

**A Multi-State Comparison
of Local Public Health
Preparedness Assessment
Using a Common, Standardized Tool**

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EXECUTIVE SUMMARY

The sudden and rapid influx of new funds for public health emergency preparedness during the last five years has raised several challenges for planning and evaluation. Soon after the new funds were made available, it became clear that there was an urgent need for measuring preparedness at the state and local levels in ways that were more detailed and accurate than before. Program managers needed to assess the capacity of their agencies and how well they could perform a long list of functions that were being identified quickly as critical for responding to public health emergencies. At the same time, funding agencies required accountability for the moneys that they made available to create new programs and expand existing ones. Some major challenges in this process were the absence of national performance standards describing what functions and services state and local health departments could reasonably be expected to perform and the absence of standardized tools to assess the capacity of public health agencies in the field of emergency preparedness. In other words, program managers throughout the country received little guidance on how to set goals for their programs and how to monitor their progress.

In 2002 the Centers for Disease Control and Prevention (CDC) published a “Public Health Preparedness and Response Capacity Inventory” (referred to in this document as the “capacity inventory”), which through 79 questions comprising some 700 items assessed functions in the six focus areas included in the Bioterrorism Preparedness Cooperative Agreement between the CDC and state public health agencies. Two versions of the CDC capacity inventory, one for state and another for local assessments, were published. An evaluation published in 2003 reported that this assessment instrument had been used by at least 22 states and more than 800 local health departments. The capacity inventory did not include instructions on how to use the answers to survey questions, nor did it include a system to summarize and display assessment results.

The project described in this report was conducted by three public health institutes that were actively involved in their respective states in conducting local capacity assessments using the capacity inventory. The assessments were performed independently in Michigan, Illinois, and Kansas before the start of the current project, using various protocols and procedures. Kansas and Illinois used different scoring algorithms to evaluate the results of their surveys, while Michigan used frequency reports. The objectives of this project were to describe the usefulness

of a standardized tool in performing capacity assessments, comparing the different experiences in the three states; to perform an analysis of the information collected in the three states through the capacity inventory using alternative scoring algorithms; and to summarize key areas of findings from the assessments in the three states, identifying overall trends and knowledge that can be used by other states and institutes.

For this project the information collected in the three states was re-analyzed using both the Kansas and Illinois algorithms, and the scores achieved by the states under each scoring system were compared. Although there were variations in the scores achieved due to the differences in the two scoring methods, the trends revealed were nevertheless consistent using either system. For example, within each state, both systems ranked the same focus areas highest, and both ranked Focus Area C (laboratory capacity) the lowest in all three states. When the information from all three states was pooled together and analyzed by population density of the county where the local health departments were located, a clear trend could be observed of increasing preparedness with increasing population density.

During the course of this project, the project team also conducted a qualitative assessment of the capacity inventory by asking a convenience sample of users their impressions about the value and usefulness of that instrument. Users valued its flexibility, found some questions ambiguous and lamented a lack of benchmarks and an inability to compare the results of their agency to those of other agencies or to any universally accepted standards.

In conclusion, the experience of this project showed that the use of a structured assessment instrument combined with a structured scoring system was very helpful. The use of standardized tools and scoring methods allows comparisons of results across jurisdictions or for the same jurisdiction at multiple points in time, as well as comparisons of results against benchmarks and national standards, if those exist. Using common assessment tools also allows the pooling of data from multiple jurisdictions to perform analyses on larger samples. An important finding from this project was that even an imperfect tool like the capacity inventory used by the three states can produce valuable results. The project's results suggest a great need for the quick adoption of national performance standards, assessment instruments, and scoring methods that can be used

productively and immediately and improved based on experience and evidence acquired over time. Finally, the wealth of information that state and local jurisdictions have accumulated through the use of various assessment instruments, in particular the capacity inventory, should not be lost in the transition to the new national standards.

INTRODUCTION

Since 2001, Congress has substantially increased its allocation to the nation's public health capacity. The main goal of this increase was to assure that the nation would be adequately prepared to respond to a bioterrorism attack. In a few months between the end of 2001 and early 2002, several hundred million dollars were distributed by the Centers for Disease Control and Prevention (CDC) to all states, using an expedited process. Allocations at a similar level were repeated in following years. Most state health agencies in turn distributed varying portions of that money to their local public health departments (LHDs).

While the first funds were being disbursed, senior officials in the U.S. Department of Health and Human Services repeatedly noted the importance to the public health community of developing a system of accountability to show the results of this large investment in the improvement of public health preparedness. State and local health officials agreed in principle with this need, but no details were decided at that time regarding exactly how this accountability could be achieved. Thus, the process of developing systems was fragmented and incomplete.

The CDC cooperative agreement — The CDC cooperative agreement that provides the funding to states for preparedness activities identifies focus areas and critical capacities, and describes these capacities in varying levels of detail.¹ Some critical capabilities that should receive priority for achievement are also identified. Specific objectives and measurements for single activities are not included. A list of focus areas and critical capacities is included in Appendix A.

The Public Health Preparedness and Response Capacity Inventory tool — In 2002 the CDC Public Health Practice Program Office (PHPPPO) published a survey instrument titled “Local Public Health Preparedness and Response Capacity Inventory” (referred to in this document as the “capacity inventory”) aimed at providing a quick assessment of preparedness through the use of more than 70 questions grouped into focus areas and critical capacities that

¹ The focus area and critical capacity structure was maintained until the application for funding that states were instructed to submit in the summer 2005, when a different structure for the cooperative agreement was adopted.

mirrored the cooperative agreement with the states. The CDC published two slightly different versions of the inventory, one for the state and the other for the local assessment. To our knowledge, this remains the only standardized assessment instrument distributed nationwide that many states have at least partially used, often after introducing some modifications. However, once again, no measurable indicators are identified in that inventory, and the structure of many questions does not permit straightforward metric analysis. The capacity inventory is described in more detail below.

In summary, while relatively large amounts of money have been invested in improving public health preparedness, measuring preparedness for response to bioterrorism or other public health emergencies still suffers from at least two major challenges.

