

“Operation Helping Hands”: Massachusetts’ Health and Medical Response to Hurricane Katrina

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Keywords: emergency preparedness; evacuation; Hurricane Katrina

Abbreviations:

CDC = (US) Centers for Disease Control and Prevention
CEP = Center for Emergency Preparedness

Abstract

Introduction: As Hurricane Katrina bore down on New Orleans in August 2005, the city's mandatory evacuation prompted the exodus of an estimated 80% of its 485,000 residents. According to estimates from the US Centers for Disease Control and Prevention (CDC), at least 18 states subsequently hosted >200,000 evacuees.

Hypothesis/Problem: In this case study, “Operation Helping Hands” (OHH), the Massachusetts health and medical response in assisting Hurricane Katrina evacuees is described. Operation Helping Hands represents the largest medical response to evacuees in recent Massachusetts history.

Methods: The data describing OHH were derived from a series of structured interviews conducted with two leading public health officials directing planning efforts, and a sample of first responders with oversight of operations at the evacuation site. Also, a literature review was conducted to identify similar experiences, common challenges, and lessons learned.

Results: Activities and services were provided in the following areas: (1) administration and management; (2) medical and mental health; (3) public health; and (4) social support. This study adds to the knowledge base for future evacuation and shelter planning, and presents a conceptual framework that could be used by other researchers and practitioners to describe the process and outcomes of similar operations.

Conclusions: This study provides a description of the planning and implementation efforts of the largest medical evacuee experience in recent Massachusetts history, an effort that involved multiple agencies and partners. The conceptual framework can inform future evacuation and shelter initiatives at the state and national levels, and promotes the overarching public health goal of the highest attainable standard of health for all.

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Introduction

As Hurricane Katrina bore down on New Orleans in August 2005, the city's mandatory evacuation prompted the exodus of an estimated 80% of its 485,000 residents.¹ For those unable to find alternative housing, the US Department of Health and Human Services (DHHS) and the Federal Emergency Management Agency (FEMA) initially relocated evacuees to

EMS = emergency medical services

FEMA = Federal Emergency

Management Agency

HMR = Health and Medical Response

MDPH = Massachusetts Department of Public Health

MMR = Massachusetts Military Reservation

MPESDF = Massachusetts Emergency Support Function 8

MRC = Medical Reserve Corps

OHH = Operation Helping Hands

RMV = Registry of Motor Vehicles

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Location	Number of evacuees	Site	Scope of the paper	Reference number
Assistance to evacuees in areas far from the Gulf Coast Area				
West Virginia	~300	Army National Guard Training Site	Describe the results of a needs assessment performed on a sample of evacuees	4
Michigan	~700	Unused Municipal Airport Terminal	Description of operations at an evacuation center	3
Assistance to evacuees in states of the Gulf Coast Area				
Tarrant County, Texas	~4,500	A receiving center at a sports complex of a school district +25 shelters throughout the county	Describe the intervention of a network of primary care clinics who took responsibility for medical care of 3,700 evacuees	5
Shreveport-Bossier City	~10,000	Several locations in the sister cities	Describe the lessons learned in the acute and post-acute disaster recovery efforts of a community in Louisiana	6
Mississippi	~2,000	Several locations	Describe the role of faith-based organizations in managing sheltering operations	7

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Table 1—Literature review: Operations conducted to assist Hurricane Katrina evacuees

shelters within the Gulf Coast region. When these sites were filled beyond capacity, other states offered assistance. According to estimates from the US Centers for Disease Control and Prevention (CDC), at least 18 states hosted >200,000 evacuees.²

The results of a series of structured interviews conducted with a group of public health officials and first responders overseeing “Operation Helping Hands” (OHH), the Massachusetts’ health and medical response in for assisting Hurricane Katrina evacuees are presented in this study. Operation Helping Hands represents the largest medical response to evacuees in recent Massachusetts’ history. This analysis has led to the proposal of a conceptual framework to compare the process and outcomes of OHH to similar experiences in other states. Such findings may guide future national efforts to plan shelters.

Methods

Data describing OHH were derived from a series of structured interviews with the two leading public health officials who directed planning efforts, as well as a sample of first responders with oversight of operations at the evacuation site. Subsequently, a literature review was conducted to identify similar experiences in the care of evacuees. The search, including Medline, Embase, and several gray literature sources, identified two articles describing similar efforts in states remote from the Gulf Coast area (Michigan and West Virginia)^{3,4} and also three articles describing efforts within the Gulf Coast area (Texas, Louisiana, and Mississippi).^{5,6,7} The articles accessed are listed in Table 1.

