Creating an Online "Promising Practices" Clearinghouse for Pandemic Influenza

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SYNOPSIS

This article describes efforts to create, share, and sustain an online clearinghouse of expert-reviewed "promising practices" in pandemic influenza preparedness from September 2006 to December 2008. This project involved six activities: (*1*) determining focus areas, (*2*) defining a promising practice, (*3*) collecting practices, (*4*) establishing an expert-review process for accepting practices, (*5*) disseminating the practices, and (*6*) evaluating the project. By December 31, 2008, materials and descriptions for 181 expert-reviewed practices had been posted in a public online database. Practices were available in four areas: models for care, communication, mitigation, and at-risk groups. The database has been used by international agencies and a variety of U.S. organizations. The challenges and constraints facing the U.S. public health system underscore the need to maximize resources. We believe that the Promising Practices Project demonstrates a useful approach in pandemic preparedness and response and may serve as a valuable model for other areas of public health.

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The emergence of a novel H1N1 influenza A virus in spring 2009 has served as a reminder of how rapidly a new influenza strain can spread nationally and internationally. The first cases of novel H1N1 influenza were recognized in California in mid-April; by November 8, 2009, more than 500,000 cases and 6,250 deaths had been identified in more than 200 countries and territories worldwide, according to the World Health Organization.[1] Even though the novel H1N1 strain has caused relatively mild morbidity and mortality (as of March 2010), its rapid spread clearly demonstrates that the public health and health-care delivery systems may have little time to prepare when a pandemic occurs.

Recent experience with novel H1N1 influenza reinforces the need for detailed pandemic influenza response plans and guidelines at all levels of government and across all realms of government activity. In attempting to meet these responsibilities, public health departments face significant challenges, including:

- Fragmented, vulnerable, and outdated systems:[2] State, territorial, tribal, regional, local, and municipal public health agencies have limited opportunity to collaborate efficiently for diverse reasons, including funding; distinctive local characteristics; differing priorities, technologies, and resources; geographic distance; and workforce shortages.[3–5]
- Lack of evidence to inform best practices: Public health practice is continuously informed through an evolving evidence base. In pandemic preparedness, however, evidence-based information is limited.[6] Despite this challenge, recent years have seen a global push to develop and strengthen pandemic preparedness. Thus, those in pandemic preparedness have been forced to develop plans using relatively sparse evidence to determine what measures will or may be effective.
- Lack of mechanisms for sharing best practices across jurisdictional boundaries: Across the country, planners have been required to develop similar tools and materials without the benefit of drawing on each other's work. Because mechanisms for sharing information are limited, this approach has led to tremendous duplication of effort and redundancy, causing further stress on the public health system.

One mechanism for dealing with this last issue is to develop a system whereby public health practitioners can identify and share promising practices for pandemic preparedness, allowing agencies to build on the best work of their peers. To address this need, the Promising Practices Project was initiated in 2006. The project was coordinated through the Center for Infectious Disease Research and Policy (CIDRAP) at the University of Minnesota with funding support from the Pew Center on the States. The project involved two primary objectives:

1. Develop a system of identifying, collecting, and reviewing "promising practices" in pandemic preparedness to allow public health planners across the country easy access to expert-reviewed practices.
2. Create a sustainable process that is the least disruptive and most useful, both for public health practitioners who are providing practices and for those serving as expert reviewers.

METHODS

This project involved six activities: (*1*) determining focus areas for practice collection, (*2*) defining a promising practice, (*3*) collecting practices, (*4*) establishing an expert-review process for accepting submitted practices, (*5*) disseminating the practices, and (*6*) evaluating the project.

Determining focus areas

This initial step involved performing a literature review and conducting key informant interviews with a convenience sample of 16 public health experts nationwide to identify current issues in pandemic influenza preparedness. Key informants included three federal officials, four state officials, five local officials, three leaders or high-ranking members of national public health organizations, and one university expert. From those interviews, we identified an Advisory Committee for the project.

