

**Bioterrorism and Emergency Response
Preparedness of Local Health
Departments in Kansas: 2003**

July 2004

Final Report
for the Kansas Association of Local Health Departments
KHI/R 04-4

Prepared by
Gianfranco Pezzino, M.D., M.P.H.
Marc J. Velasco
Barbara E. Starrett, M.H.A.
Barbara J. LaClair, M.H.A.



KANSAS HEALTH INSTITUTE

212 SW Eighth Avenue, Suite 300
Topeka, Kansas 66603-3936
Telephone (785) 233-5443
Fax (785) 233-1168
www.khi.org



The Kansas Health Institute is an independent, nonprofit health policy and research organization based in Topeka, Kansas.

Established in 1995 with a multi-year grant from the Kansas Health Foundation, the Kansas Health Institute conducts research and policy analysis on issues that affect the health of Kansans.

Copyright© Kansas Health Institute 2004.
Materials may not be reproduced in any form.

TABLE OF CONTENTS

List of Appendices	iv
List of Figures.....	v
List of Tables	vi
Abbreviations.....	vii
Acknowledgements.....	viii
Executive Summary	1
Introduction	5
Background.....	5
PHPPO Assessment Tool.....	6
Description of the First Survey.....	7
Description of the Second Survey	8
Local Health Department Regions.....	8
Project Goals	10
Methods	12
Data Collection	12
<i>Scoring System</i>	12
Population Density Groups	15
Analysis	15
Assessment of Indicators for National Public Health Performance Standards	17
Limitations	18
Only Local Capacity Was Assessed	18
Survey Instrument.....	18
Accuracy and Reliability of Information Collected.....	19
Criteria to Develop Index Scores.....	19
Use of Unweighted Means	19
Regional Preparedness	20
Linkage with NNHPS Indicators	21
Results	22
Results for Critical Capacities and Focus Areas	26
<i>Focus Area A: Preparedness Planning and Readiness Assessment</i>	30
<i>Focus Area B: Surveillance and Epidemiology Capacity</i>	32
<i>Focus Area C: Laboratory Capacity-Biological Agents</i>	35
<i>Focus Area E: Health Alert Network/Communications and Information Technology</i>	38
<i>Focus Area F: Risk Communication and Health Information Dissemination</i>	41
<i>Focus Area G: Education and Training</i>	44
<i>Kansas-Specific Competencies</i>	46
Results by Population Density.....	48
Results by LHD Region	59
<i>Method 1. Regional Index = Average County Index</i>	60
<i>Method 2. Regional Index = Highest County Index</i>	63
Linkage to Essential Services and Indicators	65
Conclusions	68

LIST OF APPENDICES

Appendix A: Methods Information	73
Table A-1. Focus Areas and Critical Capacities for CDC-Funded Bioterrorism Preparedness Activities	74
Table A-2. Analysis Algorithm for the Classification of Questions.....	77
Table A-3. Cross-walk Between PHPPO Questions and Essential Public Health Service Indicators	105
Figure A-1. Converting Questions, Critical Capacities and Focus Areas into the Overall Preparedness Index	108
Appendix B: Population Density Information	109
Table B-1. Classification of Counties by Population Density Group.....	110
Table B-2. Classification of LHD Regions by Population Density Group	110
Map B-1. Population Density Peer Groups by County, 2003 Population Estimates	111
Appendix C: Survey Tool (Kansas Public Health Preparedness and Response Capacity Inventory).....	112

LIST OF FIGURES

Figure 1. Aggregating Responses to Summary Scores	13
Figure 2. State Focus Areas and Overall Preparedness Indexes, Kansas (2002 and 2003).....	28
Figure 3. State Critical Capacity Preparedness Indexes, Kansas (2002 and 2003).....	29
Figure 4. State Level of Achievement for Focus Area A Questions, Kansas (2002 and 2003) ..	31
Figure 5. State Level of Achievement for Focus Area B Questions, Kansas (2002 and 2003)..	34
Figure 6. State Level of Achievement for Focus Area C Questions, Kansas (2002 and 2003)..	37
Figure 7. State Level of Achievement for Focus Area E Questions, Kansas (2002 and 2003)..	40
Figure 8. State Level of Achievement for Focus Area F Questions, Kansas (2002 and 2003) ..	43
Figure 9. State Level of Achievement for Focus Area G Questions, Kansas (2002 and 2003) ..	45
Figure 10. State Level of Achievement for Kansas-Specific Questions, Kansas (2002 and 2003)	47
Figure 11. Average County Overall Preparedness Index for Population Density Groups (2002 and 2003) and Kansas (2002 and 2003).....	51
Figure 12. Average County Preparedness Index for Focus Area A for Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)	52
Figure 13. Average County Preparedness Index for Focus Area B for Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)	53
Figure 14. Average County Preparedness Index for Focus Area C for Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)	54
Figure 15. Average County Preparedness Index for Focus Area E for Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)	55
Figure 16. Average County Preparedness Index for Focus Area F for Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)	56
Figure 17. Average County Preparedness Index for Focus Area G for Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)	57
Figure 18. Average County Preparedness Index for Kansas-Specific Competencies for Population Density Groups (2002 and 2003) and Kansas (2002 and 2003).....	58
Figure 19. Average Overall Preparedness Index for LHD Regions (2002 and 2003)	61
Figure 20. Highest County Overall Preparedness Index for LHD Region (2003).....	64

LIST OF TABLES

Table 1. Selected Characteristics of the 15 LHD Regions in Kansas (2003).....	10
Table 2. Summary of Key Findings from the Survey Analysis	22
Table 3. State Preparedness Indexes by Focus Area and Year, Kansas (2002 and 2003)	27
Table 4. Average County Overall Preparedness Index by Population Density Peer Groups (2003).....	49
Table 5. Average Focus Area Preparedness Indexes by Population Density Group (2003).....	50
Table 6. Change in Average County Overall Preparedness Index between 2002 and 2003 by Population Density Group.....	50
Table 7. LHD Regions with Average Overall Preparedness Index Greater than the State Index, by Region's Population Density Group.....	60
Table 8. Population Residing in Areas with Overall Preparedness Index Greater than the State Index	62
Table 9. Achievement Index for Selected Performance Standard Indicators, Kansas (2002 and 2003)	66

ABBREVIATIONS

24/7	.....	twenty-four hours/seven days per week
CDC	.....	U.S. Centers for Disease Control and Prevention
Epi-X	.....	Epidemic Information Exchange
KALHD	.....	Kansas Association of Local Health Departments
KDHE	.....	Kansas Department of Health and Environment
KHI	.....	Kansas Health Institute
LHDs	.....	Local Health Departments
NPHPS	.....	National Public Health Performance Standards
PHPPO	.....	Public Health Practice Program Office
ppsm	.....	person per square mile

ACKNOWLEDGEMENTS

This report is the result of the efforts of many individuals who operate in different capacities to improve the health of Kansans. We would like to thank the Kansas Association of Local Health Departments (KALHD) for its financial support and Edie Snethen, Executive Director of KALHD, for her continuous enthusiastic support of this project, members of the KALHD bioterrorism committee (Leslie Campbell, Sandra Cline, Joe Connor, Kay Kent and Lougene Marsh) for their insightful comments regarding the criteria for classifying responses and their review of the report draft, and Dennis Kriesel, Public Health Policy Fellow with the Kansas Association of Counties, for his assistance. Additionally, we would like to thank Mindee Reece, Mary Rapp, Susan Morris, Sharon Patnode and the other staff affiliated with the Bioterrorism Program at the Kansas Department of Health and Environment who have provided crucial technical support to the project.

We would also like to thank various staff at the Kansas Health Institute (KHI) who have been involved with this project over the past three years. In particular, thanks go to Lea Steele for her early leadership and to Kim Kimminau and Ron Liebman for their unfailing willingness to provide technical review and guidance. And finally, we thank Robert St. Peter, Laura Loyacono and Emily Lubliner for their contributions to the process and production of the report.

Most important, this project would not have been possible without the contribution of the many dedicated people in the local health departments in Kansas who took the time to complete the 2002 and 2003 Public Health Preparedness and Response Capacity Inventory surveys.

EXECUTIVE SUMMARY

After the terrorist attacks of 2001, increased funding was provided to federal, state and local health departments to improve bioterrorism preparedness and response capacity. To evaluate the effect of this funding and to identify priority areas for allocation of resources, the Kansas Association of Local Health Departments (KALHD) contracted with the Kansas Health Institute (KHI) to perform an independent assessment of local health department preparedness in Kansas and how it changed between 2002 and 2003.

The report provides compelling evidence that the significant investments in public health over the last few years have resulted in measurable improvement of the bioterrorism preparedness system in Kansas. The results of comprehensive surveys conducted in 2002 and 2003 show that local health departments (LHDs) in Kansas have implemented a wide range of activities to enhance bioterrorism preparedness and that preparedness increased in specific and measurable ways. Measures of preparedness increased in 89 of 103 counties. The overall preparedness index for local health departments in Kansas increased by 27.7 percent, from 33.9 percent to 43.3 percent.

