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Bridging the Gap

Prototype Tools to Support Local Disaster Preparedness Planning and Collaboration

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Summary

Local disaster preparedness planners face a major challenge in planning and coordinating local response operations, which may involve civilian and military organizations, especially health and medical care providers. Military and civilian organizations are often unaware of each other's planning needs and capabilities in an all-hazards context.

National guidance supports capabilities-based planning for disaster preparedness, focusing on planning to provide capabilities to address a wide range of scenarios. The U.S. Department of Defense (DoD) Office of the Assistant Secretary for Health Affairs, together with the Public Health and Environmental Hazards Office of the U.S. Department of Veterans Affairs (VA), asked RAND to develop a decision-support tool to help local communities conduct risk-informed capabilities-based planning.

In this report, we describe the initial prototype for a capabilities-based planning tool that RAND developed and two prototype networking tools that RAND adapted to help local military and civilian planners collaborate in disaster preparedness:

- The Community Preparedness Planning Tool, created by RAND, is an initial prototype for risk-informed capabilities-based planning. That prototype is a result of our research and analysis to date, including consultation and vetting with local community and military installation emergency planners. Although the prototype will actually perform certain functions within the specified parameters for the limited set of scenarios that we have selected and used, more extensive research and testing and potential modifications to the prototype will be required before a more fully tested tool will be ready for validation by potential sponsors and end-users. The authors have used the best available data and strategic guidance—e.g., the Hazus model from the Federal Emergency Management Agency (FEMA) and the FluSurge model from the Centers for Disease Control and Prevention (CDC)—for certain disaster effects (FEMA, 2009; CDC, 2006). In other cases, specified later in the report, RAND has developed estimates of disaster effects for the purpose of demonstrating how the tool functions. Although we believe those estimates to be plausible based on information available to us, we are not suggesting that those estimates are valid from a scientific standpoint. The further research and field-testing that we propose is necessary before any such estimates or substitutions for those estimates can be considered "valid" for the purpose of evaluating the overall prototype for validity.
- RAND has adapted two existing tools—Liferay Social Office and Cyber Infrastructure Knowledge Networks On the Web (CI-KNOW)—as prototypes designed to facilitate social networking and network monitoring (Liferay, 2008; Northwestern University, 2010).

Specifications for the Plannning and Networking Tools

In an earlier stage of this research, we examined the current policy framework for local disaster preparedness planning in the U.S. civilian and military sectors, examined how those entities are currently undertaking preparedness planning, and inventoried existing preparedness-oriented support tools (Moore et al., 2010). These activities informed the development of specifications for the planning and networking tools for which we subsequently developed the prototypes described in this report:

- Leverage existing models and tools whenever possible, automate linkages for planning activities across disaster phases, and be applicable to all U.S. communities, regardless of size
- Be easy to use and require minimal technical expertise
- Be widely accessible
- Facilitate strengthening of community networks.

Role of the Tools Within Disaster Preparedness and Response

Capabilities-based planning implies a modular, building-block approach to operational planning. It involves an ongoing, iterative process of assessing current capabilities, determining capability gaps, making investment decisions, and reassessing capability levels, all based on relevant local disaster risk. Figure S.1 provides a view of how the prototype planning and networking tools we have developed fit into the broader process of disaster preparedness and response (shown in the boxes with the heavy black outlines).

Local planners should perform a risk assessment for their community, using other existing tools or processes to identify and assess the potential severity of locally relevant disasters and other threats. Then, our planning tool can be used to facilitate pre-disaster capabilities-based planning for major disasters, while the networking tools can be used to enhance networking and collaboration across civilian and military preparedness planners. Although the tool prototypes described in this report are intended to support preparedness planning and not response, the ultimate use of the final tools can help support risk assessment, all aspects of planning, and event management.

Key Features of the Prototype Community Preparedness Planning Tool

The Community Preparedness Planning Tool is designed to help local military and civilian organizations, either individually or collectively, plan for major disasters. This tool focuses mainly on planning for the first hours and days following a disaster event, when only local resources and capabilities are likely to be available.