- 1) There are no national standards of “ideal preparedness” for state or local jurisdictions. Many experts agree that objectives, to be realistic, may need to be different for jurisdictions of different sizes and characteristics, but no consensus has been reached about the minimum functions that one could expect to see implemented at various levels.
- 2) There are no standardized systems to assess and measure preparedness. Despite attempts to produce a standardized set of measures of preparedness, no consensus exists about any given tool, and no tool has been adopted broadly.

OBJECTIVES

This project was designed to identify and examine the experiences in assessment and evaluation of preparedness for public health emergencies and bioterrorism in Michigan, Illinois, and Kansas. The project compared the results of assessments implemented in the three states and attempted to identify possible strengths and weaknesses that could be of interest for states planning to replicate similar initiatives. In the absence of national standardized assessment systems, some states have developed assessment methods for use in their own jurisdictions. These efforts have evolved independently, and while they have sometimes used portions of assessment tools developed nationally, they have not been part of coordinated national or regional efforts. A review conducted by researchers from the RAND Corporation published in 2005 (Asch, 2005) identified 27 evaluation instruments; of these, 4 were issued by state governments, 10 by federal agencies, one by a private certifying organization, 4 by professional associations, and 6 by umbrella groups covering more than one of these categories. This proliferation of assessment instruments is particularly interesting for several reasons, one of which is that in the absence of national standards for preparedness capacity, comparisons across jurisdictions may represent one of a limited number of ways for program managers to assess their program's results against an outside benchmark. Such comparisons may also assist in the identification of valid goals and standards that can be adopted nationwide. However, comparisons may be more difficult if assessments are performed using different instruments. The question of how to measure and compare levels of public health preparedness across state and local jurisdictions is the primary focus of this project.

Here are the project's main objectives.

- a) To describe methods used in the three states to assess local preparedness and monitor progress through the capacity inventory. An issue of particular interest for this study was the challenge and utility of using a common assessment instrument in different jurisdictions to evaluate programs that were implemented independently from each other.

- b) To assess the usefulness of a standardized assessment tool like the capacity inventory for local assessment needs in the three states. The project looked at how the information generated by the assessments was used in the period following the assessment.
- c) To perform an analysis of the information collected in the three states through the capacity inventory using alternative scoring algorithms. Through this analysis the study addressed the challenges of producing common scores to quantify the findings of an assessment tool and comparing these scores across jurisdictions.
- d) To summarize key areas of findings from the assessments in the three states, identifying overall trends and knowledge that can be used by other states and institutes.

METHODS

1) THE CAPACITY INVENTORY

The capacity inventory is organized into six sections, each corresponding to one of the six focus areas of the CDC cooperative agreement mentioned above and listed in detail in Appendix A. Briefly, these focus areas are²

Focus Area A: Preparedness Planning and Readiness Assessment,

Focus Area B: Surveillance and Epidemiology Capacity,

Focus Area C: Laboratory Capacity—Biologic Agents,

Focus Area E: Health Alert Network/Communications and Information Technology,

Focus Area F: Risk Communication and Health Information Dissemination, and

Focus Area G: Education and Training.

The six focus areas include 15 critical capacities targeted for achievement. The capacity inventory was field-tested, revised, and made available for national distribution in August 2002. Its validity was described by researchers at the University of Kentucky (Costich, 2004), who compared responses to the state instrument with documentary evidence gathered in site visits and found 95 percent agreement between the two. According to information provided by the CDC and cited in that article, as of mid-2003, 22 states and more than 800 local public health agencies reported having used the capacity inventory, another indirect indication of its appropriateness.

The assessment tool includes 79 questions comprising about 700 items. Many questions in the capacity inventory have a number of multiple-choice answers or are difficult to analyze; for example, respondents are asked to specify the extent to which a certain activity had been completed. Others are checklists, sometimes lengthy, that measure the extent to which certain features are present or certain activities have been conducted. At the time the capacity inventory was published, it did not include instructions on how to use the answers to monitor progress in development of the critical capacities over time. A CD-ROM version including a scoring algorithm was made available upon request. Despite the fact that the CDC developed a scoring

² Focus Area D (laboratory capacity for chemical agents) was not part of the CDC cooperative agreement and the capacity inventory during the period that data for this project were collected.

algorithm for the capacity inventory, this algorithm received only a limited dissemination and most states that used the capacity inventory for assessment purposes were not aware of its existence. One limitation of the algorithm program distributed by the CDC is that it only allows the production of scores for the results of one capacity inventory at a time, not the collation and comparison of multiple results.

2) THE ASSESSMENT SURVEY

In all three states involved in this project, preparedness assessments were performed through independent public health institutes using modified versions of the capacity inventory. The three institutes had collected their data independently before the project started; there were differences in the ways the information was collected, as well as the timing. A summary of the methods adopted in each state is contained in Table 1 below.

Table 1. Comparison of Selected Features of Survey Methodology in the Three States

	Illinois	Kansas	Michigan
<i>Time of survey</i>	Mid-2004	Late 2003	Late 2004
<i>Method for data submission</i>	Web-based	Web-based	Web-based
<i>Modifications to standard instrument</i>	Added 14 questions to local instrument	Added 30 questions to and deleted 4 questions from local instrument	Altered most of the questions for Focus Area E (Health Alert Network/Communications and Information Technology). Altered selected questions in other focus areas.
<i>Number of surveys completed and response rate</i>	97/97 (100%)	103/105 (98%)	84/84 (100%)
<i>Analysis methods</i>	Scoring algorithm developed by CDC	Scoring algorithm developed in Kansas	Frequency reports at county, agency, region, and state levels. No scoring or quantitative analysis

Survey Instrument

All three states used the capacity inventory as the basis for their assessments, with some additions and deletions outlined below.

Illinois

The Illinois Public Health Institute (IPHI) utilized the capacity inventory with the following addition: 14 questions from the Illinois Statewide Bioterrorism Preparedness Assessment that had been developed and administered in 2000 by the Illinois Department of Public Health (IDPH). These questions focused on emergency and mass vaccination plans, communicable disease reporting and control methods, lab capacity and specimen handling protocols. Inclusion of these questions afforded the opportunity to assess changes made by local health departments subsequent to the 2000 iteration of the survey.

