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Identifying and Prioritizing Information Needs and Research Priorities of Public Health Emergency Preparedness and Response Practitioners

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Abstract

Objective—This study describes findings from an assessment conducted to identify perceived knowledge gaps, information needs, and research priorities among state, territorial, and local public health preparedness directors and coordinators related to public health emergency preparedness and response (PHPR). The goal of the study was to gather information that would be useful for ensuring that future funding for research and evaluation targets areas most critical for advancing public health practice.

Methods—We implemented a mixed-methods approach to identify and prioritize PHPR research questions. A web survey was sent to all state, city, and territorial health agencies funded through the Public Health Emergency Preparedness (PHEP) Cooperative Agreement program and a sample of local health departments (LHDs). Three focus groups of state and local practitioners and subject matter experts from the Centers for Disease Control and Prevention (CDC) were subsequently conducted, followed by 3 meetings of an expert panel of PHPR practitioners and CDC experts to prioritize and refine the research questions.

Results—We identified a final list of 44 research questions that were deemed by study participants as priority topics where future research can inform PHPR programs and practice. We identified differences in perceived research priorities between PHEP awardees and LHD survey respondents; the number of research questions rated as important was greater among LHDs than among PHEP awardees (75%, $n = 33$, compared to 24%, $n = 15$).

Conclusions—The research questions identified provide insight into public health practitioners' perceived knowledge gaps and the types of information that would be most useful for informing and advancing PHPR practice. The study also points to a higher level of information need among LHDs than among PHEP awardees. These findings are important for CDC and the PHPR research community to ensure that future research studies are responsive to practitioners' needs and provide

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Disclaimer

The conclusions and opinions expressed in this article are those of the authors and do not necessarily represent the official position of the US Centers for Disease Control and Prevention.

the information required to enhance their capacity to meet the needs of the communities and jurisdictions they serve.

Keywords

emergency preparedness; response; research priorities; public health capabilities

To ensure the public's health, it is critical for governmental public health agencies, including state health departments, territorial health departments, and local health departments (LHDs), to be adequately equipped to identify and respond to specific incidents threatening health and well-being across states and communities.¹ Public health agencies, however, face challenges in public health emergency preparedness and response (PHPR) related to how to prioritize resources and ensure they are directed to jurisdictional priorities. To support and advance the ability of state, local, and territorial public health agencies to respond to public health emergencies, the Centers for Disease Control and Prevention (CDC) administers the Public Health Emergency Preparedness (PHEP) Cooperative Agreement program. The program provides funding to support 62 awardees in the United States: 50 state health departments, 4 large city health departments, and 8 territories and insular areas.² To guide awardees' priorities, CDC developed a set of 15 Public Health Preparedness Capabilities in 2011 that serve as preparedness planning standards for state health departments, territorial health departments, and LHDs.³

To ensure that jurisdictional needs are met, it is crucial for public health agencies to have the information they need—including knowledge of the most efficacious practices—to adequately protect against, respond to, and recover from public health emergencies. To this end, CDC recognized the importance of engaging practitioners in an assessment to identify PHPR topics requiring additional research to validate, improve, and inform programmatic operations, policy decisions, and public health practices. Gathering feedback from practitioners by using a community-based participatory research approach to identify key topics where knowledge gaps exist, to identify areas where additional research could help build the evidence base to address gaps, and to prioritize these topics will enable CDC to support research that generates new knowledge and products relevant to public health practice.

This article describes a study implemented by NORC at the University of Chicago, an independent research organization, in collaboration with CDC, to identify and prioritize the PHPR information needs of public health agencies. The study systematically identified state, territorial, and local preparedness directors' or coordinators' perceived knowledge gaps and research priorities through a survey, focus groups, and expert panel meetings by use of a consensus decision-making process. The goal of the study was to gather information that would be useful for shaping and prioritizing future research to advance PHPR practice.

METHODS

The NORC and CDC research team implemented a mixed-methods research design in collaboration with project partners to gather feedback from all PHEP awardees and a sample of LHDs. Quantitative data collection consisted of a web-based survey of state health

department, territorial health department, and LHD preparedness directors and coordinators. Qualitative data collection consisted of 3 focus groups: 2 with state and local public health preparedness staff and 1 with CDC subject matter experts. NORC also convened an expert panel consisting of state and local practitioner experts and CDC subject matter experts. The expert panel met 3 times and participated in a consensus decision-making process to prioritize research questions. Below, we describe methods for survey instrument development, data collection, data analysis, and expert panel consultation.

