not generalizable to a larger population, as is desired in many opinion surveys. Though a large number of responses was received, the study and the findings were developed in a proactive policy evaluation framework that sought a limited number of qualified opinions that could inform an initial assessment of the Sphere standards' applicability. In a sense this amounts to an intentional coverage error, but it was expected in the survey design and acknowledged in the findings. The rationale was that the research was an examination of the Sphere standards as informed by the opinions of public health preparedness personnel, it was not a study of the opinions of public health preparedness personnel per se. Indeed, it was not intended to identify majority opinions or best opinions. However, it effectively identified a range of views and values which, in later discussions, can now be explicitly identified, discussed, and prioritized. It effectively defined the valuative criteria for subsequent, broader and higher level policy analysis. As in most social policy analysis, the judgments to be made are not technical but rather valuative. The goal of effective social policy, then, must be to make such values explicit and allow the different participants entering the policy arena to choose between competing values if need be.[269]

Many other problems face the same situation that those who developed the Sphere standards faced. Disasters were seen as becoming more complex and numerous, and simultaneously humanitarian response organizations and their measures of success were multiplying.[270] The same could be true of the US disaster preparedness environment, and hence the Sphere standards, it was argued, ought to be considered for use in the US. Those same

general conditions can be said to apply to many other matters that become -- or at least appear to become -- increasingly complex as populations, organizations, interest groups, and communication technologies multiply. Hence many other policy problems may confront similar conditions as this study, with diverse, dispersed stakeholders that must be consulted. The problem studied, and the methods used here to examine it, reflect what has been identified as the increasing shift away from hierarchical governance toward governance by networks. Goldsmith and Eggers argue that such efforts, because they disperse responsibilities to various partners in the network, require measurable performance goals, assigned responsibilities for partners, and structured information flow.[271] Consequently, as more and more stakeholders are outside of the government hierarchy – as the current study was – it is difficult to access the many channels of the hierarchy to locate and recruit participants in the policy discussion. The study did not come from a Federal agency which could use formal channels to reach any or all state agencies and on down through their lines to appropriate program staff and locally known nongovernmental organizations. Nonetheless, the same technology that seems to enable stronger connections among the elements of the governance network, the Internet, offers supportive solutions with which to address complex policy issues that underpin that governance network. As in the study at hand, the challenges can be clearly identified and methodically addressed.

VI. CONCLUSION

First, to examine the use of the Web survey methods for conducting a policy evaluation among dispersed stakeholders, it must be said that the targeted sampling limits the generalizability of the results. The responses were not a representative sample of the entire population of stakeholders involved in displaced population care. Even within a single targeted sector -- public health preparedness personnel -- the opinions of the respondents are not generalizable to a larger population, as is desired in many opinion surveys. Though a large number of responses was received, the study and the findings were developed in a proactive policy evaluation framework that sought a limited number of qualified opinions that could inform an initial assessment of the Sphere standards' applicability. In a sense this amounts to an intentional coverage error, but it was expected in the survey design and acknowledged in the findings. The rationale was that the research was an examination of the Sphere standards as informed by the opinions of public health preparedness personnel, it was not a study of the opinions of public health preparedness personnel per se. Indeed, it was not intended to identify majority opinions or best opinions. However, it effectively identified a range of views and values which, in later discussions, can now be explicitly identified, discussed, and prioritized. It effectively defined the valuative criteria for subsequent, broader and higher level policy analysis. As in most social policy analysis, the judgments to be made are not technical but rather valuative. The goal of effective social policy, then, must be to make such values explicit and allow the different participants entering the policy arena to choose between competing values if need be.[272]

Many other problems face the same situation that those who developed the Sphere standards faced. Disasters were seen as becoming more complex and numerous, and

simultaneously humanitarian response organizations and their measures of success were multiplying.[273] The same could be true of the US disaster preparedness environment, and hence the Sphere standards, it was argued, ought to be considered for use in the US. Those same general conditions can be said to apply to many other matters that become -- or at least appear to become -- increasingly complex as populations, organizations, interest groups, and communication technologies multiply. Hence many other policy problems may confront similar conditions as this study, with diverse, dispersed stakeholders that must be consulted. The problem studied, and the methods used here to examine it, reflect what has been identified as the increasing shift away from hierarchical governance toward governance by networks. Goldsmith and Eggers argue that such efforts, because they disperse responsibilities to various partners in the network, require measurable performance goals, assigned responsibilities for partners, and structured information flow.[274] Consequently, as more and more stakeholders are outside of the government hierarchy – as the current study was – it is difficult to access the many channels of the hierarchy to locate and recruit participants in the policy discussion. The study did not come from a Federal agency which could use formal channels to reach any or all state agencies and on down through their lines to appropriate program staff and locally known nongovernmental organizations. Nonetheless, the same technology that seems to enable stronger connections among the elements of the governance network, the Internet, offers supportive solutions with which to address complex policy issues that underpin that governance network. As in the study at hand, the challenges can be clearly identified and methodically addressed.

Turning to the substantive matters examined in the study, it has to be admitted that many of the great hazards that have displaced populations throughout North American history can be confronted with technology and by adapting settlements and infrastructure. Yet they will fail.

Allowing for those failures and for major consequences -- such as large population displacements -- the ultimate goal from a societal perspective is not preparedness but resiliency, a term adapted from the ecological sciences. It is "the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change."[275] As existing settlements continue to grow in population and in exposure to major natural and other hazards, complete resistance to those hazards will be limited. Resilience should be expanded through more sophisticated policies for dealing with displaced populations in a manner that allows the communities and society at large to persist.

In the participants' discussion of such hazards, the researcher expected many responses to exhibit the psychological characteristics of what are formally defined as "catastrophes": events that combine a low or unknown probability of occurring with an extraordinary high impact. Such characteristics often challenge rational planning and discussion.[276] However, many participants considered population displacements as high probability. Other respondents that considered population displacements to be low probability events did not express bewilderment about what to do, but simply stated that the response would, variously, be weak, chaotic, or otherwise poor, but not catastrophic and unimaginable. Only one respondent remarked that displacement-causing disasters are unpredictable and truly overwhelming. While some respondents believed that the response to such incidents should be determined as events unfold, and did not favor use of standards, such views do not represent psychological paralysis in the face of immense threat. Rather, they perhaps reflect some form of experience or hubris.

Yet within the US, the Sphere standards may have significant potential to assist planners with limited experience hosting displaced populations and review the multiplicity of plans and

guidelines already in use in an *ad hoc* manner. The risk of displacements may be high enough to merit programmatic attention, with a high frequency expected by most respondents and low threshold for triggering a crisis response. Existing plans, experience, and confidence in response/hosting capacity is mixed, as seen in the enormous number of different documents cited by respondents for dealing with displaced populations. Such diversity can indicate local adaptations, but just as likely it can indicate indirection, inconsistency, lack of interoperability, or exasperation. Rather than continue or increase such piecemeal planning, well-structured common standards could replace, augment, evaluate, or frame the many local solutions and gaps currently found.

The potential benefits of utilizing the Sphere standards are arguably significant, but must be approached with patience and caution. The majority of respondents expressed high hopes for use of standards in some fashion, but a similar majority spelled out major challenges. Of the surprisingly few negative views of the proposition to use standards, those complaining of being constrained or judged are correct; the purpose is indeed to direct behavior and evaluate. Yet many others highlighted benefits to the contrary. Stakeholders could effectively shift many deliberations from during an incident to beforehand. Service levels and evaluation measures could be pre-determined, agreed upon, and standardized. Doing so would, in effect, constrain judgment of any response effort.

Dealing with displaced populations can be complex, emotive, and political. A potential example revealed in this study is the difference in expected frequency of population displacements. While nearly all respondents concerned with the country as a whole expect regular population displacement, those at much lower local levels expect far fewer (95.6% of respondents concerned with the country versus 29.2% of respondents concerned with just the

town). While they may have excellent reasons, such a difference presents serious policy and leadership implications. National level planners might insist on preparing for displaced populations, but the majority of the people they expect to be involved in the preparedness efforts at the local level will disagree. It is essential, then, to understand the range and variation in such beliefs. Ultimately the decision of how to prepare for and serve displaced populations is a social, not technical issue; the question is not how they should get assistance but how much should they get and to what lengths should society go to ensure they do get that assistance. Social policy decisions made around such issues are based on value judgments, often requiring social and political actors to choose from among competing values.[277] The intent of this preliminary study has been to help make the range of values explicit. Doing so can enable clearer discussion of what is at stake and, if need be, constructive prioritization of the competing values.

APPENDICES

APPENDIX A

SURVEY INSTRUMENT

The following provides the text of the Web survey and indicates major steps in the sequence where different participants would be directed to different questions based on their responses (i.e., “skip logic”). Some questions used “piping” programming which integrated responses into later questions, as indicated in square brackets: “[ ]”. Horizontal lines indicate the beginning of a new screen in the Web survey.

Survey on displaced population care policies
Welcome!

Thank you for your interest in this survey. The purpose of the study is to gather a wide range of opinions about disaster risks, the risk of large population displacements, and the need for additional policies to deal with such events. No particular expertise is required, and many terms will be explained. All responses will be greatly appreciated.

At any time you need to take a break, click "Save and continue survey later" at the top of any page. You will be emailed a link that lets you continue from where you left off.
Before you answer any questions, the next page will provide you with a few facts about this research and verify that you wish to participate.
[UIC logo]

Research Information and Consent for Participation in Social Behavioral Research

The following information is provided to help protect your rights as a research participant. Please review it and indicate at the bottom whether you wish to continue.

University of Illinois at Chicago
Project title: "Applicability of international disaster standards to displaced population care in the United States"
You are being asked to participate in a research study about disaster planning policies in the US.

<u>What is the purpose of this research?</u>
The purpose of the study is to gather opinions about the risk of large population displacements after disasters, and the need for additional policies to deal with such events.

<u>Why am I being asked?</u>
You have been asked to participate in the research because your experience is believed to give you insight into these issues in your community. Anyone age 18 or over is eligible to participate.

Your participation in this research is voluntary. Your decision whether or not to participate will not affect your current or future dealings with the University of Illinois at Chicago. If you decide to participate, you are free to withdraw at any time without affecting that relationship.

Approximately 250 participants may be involved in this research at UIC.

APPENDIX A (continued)

What procedures are involved?
This research consists of a Web-based survey. Completing the questionnaire will take approximately 15 minutes.

What are the potential risks and discomforts?
The risks associated with participating in this study are no greater than those ordinarily encountered in daily life.

Are there benefits to taking part in the research?
Taking part in this research study may not benefit you personally, but I may learn new things that will help others. Depending on the results, if you are a professional working on disaster planning in the US, you may find the results of this research interesting or useful in your work.

What about privacy and confidentiality?
All responses are anonymous and confidential. When the results of the research are published or discussed in conferences, no information will be included that would reveal your identity. All data collected by the Web survey program will be temporarily stored in the secure database run by a commercial Web survey company. After the survey data collection period closes, all data will be removed from the secure Web server and stored offline for analysis.

Will I be compensated for my participation in this research?
Once you complete the survey, you will have the opportunity to vote on the allocation of donations among several disaster-related charities. No monetary compensation is paid to participants.

Who should I contact if I have questions?
Contact me as the Principal Investigator on this research:
[Name and contact information]

As this research is part of my doctoral degree program, the project is also overseen by my faculty sponsor, [Name and contact information].

What are my rights as a research participant?
If you have any questions about your rights as a research participant, you may call the Office for the Protection of Research Subjects (OPRS) at 312-996-1711 or 1-866-789-6215 (toll-free) or e-mail OPRS at uicirb@uic.edu.

Indication of Agreement to Participate
1.) If you have read the above information and agree to participate in this research, please select the appropriate choice below and click "next".
( ) Yes, I have read the above information and agree to participate in the research.
( ) No, I do not agree with the above conditions and choose not to participate in the research.
Page Logic — the following conditions will run when the page above gets submitted

APPENDIX A (continued)

If: The answer to Question #1 is in list No, I do not agree with the above conditions and choose not to participate in the research.
Then: Save data prior to redirect
and: Redirect to: www2.uic.edu/~egebbi2/declineparticpate.html

---

Introduction
This survey is intended as a conversation with colleagues and fellow community members. The intent is to gather the opinions of stakeholders. There are no right or wrong answers.
Please answer as many of the questions as possible. Your responses are greatly appreciated.
Only two questions are actually required by the survey. All others can be skipped if you do not feel able or willing to respond to them.
Technical notes:

- Use the progress bar at the bottom of every page to see how much of the survey you have completed.
- At any time you need to take a break, click "Save and continue survey later" at the top of any page. You will be emailed a link that lets you continue from where you left off.

