



Regional Disaster Response Coordination to Support Health Outcomes: Information Sharing and Incident Management: Workshop in Brief

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Regional Disaster Response Coordination to Support Health Outcomes: Information Sharing and Incident Management— Workshop in Brief

When a disaster strikes, it rarely impacts just one jurisdiction. It is important for jurisdictions to consider how they will respond to a scenario in which the entire region is impacted. To explore these considerations, the Institute of Medicine's Forum on Medical and Public Health Preparedness for Catastrophic Events organized three regional workshops in 2014 to explore opportunities to strengthen the regional coordination required to ensure effective medical and public health response to a large-scale multijurisdictional disaster.¹ The purpose of each regional workshop is to discuss potential mechanisms to strengthen coordination between multiple jurisdictions in various regions to ensure fair and equitable treatment of communities from all impacted areas.

Each of the three workshops covers different topics that may strengthen regional disaster response. The first workshop, held in Irvine, California, explored issues of community planning and engagement.² The Forum convened a second regional workshop in Minneapolis, Minnesota, bringing together key stakeholders to examine how information and incident management can augment response efforts in a complex, regional emergency, which is the focus of this brief summary.³ The final workshop in this series will take place in New Orleans and will consider how community engagement and information sharing can impact issues of surge management.⁴

Integration of Emergency Management and Communication

“We need to reach out and engage with each other across a wide variety of borders—whether they are cross-sectoral or jurisdictional—in order to be prepared when events occur.” —W. Craig Vanderwagen

“Communication is the bridge between social engagement and the surge, and it is critical to strengthening our ability to be effective in preparing together, responding together, and moving recovery forward as swiftly as possible,” stated W. Craig Vanderwagen, workshop chair. To focus in on fundamental pieces of this topic, discussions were held on information sharing and dissemination to stakeholders, using data to augment situational awareness and decision making and coordination within and across sectors.

In metropolitan regions, communication among multiple agencies can be challenging, even those under the same local government. Gary Schenkel, Executive Director of the Chicago Office of Emergency Management and

¹ For the purposes of these workshops, “region” is defined as a multicounty or multistate affected area, not necessarily abiding by the regions defined by the Federal Emergency Management Agency (FEMA).

² The workshop in brief can be accessed online at <http://www.iom.edu/Activities/PublicHealth/MedPrep/~/.media/Files/Activity%20Files/PublicHealth/MedPrep/2014-MAR-26/WIB-Regional-Disaster.pdf> (accessed October 13, 2014).

³ This summary represents the viewpoints of the speakers and does not represent consensus recommendations or conclusions of the workshop, but rather provides a summary of presentations and discussions and provides a valuable snapshot of the current state of incident and information management for regional preparedness initiatives and potential paths forward.

⁴ A full summary of the entire workshop series will be available in spring 2015.

Communication (OEMC), provided an overview of how information and incident management is coordinated by his office for the city of Chicago. OEMC closely partners with local, regional, state, and federal partners to integrate operations. “OEMC’s success stems from the integration of emergency management into its organizational structure,” said Schenkel, “which mitigates many events and activities that would normally be considered emergencies down to routine.”

In addition to its partnerships with local public service departments, OEMC maintains a public–private partnership, the Facility Information Management System (FIMS); which houses building plans, emergency points of contact, and emergency operations plans for buildings throughout the city and makes them accessible to OEMC and the police and fire departments during emergencies. The city also tapped into FIMS to cover the Chicago Marathon. Because the city’s existing camera system did not cover all of the 26.2 miles of the race, FIMS coordinated with the private sector to take over private cameras so that the entire route could be surveyed by emergency managers. Separately, during various heat waves in recent years, the city of Chicago coordinated with the state of Illinois and Cook County to hold press conferences and align messages. Through partnerships with various agencies and private organizations, OEMC was able to reach a larger number of people to convey risks and guidance, keeping the mission—rather than jurisdictional authority—prioritized.

Information Sharing and Dissemination to Stakeholders

Although the goal of rapid information sharing is important, a participant commented that it is also necessary to find a balance between sharing information quickly and vetting the information to ensure accuracy before widespread release. In pursuit of more and higher-quality information sharing and dissemination in disaster planning, participants explored how to expand these efforts, as well as the changes in focus and organization that may be necessary.