Designing the Survey

The survey was organized into 2 sections. The first presented 6 background questions about the respondents' job titles, familiarity with existing preparedness literature and research, and interest in having additional information or training on preparedness research. Respondents were also asked to indicate their health department's involvement, collaboration, and funding for PHEP research. The second survey section presented 44 research questions organized into 6 broad Public Health Preparedness domains that encompass the 15 Public Health Emergency Preparedness Capabilities (plus a seventh cross-cutting domain): Biosurveillance, Community Resilience, Countermeasures and Mitigation, Incident Management, Information Management, and Surge Management. Within each domain, the survey respondents were asked to rank the importance of each research question (from 1 = "not at all important" to 5 = "extremely important") in addressing an area where additional information is needed to advance practice. Response options of 6 = "N/A" and 7 = "Don't Know" were also included. Respondents were also asked to report via open-ended fields any additional domain-specific research questions that were unanswered or for which additional knowledge is needed to advance practice. The research questions were identified as important topics by CDC following review of data previously gathered from subject matter experts within CDC who engaged routinely with the public health preparedness and response community. The final survey instrument was developed through an iterative process, including review and revision by practitioners at the state and local level.

The NORC research team pretested the survey instrument in collaboration with project partners the Association of State and Territorial Health Officials (ASTHO) and the National Association of County and City Health Officials (NACCHO). ASTHO and NACCHO recruited staff from 5 state health departments and 4 LHDs to complete the survey and provide feedback on question content, navigability, formatting, and time needed to respond. NORC implemented minor revisions to the survey instrument following the pretest. The NORC Institutional Review Board determined this research to be exempt from full review and CDC concurred with reliance on this determination for human subjects clearance. The information collection was also approved by the Office of Management and Budget for compliance with the requirements of the Paperwork Reduction Act.

Collecting Survey Data

The survey was sent to the universe of health departments directly funded by the PHEP Cooperative Agreement (<http://www.cdc.gov/phpr/coopagreement.htm>; n = 62) and a stratified, random sample of LHDs (n = 200). The directly funded health departments (ie, PHEP awardees) included the 50 state health departments, 4 major city health departments

(Washington, DC; Los Angeles; Chicago; and New York City), and 8 health departments from US territories and insular areas. (The 8 territories and insular areas are American Samoa, Guam, US Virgin Islands, Northern Mariana Island, Puerto Rico, Federal States of Micronesia, Republic of the Marshall Islands, and Republic of Palau.) NACCHO developed the LHD sample from their database of LHDs by excluding those directly funded and those serving jurisdictions with fewer than 10,000 individuals, as they are overrepresented in their database. We stratified the sampling frame of 2086 LHDs by size of population served (<50,000; 50,000 to 499,999; and >500,000) and geographic region (Northeast, Midwest, South, and West). We oversampled LHDs with large population sizes, because they represent a relatively small portion of all LHDs, to ensure a sufficient number for analysis. The resulting sample was divided into 12 strata. Within each stratum, NACCHO identified alternate LHDs as replacements for those without preparedness director or coordinator contact information.

The survey was conducted from December 2014 through January 2015. NORC sent the survey invitation and web link via e-mail to PHEP awardees and the LHD sample and sent reminders to complete the survey. ASTHO and NACCHO also sent e-mails to PHEP awardees and the LHD sample, respectively, to inform them of the survey, encourage participation, and remind nonrespondents to complete the survey.

Conducting the Focus Groups

Following the survey, we conducted 3 focus groups, 2 with state and local public health preparedness staff (n = 8 in each focus group) and 1 with CDC staff (n = 9). A nonrandom convenience sample of 16 public health practitioners was recruited from the universe of state and local public health practitioners attending the 2015 Preparedness Summit in April 2015 in Atlanta, Georgia.⁴ Similarly, a nonrandom convenience sample of 9 CDC staff with PHPR expertise was recruited. The research team facilitated discussions of high-level survey findings and sought to identify other topics where participants believed additional research is needed to inform practice. The research team created an audio recording of each focus group discussion and detailed notes to capture feedback and recommendations regarding the research questions. The notes were later analyzed by the research team, as described below.

