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Hurricanes Frances and Ivan: Improving the Delivery of HHS and ESF#8 Support

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Executive summary

Hurricane Frances hit the east coast of Florida as a category 2 storm on 5 September 2004. The state was still recovering from Hurricane Charley, which made landfall on 13 August on the state's southwest coast. Frances crossed Florida and made landfall a second time near Tallahassee on 6 September. The significant rainfall from the storm caused severe flooding across the state.

On the same day that Hurricane Frances hit Florida, another storm, named Ivan, was upgraded to hurricane status. Ivan made landfall near Gulf Shores, Alabama, on 16 September as a category 3 storm. Ivan was the most destructive hurricane to hit northeast Florida in 100 years, causing widespread beach erosion and flash flooding, and spawning numerous tornadoes.

As the primary federal agency for Emergency Support Function (ESF) #8, the Department of Health and Human Services (HHS) deployed numerous personnel to coordinate ESF#8 response operations in the field and to augment and support state health and medical response activities. These activities included the following:

- Augmenting medical staff at special needs shelters and hospitals affected by the storm
- Operating a special needs "super shelter" in Orlando, Florida
- Providing epidemiological, vector-control, and environmental support and expertise
- Funding services provided to special needs populations.

HHS coordinated these efforts through the Secretary's Operations Center (SOC), located in Washington, DC, and the Secretary's Emergency Response Team (SERT), which was deployed to the disaster area.

The storms provided an important opportunity for the Office of the Assistant Secretary for Public Health Emergency Preparedness

(OASPHEP) to assess the HHS response and identify areas for improvement. Our recommendations address improvements that are necessary on three levels: OASPHEP, HHS, and ESF#8.

- OASPHEP should make several improvements to prepare for responding to future events:
  - — Create detailed procedures to support the Concept of Operations (CONOPS) and SERT plans that clarify the HHS emergency command and reporting structure and standardize SOC operations and the deployment of the SERT for the most likely events (such as hurricanes)
  - — Develop an electronic incident management system that will provide situational awareness of ongoing operations and tools to track personnel and other resources (the current system, E-Team, does not meet these needs)
  - — Expand the number of experienced, trained personnel available to serve in the SOC and on the SERT.
- Within HHS, OASPHEP should work with the Assistant Secretary for Health, the Surgeon General, and the Office of Force Readiness and Deployment to improve the capabilities of the U.S. Public Health Service (PHS). Most importantly, PHS needs to develop the ability to deploy teams with adequate administrative, logistical, management, and equipment support.
- OASPHEP should work with the National Disaster Medical System (NDMS) and its other ESF#8 partners to:
  - — Improve coordination between HHS and NDMS during response operations (the separation of NDMS from HHS has fractured ESF#8)
  - — Clarify the federal request process and the roles and responsibilities of each ESF#8 partner in written policies and procedures
  - — Plan for future emergency requests for special needs super shelters and mass patient evacuation.

Introduction

The National Oceanographic and Atmospheric Association's (NOAA) prediction for an above-normal outlook for the 2004 Atlantic hurricane season proved to be true. Thirteen tropical cyclones and seven hurricanes formed in August and September. Four of these hurricanes hit the southeastern United States. As the primary federal agency for Emergency Support Function (ESF) #8, health and medical services, the Department of Health and Human Services (HHS) is responsible for coordinating the provision of federal health and medical services under the National Response Plan.

In this capacity, HHS coordinated a variety of federal support, including augmenting medical staff at local hospitals and shelters, setting up and operating a special needs super shelter, performing epidemiological investigations, and providing environmental health expertise. The number of personnel deployed by HHS and its ESF#8 partners—including the National Disaster Medical System (NDMS), Department of Veterans Affairs (VA), Department of Defense (DOD), Bureau of Prisons (BOP), and many others—was unprecedented.

Tasking and approach

The Office of the Assistant Secretary for Public Health Emergency Preparedness (OASPHEP) asked The CNA Corporation (CNAC) to conduct an after-action review of the HHS response to Hurricanes Frances and Ivan. In earlier reports, CNAC completed a quick response after-action report on Hurricane Charley [1] and a quick look report on Hurricanes Frances and Ivan [2].

The analysis presented in this report is based on a reconstruction of events. We collected data by performing the following tasks:

- Listening to ESF#8 conference calls hosted by the Secretary's Operations Center (SOC) between 2 and 22 September

- Accessing the information in E-Team, OASPHEP's incident management system
- Conducting a hotwash meeting with HHS and ESF#8 personnel on 24 September
- Collecting written information from HHS personnel serving in the field
- Interviewing personnel from HHS and other ESF#8 agencies that were involved in the response.

In the course of our interviews, we spoke with numerous personnel, and we thank all those who took the time to talk with us. Using these various data sources, we reconstructed the main events in the deployment. We compared these data to existing operational plans and selected key issues to address in this report.

Organization of this report

In the next section, we begin our report with an overview of the HHS response to Hurricanes Frances and Ivan. Each of the following sections addresses the following five key issue areas:

- The coordination of HHS and ESF#8 operations
- The federal request process
- The deployment of health and medical personnel under ESF#8
- The super shelter
- The logistics and equipment support.

Each of these five sections begins with a discussion of the key issues for that area. At the end of each section, we include a detailed discussion of recommendations for addressing these issues. Many of the recommendations can be implemented by OASPHEP alone. Others, however, will require coordination within HHS and with other agencies.

These storms provide an important opportunity to identify issues and make improvements to HHS's emergency response plans. As

such, our discussion of the many successes observed during the response to these hurricanes is brief. We focus mainly on areas that require critical improvements so that HHS can continue to successfully respond to a wide variety of disasters and emergencies.

Response overview

Hurricane Frances hit the east coast of Florida as a category 2 storm on 5 September 2004. The state was still recovering from Hurricane Charley, which made landfall on 13 August on the state's southwest coast. Frances crossed the state and made landfall a second time near Tallahassee on 6 September. The significant rainfall from the storm caused severe flooding across the state.

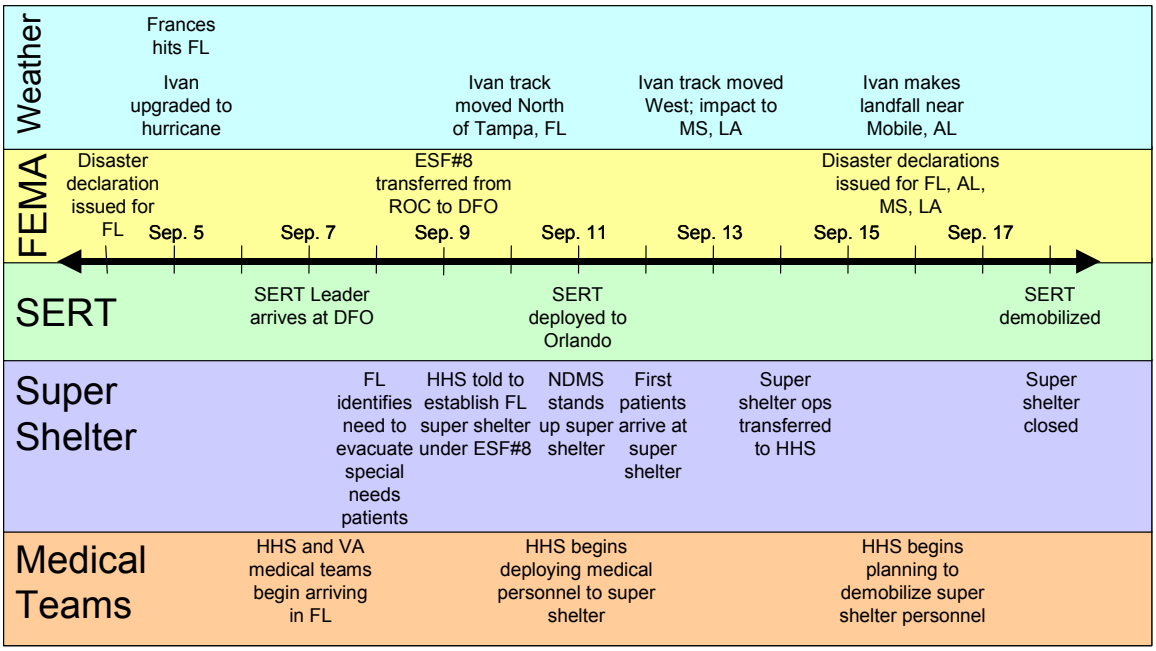
On the same day that Hurricane Frances hit Florida, another storm, named Ivan, was upgraded to hurricane status. Ivan made landfall near Gulf Shores, Alabama, on 16 September as a category 3 storm. Ivan was the most destructive hurricane to hit northeast Florida in 100 years, causing widespread beach erosion and flash flooding, and spawning numerous tornadoes.

As the primary federal agency for ESF#8, HHS deployed numerous personnel to coordinate ESF#8 response activities in the field and to augment and support state health and medical response activities. HHS coordinated these efforts through the Secretary's Operations Center (SOC), located in Washington, DC, and the Secretary's Emergency Response Team (SERT), which was deployed to the disaster area.

Reconstruction summary

Our reconstruction is focused on a three-week period that began on or about 1 September. In this section, we summarize HHS and ESF#8 response activities for this period. Figure 1 shows a timeline of the main events that occurred between 4 and 18 September. For a more detailed reconstruction of events, see appendix C.

Figure 1. Timeline of main events



On 30 August, an HHS representative in the Regional Operations Center (ROC) in Atlanta posted the first entry for Hurricane Frances in E-Team, HHS's incident management system. On 1 September, HHS received funding from the Federal Emergency Management Agency (FEMA) to activate ESF#8 in the Region IV ROC in preparation for Hurricane Frances. On the same day, NDMS activated four Disaster Medical Assistance Teams (DMATs) and sent them to locations in Atlanta and Florida to pre-position for the response. The next day, an HHS representative was sent to Tallahassee to lead ESF#8 on the FEMA Emergency Response Team A (ERT-A), and the SOC convened daily ESF#8 conference calls to discuss preparations and planning for Hurricane Frances.

On 3 September, Florida requested that ESF#8 place 300 clinical providers on standby. FEMA also requested that each ESF gather 150 community relations officers for deployment. The next day, FEMA issued a major disaster declaration for Florida.

Hurricane Frances made landfall on 5 September. Coincidentally, on the same day, Ivan was upgraded to hurricane status. A senior PHS officer, who was working in the ROC, was given responsibility for managing the HHS response to Hurricane Frances. The next

day, two OASPHEP personnel were deployed to Orlando to support this officer. However, a formal SERT was not stood up at this time.

On 7 September, PHS and VA medical personnel began arriving in Florida to support the response. They were staged and deployed to hospitals and shelters to augment medical staffs.

As Florida began preparing for Hurricane Ivan, state officials became concerned about their special needs population. Specifically, some officials wanted to evacuate the shelters that were in the path of the storm and set up new shelters in safer locations. However, there was controversy within the state and some state officials were not in favor of the plan. At the same time, discussions began about a potential request to air evacuate hospital patients out of the state.

On the evening of 10 September, HHS received verbal approval for the state's request to set up a special needs super shelter capable of handling up to 8,000[1] patients in the Orange County Convention Center (OCCC). NDMS was tasked to set up and operate the shelter for the first 24 hours. The next day, additional OASPHEP staff members were sent to Orlando to stand up a formal SERT. Additional health and medical personnel were also deployed to staff the super shelter. On the same day, the state canceled its request for air evacuation support under ESF#8, halting these discussions.

The first super shelter patients arrived on 12 September. Because Ivan's path had shifted to the west, HHS expected that the shelter would not receive the large number of patients it had originally anticipated, and so began planning to address needs in the Florida panhandle and other states.

On 14 September, Tropical Storm Jeanne was upgraded to hurricane status. The Region IV ROC was activated for Ivan and the super shelter's operation was transitioned from NDMS to the SERT. The SERT reported that the super shelter held 90 special-needs patients, and began working with Florida to discharge patients.

1. The approved MA scaled this number down from 8,000 to 3,000 patients.

Hurricane Ivan hit on 16 September near Mobile, Alabama, and FEMA issued major disaster declarations for Florida, Alabama, Mississippi, and Louisiana. Patients continued to be discharged from the super shelter, and HHS began planning to demobilize the super shelter personnel and the SERT.

Florida requested 61 medical personnel on 17 September to augment staff at a Pensacola hospital. The VA and NDMS assisted PHS in filling the requested positions (many of the PHS personnel were transferred from the super shelter), and personnel were deployed the next day. The SERT demobilized on 18 September and the super shelter was closed.

This reconstruction is based on the data available to us. As our sponsor, OASPHEP was our primary data source. We had limited visibility into the daily operations NDMS[2] and the missions that it carried out during the hurricane response, except where NDMS and other ESF#8 missions overlapped. Our report focuses on the activities described in this reconstruction. The reader should keep in mind that this is only a piece of the entire ESF#8 response.

Personnel deployed under ESF#8

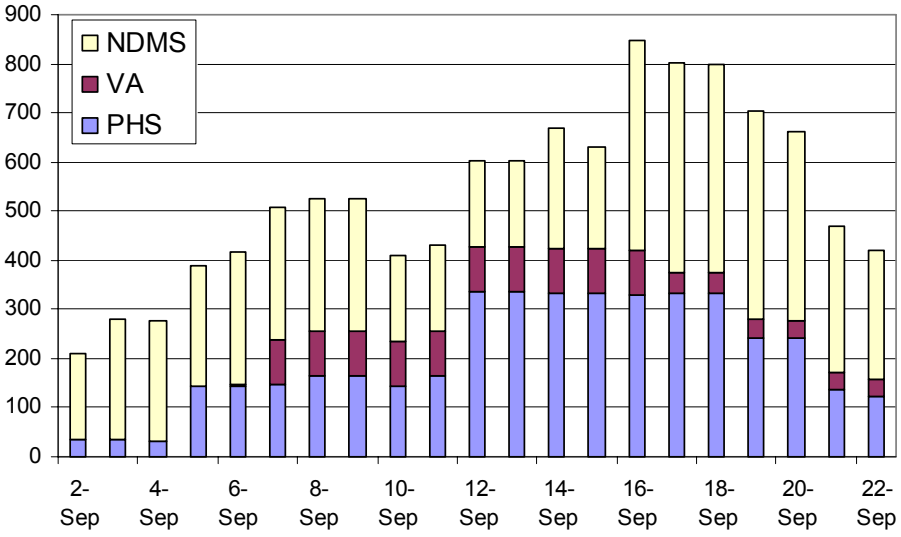
Figure 2 shows the number of ESF#8 personnel on active deployment each day between 2 and 22 September. It includes SERT members and medical and environmental personnel deployed by PHS, VA, and NDMS to Florida and other states affected by Hurricanes Frances and Ivan. It does not include HHS personnel deployed directly by their home Operational Divisions (OPDIVs) and offices (because we did not have data on these personnel), such as the Centers for Disease Control and Prevention (CDC) personnel deployed for environmental and epidemiological missions.

Most of the deployed PHS personnel came from HHS. The Bureau of Prisons (BOP) supplied the largest number of PHS officers from outside of HHS. As an ESF#8 partner agency, the VA helped fill re-

2. We did interview ESF#8 personnel from other agencies (including NDMS). However, our focus was on the interactions of these agencies with OASPHEP and HHS.

quests for medical personnel. NDMS personnel deployed primarily with DMATs. Some were also deployed to fill requests for specific types of personnel.

Figure 2. Total ESF#8 personnel on deployment each day[a]



a. Data compiled from the following sources: SOC and PHS deployment records, the super shelter personnel database, correspondance with VA personnel, and NDMS daily reports posted on E-Team.

The large increase in PHS personnel on 12 September coincided with the opening of the super shelter. After the shelter closed on 18 September, the number of PHS personnel deployed declined. The jump in NDMS personnel on 16 September coincided with Hurricane Ivan's landfall.

Mission assignments

Table 1 shows the ESF#8 mission assignments (MAs) approved by FEMA during Hurricanes Frances and Ivan. Missions given to NDMS under ESF#8 are not included in this table. Because NDMS is part of the Department of Homeland Security (DHS), it is tasked directly and does not need MAs, which transfer funding from DHS to outside agencies.

HHS successfully carried out all of the missions assigned to it during the responses to Hurricanes Frances and Ivan. However, the re-

sponses were extraordinarily complex due to the multiple storms, the large numbers of personnel deployed, and the novel requests from the state. Furthermore, the federal response structure is still acclimating to the creation of DHS and the revision of federal response procedures. Similarly, HHS is still testing new response assets created after 9/11.