- John Hick, Associate Medical Director for emergency medical services (EMS) at Hennepin County Medical Center in Minneapolis, emphasized **creating better, more reliable systems monitoring that can be used consistently between partners when an incident happens**. Some participants agreed that shared systems monitoring offered an easy information-sharing opportunity for broadening networks and accessing new data streams that could have significant importance during an event. Active information mining and sharing on a routine basis is valuable to identify the pertinent stakeholders and allow them to provide expertise during an emergency. Rahul Gupta, Executive Director and Health Officer at the Kanawha-Charleston Health Department, said that rumor control, media monitoring, and message development were also recognized as critical components of systems monitoring. Several participants discussed the use of joint information centers (JICs) to coordinate messages. They could also seamlessly receive information from other stakeholders that would guide decision making and avoid the release of conflicting messages from different agencies or entities.
- Gupta also offered the idea to **improve coordination between agencies and entities in order to better align messages for the public**. He suggested having a Health Public Information Officer provide talking points to leadership daily during a response if needed, even if not requested, to ensure public health information is up to date and included in broader communications. He noted that legal and competing interests can create additional challenges that hamper decision making following an incident, as may occur when business and economic decisions start to outweigh public health priorities. Several participants suggested that after a disaster, circulating a structured, short report periodically among all entities within the emergency support function spectrum can improve awareness, inform about work being done by others, and provide an opportunity for dialogue.
- Capt. Deborah Levy, Acting Director of the Division of Strategic National Stockpile (SNS) in the Office of Public Health Preparedness and Emergency Response (OPHPR) at the Centers for Disease Control and Prevention (CDC), described the use of Scientific Response Units, which **bring together technical experts in various fields to offer their expertise or develop guidance as an event unfolds**. These

units preposition information and use the JIC to do their work, which creates a very structured approach for incident management. Daily updates are released in a scheduled, consistent fashion to partners and media outlets so that data and information are pushed out at set times every day. Some participants noted that having a common structure to bring together silos of technical experts offers an opportunity to strengthen interagency partnerships and craft more consistent messages.⁵

- Hick noted that **identifying the right amplifiers for the message by leveraging trusted sources of information**—the language and the way the message is delivered—is critical to ensuring that it is relevant to the target audience. Some group participants mentioned that developing external partnerships with tribal, faith-based, and cultural organizations across communities offers an opportunity to filter information so that it is delivered effectively and in the right cultural context. This can also extend the reach of messaging beyond those in the community, reaching those populations across a state or region. Julie Casani, Director of Public Health Preparedness in the North Carolina Division of Public Health, highlighted the Trusted Leaders in the Community (TLC) Information Network, an initiative in North Carolina that engages local religious and civic leaders in disseminating public health emergency preparedness and response information to congregations and communities that are culturally competent.

Information Sharing: 2014 West Virginia Chemical Spill

The chemical spill in West Virginia in 2014 was examined to identify some of the challenges in disseminating important health and safety information during a real event. Gupta discussed his experiences with challenges around information sharing and dissemination to stakeholders during the incident on January 9, 2014. The largest incident of chemical contamination of drinking water in recent U.S. history occurred when 10,000 gallons of 4-methylcyclohexanemethanol (MCHM, a chemical used to wash coal) and eight other chemicals were detected leaking from a Freedom Industries facility into the Elk River in West Virginia, which feeds into a water treatment center. Across nine counties, 300,000 people were served by this water utility. Although no human data were available about MCHM, it is considered hazardous by the Occupational Safety and Health Administration, and the CDC indicates that no MCHM should be detectable in drinking water. Information finding alone was a challenge, said Gupta, because there was so much unknown about the chemical and its health effects. There was not enough information available to know the full scope or ease the ensuing panic of the public.