Convening the Expert Panel

Following data collection, an expert panel was convened to assist with prioritizing and refining the research questions. We identified current public health practitioners and CDC research staff to serve on the expert panel based on areas of expertise and practical PHPR experience; 9 state and local public health preparedness practitioners and 9 CDC staff were recruited. The practitioner experts represented a range of expertise and geographical diversity of health departments across the country, including 6 state, 1 regional, 1 city, and 1 county health department. Several practitioners also participated in the focus groups. CDC scientific and programmatic staff from multiple centers and offices (eg, preparedness and response, emerging and zoonotic infectious disease, environmental health) were also selected to represent a range of expertise and content knowledge. The expert panel met 3 times in August, October, and December 2015. The research team created an audio

recording of each meeting and detailed notes to capture feedback and recommendations regarding the research questions.

Analyzing Data and Prioritizing Research Questions

To synthesize and prioritize a list of research questions from the data collected, we drew upon both qualitative and quantitative data from the survey, focus groups, and the first expert panel meeting to create an initial list of research questions. To prepare survey data for analysis, a final, clean data file and codebook with an index of variables, frequency of responses, and number of missing responses was created. To determine the frequency distributions and averages for quantitative data and to identify the priority research questions within each domain, univariate analyses were conducted. We first identified the research questions from the survey rated “extremely important” or “very important” by at least 50% of the survey respondents and included these research questions in the initial synthesized list of research questions. Then, we reviewed qualitative data from the survey, as well as the notes from the focus groups and the first expert panel meeting, to identify additional topics that were recommended by participants and not already reflected in the research questions. Research questions and topics that were mentioned by more than one respondent were included in the synthesized list of research questions.

To prioritize the synthesized list, we requested that the expert panel members review the list, designate the most important research questions in each domain, and rank-order the 5 most important questions in each domain on a scale of 1 to 5 where 1 signified greater importance and 5 signified lower importance. Nine expert panel members provided rank-ordering for the research questions and the research team computed a weighted average ranking for each research question (rank #1 = 5, #2 = 4, #3 = 3, #4 = 2, #5 = 1, and no rank = 0) and compared the weighted average rankings across research questions in each domain to identify the most important research questions. The priority research questions were those with weighted average rankings equal to or greater than the median ranking average (median = 1.0) across domains and represented the most important research questions overall, across expert panel members who completed the rank-ordering.

To further refine and prioritize the research questions, the research team held discussions with the expert panel. Expert panel members engaged in a consensus decision-making process to determine which questions should remain on the priority list and which questions required additional revisions or clarification. Expert panel members offered suggestions on question wording, granularity, appropriateness, and overall importance, and also identified additional topics and subtopics for potential inclusion in the list of priority research questions. Following each meeting, we revised the research questions to incorporate additional expert feedback.

RESULTS

Survey Results

Table 1 presents data on the survey response rate. We received responses from 51 of 61 PHEP awardees (84%) and from 78 of 183 LHDs (43%), resulting in an overall response

rate of 53%. To calculate the response rates, we excluded unreachable nonrespondents from the denominators, which we defined as those with invalid contact information (1 PHEP awardee and 17 LHDs for a total of 18 unreachable potential respondents). The majority of survey responses were from preparedness directors (69%), followed by health directors/health officials (23%).

Table 2 presents the characteristics of the stratified random sample compared with the LHD respondents. Based on the NACCHO data, the respondent distribution was comparable to the stratified random sample. For example, LHDs serving large population sizes were oversampled (20%) and this over-representation remained among respondents (19%).

Table 3 presents the number of research questions from the survey and the number and percentage of research questions that were identified as the highest priority overall, by respondent group, and by domain. Overall, 44 research questions were included in the survey across the 7 domains. In total, 27 research questions (61%) were rated “extremely important” or “very important” by half or more of survey respondents. By domain, there were 8 (57%) highest-priority research questions identified in Countermeasures and Mitigation, followed by 6 in Biosurveillance (86%), 5 in Information Management (100%), 3 in Surge Management (100%), 3 in Cross-Cutting Topics (33%), 1 in Community Resilience (33%), and 1 in Incident Management (33%).

