

Preparing Public Health Nurses for Pandemic Influenza Through Distance Learning

Everly Macario, Lisa D. Benton, Janet Yuen, Mara Torres, Violet Macias-Reynolds, Patricia Holsclaw, Natalie Nakahara, and Marcy Connell Jones

ABSTRACT As a global influenza pandemic appears imminent with the spread of avian influenza, the California Department of Health Services (CDHS) and the California Distance Learning Health Network (CDLHN) presented a live 90-min satellite broadcast and subsequent 2-hr small group problem-solving tabletop exercise to practice interventions needed to minimize the consequences of a pandemic event. Public health nurses (PHNs), managers, and other staff in laboratories, clinical care, veterinary medicine, environmental health, public information and safety, emergency management, and transportation down linked the program, broadcast by satellite from the CDHS Richmond Laboratory Campus, to view on-site locally. PHNs represented the professional category with the highest number of participants for those conducting the program outside of California. For those in California, PHNs represented the professional category with the second highest number of participants. Participants and distance-learning facilitators completed a training evaluation survey. Continuing education credits were provided by the Centers for Disease Control and Prevention to participants who completed the satellite broadcast evaluation. This distance-learning-by-satellite method of education paired with an activities-based tabletop exercise, and a focus on local rather than State-based responsibility, marks an innovative method of training PHNs and other staff in emergency preparedness response.

Key words: education, emergency management, influenza, pandemic disease.

Threat of Pandemic Influenza

Pandemic influenza is the global spread of a new strain of influenza for which few people, if any, have

pre-existing immunity. Influenza that qualifies for the pandemic label must meet three criteria: the virus that causes it must be a new subtype; it must demonstrate the ability to replicate and cause serious disease

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in humans; and it must be able to spread easily and sustainedly among humans. Since the outbreak of avian influenza A/H5N1 in December 2003, 226 people in 10 countries have been identified as infected with this virus, 129 of whom have died (WHO, 2006). By already fulfilling the first two criteria of the pandemic definition, avian influenza poses the most obvious current threat of a near-future natural disaster.

As we know from bitter experience with hurricane Katrina's devastation of New Orleans in August 2005, governments do not always prepare for or adequately respond to a natural disaster. Moreover, a pandemic is different from what we have seen in natural disasters. Katrina tragically hit Louisiana, Mississippi, and parts of Alabama in the United States, but the hurricane was over quickly and was confined to these geographic areas. A pandemic, in contrast, would occur simultaneously in thousands of different towns, lasting from months to years and occurring in waves.

While influenza vaccines offer future promise for pandemic influenza response, early, enhanced surveillance and prompt investigation of suspected cases, targeted administration of antivirals, quarantine and isolation measures, social distancing, and other containment strategies remain essential for containing an influenza pandemic (Butler, 2005). These interventions have the potential for slowing the spread of a virus and reducing morbidity and mortality. There is therefore an urgent need to learn from the deficiencies in the responses to disasters like Katrina and to prepare for pandemic influenza in advance.

One of public health nurses' (PHNs) important duties is to respond to disasters and prevent the spread of disease. While PHNs act as advocates for their clients, PHNs realize that certain individual rights may be forfeited for the protection of the community. PHNs and the personnel who work with them need to retain the emergency response skills that result from more frequent and better preparedness training.

In response to this need, the California Department of Health Services (CDHS) and the California Distance Learning Health Network (CDLHN) produced *Public Health Preparedness: Pandemic Influenza California Update 2005*, a live satellite broadcast with an accompanying tabletop exercise designed to assist California's 61 local health departments (see Fig. 1) in meeting the preparedness training needs of PHNs and others and in building surge capacity to respond to a pandemic.