Given this information, a “Do Not Use” (DNU) order for tap water took effect within hours of the spill, explained Gupta, which meant launching an exceptional health response to inform local residents and enforce closure orders for schools and businesses. The DNU order affected all 300,000 people served by the water utility across nine counties surrounding the river and the state capital, Charleston (see Figure 1). Some participants commented that when multiple stakeholders are involved, common challenges in information sharing and dissemination include issues of message coordination and information access, resources and staffing, and message adaptability and customization for the target audience. Gupta explained that this large operation was organized by an interagency task force that included representatives from the CDC, Environmental Protection Agency, Federal Emergency Management Agency (FEMA), Department of Environmental Protection, National Institutes of Health, National Guard, West Virginia governor’s office, the WV-American Water Company, city and county governments, local boards of education, hospital systems, law enforcement, and local health departments. What became apparent through the response, he noted, was the importance of effective negotiation skills, and using those and credible science to inform decision-making capacity and mutual objectives among so many stakeholders.

Gupta cited several other challenges following the incident, particularly issues with conflicting public messaging.⁶ “This resulted in issues of trust, communication, and negative perception of water safety within the community,” he said, while also noting the evolving role of social media in disaster management and how it can be leveraged as a means of digital surveillance. He suggested that it should absolutely be used when possible to see what is and is not working, and actions should be immediately changed, if needed, instead of simply waiting for an

⁵ The CDC’s Healthcare Preparedness Activity hosts stakeholder meetings with a “whole of community” approach and builds in partnership activities. For more resources on communication, outreach, and building partnerships, see <http://www.cdc.gov/phpr/health-care/tools-resources.htm> (accessed October 13, 2014).

⁶ For risk communication tools, visit some of NACCHO’s Advanced Practice Center products: <http://tinyurl.com/qf2dvt6>, <http://tinyurl.com/nbgaam>, <http://tinyurl.com/nbko7ar>, and <http://tinyurl.com/p65wtfa> (accessed October 13, 2014).



FIGURE 1 Map of West Virginia counties affected by the January 2014 chemical spill.

SOURCE: Rahul Gupta presentation, July 24, 2014.

After Action Report to be released. Rich Serino, formerly Deputy Administrator and Chief Operating Officer for FEMA, also emphasized the importance of social media during long responses, such as the 2013 Boston bombings, and the need to have an established social media presence before an incident so you can widely share accurate information in an emergency and quickly correct rumors. He noted that Operation Dragonfire, an initiative begun by the CDC and the National Voluntary Organizations Active in Disasters (NVOAD), is attempting to address the issues of multiple sources of information and misinformation and consolidate tools and resources to make the process of analyzing, verifying, and sharing accurate information easier for all stakeholders.

Using Data to Augment Situational Awareness and Incident Management

The mining and pulling of information up from the ground level can be very informative as decision makers try to correctly allocate resources and direct responders to varying needs. As preparedness funding across the country continues to decline and the lack of uniformity around data reporting and interoperability persists, a few participants outlined some opportunities in this area moving forward:

- Dan Hanfling, Senior Advisor at Inova, suggested **participation in an open source information movement**⁷ and possibly tying this to funding as a potential incentive. As more and more hospitals and clinics transition to electronic health records, it is important that these systems are able to communicate with one another and share information across institutions and state lines. Additionally, working more to engage the private-sector companies the public uses every day in open sourcing, such as Amazon, Facebook, and Google, could be great new partnerships, since they already perform data surveillance and perform it well.
- Hanfling also suggested **defining the “buckets” of information that should be prioritized and used widely to ensure that responders and researchers are capturing the same information with the same terminology.** Steve Ramsey, of Social and Scientific Systems Inc., mentioned his experience in having to recreate data banks in order to be able to compare information across years and events for a current study on health effects in the Gulf. Participants asked if there may be a role here for modeling to help inform which data pieces and information would make a difference and provide the most value-add, and which should be captured in systems after future incidents.

⁷ For more information on open source software, see <http://www.sciencedirect.com/science/article/pii/S1386505602001041> (accessed October 13, 2014).

- Through regional coalitions, many interdisciplinary and multijurisdictional efforts have already been started, said Hanfling, but pushing these efforts further to **figure out what questions should be asked in order to collect the right information to inform decision makers could be very informative as regional health care coalitions around the country continue to develop.** Additionally, for those regional partnerships that are more mature, understanding their evolution and what incentives and mechanisms have made them successful can help others that are in the beginning stages.