Introduction
This survey is about policies and readiness to deal with large displaced populations.
What is a "displaced population"?
The term "displaced population" refers to large groups of people that have to move from their homes or communities against their will. It usually occurs as a result of an emergency or disaster.
A displaced population often gets special attention or special services for several reasons:
A. They may be vulnerable to hazards, such as weather or disease
B. They use resources in the place they arrive
C. They don't have access to their usual homes, jobs, or social network

---

Structure of the survey
You will be asked about your opinions on the following three major topic areas:

- Section 1: The risk of population displacements affecting your community.
- Section 2: The current plans used to deal with displaced populations in your community, if any.
- Section 3: Whether a specific policy proposal might be useful for better dealing with displaced populations.

Your community
First, it will be helpful to clarify what kind of community or jurisdiction you are most concerned with. This varies for each respondent. For example, if you work for a state government agency, you are probably concerned with disaster planning in your entire state. But if you work for a small town's government agency, we should probably discuss disaster planning in just your town, not your entire state. If you work for some other organization, or are simply completing this survey as a "concerned citizen", simply choose what kind of community you feel most comfortable discussing. The choice is entirely up to you.

APPENDIX A (continued)

2.) What type of jurisdiction are you concerned with? The response you choose here will be used in many of the questions that follow later in the survey.

( ) Neighborhood	( ) County	( ) State
( ) Town	( ) Parish	( ) Multi-state region
( ) City	( ) Borough	( ) Country
( ) Metropolitan area	( ) Multi-county region	( ) Other (please specify)

3.) Approximately how many years have you lived in that [question("value"), id="6"]?

4.) Approximately how many years have you worked in that [question("value"), id="6"]?

Section 1 of 3
This first section asks for your opinions about the risk of large population displacements.

5.) Has your [question("value"), id="6"] hosted a displaced population at any time in the past? The population may have been from your own [question("value"), id="6"] or may have arrived from another location.

( ) Yes, definitely
( ) Yes, I think so
( ) No, I don't think so
( ) No, definitely not
( ) I don't know

Page Logic — the following conditions will run when the page above gets submitted

If: The answer to Question #5 is in list **No, I don't think so**, **No, definitely not** or **I don't know**

Then: Jump to page #11 [Because the respondents to this survey come from communities of very different sizes and abilities, it will be helpful to choose a more specific scenario for us to discuss in your survey.]

6.) What are some examples of when your [question("value"), id="6"] hosted a displaced population? Please describe briefly, no more than a few sentences. Or leave this blank and click "next".

Because the respondents to this survey come from communities of very different sizes and abilities, it will be helpful to choose a more specific scenario for us to discuss in your survey.

7.) If a displaced population arrives in your [question("value"), id="6"], what is the smallest number of displaced persons required to constitute a crisis and require special actions by authorities and/or community groups? In other words, complete this sentence: "A displaced population of _____ or more people arriving in my [question("value"), id="6"] would constitute a crisis and require special actions by authorities and/or community groups."

_____

APPENDIX A (continued)

Page Logic — the following conditions will run when the page above gets submitted
If: The answer to Question #7
Then: Jump to Page #13 [10. How frequently do you think your [question("value"), id="6"] might host a displaced population of one thousand (1,000) or more people?]

8.) How frequently do you think your [question("value"), id="6"] might host a displaced population of [question("value"), id="16"] or more people?

( ) Every year
( ) Every 3 years
( ) Every 5 years
( ) Every 10 years
( ) Every 20 years
( ) Every 30 years
( ) Every 50 years
( ) Every 75 years
( ) Every 100 years
( ) Less than once every 100 years
( ) Other (please specify how frequently)

Page Logic — the following conditions will run when the page above gets submitted
If: The answer to Question #7
Then: Jump to Page #14 [Section 2 of 3]

9.) Do you have comments about your answer to the above question? (Optional.)

10.) How frequently do you think your [question("value"), id="6"] might host a displaced population of one thousand (1,000) or more people?

( ) Every year
( ) Every 3 years
( ) Every 5 years
( ) Every 10 years
( ) Every 20 years
( ) Every 30 years
( ) Every 50 years
( ) Every 75 years
( ) Every 100 years
( ) Less than once every 100 years
( ) Other (please specify how frequently)

11.) Do you have comments about your answer to the above question? (Optional.)

Section 2 of 3
This next section asks about plans that may or may not exist to deal with displaced populations.

12.) Does your [question("value"), id="6"] have any plans of its own that would help it deal with a displaced population of [question("value"), id="16"] people?

( ) Yes, definitely
( ) Yes, I think so
( ) No, I don't think so
( ) No, definitely not
( ) I really can't say

APPENDIX A (continued)

13.) Are there any plans from sources other than your [question("value"), id="6"] that would help your [question("value"), id="6"] deal with a displaced population of [question("value"), id="16"] people?
( ) Yes, definitely
( ) Yes, I think so
( ) No, I don't think so
( ) No, I know it does not
( ) I really can't say
Page Logic — the following conditions will run when the page above gets submitted
If: The answer to Question #12 is in list **No, I don't think so**, **No, definitely not** or **I really can't say**
AND
The answer to Question #13 is in list **No, I don't think so**, **No, I know it does not** or **I really can't say**
Then: Jump to Page #21 [Section 3 of 3]

14.) You indicated that there are plans from your [question("value"), id="6"] and/or other sources that would help your [question("value"), id="6"] deal with a displaced population of [question("value"), id="16"] people. Are any of those plans specifically for the scenario of displaced populations?
( ) Yes
( ) No, but they are for closely related scenarios or components of the response, and could be directly applied to displaced populations
( ) No, they are for other scenarios but could be applied to displaced populations with some modification
( ) No, but they would have some use
( ) I don't know
( ) Other (please specify)

15.) Additional comments (optional):

16.) Overall, how would you rate the quality of those existing plans?
( ) Extremely weak
( ) Very weak
( ) Neither weak nor strong
( ) Very strong
( ) Extremely strong
( ) I don't know

17.) Additional comments (optional):

APPENDIX A (continued)

18.) How have those existing plans been used? (Select all that apply.)
[ ] Used in multiple major real events
[ ] Used in one major real event
[ ] Used in multiple small real events
[ ] Used in one small real event
[ ] Used in exercises
[ ] Used in planning activities
[ ] Other ways (please specify below)
[ ] I don't know

19.) If you can, please briefly summarize how those plans have been used. (No more than 3 to 5 sentences.)
Page Logic — the following conditions will run when the page above gets submitted
If: The answer to Question #18 is exactly equal to **I don't know**
Then: Jump to Page #21 [Section 3 of 3]

20.) You indicated that those existing plans have been used in some way. How much would you say those existing plans have been improved as a result of that use?
( ) Not at all improved
( ) Not too improved
( ) Somewhat improved
( ) Very much improved
( ) Extremely improved
( ) I don't know

Section 3 of 3
This next section asks your opinion about a set of standards that have been developed for dealing with displaced populations. The standards are intended to specify the minimum level of service, goods, and attention received by a large displaced population.

The list of standards is too long to review here. This survey is only an initial evaluation of the concept. Therefore you will not be asked to judge specific standards. Rather, you will be asked whether it is appropriate to have such standards for caring for large displaced populations, and whether the categories of needs they address are appropriate.
Before the next question, you will be presented with three screens of information about the standards.

Proposed standards
The standards cover a long list of needs that a displaced population may have. They are grouped into the following categories:
• Water supply, sanitation and hygiene promotion
• Food security, nutrition and food aid
• Shelter, settlement and non-food items
• Health services
• Other management and planning standards common to all of the above sectors

APPENDIX A (continued)

Example standard and indicators
For the category "hygiene promotion," one standard is:

"Toilets are sited, designed, constructed and maintained in such a way as to be comfortable, hygienic and safe to use."

For each standard, there are also indicators that are intended to be used to determine if each standard has been achieved. For the above standard on hygiene promotion, some of the indicators are:

• Users (especially women) have been consulted and approve of the siting and design of the toilet.
• The water supply is at least 15 liters (4 gallons) per person per day.
• The water supply is no more than 500 meters (550 yards) from any household.
• There is a waiting time of no more than 15 minutes at a water supply point.
• The water supply requires no more than three minutes to fill a 20-liter (5-gallon) container.

Purpose of standards and indicators
The intent of these standards is to guide disaster planning at several stages, including:

• Preparing for future events
• Assessing needs once a crisis has occurred
• Planning specific programs to deliver needed services
• Monitoring the impact of services on the recipients
• Evaluating the services afterward

21.) Do you know of similar standards that already exist?
( ) No
( ) Yes
Page Logic — the following conditions will run when the page above gets submitted
If: The answer to Question #21 is in list **No**
Then: Jump to Page #27 [25. How useful would it be to have a set of standards for caring for displaced populations?]

22.) You indicated that similar standards already exist. How similar do you think those standards are to the ones that have been briefly reviewed here?
( ) Not at all similar
( ) Not too similar
( ) Somewhat similar
( ) Very similar
( ) Extremely similar
( ) I don't know

APPENDIX A (continued)

23.) What is the name of these existing standards (as best you can remember)?

24.) What organization or person produced these existing standards?

25.) How useful would it be to have a set of standards for caring for displaced populations?
( ) Not at all useful
( ) Not too useful
( ) Somewhat useful
( ) Very useful
( ) Extremely useful
( ) I don't know

26.) Why do you think so?

27.) In your opinion, how difficult would it be to use a set of standards for caring for a displaced population of [question("value"), id="16"] people?
( ) Not at all difficult
( ) Not too difficult
( ) Somewhat difficult
( ) Very difficult
( ) Extremely difficult
( ) I don't know

28.) What would be the greatest challenges?

Thank you!
You have completed the main portion of the survey. The few remaining questions will ask about your background.

29.) Before proceeding to the demographic questions, are there any important comments about the topics presented in this survey that the researcher should know about? If so, please enter them below.

Demographics
30.) What is your sex?
( ) Male
( ) Female
( ) I prefer not to respond

31.) What year were you born?

32.) Ethnicity: Are you of Hispanic, Latino, or Spanish origin?
( ) No
( ) Yes

APPENDIX A (continued)

33.) What is your race? (Check all that apply.)

[ ] White
[ ] Black or African American
[ ] American Indian or Alaska Native
[ ] Asian Indian
[ ] Asian
[ ] Pacific Islander
[ ] Some other race (Please specify:)

34.) What is the highest educational degree you have received?

( ) None
( ) Elementary school diploma
( ) High school diploma or the equivalent (GED)
( ) Associate degree
( ) Bachelor's degree
( ) Master's degree
( ) Professional degree (such as MD, DDS, DVM, LLB, JD, DD, etc.)
( ) Doctorate degree (such as PhD, EdD, etc.)

35.) What professional license(s) do you hold, if any? (Check all that apply.)

[ ] None
[ ] Medical doctor (MD)
[ ] Registered nurse (RN)
[ ] Nurse Practitioner (NP)
[ ] Community Health Education Specialist (CHES)
[ ] Emergency Medical Technician (EMT)
[ ] Social Worker
[ ] Certified in Public Health (CPH)
[ ] Other professional license (Please specify:)

APPENDIX A (continued)

36.) What state/territory do you live in? If it is outside the United States or US territories, please choose "Other".

( ) Other (not listed)	( ) Florida	( ) Minnesota	( ) Oregon
( ) Alabama	( ) Georgia	( ) Mississippi	( ) Palau
( ) Alaska	( ) Guam	( ) Missouri	( ) Pennsylvania
( ) American Samoa	( ) Hawaii	( ) Montana	( ) Puerto Rico
( ) Arizona	( ) Idaho	( ) Nebraska	( ) Rhode Island
( ) Arkansas	( ) Illinois	( ) Nevada	( ) South Carolina
( ) California	( ) Indiana	( ) New Hampshire	( ) South Dakota
( ) Colorado	( ) Iowa	( ) New Jersey	( ) Tennessee
( ) Connecticut	( ) Kansas	( ) New Mexico	( ) Texas
( ) Delaware	( ) Kentucky	( ) New York	( ) Utah
( ) District of Columbia	( ) Louisiana	( ) North Carolina	( ) Vermont
( ) Federated States of Micronesia	( ) Maine	( ) North Dakota	( ) Virgin Islands
	( ) Marshall Islands	( ) Northern Mariana Islands	( ) Virginia
	( ) Maryland		( ) Washington
	( ) Massachusetts	( ) Ohio	( ) West Virginia
	( ) Michigan	( ) Oklahoma	( ) Wisconsin
			( ) Wyoming

Other state/territory not listed above: (If it is outside the United States or US territories, please indicate the country and state/administrative region.)