Satellite Broadcast

Public Health Preparedness: Pandemic Influenza California Update 2005 consisted of a 90-minute satellite broadcast aired live on October 6, 2005, via CDLHN from 10:00 to 11:30 a.m. Pacific. The broadcast was filmed at the CDHS Richmond Laboratory auditorium. The format was designed to model what might be expected in the event of an actual public health emergency. In the event of a pandemic, local health departments would be notified of an emergency conference with State officials. The emergency broadcast would allow State nurses, epidemiologists, physicians, and laboratorians to address their colleagues at the local level simultaneously. Our pandemic "drill" provided an opportunity to test the capacity to share important and current information quickly with a large number of people located in different places at the same time.

Broadcast presenters, nine total, included CDHS Communicable Disease Control and Immunization Branch public health medical officers and laboratory research scientists, as well as public affairs professionals. A CDC epidemiologist and the University of California, Davis Director of the Wildlife Health Center shared their expertise. Health officers from three California counties (Kern, Riverside, and Tuolumne) also took part. An 8-minute video on the 1918 pandemic influenza was included, in addition to a live, moderated question-and-answer session.

Presenters provided an overview of pandemic influenza, including a definition and historical background, and discussed issues surrounding vaccine and antiviral medications as potential control measures (e.g., priority groups for vaccines and antivirals; equitable distribution of vaccines to states; monitoring coverage, effectiveness, and adverse effects of vaccines). They also shared updates on preparedness and response planning activities at the federal level, as well as within California and its local health departments. Speakers reviewed notification procedures for the first identified cases, surveillance and investigation of subsequent cases, and the role of laboratories in influenza surveillance. Experts offered strategies to reduce influenza transmission, including infection control, isolation, and quarantine, along with underscoring the importance of preparedness for risk communication and of collaborating with outside agencies.

Public Health Preparedness:
 Pandemic Influenza - California Update 2005
 October 6, 2005



Figure 1. Public Health Preparedness: Pandemic Influenza—California Update 2005

The learning objectives of the satellite broadcast were to:

- Describe at least two measures that reduce the transmission of influenza.
- Identify an issue related to the availability of vaccine and antivirals during an influenza pandemic.
- Describe at least one way in which the laboratory is involved in responding to pandemic influenza.
- Identify at least one non-medical intervention to decrease the spread of pandemic influenza.
- Explain why it is essential to collaborate with outside agencies.

Trainings using satellite broadcast may be viewed in a variety of formats: live on the day of the

broadcast; via archived webcast; and as a post-broadcast presentation on video/DVD. The program was broadcast by satellite to 1,578 downlink sites throughout the United States. A total of 172 California sites (including 58 of the 61 local health departments) and 1,406 out-of-state sites registered to either host a live broadcast or archive the program for later viewing. Distance-learning facilitators estimated the number of viewers of the live broadcast on October 6, 2005, to be 8,856 participants, 18% in California and 82% outside California. An estimated 16,088 additional viewers (14% in California; 86% outside California) watched the broadcast as an archived webcast or on video/DVD after the live broadcast. Close to 25,000 individuals, then, viewed the broadcast.

Audience members included PHNs and other professionals ranging from laboratorians to veterinarians and transportation officials. Participating organizations represented many types of agencies, from the Veterans Administration to Offices of the U.S. Attorney, to correctional and vocational institutions. PHNs represented the professional category with the highest number of participants for those conducting the program outside of California. For those in California, PHNs represented the professional category with the second highest number of participants.

Tabletop Exercise

A 2-hr tabletop exercise (herein also referred to as “tabletop”) was developed in conjunction with the satellite broadcast as an optional activity to reinforce what was learned and its application to local response. The purpose of the tabletop was to practice response activities related to an influenza pandemic, touching on areas such as surveillance, vaccination, antiviral medications, risk communication, and emergency response. This exercise encouraged participants of different disciplines to cross-train through group problem solving to increase the readiness level for meeting the needs of a surge capacity situation. For example, potential responders, such as epidemiologists and emergency managers, learned about the roles of PHNs in responding to a pandemic.