Using Data: H1N1 in Minnesota and the Boston Bombings

Aaron Devries, Medical Director of the Infectious Disease Division at the Minnesota Department of Health (MDH), described their experience during the H1N1 pandemic to improve access to medical care and reduce surge on health care facilities in the state during the outbreak. During the spring and summer of 2009, many Minnesota hospitals and clinics experienced large numbers of ill people seeking care, including those with influenza symptoms and the worried-well. In addition, access to H1N1 antiviral treatment became increasingly problematic. Therefore, MDH leaders created partnerships with existing nurse triage telephone lines operating in the state to create a coordinated statewide nurse triage line that could target high-risk groups across counties and recommend care and treatment where necessary.

Since multiple health systems in Minnesota had nurse triage lines, the MDH acted as the liaison, contacting each one and integrating them into a single statewide nurse triage line called “Minnesota Flu Line.” Devries said gathering all of these different organizations in one room was a challenge because they typically saw themselves as competitors and were initially wary of sharing what they thought was “proprietary” information. Having the state as the coordinator and finding the “decision makers” in each organization quickly was critical to keeping the effort moving. The Flu Line was created to address the following objectives: “(1) decrease public confusion by providing accurate information—consistent messaging, and assistance, including use of antiviral medications; (2) decrease the spread of disease by reducing the volume of sick individuals gathering in health care settings; (3) reduce medical surge on health care facilities to ensure that other priority medical needs would continue to be met; and (4) meet the needs of uninsured or underinsured patients and those without easy access to health care.” Devries stated that more than 27,000 individuals from 86 different counties called the Minnesota Flu Line, with the highest call volumes from rural, northern Minnesota counties. MDH officials estimated that approximately 11,000 in-person health care encounters may have been prevented by the Minnesota Flu Line. However, since this system was built quickly and created solely for the purpose of clinical triage, there were challenges and gaps in data collection. Devries said they did not have time to design reporting systems based on this capability but that for future endeavors they hope to gather real-time caller demographics, geo-location, and outcome of patients in order to give even more information to public health officials and state health care partners during a pandemic emergency.

Rich Serino, formerly Deputy Administrator at FEMA, also described his experience, in which gathering data to augment situational awareness was incredibly helpful as responders tried to put together a full common operating picture following the Boston Marathon bombings in 2013. Boston’s Medical Intelligence Center, currently a unique concept, was created in 2009 to coordinate all members of the medical community including state and local public health, EMS, and city and regional hospitals, and has since grown to include business associations and the private sector in the region. The Medical Intelligence Center is also linked to their law enforcement fusion center, called the Boston Regional Intelligence Center, which coordinates information flow across nine jurisdictions in the metropolitan area. To further ensure this important health connection, they have a paramedic working full-time in the Boston Regional Intelligence Center who is also responsible for running the Medical Intelligence Center. As the entire health care system across the country continues to undergo changes, this type of regional public–private partnership involving health care and public health could be a model for medical coordination during emergencies.

Showing how essential good communication and incident management are, Serino highlighted that not one of the area hospitals that received the 260 injured patients were overwhelmed. While that was also due to good relationships and years of planning and practice, being able to monitor needs and status of different hospitals through their Web emergency operation center (EOC) system and notifying member health care organizations of the bombings within minutes both aided in the process of dispatching critical patients across multiple EMS companies safely and successfully. As this was occurring, they also realized the immediate need for additional law enforcement, as all hospitals reported they were following protocol after a terrorist attack and going into lock-down mode. Since Boston police and Massachusetts state police teams were already committed to the marathon

course, incident management was able to coordinate and rapidly send teams from surrounding cities and towns to each hospital under lockdown. While this quickly involved the FBI and other federal agencies that were in charge of many parts of the response, a unified command structure was active, and several decisions were still made locally. Serino noted that together the transit police, Boston police, and some health personnel made the decision to keep the train system open immediately after the bombings, which was a very important one. He emphasized the importance of holding full-scale exercises, not just tabletops, to find important gaps in operations, and said doing this in Boston in previous years directly resulted in changes to policies that were called into play after the bombings.