On the basis of the literature review and key informant interviews, project staff developed a "ballot" of 22 possible priority preparedness topic areas. Advisory Committee members then selected nine focus areas from this ballot; these were then grouped into three categories. (We added an additional category in April 2008 as the result of the At-Risk Populations Project [ARPP], a partnership with the Association of State and Territorial Health Officials [ASTHO] to develop national guidance for at-risk populations and pandemic influenza planning, including identification of promising practices.) The current categories and their respective focus areas include:

- Models for care: These refer to promising practices that (*1*) significantly increase health-care worker surge capacity, (*2*) alter standards of care, (*3*) identify strategies for triaging people

when the traditional system is overwhelmed, (*4*) identify strategies of patient care when the traditional system is overwhelmed, or (*5*) strengthen collaborations between public health and the health-care system.

- Communication: This refers to promising practices that (*1*) enhance risk communications and public education on pandemic influenza, (*2*) improve community engagement and citizen participation, or (*3*) enhance resiliency and individual levels of preparedness.
- Mitigation: This refers to promising practices that identify nonpharmaceutical interventions for community disease mitigation.
- At-risk groups: This refers to promising practices that (*1*) focus on collaborating with at-risk populations and the groups serving them, (*2*) identify and prioritize at-risk populations, (*3*) enhance efforts to communicate effectively with at-risk populations throughout a pandemic, (*4*) address provision of clinical and non-clinical services for at-risk populations, and (*5*) evaluate the preparedness of at-risk populations for an influenza pandemic.

Defining a promising practice

We characterized a candidate promising practice as "a preparedness planning or response activity that could be shared with peers." A wide range of materials could be considered as possible promising practices, such as strategies, projects, processes, templates, toolkits, concepts of operations, guidance documents, protocols, products, algorithms, activities described in medical journal articles, and educational materials. Materials that did not fit were excluded from further consideration and are not included in the data analysis of this project.

Candidate practices were then reviewed through an expert-review process, as described in detail in this article. To merit final inclusion, a practice was required to (*1*) be promising, in the best judgment of expert reviewer(s); (*2*) contain useful, tangible materials; (*3*) be generalizable or transferable to other agencies/stakeholders; (*4*) have relevance beyond the jurisdiction that created it; and (*5*) not have any obvious flaws that would prevent it from being potentially effective.

Collecting practices

For the initial three categories, practices were solicited via electronic and Web-based surveys. One survey for each of the three categories was sent to national professional organizations or agencies. (Several agencies only received the survey whose topic corresponded to their specialized interest or advocacy area.) These included the Directors of Public Health Preparedness (via ASTHO), the Council of State and Territorial Epidemiologists, the National Association of County and City Health Officials (NACCHO) preparedness listserv and Advanced Practice Centers, the National Public Health Information Coalition, the National Association of State Public Health Veterinarians, the Infectious Diseases Society of America, the U.S.-Mexico Border Health Commission, the Centers for Public Health Preparedness, the Department of Veterans Affairs, the Centers for Disease Control and Prevention, and the Association of Public Health Laboratories. Organizations then either distributed the surveys to the subset of their membership focused on the relevant topics, or, rarely, to their entire membership. In addition, the surveys were posted on the CIDRAP website and provided to Advisory Committee members for dissemination to colleagues as appropriate. Surveys queried responders about the state of preparedness and overall importance of the topic within their agencies, and requested information on promising practices developed by their agencies.

Other steps to identify promising practices included performing online research of peer-reviewed and grey literature by focus area, and conducting additional key informant interviews. CIDRAP staff also hosted a booth at the second annual Public Health Preparedness Summit in February 2007. Finally, CIDRAP created a toll-free phone number for people to call with practices. Project staff obtained an exemption from the University of Minnesota Institutional Review Board before undertaking data collection.

Practices in the at-risk groups category were identified through (*1*) Internet searches of state and territorial health department sites, the U.S. Department of Homeland Security's Lessons Learned Information Sharing website, and ASTHO's online database; (*2*) a search of NACCHO's in-house and other online databases of local public health practices; and (*3*) a call for practices issued to more than 1,300 state and local public health preparedness practitioners.

Establishing an expert-review process

Practices submitted as part of the first three categories were initially reviewed by CIDRAP staff members with direct expertise in clinical medicine, communications, and public health practice. In cases in which additional review was deemed necessary, practices were subsequently sent to an Advisory Committee member or an external reviewer. A full list of those reviewers

is available on the Promising Practices website at http://www.CIDRAPpractices.org/practices/article.do?path=exprev.html. ARPP practices were reviewed by one or more of the following: NACCHO Advanced Practice Centers; Centers for Public Health Preparedness; ASTHO, CIDRAP, and NACCHO project staff; or individual ARPP Advisory Panel members.