Goal and Scope
The goal of the Community Preparedness Planning Tool is to facilitate capabilities-based disaster preparedness planning by local military installations and civilian entities, including local VA and other health care providers and relevant local nongovernmental organizations. The tool

Figure S.1.
Tools to Support Capabilities-Based Planning and Community Networking
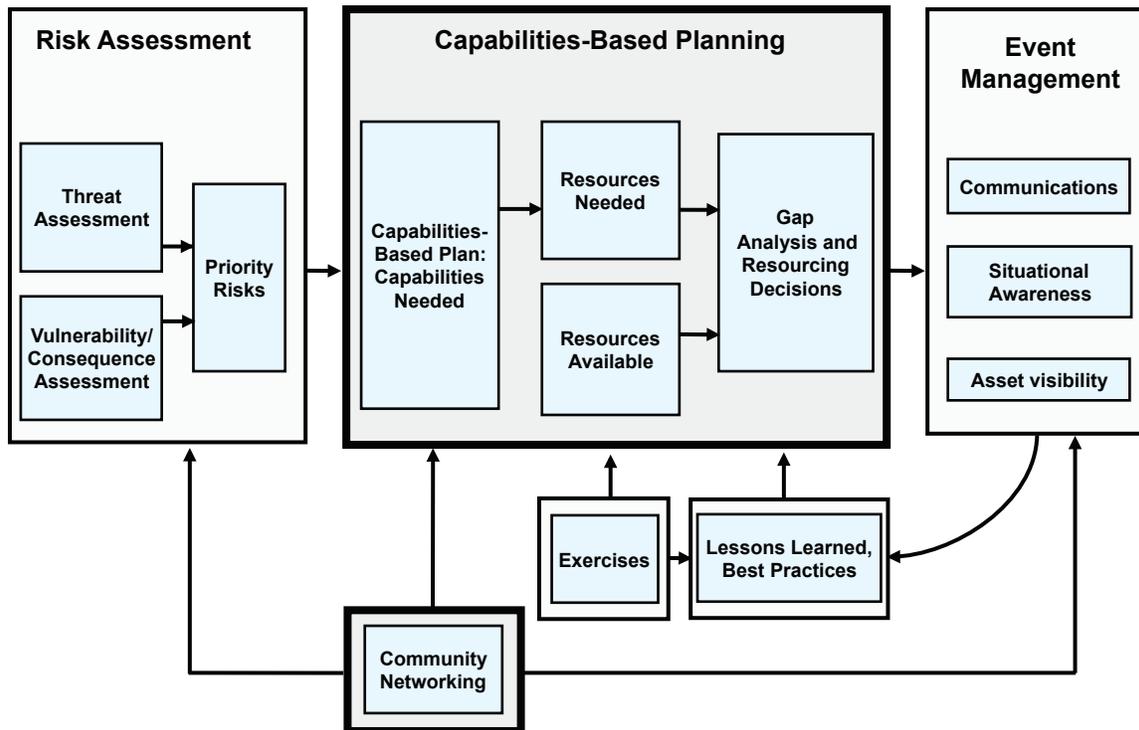
RAND *TR928-S.1*

emphasizes the capabilities and resources needed during initial response to a disaster, utilizing only resources that are immediately available. To develop a solid and workable proof of concept and initial prototype, we focused on the health-related capabilities needed for local response to three types of disasters: hurricane, earthquake, and pandemic influenza.

When we interviewed community emergency managers in the exploratory research phase, we heard that many managers were familiar with documents such as the U.S. Department of Homeland Security (DHS) Target Capabilities List (TCL), and the National Planning Scenarios (NPS), but did not use them as the data were difficult to assimilate and did not apply to their communities (Moore et al., 2010; DHS, 2007; White House, 2005). We also heard that many emergency managers were familiar with FEMA's Hazus Software, but did not use it (FEMA, 2009). We did not identify any other tools in existence that provided capabilities-based planning support to local communities and allowed them to determine capabilities and resources that they should either procure in advance or prepare mutual aid agreements to make available were a disaster to strike. We were concerned that undertaking a research project to develop such a tool would be an incredibly difficult endeavor, but we thought that we could make a great contribution by designing and developing an initial prototype to inspire future research and development.

It was our intent to collect the best planning guidance available from the current field of emergency preparedness research, then simplify and consolidate the data into an easily used tool. To the extent possible, we used detailed input information from disaster planning publications and software. We also generally drew data from federal government guidance and

other sources that have been widely disseminated and used by planners at all levels. It is beyond the scope of the current project to assess the integrity or vouch for the accuracy of such data. Nevertheless, given the sources of those data and the efforts that were undertaken to compile them, we have assumed that they are reasonably accurate for planning purposes. We have also provided detailed explanation or assumptions for functions we estimated based on more limited guidance data.

The data in this initial prototype tool are derived mainly from the following list of sources: CDC FluSurge 2.0 software, U.S. Department of Health and Human Services (HHS) Area Resource File (ARF), DHS Target Capabilities List, HHS National Health Security Strategy (NHSS), and the Federal Emergency Management Agency Resource Typing, and were used to define functions that estimate the disaster effects, required capabilities, and required resources for a given disaster scenario and community (CDC, 2006; HHS-ARF, 2009; DHS, 2007; HHS-NHSS, 2009; FEMA, 2005).