The processes and outcomes of the Massachusetts experience were analyzed and compared, when appropriate, to

the other five experiences to identify lessons learned and recommendations for future planning efforts.

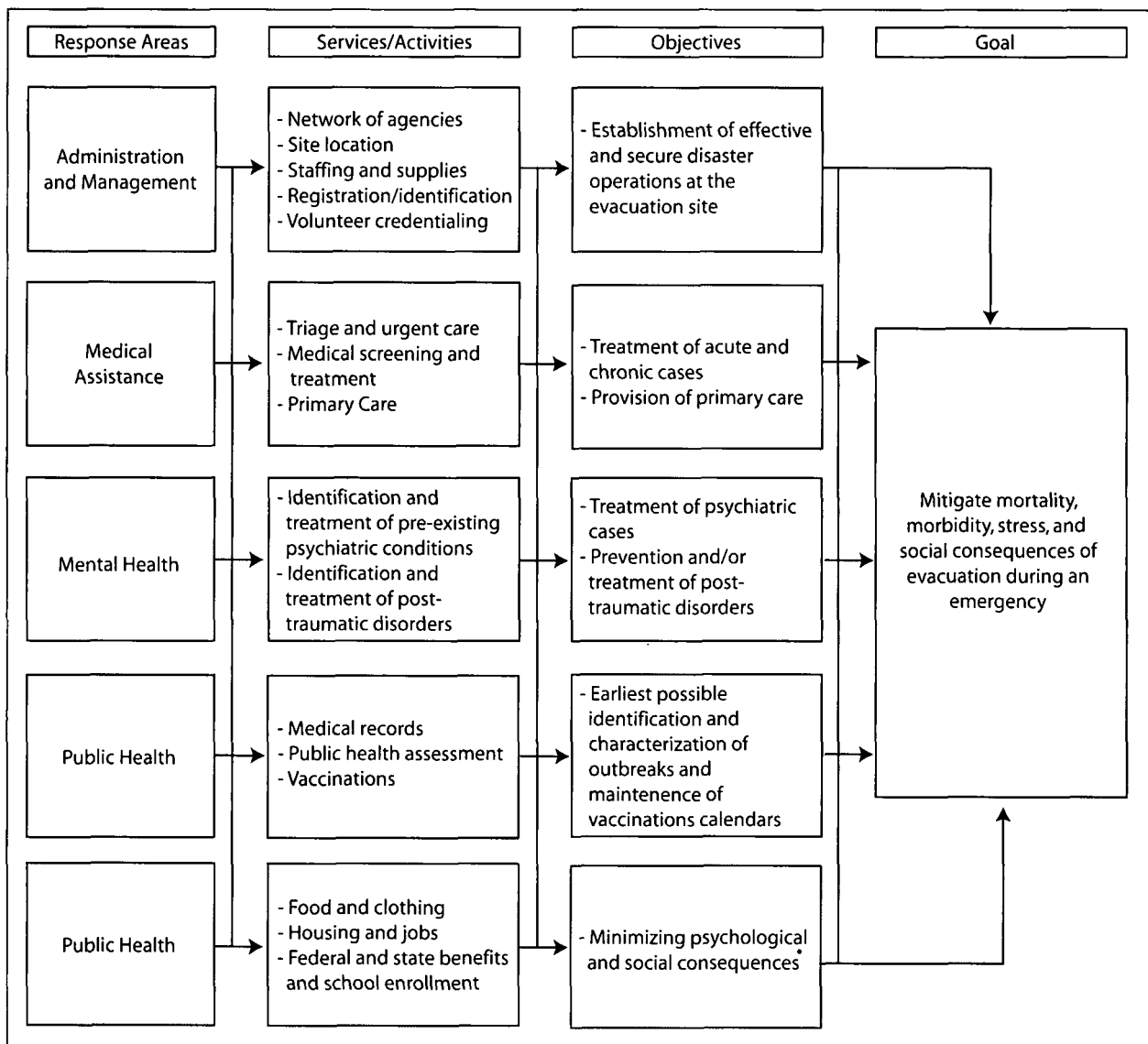
Results

Conceptual Framework

Data from the OHH interviews were compiled into a narrative form describing, in chronological order, the steps taken by the planners and first responders who provided assistance to evacuees. Operations conducted in other states were described by qualitative analysis of the corresponding published articles. While unique solutions were developed in each state—relevant to the context in which evacuee care occurred—content analysis of the interview scripts, as well as of the published articles, identified five common response areas: (1) administration and management; (2) medical assistance; (3) mental health; (4) public health; and (5) social support. These five areas were used to develop a conceptual framework relevant to all five states (Figure 1).