All reviewers submitted qualitative feedback through use of a standardized online review form. Based on that review process, practices were either accepted for inclusion or rejected. For accepted practices, a short description of the practice was developed and the authors were contacted to obtain consent to share the practice.

Disseminating practices

A freely accessible website was chosen as the best means to share the practices. Each practice consisted of a description, reviewer comments, and a list of component information and tools. The website (http://www.CIDRAPpractices.org) launched on September 24, 2007, with 134 practices. Users could enter the site via a map to search areas of the country, or they could search using the various focus areas. As of December 31, 2008, 181 practices were available online. Practices continue to be reviewed and added to the site using the methods described previously. Terms and conditions of use, as posted on the website, included the following: (*1*) the practices on the website are not comprehensive, endorsed, or evaluated for outcomes; (*2*) neither CIDRAP, cooperating organizations, nor Advisory Committee members endorse the practices; (*3*) internal experts within each organization or agency need to review the practices and independently determine their suitability for the agency/organization; and (*4*) inclusion of a practice does not guarantee or imply that a practice is or will be effective in impacting health outcomes during an influenza pandemic.

Online marketing is ongoing and has comprised three general activities: announcement of the site, public presentations, and electronic notification of site updates. The site was launched with a targeted national campaign of print and electronic publicity materials distributed via (*1*) outreach to each organization that was surveyed with a request to notify organizational members; (*2*) electronic notification to hundreds of members of national organizations, and local, state, or federal agencies; and (*3*) an electronic press release disseminated nationally on a public relations newswire. This campaign resulted in online, newspaper, and radio coverage of the launch. CIDRAP staff members also have made state, regional, and national presentations on the Promising Practices website to increase awareness, and have written blogs and newspaper articles about the project. Site users can subscribe for ongoing electronic notification at no charge; subscribers receive e-mail alerts whenever the site is updated with new practices. E-mail alerts currently reach approximately 300 subscribers. Finally, a series of articles exploring selected promising practices in depth is being published on an ongoing basis on the Promising Practices and the CIDRAP news websites. Subscribers for both sites receive notice of those articles. E-mail alerts for the CIDRAP site currently reach approximately 3,800 subscribers.

Evaluating the project

Several methods were or are being used to determine the ease of use of the site, the geographic reach, and the organizational users of the Promising Practices online database. Use of the site was monitored daily through WebTrends Analytics™[7] for several weeks following the site launch, and intermittently since then as reporting and evaluation needs dictate. The evaluation data cover the period of September 24, 2007, to December 31, 2008. The software provided information on the geographic and organizational diversity of site users. Data collected via WebTrends Analytics included visit counts and page hits from international and domestic organizations that accessed the Promising Practices database, along with organizations that posted a link to the Promising Practices website on one of their Web pages. In addition, the Promising Practices website includes a link to an online survey so that users can offer feedback on the site's usefulness and usability, provide information on how the materials are being used, and identify who referred them to the site.