Kansas

An additional section of 30 Kansas-specific questions was added that included items developed by the Kansas Association of Local Health Departments, the Kansas Department of Health and Environment (KDHE), and the Kansas Health Institute (KHI). The Kansas-specific module addressed the same focus areas as the national inventory, but added questions that were not covered in the original version of the instrument. Questions about coordination of LHD activities with area hospitals and other counties were also added. Four questions (7, 17, 18, and 52) were deleted from the capacity inventory because they were considered not relevant to Kansas.

Michigan

Michigan has collected information using the capacity inventory since 2002. Initially data collection was based upon the CDC's tool, with minimal changes. The most notable changes were made to the Focus Area E (Health Alert Network/Communications and Information Technology) section, for which information was collected only partially using the standardized questions included in the original capacity inventory. Since the initial data collection, the Office of Public Health Preparedness at the Michigan Department of Community Health has reviewed the capacity inventory annually, and has made changes to selected questions, as well as deleting and adding questions to meet the needs of the state.

Data Collection

Illinois

The IPHI subcontracted with the Center for the Advancement of Distance Education at the School of Public Health of the University of Illinois at Chicago to create a Web-based tool that was arranged in the same format as the paper version of the modified capacity inventory. Local health jurisdictions were able to access the online tool, enter the information, save entered data, and return at a later time if needed. For jurisdictions not served by a health department, the responsible emergency response coordinator (ERC) was given a unique username and password to enter data for that jurisdiction.

IPHI developed, in conjunction with IDPH, a standard methodology and training for completing the capacity inventory. Each health jurisdiction was asked to designate one person to serve as the assessment coordinator and collect the responses from appropriate internal and external stakeholders. After the responses were collected, the assessment coordinator shared them with the local health administrator for review of their general accuracy and completeness. The responses were then entered into the Web-based tool.

The survey was conducted in mid-2004. In Illinois, 99 of the 102 counties are covered by 97 local health departments. All 97 local health departments submitted a survey.

Kansas

Data collection occurred at the end of 2002 and again at the end of 2003. Although the capacity inventory was designed to be conducted through the mail, KDHE felt that it would be advantageous to collect the survey response data electronically via a secure Web-based system. Hard copies of the inventory were mailed to LHD administrators, who were invited to complete the survey online. The information from the second survey (2003) was used for the purpose of this project. Of 105 LHDs in Kansas, 103 (98%) responded to the 2003 survey.

Michigan

Michigan began collecting data in 2002, initially using an instrument called the Michigan Local Capacity Inventory, based on the CDC instrument. Since 2003, data have been collected using Web-based software developed by the Michigan Public Health Institute.

In Michigan, local health departments are required to review and update online their capacity inventory data on a quarterly basis. The information used for this analysis was updated in December 2004. The response rate was 100 percent.

Data Analysis

When it was released, the capacity inventory did not include any directions on how the answers to the questions included in the survey could be used to track progress in each area in a consistent, standardized manner. Therefore, every entity that decided to use the inventory also had to make independent decisions on how to analyze the information collected.

Illinois

Results of the surveys were scored using an algorithm developed by the CDC that assigns a point value and, where applicable, a weight to each question in the inventory. Point values are assigned based on the type and relative importance of each question (additional detail and examples are included in Appendix B). Producing a summary result for each question requires multiplying the point values by their respective weights, where applicable, and summing.

After each question was scored, results were generated for focus areas, critical capacities, benchmarks, and cross-cutting issues, and were then classified into the following categories:

Complete	90-100%
Mostly Complete	80-89%
Partially Complete	70-79%
Minimally Complete	60-69%
Not Complete	< 60%

A summary score was also calculated from the focus area values.

Results from the capacity inventory were aggregated in two ways: by Public Health Regional Response Planning Areas (PH-RRePA) and by sub-state geographical groups.

Kansas

To calculate an overall measure of LHD capacity at the level of a critical capacity or focus area, the KHI project team developed a method for aggregating responses from multiple questions into summary scores. Because many questions were in the form of inventory checklists, it was deemed desirable to have a system where a given answer could be classified as “successful” even if some of the boxes weren’t checked. In addition, since items were not of equal relevance or importance to evaluating LHD critical capacities, simply summing the number of affirmative responses to a specified group of questions was not considered to be appropriate. Addressing the problem of unequal importance of individual question items required imposing a system of value judgments to give the most important items greater relative weight in summary score calculations.

To this end, research staff at KHI drafted a proposed formula for converting responses for each survey question to a dichotomous achieved/not achieved classification. Next, a team of representatives from LHDs was asked to review the proposed scoring formulas and methods, and propose modifications when necessary. The revised formulas were applied to the analysis of both the 2002 and the 2003 data sets.³ Using guidance provided by the capacity inventory, KHI assigned each individual question to a single critical capacity. For each LHD a critical capacity preparedness index was calculated for every critical capacity by computing the percentage of questions assigned to that capacity that was achieved (based on the dichotomy rules developed). For example, if the preparedness index for critical capacity B-I.A for a certain county is reported to be 62 percent, it means that the LHD had a positive achievement score for 62 percent of the questions assigned to that critical capacity. Using a similar process, KHI assigned each critical capacity to focus areas, and a focus area preparedness index was computed by calculating the

³ Only information from the 2003 survey was included in this study.

average of the critical capacities indexes included in that focus area. Finally, a county overall preparedness index was computed as the average of the indexes for all the focus areas in each county.

To measure the local capacity for the entire state, state preparedness indexes were computed by taking the average of all the corresponding county-level indexes. In this way, it was possible to calculate state critical capacity indexes (as the average of all county indexes for each critical capacity), state focus area indexes (as the average of all county indexes for each focus area), and an overall state preparedness index (as the average of all county overall preparedness indexes).

Michigan

In Michigan the information collected through the capacity inventory is continuously updated and reviewed by local and state program managers and used in a variety of ways. Local health departments can print off a report for the county or counties under their jurisdiction to measure changing levels of preparedness, as well as tracking the results of exercises and drills. The state office uses LHD data, as well as data for the nine emergency preparedness regions in the state, to monitor local preparedness activities in the state. In Michigan no analysis is performed using standardized scoring algorithms.

3) THE NNPHI COLLABORATIVE PROJECT

This project is based on two major components, one quantitative and the other qualitative.

The Quantitative Component

The quantitative component of this study utilized the data collected independently in the three states between late 2002 and 2004. The electronic data sets with the records containing the answers from all the surveys were obtained from each of the three states. The three data sets were combined into one Statistical Analysis System (SAS) database, after resolving formatting and coding inconsistencies.