Table 1. ESF#8 MAs approved for Hurricanes Frances and Ivan

MA number	Hurricane	New or amendment	Description	Funding
7220SU-FL-HHS-01	Frances	New	HHS to ROC in Atlanta	10,000
1545DR-FL-HHS-01	Frances	New	HHS activated to support Florida	10,000
1545DR-FL-HHS-01	Frances	Amend	Mental health workers	20,000
1545DR-FL-HHS-02	Frances	New	25-30 Community relations workers	300,000
1545DR-FL-HHS-03	Frances	New	Activate NEOC and ERT-N teams	10,000
1545DR-FL-HHS-04	Frances	New	Medical staffing support	1
1545DR-FL-HHS-04	Frances	Amend	Funding for MA	2,309,999
1545DR-FL-HHS-04	Frances	Amend	Funds added to prolong deployment	1,058,000
1545DR-FL-HHS-04	Ivan	Amend	Support for staff at St. Lucie	75,000
1545DR-FL-HHS-05	Frances	New	CDC teams	1
1545DR-FL-HHS-05	Frances	Amend	Funding for MA	199,000
1545DR-FL-HHS-05	Ivan	Amend	Extension of vector team	42,000
1545DR-FL-HHS-06	Frances	New	Special needs funding (25% state co-pay)	4,000,000
1545DR-FL-HHS-08	Frances	New	Super shelter funding	30,000,000
1545DR-FL-HHS-09	Frances	New	20 sanitarians (25% state co-pay)	150,000
1549DR-AL-HHS-01	Ivan	New	HHS activated to support Mississippi	50,000
1549DR-AL-HHS-02	Ivan	New	Special needs funding	4,000,000
1551DR-FL-HHS-01	Ivan	New	Special needs funding	4,000,000
1150DR-MS-HHS-02	Ivan	New	HHS shelter for VA hospital patients	50,000
7220SU-MS-DOD-03	Ivan	New	Housing for Miramar Center at Keesler AFB	70,000
1150DR-MS-HHS-03	Ivan	New	Activate ESF#8	10,000
1551DR-FL-HHS-02	Ivan	New	Medical staff to Sacred Heart	427,000
1551DR-FL-HHS-02	Ivan	Amend	Personnel extended (25% state co-pay)	750,000
1551DR-FL-HHS-03	Ivan	New	Activate ESF#8	10,000
1551DR-FL-HHS-04	Ivan	New	Rapid Needs Assessment Team (CDC)	14,000
7220SU-FL-HHS-04	Ivan	New	Activate ESF#8 to ROC in Atlanta	10,000

Coordination of HHS and ESF#8 operations

On behalf of the Secretary of HHS, the Assistant Secretary for Public Health Emergency Preparedness (ASPHEP) is responsible for directing and coordinating HHS's efforts to prevent, prepare for, respond to, and recover from the public health and medical consequences of a disaster or emergency [3]. This includes coordinating HHS personnel from other offices and OPDIVs, such as CDC, when they are deployed to assist in response and recovery operations. The ASPHEP is also responsible for coordinating ESF#8 on behalf of the Secretary [4].

During response and recovery operations, the ASPHEP uses two key assets—the SOC and the SERT—that HHS describes as follows:

> The [Secretary's Operations Center (SOC)][3] serves as an information and operations center that provides a single focal point for information sharing, command and control, communications, specialized technologies and information collection, assessment, analysis and sharing for all HHS components [3].
>
> The Secretary's Emergency Response Team (SERT) acts as the Secretary's agent on scene at emergency sites under the direction of the ASPHEP.... The SERT directs and coordinates the activities of all HHS personnel deployed to the emergency site.... The HHS SERT System Description establishes a framework for the management of HHS's field operations in response to public health and medical emergencies and events that require assistance from HHS or Emergency Support Function (ESF) #8 [5].

We begin this section with a discussion of issues that are mainly internal to HHS operations. We also discuss issues observed in HHS's coordination of ESF#8.

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3. The Secretary's Operations Center used to be called the Secretary's Command Center (SCC). It was renamed after the publication of this reference.

Internal coordination issues

The most critical problem we observed during the response to Hurricanes Frances and Ivan was the lack of situational awareness, which hindered HHS's coordination of both HHS and ESF#8 activities. We describe some examples below.

HHS personnel at headquarters and in the field had different understandings of the number of patients in the super shelter at the time that operations were transferred from NDMS to the SERT. Because they were using different definitions of patients, headquarters personnel thought there were far fewer patients than the number counted by the SERT. This led to disagreements between headquarters and the SERT about whether the SERT needed to purchase supplies and how quickly the shelter should be closed down.

HHS did not have a system to track, at any given time, the location of all of the personnel it had deployed to Florida. Many different people needed access to this information, which was important for making decisions, managing resources, and providing logistical support. Thus, a number of individuals created ad hoc methods to track personnel. However, it ultimately became very difficult to reconcile these disparate sources of data. If an emergency had occurred, HHS would have had difficulty accounting for the safety of all its personnel in a timely manner.

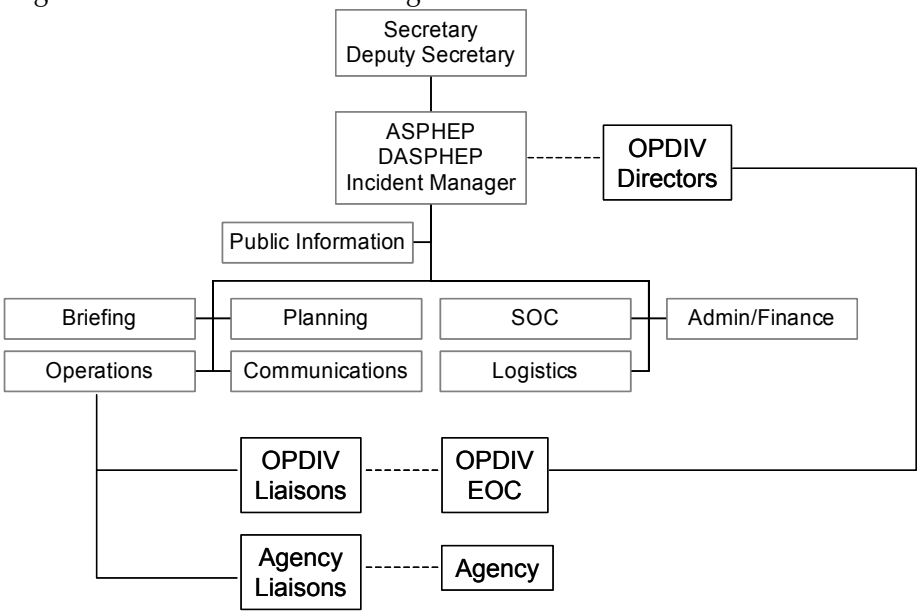
Improvements are needed in both the headquarters and field components of HHS's response structure to address these coordination problems in the future. These improvements also need to be supported with tools, such as a robust incident management system.

Headquarters incident management and the SOC

The HHS Incident Management Team (IMT) structure is outlined in the SERT training materials as shown in figure 3 [6]. On behalf of the Secretary and ASPHEP, the Deputy ASPHEP is the Incident Manager. The IMT includes seven sections: operations, planning, SOC, briefing, administration/finance, communications, and logistics. Not every section had personnel assigned to it during Hurricanes Frances and Ivan. Because the SOC has limited space and no

separate rooms, some of the sections operated from the SOC and others operated from offices near the SOC.

Figure 3. HHS Incident Management Team[a]



a. Adapted from SERT training materials [6]

No written procedures for the IMT

We found no written procedures on the IMT other than the training materials (which consist of Power Point briefings) cited above. For many of the IMT staff we interviewed, this was their first experience in working on an HHS response. Many had not yet gone through SERT training. They were given quick briefings and general responsibilities on their assignments, but they had no written procedures to follow.

As a result, there was no continuity from shift to shift. The particular activities performed, the types of decisions made, and the way information was tracked, maintained, and displayed varied depending on the individual who was filling the position at the time. For example, numerous spreadsheets, databases, and other methods were used to track information, such as MAs and personnel. Individuals often recreated existing information at the start of their shifts rather than use the same system as their predecessors.

The IMT essentially operated as a collection of individuals. Because there are no IMT email accounts, individuals had to resort to using

their own personal email accounts to communicate response-related information to other locations. This also contributed to the lack of continuity from shift to shift. Those interacting with the IMT sometimes encountered problems when the particular individual they had been communicating with went off his shift.

The lack of a formal structure led to problems in coordinating with other HHS offices and federal agencies. For example, the Principal Deputy Assistant Secretary for Budget, Technology, and Finance had to submit weekly reports to the DHS on HHS recovery efforts. Because basic information on the status of the response was not readily available from the IMT or the SOC, his staff had to request it. The particular point of contact they were given changed from week to week, making it difficult to standardize this process.

The SOC liaisons we interviewed said that the SOC adequately supported them during their time there. Some liaisons, however, had difficulty getting up to speed on the current status of the response at the start of their shifts. As we discuss below, this information was not readily available in E-Team or elsewhere. These liaisons noted that this information was included in informal shift change briefings that occurred when IMT staff turned over; however, liaisons were not invited to participate in these briefings.

E-Team and the integration of the SOC section

E-Team is an incident management system used by the SOC and by HHS personnel in other locations to capture and share event-related information. However, it is not organized in a manner that allows staff to quickly find needed information. Although we found it useful to collect information after the event, many staff observed that it does not provide them with real-time situational awareness of ongoing events. Furthermore, many staff members are not trained in its use.

Although the SOC is shown as a supporting section of the IMT in figure 3, many staff observed a separation between IMT and normal SOC operations during Hurricanes Frances and Ivan. For example, when IMT staff tried to implement a change to the format of SOC daily reports as requested by the Deputy ASPHEP, they encountered difficulty in coordinating these changes with the full-time SOC staff

that compile this report. SOC and IMT staff also appeared to report through different channels, as opposed to the single reporting channel shown in figure 3.

Headquarters staffing issues

HHS does not have enough personnel to staff large-scale, extended-response operations. This series of hurricanes strained OASPHEP personnel, causing many people to work extended hours for many weeks. For certain functions, like logistics, there is only one experienced person to work in this section. OASPHEP does not have the depth required to staff all IMT functions around-the-clock for an extended period. The lack of experienced, trained personnel is a serious issue that will recur in this report.

Coordinating in the field through the SERT

The deployment and use of HHS personnel to direct and manage the field response was not consistent with OASPHEP plans. Most importantly, a fully functional SERT was absent for much of the response. This inconsistency contributed to the lack of situational awareness noted earlier.

SERT not deployed according to plans

In preparation for Hurricane Frances, OASPHEP deployed a senior PHS officer to Atlanta to serve as the "overarching HHS leadership in the field."[4] The SERT Leader is usually the Regional Health Administrator (RHA), but another person can be chosen by the ASPHEP [5]. OASPHEP did not clearly designate the SERT Leader at the outset, and field personnel worked for several days without a clear understanding of the command structure. After asking for clarification, HHS personnel in the field were told that the senior PHS officer was the SERT Leader and the Region IV RHA was the SERT Deputy.

Although familiar with OASPHEP plans, the SERT Leader made decisions and took actions that were contrary to what OASPHEP

4. This was the mission described to us by interviewees.

expected. For example, the SERT Leader did not assign positions or roles to two OASPHEP personnel who were sent to assist him. The SERT Leader and OASPHEP also disagreed on whether additional SERT members were needed. Thus, a full SERT was not sent until Florida officials requested that ESF#8 stand up the super shelter six days after Hurricane Frances hit.

HHS does not adhere to a rotational SERT roster when deploying personnel to staff SERTs. Instead, it selects deploying staff members as the need arises. A SERT roster was created for Hurricane Frances when OASPHEP began assigning staff to manage its response. However, it made several changes to the roster when it finally deployed the SERT to the super shelter. The limited number of trained staff available to serve on the SERT makes it difficult to create and adhere to deployment rosters.

SERT had to manage the super shelter

There was much disagreement by HHS personnel during the response over what the SERT should be doing. Inadequate planning by OASPHEP prior to the SERT's deployment contributed to this. When the full SERT finally arrived, it discovered that a significant amount of planning needed to be done to implement the super shelter mission. It immediately began preparing to take over management of the super shelter from NDMS and moved to that site. Because the PHS personnel HHS deployed to staff the shelter were not organized in a manner to operate the shelter (see the section on deploying medical personnel), the SERT had to step in to organize and manage the shelter operation. Although HHS could not have successfully completed this mission if the SERT had not assumed this role, doing so is contrary to the SERT system description [5], which states that the SERT does not provide direct response services.

SERT staffing issues

The SERT also lacked several key positions, such as OPDIV liaisons and a Public Information Officer (PIO). A Food and Drug Administration (FDA) liaison was placed on call, but this person was never called on to staff the SERT. Although PIOs were included for both Hurricanes Charley and Jeanne, a PIO was not sent for Hurricanes

Frances and Ivan, which involved larger numbers PHS personnel than the other two storms.

OASPHEP also had difficulty staffing liaison positions in the field with experienced personnel. Positions with the state Emergency Operations Center (EOC) and federal offices are critical to ensuring the coordination of ESF#8 support. Some of the HHS staff assigned to these positions were inexperienced and had no background or familiarity with emergency response. As we discuss later, this caused problems when HHS interacted with other agencies involved in ESF#8.

When and where should the SERT be sent?

During our interviews, we observed much disagreement over when the SERT should have been deployed and when it should have been sent home, as well as where it should have been located during its deployment. The SERT system description leaves these decisions to the discretion of the ASPHEP in coordination with the SERT Leader. During the four recent hurricanes, the SERT operated from or near a variety of locations, including the state EOC, the Disaster Field Office (DFO), the super shelter, and a hotel.

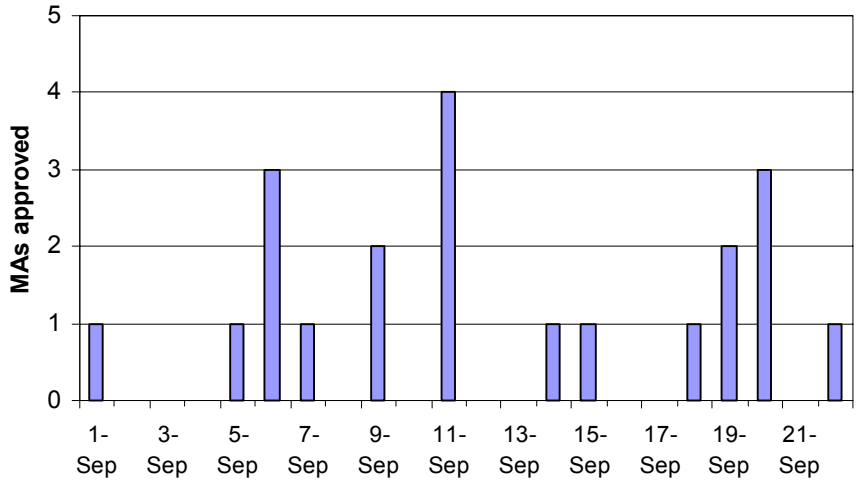
In figure 4, we show the number of Hurricane Frances and Hurricane Ivan ESF#8 missions approved for Florida each day. Six missions totaling $4.9 million were approved after the SERT was demobilized. As shown in figure 2, there were still more than 200 PHS officers deployed at the time the SERT departed Florida. Most of these officers were on their way home, but about 60 officers were still working at Sacred Heart Hospital, in Pensacola, Florida. As stated earlier, one of the purposes of the SERT is to manage ESF#8 field operations. Although field operations had significantly scaled back, they were still ongoing at the time the SERT departed. It's important to note, however, that SERT liaison officers were still present in the ROC and other FEMA locations.

Coordinating ESF#8

Although HHS coordinated with many of the ESF#8 partner agencies to fulfill mission assignments, ESF#8 functioned as two distinct

parts: HHS and NDMS. In every location and on every team (e.g., EST, ERT-A, rapid needs assessment team, DFO), these two agencies sent separate representatives to fill ESF#8 seats. Rarely did the two agencies exchange liaison officers. When HHS requested an NDMS liaison to the SOC, NDMS did not send one.[5] The NDMS's Joint Management Team (JMT) and the SERT, both of which operate in the field, did not exchange liaison officers either.

Figure 4. Number of Florida ESF#8 missions approved per day



HHS is not viewed as the leader of ESF#8 in field. It often sends inexperienced junior staff members to fill positions in the DFO and elsewhere to assist the state and FEMA in the ESF#8 request process. These personnel often have no background in emergency management and are sent without written material to guide them in performing their duties. Other staff members at these locations, such as NDMS personnel, must often help train and orient these ESF#8 representatives. This disparity sometimes created friction. In this instance, the level of coordination between HHS and NDMS at various locations depended on the particular individuals present at a given location.

5. During Hurricane Jeanne, however, NDMS did send a liaison to the SOC.

NDMS personnel also noted that ESF#8 decision-making processes were not well coordinated. In particular, the command element of the JMT felt that it should have a more active role in assessing needs and defining requests for medical resources when NDMS assets are deployed.

ESF#8 conference calls helped and hindered

Many of the ESF#8 partner agencies reported that the daily ESF#8 conference calls were an important means of information sharing. These calls began with weather updates and went on to discuss both HHS and ESF#8 activities. For those agencies without liaisons in the SOC, these calls were their primary link to the HHS IMT.

However, the calls were not well organized. Agendas were not used and some participants were unsure of what should and should not be reported in these calls. Thus, some participants reported at length, whereas others said nothing at all. Much of the call was often spent having the SERT report to headquarters on the status of field operations. Many felt that HHS coordination should have occurred on separate HHS-only calls. Side conversations in the SOC also distracted those who were supposed to be running the calls, and some participants reported that a few calls confused, instead of clarified, issues.

DOD did not engage in planning

HHS experienced a great deal of frustration in working with DOD to provide assistance under ESF#8. DOD policy is to not begin actively working on a support request (including planning for possible missions) until it receives a signed MA. This is a lengthy process, as we discuss in the next section, and HHS is often in a position in which it must act on verbal approval alone. After DOD does receive a signed MA, it takes several days for it to work through its own process to fill it. During Hurricanes Frances and Ivan, DOD's only assignment was to provide four respiratory therapists and nine telemetry nurses for staff augmentation. This mission reportedly took three to four days to fill after it was approved.

The state began the process of requesting support to air evacuate patients at about the same time that it began planning to request

the super shelter. DOD offered little information to HHS during the many ESF#8 discussions about how to plan for this mission. Patient movement from disaster sites is also a component of the NDMS, with DOD as the lead. The state eventually canceled its request for patient evacuation under ESF#8, halting all attempts to plan for this mission.

Recommendations

We have two main recommendations for addressing the issues discussed in this section. First, HHS should clarify its incident management structure by writing detailed supporting procedures to the HHS CONOPs. Second, HHS should work with NDMS and its other partners to unify ESF#8 management. Once improved, these systems need to be supported with adequate tools, resources, education, and training. Finally, OASPHEP needs to develop a cadre of trained and experienced personnel to carry out these plans during emergencies.