While the tabletop exercise was ideally conducted after the broadcast on the same day (the content of the broadcast would be fresh in participants’ minds), it was also packaged so that it could be held on later dates. At least 26 of California’s 61 local health departments took part in the exercise; about half did it simultaneously on the live satellite date and the other half on a later date. At least two health departments conducted the tabletop twice. As of March 8, 2006, the tabletop web page had received 11,703 hits from visitors.

Each participating agency identified a facilitator to coordinate the exercise, many of whom were PHNs. These facilitators were instructed to bring a copy of their agency’s pandemic influenza plan to the training, as well as to regularly visit a website address that provided all training materials. While facilitators were not expected to be experts on pandemic influenza, they were responsible for meeting the following objectives:

- familiarizing participants with their local jurisdiction’s pandemic influenza plan; and
- practicing 2 of 10 deliverables (see Table 1) presented that should be included in a pandemic influenza plan.

Local facilitators divided the total number of tabletop participants into workgroups of no more than five participants each. While most facilitators utilized a mixed-group approach for this activity

TABLE 1. *Summary of Deliverables*

Deliverable #1 (Scenario A)	Draft a Health Advisory intended for your local health department staff on what your county is doing to prepare for pandemic influenza
Deliverable #2 (Scenario B)	Create a Public Information Fact Sheet for one of various activities listed (e.g., alerting health providers of the first person-to-person influenza case)
Deliverable #3 (Scenario B)	Draft possible key messages and use them to draft a press release about pandemic influenza in general before a local outbreak has occurred
Deliverable #4 (Scenario C)	Identify agency partners and other stakeholders who would be involved in two response activities, and list respective roles and responsibilities
Deliverable #5 (Scenario C)	List issues to be included in an MOU with one partner agency (on any of the issues listed in Deliverable #4) and then draft a sample MOU
Deliverable #6 (Scenario C)	Draft possible key messages and use them to draft a press release to alert the public about the first case of pandemic influenza
Deliverable #7 (Scenario D)	Identify agency partners who would be involved in two response activities, and list their respective roles and responsibilities
Deliverable #8 (Scenario D)	Draft the key messages to include in a press release to alert the public about any of the issues listed in Deliverable #7
Deliverable #9 (No Scenario)	Test your organization’s emergency response command and communication structure by drawing a schematic of the response structure and information flow, or a call-down tree to activate an emergency response plan
Deliverable #10 (No Scenario)	Devise a step-by-step plan for the type of communication channels that will be used, how they will be used, and the populations the communication channels will reach

(where persons who do not share similar responsibilities or skills were grouped together such as mixing PHNs with laboratory personnel and transportation agency representatives), several facilitators separated teams based on what they thought individuals' assigned functions would be during an emergency. An advantage of the mixed-group approach is that more perspectives are represented in the discussion within workgroups, providing participants with new information about the roles and responsibilities of other professionals and agencies. For example, as PHNs are front-line staff who would be conducting home visits and outbreak investigations during a pandemic, non-PHNs in workgroups learned vital concepts in field nursing that they can translate to their various jobs.

Participants used information from three sources—the satellite broadcast, their agency's pandemic influenza plan, and tip sheets—to create 2 of 10 deliverables that were part of four scenarios describing the hypothetical spread of pandemic influenza from outside the United States to California. Each scenario had between one and three corresponding deliverables; 2 deliverables were stand-alone activities not related to any of the four scenarios. Tip sheets to assist workgroups in completing their deliverables included those for writing a health advisory, a press release, a Memorandum of Understanding (MOU), and a public information fact sheet. Other resources available included an emergency phone tree worksheet and tips on writing in plain language. As there was not enough time to fill in all the details, facilitators encouraged participants to complete their deliverables in outline or template form.

The deliverables served as a stimulus for participants to clarify the details of their local health departments' pandemic influenza plans and to discuss the ways in which each participant might carry out a responsibility. For example, we intended for participants to consider the role of PHNs in the enforcement of isolation and quarantine, the care of influenza patients and/or other household members who are quarantined in on-site versus off-site care facilities, providing other medical and social services, administering antivirals for treatment and/or prophylaxis, and conducting contact investigations.