The overall achievements of the preparedness activities implemented in the last few years, however, must be balanced with the finding that large disparities persist among different areas of the state. Despite the progress made, many state focus area and critical capacity scores remain low. Clearly, room for improvement remains. If continued progress is a priority for policymakers, then the necessary resources must be made available.

It is important to note that there are no accepted standards for what constitutes adequate preparedness for LHDs. The indexes and thresholds used in this study to measure preparedness were created by local experts and are among the first such measures to be used to assess bioterrorism preparedness of LHDs in a quantifiable manner. It is clear that achieving a score of 100 percent for all counties is not a realistic goal, nor may it even be a desirable goal given the resources that would have to be committed to do so. These indexes are, however, useful in

tracking progress and for targeting resources to priority areas judged to be in greater need for improvement.

While determining the optimal level of preparedness for LHDs in Kansas was not an objective of this study, the findings show that when substantial funds are allocated, preparedness improves in specific and measurable ways. Policymakers must balance their desire to achieve even higher levels of preparedness throughout the state with the costs of providing the funds necessary for those enhancements. Some capacities can be achieved through a rapid, substantial capital investment, such as improved connectivity or access to advanced technologies. However, many public health preparedness activities do not lend themselves to quick solutions and require a more prolonged and sustained effort than what can be generated over a period of only one or two years (e.g., a ready supply of highly skilled public health professionals).

Specific findings from the study include:

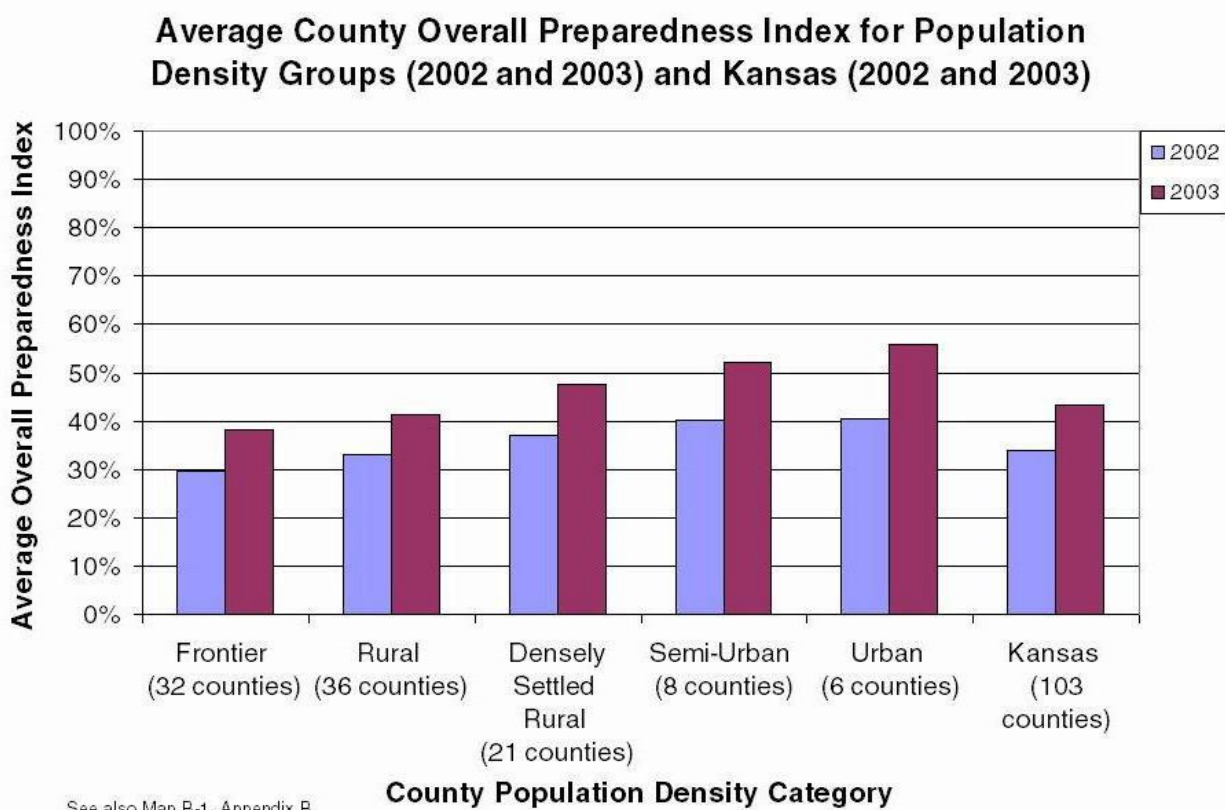
- **Preparedness for bioterrorism improved in Kansas between 2002 and 2003.** During that time, 89 of the 103 reporting counties improved their county preparedness indexes, and the statewide local preparedness index increased by 27.7 percent, from 33.9 percent to 43.3 percent.

State Preparedness Indexes by Focus Area and Year, Kansas (2002 and 2003)

Focus area	2002 Baseline	2003 Follow-up	Proportional increase
A – Planning and Assessment	49.3 %	57.1 %	15.8%
B – Surveillance and Epidemiology	35.6 %	47.9 %	34.3%
C – Laboratory Capacity	18.7 %	20.6 %	10.4%
E – Communication and Information Technology	42.0 %	52.8 %	25.7%
F – Risk Communication and Health Information Dissemination	23.6 %	28.9 %	22.6%
G – Education and Training	28.7 %	42.6 %	48.3%
Kansas-Specific Areas	39.2 %	52.9 %	34.8%
State overall preparedness index	33.9 %	43.3 %	27.7%

- **Substantial room for improvement remains.** Despite the progress observed, many areas remain where further improvement can be achieved.

- **Preparedness levels are not comparable in all counties and regions, or in all critical capacity areas.** There are large variations of preparedness measures in the state; the highest county preparedness index is more than four times greater than the lowest county index.
- **Rural areas lag in measures of preparedness.** Sparsely populated counties achieved lower measures of preparedness than counties with higher population density. Furthermore, between 2002 and 2003, this gap appeared to widen.
- **Regional efforts enhance preparedness.** The level of preparedness as measured in this study was found to improve when counties joined their efforts and formed regional groups.



In summary, LHDs in Kansas should be commended for the improvements they have achieved to date. The findings of this report should be used in developing and measuring the success of future strategies for investing resources to improve preparedness for what many consider the inevitability of future bioterrorism events.

INTRODUCTION

BACKGROUND

In the aftermath of the terrorist attacks of September 11, 2001 and the anthrax incidents in the months that followed, government officials and the general public became more aware of the importance of the public health infrastructure and its role in emergency preparedness and response. In 2002, the Kansas Department of Health and Environment (KDHE) received supplemental funding from the U.S. Centers for Disease Control and Prevention (CDC) as part of a federal allocation to states for public health preparedness and response to bioterrorism. The funding was earmarked toward increasing emergency preparedness of the public health infrastructure in the state. KDHE received additional federal funding from CDC again in 2003. As with the first funding cycle, a portion of the second-round funding was designated specifically for strengthening capacity in local health departments (LHDs).

In providing the funding, CDC asked that state and local preparedness activities be organized around 15 critical capacities grouped into six focus areas (Table A-1, Appendix A). Focus areas and critical capacities represented general areas of intervention in which states and local jurisdictions were expected to achieve proficiency using the federal funds made available to them. This represented a formidable challenge for public health agencies throughout the country that for years had been struggling with inadequate resources. Multiple reports, including one from the Institute of Medicine,¹ had pointed out that the nation's public health system was very weak and in need of major improvements. While the new funds were a welcome infusion of badly needed resources, they also were linked to expectations that public health agencies soon would be able to perform their traditional functions, as well as the new functions that emerged as a result of bioterrorism threats. Congress and the CDC expressed an interest in evaluation that would demonstrate tangible progress toward bioterrorism project goals.

While all the additional federal funding was dispersed through the state public health agencies, KDHE passed about half of the new moneys to LHDs in the state. KDHE and the Kansas Association of Local Health Departments (KALHD) became involved in a partnership

¹ Institute of Medicine, *The Future of Public Health*. National Academy Press, Washington, D.C., 1998.

effort to assist LHDs in addressing their needs and to set parameters for the use of the federal funding. To support this process, KDHE and KALHD signed a contract stipulating the following:

- KALHD would develop and administer assessments of the status of bioterrorism preparedness and public health emergency response capacity in LHDs in Kansas.
- KALHD would propose standard criteria and guidelines for regionalization of some functions of LHDs, based on principles of state-local collaboration.
- The proposed standards would be closely tied to the 10 Essential Services of Public Health and the methodology developed by the CDC's Public Health Practice Program Office (PHPPO) and other partners for assessing and monitoring LHD infrastructure.²
- KALHD would propose a way to tie measurement of bioterrorism program activities to national public health performance standards.