37.) What state/territory do you work in? If it is outside the United States or US territories, please choose "Other". If your work covers multiple states/territories, list the one where you are physically present for your work.

( ) Other (not listed)	( ) Florida	( ) Minnesota	( ) Oregon
( ) Alabama	( ) Georgia	( ) Mississippi	( ) Palau
( ) Alaska	( ) Guam	( ) Missouri	( ) Pennsylvania
( ) American Samoa	( ) Hawaii	( ) Montana	( ) Puerto Rico
( ) Arizona	( ) Idaho	( ) Nebraska	( ) Rhode Island
( ) Arkansas	( ) Illinois	( ) Nevada	( ) South Carolina
( ) California	( ) Indiana	( ) New Hampshire	( ) South Dakota
( ) Colorado	( ) Iowa	( ) New Jersey	( ) Tennessee
( ) Connecticut	( ) Kansas	( ) New Mexico	( ) Texas
( ) Delaware	( ) Kentucky	( ) New York	( ) Utah
( ) District of Columbia	( ) Louisiana	( ) North Carolina	( ) Vermont
( ) Federated States of Micronesia	( ) Maine	( ) North Dakota	( ) Virgin Islands
	( ) Marshall Islands	( ) Northern Mariana Islands	( ) Virginia
	( ) Maryland		( ) Washington
	( ) Massachusetts	( ) Ohio	( ) West Virginia
	( ) Michigan	( ) Oklahoma	( ) Wisconsin
			( ) Wyoming

APPENDIX A (continued)

Other work state/territory not listed above: (If it is outside the United States or US territories, please indicate the country and state/administrative region.)

Employment

38.) Do you currently work for any of the following? (Check all that apply.)

[ ] Local government
[ ] State/territorial government
[ ] Federal/national government
[ ] Institution of higher learning (college, university)

39.) What kind of business or industry do you work for?

40.) What kind of work do you do?

41.) What are your most important work activities?

42.) How relevant is disaster planning to your involvement with organizations other than those that you work for? (Such as organizations you volunteer with.)

( ) Not at all relevant
( ) Not too relevant
( ) Somewhat relevant
( ) Very relevant
( ) Extremely relevant

Please describe briefly: (No more than 3 to 5 sentences at most please.)

43.) Have you ever helped respond to a displaced population?

( ) Yes
( ) No
( ) I'm not sure

44.) At any time in your life, have you been part of a displaced population?

( ) Yes
( ) No
( ) I'm not sure

Thank you! Survey complete!

To thank all of the survey participants for their time, I will make cash donations to several charities involved in disaster relief operations and policy. The donations will be divided according to the preferences of the survey participants. (Please note that the donations come from my personal funds, not from any Federal or other grant.)

APPENDIX A (continued)

45.) Which of the following would you like your share of the donation made to?
( ) MercyCorps
( ) American Red Cross
( ) American Public Health Association
( ) Habitat for Humanity International
( ) Humane Society of the United States
( ) Lutheran Disaster Response
( ) Save the Children
( ) United Way of America
( ) World Vision
( ) Catholic Charities, USA
( ) None of the above options

Thank you for completing the survey!
All your responses have been saved and you may close this window.

- Click here to: [Link to researcher's academic web page: http://www2.uic.edu/~egebbi2/currentresearch.html]
- Learn more about this research
- Sign up for updates
- Forward the survey to others

Please do consider inviting others to complete this survey. All responses are greatly appreciated.

Sincerely,
Eric Gebbie
DrPH Candidate
University of Illinois at Chicago

APPENDIX B

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

UNIVERSITY OF ILLINOIS
AT CHICAGO

Office for the Protection of Research Subjects (OPRS)
Office of the Vice Chancellor for Research (MC 672)
203 Administrative Office Building
1737 West Polk Street
Chicago, Illinois 60612-7227

Exemption Granted

September 9, 2010

Eric Gebbie, MA, MIA
Community Health Sciences

RE: Research Protocol # 2010-0715
"Applicability of International Disaster Standards to Displaced Population Care in the United States"

Dear Mr. Gebbie:

Your Claim of Exemption was reviewed on September 7, 2010 and it was determined that your research protocol meets the criteria for exemption as defined in the U. S. Department of Health and Human Services Regulations for the Protection of Human Subjects [(45 CFR 46.101(b)]. You may now begin your research.

Exemption Period:	**September 7, 2010 – September 6, 2013**
Sponsor:	None
Engaged Performance Site:	UIC
Subject Population:	Adult subjects only

The specific exemption category under 45 CFR 46.101(b) is:
(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

You are reminded that investigators whose research involving human subjects is determined to be exempt from the federal regulations for the protection of human subjects still have responsibilities for the ethical conduct of the research under state law and UIC policy. Please be aware of the following UIC policies and responsibilities for investigators:

APPENDIX B (continued)

1. Amendments You are responsible for reporting any amendments to your research protocol that may affect the determination of the exemption and may result in your research no longer being eligible for the exemption that has been granted.

2. Record Keeping You are responsible for maintaining a copy all research related records in a secure location in the event future verification is necessary, at a minimum these documents include: the research protocol, the claim of exemption application, all questionnaires, survey instruments, interview questions and/or data collection instruments associated with this research protocol, recruiting or advertising materials, any consent forms or information sheets given to subjects, or any other pertinent documents.

3. Final Report When you have completed work on your research protocol, you should submit a final report to the Office for Protection of Research Subjects (OPRS).

4. Information for Human Subjects UIC Policy requires investigators to provide information about the research protocol to subjects and to obtain their permission prior to their participating in the research. The information about the research protocol should be presented to subjects in writing or orally from a written script. When appropriate, the following information must be provided to all research subjects participating in exempt studies:

    a. The researchers affiliation; UIC, JBVMAC or other institutions,
    b. The purpose of the research,
    c. The extent of the subject's involvement and an explanation of the procedures to be followed,
    d. Whether the information being collected will be used for any purposes other than the proposed research,
    e. A description of the procedures to protect the privacy of subjects and the confidentiality of the research information and data,
    f. Description of any reasonable foreseeable risks,
    g. Description of anticipated benefit,
    h. A statement that participation is voluntary and subjects can refuse to participate or can stop at any time,
    i. A statement that the researcher is available to answer any questions that the subject may have and which includes the name and phone number of the investigator(s).
    j. A statement that the UIC IRB/OPRS or JBVMAC Patient Advocate Office is available if there are questions about subject's rights, which includes the appropriate phone numbers.

Please be sure to:

→Use your research protocol number (listed above) on any documents or correspondence with the IRB concerning your research protocol.

We wish you the best as you conduct your research. If you have any questions or need further help, please contact me at (312) 355-2908 or the OPRS office at (312) 996-1711. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

APPENDIX B (continued)

Sincerely,

Charles W. Hoehne, CIP
Assistant Director, IRB # 2
Office for the Protection of Research Subjects

Enclosure(s): None

cc: Bernard Turnock, Community Health Sciences, M/C 923

CITED LITERATURE

[1] Committee for the Study of the Future of Public Health; Division of Health Care Services; Institute of Medicine (IOM). The Future of Public Health [Internet]. . Washington, DC: National Academies P; 1988. [cited 2010 Mar 30]; p. 44. Available from: http://books.nap.edu/openbook.php?record_id=1091&page=44

[2] Rowitz L. *Public Health Leadership: Putting Principles into Practice*. Sudbury: Jones & Bartlett Pub; 2003. P. 126-142.

[3] Sanderson LM. Toxicologic disasters: natural and technologic. In: Sullivan JB, Krieger GR, editors. *Hazardous materials toxicology: clinical principles of environmental health.* Baltimore, MD: Williams & Wilkins; 1992. P 326-331. And Gunn SWA. *Multilingual dictionary of disaster medicine and international* relief. Dordrecht, The Netherlands: Kluwer Academic Publishers; 1990. In: Noji EK. The Nature of Disaster: General Characteristics and Public Health Effects. In: Noji, Eric K. (ed.) *The Public Health Consequences of Disasters*. Oxford: New York; 1997. P. 7.

[4] Federal Emergency Management Agency (FEMA). Evacuee support planning guide [Internet]. FEMA P-760/Catalog No. 09049-2; 2009 Jul [cited 2011 Mar 24]. Available from: http://www.fema.gov/pdf/government/evacuee_support_guide.pdf

[5] United Nations High Commissioner for Refugees (UNHCR). Handbook for Emergencies [Internet]. 3rd edition. Geneva: UNHCR; 2007. [Cited 2009 Nov 06]; p. 548. Available from: http://www.unhcr.org/471db4c92.html

[6] United Nations High Commissioner for Refugees (UNHCR). Handbook for Emergencies [Internet]. 3rd edition. Geneva: UNHCR; 2007. [Cited 2009 Nov 06]; p. 4. Available from: http://www.unhcr.org/471db4c92.html

[7] Fink M, Plumer I, Radosevich K, Ward E, and Green R. Post-disaster Temporary Housing Is Often An Unmet Need" In: Miller, Debra A. (ed.) *Disaster Response*. Detroit: Gale, Cengage Learning; 2009.

[8] United Nations Conference of Plenipotentiaries on the Status of Refugees and Stateless Persons. Convention Relating to the Status of Refugees. Article 1.A.(2)

[9] American Heritage Dictionary of the English Language. Third Ed. Houghton Mifflin Company. [CD-ROM] 1992. "Refugee" and "Refuge".

[10] United Nations Development Programme (UNDP). Human Development Report 2009 - Overcoming barriers: Human mobility and development [Internet]. [Cited 2009 Dec 03]; p. 71-92. Available at: http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf

[11] United Nations Development Programme (UNDP). Human Development Report 2009 - Overcoming barriers: Human mobility and development [Internet]. [Cited 2009 Dec 03]; p. 26. Available at: http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf

[12] Global Humanitarian Assistance. GHA Report 2009 [Internet]. [Cited 2009 Dec 03]; p 4. Available at: http://www.globalhumanitarianassistance.org/uploads/gha-report-2009-2nd.pdf

[13] Simon D. Development Reconsidered; New Directions in Development Thinking. Geografiska Annaler. Series B, Human Geography, Vol. 79, No. 4, Current Development Thinking (1997), p. 183-201. Blackwell Publishing on behalf of the Swedish Society for Anthropology and Geography Stable. [Cited 2009 Dec 03]. Available from: http://www.jstor.org/stable/490357

[14] National Archives and Records Administration. The 1906 San Francisco Earthquake and Fire [Internet]. [Cited 2009 Dec 07]. Available at: http://www.archives.gov/exhibits/sf-earthquake-and-fire/aftermath.html

[15] Michael Helquist. Portland to the rescue: the Rose City's response to the 1906 San Francisco earthquake and fire. Oregon Historical Quarterly 108.3 (Fall 2007); p. 384.

[16] United States Congress (February 19, 2006) (PDF). A Failure of Initiative: Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina [Internet]. Washington, DC: Government Printing Office. Retrieved 2009 Dec 07. Available at: http://www.gpoaccess.gov/katrinareport/fullreport.pdf P 312.

[17] Federal Emergency Management Agency (FEMA). By the Numbers: First 100 Days: FEMA Recovery Update for Hurricane Katrina [Internet]. Washington, DC. Accessed 2009 Dec 07. Available at: http://www.fema.gov/news/newsrelease.fema?id=21078

[18] Department of Homeland Security. Department of Homeland Security Citizens' Report: Fiscal Year 2008 Summary of Performance and Financial Results [Internet]. Washington, DC. [Cited 2009 Dec 02]; p. 16. Available at: http://www.dhs.gov/xlibrary/assets/cfo_citizensfy2008.pdf

[19] Federal Emergency Management Agency (FEMA). Evacuation plans. [Cited 2011 Feb 27]; [about 2 screens]. Available at: http://www.fema.gov/plan/prepare/evacuation.shtm

[20] Reza, HG Bernstein S, Garvey M. 1 million fled fires? As the smoke clears, the numbers shrink [Internet]. Los Angeles Times. 2007 Oct 25. [Cited 2009 Dec 08]. Available at: http://www.latimes.com/news/local/la-me-evacuation25oct25,0,3958904,full.story

[21] California Department of Forestry and Fire Protection. 2007 Wildfire Activity Statistics [Internet]. [Cited 2010 Jan 27]. Available at: http://www.fire.ca.gov/downloads/redbooks/2007_BW.pdf

[22] Dash N, Hearn Morrow B. Return delays and evacuation order compliance: the case of Hurricane Georges and the Florida Keys. Environmental Hazards 2 (2001) 119–128.

[23] Dow K, Cutter SL. Public orders and personal opinions: household strategies for hurricane risk assessment. Environmental Hazards 2 (2000) 143–155.

