ORIGINAL RESEARCH

Connecticut Competency-Based Point of Dispensing Worker Training Needs Assessment

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ABSTRACT

Objectives: In April 2006, Connecticut conducted an exercise that tested its ability to receive and dispense antibiotics from the Strategic National Stockpile. In conjunction with the exercise, a competency-based assessment was performed to determine the training needs of point of dispensing (POD) workers.

Methods: POD core competencies were developed by adapting existing preparedness materials. They were used to assess the training needs of more than 250 people who staffed a POD during the exercise. The assessment measured their confidence in their ability to perform 17 competency-based tasks.

Results: The vast majority needed training on 5 or fewer tasks, suggesting that they were fairly well trained. Pharmacists were particularly likely to need training on at least 5 tasks. Given their role in a POD operation, they should be a focus of further training. Almost one third of participants needed additional training on at least 1 of the 3 basic POD Incident Command System tasks. Additional training is also needed on competencies concerning POD safety and security, liability protections, and family preparedness. POD workers who are concerned about these matters may be less willing or able to staff a POD. People who participated in training both before and on the day of the exercise were best prepared to staff the POD, indicating that both types of training have value.

Conclusions: When compared with the competencies, POD workers possessed many of the necessary skills to staff a POD; however, training with emphasis on areas of weakness revealed by the assessment could improve willingness to report for duty and performance.

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Key Words: mass dispensing, training needs assessment, point of dispensing, Strategic National Stockpile

The ability of a community to undertake mass dispensing is a key aspect of disaster and emergency preparedness. Mass dispensing refers to the dispensing of medications or vaccines to many people in a short time period to protect them from naturally occurring or bioterrorism-related infectious disease. For example, metropolitan areas that are part of the Cities Readiness Initiative, including those in Connecticut, aim to be able to provide preventive medications to the whole population within 48 hours of the decision to do so.[1] Successful dispensing on this scale would require a large, well-trained workforce made up of government employees and volunteers from diverse professional backgrounds.

Training programs may include preparedness-phase training that occurs before a POD activation and just-in-time training that occurs at the time of a POD activation. Before the training is implemented, a training needs assessment may be necessary to identify areas of potential weakness in performance that may be improved through training. Performance can be measured against competency standards. Competencies are applied skills and knowledge that enable people to perform work. Competencies are acquired through formal training and by experience.[2]

In April 2006, a full-scale mass dispensing exercise was conducted in Connecticut. This full-scale exercise was cosponsored by the Connecticut Department of Public Health (CT DPH), and the Connecticut Department of Emergency Management and Homeland Security, with assistance and financial support from the Centers for Disease Control and Prevention (CDC) and the US Department of Homeland Security. The exercise tested Connecticut's ability to receive and distribute assets of the Strategic National Stockpile (SNS) in response to a fictitious release of aerosolized *Yersinia pestis* at large sporting events.

Seven community PODs were established to dispense doxycycline or ciprofloxacin to members of the public. The main stations of the POD were greeting, triage, dispensing, and health education. Medical screening and mental health stations were also present. Each community POD was run by a lead local health department or district with the assistance of neighboring health departments or districts. Four hospitals throughout CT also participated in the exercise.