Among PHEP awardees, fewer research questions ($n = 15$, 34%) were rated “extremely important” or “very important” by half or more respondents. By domain, there were 8 (57%) highest-priority research questions among PHEP awardees in Countermeasures and Mitigation, 2 in Biosurveillance (29%), 2 in Cross-Cutting Topics (22%), 1 in Surge Management (33%), 1 in Community Resilience (33%), and 1 in Information Management (20%).

Among the LHD sample, 75% of research questions ($n = 33$) were rated “extremely important” or “very important” by more than half of survey respondents. By domain, there were 10 (71%) highest-priority research questions among the LHD respondents in Countermeasures and Mitigation, 6 in Biosurveillance (86%), 6 in Cross-Cutting Topics (67%), 5 in Information Management (100%), 3 in Surge Management (100%), 2 in Incident Management (67%), and 1 in Community Resilience (33%).

Of the 44 research questions in the survey, the research question within the Community Resilience domain related to appropriate methods and procedures for identifying and mapping at-risk populations received the highest importance rating (64%). This research question was also the highest-priority research question among PHEP awardees, rated “extremely important” or “very important” by 69% of PHEP awardee respondents. At the local level, the highest-priority research question was within Biosurveillance and related to processes and protocols for guiding inter-state and inter-jurisdictional epidemiological investigation, which was rated important by 74% of LHD respondents.

Table 4 presents the research questions from the survey with the greatest absolute difference in importance rating between PHEP awardees and the LHD sample. Eight research questions had an absolute difference of 20 percentage points or greater. The research question with the

greatest difference in importance rating (35%) was the question related to processes and protocols for guiding inter-state and inter-jurisdictional epidemiological investigation, which was of greatest importance to the local sample but considerably less so to the PHEP awardees. Other topics that were rated highly by the LHD sample but less so by PHEP awardees included practices and procedures for engaging, registering, and tracking public health volunteers; collaboration with other entities during an emergency; important memorandum of understanding components for disaster response; effective communication methods for response; e-mail communications during an event or incident; and administrative processes to facilitate acquisition of assets. One topic that was rated highly by PHEP awardees but less so by the LHD sample was pediatric support and expertise across PHEP topic areas.

Table 5 presents the priority domains among survey respondents, overall and by respondent group. Priority domains are defined as those with the highest percentage of research questions rated “extremely important” or “very important” by half or more of survey respondents. Overall, the 2 highest-priority domains were Information Management and Surge Management, with 100% of research questions rated important by half or more of respondents. Two domains had 50% or more of research questions rated important by all respondents: Biosurveillance, and Countermeasures and Mitigation. The remaining domains, Community Resilience, Incident Management, and Cross-Cutting Preparedness Topics, had about one-third of research questions rated important. Among LHD sample respondents, the 3 most important domains were the same as the priority domains overall: Information Management (100%), Surge Management (100%), and Biosurveillance (86%). The most important domain among PHEP awardees was Countermeasures and Mitigation (50%). For all domains, PHEP awardees rated a lower proportion of research questions as important compared to the LHD sample, with one exception: Community Resilience was rated the same between respondent groups (33%). In the Incident Management domain, no research questions were rated important by half or more of PHEP awardees.

Research Synthesis and Prioritization Results

The synthesis first identified research questions from the survey rated “extremely important” or “very important” by more than half of survey respondents; as previously noted, 27 of 44 (61%) research questions from the survey were rated as such, which we included in the synthesized list. Next, we identified 55 additional research questions from open-ended survey responses, focus groups, and the first expert panel meeting. The final synthesis included 82 research questions across the Public Health Preparedness domains.

The prioritization process was completed with the assistance of expert panel members through rank-ordering and group consensus discussions. The rank-ordering analysis identified 44 research questions equal to or greater than the median average ranking (median = 1.0). These were the most important research questions overall and were included in the list of priority research questions discussed with expert panel members. The result of these meetings was a final list of 44 research questions deemed by PHEP practitioners and CDC staff as priority topics where future research can inform public health preparedness programs and practice. The research questions were grouped by domain and covered multiple topic

areas related to the Public Health Preparedness Capabilities. Table 6 presents the priority research questions by domain.