[24] Enarson E, Scanlon J. Gender Patterns in Flood Evacuation: A Case Study in Canada's Red River Valley. Applied Behavioral Science Review, Volume 7, Number 2, pages 103-124.

[25] Mozumder P, Raheem N, Talberth J, Berrens RP. Investigating intended evacuation from wildfires in the wildland–urban interface: Application of a bivariate probit model. Forest Policy and Economics 10 (2008) 415–423.

[26] Urbina E, Wolshon B. National review of hurricane evacuation plans and policies: a comparison and contrast of state practices. Transportation Research Part A 37 (2003) 257–275.

[27] Stepanov A, MacGregor Smith J. Multi-objective evacuation routing in transportation networks. European Journal of Operational Research 198 (2009) 435–446.

[28] Sorensen J, Vogt B. Interactive Emergency Evacuation Guidebook [Internet]. Chemical Stockpile Emergency Preparedness Program, Oakridge National Laboratory; 2006 Feb. [Cited 2010 Mar 2]. Available from: http://emc.ornl.gov/CSEPPweb/evac_files/index.htm

[29] Campbell BC. *Disasters, Accidents, and Crises in American History: A Reference Guide to the Nation's Most Catastrophic Events.* New York: Facts on File; 2008.

[30] Lansing J. *Portland: People, Politics, and Power, 1851-2001*. Corvalis: Oregon State UP; 2003. P. 350-351.

[31] US Census Bureau, Population Estimates Program. Louisiana , GCT-T1, Population Estimates, Data Set: 2008 Population Estimates. [Cited 2009 Dec 12]. Available at: http://factfinder.census.gov/servlet/GCTTable?_bm=y&-geo_id=04000US22&-_box_head_nbr=GCT-T1&-ds_name=PEP_2008_EST&-_lang=en&-format=ST-9&-_sse=on

[32] Schiermeier Q. The Chaos to Come. Nature. Vol 438, 15 December 2005.

[33] Tanguy JC, Condomines M, Le Goff M, Chillemi V, La Delfa S and Patanè G. Mount Etna eruptions of the last 2,750 years: revised chronology and location through archeomagnetic and ^{226}Ra-^{230}Th dating. Bulletin of Volcanology, Volume 70, Number 1 / September, 2007.

[34] Cheng-Zheng Luo. Investigation and regionalization of historical floods in China. Journal of Hydrology, Volume 96, Issues 1-4, 1987 Dec 15; P. 41-51.

[35] Altinok Y, Ersoy Ş. Tsunamis Observed on and Near the Turkish Coast. Natural Hazards 21: 185–205; 2000.

[36] National Park Service, National Historic Landmarks Program. Acoma Pueblo. [Cited 2010 Jan 21]. Available at: http://tps.cr.nps.gov/nhl/detail.cfm?ResourceId=357&ResourceType=District

[37] Encyclopædia Britannica. Oraibi [Internet]. Encyclopædia Britannica Online; 2010. [Cited 2010 Jan 21]. Available at: http://search.eb.com/eb/article-9057251

[38] National Park Service, National Historic Landmarks Program. Old Oraibi [Internet]. [Cited 2010 Jan 21]. Available at: http://tps.cr.nps.gov/nhl/detail.cfm?ResourceId=100&ResourceType=District

[39] Brandon W. *The Rise and Fall of North American Indians: From Prehistory through Geronimo*. Lanham, MD: Taylor Trade; 2003. P. 135.

[40] Johnson M. *Encyclopedia of Native Tribes of North America.* Buffalo: Firefly; 2007. P. 198.

[41] Steinberg T. *Acts of God : the unnatural history of natural disaster in America*. New York: Oxford UP; 2006. P. 25.

[42] Posner RA. *Catastrophe: Risk and Response.* New York: Oxford UP; 2004.

[43] Steinberg T. *Acts of God : the unnatural history of natural disaster in America*. New York: Oxford UP; 2006. P. 26-42.

[44] Steinberg T. *Acts of God : the unnatural history of natural disaster in America*. New York: Oxford UP; 2006. P. 198

[45] Napier JL, Mandisodza AN, Andersen SM, Jost JT. System justification in responding to the poor and displaced in the aftermath of hurricane Katrina. Analyses of Social Issues and Public Policy, Vol. 6, No. 1, 2006; p. 57-73.

[46] Steinberg T. *Acts of God : the unnatural history of natural disaster in America*. New York: Oxford UP; 2006. P. 71.

[47] Tinguaro Rodríguez J. A natural-disaster management DSS for humanitarian non-governmental organisations. Knowledge-based systems. 2010 Feb 01; 23(1): 17.

[48] Field CB, Mortsch LD, Brklacich M, Forbes DL, Kovacs P, Patz JA, Running SW, Scott MJ. North American cities integrate impacts across multiple scales and sectors [Internet]. Box 14.3. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors. 2007: North America. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge (UK): Cambridge University. [Cited 2009 Dec 07]. P. 617-652. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter14.pdf

[49] Crossett KM, Culliton TJ, Wiley PC, Goodspeed TR. Population trends along the coastal United States: 1980-2008. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service; 2004 Sep. [Cited 2009 Dec 07]. Available at: http://oceanservice.noaa.gov/programs/mb/pdfs/coastal_pop_trends_complete.pdf

[50] Rosenbaum, W. The Developmental and Environmental Impacts of the National Flood Insurance Program: A Review of Literature Prepared as part of the Evaluation of the National Flood Insurance Program; 2005. Available from: http://www.fema.gov/library/file?type=originalAccessibleFormatFile&file=nfip_eval_dei_literature_review.txt&fileid=68578010-f41f-11db-8f7c-000bdba87d5b

[51] Cross, JA. Flood Insurance and Coastal Development. The Florida Geographer. 1989; 23:22-45.

[52] Steinberg T. *Acts of God : the unnatural history of natural disaster in America*. New York: Oxford UP; 2006. P. 81.

[53] The Economist. Protecting life but not yet livelihoods [Internet]. 2007 Nov 8. [Cited 2009 Dec 12]. Available at: http://www.economist.com/world/americas/displaystory.cfm?story_id=E1_TDTDQJQQ

[54] United States Congress. A failure of initiative: final report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina. Washington, DC: Government Printing Office; 2006 Feb 19. [Cited 2009 Dec 07]. P. Available at: http://www.gpoaccess.gov/katrinareport/fullreport.pdf

[55] Homeland Security Council. National Planning Scenarios: Created for Use in National, Federal, State, and Local Homeland Security Preparedness Activities. Version 21.3, Final Draft. 2006 March.

[56] See also publicly accessible similar draft version: Homeland Security Council. National Planning Scenarios: Created for Use in National, Federal, State, and Local Homeland Security Preparedness Activities. Version 20.1, Draft. 2005 Apr. [Cited 2009 Dec 06]. Available at: http://media.washingtonpost.com/wp-srv/nation/nationalsecurity/earlywarning/NationalPlanningScenariosApril2005.pdf

[57] Schneider SH, Semenov S, Patwardhan A, Burton I, Magadza CHD, Oppenheimer M, Pittock AB, Rahman A, Smith JB, Suarez A, Yamin F. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors. 2007: Assessing key vulnerabilities and the risk from climate change. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge (UK): Cambridge UP. [Cited 2009 Dec 07]. P. 779-810. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter19.pdf

[58] Solomon S, Qin D, Manning M, Alley RB, Berntsen T, Bindoff NL, Chen Z, Chidthaisong A, Gregory JM, Hegerl GC, Heimann M, Hewitson B, Hoskins BJ, Joos F, Jouzel J, Kattsov V, Lohmann U, Matsuno T, Molina M, Nicholls N, Overpeck J, Raga G, Ramaswamy V, Ren J, Rusticucci M, Somerville R, Stocker TF, Whetton P, Wood RA, Wratt D. 2007: Technical Summary. In: Solomon S, Qin D, Manning M, Chen Z, Marquis M, Averyt KB, Tignor M, Miller HL, editors. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge (UK): Cambridge UP. [Cited 2009 Dec 07]. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter19.pdf

[59] Parry ML, Canziani OF, Palutikof JP and co-authors. 2007: Technical Summary. Climate Change 2007: Impacts, Adaptation and Vulnerability [Internet]. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Internet]. Cambridge (UK): Cambridge UP. [Cited 2009 Dec 07]. Table TS.1. Selected examples of current and projected climate-change impacts on industry, settlement and society and their interaction with other processes. P. 23-78. Available from: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-ts.pdf

[60] Field CB, Mortsch LD, Brklacich M, Forbes DL, Kovacs P, Patz JA, Running SW, Scott MJ. Box 14.3. North American cities integrate impacts across multiple scales and sectors. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors.

2007: North America. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge (UK): Cambridge UP. [Cited 2009 Dec 07]. P. 617-652. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter14.pdf

[61] National Oceanic and Atmospheric Administration. Atlantic hurricane season sets records [Internet]. 2008 Nov 26. [Cited 2009 Jan 13]. Available at: http://www.noaanews.noaa.gov/stories2008/20081126_hurricaneseason.html

[62] Goldenberg SB, Landsea CW, Mestas-Nunez AM, Gray WM. The recent increase in Atlantic hurricane activity: causes and implications. Science. 2001 Jul 20; 293(5529): 474-9.

[63] Illinois Public Health Preparedness Center. After Action Report / Improvement Plan for the Arkansas Department of Health Hurricane Gustav Response, 2008. 2008 Nov 2.

[64] Hamin EM, Gurran N. Urban form and climate change: balancing adaptation and mitigation in the U.S. and Australia. Habitat International. 2009 Jul; 33(3): 238-245.

[65] Climate Change 2007: Impacts, Adaptation and Vulnerability. Appendix I: Glossary. In: Parry L, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge (UK): Cambridge UP. [Cited 2009 Dec 07]. 976 p. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-app.pdf

[66] Sullivan L. Wal-Mart: lessons of the storm. InformationWeek. 2005 Sep 26. [Cited 2009 Dec 13]. Available from: http://www.informationweek.com/news/global-cio/showArticle.jhtml?articleID=171200601&queryText=wal-mart%20lessons%20of%20storm

[67] Tierney J. From FEMA to WEMA [Internet]. New York Times. 2005 Sep 20. [Cited 2009 Dec 13]. Available at: http://select.nytimes.com/2005/09/20/opinion/20tierney.html

[68] Ozlem E, Heier Stamm JL, Keskinocak P, Swann JL. Waffle House Restaurants hurricane response: a case study. International Journal of Production Economics (2009),doi:10.1016/j.ijpe.2009.08.018.

[69] Hotel news now - For the month of June 2009. Hotels Magazine. [Cited 2009 Aug 23]. Available from: http://www.hotelsmag.com/contents/pdf/HotelNewsNow_200906_HotelsMag.pdf

[70] U.S. Census Bureau, Population Division. HU-EST2008-[ST_FIPS]: Housing Unit Estimates for Counties of United States: April 1/2000 to July 1/2008 [Internet]. File: 7/1/2008 Housing Unit Estimates File. Release Date: August 6, 2009 [Cited 2009 Aug 23]. Available from: http://www.census.gov/popest/housing/HU-EST2008-CO.html

[71] Ramroth WG. *Planning for Disaster: How Natural and Manmade Disasters Shape Built Environment.* New York: Kaplan; 2007. P. 65-66.

[72] International Code Council. About ICC – History [Internet]. Washington, DC: Author. [Cited 2010 Feb 24]. Available from: http://www.iccsafe.org/AboutICC/Pages/default.aspx

[73] Ramroth WG. *Planning for Disaster: How Natural and Manmade Disasters Shape Built Environment.* New York: Kaplan; 2007. P 47.

[74] International Association of Assembly Managers, Inc. Mega-shelter: a best practices for planning, activation, operations. Coppel, TX: Author; 2006 Jul 15. [Cited 2009 Dec 06]. Available from: http://www.fema.gov/pdf/emergency/disasterhousing/MegaShelterPlanningActivation.pdf

[75] United States Congress. A failure of initiative: final report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina. Washington, DC: Government Printing Office; 2006 Feb 19. [Cited 2009 Dec 07]. P. 315. Available at: http://www.gpoaccess.gov/katrinareport/fullreport.pdf

[76] Government Accountability Office. Hurricanes Gustav and Ike disaster assistance: FEMA strengthened its fraud prevention controls, but customer service needs improvement [Internet]. 2009 Jun. [Cited 2010 Feb 12]. Available from: http://www.gao.gov/new.items/d09671.pdf

[77] Campbell BC. *Disasters, Accidents, and Crises in American History: A Reference Guide to the Nation's Most Catastrophic Events.* New York: Facts on File; 2008.