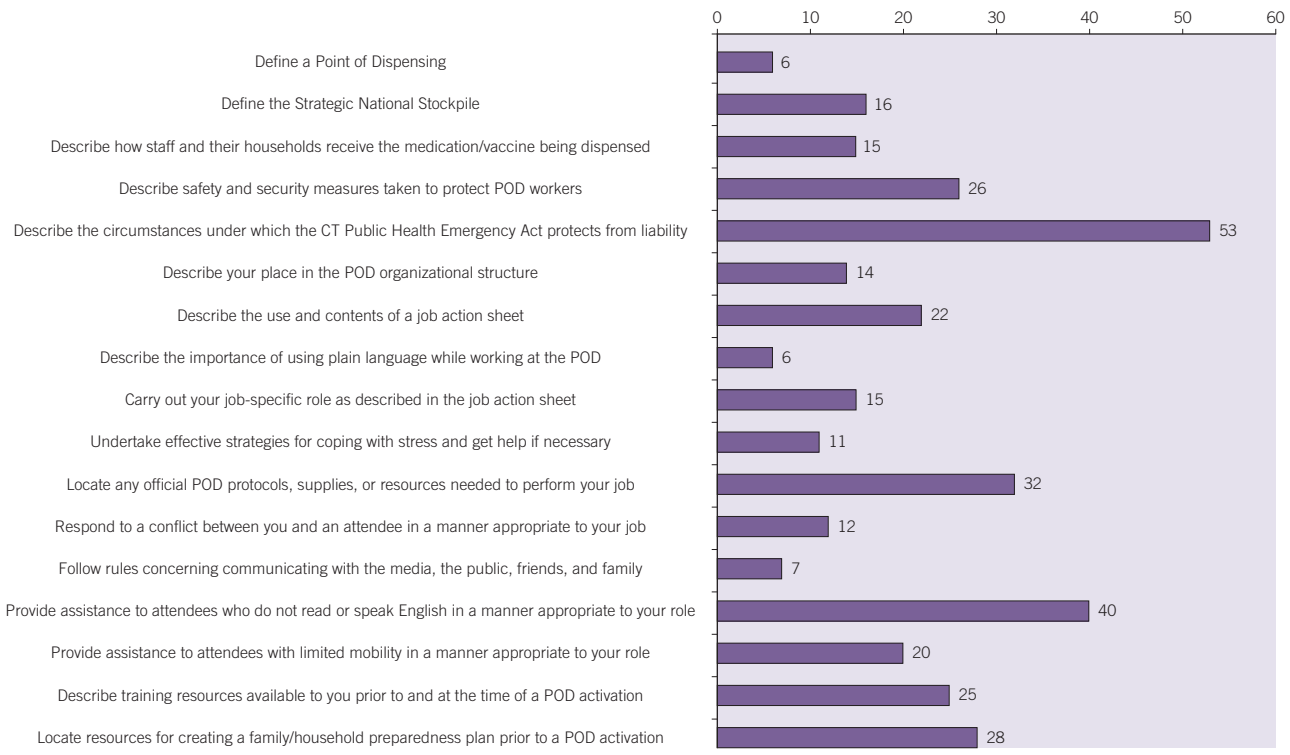
CT DPH and the Yale Center for Public Health Preparedness undertook a competency-based assessment of the training needs of people who staffed the PODs during the exercise. This was an opportunity to perform a real-time assessment of training needs and the effect of training on self-efficacy. A major advantage of a real-

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FIGURE

Percentage of participants who require additional training by competency-based task.



time assessment is that participants could use their participation in the exercise to more objectively judge their need for training to perform the POD core competencies. This report describes the development of competencies for CT POD workers and their use to conduct a training needs assessment.

METHODS

Competency Development

A search was executed for existing POD worker competencies. This search included a review of materials available on the Internet, documents from the MEDLINE database, a review of the National Institutes of Health SNS listserv, and consultation with personnel from the Division of SNS at the CDC.

Because POD worker competencies were not identified using the process described above, POD worker competencies were adapted from available sources. Existing preparedness competencies were reviewed.[3-5] Ultimately, the Emergency Preparedness Competencies used by the North Carolina Center for Public Health Preparedness, as part of their assessment of the preparedness of North Carolina public health workers,[4] were used as a model to develop POD-specific competencies. The North Carolina competencies were themselves an adaptation of the Competencies for All Public Health Workers that were developed by the Columbia University School of Nursing, Center for Health Policy.[6]

The all-hazards competencies used by the North Carolina Center for Public Health Preparedness were modified to make them POD specific. Further modifications, including the development of subcompetencies, were made based on a review of CT and CDC SNS training materials, the SNS Appendix of the CT DPH Public Health Emergency Response Plan,[7] POD planning guidelines,[8] a review of other competency sets,[3,5] and consultation with the controllers of the PODs participating in the April 2006 full-scale mass dispensing SNS exercise, staff of several Centers for Public Health Preparedness, and the Connecticut Association of Directors of Health.

The POD core competencies developed using this process are as follows:

1. Define a POD.
2. Define the Strategic National Stockpile.
3. Describe key aspects of the POD organization in your community relevant to your work:
   a. Describe how staff and their households receive the medication/vaccine being dispensed.
   b. Describe safety and security measures taken to protect POD workers.
   c. Describe the circumstances under which the Connecticut Public Health Emergency Act of 2003 protects POD workers from liability.