Administration and Management

Prediction of Numbers of Evacuees and Coordination of a Network of Agencies—On Saturday, 03 September 2005, five days after Hurricane Katrina made landfall in the Gulf Coast region, the Massachusetts Department of Public Health (MDPH) was advised by the Governor’s Office to prepare for as many as 2,500 evacuees. The exact number of evacuees who actually arrived on 07 and 08 September totaled 235. The demographics of the evacuees are listed in Table 2. The literature review found that in other states as well, accurate prediction of evacuee numbers was challenging. Michigan volunteered to assist up to 2,000 evacuees, but the actual number that arrived was much smaller



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Figure 1—Conceptual framework: Response areas of evacuation site operations

Age and Gender	n (%)
Children (0–18 years)	35 (15)
Adult Males (19–59 years)	115 (49)
Adult Females (19–59 years)	42 (18)
Elders (≥60 years)	43 (18)
Families with Children	14 (6)

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Table 2—Evacuees’ demographics (n = number)

(~700). West Virginia also received a small number of evacuees (~300). On the contrary, evacuation sites in the Gulf Coast area received thousands of people (i.e., Shreveport-Bossier City received approximately 10,000), with numbers far exceeding the planners’ expectations.

According to the Massachusetts Comprehensive Emergency Management Plan (CEMP), MDPH is the primary support agency responsible for Emergency Support Function 8 (MAESF-8): Health and Medical Services.

Under MAESF-8, the MDPH coordinates “state public health, mental health, medical, and health care resources during activation of the State Emergency Operations Center.” To this end, the MDPH Commissioner appointed the MDPH Interim Director of the Center for Emergency Preparedness (CEP) as the Director of the Health and Medical Response (HMR) for this event. The CEP Director worked in collaboration with the Assistant Secretary for the Executive Office of Health and Human Services to convene

a multidisciplinary response network of agencies, including public, private, and non-profit organizations. The network included healthcare providers, mental health specialists, environmental health experts, and agencies within the Executive Offices of Public Safety and Health and Human Services. Other agencies involved in the response efforts were the FEMA, the Registry of Motor Vehicles (RMV), the Department of Agricultural Resources, the Department of Transitional Assistance, and the Department of Transportation. In addition, OHH was supported by dozens of volunteers from the American Red Cross (ARC) and the Salvation Army. Similar to other evacuee reception efforts conducted in states remote from the disaster impact zone, the MDPH and other state governmental agencies assumed a leadership role by coordinating state-level formal agreements, mostly reliant upon formally recognized pre-existing coalitions or partnerships.³

In contrast, operations at evacuation sites in states close to the disaster-affected area (i.e., Louisiana, Mississippi) relied heavily on pre-existing informal community networks⁸ of non-profit, faith-based, and business sectors that took the lead in the administration of complex operations (e.g., development of the health system response) with little guidance from governmental agencies.⁵⁻⁷

Determining Site Location—On 05 September, within 48 hours of the initial notification from the Governor's Office, the OHH team established a multi-functional, receiving site for evacuees in an empty aircraft hangar at Camp Edwards, a Massachusetts Military Reservation (MMR) on Cape Cod. Site selection was influenced heavily by the immediate availability of surrounding residential barracks that would offer comfortable and private shelters for the evacuees. Just outside of the hangar, an emergency medical services (EMS) station was established for use by patients requiring immediate transport to an area hospital. The OHH experience matched that of West Virginia, where a military facility, the Army National Guard Training Site Command, was selected to receive evacuees with housing provided in nearby communal barracks.⁴

Establishing Staffing and Supplies—In order to rapidly recruit qualified medical providers, the CEP enlisted the support of the Massachusetts Medical Society (MMS), the Cape Cod Medical Reserve Corps (CCMRC), and the Harvard School of Public Health Center for Public Health Preparedness. By Monday, 05 September, the HMR team was comprised of personnel from these organizations and others to total approximately 60 staff and volunteers. In addition, approximately 100 National Guardsmen, who assisted with transportation, logistics, and maintenance of housing units, joined the team. As in Michigan and West Virginia, the Massachusetts team recruited physicians, nurses, epidemiologists, mental health specialists, and administrators. In Michigan, a pre-existing emergency preparedness coalition dubbed "Region 2" was responsible for coordination of recruitment efforts and the facilitation of credentials verification.³

The three states used similar methods to gather medical and non-medical supplies. For example, local pharmacies

played a key role by filling and distributing a range of prescriptions for the evacuees. In Massachusetts, prescriptions were faxed directly from the hangar to a local 24-hour pharmacy, which delivered the medications to the MMR. Medical equipment was provided by local hospitals and the MDPH state hospital system, and non-medical sheltering supplies were provided by non-profit organizations such as the Red Cross and Salvation Army, or by the Massachusetts National Guard.