[78] Chinni D. Wall Street shouldn't trump the government in emergency response [Internet]. Christian Science Monitor. 2005 Sep 27. [Cited 2009 Dec 13]. P. 105. Available at: http://www.csmonitor.com/2005/0927/p09s01-codc.html

[79] FEMA. Administrative Information [Internet]. [Cited 2010 Jan 27]. Available from: http://training.fema.gov/EMIweb/downloads/admin_info.pdf

[80] Department of Homeland Security. Annual performance report, fiscal years 2008 – 2010 [Internet]. [Cited 2011 Mar 24]. P. 88. Available at: http://www.dhs.gov/xlibrary/assets/cfo_apr_fy2008.pdf

[81] Department of Homeland Security . Department of Homeland Security Citizens' Report: Fiscal Year 2008 Summary of Performance and Financial Results. Washington, DC. Accessed 2009 Dec 02. Page 16. Available at: http://www.dhs.gov/xlibrary/assets/cfo_citizensfy2008.pdf

[82] National Emergency Management Association (NEMA). Table A: State emergency management: agency structure, budget and staffing [Internet]. [Cited 2010 Jan 27]. Available from: http://www.nemaweb.org/default.aspx?2328

[83] National Voluntary Organizations Active in Disaster. National VOAD members resource directory [Internet]. [Cited 2010 Jan 27]. Available from: http://www.nvoad.org/Portals/0/Resource%20Directory%202009.doc

[84] American Red Cross. The 2008 disaster relief program annual review [Internet]. [Cited 2009 Jan 27]. Available from: http://www.redcross.org/www-files/Documents/pdf/corppubs/DRFReport.pdf

[85] The Salvation Army. 2009 annual report: onward [Internet]. [Cited 2010 Jan 27]. Available from: http://annualreport.salvationarmyusa.org/_pdf/entire_annual_report_2009.pdf

[86] National Voluntary Organizations Active in Disaster. National VOAD members resource directory [Internet]. [Cited 2010 Jan 27]. Available from: http://www.nvoad.org/Portals/0/Resource%20Directory%202009.doc

[87] Garrett TA, RS Sobel. The political economy of FEMA disaster payments. *Economic Inquiry*. 2003 Jul;41(3):496-509.

[88] European Commission. *European University Degree in International Humanitarian Assistance - Volume 2 - Management in humanitarian assistance.* Second edition. Luxembourg: Office for Official Publications of the European Communities; 1998. P. 30-31.

[89] European Commission. *European University Degree in International Humanitarian Assistance - Volume 2 - Management in humanitarian assistance.* Second edition. Luxembourg: Office for Official Publications of the European Communities; 1998. P. 32-34.

[90] Centers for Disease Control and Prevention. Continuation guidance for cooperative agreement on public health preparedness and response for bioterrorism – budget year five program, announcement 99051. 2004 Jun 14. [Cited 2009 Dec 07]. P. 7. Available at: http://www.bt.cdc.gov/planning/continuationguidance/pdf/guidance_intro.pdf

[91] Centers for Disease Control and Prevention. 2005 guidance/budget period 6, appendix 4: draft measurement descriptions and methods of data collection [Internet]. [Cited 2009 Dec 07]. Available at: http://www.bt.cdc.gov/planning/guidance05/pdf/appendix4.pdf

[92] Centers for Disease Control and Prevention. 2006 guidance/budget period 7, program announcement AA154 - 2006 (budget year 7) [Internet]. [Cited 2009 Dec 07]. Available at: http://www.bt.cdc.gov/cotper/coopagreement/pdf/fy06announcement.pdf

[93] Centers for Disease Control and Prevention. Public health emergency preparedness cooperative agreement, budget period 8, performance measures definitions and guidance. BP8 version 1, 2007 Dec 26. [Cited 2009 Dec 07]. Available at: http://www.bt.cdc.gov/cotper/coopagreement/pdf/fy07guidance_definitions_v1_122607.pdf

[94] Centers for Disease Control and Prevention. Public health emergency preparedness cooperative agreement, budget period 9 (BP9), performance measures guidance. 2008 Nov. [Cited 2009 Dec 07]. Available at: http://www.bt.cdc.gov/cotper/coopagreement/09/pdf/BP9_PHEP_PerformanceMeasuresGuidance11_14_2008FINAL.pdf

[95] Western New York Public Health Alliance (NYPHA). (National Association of County and City Health Officials, Centers for Disease Control and Prevention). Rural preparedness planning guide: planning for population surge following urban disasters. [Cited 2010 Apr 12]. Available from: http://www.norc.org/NR/rdonlyres/227B10FB-44B4-41D9-B214-6F5DD26ABA6D/0/RuralPreparednessGuide2008.pdf

[96] Competency Committee, International Nursing Coalition for Mass Casualty Education. Educational competencies for registered nurses responding to mass casualty incidents [Internet]. 2003 Aug. [Cited 2010 Jan 26]. Available at: http://www.aacn.nche.edu/Education/pdf/INCMCECompetencies.pdf

[97] Bernardo LM, Veenema TG. Pediatric emergency preparedness for mass gatherings and special events. Disaster Management & Response. 2004; 2(4): 118-22.

[98] Department of Homeland Security. Target capabilities list [Internet]. Washington, DC: Autor; 2007 Sep.

[99] Department of Homeland Security. Target capabilities list [Internet]. Washington, DC: Autor; 2007 Sep. P. 493.

[100] United States Government Accountability Office (GAO). Disaster housing: FEMA needs more detailed guidance and performance measures to help ensure effective assistance

after major disasters [Internet]. GAO-09-796 Disaster Housing. 2009 Aug. P. 40-41. [Cited 2009 Dec 02]. Available at: http://www.gao.gov/new.items/d09796.pdf

[101] United States Government Accountability Office (GAO). Budget issues: FEMA needs adequate data, plans, and systems to effectively manage resources for day-to-day operations [Internet]. 2007. [Cited 2009 Dec 03]. P. 4. Available at: http://www.gao.gov/new.items/d07139.pdf

[102] US Congres. Post-Katrina emergency management reform act of 2006. 120 STAT. 1394 Public Law 109–295—2006 Oct. 4. Title VI: National emergency management. [Cited 2009 Dec 02]. Available from: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_public_laws&docid=f:publ295.109.pdf

[103] US Department of Homeland Security, Federal Emergency Management Agency (FEMA). National disaster housing strategy [Internet]. [Cited 2009 Dec 06]. Available at: http://www.fema.gov/pdf/emergency/disasterhousing/NDHS-core.pdf

[104] US Department of Homeland Security, Federal Emergency Management Agency (FEMA). National disaster housing strategy [Internet]. [Cited 2009 Dec 06]. Annex 4: disaster housing community site operations. Available at: http://www.fema.gov/pdf/emergency/disasterhousing/NDHSAnnex4.pdf

[105] International Association of Assembly Managers, Inc. Mega-shelter: a best practices for planning, activation, operations. Coppel, TX: Author; 2006 Jul 15. [Cited 2009 Dec 06]. Available from: http://www.fema.gov/pdf/emergency/disasterhousing/MegaShelterPlanningActivation.pdf

[106] American Red Cross. Disaster Services Program Guidance for Mass Care and Sheltering [Internet]. [Cited 2009 Dec 06]. Available from: http://www.fema.gov/pdf/emergency/disasterhousing/ARC_MassCareShelter.pdf

[107] Federal Emergency Management Agency (FEMA). Evacuee support planning guide [Internet]. FEMA P-760/Catalog No. 09049-2; 2009 Jul [cited 2011 Mar 24]. Available from: http://www.fema.gov/pdf/government/evacuee_support_guide.pdf

[108] US Congres.. Pet Evacuation and Transportation Standards (PETS) Act of 2006 – (Public Law 109-308 [H.R. 3858]) Amendment to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) to ensure that State and local emergency preparedness operational plans address the needs of individuals with household pets and service animals following a major disaster or emergency. Available from: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_public_laws&docid=f:publ308.109.pdf

[109] Federal Emergency Management Agency. IS-1 Emergency Manager: An Orientation to the Position. [Cited 2010 Feb 25]. Unit 1, p. 2. Available from: http://training.fema.gov/EMIWeb/IS/is1lst.asp

[110] Geyer M. German Strategy in the Age of Machine Warfare, 1914-1945. P. 541. In: Paret P, editor. *Makers of Modern Strategy: from Machiavelli to the Nuclear Age*. Princeton: Princeton UP; 1986.

[111] Sphere Project. Sphere Project Humanitarian Charter and Minimum Standards in Disaster Response [Internet]. [Cited 2010 Mar 22]. Available from: http://www.sphereproject.org/content/blogsection/7/83/12/0/lang,english/

[112] Humanitarian Action in Complex Political Emergencies course syllabus. [Fall Semester 2009]. [Cited 2011 Feb 27]. Available at: http://fletcher.tufts.edu/faculty/Maxwell/pdfs/Maxwell_DHP_D230.pdf

[113] Duke University Program On Global Policy And Governance, International Humanitarian Assistance: Policy, Law And Practice. Course Outline And Syllabus, June 22nd-26th 2009. [Cited 2011 Feb 27]. Available at: http://sanford.duke.edu/graduate/mpp/geneva/documents/HumanitarianAssistanceCourseSyllabus2009final.doc

[114] Complex Humanitarian Emergencies Seminar - HSA 5302. Syllabus – Fall 2008 [Internet]. [Cited 2011 Feb 27]. Available at: http://continuingstudies.uconn.edu/onlinecourses/welc/hsa5302fa08.html

[115] TH 539/IN 539 Human Rights, Humanitarian Crises and Refugees: Ethical, Political, and Religious Responses [Internet]. Boston College. [Cited 2011 Feb 27]. Available at: http://www2.bc.edu/~hollenb/th539/th539.htm

[116] INTS 4492: Health & Humanitarian Aid (updated, 1 September 2009) [Internet]. [Cited 2011 Feb 27]. Available at: https://portfolio.du.edu/portfolio/getportfoliofile?uid=146932

[117] United States Government Accountability Office (GAO). Disaster Housing: FEMA Needs More Detailed Guidance and Performance Measures to Help Ensure Effective Assistance after Major Disasters [Internet]. 2009 Aug. GAO-09-796 Disaster Housing. [Cited 2009 Dec 02]. P. 52. Available at: http://www.gao.gov/new.items/d09796.pdf

[118] Altevogt BM, Pope AM, Hill MN, Shine KI, editors, Institute of Medicine of the National Academies. Research Priorities in Emergency Preparedness and Response for Public Health Systems: A Letter Report [Internet]. Research Priorities in Emergency Preparedness and Response for Public Health Systems: A Letter Report. Washington,

DC: National Academies P; 2008. [Cited 2009 Dec 07]. Available at: http://www.nap.edu/catalog/12136.html

[119] Centers for Disease Control and Prevention (CDC), US Department of Health and Human Services. Advancing the Nation's Health: A Guide to Public Health Research Needs, 2006 - 2015 [Internet]. 2006 Dec. [Cited 2010 Mar 01]. P. 44. Available from: http://www.cdc.gov/od/science/PHResearch/cdcra/

[120] The Sphere Project: Humanitarian Charter and Minimum Standards in Disaster Response [Internet]. Geneva: The Sphere Project; 2004. [Cited 2009 Jan 22]. P. 73 Available from: http://www.sphereproject.org/content/view/27/84/lang,english/

[121] The Sphere Project: Humanitarian Charter and Minimum Standards in Disaster Response [Internet]. Geneva: The Sphere Project; 2004. [Cited 2009 Jan 22]. P. 63. Available from: http://www.sphereproject.org/content/view/27/84/lang,english/

[122] The Sphere Project: Humanitarian Charter and Minimum Standards in Disaster Response [Internet]. Geneva: The Sphere Project; 2004. [Cited 2009 Jan 22]. Available from: http://www.sphereproject.org/content/view/27/84/lang,english/

[123] The Sphere Project. Welcome to the Sphere Handbook 2010 Revised Edition [Internet]. [Cited 2010 Mar 22]. Available from: http://www.sphereproject.org/content/view/530/302/lang,english/

[124] The Sphere Project. "The Sphere Project Training Report 2008: An overview of learning activities around the world." P 3. Accessed 2010 Mar 22. Available from: http://reliefweb.int/rw/lib.nsf/db900sid/SNAA-7WC3KM/$file/SphereTrainingReport2008.pdf?openelement

[125] The Sphere Project. Sphere Training [Internet]. [Cited 2010 Mar 22]. Available from: http://www.sphereproject.org/content/view/14/33/lang,english/

[126] The Sphere Project. Available materials [Internet]. [Cited 2010 Mar 22]. Available from: http://www.sphereproject.org/content/view/461/251/lang,english/

[127] The Sphere Project. Tool for estimating nutrients in rations in line with Sphere Key indicators [Internet]. [Cited 2010 Mar 22]. Available from: http://www.sphereproject.org/content/view/366/83/lang,english/

[128] Sphere Project. About us [Internet]. [Cited 2010 Mar 26]. Available from: http://www.sphereproject.org/content/view/91/58/lang,english/

[129] UNHCR. Practical Guide to the Systematic Use of Standards and Indicators in UNHCR Operations [Internet]. Geneva: UNHCR; 2006 Feb. Second edition. Available from: http://www.unhcr.org/statistics/STATISTICS/40eaa9804.pdf

[130] Ministerio de Asuntos Exteriores y de Cooperacion. Humanitarian Action Strategy Paper Spanish Development Cooperation (Executive Summary) [Internet]. [Cited 2010 Mar 22]. Available from: http://www.iecah.org/ftp/DES_AH_Res_ejec_Eng.pdf

[131] The Sphere Project. The European Consensus on Humanitarian Aid advocates for International Standards including Sphere [Internet]. [Cited 2010 Mar 22]. Available from: http://www.sphereproject.org/content/view/333/83/lang,english/

[132] Griekspoor A, Collins S. Raising standards in emergency relief: how useful are Sphere minimum standards for humanitarian assistance? BMJ. 2001 Sep;323:29.