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4. Describe the incident command system as it applies to your work at the POD:
   a. Describe your place in the POD organizational structure.
   b. Describe the use and contents of a job action sheet.
   c. Describe the importance of using plain language while working at the POD.
5. Carry out your roles and responsibilities during a POD activation:
   a. Carry out your job-specific role as described on your job action sheet.
   b. Undertake effective strategies for coping with stress and get help if necessary.
   c. Locate any official POD protocols, supplies, or resources needed to perform your job.
   d. Respond to a conflict between you and an attendee in a manner that is appropriate to your job.
   e. Follow rules for communicating with the media, friends, family, and the public.
   f. Provide assistance to an attendee who does not read or speak English in a manner that is appropriate to your role.
   g. Provide assistance to an attendee with limited mobility in a matter that is appropriate to your role.
6. Describe training resources available to you before and at the time of a POD activation.
7. Locate resources for creating family or household preparedness plans before a POD activation.

These competencies were used to develop preparedness-phase training for the SNS exercise. They were not explicitly incorporated into the design of the exercise and were not known ahead of time to the players and evaluators.

Needs Assessment

A set of 17 competency-based tasks were derived from the POD worker competencies (Figure 1). A training needs assessment form was then designed to collect information from POD workers on their confidence in their ability to perform each of the tasks. The form also collected information on their perceived need for further training on these tasks. The format of the assessment instrument was adapted from the North Carolina Center for Public Health Preparedness needs assessment form. Other data collected included demographic characteristics of POD workers, computer access, and POD-related activities on the day of the SNS exercise. The assessment form did not record participant names.

The target sample for the training needs assessment was people who staffed a POD, in any role, during the SNS exercise in CT in April 2006. They completed this form after the exercise was completed. At most PODs, the assessment form was distributed to POD workers by the exercise lead evaluator during the exercise hot wash that was held immediately after the conclusion of the exercise. POD workers were asked to fill in the form and return it at the time of the exercise or later in a postage-prepaid envelope. Players were given the option to complete the assessment online at the TRAINConnecticut Web site (the learning management tool for public health workers in CT). After the exercise, POD lead evaluators and lead controllers were asked to encourage POD players to participate in the assessment.

Respondents were excluded from this analysis if they were exercise evaluators, actors, or controllers, or if they did not complete the section of the form on which POD workers reported their confidence in their ability to perform the competency-based tasks.

Assessment data were analyzed by calculating frequency distributions to describe participant demographic characteristics, educational level, and current professional licenses or certifications. The same technique was used to describe POD-related variables including place in the POD organizational structure, status as a volunteer or department of health employee, and participation in preparedness and just-in-time training.

Participants were considered to require more training on a particular competency-based task if they reported being somewhat unconfident or not at all confident in their ability to perform the task, or indicated that they needed more training on the task, or did not answer the questions concerning the task. A variable was created to examine the need for further training on POD incident management under the incident command system (ICS). A subject was considered to need further POD ICS training if he or she required further training on any of the 3 POD ICS-related tasks: describe your place in the POD organizational structure, describe the use and contents of a job action sheet, and describe the importance of using plain language while working at the POD.

As a summary measure of training needs, POD workers who required training to perform 5 or more tasks were identified (the 30% of POD workers with the greatest number of training needs). Cross-tabulations, odds ratios, and 95% confidence intervals were calculated to examine relations between this summary measure and subject characteristics.

RESULTS

A convenience sample of 292 exercise participants completed all or part of the POD worker training needs assessment survey. Twenty-two participants were excluded from this analysis because they were exercise controllers, evaluators, or patients. Four more were excluded because they did not complete survey questions that measured confidence in their ability to perform competency-based tasks. Therefore, the analysis presented here is based on the results from 266 participants.

The demographic characteristics of assessment participants included in this analysis are presented in Table 1. Almost 85% of the sample was older than 40 years and 70% was female. The vast majority (96%) describe themselves as white non-Hispanics. Of POD workers, 28% were registered nurses, 11% were licensed pharmacists, 24% had another type of professional license or certificate, and 35% did not have any profes-

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sional certificate or license. Seven participants reported that they spoke French fluently and 5 (2%) reported that they spoke Spanish fluently. No other language was spoken fluently by more than 2 participants.