In the fall of 2002, KALHD engaged the Kansas Health Institute (KHI) in its capacity assessment effort and subsequently contracted with KHI to develop and analyze a baseline assessment in 2002 and a follow-up assessment in 2003.

This report provides a comparison of the results from the 2002 and 2003 assessments. Following a description of the survey instrument, data collection and analytic methods, the report presents key findings for the state as a whole, as well as by LHD regions and peer groups based upon county population density.

PHPPO ASSESSMENT TOOL

As part of its bioterrorism response effort, the CDC's PHPPO developed a survey tool, the Public Health Preparedness and Response Capacity Inventory, which was designed to provide a rapid assessment of a public health agency's ability to respond to public health threats and emergencies. This tool (referred to in this document as the PHPPO assessment tool) is organized into six sections that correspond directly with the six funded focus areas. Although the assessment tool was developed independently from the CDC's bioterrorism state grant activity,

² For a more detailed description of the Public Health Essential Services and Performance Standards project, see below in section "Project Goals" and <http://www.phppo.cdc.gov/nphpsp/index.asp>.

the CDC later made an effort to link each question contained in the tool with one critical capacity described in the grant. The PHPPO assessment tool was field-tested, revised and made available for national distribution in August 2002.

DESCRIPTION OF THE FIRST SURVEY

Following the release of the PHPPO assessment tool, KALHD became interested in using it as an assessment instrument in the state and promoted the development of a Kansas-specific version of the assessment instrument. The final Kansas Public Health Preparedness and Response Capacity Inventory was based largely on the PHPPO tool, with an additional section of 30 Kansas-specific questions that included items developed by KALHD, KDHE and KHI. The Kansas-specific module addressed the same focus areas as the national inventory, but added questions that were not covered in the PHPPO portion of the instrument. In addition, questions about coordination of LHD activities with area hospitals and other counties were added. Four questions (numbers 7, 17, 18 and 52) were deleted from the PHPPO assessment tool because they were considered not to be relevant to Kansas. In an effort to identify achievements and gaps of the current system and to monitor progress toward the goals of this project, KALHD decided to survey all LHDs in the state using this instrument, and to repeat the same survey after one year.

Although the PHPPO assessment tool was designed to be conducted as a mail-out/mail-back instrument, KDHE felt that it would be advantageous to collect the survey response data electronically via a secure Web-based system.³

The first electronic survey was made available to all LHDs in November 2002. Data collection was completed in January 2003, and LHDs from all 105 Kansas counties submitted data for all sections of the survey. Findings from this first assessment were analyzed and summarized by KHI, and summary reports were distributed to representatives of KALHD and KDHE in April 2003.

³ KDHE staff adapted the survey instrument for online administration; a more detailed description of the programming and testing processes were included in the report for the 2002 assessment. (*Bioterrorism and Emergency Response Preparedness of Local Health Departments in Kansas: 2002 Baseline Survey Report*. Kansas Health Institute, Topeka, Kansas, April 2003, KHI/R 03-3.)

DESCRIPTION OF THE SECOND SURVEY

About ten months after the first survey, a second survey was conducted. The PHPPO assessment tool as modified for the first data collection was used without any additional modification. Local health departments from 103 of the 105 Kansas counties submitted data for the second survey. Findings from the 2003 data collection, including a comparison to the results of the 2002 survey, are the subject of this report.

LOCAL HEALTH DEPARTMENT REGIONS

Between the 2002 and the 2003 surveys, many activities took place in the public health system throughout the state. Using the additional funds they received, many LHDs hired new staff whose primary responsibilities were to focus on bioterrorism preparedness activities. In addition, KALHD and KDHE encouraged LHDs to collaborate in efforts and maximize their resources through the adoption of LHD regions. Since only one of these regions was already in existence at the time of the first survey, the first survey can be considered as baseline information, and the early effects of the regionalization process may be measured through the second survey.

The regionalization process was undertaken to increase infrastructure in the areas of preparedness for bioterrorism, public health emergencies and communicable disease, with the following overarching goals:

- broadening the state's epidemiological surveillance;
- improving capacity to deliver services to areas with sparse population;
- coordinating planning efforts; and
- sharing workforce expertise and resources.

Additional potential benefits of the regionalization process included strengthening relationships and communications among LHDs, improving long-term sustainability for the local public health infrastructure, and facilitating coordination of local and regional preparedness efforts with statewide activities.

In the fall of 2002, KALHD adopted regionalization standards and procedures for LHDs, with the support of KDHE and the Kansas Association of Counties. Criteria for the formation of

LHD regions included that three or more contiguous counties (with no minimum population restrictions) jointly participate in a formal, written regionalization governance structure with equal representation. A single fiscal agent was to be named for each regional group. The types of activities that were suggested for consideration included the following:

- activities aimed at fulfilling critical capacities of the bioterrorism federal grant guidelines;
- items in the state and local bioterrorism work plans;
- efforts toward the achievement of communicable disease control standards;
- employment of epidemiologists and regional bioterrorism coordinators;
- organization of or participation in regional education and training programs; and
- development of written policies, procedures and regional bioterrorism response plans.

Only new or enhanced activities were eligible for inclusion in the regional efforts (use of the funds for supplanting existing activities was not allowed). KDHE and KALHD offered financial incentives to LHDs that agreed to form a regional group. In December 2002, ninety-eight Kansas counties applied to form 14 regions. Regions were actually created at the beginning of 2003.

At the time of the second survey, 104 of the 105 counties in Kansas were participating in one of 15 regions. Table 1 indicates the 15 LHD regions' population density designations at the time of the 2003 survey.

Table 1. Population Density of the 15 LHD Regions in Kansas (2003)

LHD region*	Population density of the region**
1	Densely settled rural
2	Frontier
3	Frontier
4	Rural
5	Rural
6	Rural
7	Semi-urban
8	Rural
9	Densely settled rural
10	Rural
11	Rural
12	Rural
13	Urban
14	Semi-urban
15	Semi-urban

*For confidentiality purposes, LHD Regions are not identified in this report.

**Groups are (from the least to the most densely populated): frontier, rural, densely settled rural, semi-urban and urban. For more information on population density groups, see the section in Methods on Population Density Groups and Tables B-1 and B-2 (Appendix B)

PROJECT GOALS

The primary goals of the follow-up assessment and this report are: 1) to evaluate progress in all areas of local public health preparedness activities between 2002 and 2003; 2) to describe current capacity achieved at the regional level through the establishment of LHD regions; and 3) to identify gaps in capacity that should receive priority attention in future efforts. It should be emphasized that since only local public health agencies received the surveys, this project represents a statewide assessment of local preparedness capacity only and does not include an assessment of functions located primarily in state or federal agencies.

Additionally, as called for by the contract between KDHE and KALHD, the data gathered in this assessment was used for a broader evaluation of local public health infrastructure based on the concepts described in the National Public Health Performance Standards (NPHPS) published

by CDC.⁴ The NPHPS program was the result of a collaborative effort of seven national institutions⁵ to identify the optimal level of performance for state and local public health systems in the nation. The performance standards are designed around 10 Essential Public Health Services, which describe the full range of public health responsibilities for public health systems in the country. Performance standards are measured through indicators specific to each standard. While the PHPPPO assessment tool was not created with the explicit purpose of evaluating the essential public health services or public health performance indicators, there is overlap between the two projects, and some of the critical capacities defined in the bioterrorism preparedness project are very similar to some indicators of public health essential services.

⁴ A detailed description of the NPHPS project can be found at <http://www.phppo.cdc.gov/nphpsp/index.asp>.

⁵ The institutions involved were the CDC, Public Health Practice Program Office (CDC/PHPPPO); the American Public Health Association (APHA); the Association of State and Territorial Health Officials (ASTHO); the National Association of County and City Health Officials (NACCHO); the National Association of Local Boards of Health (NALBOH); the Public Health Foundation (PHF); and the National Network of Public Health Institutes (NNPHI, joined in 2001).