[133] Gidley, R. Critics find fault with Sphere standards for relief work [Internet]. Reuters AlertNet. 2004 Oct 15. [Cited 2010 Mar 22]. Available from: http://www.alertnet.org/thefacts/reliefresources/109783801066.htm

[134] Salama P, Buzard N, Spiegel P. Improving Standards in International Humanitarian Response: The Sphere Project and Beyond. JAMA. 2001 Aug 01;286(5):531-532.

[135] Shrady N. *The Last Day: Wrath, Ruin and Reason in the Great Earthquake of 1755*. Penguin: New York; 2008. P. 45-47.

[136] US Congress. An act providing relief of such of the inhabitants of Saint Domingo resident within the United States, as may be found in want of support. Private Acts of the Third Congress of the United States. 1794 Feb 12. [Cited 2010 Mar 19]. Available from: http://books.google.com/books?id=ojkFAAAAYAAJ&pg=PA13#v=onepage&q=&f=false

[137] Encyclopædia Britannica. Solferino, Battle of [Internet]. Encyclopædia Britannica Online. Encyclopædia Britannica, 2010. [Cited 2010 Mar 8]. Available from: http://search.eb.com/eb/article-9068587

[138] Dunant H. *A Memory of Solferino*. International Committee of the Red Cross [Internet]. 1862 (version 1986). [Cited 2010 Mar 8]. Available from: http://www.icrc.org/web/eng/siteeng0.nsf/html/p0361p 1.

[139] Howard M. Men against Fire: the Doctrine of the Offensive. P. 510-526, P. 511-516. In: Paret, P, editor. *Makers of Modern Strategy: from Machiavelli to the Nuclear Age*. Princeton: Princeton UP; 1986.

[140] Rystad G. Immigration History and the Future of International Migration. International Migration Review. Winter, 1992;26(4):1168-1199. P. 1171.

[141] Conoir Y, Langholtz HJ. Conduct Of Humanitarian Relief Operations: Principles Of Intervention And Management. United Nations Peace Operations Training Institute. P. 8.

[142] UNHCR. Financial Figures [Internet]. [Cited 2009 Dec 03]. Available at: http://www.unhcr.org/pages/49c3646c1a.html

[143] UNHCR. UNHCR Global Report 2008 [Internet]. [Cited 2009 Aug 23]. Populations of concern to UNHCR. Available from: http://www.unhcr.org/4a2d1be92.pdf

[144] United Nations General Assembly. Strengthening of the coordination of humanitarian emergency assistance of the United Nations [Internet]. December 1991, the General Assembly adopted Resolution 46/182. [Cited 2009 Dec 03]. Available at: http://www.un.org/Depts/dhl/res/resa46.htm

[145] Office for the Coordination of Humanitarian Affairs (OCHA). OCHA Annual Report 2008 [Internet]. Geneva, Switzerland. [Cited 2009 Dec 03]. Available at: http://ochaonline.un.org/FundingFinance/AnnualReports/tabid/1279/Default.aspx

[146] OCHA. About OCHA [Internet]. [Cited 2009 Dec 03]. http://ochaonline.un.org/AboutOCHA/tabid/1076/language/en-US/Default.aspx

[147] OCHA, Financial Tracking Service. Global Humanitarian Contributions in 2008: Totals per Appealing Agency [Internet]. 2009 Dec 03. [Cited 2009 Dec 02]. Available at: http://ocha.unog.ch/fts/reports/daily/ocha_R31_Y2008___0912030211.pdf

[148] OCHA. Global Humanitarian Contributions in 2008: Totals per Sector [Internet]. Available at: http://ocha.unog.ch/fts/reports/daily/ocha_R16_Y2008___0912030211.pdf

[149] OCHA. Global Humanitarian Contributions in 2008: Totals by Donor [Internet]. Available at: http://ocha.unog.ch/fts/reports/daily/ocha_R18_Y2008___0912030211.pdf

[150] Global Humanitarian Assistance. GHA Report 2009 [Internet]. [Cited 2009 Dec 03]. Available at: http://www.globalhumanitarianassistance.org/uploads/gha-report-2009-2nd.pdf

[151] World Food Programme. WFP by the numbers [Internet]. [Cited 2009 Dec 03]. Available at: http://www.wfp.org/wfp-numbers

[152] UNHCR. UNHCR Global Report 2008. [Cited 2009 Aug 23]. Populations of concern to UNHCR. Available from: http://www.unhcr.org/4a2d1be92.pdf

[153] UNHCR. Financial Figures [Internet]. [Cited 2009 Dec 03]. Available at: http://www.unhcr.org/pages/49c3646c1a.html

[154] UNICEF. Annual Report 2008 [Internet]. [Cited 2009 Dec 03]. Available at: http://www.unicef.org/publications/files/UNICEF_Annual_Report_2008_EN_072709.pdf

[155] United Nations. Report of the Commissioner-General of the United Nations Relief and Works Agency for Palestine Refugees in the Near East, 1 January-31 December 2008 [Internet]. General Assembly Sixty-fourth Session, Supplement No. 13, A/64/13. United Nations: New York; 2009. [Cited 2009 Dec 03]. P. 11. Available at: http://www.un.org/unrwa/publications/pdf/ComGen-AR2008.pdf

[156] International Committee of the Red Cross. Annual Report 2008 [Internet]. Geneva, Switzerland. [Cited 2009 Dec 03]. Available at: http://www.icrc.org/Web/Eng/siteeng0.nsf/htmlall/section_annual_report_2008

[157] Food and Agriculture Organization of the United Nations. 2008-09: The Director-General's Programme of Work and Budget [Internet]. Rome; 2007. [Cited 2009 Dec 04]. Available at: http://www.fao.org/pwb/2008/index_en.htm

[158] Food and Agriculture Organization of the United Nations. Protect, restore, enhance: FAO's role in emergencies [Internet]. [Cited 2009 Dec 04]. Available at: ftp://ftp.fao.org/docrep/fao/011/i0765e/i0765e02.pdf

[159] CARE USA. 2008 Annual Report [Internet]. [Cited 2009 Dec 04]. Available at: http://www.care.org/newsroom/publications/annualreports/2008/AR_2008.pdf

[160] CARE International UK. Annual Review 2008: Transforming Lives Together [Internet]. London. [Cited 2009 Dec 04]. Available at: http://www.careinternational.org.uk/docs/care-international-uk-annual-review-2008.pdf

[161] Office for the Coordination of Humanitarian Affairs (OCHA). OCHA in 2008: Activities and extrabudgetary funding requirements [Internet]. Geneva, Switzerland. [Cited 2009 Dec 03]. Available at: http://ochaonline.un.org/AboutOCHA/OCHAin2009/2008/tabid/1282/language/en-US/Default.aspx

[162] Office for the Coordination of Humanitarian Affairs (OCHA). OCHA Annual Report 2008 [Internet]. Geneva, Switzerland. [Cited 2009 Dec 03]. Available at: http://ochaonline.un.org/FundingFinance/AnnualReports/tabid/1279/Default.aspx

[163] World Health Organization. Programme Budget 2008-2009: Financial Tables [Internet]. [Cited 2009 Dec 04]. Available at: http://apps.who.int/gb/ebwha/pdf_files/AMTSP-PPB/a-mtsp_7en.pdf

[164] International Save the Children Alliance Secretariat. International Save the Children Alliance: Annual Review 2008 [Internet]. London. [Cited 2009 Dec 05]. Available at: http://www.savethechildren.net/alliance/resources/reports/annual_review_2008.pdf

[165] Toole MJ. The Role of Rapid Assessment. In: Leaning J, Briggs S, Chen L, editors. *Humanitarian Crises: The medical and Public Health Response*. Cambridge, MA: Harvard UP; 1999. Chapter 1, p. 15.

[166] Médecins San Frontières. *Refugee Health: An approach to emergency situations*. London: MacMillan; 1997. P. 37-240.

[167] Toole, MJ, Waldman RJ. Prevention of excess mortality in refugee and displaced populations in developing countries. JAMA. 1990 Jun 27;263(24).

[168] Toole, MJ. The Role of Rapid Assessment. In: Leaning J, Briggs S, Chen L, editors. Humanitarian Crises: The medical and Public Health Response. Cambridge, MA: Harvard UP; 1999. Chapter 1, p. 38-39.

[169] Hallam A. Evaluating Humanitarian Assistance Programmes in Complex Emergencies [Internet]. [Cited 2009 Dec]. P 92. Available at: http://www.odihpn.org/download.asp?id=2109&ItemURL=documents/gpr7.pdf

[170] Sphere Project. Executive briefing on the Sphere Project. [Cited 2010 Mar 22]. Slide 3. Available from: http://www.sphereproject.org/component/option,com_docman/task,doc_details/gid,199/Itemid,203/

[171] European Commission. *European University Degree in International Humanitarian Assistance - Volume 2 - Management in humanitarian assistance.* Second edition. Luxembourg: Office for Official Publications of the European Communities; 1998. P. 7.

[172] Gerstein M, Ellsberg M. *Flirting with Disaster: Why Accidents are Rarely Accidental*. New York: Union Square; 2008. P. 279-280.

[173] UNHCR. Practical Guide to the Systematic Use of Standards and Indicators in UNHCR Operations [Internet]. Geneva; 2006 Feb. Second edition. P. vii. Available from: http://www.unhcr.org/statistics/STATISTICS/40eaa9804.pdf

[174] Hallam A. Evaluating Humanitarian Assistance Programmes in Complex Emergencies [Internet]. [Cited 2009 Dec]. Available at: http://www.odihpn.org/download.asp?id=2109&ItemURL=documents/gpr7.pdf

[175] Hallam A. Evaluating Humanitarian Assistance Programmes in Complex Emergencies [Internet]. [Cited 2009 Dec]. P. 12. Available at: http://www.odihpn.org/download.asp?id=2109&ItemURL=documents/gpr7.pdf

[176] Hallam A. Evaluating Humanitarian Assistance Programmes in Complex Emergencies [Internet]. [Cited 2009 Dec]. P. 84. Available at: http://www.odihpn.org/download.asp?id=2109&ItemURL=documents/gpr7.pdf

[177] Hallam A. Evaluating Humanitarian Assistance Programmes in Complex Emergencies [Internet]. [Cited 2009 Dec]. P. 12. Available at: http://www.odihpn.org/download.asp?id=2109&ItemURL=documents/gpr7.pdf

[178] Lichiello P. (Robert Wood Johnson Foundation/University of Washington Turning Point National Program Office). Guidebook for Performance Measurement [Internet]. Turning Point Collaborative for a New Century in Public Health. [Cited 2010 Mar 2]. P. 25-34. Available at: http://www.turningpointprogram.org/Pages/pdfs/perform_manage/pmc_guide.pdf

[179] Poister TH. *Measuring performance in public and nonprofit organizations*. Jossey-Bass: San Francisco; 2003. P. 9-15.

[180] Central Intelligence Agency. World Factbook [Internet]. [Cited 2010 Mar 10]. GDP - per capita (PPP). Available from: https://www.cia.gov/library/publications/the-world-factbook/rankorder/2004rank.html

[181] United Nations Development Programme (UNDP). Human Development Report 2009 - Overcoming barriers: Human mobility and development [Internet]. [Cited 2009 Dec 03]. Table G: Human development index trends; p. 167. Available at: http://hdr.undp.org/en/media/HDR_2009_EN_Complete.pdf

[182] Macinko JA, Smith SJ. Humanitarian assistance and disaster relief: an overview. In: R. Rodriguez-Garcia, JA Macinko, JA Casas, editors. *From Humanitarian Assistance to Human Development*. P. 33-72.