Clarify HHS incident management structure

HHS should review its headquarters incident management structure and write detailed procedures for each position. The operations and SOC sections were the only ones staffed around-the-clock during Hurricanes Frances and Ivan. Other sections, like planning, were staffed periodically. The logistics and administration/finance sections mainly operated from other offices and were staffed by people whose normal duties are to manage those functions.

HHS should determine the core positions necessary for certain types of events, such as hurricanes. IMT procedures should clarify how to integrate the full-time SOC staff and its daily activities into the IMT structure so no confusion exists regarding the reporting chain during emergency operations. For example, the production of the SOC daily report should be coordinated with other reporting and information compilation activities so decision makers receive the information they need with no duplication of effort. The procedures for each position should include the following:

- The criteria for determining whether a position should be staffed during an emergency
- The requirements for each position (e.g., the training and experience level necessary)
- The specific duties and responsibilities of each position
- The types of decisions and actions each position is authorized to make and which ones require approval from the incident manager.

OASPHEP should establish separate email accounts for each section so that individuals do not need to resort to using their own accounts and should act to maintain continuity in communications from shift to shift. In addition, IMT procedures should outline the general operational cycle. For example, shift change briefings should incorporate all positions in the SOC—including liaison officers from other agencies—so that situational awareness is maintained by all.

Procedures for conference calls should be included. OASPHEP should consider establishing separate HHS and ESF#8 calls. The IMT should assign the responsibility for writing call agendas that clearly state the purpose of each call to a particular position on the IMT. The person in this position should be responsible for moderating the calls so that they go smoothly even if the incident manager is called away. The IMT should also capture call minutes and disseminate them to participants or post them on E-Team.

OASPHEP should also support the SERT system description with detailed protocols or checklists for specific types of events. During an event, this will save time deciding who and what should be deployed. At a minimum, the following should be included:

- When the SERT should be deployed, or the criteria for making this determination
- What core positions should be filled (and position-specific checklists should be written for each)
- Where the SERT should be located
- What criteria should be used to determine when the SERT should be demobilized

- What equipment is needed.

The third item above—the location of the SERT—requires more thought by OASPHEP. During Hurricanes Frances and Ivan, the main role of the SERT (aside from the super shelter) was to coordinate ESF#8 requests with FEMA and its partner agencies. To do this, the SERT should be located in the operations centers where these requests are being made, validated, and processed. In other types of emergencies, the SERT may need to work closely with state and local health department personnel, which suggests that it should be located at or near the state/local health department.

When choosing locations for SERT personnel, HHS should work closely with the state agencies it is serving to ensure that they are operating effectively. HHS must balance its desire to lean forward with the needs of the state and local responders.

OASPHEP should consider how to meet the demands of missions that require additional logistical and management support in the field—beyond that which the SERT is designed to provide. This issue is discussed further in the section on deploying health and medical personnel.

OASPHEP should work with all HHS offices and OPDIVs to make sure that they are aware of the incident management structure and to ensure that it also meets their needs. Although OASPHEP has much experience working with the larger OPDIVs, smaller offices and OPDIVs are less familiar with OASPHEP's mandate to coordinate a departmental response. These offices can be involved at both the headquarters and field levels.

Finally, OASPHEP should consider sending a representative from its senior leadership to visit the disaster area during large-scale emergencies, such as the 2004 hurricane season. A senior staff member involved in past emergencies noted this practice helps maintain a common situational awareness among headquarters and field personnel.

Unify ESF#8 coordination

The response to these hurricanes shows that the separation of NDMS from HHS has adversely impacted the coordination of ESF#8. Because it is a critical health and medical resource, NDMS should become a part of HHS again. Not only is HHS the lead agency for ESF#8, but it also has the authority to respond to public health emergencies whether or not a disaster declaration is made. We recognize that such a reorganization may be difficult; therefore, HHS should work with NDMS to unify the management of ESF#8.

At a minimum, the two agencies should agree on a policy for exchanging liaisons at the headquarters level (e.g., HHS SOC) and in the field (e.g., SERT, JMT, NDMS Emergency Coordinators) during large-scale emergencies. Furthermore, HHS, NDMS, and its partners should implement a formal process for conducting needs assessments, defining missions, and coordinating decision making.

The two agencies should work with DOD to develop plans for carrying out patient evacuation in the future. Even though DOD is charged with leading this mission under NDMS, it is not treated as a priority by the agency. Large-scale patient evacuation in support of a domestic natural disaster response has never been undertaken. This issue requires further thought and planning, and ESF#8 may need to come up with alternatives.

Make technology improvements

Problems with E-Team have been noted in many after-action reports. OASPHEP should develop written requirements for its incident management system that include a method for tracking personnel and equipment. Once the office has vetted these requirements, OASPHEP should determine whether E-Team can be modified to meet its needs or whether another system should be used. In developing these requirements, OASPHEP should:

- Define the categories and types of information it needs to manage for different types of events

- Determine who needs access to this information (e.g., senior decision makers and operators), how timely it must be, and the required level of detail
- Decide who should be responsible for collecting, entering, maintaining, analyzing, and displaying the data (responsibilities might be assigned to a single person or to different persons depending on the responsibility or category of information)
- Develop detailed procedures for collecting, maintaining, and updating the system.

Once developed and tested, this incident management system needs to be incorporated into OASPHEP training programs so that all staff is able to use it. OASPHEP should also develop simple field manuals that provide instructions to personnel on how to use the system.

Many of the OASPHEP and PHS personnel who fill roles at headquarters and in the field are relatively new to their jobs or have no experience at all. OASPHEP should develop tools and job aids to help individuals learn while on the job. These might include written materials, CD-ROMS, or information that is preloaded onto laptops. At a minimum, this information should include:

- OASPHEP emergency plans and procedures
- Background on the federal response structure and ESF#8
- Position-specific responsibilities and checklists
- Travel procedures
- Important contacts.

Develop a cadre of trained, experienced personnel

Developing a large pool of trained, experienced personnel to staff the SOC and the SERT will take time. OASPHEP should continue to expand its ongoing SERT training program to offer training targeted at specific agencies (e.g., HHS, PHS, ESF#8 partners) and roles (such as serving on the IMT or working in the ROC and DFO).

In the past, OASPHEP has deployed personnel as observers or to learn on the job alongside a more experienced staff member. Such training deployments should be increased to the extent possible since they will expand the pool of experienced personnel. Furthermore, many personnel have observed that certain critical ESF#8 jobs (such as working in the DFO) require field experience before one can practically assume the responsibilities.

OASPHEP should explore other sources of personnel who could be used to provide surge staffing in large-scale and/or long-term emergencies. For example, it might create a pool of volunteers who could be trained and federalized when needed. This approach is used by NDMS to staff DMATs and other teams.

Once it has sufficient personnel to staff the IMT and SERT, OASPHEP should create and maintain rotational deployment rosters. This will help staff to plan for the possibility of being deployed and save time in selecting staff during emergencies. Pre-established shift cycles for the IMT and SERT should also be developed so that OASPHEP can manage and maintain continuous and long term operations.

The federal request process

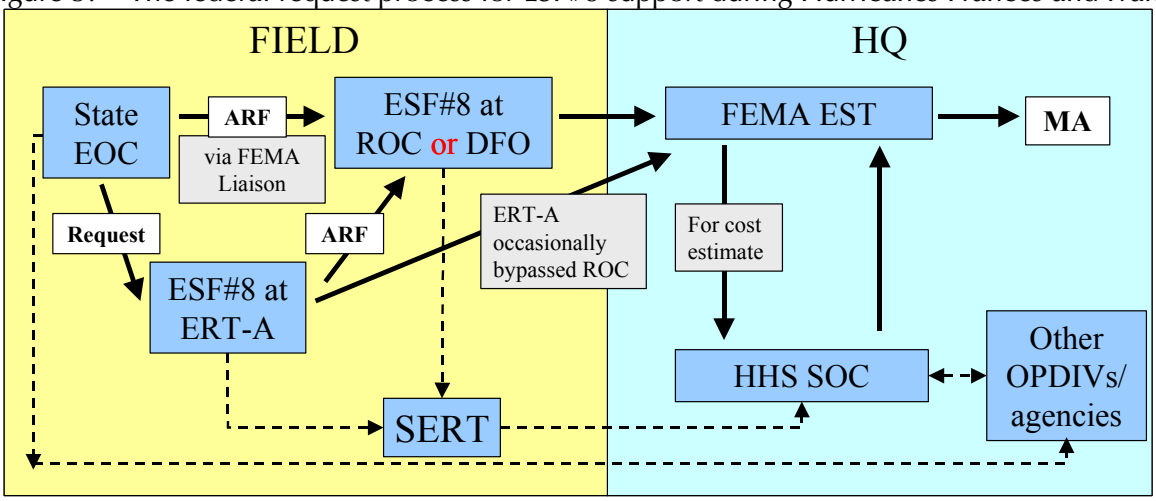
Figure 5 diagrams the federal request process as it operated during Hurricanes Frances and Ivan. This process was pieced together through numerous interviews with staff at various locations. Requests were formulated at the State Emergency Operations Center (SEOC) in Tallahassee. The state sent most health and medical requests to the ESF#8 desk at the ERT-A, which was located in a separate building in Tallahassee.[6] The HHS personnel deployed with the ERT-A also served as liaisons with the state after the DFO was stood up. The ESF#8 ERT-A personnel helped the state fill out Action Request Forms (ARFs) and then forwarded them to either the ROC or DFO. Other health and medical requests were forwarded directly to the ROC or DFO by the FEMA liaison in the SEOC. From here, the ARF was sent to the FEMA Emergency Support Team (EST) where FEMA drafted the MA and sent it to the SOC for a cost estimate. After HHS returned the MA to the EST, FEMA would approve the MA. A list of all approved HHS MAs is shown in table 1 above.

HHS involved personnel at all of the federal teams and command centers in the request process. It did not have personnel located in the SEOC, but HHS ERT-A personnel were located nearby and acted as state liaisons. All HHS personnel were coordinated by the SERT and were well positioned to maintain situational awareness and share information. As noted in figure 5, information traveled through many different channels in addition to following the for-

6. Typically, the ERT-A deploys as an advanced element of the FEMA ERT and moves to the DFO to form the ERT once it is operational. However, HHS personnel with the ERT-A continued to operate at the same location after the DFO stood up. Though they referred to themselves as the ERT-A in interviews (and were listed as the ERT-A in rosters and other materials), they were likely acting in a state liaison capacity after the DFO stood up. In this section, we also refer to these personnel as the ERT-A.

mal request channels. This sometimes caused problems, as we will discuss later.

Figure 5. The federal request process for ESF#8 support during Hurricanes Frances and Ivan



Information traveled several ways, including the following:

- The SEOC used a system called "Tracker" to record and track requests. At times, HHS ERT-A personnel had access to Tracker. As different versions of the ARFs made their way through the request process, the original Tracker forms were sometimes included as a reference.
- Some HHS personnel used E-Team to ask follow-up questions regarding a particular ARF or an MA. It was used to clarify requests, get information regarding their status, and change or cancel current requests.
- Faxing was used to transfer ARFs and MAs between FEMA and the SOC. This was done to ensure that all approved MAs included a signature before being sent to the SOC for a cost estimate.
- Conference calls, phone calls, and emails were also used to exchange information regarding ARFs and MAs.

However, many problems hindered information flow and caused delays and confusion during the request process, as we discuss next.

Process issues

The request process was complicated by multiple storms. Normally, the ROC handles the beginning stages of a disaster response by issuing the initial mission assignments and deploying the ERT-A. The ERT-A works with the state EOC to perform the rapid needs assessment and determine the scope of the federal response. It forms the nucleus of the ERT, which staffs the DFO. After the DFO is established, the ROC stands down.

This process is clear when responding to a single event. However, there were multiple storms with overlapping responses, which resulted in simultaneous ROC and DFO operations. At times, the ROC handled requests for one storm while the DFO handled requests for another storm. At other times, all requests were handled by the DFO. Often, the ROC wanted to receive copies of all requests, whether or not the DFO was handling them. This process changed on a daily basis, further complicating the flow of information and contributing to the many issues we describe below.

Degree of coordination with the state varied

One of the focuses of ESF#8 ERT-A personnel was to work with the state on formulating and validating requests. The degree to which this was accomplished varied depending on the experience level of the staff who were working with the state. Some of the HHS personnel sent to staff the federal ESF#8 seats were inexperienced and untrained. Many had no emergency management background at all. They learned on the job and became better at performing their duties as their deployments progressed.

Requests for CDC assistance were facilitated by the presence of a local CDC representative in the SEOC. For example, on 5 September Florida submitted several ARFs requesting multiple CDC personnel and equipment. These requests were written with the help of the CDC representative, who was able to confirm the accuracy, language, and details of the request before it was sent in.

Some requests were not validated because they bypassed the ERT-A. A FEMA liaison was occasionally present in the SEOC. This liaison often sent state requests for health and medical support directly to

the ROC or DFO without coordinating or communicating with the ESF#8 ERT-A personnel.

Roles of personnel not standardized

As requests traveled up the chain and were turned into ARFs and MAs, many different people were involved in writing them. Sometimes the wording developed by the ESF#8 ERT-A personnel was sufficient. Other times it was edited or clarified by staff working in the EST, SOC, or elsewhere. The responsibility for writing ARFs and MAs is not assigned to any single role and many people were involved. One reason for this was the lack of experience by many of the ESF#8 personnel working in the field, which sometimes necessitated that others step in to assist with writing ARFs and MAs. Because some of the requests were unusual (like the one for the super shelter), they also contributed to drawing on the skills of multiple authors.

Headquarters personnel leaned forward

After ESF#8 ERT-A personnel received a request from the state, they would inform the SERT that the request was in process. The SERT would then inform the SOC and HHS headquarters, which would begin planning to fill the request. For personnel requests, this included identifying staff available to deploy, which can be a time-consuming process. This practice caused confusion, however, when ARFs were later changed or cancelled.

No system for tracking information at federal level

As shown in figure 5, information flowed mainly from the state up to the federal headquarters level. This process was largely one-way and information did not automatically flow back down the chain. The SEOC often called the ERT-A with questions about the status of requests. HHS personnel with the ERT-A would then make a series of phone calls (to the SOC, DFO, or ROC) to retrieve this information.

As requests moved up the chain into ARFs and MAs, they acquired several different numbers. For example, the request that would eventually become FL-HHS-04 (see table 1) was referred to at various times as "FRAN 01," "DFO 112," and "ARF 37." During conference calls and conversations regarding requests on E-Team, there were several instances in which not all parties were clear which requests were being discussed.

Much of this confusion about the status of ARFs and MAs occurred because there is no standard process in place for tracking and disseminating this information. As discussed in a previous section, SOC personnel created ad hoc methods to track this information, and people used multiple sources of information, some of which conflicted.

Combining requests sometimes caused problems

Combining multiple requests into a single ARF or MA sometimes caused confusion. For example, both Lawnwood Medical Center in Fort Pierce and St. Lucie Medical Center in Port St. Lucie requested several types of nurses. One ARF (Ivan 003) was written to cover both requests. This became problematic when the Lawnwood request was cancelled. The result was a delay and the wrong type of nurses being sent to St. Lucie.

In another situation, two requests were combined into an MA tasked to DOD for both air evacuation and respiratory therapists (RTs) to staff the super shelter. The cancellation of the evacuation part of the MA also resulted in cancellation of the RT request. Later, HHS determined it still needed the RTs and had to work with DOD to reactivate the RT mission.

There were other cases, however, when combining requests probably helped reduce paperwork. Five different requests for CDC support were combined into FL-HHS-05. The CDC requests were standard hurricane responses, and combining the different teams did not lead to confusion.

Cost estimating, coordination, and approval caused delays

FEMA reviewed MAs and then faxed them to the SOC on a 24-hour schedule. MAs sent during the night weren't costed out until the next morning when financial personnel arrived at work. The cost estimate process often involved coordination with other agencies, such as CDC, DOD, or VA, which took additional time. For example, the DOD process for approving MAs was cumbersome and took several days to complete.

Several personnel we interviewed felt that the fax process contributed to delays in the approval process. FEMA uses faxes so that forms can be transmitted with signatures. However, other personnel noted that once verbal approval is received, agencies could begin acting on an MA without waiting for the paper copy.

FEMA questioned the validity of approved MAs

Recently, FEMA questioned the validity of four MAs that addressed the medical needs and movement of special needs patients in both Florida and Alabama. HHS chose to execute these missions using the Centers for Medicare and Medicaid Services (CMS). CMS turned to a contractor to provide the requested services. When it discovered that the mission was facilitated through a third party, FEMA declared it inappropriate and not authorized under the Stafford Act. Numerous phone conversations were held to discuss this issue, delaying payments and leading to end user service providers notifying the state of their intentions to release patients because of lack of payment. Later, all parties agreed to move forward with the existing mission assignment as issued.

Recommendations

Although much of the federal request process is driven by FEMA procedures, there are areas within HHS and ESF#8 that can be improved.

Standardize ESF#8 process for ARFs and MAs

OASPHEP should develop a written procedure standardizing the process of completing ESF#8 MAs and outlining the roles and responsibilities of staff members at various locations. This procedure should:

- Standardize the process of validating and writing ARFs and MAs
- State the roles and responsibilities of staff situated at the different locations involved in the process
- Include the reporting chain and requirements for information flow throughout the system
- Outline a model for liaisoning with the state. HHS personnel found a location near or at the state EOC to be important; however, flexibility for meeting the needs of the state should be incorporated.
- Document the procedures to follow when tasking partner agencies like VA and DOD (e.g., providing the appropriate signed letters)
- Include written documentation to support actions and decisions made by all agencies.