Of POD workers, 11% reported that they did not have access to a computer on which they could take a training course. Of those who had access to a computer, all but 1 had access to the Internet and all but 8 had a CD-ROM drive. About one third of those with a computer did not have a DVD drive.

Table 2 describes the POD-related characteristics of survey participants. Within the PODs, 77% of POD staff worked in the operations section: 53% in medical, 15% in nonmedical, and 10% in security. When asked to report their job title as specified on the job action sheet, 15% of POD workers did not provide sufficient information to determine their position in the POD ICS organization. Among POD workers, 79% were volunteers and 9% worked in their capacity as a local or state department of public health employee. Of POD workers, 61% reported that they had participated in preparedness-phase training and just-in-time training. Seventeen had just-in-time training only and 18% had preparedness-phase training only; 5% did not receive training at either time. Figure 1 shows the percentage of POD workers who required more training for each competency-based task. At least 20% of people would require more training to perform the following tasks: 3b. Describe safety and security measures taken to protect POD workers. 3c. Describe the circumstances under which the CT Public Health Emergency Act of 2003 protects POD workers from liability. 4b. Describe the use and contents of a job action sheet. 5c. Locate any official protocols, supplies, or resources needed to perform your job. 5f. Provide assistance to attendees who do not read or speak English in a matter appropriate to your role. 5g. Provide assistance to attendees with limited mobility in a manner appropriate to your role. 6. Describe training resources available to you prior to and at the time of a POD activation. 7. Locate resources for creating a family or household preparedness plan prior to a POD activation.

In all, 15% required further training to carry out their job-specific roles as described in their job action sheet. One third of POD workers required training on ≥5 tasks. There was no significant difference in the proportion of POD workers who required training in ≥5 tasks by volunteer status, health department employee status, highest level of educational attainment, or age.

Among pharmacists, 43% required further training to perform ≥5 competency-based tasks compared with 32% of registered nurses, 22% of people with other types of professional certificates or licenses, and 37% of those without a professional certificate or license (Table 3). Pharmacists were significantly more likely than those with other certificates to require further training (odds ratio [OR] 2.7; 95% confidence interval [CI] 1.1-7.1). Other professional certificates or licenses included sanitarian, medical doctor, emergency medical technician, advanced practice registered nurse, social worker, licensed practice nurse, and physician assistant.

Of POD workers who participated in preparedness-phase training and just-in-time training, 23% required further training on ≥5 competency-based tasks (Table 3). POD workers who did not participate in both types of training were significantly more likely to require further training on ≥5 tasks. Of POD workers who participated in just-in-time training only, 40% required further training on ≥5 tasks (OR 2.2; 95% CI 1.1- 4.5), as did 47% of workers who participated in preparedness-phase training only (OR 2.9; 95% CI 1.5-5.8). Workers who did not participate in either type of training were most likely to require training in ≥5 tasks (77%, OR 11.1; 95% CI 2.9-42.6).

COMMENT

This assessment demonstrates the usefulness of the competencies for analyzing the SNS exercise and for designing future POD

TABLE 1

Demographic Characteristics of Survey Participants

Characteristic	N	%
Age group, y		
≤29	14	5
30-39	31	12
40-49	63	24
50-59	80	31
60-69	44	17
≥70	28	11
Total	260	
Sex		
Female	175	71
Male	72	29
Total	247	
Race or ethnicity		
White non-Hispanic	239	96
Other	10	4
Total	249	
Highest level of educational attainment		
High school	32	13
Associate's degree	40	16
Bachelor's degree	83	33
Master's degree	80	32
Doctoral degree	16	6
Total	251	
Has a degree in public health (bachelor's, master's, or doctoral)		
Yes	30	12
No	223	88
Total	253	
Certificate or license type*		
RN	79	30
Pharmacist	28	11
Other	65	24
None	94	35
Total	266	

*Other certificates or licenses included sanitarian, medical doctor, emergency medical technician, advanced practice registered nurse, social worker, licensed practice nurse, and physician assistant.