METHODS

DATA COLLECTION

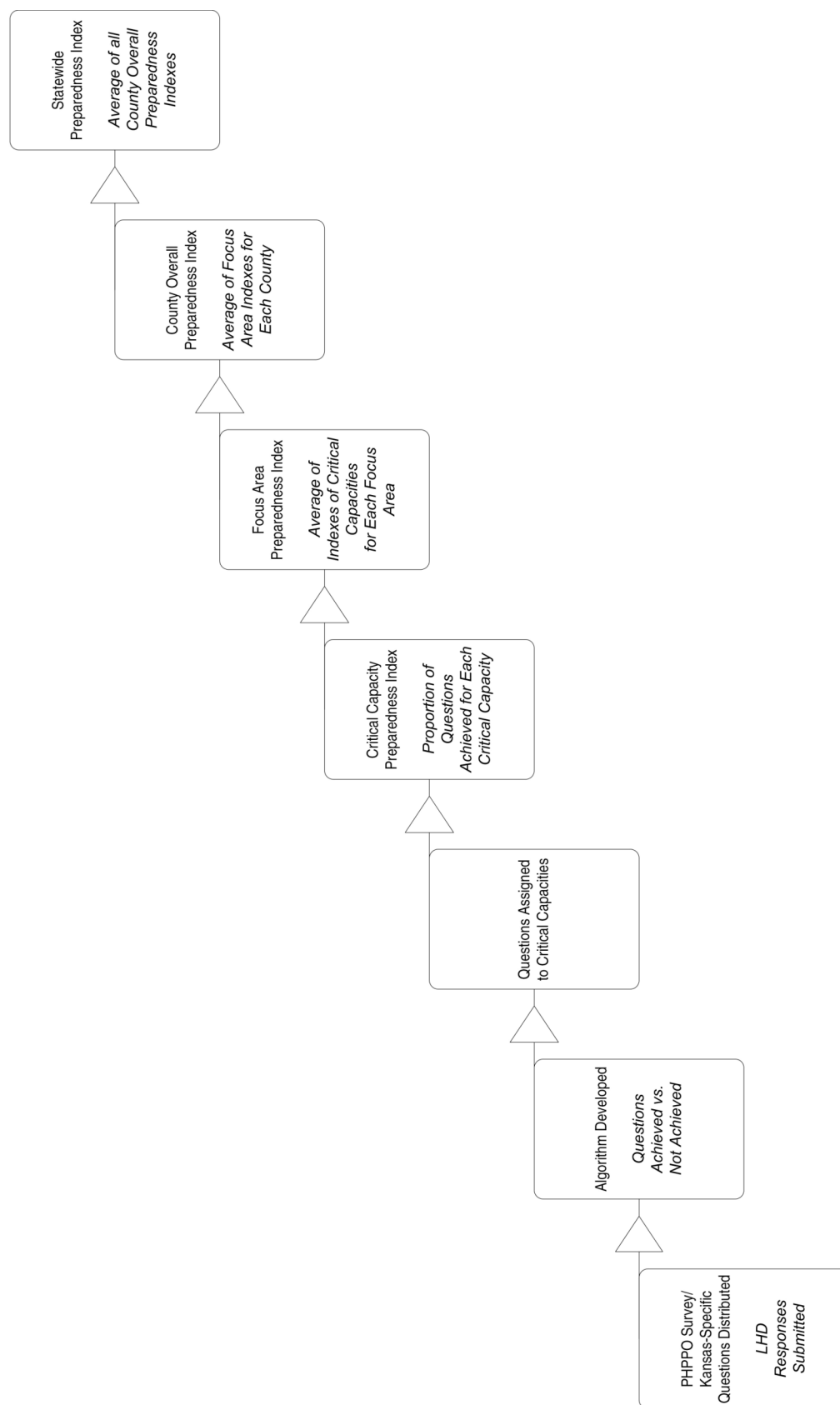
As in the 2002 survey, the printed questionnaire was converted to electronic format to support data submission via a secure Internet-based communication system. The appearance (but not the content) of the electronic data entry screens underwent significant revision for the 2003 round of data collection. Screens were re-designed to more closely resemble the paper version of the questionnaire and to ease data entry. Users could not advance through the online questionnaire if they had not answered all applicable questions. Paper copies of the questionnaire (Appendix C) were mailed to all LHDs in July 2003 accompanied by a cover letter from the executive director of KALHD. Answers were submitted electronically in fall of 2003, approximately one year after the first assessment.

SCORING SYSTEM

A strategy for the analysis of LHD responses is needed, because the PHPPO assessment tool includes multiple questions and sub-questions within each focus area and critical capacity, totaling over 700 specific items grouped into 79 questions. Although most questions have a limited number of multiple choice answers, many of them are qualitative in nature; for example, asking the respondent to specify the extent to which a certain activity had been completed. Such level of detail does not easily lend itself to summary descriptions and could quickly overwhelm a reader.

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. Figure 1 shows the method used to aggregate the responses. 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 not all the boxes were 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.

Figure 1. Aggregating Responses to Summary Scores



In response to this, KHI drafted a proposed formula for converting responses for each survey question to a dichotomous *achieved vs. not achieved* classification. Next, a team of representatives appointed by KALHD who had expertise in bioterrorism preparedness and represented diverse local situations reviewed the proposed scoring formulas and methods and identified areas they felt were problematic or required further refinement. Comments and suggestions from the KALHD representatives were incorporated into revisions of the scoring formulas, and the revised formulas were applied to the analysis of both the 2002 and 2003 data sets. A description of the formulas used to classify each answer can be found in Table A-2, Appendix A. Using guidance provided by the PHPPO instrument, 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 were 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 a focus areas, and a focus area preparedness index was computed by calculating the unweighted average (i.e., arithmetic mean) of the critical capacities indexes included in that focus area. For the purpose of the analysis, Kansas-specific questions added to the PHPPO assessment tool were either assigned to a related, existing focus area and considered as a separate critical capacity within that area, or grouped into a Kansas-specific area, which was considered as an independent focus area. Finally, a county overall preparedness index was computed as the unweighted average (i.e., arithmetic mean) of the indexes for all the focus areas in each county. For more details on how questions, critical capacities and focus areas were grouped together, see Figure A-1, Appendix A.

To measure the capacity for the entire state, state preparedness indexes were computed by taking the average of all the correspondent county-level indexes. This allowed KHI 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 one state overall preparedness index (as the average of all county overall preparedness indexes).

POPULATION DENSITY GROUPS

The difficulty of assuring access to comprehensive and high-quality public health services in sparsely populated jurisdictions is recognized as one of the barriers that many counties in Kansas face. For this reason, population density is one of the factors that were taken into account in the analysis of the information. Counties were classified into one of five groups, based on their population density, following criteria provided by KDHE. Based on this classification, 33 (31 percent) of the counties were classified as frontier (the least densely populated category); 36 (34 percent) as rural; 22 (21 percent) as densely settled rural; 8 (8 percent) as semi-urban; and 6 (6 percent) as urban (the most densely populated group). Using the same criteria, each of the 15 LHD regions were also classified into one of the five population density groups, based on the population per square mile of the region's combined counties. Tables B-1 and B-2 (Appendix B) contain more detailed information on population density groups. Map B-1 (Appendix B) depicts the counties by their population density and provides the classification criteria for each group.

ANALYSIS

In 2002, LHDs from all 105 counties in the state responded to the assessment survey. In 2003, the number of responses was 103 (98.1 percent). The analysis in this report is based on the 103 counties that responded to both surveys. For LHD regional information, since one county did not join any of the 15 regions, the analysis is based on the 102 of the 103 respondents that participated in LHD regions.

In order to focus attention on key issues of preparedness and capacity, and to allow comparisons between the 2002 and the 2003 survey results as well as across population density groups, the data were summarized at several levels, and at each level of analysis results from the 2003 assessment were compared to the 2002 baseline survey. Critical capacity and focus area results from the individual LHDs were summarized based upon population densities (frontier, rural, densely settled rural, semi-urban and urban). Results by LHD region were calculated using two methods. For the first method, the regional preparedness capacity was assumed to be the unweighted average (i.e., arithmetic mean) of the capacities present in each county in the region. This assumption could be defined as "narrow," because it assumes that all members contribute equally to the overall regional capacity and that "strong" counties affect the overall region's

capacity in the same way as relatively “weaker” members. For the second method, it was assumed that in each LHD region, the level of capacity was equal to the level achieved by the county with the highest index. This assumption could be defined as “broad,” because it assumes that a high capacity level achieved by a single LHD can be applied and made available to all members of a LHD region through a synergistic effect. These alternatives are presented to show the range of potential impact that a LHD region could achieve through resource sharing. Neither method probably is fully accurate in measuring the “true” capacity of a LHD region, which probably lies somewhere between the two reported measures. The presence of one, strong LHD with a preparedness level considerably higher than that of other LHDs in the region could contribute to a regional index greater than the average county index, but smaller than the index achieved by that single health department. The LHD region’s capacity also may depend on other factors not fully captured by the two surveys or by the indexes that were generated from the survey results. Policy decisions at the regional level on how to activate and share resources throughout the region can have an important effect on the regional preparedness. Strong leadership and commitment in one or more LHDs in a region also can affect the resulting regional capacity. For these reasons, the KHI project team analyzed the data in both ways and presented the results as indicators of the potential spectrum of the regional preparedness level.