Having access to the combined information in the same standardized format made it possible to analyze the answers from the three states using two different algorithms. The researchers

decided to perform the analysis using both the CDC scoring algorithm adopted in Illinois and the one adopted in Kansas. These dual analyses allowed some interesting comparisons. Although the scores reached by each state could be expected to vary with each system, given that the scoring criteria are substantially different, the team wanted to explore the extent to which the two systems produced consistent trends, which could be considered an indication of the validity of both the assessment instrument and the scoring systems. The team also wanted to assess the extent to which the choice of a scoring algorithm would affect the usefulness of the information generated by the capacity inventory. Both algorithms had proven their usefulness in the states in which they were adopted, but if through this comparison one emerged as more accurate or as more applicable to public health preparedness assessment that would have important implications for future projects.

Given the differences discussed above in the methodologies utilized by the three states, some adjustments had to be made before analyzing the information combined from the three states. Since Michigan had introduced substantial changes into the questions relative to Focus Area E (Health Alert Network/Communications and Information Technology), it was decided that scoring the answers for these questions from the surveys in Michigan was too problematic and could be potentially misleading. Therefore answers for the questions relative to Focus Area E from Michigan were excluded from the analysis. In addition, seven other questions were excluded from the analysis because of inconsistencies in the way they were handled or modified in the three states.⁴

Using both algorithms the answers from the three states were analyzed and preparedness indexes were computed for each focus area. A summary preparedness index was also calculated. These indexes were computed for each state separately and for the three states combined. In addition, preparedness indexes were stratified by county population density, an important variable that has been shown to be associated with many public health capacity functions. The population density categories applied to this analysis have been used in Kansas by rural public health programs since 1997, when they were adopted by a consensus group in that state based on

⁴ The questions excluded were as follows: FA A, 3 (the Health Alert Network partners part only), 7, 17, 18; FA C, 36; FA E, 52; FA F, 63.

a modified national definition. This typology was utilized in the absence of a universally accepted rural and urban classification of population density that the study team could rely on. Using another classification system could possibly have produced results different from those observed in this study. The population density categories are defined in Table 2.

Table 2. Population Density Categories

Description	Population Density
Frontier	Less than 6 persons per square mile (ppsm)
Rural	6.0 to 19.9 ppsm
Densely settled rural	20.0 to 49.9 ppsm
Semi-urban	50.0 to 149.9 ppsm
Urban	150.0 ppsm and over

The Qualitative Component

To augment the analysis of the capacity inventory data from each of the three states, in-depth interviews with users of the data were conducted. The purpose of the interviews was to gather, from the users’ perspective, the value of the data in answering questions about emergency preparedness and reporting on local agency levels of emergency preparedness. The respondents also answered questions about the overall usefulness of the instrument and difficulties they encountered using the instrument or data.

Each of the three project partners provided contact information for users of their state’s capacity inventory and/or users of the data collected by the instrument. Individuals were selected from both state and local agencies with different characteristics to provide a broad perspective on the instrument, as shown in Table 3.

Table 3. Respondent Profile for the Qualitative Survey

State	State Agency or Organization n=6	Rural n=1	Densely-settled Rural n=1	Semi-urban n=2	Urban n=3	Multi-county n=1
<i>Illinois n=5</i>	3			1	1	
<i>Kansas n=4</i>	1		1		1	1
<i>Michigan n=5</i>	2	1		1	1	

Note: None of the respondents represented a frontier county in the five-level classification system.

Fourteen in-depth interviews were conducted in the fall of 2005, utilizing an instrument comprising six open-ended questions developed by the project team from the three public health institutes. The questions were sent via e-mail to respondents prior to the interview, allowing respondents to consider their responses to each question. Staff from NNPHI conducted the interviews via telephone. The responses were taped and transcribed.

Data were analyzed for themes. Summary statements of those themes were developed and are included below with examples of comments from the transcript. Where appropriate, themes are presented according to type of respondent (state or local).

RESULTS

1) THE QUANTITATIVE COMPONENT

The results of the calculation of the preparedness indexes for the three states using the two scoring systems are presented in Table 4. To protect the confidentiality of the states involved in this project, the states are not identified in the table. For the same reason, since preparedness indexes for Focus Area E could not be calculated for Michigan (as explained above in the methods section), no preparedness indexes for Focus Area E are displayed for any of the states.

Table 4. Preparedness Indexes by Focus Area and State Using the Illinois and the Kansas Scoring Systems.

Focus Area	State 1		State 2		State 3	
	IL Scoring	KS Scoring	IL Scoring	KS Scoring	IL Scoring	KS Scoring
A (preparedness/planning)	57	67	50	65	51	60
B (surveillance/epidem.)	56	58	49	48	57	59
C (laboratory)	33	38	14	21	16	25
F (risk communication)	43	49	33	33	33	46
G (training)	58	63	41	43	41	55

Since the two scoring algorithms utilize different scales and thresholds, a comparison of the absolute values of the indexes obtained is not meaningful. However, overall the two scoring systems produced results that were very consistent in the three states. In all three states, Focus Area C (laboratory capacity) had the lowest preparedness index, and focus areas A and B (preparedness and planning, and surveillance and epidemiology) had relatively high scores. Within each state, the two scoring systems produced a very similar pattern of rankings of the focus areas indexes, as shown in Table 5. For example, in state 2 both scoring systems identified Focus Area A as the strongest, followed in order by focus areas B, G, F, and C. For states 1 and 3, the only ranking discrepancy was in rank-ordering numbers one and two, as indicated by the bold characters in the table; in both states the Kansas scoring system gave a higher score to Focus Area A, while the Illinois system gave a higher score to Focus Area G in state 1 and Focus Area B in state 3 (which were both ranked number two by the Kansas system). It should be noted

that in these cases the differences between the two discrepant focus area scores (reported in Table 4) were relatively small, ranging from 1 to 6 points.