DISCUSSION

The study methods and approach implemented by NORC and CDC ensured that comprehensive data were gathered from PHEP awardees and from a representative sample of LHDs throughout the United States. To aid with interpretation of the survey data, qualitative data were gathered via focus groups with PHEP practitioners and CDC staff. Furthermore, the subsequent feedback gathered from the participants of the expert panel enabled us to not only prioritize research questions in the field but also build consensus on the final wording for the priority research questions. The research questions spanned the 7 domains and addressed the following topics: resources and tools for information sharing, emergency risk communication, and social media; ensuring capacity for medical surge and mass care activities and operations; biosurveillance procedures and processes for investigation and response, collaboration, and disease control; best practices, strategies, and methods for responder health and countermeasure management; strategies and methods for planning and enhancing community preparedness and resilience; incident management planning, communication, and implementation; and other topics that span multiple domains. The research questions provide CDC with an understanding of practitioners' knowledge gaps in PHEP practice. This understanding is essential for ensuring that future research studies address research questions relevant to communities. Such understanding is also essential to provide information to address the needs of state, tribal, local, and territorial (STLT) public health practitioners to enhance their capacity to meet the needs of the communities and jurisdictions they serve. The findings are also relevant for STLT agencies, providing them with an understanding of the diversity of PHEP information needs perceived across the practice community. This understanding can facilitate efforts to ensure collaboration and enhancement of PHEP programs across public health agencies.

While this study resulted in a clearly defined list of priority research questions, it also identified differences in perceived research needs and priorities between PHEP awardees and LHDs. The number of research questions from the survey rated "extremely important" or "very important" by half or more of respondents was far greater among the LHD sample than among PHEP awardees (75%, n = 33, compared to 24%, n = 15), indicating a higher level of information need among LHDs. The specific research questions and domains of highest importance were different for PHEP awardees than for the LHD sample, indicating that LHDs have different information needs than state, city, and territorial health departments who receive PHEP funding directly. During focus groups, respondents indicated concerns about these differences. For example, one participant felt that some research questions within the Information Management domain had already been addressed through research and therefore should not be a high priority among LHDs. Other participants explained that many LHDs implement different PHEP procedures and activities, compared to state health departments and large cities funded by CDC, such as the topics addressed by research questions within the Countermeasures and Mitigation domain, which may explain some of the differences in priority ratings. Focus group participants also suggested that differences may be due to the types of relationships LHDs have with their state health

departments, such as governance structure, communication, and concurrence on priorities and deliverables. Furthermore, the size and funding levels of health departments may also be a factor. Large, well-funded health departments, typically states and large cities, may have additional resources to support staff to be involved in reviewing research, as well as increased training resources and awareness of evidence-based guidelines, compared to smaller health departments with more limited resources.⁵

The information from this study provides useful context and data on appropriate topics for future research that can inform PPHR practice. A number of findings are particularly important to CDC as they consider possible topics for which they will direct funding related to PPHR. Similarly, findings are important for the PPHR research community to ensure that future studies are contextually relevant to inform public health practice.

Limitations

Several limitations of the study and analysis should be noted. First, the survey was sent to the preparedness director or coordinator at each health department; hence, the responses are reflective of that individual's perspective. While it is possible that a subset of respondents consulted with colleagues to reflect multiple perspectives in their response, the limitation posed by single respondents speaking for their entire health department should be considered when interpreting findings. Second, to develop the LHD sample, we excluded LHDs serving populations of 10,000 individuals or fewer and stratified the sample by geographic region and size of population served to increase representativeness. Despite this, the response rate among LHDs was lower than that for PHEP respondents. As a result, the findings may not be representative of the broader universe of LHDs in the United States and may overemphasize the perspectives of PHEP respondents when considering overall findings. Third, focus group respondents consisted of a convenience sample, and expert panel participants consisted of a select group of state and local practitioners and federal experts. Thus, these respondents are not necessarily representative of the public health practitioner population. Fourth, because of the priority-ranking and consensus-building process implemented during the expert panel review, there may be additional topics not reflected in the final list of priority research questions that represent important PPHR topics where additional research is needed to advance practice. To ensure these data were captured through the study, NORC provided the CDC with all topics and research questions identified through this study's methods in the project final report. Finally, some expert panel participants were challenged to define clear and focused research questions and instead emphasized the importance of broader PPHR research questions. This limitation may reflect that panelists represented practitioners from different public health disciplines that may or may not have had experience with framing specific research questions. As a result, some of the broader priority research questions identified through this study may require additional refinement to improve their utility for informing future research.