The use of achievement levels and preparedness indicators built from over one hundred items in the survey introduced some complexity in the analysis and produced a large volume of results. The meaning and limitations of these results need to be carefully assessed when attempting to draw conclusions. For this reason, KHI decided that the use of tests of statistical significance could be misleading. For example, moving the thresholds for achievement assigned to the survey questions could have important effects on whether numeric differences between indexes are found to be statistically different or not, and some differences found to be statistically significant could, in fact, have implications more limited than other differences that do not reach statistical significance. KHI determined that although the use of statistical comparisons could have some advantages in this context, it carried a greater overall risk of inducing the reader toward misleading conclusions. For these reasons, the KHI project team did not perform any statistical tests on the survey results.

ASSESSMENT OF INDICATORS FOR NATIONAL PUBLIC HEALTH PERFORMANCE STANDARDS

To broaden the effect of the current assessment and integrate the results into an ongoing evaluation of public health capacity indicators, KALHD asked KHI to link the PHPPO assessment and the NPHPS projects. To address this, KHI built a “cross-walk” aligning questions from the PHPPO assessment tool to the local indicators of the NPHPS. KHI staff compared the two projects and identified areas where the questions from the PHPPO instrument addressed part or all of a performance standard indicator. Through this process, 69 (65.1 percent) of 106 assessment questions were assigned to 17 (54.8 percent) of 31 unique indicators. Essential Service Indicator achievement indexes were computed (in a way similar to the critical capacity preparedness indexes) as the unweighted percentage of questions for each indicator that were achieved, using the same formula developed for the analysis of the PHPPO survey. Performance standard indicators were only partially measured by the questions matched to them, and not all indicators had an adequate number of appropriate questions to match (with some indicators having no compatible PHPPO questions). For these reasons, achievement indexes were only computed for some of the performance standard indicators, and no indexes were computed for an entire essential service. The cross-walk process is described in Table A-3 in Appendix A.

LIMITATIONS

There are several limitations that must be considered when reviewing this report and interpreting the results of the assessment process.

ONLY LOCAL CAPACITY WAS ASSESSED

The scope of this study was on assessment of preparedness capacity at the local level, based on functions performed in local public health agencies. The information collected, also when analyzed for the entire state and for regional coalitions, reflects only the results of local activities and programs. The effects on preparedness of activities based primarily in state and federal agencies were not measured.

SURVEY INSTRUMENT

The PHPPO instrument was designed by CDC for use by health departments nationwide serving various types and sizes of jurisdictions. Consequently, many of the questions were designed for general applicability, resulting in wording that was sometimes imprecise and subject to various interpretation by respondents. In some cases, inventory questions may not have been directly applicable to the responsibilities, needs and capacities of LHDs in Kansas.

The instrument was designed to be completed on paper, but was adapted for electronic distribution in Kansas. In the 2002 round of data collection, the appearance of the electronic data entry screens differed from that of the printed copy, and in some places entire questions could not be viewed on a single screen. These factors made the online survey response process somewhat challenging for respondents. While the user interface screens were re-designed in 2003 to more closely resemble the hard-copy format of the instrument, transcription errors may still have occurred as respondents entered their data in the on-line system. Neither KHI nor KDHE reviewed individual item responses with LHDs; data were accepted as submitted as representing the intended responses of the individual LHDs.

ACCURACY AND RELIABILITY OF INFORMATION COLLECTED

All of the information analyzed was self-reported and there was no validation or verification of the answers. Such information is therefore subject to reporting biases, which are potentially made more problematic by the fact that in 37 (36.3 percent) of the 102 counties, different health department employees completed the 2002 and the 2003 surveys. Given the possible ambiguity in the interpretation of questions, it is possible that changes observed between the two surveys (especially at the level of individual questions) could represent a measure of respondent variability, rather than a true change. However, it should be noted that in aggregate, almost all the changes observed point to an increase in the preparedness index scores, and very few internal inconsistencies were observed in the survey results.

CRITERIA TO DEVELOP INDEX SCORES

While the use of the preparedness indexes allows easy comparisons between the 2002 and 2003 surveys and between different groups of respondents, the criteria used to compute these indexes reflect the consensus of a panel of experts from KHI and KALHD but have not been validated by others. The adoption of different criteria, or the movement up or down of the achievement thresholds for individual questions, could produce different results. For these reasons, the indexes should not be interpreted as absolute measurements of capacity at the local, regional or state level, but rather as a method to monitor the overall change in specific areas. Absolute achievement levels and preparedness index numbers are less meaningful than the changes of the same indicators over time, or as a comparison of the same indicators across different jurisdictions or groups.

USE OF UNWEIGHTED MEANS

Focus area indexes used in this study are built using unweighted means, and since the number of elements that compose each index varies, single response elements may affect summary indexes disproportionately. For example, the preparedness index for critical capacity A-I.A is based on six questions (Questions 1 through 6), while the index for critical capacity A-I.B is based on one question (Question 8). Since the preparedness index for Focus Area A is the

unweighted average of the indexes of all its critical capacities, the results for Question 8 will affect the Focus Area A index more than the results for Questions 1 through 6.

Since the scope of this study was on assessment of preparedness capacity at the local level, state and regional average index scores were not weighted for the size of the population resident in each of the counties contributing to the scores. The assumption using these unweighted scores is that each county contributes to local preparedness at the state and regional level in cumulative amounts, regardless the size of the population living in the county. This would mean that a large county such as, for example, Sedgwick, and a small county, such as, for example, Allen, each contributes to 1/103 of the local preparedness at the state or regional level. An alternative calculation method could use averages weighted for population size. In this case, the assumption is that the contribution to local preparedness in the state or in a region of counties with larger population is greater than that of counties with smaller population. Both these assumptions are reasonable, and it is possible that they apply in each region and focus area differentially. However, it was not possible in this study to verify the validity of either of these two assumptions. The ways that preparedness in a large health department affects the state or a region depend to a great extent on local policies and mutual aid agreements, and could not be measured in this study. The use of unweighted averages also has the advantage of being more straightforward for data analysis and presentation, which is preferable in the absence of evidence that a more complex approach is needed. For these reasons, in this study only unweighted averages were used.

REGIONAL PREPAREDNESS

There are limitations in the analysis of preparedness at the LHD regional level. The modified PHPPO assessment tool used for these surveys asked only about activities and capacities at the single agency level, that is, a single LHD. In their responses, LHDs were not asked to consider capacity that might exist elsewhere within their LHD regions. For analytical purposes, the potential capacity of a coalition was measured using two different methods, both based on individual county indexes, as described in the methods section of this document. In the absence of agreed-upon regional standards and information on the current regional capacity related to those standards, it was not possible to have a more direct measurement of regional preparedness.

Furthermore, the regional groups were organized for only a few months at the time of the 2003 survey, and sufficient time may not have passed for the groups to be fully operational and achieve the full potential benefit of collaboration. Consequently, while results summarized by LHD regions may show some changes from the 2002 to the 2003 assessment, it is difficult to know which or what proportion of changes might be directly attributed to the regionalization effort, or to assess the full potential of the regionalization process.

LINKAGE WITH NPHPS INDICATORS

Finally, the linkage between the questions included in the PHPPO assessment instrument and the NPHPS is weak and partial, since the PHPPO assessment was focused solely on emergency preparedness and response capacities and the NPHPS program addresses a much broader continuum of essential public health services. While the two are not unrelated, data collected through the PHPPO assessment process can address only partial sections of the NPHPS. Attempts to assess compliance with the national standards through a cross-walk process utilizing data from the PHPPO assessment tool may generate results different from what would be found if the NPHPS had been surveyed directly.

RESULTS

The results of the survey are presented in four separate sections: (1) critical capacities and focus areas,⁶ (2) population density groups, (3) LHDs regions and (4) the linkage to NPHPS.

Table 2 summarizes the key findings for all the sections.

Table 2. Summary of Key Findings from the Survey Analysis

Analysis for:	Key findings:
Overall State Indexes <i>page 26</i>	<ul style="list-style-type: none"> The county overall preparedness index improved in 89 (86.4%) of reporting counties. The overall preparedness index in the state improved by 27.7% (from 33.9% to 43.3%) between the 2002 and 2003 surveys. The preparedness index for all focus areas showed some improvement between the 2002 and 2003 surveys, with the largest change observed in Focus Area G (Education and Training) and the smallest in Focus Area C (Laboratory Capacity).
Focus Area A Planning and Assessment <i>page 30</i>	<p>Achievements</p> <ul style="list-style-type: none"> The preparedness index improved by 15.8% (from 49.3% to 57.1%) between 2002 and 2003. LHDs devoted attention to preparedness and coordination. <p>Gaps</p> <ul style="list-style-type: none"> Most LHDs lack formal agreements with important local partners. Leaders in county agencies may need additional training.
Focus Area B Surveillance and Epidemiology <i>page 32</i>	<p>Achievements</p> <ul style="list-style-type: none"> The preparedness index improved by 34.4% (from 35.6% to 47.9%) between 2002 and 2003. LHDs strengthened relationships with local and state reporting sources. Most LHDs can receive reports 24/7. <p>Gaps</p> <ul style="list-style-type: none"> 30 LHDs do not have a 24/7 contact person. Surveillance activities are incomplete. Risk and vulnerability assessments for hazardous substances, food, water or air threats are rarely done.