Table 5. Ranking of Focus Area Scores by State Using the Illinois and the Kansas Scoring Systems*

Rank	State 1		State 2		State 3	
	IL Scoring	KS Scoring	IL Scoring	KS Scoring	IL Scoring	KS Scoring
1)	G	A	A	A	B	A
2)	A	G	B	B	A	B
3)	B	B	G	G	G	G
4)	F	F	F	F	F	F
5)	C	C	C	C	C	C

* **BOLD** indicates a discrepancy between the two scoring systems.

When we stratified the analysis by population density, the different demographic characteristics of the three states made a direct state-to-state comparison problematic. Table 6, which shows the distributions into the five population density groups of the counties that responded to the survey, illustrates this point.

Table 6. Distribution of Counties by Population Density in Illinois, Kansas and Michigan

	Frontier	Rural	Densely Settled Rural	Semi-Urban	Urban	TOTAL
<i>Illinois</i>	0 (0%)	2 (2%)	44 (45%)	26 (27%)	25 (26%)	97 (100%)
<i>Kansas</i>	32 (31%)	36 (35%)	21 (20%)	8 (8%)	6 (6%)	103 (100%)
<i>Michigan</i>	2 (2%)	10 (12%)	20 (24%)	30 (36%)	22 (26%)	84 (100%)
TOTAL	34 (12%)	48 (17%)	85 (30%)	64 (22%)	53 (19%)	284 (100%)

It is apparent from the table that there is substantial variability in the demographic distribution of the counties in the three states. Illinois had no frontier counties and Michigan had only 2, while Kansas had 32, representing almost one-third of all the counties that responded to the survey in that state. Conversely, more than one-quarter of the counties in Illinois and Michigan were classified as urban, but only six counties in Kansas fell into that category. It is also clear that in each state at least one of the five categories in the classification includes

relatively few observations, making the use of this stratification at the individual state level problematic. For that reason, rather than comparing trends of preparedness indexes by population density among states, we analyzed the results from all the states combined, which allowed us to examine a larger sample size in each of the population density groups. Table 7 shows the results of this analysis. Only average local preparedness indexes are shown, but focus area scores (not shown in the table) exhibited the same patterns.

Table 7. Average Local Preparedness Indexes by Population Density Group for the Three Combined States Using the Illinois and the Kansas Scoring Systems

Population Density	IL Scoring	KS Scoring
<i>Frontier</i>	36	35
<i>Rural</i>	40	41
<i>Densely-settled rural</i>	44	47
<i>Semi-urban</i>	49	54
<i>Urban</i>	54	60

A clear gradient is apparent with the preparedness indexes increasing progressively with increasing population density. Once again the two scoring systems performed very similarly and produced comparable results. Using the Illinois scoring system, moving up from one population group to the next was accompanied by an increase in preparedness index of about 10 percent. Using the Kansas scoring system that increase was slightly higher, about 13 to 15 percent. With the Illinois system the ratio of the urban to the frontier index was 1.5, meaning that the preparedness index in urban counties was on average about 1.5 times higher than that in frontier counties. Using the Kansas scoring system, the same ratio was 1.7.

2) THE QUALITATIVE COMPONENT

This section of the report summarizes the data gathered through the in-depth interviews about the usefulness of the capacity inventory instrument. The data were analyzed and coded into themes, presented below, with illustrative direct quotes from the respondents in italics.

Public Health Preparedness Assessment Information Needs

The respondents said that they were often asked information about their state and local public health plans, roles, and capacity for emergency response. Sometimes the questions are in regard

to a specific health threat (i.e., “What is the health department doing to prepare for an outbreak of pandemic flu?”). These questions come from local and state agencies, the media, and the public.

What plans (do) we have in place? (What) collaborative relationships (do) we have in place to work with partners and agencies?

What role does public health play in the community’s role in responding to a disaster?

What is the organizational capacity to respond to any kind of emergency (i.e., ability to mobilize volunteers, treat or vaccinate a population, etc.)? What kind of materials do you have on hand? How to increase the supply quickly?

In addition, legislators, policymakers, and the public ask about specific threats, such as avian flu.

They are asking pretty broad questions (about) specific threats (such as) avian flu.

The Need for Preparedness Benchmarks

While the data collected by the capacity inventory measured an individual agency’s preparedness, several users indicated they had no way of comparing their agency’s level of preparedness to that of other agencies. The need for benchmarks and standards to be established for planning and measurement purposes was expressed.

(What) type of a standard (is there to) compare a jurisdiction with another jurisdiction?

What is the baseline in regards to preparedness?

Determine benchmarks and minimal standards, and let people know what they are being measured against. Let people know where they rank.

Uses for the Data Collected by the Capacity Inventory

The respondents were mixed regarding how helpful the data were in answering preparedness questions. Approximately 60 percent of the respondents indicated the data were useful while the remaining 40 percent provided comments suggesting the data were not very useful.

Respondents found the data useful in communicating with funders, stakeholders, and the media. Several respondents use the data when reporting to the CDC and allocating bioterrorism funds provided by the CDC. Other respondents thought the capacity inventory provided information helpful when addressing the issue of public health preparedness with state legislators, the public, and the media. The process enhanced the credibility of the information and provided a structure for discussion.

It was very useful when talking to (the) legislature, since we had a third party instrument, and we had the institute to do the analysis.

The preparedness assessment is useful in answering questions regarding preparedness from the public and the media. The assessment gave a structure for talking about what the local health department does; specifically it gave a structure for talking about risk communication, surveillance, and epidemiology.

The data were also used to measure capacity and progress toward preparedness goals, or for accountability purposes.

State/federal level (agencies). . . look at (local agency) training needs, funding issues, deliverables, etc., so that we can improve our capacity.

(I) used it to identify gaps, then to strengthen our preparedness. We found the Preparedness Assessment valuable. (We) saw ... progress from time to time.

However, some thought the capacity inventory data were not helpful in answering questions about public health preparedness because the content was not applicable to the questions asked of them by stakeholders and others. In two states, the data were collected some time ago, limiting their usefulness.

Unit of Measurement for Preparedness Data

Many of the LHDs have multiple counties within their jurisdiction. The respondents from multi-county jurisdictions, along with some from state agencies, think it is important to have county-level, as well as agency-level, preparedness data.

In (our state) each individual county is its own health jurisdiction, so we had access to those individual pieces of information and we were actually able to break it down into results by region, county, and able to do as best we could by jurisdictional size comparison.

(We) can access by county level and within a jurisdiction, and do use that information. We do compare multi-counties versus single counties.