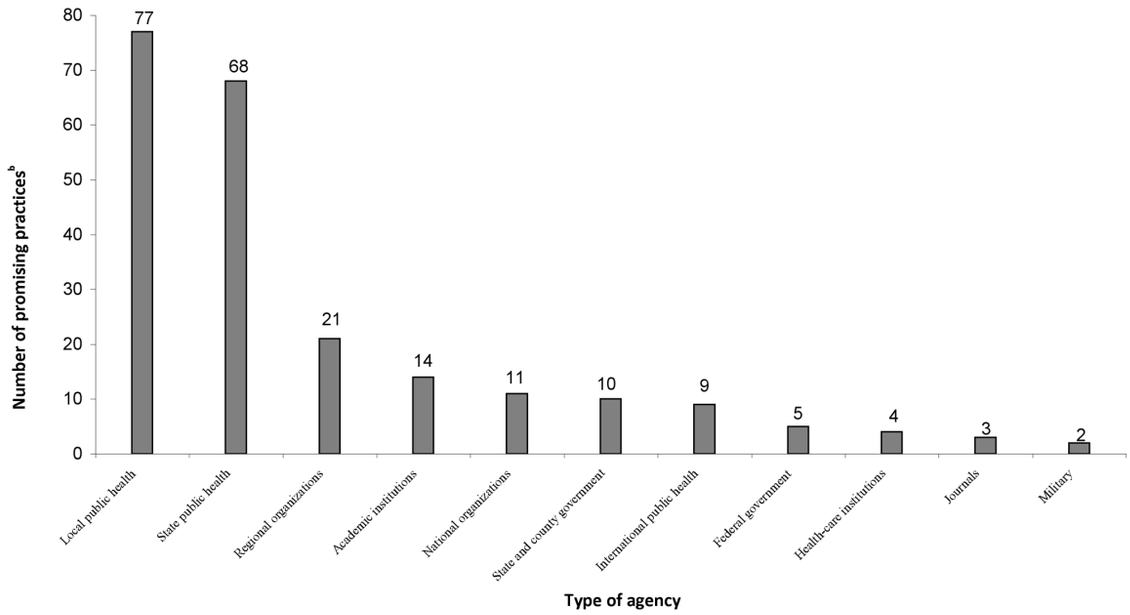
RESULTS

Collection, expert review, and dissemination of practices

After approximately two years of soliciting promising practices through various channels, 343 practices were considered candidates for further review between October 1, 2006, and December 31, 2008. Reviewers determined that 211 practices (61.5%) met the project criteria and could be considered "promising;" 93 practices (27.1%) did not meet the criteria and were rejected. Thirty-nine practices (11.4%) were under review at the end of the year and are not included in this article. The majority of practices were posted to the database when the website launched in September 2007.

As of December 31, 2008, materials and expert-reviewed descriptions for 181 practices had been

Figure 1. Promising practices in pandemic influenza preparedness[a] by type of authoring agency or organization



[a]Promising practices were identified between September 2006 and December 2008.

[b]Combined numbers exceed total number of practices (n=181) owing to the inclusion of practices that were created through collaborations with more than one type of agency.

posted in the online database. Practices in the database originated from a range of agencies or organizations (Figure 1), including 27 state health departments; 44 city and county health departments; 13 national or military organizations; and public health agencies in Canada, New Zealand, and Wales. The Table shows the breakdown of practices by specific focus areas within the four main categories. Figure 2 shows the domestic geographic sources of practices.

Promising practices in the database have addressed a wide array of preparedness topics. Examples include a preparedness workbook for individuals with functional needs, a communications toolkit for conducting communication with community-based organizations, several home care manuals, triage and alternate care site guidelines and supply lists, and ethical frameworks for allocating ventilators and other scarce medical resources. By December 31, 2008, the Promising Practices website contained materials in 23 languages and a selection of cross-cutting areas, including ethics, personal preparedness, home care, and school toolkits.

Project evaluation

Monitoring of site users. As of December 31, 2008, the database had been used by more than 26,000 visitors who collectively viewed a mean of 381 pages per day. Approximately 11% of visits came from agencies and