⁶ For a detailed description of the critical capacities and focus areas mentioned in this section see Table A-1, Appendix A.

Table 2 (continued). **Summary of Key Findings from the Survey Analysis**

Analysis for:	Key findings:
Focus Area C Laboratory Capacity- Biological Agents <i>page 35</i>	Achievements <ul style="list-style-type: none"> • The preparedness index improved by 10.4% (from 18.7% to 20.6%) between 2002 and 2003. • Most question scores slightly improved. Gaps <ul style="list-style-type: none"> • This focus area has the lowest index and the smallest improvement. • No individual question was achieved by the majority of LHDs. • LHDs experience difficulty in this area.
Focus Area E Communication and Information Technology <i>page 38</i>	Achievements <ul style="list-style-type: none"> • The preparedness index improved by 25.7% (from 42.0% to 52.8%) between 2002 and 2003. • 94 LHDs are connected to the state system through a secure electronic link. • Most LHDs have public alert systems in place. Gaps <ul style="list-style-type: none"> • Procuring local technical support is difficult. • Few LHDs have a public Web site. • Electronic data exchange is limited.
Focus Area F Risk Communication and Health Information Dissemination <i>page 41</i>	Achievements <ul style="list-style-type: none"> • The preparedness index improved by 22.6% (from 23.6% to 28.9%) between 2002 and 2003. • Most LHDs have a media contact directory. Gaps <ul style="list-style-type: none"> • Scarce topic-specific material has been prepared in anticipation of emergency events. • Limited activities for communication with special populations (e.g., translation of documents).

Table 2 (continued). **Summary of Key Findings from the Survey Analysis**

Analysis for:	Key findings:
Focus Area G Education and Training <i>page 44</i>	<p>Achievements</p> <ul style="list-style-type: none"> • The preparedness index improved by 48.3% (from 28.7% to 42.6%) between 2002 and 2003 (the largest focus area increase). • Most LHDs report educational and training activities for health care professionals. • Distance learning capabilities have more than doubled. <p>Gaps</p> <ul style="list-style-type: none"> • Few LHDs report educational and training activities targeting their own staff. • Job descriptions and training needs assessments are incomplete. • Access to satellite download facilities is rare.
Kansas-Specific Competencies <i>page 46</i>	<p>Achievements</p> <ul style="list-style-type: none"> • The preparedness index improved by 34.8% (from 39.2% to 43.3%) between 2002 and 2003. • Most LHDs are developing relationships with other counties for emergency response. <p>Gaps</p> <ul style="list-style-type: none"> • Few LHDs have alternative plans for communication with area hospitals. • Few LHDs have plans to receive morbidity and mortality data from hospitals.
Population Density <i>page 48</i>	<ul style="list-style-type: none"> • Low population density is associated with preparedness indexes that are lower than the state average. • Considerable variability of preparedness index exists throughout the state (highest county index in the state was 4.4 times higher than lowest county index). • Indexes improved in all population density groups, but less so in frontier and rural counties.

Table 2 (continued). **Summary of Key Findings from the Survey Analysis**

Analysis for:	Key findings:
LHD Regions <i>page 59</i>	<ul style="list-style-type: none"> • All regions improved their index between 2002 and 2003. • Progress was greater in regions with a low index in 2002, suggesting that regional gaps may be narrowing. • The ratio between the highest and the lowest regional index in 2003 was only 1.5, about one third of the ratio between the highest and the lowest <i>county</i> index. • Regions with low population density had a lower index than the state index. • Every region had at least one county with an index higher than the state average. • Nine (60%) of the 15 regions had an average index higher than the state index. • Twenty-one (37.5%) of the 56 counties with a county index lower than the state index participated in a region that had an average index higher than the state index.

State Key Findings

- The county overall preparedness index improved in 89 (86.4 percent) of the reporting counties.
- The state overall preparedness index improved by 27.7 percent (from 33.9 percent to 43.3 percent) between 2002 and 2003.
- The preparedness index for all focus areas showed some improvement between 2002 and 2003, with the largest change observed in Focus Area G (Education and Training) and the smallest in Focus Area C (Laboratory Capacity).

RESULTS FOR CRITICAL CAPACITIES AND FOCUS AREAS

The county overall preparedness index increased in 89 (86.4 percent) of the 103 counties that responded to both surveys. The mean change in the counties was an increase of 37.9 percent. As a result, the state preparedness indexes for each focus area and the state overall index increased between the two surveys, as shown in Table 3 and Figure 2. Between the 2002 and the 2003 surveys, progress in the achievement of critical capacities was observed at the state level, despite considerable differences in the preparedness index among critical capacities (Figure 3). During the interval between the two measurements, the state overall preparedness index moved from 33.9 to 43.3 percent, a 27.7 percent improvement. State preparedness indexes also improved for all critical capacities and focus areas, with focus area changes ranging from 10.4 percent (Focus Area C) to 48.3 percent (Focus Area G).

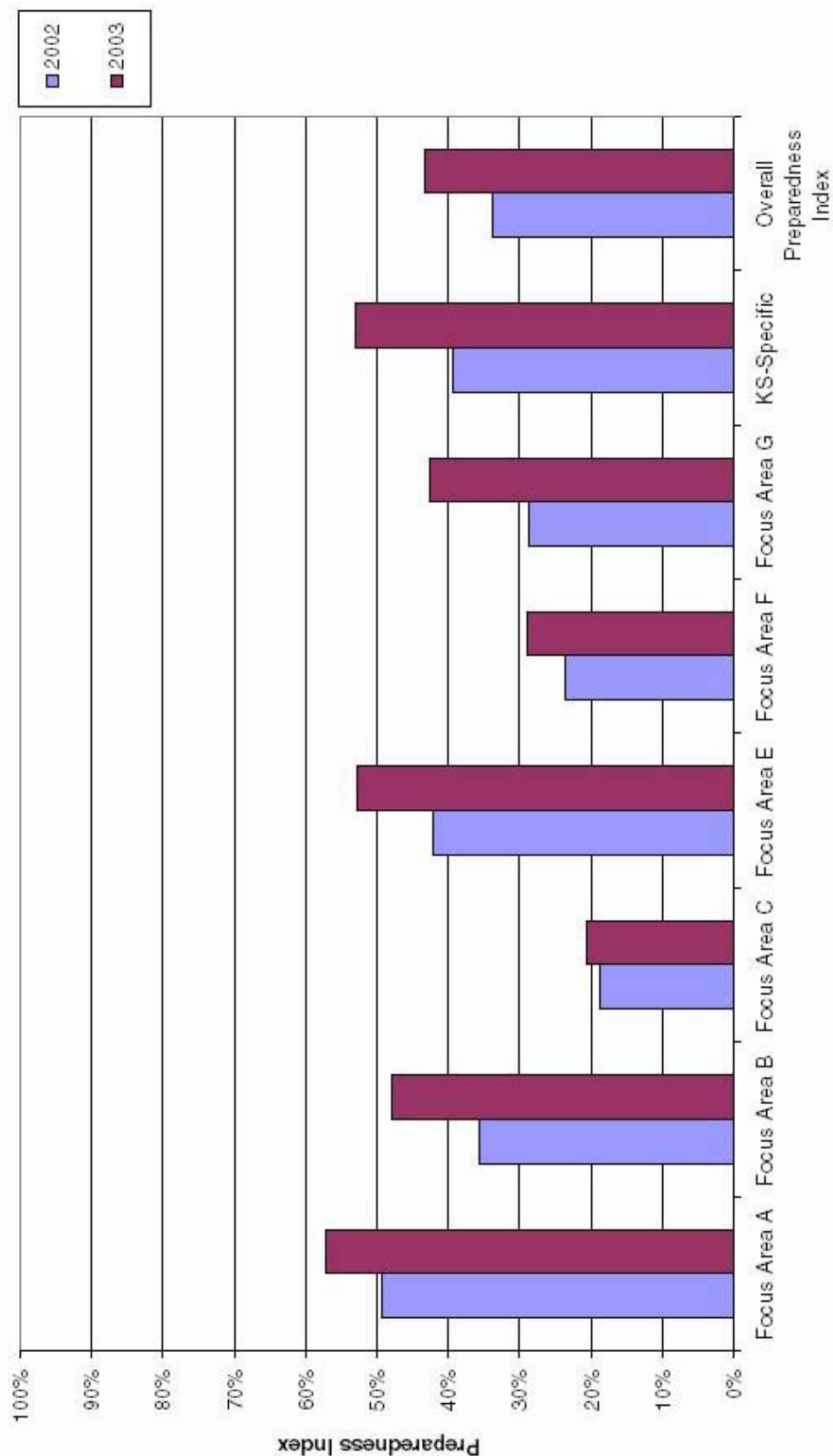
Table 3. State Preparedness Indexes by Focus Area and Year, Kansas (2002 and 2003)