[183] Centers for Disease Control and Prevention (CDC), Department of Health and Human Services. National Public Health Performance Standards Program (NPHPSP) User Guide [Internet]. 2007 Fall. [Cited 2010 Mar 2]. P. 8. Available at: http://www.cdc.gov/od/ocphp/nphpsp/PDF/UserGuide.pdf

[184] Department of Health and Human Services. Healthy People - Implementation [Internet]. [Cited 2010 Mar 2]. Available from: http://www.healthypeople.gov/Implementation/

[185] Centers for Disease Control and Prevention (CDC), Office of the Director (OD), Office of the Chief of Public Health Practice (OCPHP). National Public Health Performance Standards Program (NPHPSP). [Cited 2010 Mar 2]. Available from: http://www.cdc.gov/od/ocphp/nphpsp/

[186] Lichiello P. (Robert Wood Johnson Foundation/University of Washington Turning Point National Program Office). Guidebook for Performance Measurement [Internet]. Turning Point Collaborative for a New Century in Public Health. [Cited 2010 Mar 2]. Available at: http://www.turningpointprogram.org/Pages/pdfs/perform_manage/pmc_guide.pdf

[187] European Commission. *European University Degree in International Humanitarian Assistance - Volume 2 - Management in humanitarian assistance.* Second edition. Luxembourg: Office for Official Publications of the European Communities; 1998. P. 104.

[188] Allbaugh JM. Testimony of Federal Emergency Management Agency Director Joe M. Allbaugh. Washington, DC: Federal Emergency Management Agency. Last modified 2009 Jun 04. Available from: http://www.fema.gov/about/director/allbaugh/testimony/051601.shtm

[189] McGuire LC, Ford ES, Okoro CA. Natural disasters and older US adults with disabilities: implications for evacuation. Disasters. 2007;31(1):49−56.

[190] European Commission. *European University Degree in International Humanitarian Assistance - Volume 2 - Management in humanitarian assistance.* Second edition. Luxembourg: Office for Official Publications of the European Communities; 1998. P. 24.

[191] Committee for the Study of the Future of Public Health; Division of Health Care Services, Institute of Medicine (IOM). The Future of Public Health [Internet]. Washington, DC: National Academies P; 1988. [Cited 2010 Mar 30]. P. 44. Available from: http://books.nap.edu/openbook.php?record_id=1091&page=44

[192] Patton C, Sawicki DS. *Basic Methods of Policy Analysis and Planning*. 2nd Ed. Prentice Hall; 1993. P. 53.

[193] Miller DC, Salkin NJ. *Handbook of Research Design & Social Measurement.* 6th ed. Thousand Oaks: Sage; 2002. P. 3.

[194] Miller DC, NJ Salkin. *Handbook of Research Design & Social Measurement.* 6th ed. Thousand Oaks: Sage; 2002. P. 92-93.

[195] Wouters M, Wilderom C. Developing performance-measurement systems as enabling formalization: A longitudinal field study of a logistics department. Accounting, Organizations and Society. 2008 May-July;33(4-5):488-516.

[196] Poister TH. *Measuring performance in public and nonprofit organizations*. Jossey-Bass: San Francisco; 2003. P. 23.

[197] Schonlau M, Fricker RD, Elliott MN. *Conducting Research Surveys via E-mail and the Web*. RAND Corporation; 2002. [Cited 2010 Apr 12]. Background on the survey process; p. 6. Available at: http://www.rand.org/pubs/monograph_reports/MR1480/MR1480.ch2.pdf

[198] National Center for Public Productivity, Rutgers University. A Brief Guide for Performance Measurement in Local Government [Internet]. Newark: National Center for Public Productivity; 1997. Available at http://newark.rutgers.edu/~ncpp/cdgp/Manual.htm#man4 In: Lichiello, Turning Point. p 68.

[199] Poister TH. *Measuring performance in public and nonprofit organizations*. Jossey-Bass: San Francisco; 2003. P. 86-107.

[200] The Sphere Project: Humanitarian Charter and Minimum Standards in Disaster Response. Geneva: The Sphere Project; 2004. [Cited 2009 Jan 22]. P. 8. Available from: http://www.sphereproject.org/content/view/27/84/lang,english/

[201] Poister PH. *Measuring performance in public and nonprofit organizations*. Jossey-Bass: San Francisco; 2003. P. 265-273.

[202] Poister TH. *Measuring performance in public and nonprofit organizations*. Jossey-Bass: San Francisco; 2003. P. 17-21.

[203] National Association of County and City Health Officials (NACCHO). 2008 National Profile of Local Health Departments [Internet]. Washington, DC: NACCHO; 2009. [Cited 2010 Jan]. P. 36. Available from: http://www.naccho.org/topics/infrastructure/profile/index.cfm

[204] Centers for Disease Control and Prevention (CDC). Public Health Emergency Preparedness (PHEP) Cooperative Agreement, Program Announcement AA154 - FY 2009 (Budget Period 10) [Internet]. Atlanta, GA: Author; 2009 May 01. [Cited 2010 May 23]. P. 24-26. Available from: http://www.bt.cdc.gov/cdcpreparedness/coopagreement/index.asp#09

[205] Department of Health and Human Services. Health and Human Services employee directory. [Database]. Results where "other organization" equal to "DHHS/CDC/OPHPR". [Cited 2010 Sept 20]. Available from: http://directory.psc.gov/employee.htm

[206] Moote AL, Moote DC. *The Great Plague: The Story of London's Most Deadly Year.* Baltimore: Johns Hopkins UP; 2006. P. 75-94.

[207] Federal Emergency Management Agency (FEMA). By the Numbers: First 100 Days: FEMA Recovery Update for Hurricane Katrina [Internet]. Washington, DC. [Cited 2009 Dec 07]. Available at: http://www.fema.gov/news/newsrelease.fema?id=21078

[208] Gerber B. Mass evacuation to rural communities [Internet]. University at Albany Center for Public Health Preparedness. 2009 Nov 09. [Cited 2010 Apr 28]. Available at: http://www.ualbanycphp.org/SiteCoordinators/11_09_06/Media/Handouts.pdf

[209] Dillman DA, Smyth JD, Christian LM. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. Third edition. Hoboken: Wiley; 2009.

[210] Posner RA. *Catastrophe: Risk and Response.* New York: Oxford UP; 2004. P. 10.

[211] Dillman DA, Smyth JD, Christian LM. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. Third edition. Hoboken: Wiley; 2009. P. 16-22.

[212] Dillman DA, Smyth JD, Christian LM. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. Third edition. Hoboken: Wiley; 2009. P. 271-299.

[213] Foss SK, Waters W. *Destination Dissertation: A Traveler's Guide to a Done Dissertation*. Lanham: Rowman & Littlefield; 2007. P. 186-208.

[214] Adapted from the United Nations High Commissioner for Refugees (UNHCR) definition of a refugee emergency in: UNHCR. Handbook for Emergencies [Internet]. 3rd edition. [Cited 31 Jan 2011]. P. 4. Available at: http://www.unhcr.org/publ/PUBL/471db4c92.html.

[215] United Nations Conference of Plenipotentiaries on the Status of Refugees and Stateless Persons. Convention Relating to the Status of Refugees. Article 1.A.(2)

[216] American Heritage Dictionary of the English Language [CD-ROM]. Third Edition. Houghton Mifflin Company: 1992. Entries for "Refugee" and "Refuge".

[217] Field CB, Mortsch LD, Brklacich M, Forbes DL, Kovacs P, Patz JA, Running SW, Scott MJ. Box 14.3, North American cities integrate impacts across multiple scales and

sectors. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors. 2007: North America. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge (UK): Cambridge UP. [Cited 2009 Dec 07]. P. 617-652. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter14.pdf

[218] Crossett KM, Culliton TJ, Wiley PC, Goodspeed TR. Population Trends Along the Coastal United States: 1980-2008 [Internet]. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service; 2004 Sep. [Cited 2009 Dec 07]. Available at: http://oceanservice.noaa.gov/programs/mb/pdfs/coastal_pop_trends_complete.pdf

[219] Rosenbaum W. The Developmental and Environmental Impacts of the National Flood Insurance Program: A Review of Literature Prepared as part of the Evaluation of the National Flood Insurance Program [Internet]. 2005. Available at: http://www.fema.gov/library/file?type=originalAccessibleFormatFile&file=nfip_eval_dei_literature_review.txt&fileid=68578010-f41f-11db-8f7c-000bdba87d5b

[220] Cross JA. Flood Insurance and Coastal Development. The Florida Geographer 1989;23:22-45.

[221] Homeland Security Council. National Planning Scenarios: Created for Use in National, Federal, State, and Local Homeland Security Preparedness Activities. Version 21.3, Final Draft. 2006 March.

[222] See also publicly accessible similar draft version: Homeland Security Council. National Planning Scenarios: Created for Use in National, Federal, State, and Local Homeland Security Preparedness Activities. Version 20.1, Draft. 2005 Apr. [Cited 2009 Dec 06]. Available at: http://media.washingtonpost.com/wp-srv/nation/nationalsecurity/earlywarning/NationalPlanningScenariosApril2005.pdf

[223] Schneider SH, Semenov S, Patwardhan A, Burton I, Magadza CHD, Oppenheimer M, Pittock AB, Rahman A, Smith JB, Suarez A, Yamin F. 2007: Assessing key vulnerabilities and the risk from climate change. Climate Change 2007: Impacts, Adaptation and Vulnerability [Internet]. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors. Cambridge(UK): Cambridge UP. [Cited 2009 Dec 07]. P. 779-810. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter19.pdf

[224] Solomon S, Qin D, Manning M, Alley RB, Berntsen T, Bindoff NL, Chen Z, Chidthaisong A, Gregory JM, Hegerl GC, Heimann M, Hewitson B, Hoskins BJ, Joos F, Jouzel J, Kattsov V, Lohmann U, Matsuno T, Molina M, Nicholls N, Overpeck J, Raga G, Ramaswamy V, Ren J, Rusticucci M, Somerville R, Stocker TF, Whetton P, Wood RA, Wratt D. 2007: Technical Summary. In: Solomon S, Qin D, Manning M, Chen Z, Marquis M, Averyt KB, Tignor M, Miller HL, editors. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Internet]. Cambridge(UK): Cambridge UP; [Cited 2009 Dec 07]. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter19.pdf

[225] Parry ML, Canziani OF, Palutikof JP, and co-authors. 2007: Technical Summary. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Internet]. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors. Cambridge(UK): Cambridge UP. P. 23-78. Table TS.1. Selected examples of current and projected climate-change impacts on industry, settlement and society and their interaction with other processes. [Cited 2009 Dec 07]. Available from: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-ts.pdf

[226] Post-Katrina Emergency Management Reform Act of 2006. 120 STAT. 1394 Public Law 109–295—OCT. 4, 2006. Title VI: National Emergency Management. [Cited 2009 Dec 02]. Available from: http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_public_laws&docid=f:publ295.109.pdf

[227] US Department of Homeland Security, Federal Emergency Management Agency (FEMA). National Disaster Housing Strategy [Internet]. [Cited 2009 Dec 06]. Available at: http://www.fema.gov/pdf/emergency/disasterhousing/NDHS-core.pdf

[228] Department of Homeland Security. Target Capabilities List [Internet]. 2007 Sep. Entry for “Mass Care”. P 493.

[229] Sphere Project. The Sphere Project: Humanitarian Charter and Minimum Standards in Disaster Response [Internet]. Geneva: The Sphere Project; 2004 [cited 2009 Jan 22]. Available from: http://www.sphereproject.org/content/view/27/84/lang,english/

[230] Sphere Project. Executive briefing on the Sphere Project [Internet]. [Cited 2010 Mar 22]. Slide 3. Available from: http://www.sphereproject.org/component/option,com_docman/task,doc_details/gid,199/Itemid,203/

[231] Patton C, Sawicki DS. *Basic Methods of Policy Analysis and Planning*. 2nd Ed. Prentice Hall; 1993. P. 53.

[232] Wouters M, Wilderom C. Developing performance-measurement systems as enabling formalization: A longitudinal field study of a logistics department. *Accounting, Organizations and Society*. May-July 2008;33(4-5):488-516.

[233] Poister TH. *Measuring performance in public and nonprofit organizations*. Jossey-Bass: San Francisco; 2003. P. 23.