Registration and Identification of Evacuees—All evacuees received primary medical triage onboard the aircraft upon arrival in Massachusetts, then entered the hangar to register with the Commonwealth. As part of the registration process, each evacuee was asked to provide demographic information via the "Basic Identification Form" and RMV personnel took a photograph of the evacuee and assigned them an identification number. The MDPH and RMV staff also provided each guest with an identification card and number to enable temporary 30-day medical insurance coverage through the Commonwealth's MassHealth (Medicaid) program.

The availability of dedicated RMV personnel to this process was unique to Massachusetts. In other states, such identification processes were primarily conducted by the Police Department, which also performed background checks.⁴ The Massachusetts Emergency Management Agency (MEMA) also established a Disaster Recovery Center (DRC) at Camp Edwards in order to provide evacuees with access to federal and state services. Registration with the FEMA was required before receiving federal benefits. In Michigan, such registration was the first step after reception, while in Tarrant County, Texas, evacuees were provided with Internet access and administrative support to complete the FEMA forms.⁵

Volunteer Credentialing—The news that Katrina evacuees would arrive in Massachusetts drew hundreds of local volunteers to the site. Previously credentialed volunteers (e.g., Medical Reserve Corps (MRC), local EMS) were incorporated rapidly into response efforts. However, the convergence of non-credentialed volunteers posed challenges, as those who were not formally associated with the MDPH, MRC, Red Cross, or Salvation Army could not be employed for safety and security reasons. In other states as well, the absence of a process for volunteers' credentials verification was problematic, and many spontaneous volunteers were turned away, even if they were needed.

The OHH experience has led the MDPH to develop a statewide, secure database of pre-credentialed volunteers. Additionally, the similar situation in Shreveport-Bossier, Louisiana led to the development of a Website for volunteers to sign up.⁶

Medical Assistance

Triage and Urgent Care—Emergency physicians and EMS personnel performed triage onboard the two aircraft at Camp Edwards to assess if any passenger required immediate medical attention at an area hospital. In total, 12 passengers (5%) were transported immediately to nearby hospitals

for treatment and observation, and an additional three (1.3%) evacuees were hospitalized after subsequent medical evaluation. These figures are higher than those reported in the literature; data from Michigan indicated a 1% hospitalization rate.³ However, data present obvious difficulties of comparison in absence of information on the specific cases.

Medical Screening and Treatment—Following registration, evacuees underwent an assessment of physical and mental health needs. Both non-acute and acute medical care was provided on-site. The most complex, immediate issue was to restore continuity of prescription medication regimens for those with chronic health conditions. This was challenging since numerous evacuees could not recall the name and dosage of the medications they were taking. This theme also is present throughout the literature. In order to assist with this situation in Michigan, a dedicated pharmacist was available near the examination area for medication identification and information.³

In Massachusetts, HMR personnel used a Medical Clearance Questionnaire screen for medical, psychosocial, and behavioral conditions, including communicable diseases and immunization status. Upon arrival, >30% of evacuees in Massachusetts required some type of medical and/or mental health assistance upon arrival. Of the 15 evacuees requiring hospitalization, one evacuee gave birth on 27 September at nearby Falmouth Hospital.

Primary Care—Individuals requiring counseling, treatment, or medication were assisted promptly on-site and depending on the results of the assessment, those requiring follow-up care either were assisted on-site or assigned to local primary care offices. In Massachusetts, a primary care clinic was established on the base.