Focus area	2002 Baseline	2003 Follow-up	Proportional increase
A – Planning and Assessment	49.3 %	57.1 %	15.8%
B – Surveillance and Epidemiology	35.6 %	47.9 %	34.3%
C – Laboratory Capacity	18.7 %	20.6 %	10.4%
E – Communication and Information Technology	42.0 %	52.8 %	25.7%
F – Risk Communication and Health Information Dissemination	23.6 %	28.9 %	22.6%
G – Education and Training	28.7 %	42.6 %	48.3%
Kansas-Specific Areas	39.2 %	52.9 %	34.8%
State overall preparedness index	33.9 %	43.3 %	27.7%

The following sections examine the results for the entire state by focus area.⁷

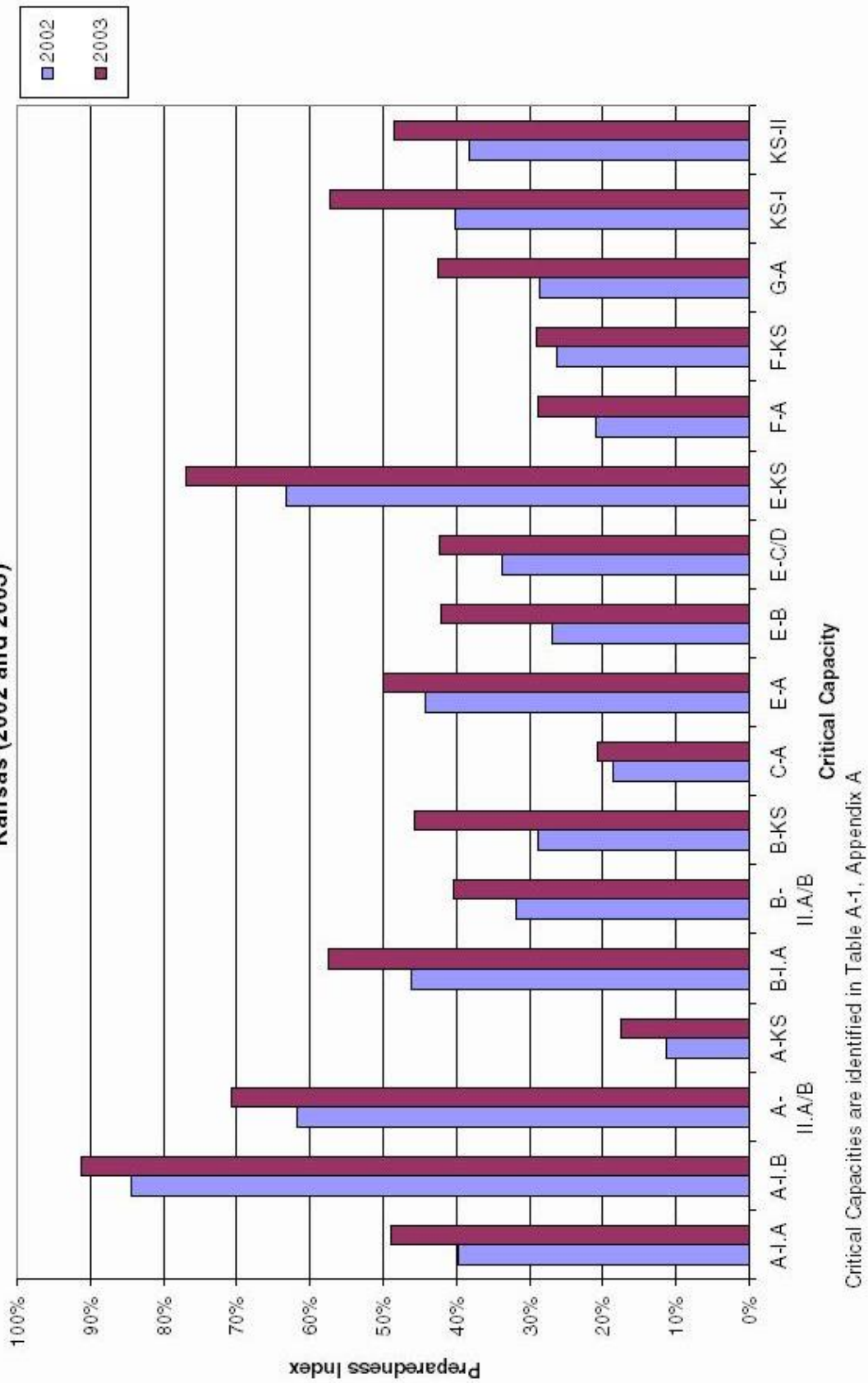
⁷ For a detailed description of the questions mentioned in the following sections see Appendix C.

**Figure 2. State Focus Areas and Overall Preparedness Indexes
Kansas (2002 and 2003)**



Focus Areas are identified in Table A-1, Appendix A

**Figure 3. State Critical Capacity Preparedness Indexes
Kansas (2002 and 2003)**



Key Findings for Focus Area A

Achievements

- The preparedness index improved by 15.8 percent (from 49.3 percent to 57.1 percent) between 2002 and 2003.
- LHDs devoted high importance to preparedness and coordination.

Gaps

- Most LHDs lack formal agreements with key local partners.
- Leaders in county agencies may need more training.

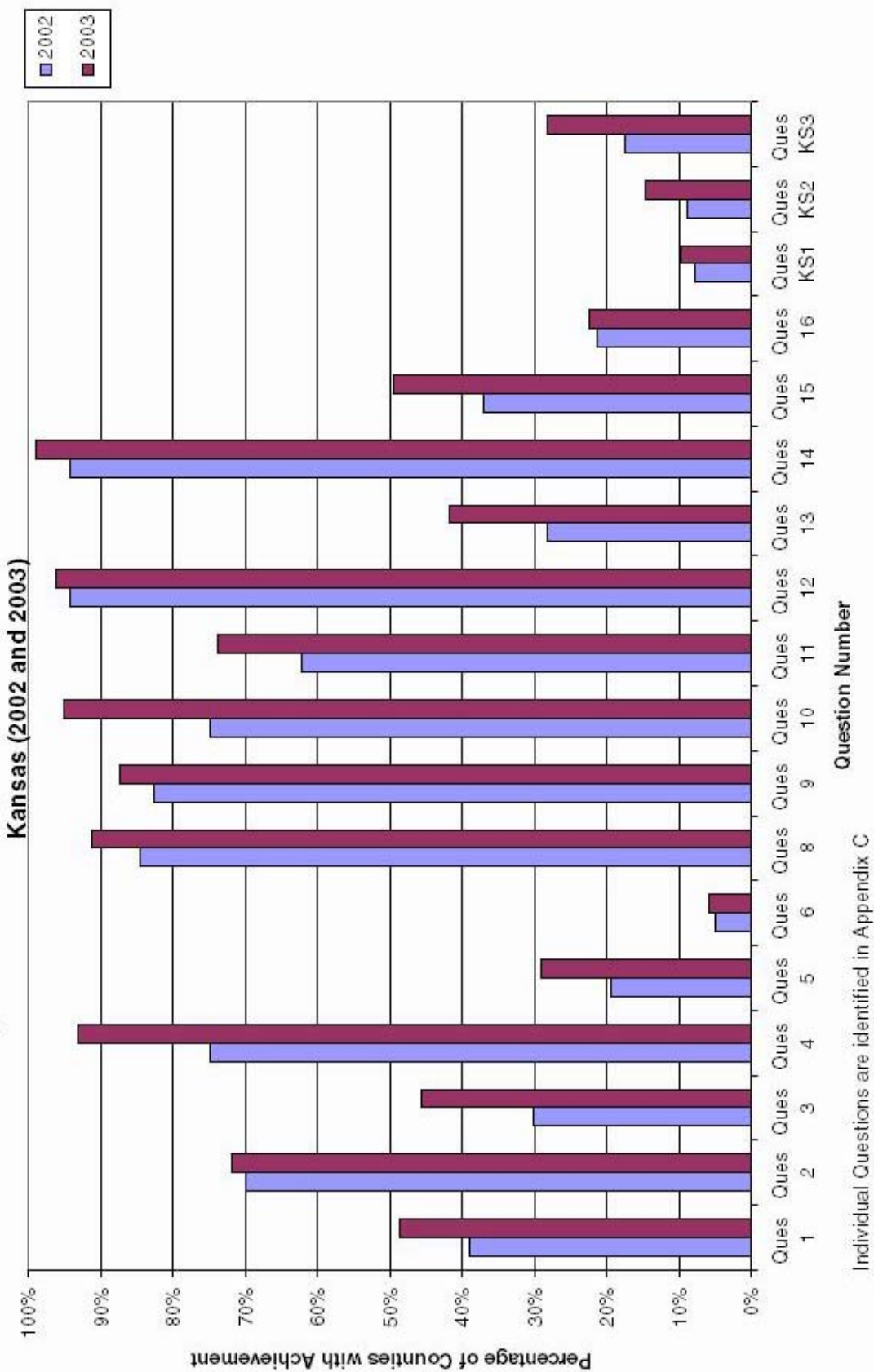
Focus Area A: Preparedness Planning and Readiness Assessment

Focus Area A evaluation was based on 15 questions from the PHPPO assessment tool and three Kansas-specific questions. The questions were grouped in three critical capacities,⁸ plus one Kansas-specific group. LHDs throughout the state appear to have devoted high importance to preparedness and assessment coordination in their jurisdictions, and most of them report that they have integrated their emergency response plans with those of other entities. As a result, the preparedness index for Focus Area A moved from 49.3 percent in 2002 to 57.1 percent in 2003, a 15.8 percent improvement.