[234] Miller DC, Salkin NJ. *Handbook of Research Design & Social Measurement.* 6th ed. Thousand Oaks: Sage; 2002. P. 3, 92-93.

[235] Dillman DA. , Smyth JD, Christian LM. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. Third edition. Hoboken: Wiley; 2009. P. 16-22, 271-299.

[236] Gebbie EN. Applicability of international disaster standards to displaced population care in the United States [Internet]. Chicago, IL: University of Illinois at Chicago; 2010. [Cited 2011 Feb 06]. Available at: https://docs.google.com/leaf?id=0Byclc2ZkQYilN2QwMjI5NDAtMWZlYi00YmUzLTk5NDUtZDU4OGVkZjAzMjc5&hl=en

[237] Gebbie EN. Use of a Web survey for policy analysis among a dispersed stakeholder network: an initial evaluation of proposed performance measurement standards [Internet]. [Thesis.] To be submitted for publication.

[238] American Association for Public Opinion Research. Standard Definitions Final Dispositions of Case Codes and Outcome Rates for Surveys [Internet]. 5th Ed. Lenexa, Kansas: AAPOR; 2008.

[239] Tanguy JC, Condomines M, Le Goff M, Chillemi V, La Delfa S, Patanè G. Mount Etna eruptions of the last 2,750 years: revised chronology and location through archeomagnetic and ^{226}Ra-^{230}Th dating. Bulletin of Volcanology.2007 Sep;70(1).

[240] Cheng-Zheng Luo. Investigation and regionalization of historical floods in China. Journal of Hydrology. 1987 Dec 15;96(1-4):41-51.

[241] Altinok Y, Ersoy Ş. Tsunamis Observed on and Near the Turkish Coast. Natural Hazards. 2000;21:185–205.

[242] Climate Change 2007: Impacts, Adaptation and Vulnerability. Appendix I: Glossary. [Cited 2009 Dec 07]. Available at: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-app.pdf In: Parry ML, Canziani OF, Palutikof JP, van der Linden

PJ, Hanson CE, editors. IPCC, 2007: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge(UK): Cambridge UP. 976 p.

[243] Haskins R. Policy analysis. In: Miller DC, Salkin NJ. *Handbook of Research Design & Social Measurement.* 6th ed. Thousand Oaks: Sage; 2002. P. 68.

[244] Sphere Project. The Sphere Project: Humanitarian Charter and Minimum Standards in Disaster Response [Internet[. Geneva: The Sphere Project; 2004 [cited 2009 Jan 22]. Available from: http://www.sphereproject.org/content/view/27/84/lang,english/

[245] Committee for the Study of the Future of Public Health; Division of Health Care Services. The Future of Public Health [Internet]. Institute of Medicine (IOM). Washington, DC: National Academies P; 1988. [Cited 2010 Mar 30]. P. 44. Available from: http://books.nap.edu/openbook.php?record_id=1091&page=44

[246] Miller DC, Salkin NJ. *Handbook of Research Design & Social Measurement.* 6th ed. Thousand Oaks: Sage; 2002. P. 3, 92-93.

[247] Wouters M, Wilderom C. Developing performance-measurement systems as enabling formalization: A longitudinal field study of a logistics department. Accounting, Organizations and Society. May-July 2008:33(4-5);488-516.

[248] Poister TH. *Measuring performance in public and nonprofit organizations*. Jossey-Bass: San Francisco; 2003. P. 23.

[249] Moote AL, Moote DC. *The Great Plague: The Story of London's Most Deadly Year.* Baltimore: Johns Hopkins UP; 2006. P. 75-94.

[250] Federal Emergency Management Agency (FEMA). By the Numbers: First 100 Days: FEMA Recovery Update for Hurricane Katrina [Internet]. Washington, DC. [Cited 2009 Dec 07]. Available at: http://www.fema.gov/news/newsrelease.fema?id=21078

[251] Gerber B. Mass evacuation to rural communities [Internet video]. Albany, NY:University at Albany Center for Public Health Preparedness; 2009 Nov 09. [Cited 2010 Apr 28]. Available at: http://www.ualbanycphp.org/SiteCoordinators/11_09_06/Media/Handouts.pdf

[252] National Center for Public Productivity, Rutgers University. A Brief Guide for Performance Measurement in Local Government [Internet]. Newark: National Center for Public Productivity; 1997. Available at http://newark.rutgers.edu/~ncpp/cdgp/Manual.htm#man4 In: Lichiello, Turning Point. p 68.

[253] Poister TH. *Measuring performance in public and nonprofit organizations*. Jossey-Bass: San Francisco; 2003. P. 86-107.

[254] Sphere Project. The Sphere Project: Humanitarian Charter and Minimum Standards in Disaster Response [Internet]. Geneva: The Sphere Project; 2004 [cited 2009 Jan 22]. P. 8. Available from: http://www.sphereproject.org/content/view/27/84/lang,english/

[255] Poister TH. *Measuring performance in public and nonprofit organizations*. Jossey-Bass: San Francisco; 2003. P. 265-273.

[256] Poister TH. *Measuring performance in public and nonprofit organizations*. Jossey-Bass: San Francisco; 2003. P. 17-21.

[257] Dillman DA, Smyth JD, Christian LM. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. Third edition. Hoboken: Wiley; 2009. P. 16-22.

[258] Posner, RA. *Catastrophe: Risk and Response.* New York: Oxford UP; 2004. P. 10.

[259] Gebbie EN. Applicability of international disaster standards to displaced population care in the United States. Chicago, IL: University of Illinois at Chicago; 2010. [Cited 2011 Feb 06]. Available at: https://docs.google.com/leaf?id=0Byclc2ZkQYilN2QwMjI5NDAtMWZlYi00YmUzLTk5NDUtZDU4OGVkZjAzMjc5&hl=en

[260] Centers for Disease Control and Prevention (CDC). Public Health Emergency Preparedness (PHEP) Cooperative Agreement, Program Announcement AA154 - FY 2009 (Budget Period 10) [Internet]. Atlanta, GA: Author; 2009 May 01. [Cited 23 May 2010]. P. 24-26. Available from: http://www.bt.cdc.gov/cdcpreparedness/coopagreement/index.asp#09

[261] National Association of County and City Health Officials (NACCHO). 2008 National Profile of Local Health Departments [Internet]. Washington, DC: NACCHO, 2009. [Cited 2010 Jan]. P. 36. Available from: http://www.naccho.org/topics/infrastructure/profile/index.cfm

[262] Department of Health and Human Services. Health and Human Services employee directory. [Internet database]. Results where “other organization” equal to “DHHS/CDC/OPHPR”. [Cited 2010 Sept 20]. Available from: http://directory.psc.gov/employee.htm

[263] National Office of Citizen Corps - FEMA Individual and Community Preparedness Division. Get Involved! Locate Your Local Preparedness Programs [Internet]. Washington, DC: Author; 2009. [Cited 2009 Sept 29]. Available from: http://www.citizencorps.gov/cc/searchCouncil.do?submitByZip

[264] Administration for Children and Families, Region VI. National Human Services & Disasters Virtual Leadership Training participants. [Cited 2009 Sept 24]. Available at: http://www.humanservicesepr.org/participants.pdf

[265] Medical Reserve Corps. Find MRC Units [Internet]. Office of the Surgeon General, US Dept of Health and Human Services; 2009. [Cited 2009 Sept 16]. Available at: http://www.medicalreservecorps.gov/FindMRC.php

[266] Department of Health and Human Services. Health and Human Services employee directory. [Internet database]. Results where "other organization" equal to "DHHS/CDC/OPHPR". [Cited 2010 Sept 20]. Available from: http://directory.psc.gov/employee.htm

[267] Dillman DA Smyth JD, Christian. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. Third edition. Hoboken: Wiley; 2009. Pp 16-22; Pp 271-299.

[268] American Association for Public Opinion Research. Standard Definitions Final Dispositions of Case Codes and Outcome Rates for Surveys. 5th Ed. Lenexa, Kansas: AAPOR; 2008.

[269] Miller DC, Salkin NJ. *Handbook of Research Design & Social Measurement.* 6th ed. Thousand Oaks: Sage; 2002. P. 68.

[270] Sphere Project. Executive briefing on the Sphere Project [Internet]. Slide 3. [Cited 2010 Mar 22]. Available from: http://www.sphereproject.org/component/option,com_docman/task,doc_details/gid,199/Itemid,203/

[271] Goldsmith S, Eggers WD. *Governing by network: the new shape of the public sector.* Washington, DC: Brookings Institution P; 2004.

[272] Miller DC, Salkin NJ. *Handbook of Research Design & Social Measurement.* 6th ed. Thousand Oaks: Sage; 2002. P. 68.

[273] Sphere Project. Executive briefing on the Sphere Project [Internet]. Slide 3. [Cited 2010 Mar 22]. Available from: http://www.sphereproject.org/component/option,com_docman/task,doc_details/gid,199/Itemid,203/

[274] Goldsmith S, WD Eggers. *Governing by network: the new shape of the public sector.* Washington, DC: Brookings Institution P; 2004.

[275] Climate Change 2007: Impacts, Adaptation and Vulnerability. Appendix I: Glossary. Accessed 2009 Dec 07. Available from: http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-app.pdf In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, editors. IPCC, 2007: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Internet]. Cambridge(UK): Cambridge UP. 976 p.

[276] Posner RA. *Catastrophe: Risk and Response.* New York: Oxford UP; 2004.

[277] Haskins R. Policy analysis. In: Miller DC, NJ Salkin. *Handbook of Research Design & Social Measurement.* 6th ed. Thousand Oaks: Sage; 2002. P. 68.

VITA

NAME: Eric Neil Gebbie

EDUCATION: Master of International Affairs (MIA), Human Rights and Humanitarian Affairs, School of International and Public Affairs, Columbia University in the City of New York, 2001

Master of Arts with Honours (MA Hons), Social Anthropology, University of St. Andrews, Scotland, 1998

HONORS: "A Light in the Darkness", Lutheran AIDS Network, 2003

Chancellor's Student Service Award, University of Illinois at Chicago, 2009

PUBLICATIONS: Levin PJ, Gebbie EN, Qureshi K. Can the healthcare system meet the challenge of pandemic flu: planning, ethical and workforce considerations. Public Health Reports. 2007; 122(51): 1-10.

Gebbie KM, Merrill JA, Sanders L, Gebbie EN, Chen DW. Public health workforce enumeration: beware the "quick fix". Journal of Public Health Management and Practice. 2007; 13(1):73-80.

Gebbie EN, Morse SS, Balter S, McCollum MC, Gebbie KM, Smailes E. Training and maintaining public health surge capacity: a program for disease outbreak investigation by student volunteers. Public Health Reports. 2007; 122(1): 127-33.

Qureshi K, Gebbie KM, Gebbie EN. Public Health Incident Command System: A Guide for the Management of Emergencies or Other Unusual Incidents within Public Health Agencies, Volumes I and II. Rensselaer (NY): University at Albany Center for Public Health Preparedness; 2006 Oct 27.

Qureshi K, Gershon RRM, Sherman MF, Straub T, Gebbie EN, McCollum M, Erwin MJ, and Morse SS. Healthcare workers ability and willingness to report to duty during catastrophic disasters. Journal of Urban Health. 2005; 82(3):378-88.

Qureshi K, Gebbie K, Shoaf K, Soto J, Gebbie EN, Morse, SS. Use of the incident command system across three sectors of the health care system in the U.S. [abstract]. Pre-Hospital and Disaster Medicine, 2005, 20(2): s9.

Gebbie K, Merrill J, Hwang I, Gebbie EN, Gupta M. The public health workforce in the year 2000. Journal of Public Health Management & Practice. 2003;9(1):79-86.

Qureshi K, Straub T, Gershon RRM, Gebbie EN. Hospital employee ability and willingness to report to duty during catastrophic disaster [abstract]. Journal of Urban Health. 2003; 80: ii56.

Gebbie EN. Blue Mosque beyond Aya Sofya, Istanbul [photograph]. New York (NY): Slant: The Magazine of Columbia University's School of International and Public Affairs; 2001.

Gebbie K, Merrill J, B'toush R, Cortazal M, Gebbie EN, Gupta M, Hwang I, King M, Wagner M. (Columbia University School of Nursing Center for Health Policy, New York, NY). The Public Health Workforce: Enumeration 2000. Washington (DC): Health Resources and Services Administration, Bureau of Health Professionals, National Center for Health Workforce Information and Analysis; 2000. Cooperative Agreement #: HRSA/ATPM U76 AH 00001-03.

King, EB, Gebbie EN, editors. Beyond Beliefs. St Andrews, Scotland: University of St Andrews Department of Social Anthropology; 1997-1998.