In Massachusetts and the other states noted in the literature, the most frequently provided type of medical assistance was the management of chronic conditions (i.e., hypertension, diabetes, cardiovascular and respiratory diseases). In West Virginia, almost one-half of the evacuees had a chronic condition and required prescription of medications.⁴ Additional medical services included the treatment of minor injuries and infections (i.e., skin infections in Tarrant County's shelters), and care of minor conditions, such as eye examination for the replacement of lost eyeglasses. In Michigan, Texas, and Louisiana, primary care, dental care, and eye care were provided free-of-charge by local clinics on a volunteer basis. In Tarrant County, Texas, a network of primary care physicians (JPS Network) volunteered to take primary responsibility for 3,700 evacuees in a two-week period.⁵

Mental Health

In Massachusetts, mental health personnel mainly were involved in three response activities: (1) the identification and treatment of evacuees with pre-existing psychiatric conditions (i.e., bipolar disorder, depression), and use of a referral system to nearby hospitals for acute psychiatric care; (2) identification and treatment of subjects with post-traumatic stress disorder; and (3) assistance with practicalities such as re-establishing communication with displaced family members—telephones were available in the hangar

for use by evacuees to contact relatives and friends. Mental health screening was aided and standardized by the use of the Mental Health Screening Form (MHSF) developed by the Massachusetts Department of Mental Health. While this form and others used at Camp Edwards were based on standard MDPH medical release forms commonly used during environmental epidemiologic follow-up investigations, they were customized to collect the information needed to provide care for the evacuees in residence at Camp Edwards. For those who wished to return to New Orleans or reunite with other family members elsewhere, the Salvation Army set up a travel center to aid evacuees with the organization of their plans.

Mental health needs were of primary concern not only in Massachusetts, but at all sites reported in the literature. For example, data from a mental health needs assessment performed in West Virginia showed that 40% of evacuees reported a mental health symptom such as depression, anxiety, sleeping disorders, and other conditions.⁴

Public Health

Medical Records—Several medical health assessment forms were adapted for the purpose of medical tracking and accounting. In Massachusetts, these documents included a Basic Identification Form, a Medical Clearance Questionnaire, and a Mental Health Screening Form. Standard forms and mechanisms of data collection helped create usable medical records of a new population.

Public Health Assessment—In Massachusetts, the HMR team shared intelligence emerging from shelter experiences in the Gulf Coast with OHH to prepare a health and medical response proportional to the needs of the evacuees. For example, early intelligence on the prevalence of hypertension and diabetes among evacuees at other sites was shared by the CDC via the Health Alert Network (HAN) and the *Morbidity and Mortality Weekly Report* (MMWR). This not only helped shape the development of the OHH Medical Clearance Form to ensure early detection and treatment of specific conditions, but also guided the OHH team in acquiring appropriate medical equipment and supplies. Also, the OHH medical staff monitored all individuals for the presence of communicable disease and maintained regular contact with MDPH communicable disease control epidemiologists to ensure coordination of prevention efforts.

Other experiences emphasized the importance of needs assessment studies. In West Virginia, personnel from the West Virginia Department of Health and Human Resources and the CDC interviewed 164 evacuees to assess their medical, dental, mental health, and social services needs.⁴ In Michigan, the CDC Hurricane Evacuees Medical Intake Form was reviewed by a public health nurse with the specific purpose of performing communicable diseases screening.³

Vaccinations—Another important public health function was the assessment of the guests' immunization status and provision of vaccinations. In Massachusetts, tetanus toxoid was provided on-site, and other vaccinations were made available in the next several days as part of the continuing primary care effort. Shreveport-Bossier City hosted a

mobile pediatric clinic to travel across the evacuation sites and provided the opportunity to bring childhood vaccinations up-to-date.⁶ In Michigan, hepatitis B and tetanus immunizations were offered to the evacuees after an appropriate medical screening examination.³

Social Support

Food and Clothing—In Massachusetts, the Salvation Army provided food and beverages for all evacuees and responders, and also established a childcare station for young children during the registration process. Supplies like clothing and toiletries also were provided by the Red Cross, and through local donations. Perhaps one of the unique features of the OHH response was the provision of veterinary care for evacuees' companion animals. This was provided by the Department of Agricultural Resources inside of the hangar, but not in close proximity to health and medical evaluation areas. Prior to the evacuees' arrival, Massachusetts agreed to accept and care for these animals (sixteen dogs, four cats, one lizard, one python, and one parrot), and allowed pets to stay with evacuees in designated areas within the shelters.

Housing—For OHH, housing on the base was assigned to each individual and family, with separate buildings for single men, families, and for individuals or families with pets. The barracks were dormitory-style buildings, a better alternative to the large, shared, open spaces typical of temporary shelters. Each room housed up to four evacuees, and was equipped with furniture including beds, desks, chairs, and lockers. Every floor had a common living room and two large bathrooms with private showers and toilets. Each building had a laundry room and dining halls, and the athletic fields were within walking distance.