We did not try to determine the quality of the existing documentation. We chose those that we believe are most relevant and that are currently in wide use by planners nationwide. Because of the limits in the amount of current documentation, we needed to make several assumptions and interpolations for the various functions, especially those used to calculate disaster effects. As a result, these RAND estimates will need particularly close scrutiny as the prototype is tested and developed further. Although we believe the specified RAND estimates (identified later) to be plausible based on information available to us, we are not suggesting that those estimates are valid from a scientific standpoint. Further research and field-testing will be required before any such estimates or substitutions for those estimates can be considered "valid" for the purpose of evaluating the overall prototype for validity.

Local Preparedness Planning with the Community Preparedness Planning Tool

The planning tool prototype uses a modular, building-block approach to preparedness planning and, based upon local risk assessment, allows users to perform these steps:

- **Step 1.** Select one or more disasters (hurricane, earthquake, pandemic influenza)
- **Step 2.** Select and specify planning assumptions related to disaster attributes.
- **Step 3.** Select and specify a variety of the community characteristics.
- **Step 4.** Review the disaster effects generated by the tool and tailor them to local needs, if or as needed.
- **Step 5.** Review the tool-generated capabilities needed to address the specified disaster planning scenario(s).
- **Step 6.** Review the tool-generated required resources needed to address the scenario(s).
- **Step 7.** Specify available resources (Optional). (Users must input data about available organizational resources.)
- **Step 8.** Review resource gaps as calculated by the tool (if optional Step 7 is completed).
- **Step 9.** Generate reports related to capability and resource needs and resource gaps.

Key Features of the Prototype Networking Tools

Well-developed social networks can potentially enhance successful local preparedness planning by building familiarity and relationships and facilitating joint activities and collaboration

among local response organizations. RAND developed a community networking framework that makes use of two existing tools, Liferay Social Office, and CI-KNOW.

Goal and Scope

Community networking tools can help preparedness planners improve their understanding of local preparedness relationships and networks, build contacts among relevant partners, and enhance the efficiency of risk assessment, planning, and other preparedness activities as well as disaster response and recovery.

Social Networking with Social Office

Social Office provides tools and practices that can be used to maintain and enhance collaboration among organizations, using an online forum. It can be used to perform the following functions, among others:

- Serve as a common platform to link all three tools created through this project
- Capture and access contact information for local emergency management organizations
- Share information on key roles and capabilities
- Store important documents in a central location
- Enhance readiness exercises and contingency planning
- Provide news, announcements, and links to key resources
- Facilitate resource sharing.

Relationship Management and Network Monitoring with CI-KNOW

CI-KNOW is a relationship management/network monitoring tool that allows emergency preparedness organizations to understand the functioning and overall "health" of their network. It can help to facilitate:

- information sharing
- collaborative readiness exercises and contingency planning
- resource sharing
- exploration of how the network is performing.

Conclusion and Next Steps

The initial prototype for the capabilities-based planning tool and the two functional networking tools developed through this project and described in this report primarily draw from extensive national guidance and other published reports, existing data and existing generic software to provide a new and automated way to perform capabilities-based disaster planning and to facilitate networking among local emergency management agencies. The planning tool is still a prototype but is functional within the scope of its design to allow users to understand what types of results these tools can provide once fully developed and validated. The planning tool prototype, in particular, should be robustly tested by local community and military emergency planners as well as by interested state and federal stakeholders, especially with regard to the disaster effects functions. That process could help identify inaccuracies or other shortcom-

ings both in the underlying, published data and in the assumptions and estimates, and it could inform modifications to the functions themselves and/or to the practical guidance for users of the tool. Testing and modifications are required before the prototype can be fully evaluated for validity and before it can be used in decision making.

The planning tool prototype can also be expanded in the future to include a broader range of disasters, capabilities needed, and required resources. Both the planning tool and the networking tools can also be enhanced to make them capable of linking to other tools that may be available to local planners.

We received input on the tools from a variety of military and civilian planning organizations, as well as colleagues within RAND. To the extent possible within the current scope of work, we have considered this input in the design and adaptation of the prototype planning tool and the networking tools. Future enhancements to the tools will require additions and updates of important sources of new and revised data.

RAND is considering ways to make the tools accessible to local civilian communities, military installations, and other government agencies that may be interested in testing them and suggesting modifications to or substitution for certain assumptions and estimates, thereby informing further development for purposes of subsequent evaluation for validity. Through this process, we will seek additional feedback from users on ways that the tools may be improved in any future effort to expand and distribute them more broadly.