Because potential responders in all disciplines must be clear about the steps they need to take before they can effectively communicate their preparedness and response activities to others, many of the deliverables pertained to the communication of information

to a variety of populations (e.g., elected officials, health providers, media outlets, and the general public). The deliverables also provided a way for participants to anticipate the general public's perception of their jurisdiction's response.

Self-diagnostic learning tool

During the second half of the tabletop exercise, each workgroup assessed its own deliverables using self-diagnostic tools provided by CDHS. Most of these diagnostic tools were checklists based on information from the broadcast to assess whether certain content issues and other considerations were included. The self-diagnostic tool was not meant to be an answer key, nor meant to provide a template for each deliverable, but rather to provide a double-check for content points to include in the respective deliverables. After workgroup members conducted this qualitative review of their deliverables, facilitators led a discussion of the deliverables and diagnostic results.

Evaluation

Program participants and facilitators completed evaluations related to both the satellite broadcast and tabletop exercise.

Satellite broadcast

CDC's Public Health Training Network's online system associated with requesting continuing education collected data for the broadcast. Broadcast viewers were asked to complete an evaluation even if they were not conducting the training for continuing education. Those who chose to complete the evaluation rated the broadcast very highly, with 821 viewers giving between 75% and 98% favorable marks (*Strongly Agree* or *Agree*) for each of 28 statements, accompanied by a 5-point Likert scale (from *Strongly Disagree* to *Strongly Agree*). To receive continuing education, participants were required to complete 10 broadcast content- and learning-related post-test questions. While a total of 1,515 participants registered for continuing education credits, 735 respondents completed all 10 questions and answered them correctly about 90% of the time.

Tabletop exercise

Facilitators collected evaluation data for the tabletop exercise using three measures: (1) a participant

survey, (2) a facilitator survey, and (3) a follow-up teleconference with local health departments.

Participant survey

One hundred sixty-four participants from 10 local health departments returned the anonymous participant survey on the tabletop. These participants gave an average score of 4.1 (on a scale of 1 [*disagree*] to 5 [*agree*]) to rate how helpful the tabletop was in making them feel more prepared to respond to pandemic influenza. The same score (4.1 average) was given for the tabletop overall, with participants saying that more time than the allotted 2 hr was needed to increase the effectiveness of this exercise. Participants said the tabletop helped them to “learn the language” of such preparedness activities and to identify major gaps with their pandemic influenza plans, such as the need for more intra- and inter-agency collaboration.

Participants gave an average score of 4.1 to rate how the deliverables helped them in familiarizing themselves with their departments’ pandemic influenza plans. They rated the helpfulness of the information from the broadcast in completing the deliverables with a 3.7. They gave average scores of 3.9 and 3.8 when rating the tip sheets and diagnostic tools, respectively.

Facilitator survey

Facilitators representing 12 of 61 local health departments completed a training evaluation survey. Nine of the 12 facilitators participated in the broadcast and tabletop on the same day. Most facilitators agreed that the two-part training program was appropriate for their health departments (4.7 average, on a scale of 1 [*disagree*] to 5 [*agree*]), and that the training helped increase their health departments’ capacity to respond to pandemic influenza (4.3 average). Facilitators commented that the program helped to identify key deficiencies in preparedness, as well as to learn what is and is not in their control. They requested that future tabletop scenarios address more localized concerns and to have materials (diagnostic tools, PowerPoint slides) available at least a week or two before the live debut date.

Follow-up teleconference

CDHS held a one-hour follow-up teleconference with representatives of 21 local health departments a few days after the live program. The call provided facilitators with the opportunity to share experiences from the two-part training, such as successful strategies implemented, and to make suggestions for improving

future broadcasts and tabletops. They gave each other ideas for streamlining the logistics of coordinating an exercise, increasing participation, and overcoming challenges and unanticipated issues.

