This product is part of the RAND Corporation technical report series. Reports may include research findings on a specific topic that is limited in scope; present discussions of the methodology employed in research; provide literature reviews, survey instruments, modeling exercises, guidelines for practitioners and research professionals, and supporting documentation; or deliver preliminary findings. All RAND reports undergo rigorous peer review to ensure that they meet high standards for research quality and objectivity.

TECHNICAL REPORT

Public Health Preparedness in California: Lessons Learned from Seven Health Jurisdictions

Nicole Lurie, R. Burciaga Valdez, Jeffrey Wasserman, Michael Stoto, Sarah Myers, Roger Molander, Steven Asch, B. David Mussington, Vanessa Solomon

TR-181

August 2004

Prepared for the California Endowment and Kaiser Permanente

HEALTH

The research described in the report was conducted by RAND Health for the California Endowment and Kaiser Permanente.

ISBN: 0-8330-3655-6

A profile of RAND Health, abstracts of its publications, and ordering information can be found on the RAND Health home page at www.rand.org/health.

Published 2004 by the RAND Corporation
1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
201 North Craig Street, Suite 202, Pittsburgh, PA 15213-1516
RAND URL: http://www.rand.org/
To order RAND documents or to obtain additional information, contact
Distribution Services: Telephone: (310) 451-7002;
Fax: (310) 451-6915; Email: order@rand.org

Executive Summary

The deterioration of the nation's public health infrastructure has been widely recognized. However, not until the terrorist attacks on the World Trade Center in New York and on the Pentagon on September 11, 2001, and the subsequent anthrax attacks were any large-scale investments made in the public health infrastructure. Such investments present an unprecedented opportunity to strengthen the public health infrastructure to respond to a variety of threats, ranging from bioterrorism, to the threats posed by a growing chronic disease epidemic, or by environmental contamination. The Little Hoover Commission, an advisory body to the California state legislature, asked the RAND Corporation to assess gaps in California's public health infrastructure, beginning with an assessment of preparedness for a public health emergency manifested as a contagious infectious disease. Note that there are currently neither established standards for preparedness nor agreed-upon methods and measures for assessing it.

California is, in many respects--including its size, geography, and ethnic diversity--unique. Yet, as in some other states, California vests considerable discretion and authority with local public health jurisdictions. For this and other reasons described in the report, we have focused our analysis at the local level. We conducted seven site visits and tabletop exercises focused on public health preparedness for a contagious infectious disease (smallpox). In two additional jurisdictions, we conducted site visits and piloted a tabletop exercise focused on preparedness to address the diabetes epidemic. Despite the differences between California and other states, we believe that our findings may be of interest to public health officials and other stakeholders beyond California's borders.

RAND used multiple methods in conducting this assessment. We reviewed the CDC [Centers for Disease Control and Prevention] Local Preparedness Capacity Inventories that were completed in late 2002, and we conducted a series of site visits and tabletop

exercises from March 2003 through November 2003[a]. California received its first allocation of preparedness funding from the CDC in early 2002, and the remaining funding in 2003. Most jurisdictions were receiving their initial funding allocations during the time this study was being conducted.

It is important to keep in mind that this study was conducted at a time of massive budget deficits in California, and public health agencies were being asked to commit significant resources to preparedness activities, including the development of smallpox preparedness plans.

Key Findings and Conclusions

1. Despite a slow start for receipt of CDC-related funding at local levels, each of the jurisdictions we studied has undertaken significant preparedness activities. Some of these activities have been related to national--CDC and the Department of Health Services--efforts; others have been in conjunction with the California Governor's Office of Emergency Services. They have included general preparedness planning, development of smallpox plans, and identification of an individual to serve as the bioterrorism coordinator. All of the jurisdictions we studied report the ability to receive emergency messages from California's Health Alert Network (CAHAN).