Serino also highlighted the utility of social media for real-time information and situational awareness. While at FEMA during Hurricane Irene, he was told by regional emergency management in New England that they were fine and did not need support, but he simultaneously noticed hundreds of tweets and references to flooding, destruction, and damage in Vermont. So although official requests were not coming in from state or regional entities, they were able to see immediate needs and start sending resources quickly.

Coordination Within and Across Sectors

Emergencies often impact multiple sectors and jurisdictions, including both public- and private-sector partners. Given the complexity of coordinating preparedness activities across multiple sectors and levels of jurisdiction, several participants discussed a few opportunities to enhance information management and communication across sectors related to disaster preparedness:

- **Involving the leadership of health care organizations remains an ongoing challenge**, said Michael “Mac” McClendon, Director of the Office of Public Health Preparedness and Response with Harris County Public Health and Environmental Services in Houston, Texas. Many C-level executives may not be concerned about resources and planning for a disaster until it occurs to their facility or within their region. Receiving support from the top level of leadership at hospitals can be influential in promoting the importance of preparedness activities within an institution, including the allocation of funding, staffing, and support. To assist in overcoming this challenge, participants suggested utilizing business-oriented channels such as chambers of commerce or trade groups to relay the importance of preparedness resources. This approach is currently active in Minnesota through partnerships with the Minnesota Hospital Association.
- **Integrating health care organizations into existing systems of information sharing**, said John Osborn, Operations Administrator at the Mayo Clinic. Some participants noted the importance of not relying on a sole source during events, but rather attempting to gather input from a variety of partners to form a stronger intelligence perspective. Including health expertise into fusion centers could promote better information processing, noted Osborn, as well as understanding what risks are immediate and related and should be communicated to the health care sector across communities. Better understanding and communicating the value-add in adding a health component to Incident Command System and EOC systems already in place could also aid in this transition.
- **Broadening the reach of health care and engaging with other sector partners**, Osborn offered. Could leveraging the credibility and influence of medical and hospital associations help to convince hospital executives that preparedness activities and planning are essential? Or should coalitions begin engaging more with chambers of commerce across regions? At a minimum, Osborn said, neighboring jurisdictions and organizations should strive to build relationships of cooperation and common interest instead of those of competition, so when questions of authority arise during an incident, response is not affected.

Coordination: Target Corporation and Harris County, Texas

Kellie Bentz, Manager for Global Crisis Management at Target Corporation, discussed the importance of public and private partnerships in coordinating a response to a disaster. Previously working for a volunteer agency, she first stressed the importance of including volunteer organizations in EOCs at all levels and highlighted the recent advance of having a seat for the Voluntary Organizations Active in Disasters (VOAD) representative within FEMA’s National Response Coordination Center.

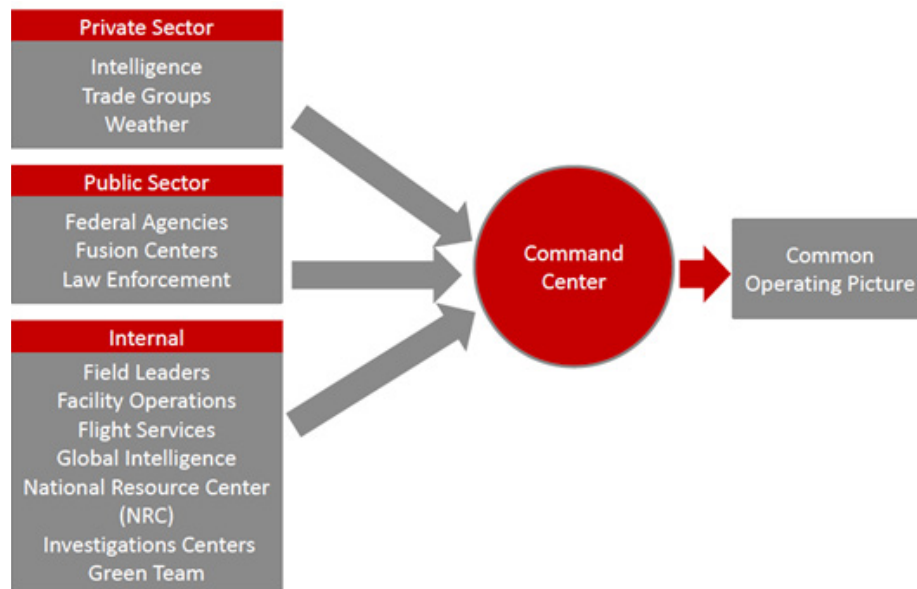


FIGURE 2 Target's information sources for their Global Crisis Management Team.