Difficulties Encountered in Completing the Capacity Inventory

A number of difficulties in completing the capacity inventory were noted: 1) the instrument was quite long, involving a great deal of time and staff resources to complete; 2) some of the questions were not applicable to the agency's jurisdiction; 3) some questions were unclear, ambiguous, or subjective; and 4) some items were related to state functions or responsibilities rather than local functions or responsibilities.

Many of the questions were not relevant to (our) local health department. Several questions were related to topics that are the responsibility of the state health department. It was difficult to answer questions on items that were not the local health department's responsibility, and it was frustrating to be measured on those items. If an outsider simply looks at the results of the assessment it would appear that (we) are not prepared.

Some of the questions lacked clarity. (It was) hard to determine what kind of information they were looking for.

A lot of it seems very subjective. There is some quantitative capacity, but it tends to be somewhat broad. We just do our best to answer accurately.

State and Local Jurisdiction Use of the Capacity Inventory Data

At several state agencies, the data are used to make comparisons between local agencies and regions, prioritize projects and funding, and develop work plans. LHDs use the data to prioritize activities, develop work plans, address gaps in planning, check progress, and report to the state.

The internal public health emergency team used the data from the assessment to prioritize the health department's activities regarding bioterrorism preparedness.

We looked at it for gaps and places where we were not at the level we felt we should be for the county and/or region, and as we've developed work plans for subsequent grant years, we have been able to address the gaps that were identified.

Recommendations for Future Preparedness Assessment

Recommendations made by the respondents included the following: 1) tailor the capacity inventory to meet the state's individual needs (including its emergency operation plan); 2) include common definitions and understandings related to accurate data collection and interpretation; 3) develop a set of benchmarks for performance; 4) create an index to summarize the data; and 5) share the data with the local agencies.

Develop common definitions and common understandings so everyone is interpreting results the same.

It is nice to have an index to summarize the data when discussing it (with the public). Obviously, an index is relative, but still allows you to place yourself relative to others.

(When) talking to legislative or community members, if you have an instrument that is third party, it makes it more credible.

One respondent cautioned not to use the data in isolation:

The tool does a good job of measuring an overall level of capacity of agencies. This is a good tool to use, but not in isolation. When you get to the county level,(you) have to pull on other resources (of measurement).

DISCUSSION

Several years after a sharp increase in funds to build public health capacity to respond to bioterrorism emergencies, no clear goals have been set for the effort and no system is in place to measure progress in a systematic fashion. States and local jurisdictions have tried to fill these gaps either by developing their own assessment models or by adopting some of the many tools developed across the nation. The disadvantages of these approaches are several, including the fact that resources are used inefficiently to re-create assessment and evaluation tools in a decentralized fashion and that assessments are performed using different methods, which does not allow easy comparison of results among jurisdictions.

In 2002 the CDC published a capacity inventory that was widely distributed among state and local health departments. Its original purpose was to create a structured instrument to monitor the performance of grantees receiving funds through the CDC cooperative agreement for bioterrorism preparedness. This close linkage with the grant guidance was one of the strengths of the instrument, but it also meant that to retain that link, the instrument would have to change every time the guidance changed. In fact, despite evolution of the grant guidance, no new editions of the capacity inventory have been published,⁵ and the link between the instrument and the guidance has weakened. (In at least one state, however — Michigan — the instrument has been revised with each new guidance change, thus maintaining the link.) Based on the quantitative and qualitative data analyzed through this project, the capacity inventory proved to be a relatively good tool to measure many preparedness functions of the essential public health services. In the article published by Asch et al.(2005) mentioned above, the capacity inventory was found to be the most comprehensive evaluation instrument of 27 evaluated, addressing 46 of the 48 sub-domains relevant to public health preparedness within the essential public health services that the authors identified.

According to the CDC (Costich, 2004), at one point almost half of the states and over 800 local jurisdictions had used the capacity inventory, making it, to our knowledge, the most widely used public health preparedness assessment tool. That fact led some to believe the capacity

⁵ A version 1.1 of the capacity inventory was published a few months after the first version, including only minor changes.

inventory could become a standard assessment tool, at least for public health preparedness projects funded through federal cooperative agreements. Contrary to these expectations, the CDC's capacity inventory did not become a national standardized assessment instrument. Nevertheless, the fact that such a large number of state and local jurisdictions have used that tool to assess their preparedness capacity and monitor their progress towards the goals established in their action plans, and that some continue to use it, makes this tool the best attempt to achieve a national standardization of the assessment process, a remarkable result whose potential impact should not be underestimated. In addition, the widespread use of the capacity instrument and the feedback from the users obtained through our qualitative survey both suggest that it can be effective in meeting some of the needs of managers of preparedness programs. Users reported that the capacity inventory has assisted them in a variety of ways, primarily with planning, priority setting, and resource allocation.

At the same time when many jurisdictions were adopting the capacity inventory for their evaluation activities, it remained unclear how the information collected could be used, since the instrument contained no standardized procedures for that purpose. A scoring algorithm produced by the CDC to categorize the answers to the inventory and generate preparedness scores was not universally known to the states utilizing the inventory. The three states included in this project all adopted different solutions to this problem. Illinois had access to the CDC scoring system and modified it for its assessment activities, while Kansas developed its own scoring methodology and Michigan did not use a scoring system at all. The three states also had some differences in the way they administered the survey distribution and the data collection.

Despite these differences and the lack of a standardized methodology to conduct the surveys, the analysis of the information from the three states using the two scoring methods produced results that were surprisingly consistent. The trends observed with the two systems were very similar, with only two minor switches in the pattern of ranking of the focus areas and local preparedness indexes. Much discussion has taken place in the recent past among federal, state, and local public health officials about what would constitute an ideal evaluation and assessment instrument, and no agreement has yet been reached. The experience of this project, in which a good but not perfect instrument and varying processes generated useful information, suggests

that the universal adoption of a reasonably good, common assessment method is perhaps more important than the absolute quality of the method itself.

This analysis allowed the teams from the three states to compare results from their respective jurisdictions, confirming relative weaknesses that they shared in certain focus areas (for example laboratory capacity) and strengths in others. In the absence of well-established national goals for public health preparedness the states could not easily measure progress toward their objectives. Given the absence of those goals, jurisdiction to jurisdiction comparisons are a method for gauging or even benchmarking local health department preparedness efforts.