CONCLUSIONS

Through in-depth and systematic procedures, this study sought to determine the information needs and research priorities of public health practitioners related to PPHR. The practice-

based assessment gathered qualitative and quantitative data via a survey and focus groups and refined research questions through a priority-ranking and consensus-building process during several meetings with an expert panel. The results are a list of priority research questions representing the most important topics across domains where public health practitioners believe additional research can help to validate, improve, and better inform public health programs and policy decisions. These findings are useful for the federal government and other stakeholders as a first important step in clarifying the most critical research questions for the field and for ensuring that future research activities and funding opportunities are directed to address them. Furthermore, state health departments, PPHR researchers, and other entities working with LHDs can use the findings to ensure PPHR research, dissemination, translation, and implementation appropriately address the priority topics identified through this study. Additional work will likely be necessary to hone and operationalize the research questions, adjust them as the field continues to evolve, and utilize them properly to inform scientific resource allocation. Further study is also necessary to understand the extent to which some perceived knowledge gaps in the practice community reflect insufficient dissemination or ineffective implementation of findings, rather than a lack of existing scientific knowledge. Future PPHR efforts should be responsive to practitioners' needs, address priority practice knowledge gaps, and yield products to help state health departments, territorial health departments, and LHDs improve practice and meet their preparedness goals.

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TABLE 1Survey Response Rate, Overall and By Respondent Group^a

	Survey Response Rate, %	No. of Responses	Original Sample, No.	Unreachable, No.	Calculated Denominator, No.
Overall	53	129	262	18	244
PHEP awardee	84	51	62	1	61
LHD sample	43	78	200	17	183

^a Abbreviations: LHD, local health department; PHEP, Public Health Emergency Preparedness.

TABLE 2

Characteristics of Stratified Random Sample Compared to LHD Respondents^a

	Stratified Random Sample, No. (%) (n = 200)	LHD Respondents, No. (%) (n = 78)
Geographic Region		
Northeast	45 (23)	16 (21)
Midwest	60 (30)	27 (35)
South	54 (27)	20 (26)
West	41 (21)	15 (19)
Population Served		
<50,000	87 (44)	33 (42)
50,000–499,999	74 (37)	30 (38)
500,000	39 (20)	15 (19)
Sampling Strata		
1: Northeast Region, <50,000 pop.	20 (10)	6 (8)
2: Midwest Region, <50,000 pop.	30 (15)	11 (14)
3: South Region, <50,000 pop.	24 (12)	8 (10)
4: West Region, <50,000 pop.	13 (7)	8 (10)
5: Northeast Region, 50,000–499,999 pop.	16 (8)	7 (9)
6: Midwest Region, 50,000–499,999 pop.	21 (11)	13 (17)
7: South Region, 50,000–499,999 pop.	23 (12)	8 (10)
8: West Region, 50,000–499,999 pop.	14 (7)	2 (3)
9: Northeast Region, 500,000+ pop.	9 (5)	3 (4)
10: Midwest Region, 500,000+ pop.	9 (5)	3 (4)
11: South Region, 500,000+ pop.	11 (6)	4 (5)
12: West, 500,000+ pop.	10 (5)	5 (6)
Geographic Jurisdiction Served		
County	141 (71)	56 (72)
City	27 (14)	10 (13)
Other	32 (16)	12 (15)
LHD Governance Classification		
Unit of state government	30 (15)	9 (12)
Unit of local government	156 (78)	65 (83)
Unit governed by both state and local authorities (shared)	14 (7)	4 (5)

^aAbbreviation: LHD, local health department.

TABLE 3Priority Research Questions Overall and Within Domains, by Respondent Group^a

Domain	Total, No. (%)	Overall, No. (%)	PHEP Awardee, No. (%)	LHD Sample, No. (%)
Countermeasures and Mitigation	14	8 (57)	8 (57)	10 (71)
Biosurveillance	7	6 (86)	2 (29)	6 (86)
Information Management	5	5 (100)	1 (20)	5 (100)
Surge Management	3	3 (100)	1 (33)	3 (100)
Cross-Cutting Topics	9	3 (33)	2 (22)	6 (67)
Community Resilience	3	1 (33)	1 (33)	1 (33)
Incident Management	3	1 (33)	0 (0)	2 (67)
Total	44	27 (61)	15 (34)	33 (75)

^aAbbreviations: LHD, local health department; PHEP, Public Health Emergency Preparedness.