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training plans. The process described here resulted in the development of a list of 7 core competencies and associated subcompetencies for POD workers. To date, most preparedness competency sets have been focused on the educational needs of specific professional groups.[3,5] The POD core competencies were developed to provide a basis for the education of the wide range of personnel types and roles that would be involved in mass dispensing. The competency set for the discipline of disaster medicine and public health preparedness, which was published after the completion of this work, takes a similarly multidisciplinary approach; however, its scope is wider because it encompasses the full range of disaster preparedness and response activities.[9]

TABLE 2

POD-Related Characteristics of Survey Participants

Characteristics	No.	%
Position in ICS		
Command staff	11	5
Operations, medical	119	53
Operations, nonmedical	33	15
Operations, security	23	10
Logistics	22	10
Administration	1	0
Planning	17	8
Total	226	
Volunteer		
Yes	206	79
No	56	21
Total	262	
Worked in capacity as health department employee		
Yes	24	9
No	242	91
Total	266	
Training type received		
Both JIT and preparedness phase	156	61
JIT only	43	17
Preparedness only	45	18
Neither	13	5
Total	257	

ICS, incident command system; JIT, just-in-time; POD, point of dispensing.

More than 20% of POD workers needed more training to describe the safety and security measures taken to protect POD workers. This is a key finding because POD workers who are not adequately protected may be at risk for safety and security problems. Almost half required further training to describe the circumstances under which the Public Health Emergency Act of 2003, as enacted in CT statute Sec. 19a-131i., protects POD workers from liability. One third of POD workers would require more training to locate resources for creating a family or household preparedness plan before POD activation. This was somewhat surprising because there have been multiple efforts by the state and agencies such as the American Red Cross to communicate this information. These efforts to encourage family preparedness appear not to have been successful and need modification.

Given these results, future training should focus on POD safety and security, available liability protections, and family preparedness because POD workers who are concerned about these matters may be less willing or able to staff a POD. A large sample of health care workers in the New York City area was surveyed about their willingness and ability to report to work during a range of disasters. In all, 61% reported that they would be willing and 69% reported that they would be able to report to work in a smallpox epidemic. Barriers to ability to work included family obligations, and barriers to willingness included fear and concern for family and self.[10] A survey of local public health workers in Maryland found that 50% of staff would not be willing to report to work during an influenza pandemic. Willingness to report was significantly associated with having confidence in personal safety and family preparedness.[11]

One quarter of participants did not feel confident in their ability to describe training resources available to them. Even for workers who are confident about their ability, there will be continued training needs as new biological agents and new protocols emerge. There will also be a need for workers to refresh their knowledge and skills.

TABLE 3

Characteristics of POD Workers Who Need Further Training in ≥5 Tasks vs Those Who Do Not

Characteristics	Yes	%	No	%	Total	Odds Ratio (95% CI)
Training type						
Both JIT and preparedness phase	36	23	120	77	156	1.0
JIT only	17	40	26	60	43	2.2 (1.1-4.5)
Preparedness only	21	47	24	53	45	2.9 (1.5-5.8)
Neither	10	77	3	23	13	11.1 (2.9-42.6)
Current professional certificate or license*						
Other certificate or license (not registered nurse or pharmacist)	14	22	51	74	65	1.0
Registered nurse	25	32	54	68	79	1.6 (0.8-3.6)
None	35	37	59	63	94	2.2 (1.01-4.5)
Pharmacist	12	43	16	57	28	2.7 (1.1-7.1)

JIT, just-in-time training; POD, point of dispensing.
*Other certificates/licenses included sanitarian, medical doctor, emergency medical technician, advanced practice registered nurse, social worker, licensed practice nurse, and physician assistant.

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The results of this survey suggest that further training in POD incident management under the ICS would be useful. The competencies measured here represent the most basic POD incident management competencies that would be necessary to function effectively in a POD. Nevertheless, one third of POD workers would require further training on 1 or more of the POD ICS competencies and more than 20% would require more training to describe the use and content of a job action sheet.