One advantage of pooling information from multiple states is that it allows stratified analyses that may not be possible for a single state that has only a small numbers of observations. In this project we analyzed the effect of population density on preparedness capacity and we found an association between increasing population density and better preparedness capacity scores. Other studies have often shown increasing organizational capability with increasing size of local health agencies. This may be the result of different factors such as pre-existing baseline differences in capacity and differences in levels of resources and investments. Teasing apart these relationships would require identification of and adjustment for relevant confounding variables and is beyond the scope of this project. The finding of this analysis not only confirms the trend observed in other studies and helps quantify it in relation to public health preparedness, but also speaks to the issue of the validity of the capacity inventory instrument. Observation of a pattern that one might reasonably hypothesize a priori, in this case that larger LHDs would score higher on a preparedness index than their smaller counterparts, can be considered evidence of the validity of the measurement tool in question. This association could not have been shown with such clarity by using the information from one state only. Similarly, pooled data from multiple jurisdictions could allow the comparison of agencies that meet performance standards despite geographic, population, or other challenges with similar agencies that do not meet those standards, to assist in the identification of best practices and strategies to replicate elsewhere. Therefore standardized assessment instruments represent a tool to increase the analytical power beyond the boundaries of individual jurisdictions.

CONCLUSIONS AND RECOMMENDATIONS

Several years after the inception of the CDC's bioterrorism preparedness program, public health agencies are still struggling in their search for a reliable and manageable system to assess the results of the considerable investments of financial and human resources in this sector. In our study we showed that even a less-than-perfect aggregation of data obtained through unstandardized procedures, but using a common assessment tool, can produce helpful information when analyzed using standardized scoring systems such as the two scoring algorithms adopted for this study. The most striking conclusions from this study are the following:

- 1) Standardized assessment tools are helpful, particularly when accompanied by standardized scoring systems that allow comparisons over time and across jurisdictions.
- 2) The public health system in the nation would be better served by adopting the best available standardized assessment process earlier rather than waiting for a more perfect system later.

There is an urgent need for the adoption of national performance goals and standardized methods to measure progress towards those goals throughout all state and local jurisdictions. These methods should include the adoption of one common assessment tool, common performance measures, and common processes to collect information on those measures. We recommended that the initial assessment tool be simple and contain items on which most state and local jurisdictions could agree. Subsequent revisions can expand and improve the assessment process, based on experience, evidence, and consensus accumulated over time. In this context, we recommend that the valuable information collected by many states in the past years using the capacity inventory be preserved. That instrument has been so widely used that it has become almost a *de facto* national preparedness assessment standard, despite its limitations. Losing the wealth of experience and information gathered through this instrument would be a mistake and would send the wrong signal to those states and local jurisdictions that attempted to fill the gap left by the absence of standardized assessment methodology. The transition from the capacity inventory into new performance measures should be carefully crafted to retain this investment.

At the very least, any new performance measures should be matched to the questions and critical capacities included in the capacity inventory, so that state and local health departments can utilize the information collected through multiple years of continuous monitoring for program evaluation purposes.

Setting national goals for preparedness capacity and adopting common measurement methodologies should be priorities. This study adds to the growing body of evidence that indicates the importance and indeed the urgency of adopting these priorities and sheds some light on how to facilitate that process. Our nation and our communities cannot afford to continue investing such high levels of resources and efforts without being able to answer the fundamental question: “How prepared are we?”

APPENDIX A

FOCUS AREAS AND CRITICAL CAPACITIES FOR CDC FUNDED BIOTERRORISM PREPAREDNESS ACTIVITIES

Table A-1. Focus Areas and Critical Capacities for CDC Funded Bioterrorism Preparedness Activities

Focus Areas	Critical Capacities
<p><u>Focus Area A:</u> Preparedness Planning and Readiness Assessment</p>	<p>A-I.A — Strategic leadership, direction, coordination and assessment of activities to ensure state and local readiness, interagency collaboration, and preparedness.</p> <p>A-I.B — Conduct integrated assessments of public health system capacities to aid and improve planning, coordination, and implementation.</p> <p>A-II.A — Respond to emergencies caused by bioterrorism, etc., through the development and exercise of a comprehensive public health emergency plan.</p> <p>A-II.B — Ensure that state, local, and regional preparedness for and response to bioterrorism, etc., is effectively coordinated with Federal response assets.</p>
<p><u>Focus Area B:</u> Surveillance and Epidemiology Capacity</p>	<p>B-I.A — Rapidly detect a terrorism event through a highly functioning, mandatory reportable disease surveillance system, as evidenced by ongoing timely and complete reporting by providers and laboratories in a jurisdiction.</p> <p>B-II.A — Rapidly and effectively investigate and respond to a potential terrorist event as evidenced by a comprehensive and exercised epidemiological response plan that addresses surge capacity, delivery of mass prophylaxis and immunizations, and pre-event development of specific epidemiologic investigation and response needs.</p> <p>B-II.B — Rapidly and effectively investigate and respond to a potential terrorist event, as evidenced by ongoing effective state and local response to naturally occurring individual cases of urgent public health importance, outbreaks of disease, and emergency public health interventions such as emergency prophylaxis or immunization activities.</p>

Table A-1 (continued). Focus Areas and Critical Capacities for CDC Funded Bioterrorism Preparedness Activities

Focus Areas	Critical Capacities
<p><u>Focus Area C:</u> Laboratory Capacity—Biologic Agents</p>	<p>C-A — Develop and implement a jurisdiction-wide program to provide rapid and effective laboratory services in support of the response to bioterrorism, etc.</p> <p>C-B — As a member of Laboratory Response Network, ensure adequate and secure lab facilities, reagents, and equipment to rapidly detect and correctly identify biological agents likely to be used in a bioterrorism incident.</p>
<p><u>Focus Area E:</u> Health Alert Network/Communications and Information Technology</p>	<p>E-A — Ensure effective communications connectivity among public health departments, health care organizations, law enforcement organizations, public officials, etc., as evidenced by (a) continuous high-speed Internet connectivity; (b) routine use of e-mail for alerts, etc.; (c) directory of public health participants including roles and contact information.</p> <p>E-B — Ensure a method of emergency communication for participants in public health emergency response that is fully redundant with e-mail.</p> <p>E -C — Ensure the ongoing protection of crucial data and information systems for the management of secure information, system backups, and system redundancy.</p> <p>E-D — Ensure secure electronic exchange of clinical, laboratory, environmental, and other public health information in standard formats between the computer systems of public health partners.</p>
<p><u>Focus Area F:</u> Risk Communication and Health Information Dissemination</p>	<p>F-A — Provide needed health and risk information to the public and key partners during a terrorism event by establishing critical baseline information about the current communication needs and barriers within individual communities and identifying effective channels of communication for reaching the general public and special populations during public health threats and emergencies.</p>