As discussed in earlier recommendations, this procedure should be supported by a unified electronic system for tracking ARFs and MAs and their status.

OASPHEP should consider separating the planning and operational phases of filling MAs to limit the confusion caused by leaning too far forward. For example, planning to fill requests could be assigned to the planning section of the IMT, and then responsibility for acting on the MA (e.g., deploying personnel) could be assigned to the operations section and officially transferred from function to function after the MA is approved. The procedure should make clear what actions can be taken by each section and when.

Pre-event planning could also help. For example, databases containing accurate numbers, availability (e.g., through rotational ros-

ters[7]), contact information, and specialties of potential medical personnel would greatly speed the process of selecting and deploying personnel. This will diminish the need for action during a "heads-up" phase.

HHS should work with its ESF#8 partners to streamline and improve the request process. Suggestions to consider include: combining the two ARF and MA forms into a single form, and determining how to handle multiple events to streamline simultaneous ROC/DFO operations.

Support the ESF#8 request process with experienced personnel

It is important that HHS staff key federal locations with experienced ESF#8 personnel. As discussed earlier, OASPHEP needs to develop a cadre of trained and experienced personnel to carry out these roles in emergency situations. While this personnel pool is being developed, OASPHEP should use the following tools and job aids to assist inexperienced staff members and provide 24/7 support:

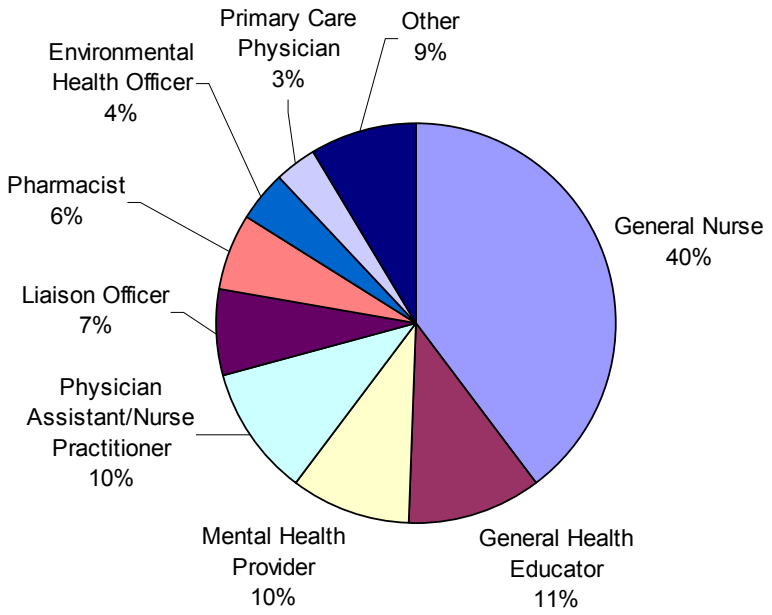
- ARF/MA templates can be used to speed the process of writing requests. Many requests are fairly standard and could be pre-written.
- Tools exist for doing simple cost estimates, and SOC staff should be trained to use them to assist in this process
- Personnel deployed to the field need job aids, such as those discussed in the previous section.

7. Although the PHS does maintain a database and rotational rosters, it must obtain supervisor approval before deploying personnel. A true deployment roster would list those available to deploy immediately during a specific time period.

Deploying health and medical personnel

The PHS deployed more than 500 personnel for the four hurricane responses in 2005. Most of these, about 400 personnel, were deployed for Hurricanes Frances and Ivan,[8] constituting one of the largest deployments in its history. By comparison, about 375 officers deployed after the 9/11 terrorist attacks, and 350 officers responded to the anthrax events in 2001. Figure 6 shows the major deployment roles that PHS personnel filled for Hurricanes Frances and Ivan.

Figure 6. PHS personnel deployed for Hurricanes Frances and Ivan by deployment role



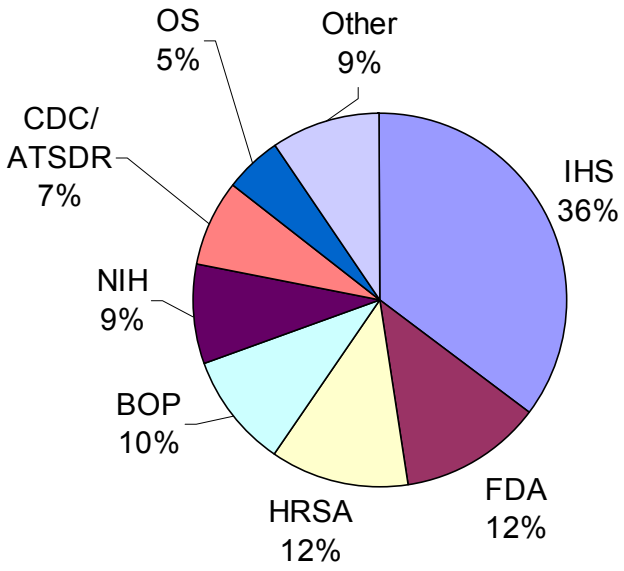
8. PHS provided the data presented in this section. It includes personnel that filled requests for ESF#8 and ESF#6, with the majority deployed under ESF#8. The data format did not allow us to precisely breakdown the overall deployment by ESF.

In addition to the PHS, the VA deployed clinical personnel under ESF#8. The combined contribution for Frances and Ivan was about 100 people, the vast majority of whom were nurses. Because our data on the VA's deployment are incomplete, this section of the report focuses on the PHS. Where applicable, we discuss issues related to the VA and offer recommendations to assist in planning for future deployments.

Areas affected by the hurricanes required a variety of clinical and public health expertise. By far, the greatest need was for clinicians to staff the special needs "super shelter." Medical and clinical support was also provided to hospitals and other medical facilities damaged by the hurricanes. Other personnel included health educators, environmental personnel, and mental health providers.

The demand for clinical personnel, especially nurses, affected some PHS agencies more than others. For example, the Indian Health Service (IHS), which employs roughly 40 percent of the PHS nursing workforce, saw 20 percent of its nurses deployed for Hurricanes Frances and Ivan. Other agencies that contributed significantly to the deployments were the FDA, Health Resources and Services Administration (HRSA), and BOP (figure 7).

Figure 7. PHS personnel deployed for Hurricanes Frances and Ivan by agency

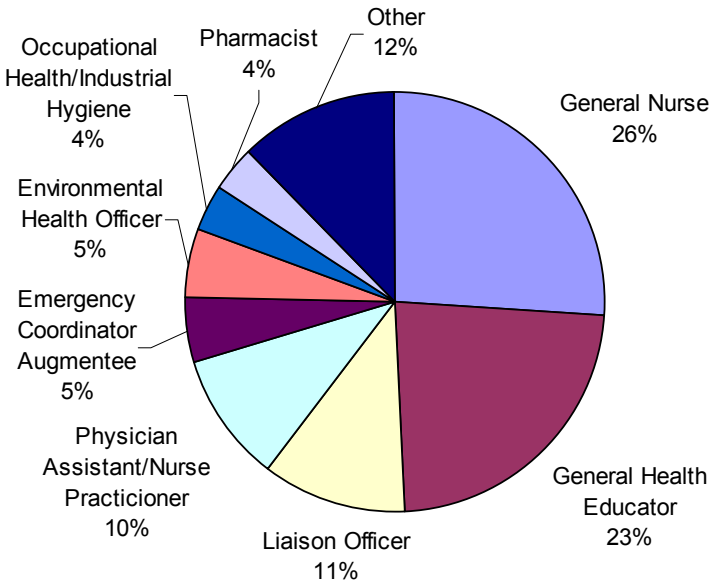


Next, we briefly examine the deployments for Hurricanes Frances and Ivan. The following sections discuss some of the major issues that arose in trying to coordinate and manage this unprecedented call up of personnel. Finally, we offer recommendations to improve future large-scale deployments for major emergencies or disasters.

Hurricane Frances

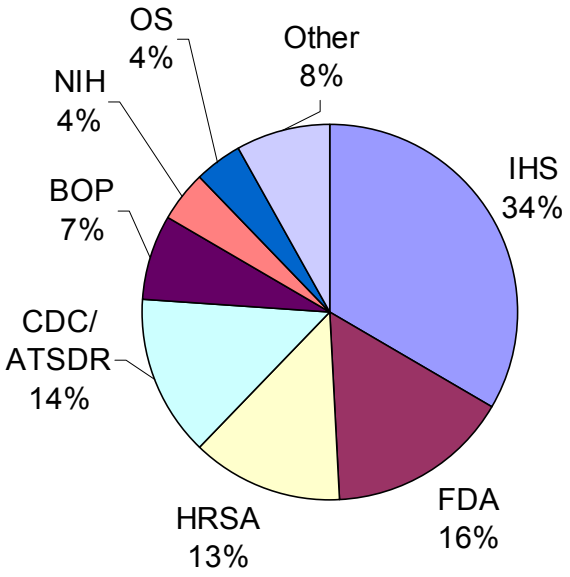
The PHS deployed 138 officers for Hurricane Frances. Some staff was sent on 1 September, just days before the storm made landfall; however, the vast majority (80 percent) of officers deployed on 5 September. Figure 8 reveals that about half of all personnel filled one of two major roles: nurse and health educator.

Figure 8. PHS personnel deployed for Hurricane Frances by deployment role



Four agencies—IHS, CDC, FDA, and HRSA—bore the lion's share of the deployment. Together, they contributed over 75 percent of the total deployed force for Hurricane Frances. Of these, the IHS contributed about 34 percent—the highest of any agency. This is not surprising since nurses made up the largest deployment group.

Figure 9. PHS personnel deployed for Hurricane Frances by agency



Hurricane Ivan

The PHS deployed 263 officers for Hurricane Ivan, with the first officers sent on 7 September. By the time Ivan reached land on 16 September, more than 75 percent of the total force had deployed, primarily to staff the super shelter. As with Hurricane Frances, most of those deployed were sent to fill a small number of critical roles, as shown in figure 10.

Although most clinicians were initially sent to staff the special needs super shelter, their assignments changed as the storm track shifted and the shelter was no longer needed. Many clinical personnel were reassigned to Sacred Heart Hospital and other healthcare facilities along the Gulf Coast that were heavily damaged by the storm.

Figure 11 spotlights which PHS agencies were most affected by the deployment. The IHS was, by far, the largest contributor, supplying 37 percent of the deployed workforce. This is attributed primarily to the need for nurses at the super shelter. As with Hurricane Frances, the FDA and HRSA were among the leading suppliers of personnel. In addition, the BOP and the National Institutes of Health (NIH) figured prominently in the deployment.

Figure 10. PHS personnel deployed for Hurricane Ivan by deployment role

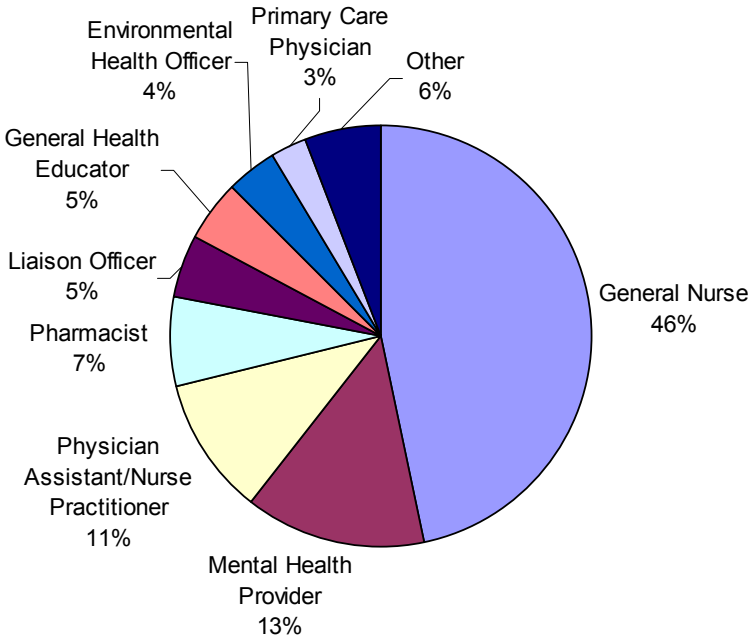
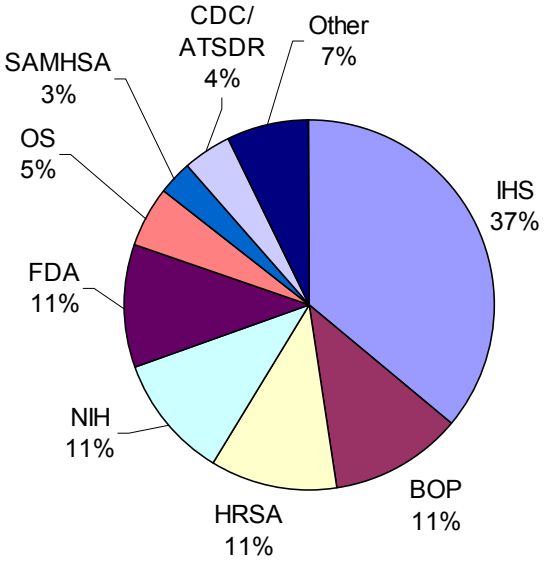


Figure 11. PHS personnel deployed for Hurricane Ivan by agency



PHS capability to support large-scale deployments

As stated previously, the size of the PHS deployment for the hurricanes was unprecedented. Officers deployed from each region of the country and every PHS rotational roster was tapped for personnel. PHS headquarters staff performed admirably to meet the requests for personnel. Likewise, officers carried out their duties in the field with tremendous commitment and professionalism.

Because of its size, the deployment offered a rare look into the ability of the PHS to support a large-scale emergency or disaster response. This examination reveals a fractured system that does not have the manpower or administrative infrastructure necessary to support a major deployment. Also evident is a system that does not prioritize clinical competency among its staff, which limits the ability of its officers to serve in clinical roles when deployed.

Inadequate staffing and administrative infrastructure

The Office of Force Readiness and Deployment (OFRD) does not have the capacity to coordinate major deployments like Frances and Ivan. For example, during Hurricane Ivan, senior staff members worked over the weekend to identify and contact officers individually via phone. There was no automated system available to send out requests for officers. This is problematic because it:

- Diverts the attention of senior staff from important strategic issues they may need to consider
- Represents an inefficient use of time and resources
- Increases the risk that inconsistent information may be delivered to personnel since no single message is disseminated.

Neither the OFRD nor OASPHEP has a formal system to assess the effect of personnel requests on PHS agencies (including the ability to account for requests to support other ESFs). For Hurricanes Frances and Ivan, a large number of nurses were requested, and the PHS had to rely heavily on the IHS. However, there was no way for the OFRD or OASPHEP to know precisely how the deployment had affected IHS's ability to provide routine services at its facilities. This lack of awareness increased the risk of causing new, secondary prob-

lems in areas distinct from those affected by the hurricanes. An example of this occurred when the IHS had to temporarily close an operating room (OR) in Santa Fe, New Mexico, because it no longer could provide the nursing support needed to maintain operations (i.e., its nurses had been deployed).

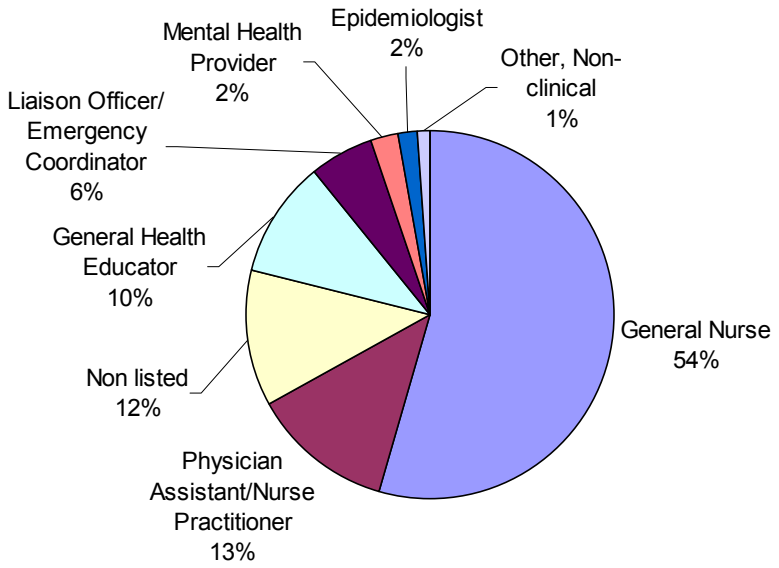
Moreover, after officers deployed, the OFRD had no way of tracking their locations. As discussed earlier, OASPHEP also had limited abilities to track personnel in the field. This was compounded by the lack of a daily call that included OASPHEP, OFRD, and leaders from the various PHS teams that deployed. A similar problem arose when OFRD deployed about 40 officers to be trained as community relations specialists by FEMA. In contrast to these cases, OFRD received solid, timely information about its personnel who deployed to support the American Red Cross (ARC) under ESF#6.

No emphasis on clinical competency

Another major issue brought to light by the hurricanes is that the PHS does not facilitate the maintenance of clinical skills among its employees. This is important because many PHS officers with clinical training hold nonclinical positions. To maintain their skills, they must find part-time work and obtain the requisite licensure and insurance coverage to practice. These are formidable barriers for a workforce that already keeps a full-time schedule for the PHS.

In addition, the skill sets of PHS personnel are not fully captured by PHS databases or rosters. Many focus only on the role that an officer currently serves and neglect past experience or training they might possess. Because officers can self-select their deployment role, some opt for nonclinical roles because they feel that their clinical skills are not up-to-date. Figure 12 shows that many nurses chose to serve in nonclinical deployment roles.