The training that participants received in preparation for the exercise did appear to enhance their ability to perform the core competencies for POD workers. People who participated in training both before and on the day of the exercise were best prepared to staff a POD given that they were the least likely to require further training on ≥5 tasks. People who participated in 1 type of training only, and especially those who participated in no training, were less well prepared. These findings indicated that both types of training have value.

Of concern are the findings with respect to the competencies of nurses and pharmacists, in which 43% of pharmacists and 27% of nurses would require training in ≥5 competency areas. This indicates that despite professional training and experience, many members of these professions are inadequately prepared for their roles in a POD.

Almost all of the participants in our assessment had access to the Internet. Consideration needs to be given to the minority who do not have similar access when designing online training programs.

When possible, POD worker training should be standardized at the state level, but some aspects of training must be based on local POD plans and conditions such as geography, demographics, and response infrastructure. The participants in the survey would likely benefit from training in a number of areas that are covered by local plans including how to assist attendees with a limited ability to speak English or limited mobility and where to locate official protocols, supplies, and resources.

The survey measured the perception of a POD worker's ability to perform a competency-based task. Having recently participated in an exercise, the participants were in a better position to judge their performance objectively than they would have been had they not participated. Discrepancies between perceived and actual ability may have persisted despite this "reality check." Approximately 10% of people who worked at a POD as a player during the April 2006 full-scale mass dispensing exercise participated in the survey. The results from this subgroup of POD players may or may not be representative of all POD players.

CONCLUSIONS

The development of POD core competencies made it possible to conduct a systematic assessment of the training needs of CT POD workers. When compared with the competencies, POD workers possessed many of the necessary skills to staff a POD; however, competency-based training with emphasis on areas of weakness revealed by the assessment could improve willingness to report for duty and performance.

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REFERENCES

1. Center for Disease Control and Prevention. Cities Readiness Initiative Factsheet. http://www.bt.cdc.gov/cri/facts.asp. Accessed November 24, 2008.
2. Center for Health Policy Columbia University School of Nursing and Association of Teachers of Preventive Medicine. Competency-to-Curriculum Tool Kit. http://www.cumc.columbia.edu/dept/nursing/chphsr/pdf/toolkit.pdf. Accessed August 2007.
3. Columbia Center for Public Health Preparedness, Center for Health Policy Columbia University School of Nursing, Greater New York Hospital Association, Emergency Preparedness and Response Competencies for Hospital Workers http://www.ncdp.mailman.columbia.edu/files/hospcomps.pdf. Accessed November 1, 2009.
4. Harrison LM, Davis MV, MacDonald PDM, et al. Development and implementation of a public health workforce training needs assessment survey in North Carolina. *Public Health Rep.* 2005;120(Suppl 1):28-34.
5. Stanley J, Chastain AR, Davies K, et al. Educational Competencies for Registered Nurses Responding to Mass Casualty Incidents. 2003. http://www.aacn.nche.edu/Education/pdf/INCMCECompetencies.pdf. Accessed August 2007.
6. Columbia University School of Nursing Center for Health Policy. Bioterrorism & Emergency Readiness. Competencies for All Public Health Workers. 2002. http://training.fema.gov/EMIWeb/downloads/BioTerrorism%20and%20Emergency%20Readiness.pdf. Accessed November 1, 2009.
7. Connecticut Department of Public Health. Public Health Emergency Response Plan Annex J—Strategic National Stockpile Plan for the Receipt, Management, and Dispensing of Emergency Medical Supplies. 2005.
8. Hupert N, Cuomo J, Callahan MA, et al. Community-based Mass Prophylaxis: A Planning Guide for Public Health Preparedness. AHRQ Publication No. 04-0044, August 2004. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/research/cbmprophyl. Accessed November 1, 2009.
9. Subbarao I, Lyznicki JM, Hsu EB, et al. A consensus-based educational framework and competency set for the discipline of disaster medicine and public health preparedness. *Disaster Med Public Health Prep.* 2008;2(1):57-68.
10. Qureshi K, Gershon RRM, Sherman MF, et al. Health care workers' ability and willingness to report to duty during catastrophic disasters. *J Urban Health.* 2005;82(3):378-388.
11. Balicer RD, Omer SB, Barnett DJ, Everly GS Jr. Local public health workers' perceptions toward responding to an influenza pandemic. *BMC Public Health.* 2006;6:99.

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