Table A-1 (continued). Focus Areas and Critical Capacities for CDC Funded Bioterrorism Preparedness Activities

Focus Areas	Critical Capacities
<p>Focus Area G: Education and Training</p>	<p>G-A — Ensure the delivery of appropriate education and training to key public health professionals, infectious disease specialists, emergency department personnel, and other health care providers in preparedness for and response to bioterrorism, etc., either directly or through the use (where possible) of existing curricula and other sources, including schools of public health and medicine, academic health centers, CDC training networks, and other providers.</p>

APPENDIX B
SCORING METHODOLOGIES

SCORING METHODOLOGIES

EXAMPLES OF CDC SCORING METHOD USED IN ILLINOIS

Question Type	Primary Method of Assigning Point
Yes/No	Point value assigned based on relative importance. Generally, one point each.
Multiple choice (Example 1)	Point value assigned based on relative importance. Generally, one point each, with equally distributed weights.
Table/Matrix (Example 2)	Items are grouped into categories. Each category assigned a point value of 1, which is equally distributed among the questions in the category. Where applicable, equally distributed weights are applied.
Base with Multiple Sub-Questions (Example 3)	Items are grouped into categories. Each category assigned a point value of 1, which is equally distributed among the questions in the category. In rare cases, the full point value is given if any of the items is answered in the affirmative.
NPS/Smallpox Preparedness Checklists	Point value assigned based on relative importance. Summary totals from appendix used to generate a percentage of “amber” and “green” responses. The weight assigned for a green response is 1 and the weight assigned for an amber response is 0.5. Resulting values are summed.

After each question was scored, results were generated for focus areas, critical capacities, benchmarks, and cross-cutting issues using the following formula:

$$\frac{\Sigma \text{ points for the focus area/capacity/benchmark/issue under review}}{\text{points for the focus area/capacity/benchmark/issue under review}} \times 100 = \% \text{ complete total}$$

Example 1: Multiple Choice

What percentage of the state population lives within local agency jurisdictions that participate in the Health Alert Network (HAN)? 1 point

- 0-24% weight =0
- 25-49% weight=0.33
- 50-74% weight=0.67
- 75-100% weight=1

Result for Example 1: point value x weight = 1 x 0.33 = 0.33 point

Example 2: Table/Matrix:

Indicate which are true regarding regional public services in your state:

	In Place (weight=1)	Planned (weight=0.5)	Not in Place, Not Planned (weight=0)
<i>Emergency medical/trauma service (EMS) regions</i> (0.33 point)	X		
<i>Public health service regions</i> (0.33 point)		X	
<i>EMS and public health regions with shared administrative boundaries</i> (0.33 point)		X	

Result for Example 2: (point value x weight) + (point value x weight) =
 (0.33 x 1) + (0.33 x 0.5) + (0.33 x 0.5) = 0.67 point

Example 3: Base with Multiple Items:

Which topics are included in the agency’s training needs assessment?

(Note: the Roman numerals in the table represent related items for scoring purposes.)

	Category (1 point each)	Point Value
<input checked="" type="checkbox"/> <i>Risk communication</i>	I	0.5
<input checked="" type="checkbox"/> <i>Crisis communication</i>	I	0.5
<input checked="" type="checkbox"/> <i>Preparing oral and written communication tailored to each type of media</i>	II	0.33
<input type="checkbox"/> <i>Preparing oral and written communication tailored to the state’s majority and minority cultures</i>	III	0.5
<input type="checkbox"/> <i>Preparing communication materials tailored to hearing- and sight-impaired persons</i>	III	0.5
<input checked="" type="checkbox"/> <i>Preparing and distributing a news release</i>	II	0.33
<input type="checkbox"/> <i>Developing communications objectives for media appearances/publication</i>	II	0.33
<input type="checkbox"/> <i>The agency does not have a training needs assessment</i>	N/A	N/A

Result for Example 3: Σ point values = 0.5 + 0.5 + 0.33 + 0.33 = 1.67

EXAMPLES OF ACHIEVEMENT CRITERIA FOR QUESTIONS USED FOR THE KANSAS SCORING METHOD

To calculate an overall measure of local health department capacity at the level of a critical capacity or focus area, the KHI project team developed a method where every answer could be classified as “successful” or not, even if not all the boxes were checked.

Example 1: Focus Area A, Question 11

Is the agency’s public health emergency response plan integrated with the:

- a Jurisdiction emergency response plan?*
- b Regional emergency response plan?*
- c State public health agency emergency response plan?*
- d (no response plan)*

Criteria for achievement = Question 11 is achieved if d = No and 2 out of 3 of the a, b, c items = Yes.

Example 2: Focus Area B, Question 24

Does the agency have the capacity to enhance surveillance	<i>Achieved if:</i>
<i>a Expanding reporting sources to include (11 options)</i>	<i>>3 Y</i>
<i>b Instituting active surveillance for (3 options)</i>	<i>>1 Y</i>
<i>c Receiving, analyzing, and compiling reports on syndromic data that include (3 options)</i>	<i>At least 1 Y</i>
<i>d Alerting reporting sources</i>	<i>Y</i>

Criteria for achievement = Question 24 is achieved if items a through d are all achieved.

REFERENCES

- Asch, S. M., Stoto, M., Mendes, M., et al. (2005). A review of instruments assessing public health preparedness. *Public Health Reports* 120(5), 532–542.
- Costich, J. F., & Scutchfield, F. D. (2004). Public health preparedness and response capacity inventory validity study. *Journal of Public Health Management & Practice*, 10(3), 225–233.