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TABLE 4

Public Health Preparedness and Response Research Question Topics with Greatest Absolute Difference in Importance Ratings between PHEP Awardees and LHD Sample^a

Domain	RQ Topic	Percentage of RQs Rated Extremely or Very Important (>50% Respondents), %		
		PHEP Awardee	LHD Sample	Absolute Difference,%
Biosurveillance	Processes and protocols for guiding inter-state and inter-jurisdictional epidemiological investigation	39	74	35
Surge Management	Practices/procedures for engaging, registering, and tracking public health volunteers	37	63	26
Cross-Cutting Topics	Collaboration with other entities during an emergency	33	58	25
Cross-Cutting Topics	Important MOU components for disaster response	28	53	25
Incident Management	Effective communication methods for response	47	69	22
Incident Management	E-mail communications during an event or incident	28	49	22
Cross-Cutting Topics	Pediatric support and expertise across PHEP topic areas	65	44	21
Cross-Cutting Topics	Administrative processes to facilitate acquisition of assets	43	64	21

^aAbbreviations: LHD, local health department; MOU, memorandum of understanding; PHEP, Public Health Emergency Preparedness; PHEP, public health emergency preparedness and response; RQ, research question.

TABLE 5Priority Research Domains From the Survey, Overall and By Respondent Group^a

Domain	No. of RQs Within Domain	Percentage of RQs Rated Extremely or Very Important (>50% respondents), %		
		Overall	PHEP Awardee	LHD Sample
Information Management	5	100	20	100
Surge Management	3	100	33	100
Biosurveillance	7	86	29	86
Countermeasures and Mitigation	14	57	50	71
Incident Management	3	33	0	67
Community Resilience	3	33	33	33
Cross-Cutting Topics	9	33	11	56

^a Abbreviations: LHD, local health department; PHEP, Public Health Emergency Preparedness; RQ, research question.

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TABLE 6

Priority Research Questions, by Domain^a

Information Management	
1	Is social media an effective platform for communicating with the public during emergencies (eg, about available resources and for maintaining situational awareness)?
2	What are the most effective message formats for information sharing (eg, public information, alerts, warning, notifications, etc) for functional and access needs populations, including populations that rely on oral traditions, limited English proficiency populations, and individuals without Internet access or smart phones?
3	What are best practices and barriers for using information-sharing systems to share data between and among states and localities, to share information about functional and access needs populations, and to address HIPAA privacy, disclosures, and confidentiality?
4	Are information sharing systems effective for handling surge-related needs (eg, surges of information, resources, and/or patients)?
5	What are best practices for translating and disseminating emergency risk communication principles used by public health departments to ensure knowledge and use across the public health system?
6	What are the most effective resources and tools (eg, data collection templates, methods for summarizing and sharing information, and/or data systems) that can be tailored to capture critical information during different types of emergency events?
Surge Management	
1	What are best practices and infrastructure needs for addressing mental health issues and needs during emergencies?
2	What are the appropriate metrics for assessing medical surge activities and operations, including services, management processes, and standards of care?
3	What are the most effective strategies for ensuring preparedness and medical surge capacity in rural, isolated, or health professional shortage areas?
4	What are the most effective and appropriate roles for public health departments in medical surge activities and operations, considering the varying capabilities, resources, knowledge, and skills that exist within public health departments?
5	What are best practices for public health departments, hospitals, and health care facilities to ensure readiness to activate and support surge activities and operations and to continue to provide services in the short and long term after an incident, especially related to: surge activities and operations; public health agencies' roles in supporting health care facility and hospital readiness; coordinating delivery of resources (eg, medical materiel or pharmaceuticals) during a crisis; staffing; medical countermeasure distribution; and patient surge?
6	What are the most effective strategies or systems (eg, regional planning, standards of care, and/or coalitions) for facilitating collaboration and communication across agencies that support medical surge and mass care operations and activities?
7	What are best practices for health care coalitions for medical surge?
Biosurveillance	
1	What are the most effective practices, procedures, and strategies for isolation and quarantine and infection control?
2	What are the most effective processes and protocols for interjurisdictional (eg, across states, localities) epidemiological investigation during an emergency event?
3	What are the most effective data sharing and data use practices for public health surveillance to ensure privacy, confidentiality, and security of personal health information?
4	What are the most effective communication and information sharing methods for epidemiological response among public health and external partners (eg, health care, law enforcement, forensic epidemiology, first responders, and emergency management)?
5	Are syndromic surveillance systems effective and timely for detecting public health threats, triggering emergency response, and conveying information/data with other public health entities?
6	What are the most effective surveillance systems for supporting surge epidemiological investigation and for supporting community situational awareness during a response?
Countermeasures and Mitigation	
1	What are the most effective strategies for medical countermeasure apportionment and collaboration to manage dispensing points and to optimize speed and coverage of dispensing to the identified populations?
2	What are the most effective methods and strategies for dispensing medication (eg, mailboxes, closed, open, or pharmacist points of dispensing) to the targeted population?