Federal, and State Benefits and School Enrollment—The MEMA established a DRC at Camp Edwards in order to provide evacuees with access to federal and state services. Registration with FEMA was required before receiving federal benefits, including financial assistance for home repair, medical, dental, transportation, and moving costs. Additionally, the Massachusetts Legislature approved \$25 million in emergency spending to provide additional housing, food, daily necessities, and to address the ongoing medical needs of the evacuees. In order to ensure ongoing medical care, all evacuees were enrolled in *MassHealth*.⁹ In addition to housing and health insurance coverage, state benefits included food stamps and emergency cash support from the Department of Transitional Assistance, employment support from the Massachusetts Division of Unemployment Assistance, and nutritional support for pregnant women, infants, and children <5 years of age from the Women, Infants and Children Nutrition program. Continued education for children was provided with school enrollment administration at Camp Edwards; 18 school-age children enrolled in public schools in the nearby town of Bourne. Roughly six weeks after the evacuees arrived, the process of closing Camp Edwards began, and by 24 October, 100 individuals had relocated within Massachusetts, and 135 had relocated out-of-state. Camp Edwards officially closed on 24 October 2005 after 47 days of operation.

Discussion

This report adds to a growing—although small—body of literature that describes the Hurricane Katrina evacuee experience, particularly that which occurred outside of the immediate Gulf Coast area. This analysis of the Massachusetts OHH response not only represents the third state report, but also adds to the experience of Michigan and West Virginia to provide lessons learned for future evacuee experiences.

All three evacuee experiences are an exercise in promoting the core public health functions of assessment, policy development, and assurance for a newly vulnerable and displaced population.¹⁰ A conceptual framework is offered which describes the goals and dimensions of the response in Massachusetts and previously described state efforts, the framework is offered in order to describe this process in an operational manner. To achieve the goal of mitigating morbidity, mortality, stress, and social consequences of evacuation, OHH leaders identified five critical response areas: (1) administration and management; (2) medical assistance; (3) mental health; (4) public health; and (5) social support.

Many common themes were present throughout these five response areas in Massachusetts, Michigan, and West Virginia. With respect to administration and management, government response planners immediately, yet flexibly, acted to prepare for evacuees, and rapidly coordinated a host of agencies throughout the government and the non-profit sector. Location on a military reservation allowed for immediate triage and care, as well as housing, meals, education, and other services for a prolonged period of 47 days. In collaboration with the state Medical Society, the Regional Center for Public Health Preparedness, and the MRC, an established staff facilitated medical assistance and appropriate support services. Efficient registration of evacuees allowed for the proper monitoring and tracking of their needs and services. However, all sites struggled with optimal coordination and use of volunteers.

Medical assistance required attention to triage, medical screening and treatment, and primary care. Restoring the continuity of medication regimens was a common theme within all three states. The optimization of response for mental health was a major theme in Massachusetts and in all of the other published reports. Public health efforts focused not only on enhancing needs assessments and medical records through standardized forms, but also on coordination of immunization services. In addition, the OHH paid special emphasis to social support during a disruptive time for evacuee families through attention to food, clothing, housing, and school enrollment. In particular, connecting evacuees to state Medicaid allowed temporary but complete provision of medical services. From a state's perspective, the most important lesson learned from the implementation of the OHH was the heightened need to develop Continuity of Operations Plans for all of the state agencies charged with providing emergency support functions per the CEMP.

The Massachusetts analysis also offers a comprehensive public health approach to the evacuee experience, from planning before arrival of evacuees through discharge. Ridenour *et al* describes the West Virginia experience, primarily focusing on the results of needs assessment on a sample of evacuees.⁴ Irvin *et al* describe the Michigan experience

by focusing attention on the operations of an evacuee center.³ Three other relevant publications from within the Gulf Coast area describe the role of health clinics in providing primary care to evacuees, and lessons learned in one Louisiana community on the role of faith-based organizations that managed shelter operations in Mississippi.

Conclusions

This case study was based on the collection of data through structured interviews and analysis of outcomes through the lens of a conceptual framework. This framework can be used by other researchers to guide analysis of evacuation site processes and outcomes. The Massachusetts experience is not easily compared with others, as there are low numbers

of published cases in existence, and this small body of literature presents studies of varying scope and purpose. However, this case study is noteworthy for describing the planning and implementation of the largest medical evacuee experience in recent Massachusetts history, an effort that took place involving multiple agencies and partners with almost no notice. The conceptual framework derived from this analysis can inform future evacuation and shelter initiatives at the state and national levels, and promotes the overarching public health goal of the highest attainable standard of health for all.

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