SOURCE: Kellie Bentz presentation, July 24, 2014.

Target operates its own EOC during a crisis (termed Corporate Command Center) that includes information sources from the private sector, public sector, and internal resources to form a common operating picture (Figure 2). During preparations for Hurricane Sandy in 2012, there were 265 Target stores in the path of the storm. A challenge for a company spread across a region like this is trying to plug in to all of the local operating EOCs and understanding priorities. However, Bentz mentioned that FEMA's recently developed National Business Emergency Operations Center (NBEOC)⁸ was activated during the Hurricane Sandy response and was able to consolidate all incoming information from across the country into an extremely useful report. Because of this, along with other data provided through NBEOC such as a regional map of active utility power, they were able to quickly prioritize generators and other resources to the stores and communities that needed them.

Mac McClendon from Harris County, Texas, also shared his region's response activities related to hurricanes. Coordination between multiple levels and jurisdiction is not uncommon, especially with large disasters such as the regional response to Hurricane Katrina. Reliant Park in Houston, Texas, became the temporary home for more than 26,000 evacuees from New Orleans. Such an event involved multiple layers of communication between local officials in Houston and New Orleans, as well as the regional counties and state of Texas and state of Louisiana officials. At that time, no integrated system existed to assist with the flow of information from a neighboring state, to hosting state, to local receiving jurisdiction, causing conflicting information to reach local personnel in Harris County. While not an ideal solution, Texas State Department of Public Safety sent spotter helicopters along the interstate to gather correct intelligence about what the county should plan for arriving.

Then, just a few weeks following Katrina, Hurricane Rita headed toward the Houston area, inciting many residents to flee their homes, creating massive traffic jams throughout the region's highways and stranding residents for hours in surrounding rural communities without access to gas, ice, or water.

In the aftermath of hurricanes Katrina and Rita, McClendon explained how the state of Texas completed an assessment of its evacuation plan, ultimately revising the State Hurricane Evacuation Plan. They decided to evacuate residents by geographic zone and worked with Texas Department of Transportation and Department of Public Safety to ensure that resources were strategically placed along evacuation routes in the surrounding rural communities. Communication plans were also designed to better facilitate coordination between inland and coastal communities, and specifically delineated responsibilities by sector for each local, city, county, state, and federal agency included.

⁸ For more on the NBEOC, see http://www.fema.gov/media-library-data/20130726-1852-25045-2704/fema_factsheet_nbEOC_final_508.pdf (accessed October 13, 2014).

Although these case studies and examples differed in many ways, they all contained elements of information and incident management that can translate across regional disasters: strong public–private partnerships; rumor control/media monitoring; message coordination; surveillance to improve situational awareness; and communication among and between cities, counties, and states. Some incidents may demand more of one than another, but taking the time to consider each element during a response could allow for more robust regional coordination and healthier outcomes. In any chaotic situation or disaster, accurate communication among so many stakeholders will be a challenge. However, as discussed throughout the meeting, and as Gupta, Hanfling, and Osborn noted, exchanging information and bringing partners together often throughout the response, identifying the right data to collect to improve situational awareness and encouraging inclusive regional health care coalitions are a few ways this challenge can start to be alleviated. 8

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REVIEWERS: To ensure that it meets institutional standards for quality and objectivity, this workshop in brief was reviewed by **Paul Biedrzycki**, City of Milwaukee Health Department, **Mary Ellen Hennessy**, Healthcare Association of New York State; and **Kellie Bentz**, Target Corporation. **Chelsea Frakes**, Institute of Medicine, served as review coordinator.

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For additional information regarding the workshop, visit <http://www.iom.edu/Activities/PublicHealth/MedPrep/2014-JUL-24.aspx>.