Figure 12. PHS nurses by deployment role



Uncertainty in the request and approval process

The process to request PHS personnel was hampered on several fronts, beginning with a lack of clear organizational structure at the SOC. The chain of command was not clear to staff at the OFRD, and requests were often initiated from different people at the SOC, with no consistency from one day to the next. There was confusion about whom to go to when questions arose, and how to get clarification on issues if needed.

Other major issues in the request and approval process include:

- A mismatch between the types of personnel available through the PHS and those requested by OASPHEP
- No guarantee that persons on active rotational rosters will be granted permission to deploy
- No written procedures or protocols for the approval process.

The following sections address each of these issues in more detail.

Mismatch between personnel requested and those available

The PHS was asked to fulfill several requests for critical care and emergency department (ED) nurses. However, the OFRD struggled to meet these requests because most PHS nurses provide general nursing care or basic public health services. There was a perception among the OFRD staff that the OASPHEP leadership did not have a clear understanding of the types of personnel available, and that requests for ED or critical care nurses should have been directed elsewhere.

In fact, PHS data reveal that only between 5 and 10 nurses with current ED or critical care skills are on each of its active rotational rosters. Most rostered nurses have self-selected to serve in a general nursing or non-clinical deployment role. Thus, OASPHEP may need to look to other agencies (e.g., the VA) to fulfill these requests in future emergencies or disasters. Alternatively, states may need to gain these personnel through memoranda of understanding (MOU) that they have with other states or jurisdictions.

Rotational rosters are not "ready-go" assets

PHS officers on rotational rosters must first obtain permission to deploy from their supervisor. Each roster is *not* set up to be a "ready-go" asset for OASPHEP. Instead, it is a pool of personnel that may be available in a time of need. Permission to deploy can depend on such factors as:

- The perceived ability of the home agency to continue its mission without the individual
- The perceived burden being placed on one agency or area of the country by a major deployment
- An officer's relationship with his/her supervisor and whether the officer feels "comfortable" asking for permission
- The ability of an officer to quickly contact his/her supervisor to obtain permission.

The third factor listed above highlights a concern with the bottom-up approach currently used to obtain permission (this term is used because all responsibility is assigned to the officer). Our interviews

indicate that officers may be made to feel that they are "asking for a favor" from a supervisor when requesting permission to deploy. This can hurt the supervisor/employee relationship and serve as a strong deterrent to seeking permission. And often there is little recourse if permission is denied because officers are employed by their home agency (e.g., IHS, NIH), and not by the PHS. In fact, during the hurricanes, the Secretary had to order home agencies to allow their staff to deploy.

Approval process is unclear

During Hurricanes Frances and Ivan, the OFRD found that personnel contacted to deploy often did not know whom to go to for permission (e.g., their direct manager or the hospital CEO). Alternatively, many personnel sought permission from the wrong person, and then contacted the OFRD thinking they were cleared to deploy. A defined procedure is needed to ensure officers know whom to ask for permission, and to specify criteria for granting or denying permission to deploy.

Lack of support to personnel deploying or in the field

There was a lack of logistical, administrative, and management support to clinical and health personnel. For ease of discussion, we first describe key issues faced during the first phase of deployment, and then focus on issues encountered after officers arrived in the field.

Initial deployment phase

From OFRD's standpoint, one of the more frustrating aspects of the deployment was the limited travel and logistics support for its officers. After OFRD staff identified officers to fill a request and they were granted permission to deploy, their names were sent to OASPHEP. The officers were told to wait to be contacted by the logistical support contractor, who would provide them with itineraries and further instructions. In some cases, however, officers were never contacted. Moreover, those who were called often received limited notice and little information about where to go, how to get

there, whom to contact, where to stay, or what role they would serve in the field.

These issues were in sharp contrast to the experience of PHS officers who deployed to assist the ARC under ESF#6. The ARC uses an automated phone system to coordinate all travel and logistics. When an officer is ready to deploy, he/she is given a phone number to call, and an agent arranges his/her travel. This allows officers to:

- Maintain responsibility for their travel plans
- Receive information on lodging and onsite points of contact to coordinate transportation and any other issues
- Be proactive in planning for their deployments.

The ARC has had success with this system for many years, and it may serve as a model program for OASPHEP to consider for use in future deployments.

Deploying personnel also had to be completely self-sufficient. Many deployed with only their own cellular phones and no additional communications equipment (e.g., satellite phones, radios). This led to some reluctance among officers to use their own phones because of questions about reimbursement for charges incurred. Indeed, after deployment those who did use their own phones encountered lengthy delays in receiving reimbursement. More importantly, reliance on cellular communications in disaster areas is sketchy at best since service may be severely affected by infrastructure damage. This says nothing of the major interoperability issues raised when staff is required to be self-sufficient on a deployment.

Issues after arrival onsite

Problems observed during the initial deployment phase carried over to the field, where personnel had inadequate management support. To provide some structure to the deployment, the OFRD sent its officers in teams and selected experienced team leaders. Although many of the personnel had related training and experience, PHS is not organized to provide cohesive and equipped team units. In the case of the super shelter, this resulted in the SERT assuming a ma-

jor managerial role for deployed personnel—a role not intended for the SERT.

The coordination of deployed personnel was also an issue. This was evident from the start since NDMS teams had little interaction with other ESF#8 partners. As noted earlier in this report, NDMS teams usually planned and executed activities on their own and were not well integrated into the overall ESF#8 response.

The experience at Sacred Heart Hospital offers a good example of the difficulties PHS personnel had coordinating with other ESF#8 personnel. Sacred Heart was severely damaged by Hurricane Ivan, and large numbers of clinical personnel were requested. The PHS, NDMS, and VA filled these requests; however, several days passed before the PHS staff was aware that VA personnel were also at the hospital. The PHS team had established a command structure to coordinate the ESF#8 staff support and it had incorporated NDMS personnel into this mission.

Recommendations

Because PHS is the central source of personnel for carrying out ESF#8 MAs and filling positions in the field, it is critical to HHS's ability to successfully coordinate and provide ESF#8 support. The issues described in this section should be addressed through a collaborative process involving OASPHEP and the PHS. Although some issues could have short-term fixes, others likely will require long-term changes in strategy or organizational structure. Many of the recommendations listed below are ideas that have originated with OFRD, which simply lacks the funds to implement them.

Develop PHS team structures

OASPHEP should work with PHS to develop the capability to deploy personnel in teams. This would represent a major shift in how the PHS is used for emergency or disaster response. A short-term solution is to develop and document organizational structures that can be used by PHS personnel on deployments (see appendix A for examples of team structures). When deployed, PHS officers would be assigned to particular positions on the team.

For the longer term, PHS should consider developing a team whose primary role is to serve as a "ready-to-go" deployment asset. Ideally, this team would include personnel with a mix of skill sets who would devote much of their time to training or deploying on exercises or to real-world events. Team members with clinical deployment roles would need to serve as clinicians when not on deployment to maintain their competency (see appendix A for examples of team structures).

PHS should purchase and maintain equipment caches to support its teams. The caches should include both communications (e.g., radios, phones, walkie-talkies) and personal protective equipment (PPE). OASPHEP should work with OFRD to determine interoperability requirements and to develop a plan to purchase and maintain the caches.

Where necessary, these team structures should include positions that provide equipment, logistical, and administrative support to the team. PHS personnel will require training to prepare them for deploying in these new team structures. PHS should also develop written procedures or team manuals.

Clarify approval process

The approval process for obtaining permission to deploy should be clarified in a written procedure. The current approval process is unclear and varies at the discretion of the supervisor who is contacted. Such ambiguity is inefficient and causes unnecessary delays in the approval process. This procedure should delineate who has authority to grant permission to deploy, and define specific criteria to use in making this decision. OFRD should consider a "top-down" approach for notification whereby OFRD first contacts designated supervisors to determine if certain personnel are available. This would eliminate the step in which the officer must ask for permission to deploy.

Preplan for supporting deployment requests

PHS should consider modifying its personnel database to more accurately capture officers' skill sets. Although the PHS collects data

on its officer corps, it is unclear whether the data accurately capture an officer's full set of skills. Moreover, OASPHEP does not appear to integrate the data into its planning assumptions.

PHS should share its data with the OASPHEP leadership to ensure that personnel requests are consistent with the types of officers available to deploy through the PHS. OASPHEP personnel felt it would be helpful if PHS personnel databases captured all clinical experience and training that officers possess, not just information specific to their current position. The PHS database could be used to populate the personnel tracking system discussed in earlier recommendations.

OASPHEP should work with PHS to define the critical operating requirements needed to maintain routine services within agencies. The purpose is to ensure that no agency is overly burdened or its services are compromised by a deployment. Each agency should conduct a thorough assessment to identify minimum staffing and resource requirements. It should identify critical "assets" (i.e., personnel, facilities, resources) needed to sustain routine operations. Rather than specific people, this may be a number of staffers or type of specialty (e.g., a clinic in the IHS may need two OR-trained nurses to provide surgical support). This information should be integrated with the PHS rotational rosters to limit the risk to agencies.

Make improvements to support emergency operations

Standard OASPHEP policies should include a trained OFRD liaison officer to sit in the SOC during a major deployment. This will promote a single point of contact at the SOC for personnel questions. The liaison will also help improve coordination of PHS personnel with other ESF#8 partners in the field.

PHS should enhance OFRD staffing and infrastructure support to manage large-scale deployments. This involves examining how new or existing personnel and resources can be used to expedite the process of identifying and deploying officers. It should develop contingency plans to "ramp up" staffing support at the OFRD during an emergency. This will help alleviate the workload of OFRD leaders and allow them to focus on larger strategic issues. Further-

more, an automated call system and/or software package for mass dissemination of personnel requests should be implemented.

OASPHEP should work with PHS to improve its logistical support during deployments. It should examine models used by other agencies, such as the ARC. PHS and OASPHEP should also examine models to improve support in the field similar to the NDMS Management Support Team. (See appendix A for more information.)

The super shelter

On 10 September, HHS received verbal approval of an ESF#8 mission assignment to establish and operate a special needs "super shelter" capable of caring for 3,000 patients at the Orange County Convention Center (OCCC) in Orlando, Florida. This mission was unprecedented for the following several reasons:

- It was the first time ESF#8 was tasked to set up and operate a shelter in addition to providing medical staff augmentation
- The shelter was primarily intended for special needs patients
- The state was overwhelmed by the extended response to multiple storm aftermaths and threats.

NDMS was tasked to set up and operate the super shelter for the first 24 hours and moved two 35-member DMATs, which were prestaged in the area to fill this assignment. Additional NDMS personnel, including 51 nurses, 3 nurse practitioners 2 physicians, 1 pharmacist, and 2 respiratory therapists augmented these DMATs.

NDMS personnel quickly set up a shelter capable of accepting 1,000 patients in the first 24 hours. This was a complex and challenging assignment and could not have been accomplished without NDMS resources, which are designed to deploy rapidly and have extensive equipment caches.

The SERT and additional medical personnel (mainly from the PHS) began arriving the next day to relieve the NDMS personnel. More than 400 PHS, VA, and DOD personnel were deployed to staff the shelter. However, once the SERT arrived, it found HHS needed to provide equipment for the shelter as well as logistical and management support. Making these arrangements took time, and a full transition of shelter operations from NDMS to HHS was not completed until 14 September.

After the super shelter mission was accepted, the path of Ivan shifted west. Thus, the large-scale evacuations anticipated by Florida officials did not occur. The shelter assisted only a small number of the patients expected; 105 were the most reported at any one time. This was a fraction of the 3,000 patients the shelter was meant to serve (and of the 8,000 patients Florida officials originally requested).

HHS successfully established an organized and motivated shelter workforce with the necessary support. Although not tested to the full capacity, it certainly could have cared for a large number of patients. It is less clear to us, however, whether plans were made to successfully transport these patients to the shelter.

In this section, we will discuss the main issues encountered by HHS in transitioning and operating the super shelter. See appendix B for a more detailed account of super shelter operations.

As we discussed earlier, there was considerable controversy within the state as to whether it should request the super shelter. There has also been much debate by the federal agencies involved on the merits of this mission. Because we have little insight into operations at the state level, we cannot assess whether or not the super shelter was an appropriate request. Thus, we focus this section on how HHS implemented this request.

Transitioning super shelter operations from NDMS to HHS

Three agencies—NDMS, the American Red Cross (ARC), and the United States Forest Service (USFS)—have relevant expertise or played a role in the management and operation of the super shelter. This experience provided a good opportunity for us to test these relationships and examine how they should be improved and clarified for future shelter operations.

NDMS

The transfer of the super shelter from NDMS to HHS was a difficult process that was complicated by a poor working relationship between HHS and NDMS. The issues discussed earlier in the section

on coordinating with ESF#8 partner agencies contributed to this. Another factor was the lack of experience by all involved in implementing such a mission. Also, the change in Ivan's path after the mission was assigned resulted in personnel carrying out a mission that was (in retrospect) not necessary.

The DMATs that initially deployed to set up the shelter anticipated being able to leave rapidly after HHS arrived. Both teams were 10 days into their 14-day deployments at the time they arrived at the super shelter. It became clear early on that the transition to HHS would take time. DMATs are designed to respond to mass casualty incidents by providing emergency care under austere conditions. Caring for special needs patients is a much different scenario, leading some NDMS personnel to express dissatisfaction with their assignment.

HHS encountered two main issues when it began working with NDMS to take over operation of the shelter:

- It had no equipment to support shelter operations. DMATs deploy with an equipment cache that they take home when they demobilize. HHS arranged for NDMS to leave some soft supplies, but it had to acquire other necessary supplies (e.g., blood pressure cuffs).
- The DMATs were taking care of several patients who required specialized or advanced care that HHS could not provide (because of a lack of necessary equipment and specialized personnel). The SERT arranged to transport these patients to nearby medical facilities and to have an ambulance on standby to transport patients who needed emergency care.

In interviews, NDMS personnel criticized the SERT's decision to discharge patients to local hospitals and reported that this burdened local emergency facilities, a concern that was also raised by state personnel. The SERT, however, felt that these patients exceeded the definition of "special needs".

NDMS personnel were also critical of the SERT's decision to begin discharging patients shortly after assuming control of the shelter and thought that it occurred because the SERT was unable to sustain operations. This decision, however, came from HHS headquar-

ters, and was made because the path of the storm had changed and the mission was no longer necessary.

American Red Cross

There was confusion as to the role ARC could play in running the super shelter. ARC offered to provide guidance and assistance, but ARC policy states it may not be "in charge," or accept responsibility and liability for any medical services, such as a special needs shelter. It can, however, provide support services, including beds, blankets, and food. ARC was minimally used for this purpose for the duration of the super shelter and ARC officials felt it was not fully utilized. Although ARC could not be the lead of the mission, its institutional experience could have been more effectively tapped. ARC personnel were unsure of their role and how to communicate more thoroughly with the SERT team in the field.

United States Forest Service

During transition discussions, FEMA tasked the USFS to provide logistics support to the super shelter. The shelter mission was implemented under a unified command structure comprised of HHS and USFS. Originally tasked to provide patient tracking responsibilities, USFS played a much larger role, mainly in managing and providing needed logistical and administrative support to the shelter. This was the first time ESF#8 used USFS in this capacity, and many participants commented positively on its support.

In after action reports, USFS noted some logistical improvements that could be made in future operations. For example, many of the beds were as far away as several hundred yards from a restroom, and certain methods and supplies, such as different bed linens, could have been used to substantially increase the comfort level of the shelter's inhabitants.

Operation of the super shelter

The shelter became operational at 1800 on 11 September and was closed on 18 September. When it became apparent that the storm

was not going to hit the anticipated areas, focus shifted to caring for and discharging the existing occupants. Within a day, shelter personnel began to discharge patients. Though it constituted only a brief segment of the operation, several issues were encountered during the shelter's operation.

Operational definitions were not standardized

As discussed earlier, HHS headquarters and field personnel lacked a common situational awareness, leading to disagreements and communications difficulty. The lack of a common vocabulary also contributed to this. For example, headquarters personnel used NDMS critical patient counts, which did not include most of the special needs patients in the shelter. Thus, headquarters had the erroneous impression that there were far fewer patients than the SERT actually counted. This miscommunication led to disagreements over the need for supplies because headquarters thought the shelter was caring for far fewer patients.

SERT had to manage the shelter

In the state of Florida, individual counties run special needs shelters. ESF#8 generally provides support in the form of staff augmentation. Because of the multiple storms, the number of shelters being operated for extended periods overwhelmed the counties, and, consequently, the whole state. Thus, it requested that ESF#8 both staff and operate the super shelter.

To meet this request, the SERT took on the responsibility of managing shelter operations. This action was met with surprise and dismay by some staff at headquarters. As discussed earlier, this role is outside the scope of the SERT's intended mission. However, the SERT was the only HHS element in place that could fill this role. Although there were many PHS personnel onsite, typically they are not deployed as a team with an organizational and command structure. Rather, they are a pool of personnel that needs to have positions and duties assigned to them.

With the assistance of the USFS, the SERT quickly implemented an Incident Command System (ICS)-based organizational structure

that included clinical operations, quality assurance and safety, planning, administration, and logistics. The SERT assumed leadership positions in partnership with the USFS, assigned PHS personnel to different functions, and trained them on the ICS. Later, command of the shelter was transitioned to other PHS personnel, freeing the SERT to focus on its normal mission.

Requirements for large-scale operations are unclear

Because the shelter never housed more than a very small fraction of the 3,000 patients it was designed to care for, the operation was not fully tested. It is also unclear whether plans for transporting patients to the shelter were completed, although this plan was not an HHS's responsibility. Plans included contracting for vehicles, retrofitting buses for patient transport, and utilizing ambulance services. DOD equipment support is difficult to determine since it requires a signed request to identify available assets. The reliance on ground transport during a time of evacuation (and heavy traffic) is also an issue. This is a significant challenge that would need to be addressed for any large-scale shelter operation of any kind.