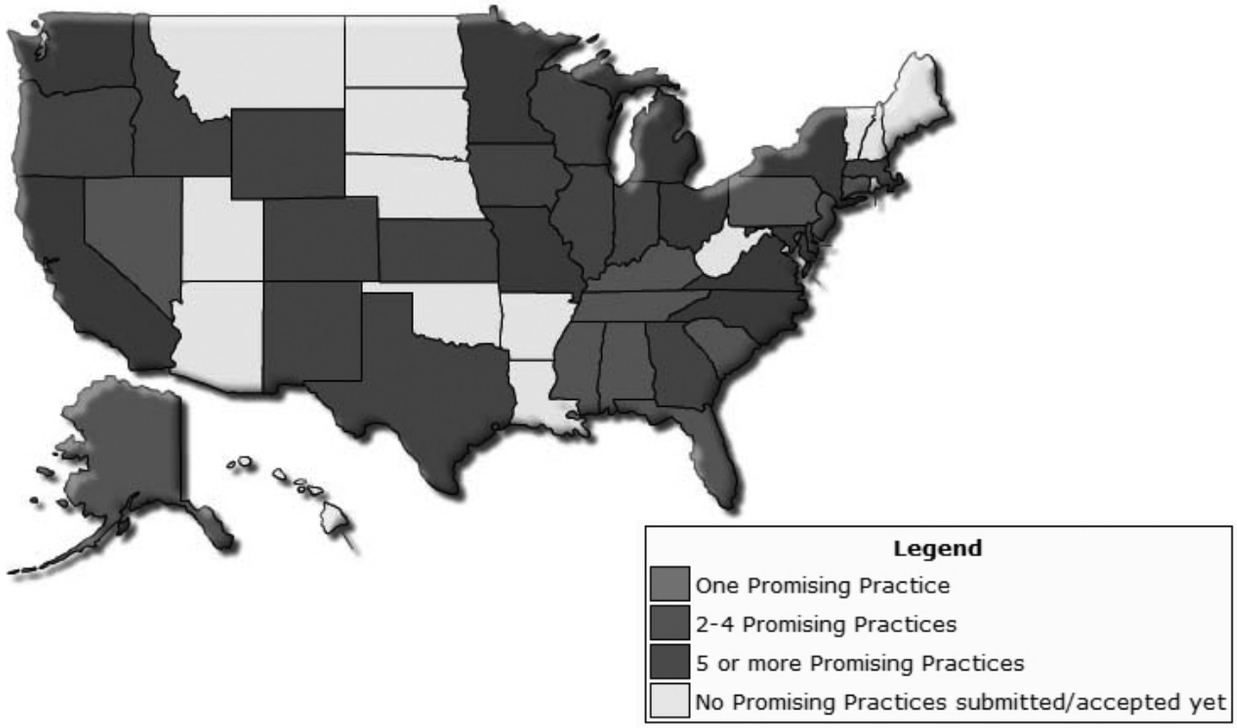
Table. Division of promising practices[a] in pandemic influenza preparedness by focus area (n=181)

Categories	*Number of practices[b]*
Models for care	91
Surge capacity	19
Standards of care	15
Triage strategies	13
Out-of-hospital care	24
Collaborations	20
Communication	114
Risk communications	58
Community engagement	22
Resiliency	34
Mitigation	21
Non-pharmaceutical interventions	21
At-risk groups	92
Collaborating	27
Identifying	6
Communicating	27
Providing services	26
Evaluating preparedness	6

[a]Promising practices were identified between September 2006 and December 2008.

[b]Numbers in each category do not add up to the total number of practices due to the inclusion of practices in more than one category.

Figure 2. Geographic representation of U.S. promising practices[a] in pandemic influenza preparedness

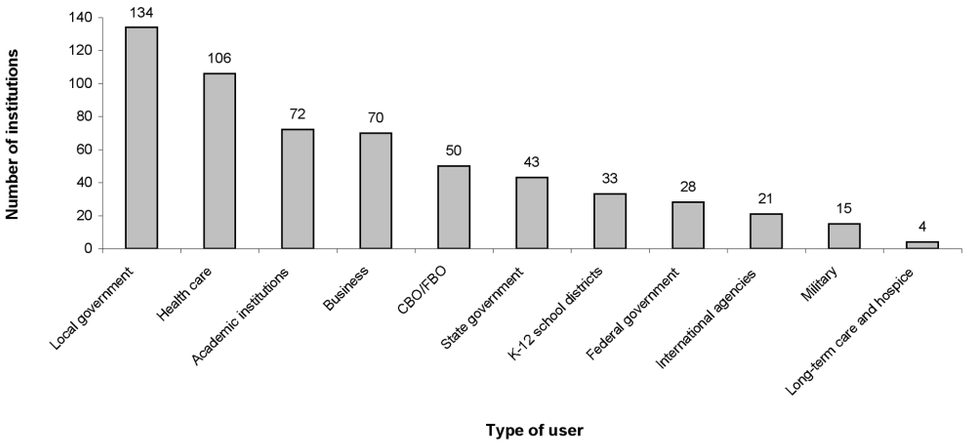


[a]Promising practices were identified between September 2006 and December 2008.

individuals outside of the United States. Although the majority of website visits occurred after the project launch, site traffic remained fairly steady with approximately 30 visits a day.

During the period of this project, the Promising Practices website was accessed by agencies in 55 countries and by a variety of U.S. organizations (Figure 3). Site users included numerous state and local public health agencies and a variety of other organizations, such as international and non-U.S.-based national health organizations, U.S. military services, military contractors, pharmaceutical companies, community-

Figure 3. Number and type of institutions that use the online Promising Practices database



CBO = community-based organization
FBO = faith-based organization

and faith-based organizations, and educational associations.