Call participants reported that the pairing of a broadcast with a hands-on activity made for an effective complementary training modality. While a number of facilitators said their sites experienced signal interference due to a solar interruption during the broadcast (one extremely rare limitation of this technology), many reported that the training helped them better understand vulnerabilities in their plans, roles of decision makers in the chain of command, and appropriate ways to draft communication materials such as a press release. They requested additional drills to further strengthen their local emergency response infrastructures and to increase their comfort levels with respective functions. They were particularly interested in learning more about isolation, quarantine, antivirals, and the legal ramifications of a pandemic.

Continuing Education

Continuing education credits were offered through the Centers for Disease Control and Prevention (CDC). CNE credits for nurses were based on 1.5 hr of instruction. The unedited broadcast program was available as a webcast through November 21, 2005, for those seeking continuing education after the live program. Approximately half of the participants who received continuing education credits requested continuing nursing credits.

Conclusions and Recommendations

Distance-learning-by-satellite, paired with a locally managed activities-based tabletop exercise, marks an innovative method of emergency preparedness response training. While pandemics are global in nature, their effects begin locally and thus require a strong local response. With today’s technology, health training using national and state experts can be delivered simultaneously to local sites via satellite and through video, DVD/CD-ROM, and live and archived webcasts. This kind of “distance learning” is a convenient, cost-effective method for training busy professionals. Pairing it with local content and group exercises facilitated by local staff transforms the learning experience from passive to active. Depend-

ing on needs and skills, PHNs can assume either a trainer or trainee role in this context.

The tabletop did not include a standard question-and-answer discussion or role-playing format (where team members act out assigned roles or “characters” in a simulated situation). Rather, we used a fun, interactive format for PHNs and others to become familiar with their agencies’ pandemic influenza plans and to get an opportunity to use the knowledge learned from the broadcast. The tabletop was also designed as an optional activity, as well as a flexible one intended for local customization, instead of a required mandate directed from the State.

In an emergency, people are often called upon to engage in activities for which they typically are not responsible. Participants of this program were invited to practice a variety of tasks and responsibilities, as well as to understand each other’s disparate roles in a pandemic influenza emergency. Participants who were not PHNs had an opportunity to understand and value PHNs as a resource in experience and knowledge. While public health nursing may not be a profession with which many participants have day-to-day interaction, participants gained an appreciation of this field’s role in an emergency.

For future distance-learning efforts to be successful, we recommend reviewing lessons learned from multiple broadcasts and tabletops, as well as our own lessons learned such as the need to:

- Conduct ongoing training for distance-learning facilitators new to the job on how to downlink a satellite broadcast and troubleshoot when there may be problems with a signal.
- Plan a global, yet detailed timeline with deadlines and roles for local facilitators.
- Factor at least six months to plan for a two-pronged program.
- Conduct at least two pre-training teleconferences with facilitators.
- Post supporting materials well in advance of the training with electronic announcements informing their availability.
- Encourage local health departments to conduct ongoing self-evaluations of their own pandemic influenza plans and preparedness levels.
- Poll health departments about the topics for which they would like more training.

Part of the broadcast’s high viewership rates related to its targeted promotional campaign that disseminated save-the-date postcards, flyers, emails, web postings, and mailings. Future distance-learning efforts could poll agencies and individuals who were not involved to learn ways to overcome barriers to participation. Given that fewer than half of California’s 61 local health departments participated in the tabletop exercise, future efforts could underscore the benefits of conducting a tabletop exercise in combination with the broadcast. Namely, that when simulating the real experience in an active manner (tabletop), we remember more of what we learned in a passive way (broadcast). And, carrying out a hands-on activity immediately following a broadcast is ideal as information gathered from the video will be fresh in the mind, ready to be applied, and reinforced.

The aspect that ranked the highest in terms of appeal is the adaptability of such a program. We heard repeatedly from participants—inside and outside California—that the ability to customize the program to a unique set of local circumstances and to deliver the training on any date is a winning formula.

Edited segments of the satellite broadcast, the tabletop exercise, and supporting materials are available at www.cdllhn.com. DVDs of the full broadcast, including downloadable resources, are available in English and Spanish.

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