2. There is widespread variation in the ability of local health jurisdictions to respond to infectious disease outbreaks and other public health threats. Public health jurisdictions vary significantly in their organizational arrangements, size, scope, understanding of their responsibilities, leadership quality, and available resources. As a result, California residents do not enjoy an equal level of protection against a wide array of public health threats, even after real or perceived differences in health risks faced by residents of different locales are accounted for. Although our analysis focused on public

[a] We conducted seven site visits and tabletop exercises focused on public health preparedness for a contagious infectious disease. In two additional jurisdictions, we conducted sited visits and piloted a tabletop exercise focused on preparedness to address the diabetes epidemic.

health preparedness, we also found similar variation in activities aimed at addressing chronic disease. Some jurisdictions report that they do "nothing," whereas others have quite robust programs. In our judgment, not all jurisdictions possess the minimum capabilities to respond to and protect the public during a contagious disease epidemic such as the one presented in the tabletop exercise.

3. Considerable ambiguity surrounds the appropriate role(s) for a local health jurisdiction vis-à-vis other local agencies with a stake in emergency preparedness and the State Department of Health Services. We found that, for some key activities, there is currently little agreement about *what* local health jurisdictions should do when faced with a public health emergency—as well as *how* they should do it. The perceived overlap in some functions between the Department of Health Services, the Governor's Office of Emergency Services, and the Emergency Medical Services Authority adds to this ambiguity.

4. Despite differences in the size and organization of the public health jurisdictions studied, many of the perceived gaps identified in relation to preparedness were similar. Such perceived gaps include training of existing public health staff to assume "backup" roles in the event of an outbreak; strategic planning; community health assessment; workforce needs, particularly in the areas of epidemiologic and laboratory capacity; and access to legal consultation on public health law. In addition, all jurisdictions identified the need for a robust information system that would automate regular disease reporting from labs and hospitals; receive and map new cases in the event of an outbreak; and serve as a tool to manage outbreak investigation, contact tracing, and vaccination or prophylaxis if necessary. Finally, the reality of large numbers of uninsured Californian's creates additional challenges in planning for and managing the public's health issues during an outbreak.

5. Despite a year of intensive planning for a smallpox epidemic, we found substantial variation in the approaches taken to a hypothetical smallpox outbreak in the jurisdictions we studied. Some of the variation we observed reflected legitimate differences in interpreting public health evidence or different approaches to handling the

scenario presented (e.g., when to communicate with the public), while other differences reflected a surprising lack of knowledge (e.g., about the disease itself, laboratory testing, and/or the smallpox vaccine) or incomplete post-event planning (e.g., who to vaccinate, when vaccination should begin, or uncertainty about designated vaccination sites).

6. In most jurisdictions we studied, involvement of those community groups that particularly serve underrepresented minority groups in public health preparedness efforts is significantly lacking. Some public health jurisdictions we visited had incomplete knowledge of exactly where minority population groups were or how to reach and communicate with them, despite the fact that, historically, poor and minority populations are some of the most vulnerable in an infectious disease epidemic. While these groups may be involved in other public health activities, they were not involved in preparedness planning in the jurisdictions we visited. Unless such groups are regularly incorporated into the planning process, it is likely that preexisting issues such as poor communication and distrust of government will be exacerbated during a public health emergency. This exacerbation could, in turn, make disease containment more difficult to achieve.

7. Strong, central leadership and coordination of public health appear to be lacking. We did not find substantial evidence to suggest that health departments we visited thought they could rely on the California Department of Health Services to address needs common to many jurisdictions, or that there was strong central leadership to facilitate coordination or sharing of resources. At least with regard to preparedness, such lacks result in a fragmented system in which each jurisdiction must fend for itself. Few jurisdictions believe that they can count on the Department of Health Services in an emergency. The state public health laboratory may be an exception.

8. The current organization of public health preparedness activities in California leads to redundancies and inefficiencies. Because each public health jurisdiction is required to complete a set of core preparedness activities, many

jurisdictions are engaged in parallel activities. However, they do not routinely have the benefit of learning from one another or sharing resources. Both efficiencies of scale and a greater degree of standardization could be obtained if jurisdictions were to share resources to a greater extent or if some functions were, in some sense, regionalized. More engaged and concerted leadership from the State Department of Health Services will be important in improving efficiency. Absent additional involvement from the Department of Health Services in the areas of technical assistance and coordination, smaller health jurisdictions are handicapped because they do not have the staff breadth and expertise to comply with many of the requirements efficiently and effectively.