The consolidation of resources into a single super shelter is efficient; however, such an approach places a burden on the host county. The shelter needed to rely on local resources (e.g., ambulances, hospital beds) for the evacuation and care of patients who needed emergency medical support, and a few shelter patients were transported to local hospitals. If the shelter had housed the 3,000 patients it was designed to care for, the impact on the local healthcare community could have been much larger.

Recommendations

This unexpected mission yielded a unique opportunity for training and field experience. Numerous PHS personnel were trained in the incident command system and gained experience that will help them in future deployments. The mission also pointed to needed improvements in interagency relationships and the assignment of roles and responsibilities in future missions.

Although unprecedented at the time, ESF#8 is likely to see future requests to operate special needs shelters. Although it never became a formal request, Alabama expressed interest in a federally run special needs super shelter after Hurricane Ivan hit the state. HHS and its ESF#8 partners need to address how to handle similar requests in the future, and OASPHEP has initiated a multiagency planning group to do this. This group should:

- Determine the conditions and criteria under which a super shelter would be appropriate
- Identify and assess alternatives to a super shelter, such as using federal or other existing medical facilities, or transporting special needs patients out of the state
- Define the capabilities of each ESF#8 partner agency and use them to establish the roles and responsibilities of each in carrying out sheltering alternatives
- Develop plans for quickly setting up the super shelter and maintaining operations for an extended period of time, and include protocols for transferring operations if separate agencies are involved at different phases of shelter operations
- Define and make universal terms for various groups, e.g., medical patients, special needs patients, and healthy displaced individuals, and the policies that apply to each
- Work with other ESFs to ensure that supporting plans for transporting patients are being similarly addressed.

OASPHEP should incorporate the policies and plans created by this group into it's own doctrine and clarify how HHS will execute its roles and responsibilities. Considerations include the following:

- Clarifying the role of the SERT in super shelter operations
- Working with the PHS to develop team structures to better organize deploying personnel (see previous section)
- Clarifying how many and what kinds of medical staff are necessary to support special needs shelters of varying sizes
- Determining equipment needs and ensuring that there are ways to quickly obtain it during an emergency
- Ensuring that a method for tracking patients is available.

Logistics and equipment support

In this section, we address general logistics and equipment support issues that arose during Hurricanes Frances and Ivan. We covered issues relating specifically to the super shelter and the deployment of medical personnel in previous sections.

Logistics and travel

OASPHEP transported many more staff during the recent hurricanes than ever before. It made travel arrangements for these personnel through its logistics support contractor. Overall, headquarters personnel felt that the logistical support contractor provided adequate travel services. However, a few key issues were observed:

- The travel management system (TMS) did not have enough identification numbers (IDs) for all of the PHS personnel who were deployed. Thus, most personnel were deployed without the proper paperwork.
- There were shortages of hotel rooms, rental cars, and fuel. Sleeper buses were used and found to be an excellent alternative when nearby hotel rooms were not available.
- The logistics support contractor arranged for the payment of airline tickets and hotel rooms. Other expenses, such as rental cars, must be paid for by the traveler, who is then reimbursed. Many PHS personnel did not want to use their personal credit cards.
- Some PHS officers did not have cell phones, making it difficult to contact them in the field.
- The problems with tracking personnel that were discussed earlier delayed the demobilization of personnel.

- PHS officers reported delays of up to several months in receiving reimbursement for expenses they incurred while on deployment. After submitting vouchers according to standard procedures for their home offices, many officers were asked to provide additional receipts and justification for expenses, which held up payment.

Contrary to the headquarters' view, PHS personnel expressed dissatisfaction with the logistics support contractor and wanted a direct contact to call for travel-related questions. Deploying PHS officers were told to wait until the contractor reached them with their travel arrangements. Some complained they were contacted late and barely received enough time to make their flights. Others said they were not contacted at all. Once contacted with travel itineraries, personnel were given very little information on where they were to report, whom they were to report to, and what their deployment role or mission would be.

Equipment and purchasing

OASPHEP maintains a cache of equipment to support the SERT. The cache was adequate for personnel deploying as SERT members. The only concern raised was that personnel assigned as liaisons to the ERT-A needed cell phones and laptops, which FEMA did not provide.

Throughout the deployment, however, many non-SERT-related equipment requests surfaced. Examples include the following:

- There were numerous requests for cell phones by personnel not deployed as part of the SERT. Although the SERT cache includes cell phones and satellite phones, they are not intended for use by non-SERT personnel.
- The medical team deployed to Pensacola after Hurricane Ivan served in an area with heavy infrastructure damage. The staff noted the need for a satellite phone because many cell phone towers had been destroyed.
- There was uncertainty surrounding the need to provide for long-term equipment needs after the SERT demobilized. All

equipment sent with the SERT went back with it. However, after the SERT left, liaisons remained in place at several locations that might have required equipment support.

As discussed in the super shelter section, equipment purchases were made to support operations after they were transferred from NDMS to the SERT. Some SERT and shelter staff members were unfamiliar with OASPHEP purchasing policies, which caused problems. For example, a $10,000 purchase order was approved for phone lines and telecommunication services at the super shelter; however, the Contracting Officer later received a bill for this purchase totaling $37,000.

Recommendations

Many of the travel-related issues noted here have been raised in previous responses. Because many staff members were deploying for the first time, they were unfamiliar with OASPHEP travel policies, which sometimes interpret travel regulations differently from the home offices of deploying personnel. To prevent these issues from continuing to surface in the future, OASPHEP should develop a written travel policy that is distributed to all deploying staff members prior to departure. This policy should include the following:

- Explain OASPHEP travel policies and the reasons for them
- State which expenses are pre-paid and which will be reimbursed for the travel
- Describe how to document and account for expenses while on deployment
- Include contact information and answers to frequently asked questions.

OASPHEP should continue to work with other HHS administrative and financial offices to improve the travel management system, general administrative, and financial procedures so that these systems function properly during large-scale emergency deployments.[9]

9. In the spring of 2004, OASPHEP developed an implementation plan to improve its emergency administrative and financial processes and

TMS should be cleaned up by eliminating outdated IDs and adding additional memory or capacity. OASPHEP should identify alternative methods to issue travel orders in the event that problems with TMS occur again in the future.

As OASPHEP begins to standardize the deployment for certain types of events, equipment needs should be incorporated into its associated procedures or checklists. Furthermore, a method for issuing and tracking equipment should be incorporated into the previously mentioned improvements to OASPHEP's personnel tracking and incident management system.

OASPHEP should work with the PHS as it develops team structures and a system for deploying and supporting personnel involved in ESF#8 response activities. OASPHEP should ensure that these teams obtain and maintain equipment that is compatible with the SERT cache.

In particular, issues with the provision of communications equipment should be addressed. Even if OASPHEP does not provide communications equipment outside the SERT, it should work with PHS and other deploying personnel to identify the best way to address these issues and ensure that all personnel in the field can communicate. Alternatives include use of the federal disaster communications plan (which allows cell phone systems to be closed to routine calls) and USFS equipment caches available under ESF #2.

To avoid purchasing problems in future deployments, the SERT should designate a single point of contact for each location who is in charge of ensuring that OASPHEP policies are followed for all services or purchases paid for with purchase orders. This policy should be incorporated into SERT training programs and other materials.

began implementing changes. One key element of this plan under development is the creation of an Administrative Support Team (AST) to provide surge personnel to perform administrative and financial functions during emergency operations.

Glossary

AOA	Administration on Aging
ARC	American Red Cross
ARF	Action Request Form
ASH	Assistant Secretary for Health
ASPHEP	Assistant Secretary for Public Health Emergency Preparedness
AST	Administrative Support Team
BOP	The Bureau of Prisons
CCRF	Commissioned Corps Readiness Force
CDC	The Centers for Disease Control and Prevention
CMS	The Centers for Medicare and Medicaid Services
CNAC	The CNA Corporation
CONOPS	Concept of Operations
DFO	Disaster Field Office (FEMA)
DHS	U.S. Department of Homeland Security
DMAT	Disaster Medical Assistance Team (NDMS)
DOD	U.S. Department of Defense
ED	Emergency Department
EOC	Emergency Operations Center
ERT	Emergency Response Team (FEMA)

EST	Emergency Support Team (FEMA)
ESF	Emergency Support Function
FDA	Food and Drug Administration
FEMA	The Federal Emergency Management Agency
HHS	U.S. Department of Health and Human Services
HRSA	Health Resources and Services Administration
ICS	Incident Command System
IDs	Identification Numbers
IMT	Incident Management Team
IHS	Indian Health Service
JMT	Joint Management Team
MA	Mission Assignments
MOU	Memoranda of Understanding
MST	Management Support Team
NIH	The National Institutes of Health
NOAA	The National Oceanic and Atmospheric Association
NDMS	National Disaster Medical System
NRP	National Response Plan
OCCC	Orange County Convention Center
OFRD	Office of Force Readiness and Deployment
OASPHEP	Office of the Assistant Secretary for Public Health Emergency Preparedness
OPDIVs	Operational Divisions
OR	Operating Room

OSG	Office of the Surgeon General
PHS	U.S. Public Health Service
PIO	Public Information Officer
RHA	Regional Health Administrator
ROC	Regional Operations Center (FEMA)
RT	Respiratory Therapist
SEOC	State Emergency Operations Center
SERT	Secretary's Emergency Response Team
SOC	Secretary's Operations Center
TMS	Travel Management System
USFS	U.S. Forest Service
VA	Department of Veterans Affairs

Appendix A: Medical response team examples

In this appendix, we review several models of medical team structures that have been used by HHS and other agencies. These models should prove informative to PHS as it develops its own team structures. We discuss two types of teams: medical teams and support teams.

Medical teams

Medical teams are primarily composed of medical personnel and are intended to directly carry out medical missions. We describe several types of medical response teams that were used during Hurricanes Frances and Ivan, or that have been used in the past. Some of these teams also include supporting personnel, like communications or logistics officers.

Strike teams

Medical strike teams are generally described as small, rapidly deployable teams that can operate with limited support. In table 2, we show two examples of strike teams. As shown in the first column, PHS assembled six 12-member strike teams in response to Florida's request that 300 medical personnel be pre-staged for Hurricane Frances. This team structure was created at the time of the request and is not indoctrinated in OASPHEP or PHS training. It did not include any support personnel other than an Emergency Manager.

NDMS began to focus more closely on the importance of strike teams at about the time it was moved into DHS. The example shown in the second column includes several supporting personnel in addition to the medical personnel.

Table 2. Strike team examples

PHS teams assembled for Hurricane Frances	NDMS strike teams for a hypothetical Smallpox scenario [7]
Emergency Manager	Physician
Medical Officer	Physician Assistant or Nurse Practitioner
2 Physician Assistants or Nurse Practitioners	3 Registered Nurses
Supervisory RN	Pharmacist
5 Registered Nurses	Comms Officer/Medical Records Specialist
Pharmacist	Logistics/Transportation Specialist
Environmental Health Officer	

Hospital-based team

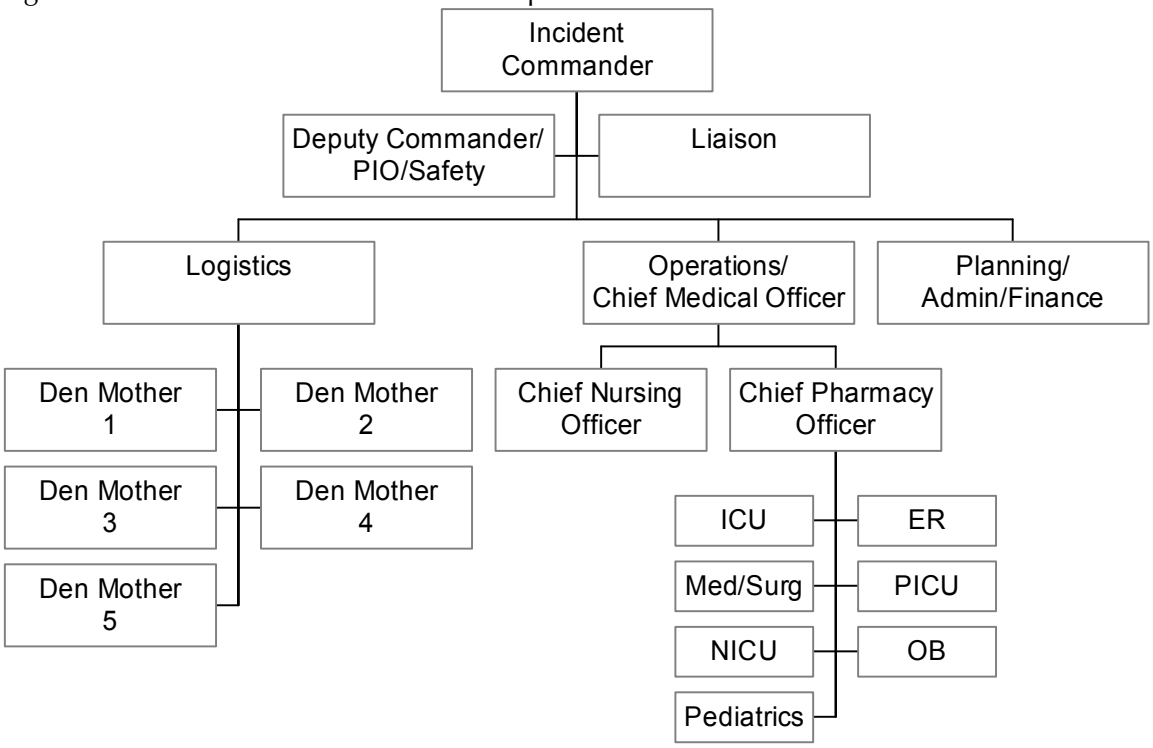
On 17 September, the State of Florida requested 61 personnel to augment staff at Sacred Heart Hospital. Many of the PHS officers sent to fill this mission were transferred from the super shelter where they had recently had (ICS) training. The Medical Officer tasked to lead the personnel assigned to this mission developed an ICS-based command structure shown in figure 13.

Figure 13 shows six leadership positions from the incident commander to the section chiefs. Two people filled these six roles. They were the main interface between the PHS team and the hospital and were responsible for managing the team and overseeing operations. They continually assessed the hospital's needs to determine whether the mission was being accomplished and when the logical endpoint would be.

Because of the lack of available hotel rooms in the area, staff was housed in 5 sleeper buses with 12 bunks each. Each bus had a Den Mother who was self-selected by the bus residents. The Den Mother was responsible for coordinating all nonoperations-related news, such as information on administrative and logistical issues.

The operations section was divided according to specialty, and the incident commander appointed individuals to lead each specialty area based on his or her experience level. These individuals were responsible for scheduling and coordinating operational information.

Figure 13. HHS ICS for Sacred Heart Hospital Mission



VA teams

As shown earlier, the VA deployed many medical personnel in support of ESF#8. It deployed 5 teams to assist HHS in pre-staging personnel for Hurricane Frances. The VA teams ranged in size from 17 to 19 personnel. A total of 91 persons were deployed. Each team included a combination of the following personnel:

- Emergency Managers
- Supervisory RNs
- RNs and/or LPNs
- Certified Nursing Assistants (CNAs)
- Health Technicians
- Pharmacists

- Drivers
- Administrative Clerks.

The VA handled all logistical and support arrangements for its personnel and staged them in Miami before deploying them to their assignments in Sebastian (two teams), St. Lucie, Port St. Lucie, and Fort Pierce. The majority of these personnel later moved to the Super Shelter.

The VA also deployed two teams with a similar make-up following Hurricane Ivan. A team of 21 people was deployed to Sacred Heart Hospital in Pensacola and another team of 13 was deployed to South Baldwin Medical Center in Foley, Alabama.

DMATs

NDMS Disaster Medical Assistance Teams (DMATs) are 35-member teams that are designed to deploy within 8 hours of notification with a cache of medical equipment and other supplies. They are capable of being self-sufficient for up to 72-hours, providing medical care at a fixed or temporary site, and treating up to 250 patients per day. The 30 core DMAT positions are listed in table 3. The 5 additional team members are chosen by the team based on their specific needs.

Support teams

Some of the medical teams we discussed above included support positions, such as communications officers and drivers. In a large-scale emergency, PHS may need to create an additional, separate team to provide logistical and management support to teams already deployed in the field. One of the comments we often heard from interviewees was that PHS needed a "Management Support Team." Many HHS and ESF#8 personnel remember this team from when NDMS and the Office of Emergency Preparedness (OEP) were part of HHS.

Table 3. Core DMAT positions [7]

Position	Number
DMAT Leader	2
Administrative/Finance Chief	1
Logistics Chief	1
Medical Officer	3
Pharmacist	1
Pharmacy Assistant	1
Supervisory Nurse Specialist	2
Staff Nurse	6
Advanced Practice Nurse or Physician Assistant	4
Safety Officer	1
Paramedic	4
Equipment Specialist	1
Communications Officer	2
Administrative Assistant	1
Total	30

The Management Support Team (MST) is a concept developed by NDMS to coordinate NDMS resources in the field. Now that NDMS has been moved to DHS, the MST has evolved into the JMT, which is responsible for coordinating both NDMS and Urban Search and Rescue resources.

The mission of the MST was to provide onsite management direction to HHS health and medical response teams to assure rapid and timely delivery of health and medical services to disaster victims [7]. In addition to providing various logistical, administrative, and equipment support to deployed teams, the MST worked closely with the HHS regional emergency coordinators (which were also moved to DHS) to report on available resources and identify needs for additional resources. This latter role is more in line with the function of the SERT, and many personnel remember the MST as "coordinating ESF#8 in the field."