- 3 What is the optimal mix of dispensing modalities (eg, closed versus open points of dispensing) for medical countermeasures dispensing?
- 4 What are best practices for understanding the health issues (eg, safety and mental health) of responders, including health department staff and others, both prior to and following incident response?

Community Resilience

- 1 What are the most effective strategies for engaging, educating, training, and motivating communities to prepare for, withstand, and recover from public health incidents and emergency events?
- 2 How effective are simulation and modeling for informing community preparedness and recovery from public health incidents?
- 3 How effective is jurisdictional risk assessment-based planning for mitigating the impact of identified risks in the community related to public health, services, and infrastructure?
- 4 What are the most effective strategies for engaging functional and access needs populations in community preparedness activities and improving their ability to prevent, mitigate, respond to, and recover from events?
- 5 What are the most effective methods for locating/mapping locations of functional and access needs populations before, during, and after an emergency event (eg, Geospatial Informational Systems [GIS] mapping, other technology)?
- 6 How can various types of data (eg, historical, geological, ecological, and sociological data) be used to inform jurisdictional risk assessments, and what is the feasibility of compiling these data centrally?

Incident Management

- 1 What are best practices for training and exercising staff and first responders to contribute to the emergency response and emergency operations communications when their usual role is not emergency preparedness?
- 2 What are the most effective elements to successful Continuity of Operations (COOP) implementation for health departments?
- 3 What is the effect of reduced federal and community funding, staffing, and resources on existing infrastructure (eg, protocols, guidelines, and plans) and communication systems for emergency operations planning and implementation?
- 4 What are the most effective strategies for ensuring the EOC is not overwhelmed, continues to identify important information during an emergency event, and has incorporated appropriate levels of redundancy into its planning and operations?
- 5 What are the most effective strategies for eliminating cross-jurisdictional (eg, across states, localities) barriers to mutual aid to ensure the EOC is fully staffed over multiple operational periods and when the local system is overwhelmed?
- 6 How effective are web-based command and control platforms (ie, WebEOC), protocols, and trainings for EOC operations?
- 7 What are the most effective EOC communication methods (both within the EOC and between the EOC and the public) during a response?
- 8 What are the most effective approaches for public health departments to coordinate with other entities both within and outside of the EOC (eg, locally and regionally, with state and local agencies, with health care and health care systems, etc)?
- 9 What are best practices for building capacity to ensure a fully staffed, working information management system during a surge?

Cross-Cutting Topics

- 1 What is the relationship between the availability of federal, state, and local resources (eg, funding, staffing, and equipment) and state and local public health preparedness and response?
- 2 How can specific disease support and expertise (eg, pediatric, bariatric, and chronic disease) be applied to medical support, sheltering, and evacuation activities?
- 3 What are best practices for managing public risk perception during an emergency event?
- 4 What are best practices for integrating preparedness activities and operations into routine public health and health care practice?
- 5 What is the relationship between leadership variables (eg, experience, background, and training) of PHEP directors, incident commanders, and Incident Command System (ICS) leaders, and the response system's performance and sustainability?
- 6 What is the comparative effectiveness and productivity of different funding streams, and how can funding sources with similar grant deliverables be integrated (eg, Homeland Security and PHEP JRAs, HPP HCCDA Factors and healthcare community assessments, Joint Commission and CMS requirements, etc)?

^aAbbreviations: CMS, Centers for Medicare & Medicaid Services; EOC, emergency operations center; HCCDA, Healthcare Coalition Developmental Assessment; HPP, Hospital Preparedness Program; JRA, jurisdictional risk assessment; PHEP, Public Health Emergency Preparedness.