9. Border and jurisdictional issues need attention. Epidemics know no borders. It is unlikely that a highly contagious infectious disease, especially one that is introduced deliberately, will be confined to one public health jurisdiction. Although some attempts are under way to promote collaboration across neighboring jurisdictions--including the establishment of a system of six Regional Disaster/Medical Health Coordinators and Specialists--formal public health mutual aid agreements are virtually nonexistent, and there is often poor communication between jurisdictions. This is particularly the case for some rural jurisdictions (to which at-risk populations might flee) and their proximate urban jurisdictions, and jurisdictions at or near state or other national borders.

10. Public health preparedness may have a hidden cost. There was substantial evidence that reassignments of staff to accomplish preparedness functions, as well as cuts to public health budgets at a county level that have resulted from the current fiscal pressures, are compromising other public health functions. Multiple examples of retrenchments in essential programs (such as sexually transmitted disease and tuberculosis contact tracing, or teen pregnancy prevention programs) were provided during key informant interviews.

11. Estimated additional annual costs statewide of filling the "preparedness gap" range from $72 to $96 million. These estimates relate exclusively to the preparedness function. They do not account for other pressing public needs in many local public health

agencies, nor do they consider economies of scale that could be achieved through reorganization. Recent federal government investments in public health have begun to address long-neglected local public health infrastructure needs. Additional investments will be required in the future to shore up and modernize local public health systems.

12. Investments in the public health infrastructure addressing preparedness concerns create an important base on which to build a stronger public health system at the local and state levels. Improvements in the public health infrastructure resulting from the recent investments in preparedness create an unprecedented opportunity to strengthen public health. However, countervailing pressures, which stem largely from California's fiscal crisis, place the likelihood of capitalizing on this opportunity at risk.

Recommendations

1. Create a high-level commission or work group to examine alternative ways of reorganizing public health in California and to develop a shared understanding of what public health is and does. Such a commission or work group should be composed of state and local public health officials, representatives from community-based groups (especially those serving minority populations), health care providers, and academic experts, as well as state and local political leaders. Not only preparedness for an infectious disease outbreak but also preparedness for the growing epidemic of chronic disease require collaborative approaches among public health agencies, public and private organizations, and specific at-risk communities. Until recently, such collaboration has generally been lacking in California's public health planning. The role of strong, central leadership focused on public health at the state level and the nature of state-local relationships, should be key components of such a reexamination. At least in the short run, centralization and regionalization of some functions, and sharing of resources among others, will likely lead to greater effectiveness and efficiency. However, any process that involves rearranging responsibilities is likely to be contentious and will need to account for the political realities of state and local jurisdictional control and funding. Hence, the process for conducting such an examination must be fair, evidence-based, and neutral, and have as its overriding goal a system that most safely and

efficiently protects and improves the health of the public across the entire state[b]. For public health to be truly prepared to address the full range of health threats and factors that influence community health it must reach outside its current organizational boundaries and the limited public health improvement strategies associated with bioterrorism preparedness. Programs in place in other states may be useful in this reexamination[c].

2. A set of objective performance measures for preparedness should be developed, implemented, and refined as needed. Preparedness in jurisdictions should be regularly exercised based on these measures. Such a system would clarify expectations and responsibilities for local public health agencies and ensure accountability. Any effort to develop performance standards and to hold public health accountable should factor in the broader vision of public health that encompasses not only official public health agencies but also the community partnerships that make up the public health system. Ultimately, such a measurement system might extend beyond preparedness to other aspects of public health.

3. Improve the statewide epidemiologic information system. A robust information system is the backbone upon which coordinated public health activities should be built. During a disease outbreak, such a system would be used to receive automated reports from hospital and commercial laboratories; manage a public health emergency, including mapping, managing and monitoring the status of contact tracing and other investigative activities; and administer and monitor vaccination or prophylaxis activities. The system should be interoperable at least throughout the state, if not the nation.

4. Generate increased community involvement in preparedness activities. Community organizations of all types, including minority-serving community organizations, schools, and large employers, need to be a part of the preparedness

[b] One measure of the historical lack of political support for many working in public health is that bioterrorism funding is the single most significant investment in basic public health infrastructure that they have seen in their professional careers.