The MST leadership included a Commander, Deputy Commander, and Chief Medical Officer. The team was organized along the incident command system and included Chiefs for Operations, Planning, Logistics, and Administration/Finance.

Although remembered positively by many people we spoke with, the NDMS MST did have some problems that needed to be resolved. It was unclear to many NDMS personnel whether the MST was a command and control element, a support element, or both, and there was some friction between it and the response teams it supported [7].

Appendix B: Super shelter—description of events

On September 9th, Hurricane Ivan was upgraded to a category 5 hurricane and threatened landfall only a week after the effects of Hurricane Frances had been felt. As a result, Florida began planning for a "super shelter" to accommodate up to 8,000[10] patients in the Orlando area in case they needed to move patients there. The next day the ARF was received to deploy federal assets to support the super shelter mission.

NDMS was tasked with the initial assignment to stand-up the super shelter at the Orange County Convention Center (OCCC). According to its MA, HHS was to take over management of the shelter after the first 24 hours. This transfer was delayed due to HHS issues encountered in acquiring equipment and establishing other logistical support.

NDMS set up the super shelter, which became operational at 1800 on 11 September and was ready to receive 1,000 patients at that time. NDMS staffing included 2 DMATs. At this time it was anticipated that additional mental health personnel and 200 nurses were needed to ramp up operations. Additional ESF#8 personnel from PHS, VA, and DOD began arriving and HHS requested the transfer of personnel from the community outreach program to the mega shelter to support administrative efforts. Ultimately, a total of 665 federal and state personnel from over 20 agencies were used to staff the shelter [8].

The first residents arrived at the shelter at 1230 on 12 September. The U.S. Forest Service (USFS) arrived with a patient tracking system, TRACES, that same day. At this time, two patient numbers

10. The approved MA scaled this number down from 8,000 to 3,000 patients.

were simultaneously being reported: 105 and 29. It was later determined that 29 referred only to the number of medical patients. The larger number also included special needs patients.

With the help of the USFS, the SERT team began using an Access database to track personnel. Administrative staff spent a considerable amount of time checking in all of the ESF#8 personnel sent to staff the shelter, verifying their skills, and selecting appropriate deployment roles.

By 13 September, it became clear that the storm was not going to land where anticipated, and that many of the efforts that had been made were no longer needed. VA was receiving requests to help augment staff in three area hospitals and inquired if it could transfer personnel currently at the shelter. At this time, there were 29 medical patients in the super shelter and 177 clinical staff members. There were more than 90 special needs residents overall.

The SERT established a unified command with the USFS (see figure 14). Most initiatives were managed in conjunction with USFS, including infection control, hazard mitigation and logistical items, such as database development. The creation of an Emergency Medical Screening Form that documents medications and other self-care needs was significantly useful and later aided in rapid discharging as well.

On 14 September, NDMS completed the transfer of shelter management to the SERT and the two DMAT teams present were demobilized. Other federal agency efforts were being made to prepare the panhandle area of Florida for the brunt of Ivan. At this time, nurses were being diverted from the shelter in Orlando to Atlanta in anticipation of the needs in Alabama, Mississippi, Louisiana, and the panhandle of Florida.

Shelter personnel continued to work effectively with the small population present at the shelter. By 1700 on 15 September, 32 residents had been discharged, with other patients being steadily discharged the following day.

Figure 14. OCCC special needs shelter leadership team I [8]

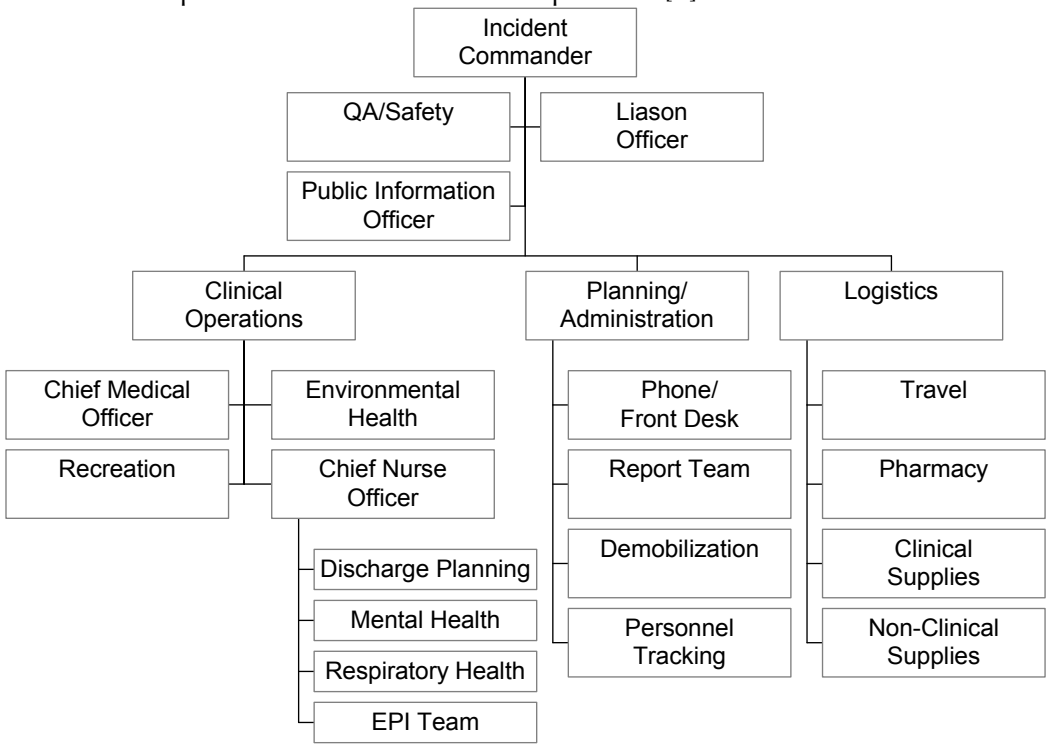
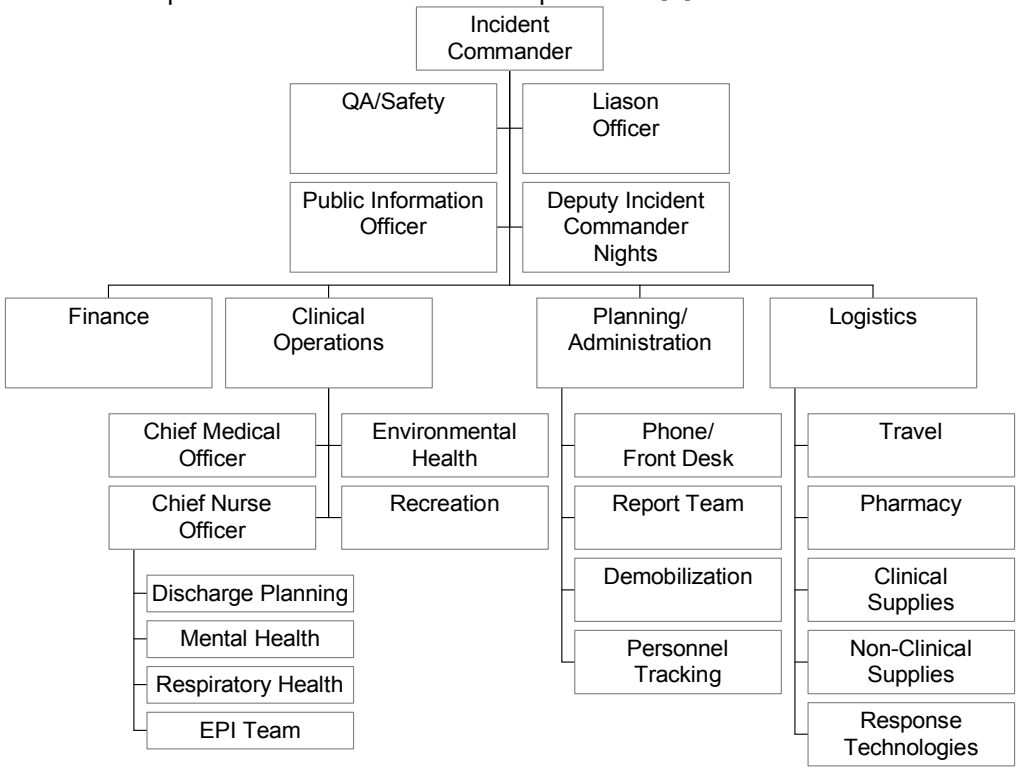


Figure 15. OCCC special needs shelter leadership team II [8]



On 17 September, the SERT transferred leadership of the shelter to a second leadership team (figure 15) comprised of PHS officers. Demobilization began that day, and the SERT planned to close the shelter the next day.

The last patient was discharged at 1730 on 17 September. The Florida Department of Elder Affairs was helpful in locating nursing home and assisted living facilities in Port St. Lucie and Fort Pierce for the shelter residents who were still in need. Orange County coordinated allocation and transportation of patients to hospitals where necessary.

Appendix C: Reconstruction

Table 4 details a reconstruction of events during Hurricanes Frances and Ivan. This reconstruction is based on data from E-Team, ESF#8 phone calls, and interviews.

Table 4. Reconstruction: Hurricanes Frances and Ivan

Date	Time	Category	Description
30-Aug	1200 - 2400	FEMA/ Stafford Act	FEMA completes operational response plan for Hurricane Frances
		HHS/SOC	First E-Team entry on Hurricane Frances
31-Aug	1200 - 2400	HHS/SOC	Region II RHA monitoring conditions in Puerto Rico and Virgin Islands, no requests for federal assistance yet
1-Sep	1200 - 2400	FEMA/ Stafford Act	ERT-A in St. Thomas to stand down, no threat to Puerto Rico or Virgin Islands
		NDMS	4 DMATs to deploy to Atlanta/FL; FL DMATs on alert
2-Sep	0000 - 1200	FEMA/ Stafford Act	Hurricane Charley DFO (Orlando) closed; ERT-As deployed to Orlando, Tallahassee, Atlanta, S. Carolina; Region IV ROC activated for Frances
		SERT	SERT Liaison to ERT-A Tallahassee enroute
2-Sep	1200 - 2400	Frances	Frances at category 4
		Ivan	NWS identifies tropical depression 9
		ARFs	ARF reported to be in process for a substantial number of medical professionals
		NDMS	3 DMATs enroute; will stage in Atlanta; 1 VMAT to stage in NC
		Red Cross	Teams staged between Orlando and Atlanta
		Patient movement	Discussion in 1700 concall regarding potential request for assistance in moving patients
		Special needs shelters	Issue of sheltering special needs patients (including dialysis and other electrically-dependent patients) discussed in 1700 concall
3-Sep	0000 - 1200	Ivan	Tropical depression 9 upgraded to tropical storm Ivan
		ARFs	FL requests 300 clinicians from ESF#8
		HHS/SOC	HRSA emergency response center stands up
		Blood supply	FL blood centers continue closing down operations in preparation for storm
3-Sep	1200 - 2400	Frances	Concern over large size of Frances and potential for large amount of rainfall
		SERT	Federal ESF#8 office standing up with ERT-A in Tallahassee
		ARFs	300 clinical providers to be put on stand-by, current shortages in ER/ICU nurses, PA/NPs, radiation techs; FEMA request for 150 community relations staff members
		Red Cross	91 shelters reported open with 30,275 people; 155 shelters on standby
		Blood supply	ARC and independent centers report adequate supply of blood, some concern over supply of platelets
4-Sep	0000 - 1200	Frances	Frances approaching West Palm Beach, FL
		FEMA/ Stafford Act	Major disaster declaration issued for Florida for response to Hurricane Frances
4-Sep	1200 - 2400	Frances	Frances at category 3, not expected to intensify, rain is main concern
		FEMA/ Stafford Act	FEMA begins working on action plan for second strike in FL panhandle and flooding in FL

Table 4. Reconstruction: Hurricanes Frances and Ivan

Date	Time	Category	Description
		ARFs	ARF for 300 clinical providers almost filled, will complete once it becomes a MA
		MAs	HHS discusses filling of MA for 150 community relations personnel
		HHS/SOC	HHS requests financial information from FEMA on FL needs for next 3 days, working on cost estimate
		Special needs shelters	300 special needs patients reported to be sheltered, may require personnel assistance 48 hours after storm
5-Sep	0000 - 1200	Frances	Frances eye makes landfall 35 miles North of West Palm Beach, FL, at category 2
		Ivan	Ivan upgraded to a category 1 hurricane
5-Sep	1200 - 2400	Frances	Frances downgraded to tropical storm, heavy rains expected
		Ivan	Ivan intensifies to a category 4 hurricane
		MAs	No MA yet for staffing for special needs shelters; still working on community relations personnel (hard to contact people during holiday weekend, can't answer questions on training, deployment length, etc.)
		Medical personnel	Discuss sending 5 15-person teams to FL after storm; potential need for pharmacists
		Community outreach	HHS post information on ETEAM for personnel identified to support community relations mission
		Special needs shelters	59/200 shelters reported open, serving 6,000 people; SERT reports differing state opinions on need for federal support
		Senior citizens/aging	Difficulty in determining number of people eligible to receive drugs because of mail-order subscriptions
6-Sep	0000 - 1200	Frances	Frances hits FL panhandle
		Ivan	Ivan weakens to a category 3 hurricane
6-Sep	1200 - 2400	Ivan	Ivan weakens further but is expected to intensify again
		SERT	Additional HHS personnel deployed to Orlando to support SERT Leader
		Medical personnel	4 PHS teams complete, working on additional 2, discuss adding 1 pharmacist per team; VA assembling 4 teams to stage in Miami; discuss adding environmental personnel to teams
		NDMS	Field reports NDMS assuming mission ends 700 tomorrow, but won't have PHS/VA teams in by then so they will need to stay longer
		Special needs shelters	SOC receives list of three additional special needs shelters where federal support is needed from ERT-A Tallahassee
		Senior citizens/aging	Concern about paying hospitals for dialysis patients care (because centers have lost power); CMS Atlanta will handle this issue; Issue of senior medications raised again, ARC hasn't been successful in dealing with this
		Logistics	Discuss how quickly can get medical teams in, problem getting flights so soon after storm
		CDC	CDC reports verbal approval for 5 ARFs received through DHHS/SOC from FEMA Region IV ROC
7-Sep	0000 - 1200	Frances	Frances downgraded to tropical depression, still circulating in GA and SC
		Ivan	Ivan heading towards Cuba and FL
		MAs	ARFs for CDC assistance reported to be MAs, CDC filling and needs a copy
		Medical personnel	Identified locations of 8 teams, working on location of 3 additional teams; verification of needs necessary, some locations may not need support; CCRF staffing 6 teams ready to go, VA staffing 4 teams, which are arriving in Miami today, 5th team in MS
		Community outreach	CCRF reports 39 officers deployed for community relations; FEMA provides SOC with information for arranging authorization and travel
		Logistics	VA to coordinate housing for its teams
		Hospitals	VA Hospital in W. Palm Beach reported to have no water
		Blood supply	Damage reported to Melbourne facility blood center, need to backfill some hospitals with blood

Table 4. Reconstruction: Hurricanes Frances and Ivan

Date	Time	Category	Description
7-Sep	1200 - 2400	Ivan	Ivan at category 4, could intensify further
		FEMA/ Stafford Act	FEMA begins standing up DFO in Orlando
		SERT	Several SERT members enroute to Orlando, should arrive tonight, PHS team leads to coordinate with SERT Leader
		MAs	MA for shelter still needed, also more information on specific locations of personnel, MA for mobile medical trailers posted on E-TEAM
		Medical personnel	34 VA personnel reported at 3 locations, 3 PHS teams reported at 2 locations, 3 additional PHS teams to stage in Orlando tonight
		Community outreach	VA has 93 people training for community relations in Atlanta, has had trouble contacting FEMA about whether they are still needed; PHS has sent 40 for community relations; EST contacts SOC for information on those authorized to deploy, want to track personnel and address problems with travel arrangements; EST reports community relations personnel are being staged and deployed
		HHS/SOC	FEMA requests information on health and safety impact from HHS for White House Briefing; SOC fills request
		NDMS	Atlanta ROC reports that state upset that PHS/VA teams not relieving NDMS teams fast enough
		Red Cross	Operating hotline, caring for 22,295 people in 93 shelters
		Logistics	Need to know where everyone is so can evacuate before Ivan if necessary; tracking of community relations personnel discussed - names of deployed PHS officers should be forwarded to SOC
		Hospitals	HRSA reports some damage to FL health centers
		Blood supply	ARC reports request for blood from three W. Palm Beach facilities, asks request be forwarded to proper channels - task force
8-Sep	0000 - 1200	Ivan	Ivan at category 4, expected to hit Jamaica on Friday, forecast to hit FL late Monday or Tuesday
		SERT	SERT members at DFO Orlando, which will officially open tomorrow; SERT tours duty locations of PHS and VA medical teams
		Medical personnel	4 PHS teams reported on ground and working, 2 more flying in today, 4 VA teams working as of this morning; asking each PHS team to have 1 environmental person assigned
		Community outreach	FEMA reported that no more community relations personnel are needed
		HHS/SOC	HHS requests CNAC develop an Access database to track personnel and match them to requests
		Patient movement	Charlie MA for EMS contract for patient movement discussed, money left so it may be expanded for Frances
		Special needs shelters	FL reported to be concerned about moving shelters and setting up new shelters
		Logistics	HHS to coordinate decision to evacuate personnel for Ivan; SOC receives locations for deployment of PHS and VA medical teams
		CDC	Community health assessment team began working today
		Blood supply	SERT reports no evidence of blood shortage, 1 W. Palm Beach blood bank on generator power
8-Sep	1200 - 2400	Ivan	High uncertainty in Ivan forecast track past 72 hours
		FEMA/ Stafford Act	DFO stood up in Orlando, FL
		SERT	SERT Env Health Officer reports to DFO
		ARFs	Request for ER nurses for 2 hospitals forthcoming
		Community outreach	VA questioned location of community relations personnel; breakdown in information from FEMA to SOC
		NDMS	St. Lucie DMAT teams ask to be released, VA nurses now providing support, SERT will reassess tomorrow
		Red Cross	Opening shelters in NC and VA