Much of the traffic to the Promising Practices website was driven by organizations that posted links to the practices on their websites or featured the database in stories about public health practice. During the project period, approximately 570 external websites and 1,000 separate Web pages linked their users to the Promising Practices website. Visits to the Promising Practices website were referred by several national and state organizations, including the Pew Charitable Trusts, the National Public Health Information Coalition, American Public Health Association, and several states. Site traffic was driven heavily by postings on influenza-specific blogs, such as Flu Wiki and FluTrackers. Links to the online database also have been posted on diverse websites hosted by other types of blogs, hospitals, pharmaceutical companies, universities, maternal and child health organizations, and a global communications initiative.

Feedback from site users. Thirty-two database users provided feedback about the site using the link provided. A majority of those users found the site easy to use (29/32, or 91%), found the Promising Practices website materials useful (28/31, or 90%), felt that the website met their needs (17/27, or 63%), or downloaded materials for personal or institutional use (17/28, or 61%).

DISCUSSION

We believe that the Promising Practices Project has filled a gap in the nation's public health infrastructure by providing an expert-reviewed clearinghouse of diverse pandemic influenza preparedness practices. Jurisdictions are now able to view relevant practices selected through an expert-review process from a wide array of locations and agencies. The utility of the site was demonstrated when the novel H1N1 influenza virus first appeared in the U.S. in April 2009; at that time, Web traffic to the site jumped from about 30 visits per day to a mean of 110 visits a day.

The online database of practices is updated continuously with new practices and tools, so its utility can be maintained over time. New categories, focus areas, and special-interest topics can be added as needed or as new resources (including funding to pursue additional areas) become available. For example, in partnership with ASTHO, the site was updated in the fall of 2009 to include promising practices in H1N1 response. An expedited review process was undertaken to ensure timely posting of materials deemed beneficial to public health agencies grappling with the complex issues of pandemic response.

The collection of promising practices originally was intended to aid public health departments in the U.S.; however, the audience seeking preparedness materials has been far more diverse, both geographically and professionally. Our results suggest that public health practice was translated across a number of other disciplines, as community-based organizations, hospitals, businesses, military units, and school districts looked at materials that had previously been unavailable to them or, at the very least, difficult to access. In addition, more than 10% of visits to the site during the project period came from viewers outside of the U.S.

Although significant advances in preparedness have occurred in the past several years, states and territories continue to face major limitations in time, staffing, and sustainable funding.[8] An estimated 7,000 local health department jobs were lost to layoffs or attrition in 2008; an estimated 16,000 disappeared in 2009.[9] Furthermore, 71% of state health departments and 44% of local health departments anticipated significant budget cuts during 2009.[10,11] A recent report emphasizes the importance of continually improving public health preparedness capabilities despite these resource limitations.[8] Pandemic influenza preparedness often can translate into enhancing all-hazards preparedness; therefore, the potential scope of the Promising Practices website reaches well beyond the arena of pandemic influenza.

Limitations

The information included in this report had several limitations. First, public health practices and survey responses were not collected for research purposes, and, therefore, were not categorized or treated as data *per se*. For example, the software used to track the number and type of online database users cannot track site visitors who do not accept cookies, nor could the authors identify which pages or materials were viewed and/or downloaded. For these reasons, the authors suspect that the information received from this software greatly underestimates the number and diversity of visitors to the website. In addition, impact evaluation was not the purpose of the project; therefore, the ways in which materials are being put to use are currently unknown.

CONCLUSION

What began as a project to strengthen state and local public health capabilities led to the development of

a robust collection of expert-reviewed practices in key areas of pandemic influenza preparedness that are appropriate for and used by a far broader cross-section of stakeholders engaged in public health issues. In this way, the Promising Practices website contributes to enhancing preparedness and effectively sharing resources among public health departments and other stakeholders, nationally and outside the U.S. The novel H1N1 influenza pandemic forced public health agencies to quickly respond to changing circumstances; the Promising Practices website was one resource public health officials used to initially meet that demand. Furthermore, more recently this project has expanded to include promising practices specific to H1N1 response. This flexible clearinghouse approach may be a valuable model for collecting practices pertinent to other areas of public health in the face of budget downturns and diminishing resources.

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