[c] For example, Washington and Illinois, unlike California, have public health improvement plans. Michigan has begun a process of accrediting local health agencies as a first step to improving public health.

process, as they are in some jurisdictions for other areas of public health. This is the case both for planning efforts and, in the event of a public health emergency (whether natural or man-made), implementation activities. Furthermore, community organizations play important roles in advocating for public health activities. At this point, such organizations have been largely overlooked. Specific performance measures should address their involvement. The need for community involvement in public health activities is obviously not confined to preparedness; indeed, community collaborations are critical to the success of most public health activities. More work is necessary to understand what the critical capacities of community organizations are and how they can be achieved.

5. **Maintain a highly skilled public health workforce in California.** Investment in training is needed for existing public health staff at all levels, from leadership development and Incident Command Structure training, to cross-training public health professionals to fulfill critical functions during a public health emergency. Such training could occur in an efficient and effective way through coordinated planning and sharing of resources. Salary structures and archaic hiring practices in most communities will need to be revised if local health jurisdictions are to be successful in recruiting and retaining highly qualified staff.

6. **Workforce planning must occur at both a local and statewide level.** In virtually all jurisdictions, key members of the workforce are aging into retirement and there is little evidence of succession planning. In addition, reassignment of key staff to preparedness functions has created workforce shortages in other areas, and many local hiring practices prevent hiring individuals in time to have them work side by side with the individual whose position they will assume. Because of overall workforce shortages, local jurisdictions are competing with one another for scarce human resources, with little regard for how human resources might be used most efficiently. As part of the planning process, county governments in which public health agencies reside should be held accountable for addressing hiring impediments.

7. Public health departments must become better linked with the health care delivery system. Public and private health care providers and the institutions in which they deliver care have critical public health responsibilities. Before an outbreak is known and after it is suspected, they must participate in surveillance activities to detect and define the outbreak's scope. They also must be incorporated into strategies for community wide preparedness planning and training.

8. An evaluation of public health preparedness and gaps at the state level will be essential to understanding more fully the preparedness issues identified in this study. Such an analysis could be considered as part of the background work required to contemplate a reorganization of public health in California.

9. Additional studies are needed to more broadly fill the knowledge gaps regarding the public health infrastructure. Such studies would not confine themselves to preparedness but would include in-depth observations of public health responsibilities, identifying gaps and what is required to fill them, and developing reliable and valid measures of performance of public health systems at state and local levels.

10. Additional resources will be necessary to improve public health preparedness and to improve local public health systems. Our current estimates examine only the additional resources needed to improve the preparedness functions that local public health agencies are expected to engage in to protect against infectious disease outbreaks. But in the jurisdictions we studied, we also found evidence that additional resources are needed to assure that essential public health services are available in all locales in the state to cover the wide range of new and old health threats the people of California face on a daily basis.

Limitations

This study has several important limitations. First, because there are no agreed-upon standards for public health preparedness, we had to rely on participants' perceptions for both the adequacy of the status quo and the size and nature of the gaps that needed to be filled. Although our exercise methodology provides a high degree of realism, we cannot guarantee that self-reported assessments of gaps in services and capabilities are valid.

Second, we did not account for potential economies of scale that could be realized through increased efforts on the part of local health jurisdictions, as well as the State Department of Health Services, to share resources. In our view, substantial increases in overall efficiency can be gained through reorganization and sharing of activities and resources.

Third, we made no assumptions regarding the possible impact of new technologies on preparedness costs. Such technologies could tend to either increase or decrease costs, so we remain neutral on this issue.

Fourth, we did not measure any possible resource gaps at the state level. At this point, we can only speculate about how changes in state-level public health infrastructure investments would affect local infrastructure costs.

Finally, our analysis focused on seven of the state's 61 health jurisdictions. It did not include a detailed look at activities that may be sponsored by other state-level agencies, such as the Emergency Medical Services Authority or Environmental Protection, or at Department of Health Services–sponsored initiatives, except as they are perceived locally. However, the study jurisdictions, which account for 39 percent of California's population, were selected to be broadly representative of all state health jurisdictions in terms of size (area and population), geographic distribution, minority populations, and per-capita public health expenditures obtained from census data, as well as budget information obtained from the jurisdictions' websites. We also note that Los Angeles,

which accounts for a large share of the state's population, receives public health funds directly through the CDC, not through the California Department of Health. As a result, it has considerably more autonomy and flexibility than do other jurisdictions. Although we believe that many of our findings apply to health jurisdictions above and beyond those included in the study, the true level of generalizability is not known.