Table 4. Reconstruction: Hurricanes Frances and Ivan

Date	Time	Category	Description
		Patient movement	EST Liaison to follow up on use of EMS contract for potential patient movement
		Special needs shelters	State planning on moving special needs shelter patients from W. Coast of FL to safer location, may need ESF#8 support
		CDC	Asks for info on environmental health personnel assigned to special needs shelters - could they assist with other efforts?
		Environmental issues	Vector control issues being addressed
		Blood supply	FDA follows up on W. Palm Beach blood bank, no product lost or damaged
9-Sep	0000 - 1200	Ivan	Ivan upgraded to category 5, expected to weaken before hitting FL, could hit FL as early as Sun night or Mon
		FEMA/ Stafford Act	Hurricane Frances ESF#8 transferred from FEMA ROC to DFO
		SERT	SERT Leaders reports difficulty monitoring environmental support, will follow up for CDC
		Community outreach	Issues regarding travel orders for PHS personnel doing community relations
		Patient movement	Governor expected to amend Charlie MA to cover Frances
		Special needs shelters	State planning for potential evacuation of nursing home and assisted living residents
		Environmental issues	More environmental-related requests coming into DFO; SERT EHO to coordinate activities of environmental personnel and reassign as needed
9-Sep	1200 - 2400	Ivan	Ivan weakens to category 4
		FEMA/ Stafford Act	DFO closes during night shift for hurricane
		ARFs	ARF received by ESF#8 for elderly care/special needs shelter, another ARF received for mosquito spraying
		MAs	MA reported for environmental health personnel from Sep. 15-20
		Community outreach	CMS personnel deployed for community relations identified and reported to SOC
		NDMS	Continuing concerns over releasing NDMS personnel
		Patient movement	State to request assistance in moving up to 4,000 patients by airlift beginning on Saturday
		Special needs shelters	State planning for “mega shelter” to accommodate up to 8,000 patients in case they need to move patients there
10-Sep	0000 - 1200	Ivan	Ivan expected to remain a major hurricane until landfall in FL
		ARFs	ARF received for federal assets to support mega shelter; ARF received for airlift of patients from 7 locations to mega shelter and back
		Patient movement	Issue of patient tracking raised
		Special needs shelters	Mega shelter plans put on hold last night due to disagreement between Secretary of Health and another Director but moving forward today
10-Sep	1200 - 2400	Ivan	Ivan regains category 5 strength, track moved farther North, forecast to hit FL North of Tampa
		ARFs	VA reports to SOC that it can fill entire St. Lucie Medical request and part of Ft. Pierce requests for personnel - if asked - can’t support ARF 58
		MAs	HHS provides the following cost estimates to the ROC: mega shelter - $184M, and airlift - $10M

Table 4. Reconstruction: Hurricanes Frances and Ivan

Date	Time	Category	Description
		Medical personnel	HHS decides to reassign personnel serving on community relations MA to work in mega shelter, sends request to CO for nurse volunteers for medical shelter
		HHS/SOC	HHS working on costing and drafting MAs for mega shelter and airlift; need detailed information on types of patients being moved, what care they need, etc.
		NDMS	NDMS received MA to stand up mega shelter and operate for first 24 hours
		Patient movement	Discuss request to transfer up to 1,000 patients (actually 500 each patients and caregivers) out-of-state by air; much confusion over status and content of request; no system for tracking patients at mega shelter yet
		Special needs shelters	Mega shelter to be established at Orange County Convention Center to handle up to 8,000 patients
		Logistics	Issue of supplying beds and others supplies for mega shelter discussed
11-Sep	0000 - 1200	Ivan	Ivan weakens to category 4 due to interaction with Jamaica, track shifted west
		SERT	Additional staff deployed to SERT
		ARFs	SERT concern over status of ARFs, requests for mental health personnel and 200 RNs reported
		MAs	No MA for federal assistance in patient air evacuation - issue of pre-event financing
		Medical personnel	CCRF, VA, others locating people to fill requests
		Community outreach	Moving 31 PHS Community Relations personnel to do admin work at mega shelter
		NDMS	2 DMATs onsite at mega shelter
		Patient movement	Decision made by state to use National Guard assets for patient movement; confusion over where patients being sent
		Special needs shelters	Mega shelter ready to receive up to 1,000 patients by 1800
		Logistics	VA to handle housing for its personnel - HHS will assist
11-Sep	1200 - 2400	Ivan	Ivan regains category 5 strength
		ARFs	Navy requests Line of Accounting memo from HHS for respiratory therapist team
		MAs	Airlift mission cancelled; state determines they don't need to send people out-of-state
		Medical personnel	Discussion about filling med/surge nurses request from 3 hospitals
		Special needs shelters	Do not expect mega shelter to receive the large number of patients planned for
		Logistics	SERT concerned there will not be enough housing in area for all people reporting to duty at mega shelter - ESI finding housing that's too far away, HHS contacts Disney World for available rooms
12-Sep	0000 - 1200	Ivan	Ivan weakens to category 4
		ARFs	Phone conversation re: St Lucie and Lawnwood. Were on same ARF request. Lawnwood cancelled, St Lucie said they are also all set and don't need additional nurses. If so, they will have to fill out new ARF.
		SERT	SERT begins pre-planning for panhandle response
		Patient movement	U.S. Fire Service personnel provide assistance to HHS in-patient tracking using TRACES software
12-Sep	1200 - 2400	Ivan	Ivan regains category 5 strength
		SERT	SERT begins using Access database to track requests and personnel
		Medical personnel	Request for respiratory therapists at mega shelter canceled, but HHS wants to keep DOD staff there in case needed elsewhere; problems with canceled orders reported; HHS needs to fix paperwork

Table 4. Reconstruction: Hurricanes Frances and Ivan

Date	Time	Category	Description
		Special needs shelters	First patients arrive at mega shelter, working with state on discharge procedures, Forest Service assisting with patient tracking
		Logistics	Concern regarding releasing NDMS from mega shelter; HHS can replace staff, but not DMAT caches
13-Sep	0000 - 1200	Ivan	Forecast track shifted farther west, impact to LA and MS
		MAs	VA received MA to staff 3 hospitals, requests extra VA staff at mega shelter be used to fill MA; DOD confusion over proper procedure regarding subtask for respiratory therapists
		Special needs shelters	29 patients in mega shelter; 177 clinical staff members
		Medical personnel	10 nurses for St. Lucie; nurses show up, but are told that they are not needed, and that ARF was cancelled
13-Sep	1200 - 2400	Ivan	Some weakening expected, eyewall passes over Cuba, U.S. landfall expected Wed night
		Jeanne	NWS identifies tropical depression 11
		SERT	SERT begins pre-response planning with Gulf states
		MAs	VA received some information saying staff no longer needed for MA - need to get MA cancelled
14-Sep	0000 - 1200	Ivan	Ivan weakens to category 4, tropical storm and hurricane watches in effect for parts of FL, LA, and MS, storm movement reported very slow
		Jeanne	Tropical depression 11 upgraded to tropical storm Jeanne
		FEMA/ Stafford Act	Region IV ROC activated for Hurricane Ivan; ERT-As deployed to Atlanta, LA, MS
		SERT	SERT is developing overall strategic plan
		Community outreach	CDC reports misinformation in field coming from community relations personnel on housing and environmental issues - needs to be fixed
		Special needs shelters	Reported that AL has limited special needs shelters, will hospitalize these patients
14-Sep	1200 - 2400	Ivan	First impact on Gulf states expected midmorning tomorrow, potential to still be at hurricane strength 12 hours after landfall
		Jeanne	Jeanne expected to intensify into hurricane
		FEMA/ Stafford Act	DHS-FEMA requests identification of ESF#8 resources required to meet needs in Region 6 in response to possible hit by Hurricane Ivan
		ARFs	ARF for 5 VA nurses for St. Lucie Hospital expected
		MAs	New MA for Ivan to stand up ROC
		Community outreach	CMS asks for contact regarding community relations personnel - want to know if continuing work or if staff will be demobilized
		Red Cross	16 shelters open holding 3,100 people - primarily in FL panhandle
		Special needs shelters	Transition of mega shelter from NDMS reported to be completed
		Senior citizens/aging	Expect special needs issues in LA, AL, MS because do not have response experience of FL
		Logistics	Trying to identify personnel deployed near limit so can demobilize before Ivan
15-Sep	0000 - 1200	Ivan	Ivan expected to make landfall at about 9 pm tonight as a category 4 storm
		ARFs	AL expected to request assets today
		MAs	CDC concerned over MA for 20 Env Health Service Officers - needs to be located - ROC contacts state to resubmit
		Community outreach	Still have no information on community relations personnel - NDMS liaison at EST to track info down
		NDMS	NDMS pre-staging DMATs to assist immediately after Ivan hits

Table 4. Reconstruction: Hurricanes Frances and Ivan

Date	Time	Category	Description
		Special needs shelters	Confusion reported on how to classify residents of mega shelter, currently have 90 special needs residents and 11 caregivers, 1 death (unrelated), expect to discharge 21 today
		Senior citizens/aging	AoA reports concern over AL coastline population
15-Sep	1200 - 2400	FEMA/ Stafford Act	ESF#8 functions transferred from region 4 ROC to the DFO Orlando as of 1410 09/15/04
		ARFs	ARF being generated for 30 patients at a hospital that can't evacuate them
		MAs	Received MA for 20 environmental health officers; CDC to begin deploying personnel this evening; approximately 70 of 100 residents from a nursing home near Biloxi, MS, were moved to Keesler AFB under DOD with the remaining residents moved to a VA location; the state contacted the local VA with concerns that adequate support/supervision for these people was not available; the ROC has been contacted and a MA from the state is expected to cover expenses
		Patient movement	Report on patients/residents evacuated from FL panhandle healthcare facilities: Nursing Homes: 319; Hospitals: 0; Assisted Living Facilities: 276; Total Evacuees: 595
		Special needs shelters	Discharged 32 patients today, 60 left in mega shelter; target midnight Fri to close shelter
16-Sep	0000 - 1200	Ivan	Eye of Ivan makes landfall as a category 3 storm, expected to stall over Appalachians and cause flooding
		Jeanne	Jeanne expected to strengthen to hurricane within 24 hours, could threaten FL, the Carolinas
		FEMA/ Stafford Act	Major disaster declarations for Ivan issued for FL, LA, MS, and AL
		SERT	Requests demobilization of 111 personnel; HHS log only has 88 names
		ARFs	ARF submitted for vector surveillance for Ivan - can't be filled because no declaration for Ivan yet; AL ARF for nurses and respiratory therapists; discussion of ARF related to AFB last night - not MA yet because no disaster declaration
		MAs	ARF for 5 nurses for St. Lucie Hospital will be added to MA 4 with funding increased to $3.5M
		Medical personnel	Birmingham likely to request nurses for mega shelter (50 diverted from Orlando to Atlanta); concern over deployment deadline for Corps Officers; HHS arranges relief from deadline
		Red Cross	ARC reports operating 252 total shelters last night housing 32,500 people
		Special needs shelters	64 people in mega shelter in Orlando; Birmingham begins planning for mega shelter that will house some special needs patients
		CDC	Request for CDC staff to do a study on pesticide exposure
		Hospitals	Reports coming on various damage to hospitals in FL and MS (e.g., damage to roof, lost power/water)
		Medical evacuation	Discussion of evacuation of U.S. citizens from the Grand Caymans; DOS to request HHS medical personnel be on flight to do assessment; HHS to look into nurses, problems getting MDs to Miami in time for 1315 flight, need to address supplies
16-Sep	1200 - 2400	Ivan	Ivan downgraded to tropical storm
		Jeanne	Jeanne just below hurricane strength, could hit FL or Carolinas in next 5--7 days
		ARFs	ARF for MDs, nurses, underway for Dade County Shelter; unclear FL request for DMORT; do not expect requests for federal assistance from LA and MS; MS did evacuate patients to an AFB and VA facility, but this request did not follow normal channels (causing issues regarding reimbursement); request from AL for CDC EARS surveillance

Table 4. Reconstruction: Hurricanes Frances and Ivan

Date	Time	Category	Description
		Special needs shelters	Mega shelter has 33 patients, total of 957 patients in FL special needs shelters; most special needs shelters in LA now closed
		Medical personnel	8 respiratory therapists requested from DOD. All are currently at the OCCC and may be requested for new mission to western FL.
		CDC	CDC trying to fill request for 20 sanitarians - unlikely it will find that many; CCRF agrees to assist
		Hospitals	Damage to 3 FL hospitals reported
		Blood supply	Concern over NW FL blood center in Pensacola - have not been able to contact
17-Sep	0000 - 1200	Ivan	Ivan still causing severe weather and rain
		Jeanne	Jeanne hit Puerto Rico last night, became hurricane briefly, expected to strengthen to hurricane again
		ARFs	Ivan ARFs include: 2 for CDC technical assistance (1 person each), 1 for 61 medical personnel for Sacred Heart Hospital; ARF for environmentalists being priced by SOC; do not anticipate any medical requests from LA
		MAs	MA from FEMA to send ESF#8 rep to Puerto Rico, verbal MA to provide 60 nurses and pharmacy staff to FL hospitals - VA assisting in finding nurses
		Special needs shelters	Mega shelter down to 29 patients
		Hospitals	VA reports problems at Medical Center in San Juan; no sustainable power - need to fix this or may have to evacuate patients
		Medical evacuation	Grand Cayman's flight complete; State Dept wants to do another flight today; need to find out how many flights planned so can continue to provide medical support
		Blood supply	Pensacola blood center to be open today, concern over delivery of blood to NW blood bank - FEDEX won't take packages heavier than 1.5 pounds
17-Sep	1200 - 2400	Jeanne	Jeanne downgraded to tropical depression, expected to strengthen again, risk to U.S. is reduced
		SERT	SERT begins planning for demobilization; SERT Team Leader released
		ARFs	FL ask ESF#8 to identify federal facilities near Pensacola that could house dialysis patients, in case needed; LA closing EOCs - no federal support needed
		MAs	MA for Sacred Heart Hospital being prepared, expected to be completed after midnight
		Medical personnel	SERT redirects PHS/VA medical personnel in FL; SOC assembles list of CO nurses for EMAC mission to FL
		NDMS	1 DMAT at Baptist Hospital, concern over DMAT requested by West FL Pensacola Hospital - hospital not significantly damaged; NDMS says this is a manpower issue
		Special needs shelters	SAMSHA concerned about population of mental health institution that was destroyed - need to place these people
		Senior citizens/aging	AoA has not had contact yet with AL Director of Aging; concern about seniors in heavily damaged areas
		Environmental issues	
		Hospitals	Region 2 RHA reports VA hospital in San Juan now has adequate water and power, but VA reports contradictory
		Blood supply	NW blood center contacted - facility needs resupply of platelets, also needs ice
18-Sep	0000 - 1200	FEMA/ Stafford Act	Major disaster declarations for Ivan issued for GA and NC; declaration for PR issued for Hurricane Jeanne
		MAs	NDMS providing assistance to HHS in filling Sacred Heart requested clinicians

Table 4. Reconstruction: Hurricanes Frances and Ivan

Date	Time	Category	Description
		Special needs shelters	Special needs shelters in FL Panhandle: 6 shelters open with 278 patients (down from 9 shelters open with 389 patients at 1300 hours on 17 Sept 2004)
		Blood supply	Shipment of platelets and ice to NW blood center delayed
18-Sep	1200 - 2400	ARFs	AL Hospitals requesting nurses
		Medical personnel	Team of nurses enroute to Sacred Heart Hospital
		Special needs shelters	Mega shelter is closed, no patients, demobilizing staff; FL has 6 shelters with 270 patients
		Senior citizens/aging	AoA monitoring outreach to residents of Dallas and Wilcox counties, which are without power
		Hospitals	Atmore Hospital may need to transfer dialysis patients
		Blood supply	First shipment of platelets and ice to NW blood center completed
19-Sep	0000 - 1200	FEMA/ Stafford Act	Major disaster declarations for Ivan issued for PA and OH
		Hospitals	Secretary Thompson requests specific information on damage to hospitals and options on assistance that HHS could provide
19-Sep	1200 - 2400	ARFs	FL request for 10 environmental specialists to be filled by CDC; working on filling 3 AL requests for nurses - much confusion over details of who is filling what between HHS and VA; VA lacking proper paperwork for Sacred Heart request
		MAs	$4M MA for AL to cover all requests
		Logistics	VA requests assistance from HHS in finding housing for medical staff being sent to duty stations in AL
		Hospitals	Situation in PR reported to be significantly improved - all hospitals have adequate power, water improving
20-Sep	0000 - 1200	ARFs	Potential request from FL health center for 5 nurses and 5 pharmacists, further requests from Sacred Heart Hospital to extend mission/add staff
20-Sep	1200 - 2400	ARFs	AL ARFs on hold pending assessments
		MAs	CDC reports problems with pesticide mission - need addition of lab costs and verbal approval; 3 FL MAs for special needs, Sacred Heart staffing, ESF#8 activation
		Blood supply	NW blood center reports continuing problem of transporting needed supplies to the facility
21-Sep	0000 - 1200	FEMA/ Stafford Act	DFO in Mobile, AL, stands up
		Medical personnel	Staffing for 2 AL hospitals arrived; surplus expected - may shift to meet Sacred Heart staffing need

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