There is room for improvement in addressing specific issues of coordination (Figure 4), such as activation of emergency plans and surge capacity (Question 13) and continuous, verified access to key local and state partners (Question 15). Also, despite the presence of informal agreements, most health departments lack formal agreements with their local health and emergency response systems (Question 3), which could complicate the activation and coordination of emergency plans. Finally, many of the key managers involved in responding to a bioterrorism event have not attended the national advanced leadership and emergency management training listed in the PHPPO tool (Question 5), although some of them may have attended relevant state or local training events that were not addressed in the question. It should be noted that for all these items, considerable progress was made between the two surveys.

⁸ Critical capacity A-II.A and A-II.B were combined in the PHPPO assessment tool into one group.

**Figure 4. State Level of Achievement for Focus Area A
Preparedness Planning and Readiness Assessment Questions
Kansas (2002 and 2003)**



Key Findings for Focus Area B

Achievements

- The preparedness index improved by 34.4 percent (from 35.6 percent to 47.9 percent) between 2002 and 2003.
- LHDs strengthened relationships with local and state reporting sources.
- Most LHDs can receive reports 24/7.

Gaps

- 30 LHDs do not have a 24/7 contact person.
- Surveillance activities are incomplete.
- Risk and vulnerability assessments for hazardous substances, food, water or air threats are rarely done.

Focus Area B: Surveillance and Epidemiology Capacity

Evaluation of Focus Area B preparedness was based on 14 questions from the PHPPO tool (combined into two critical capacities)⁹ and five Kansas-specific questions. The preparedness index for Focus Area B moved from 35.6 percent in 2002 to 47.9 percent in 2003, a 34.4 percent improvement, with counties reporting progress for most of the questions in this focus area (Figure 5). Seventy-six LHDs reported that they had access to specialized personnel in year two, up from 58 in year one (Question 27). The majority of health departments reported that in year two they were making attempts to strengthen relationships with their reporting sources (Questions 22 and 31). Most LHDs had in place some methods to receive reports 24/7 (Question 20), but more than 30 of them were lacking a 24/7 contact person.

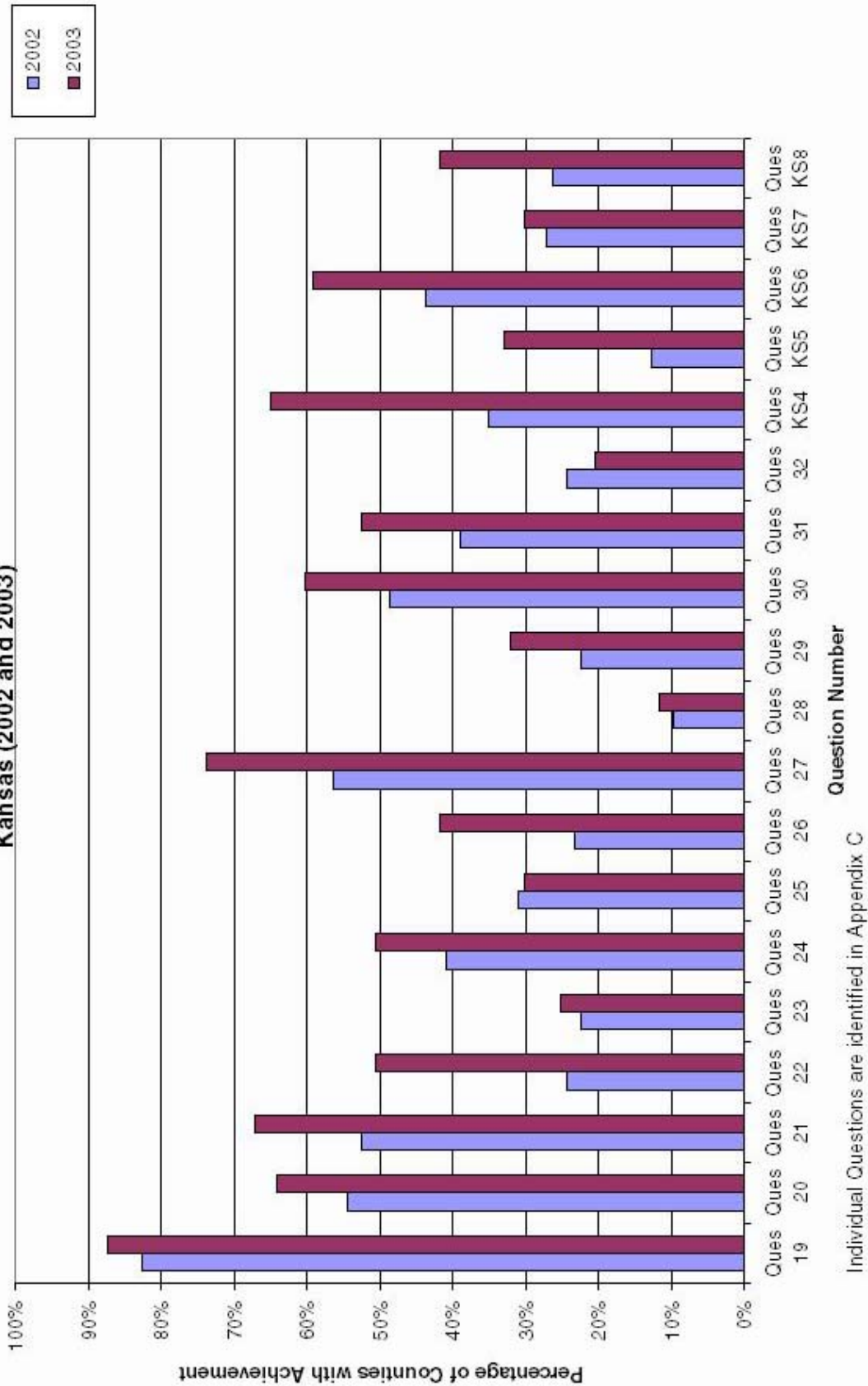
While these numbers are encouraging and show important improvements during the interval between the two surveys, LHDs continue to have difficulties in conducting the full range of activities included in public health surveillance, that is, data collection, storage, analysis, and dissemination (Question 23). Most health departments have protocols for conducting epidemiologic investigations (Question KS-6), and many (and for some conditions, almost all)

⁹ Critical capacity B-II.A and B-II.B were combined in the PHPPO assessment tool into one group.

LHDs *collect* surveillance information on conditions of public health importance (Question 23). However, few health departments *analyze* the information collected and disseminate their findings. Surveillance activities are uncommon for potential threats that have not traditionally been included within the domain of public health in Kansas, but they are receiving increasing nationwide attention as important elements of overall public health preparedness. For example, very few LHDs conduct any surveillance activities on hazardous substances or emergency events, and most health departments seem to have difficulty in expanding risk and vulnerability assessments and potential threats to food, water and air (Question 28).

Two findings in Focus Area B were somewhat surprising. First, fewer counties reported to have participated in the CDC's Epidemic Information Exchange (Epi-X) communication system in year two than in year one (Question 32), even though participation was actively promoted by KDHE after the first survey. In addition, fewer counties reported having formally assessed their epidemiologic capacity in year two than in year one (Question 25). It is unclear whether these findings are accurate, for example, technical challenges could have discouraged some LHD staff from maintaining their participation in the Epi-X system, or non-response could have represented a lack of understanding of the questions.

**Figure 5. State Level of Achievement for Focus Area B
Surveillance and Epidemiologic Capacity Questions
Kansas (2002 and 2003)**



Key Findings for Focus Area C

Achievements

- The preparedness index improved by 10.4 percent (from 18.7 percent to 20.6 percent) between 2002 and 2003.
- Most question scores slightly improved.

Gaps

- This focus area has the lowest index and the smallest improvement.
- No individual question was achieved by the majority of LHDs.
- LHDs experience overall difficulty in this area.

Focus Area C: Laboratory Capacity-Biological Agents

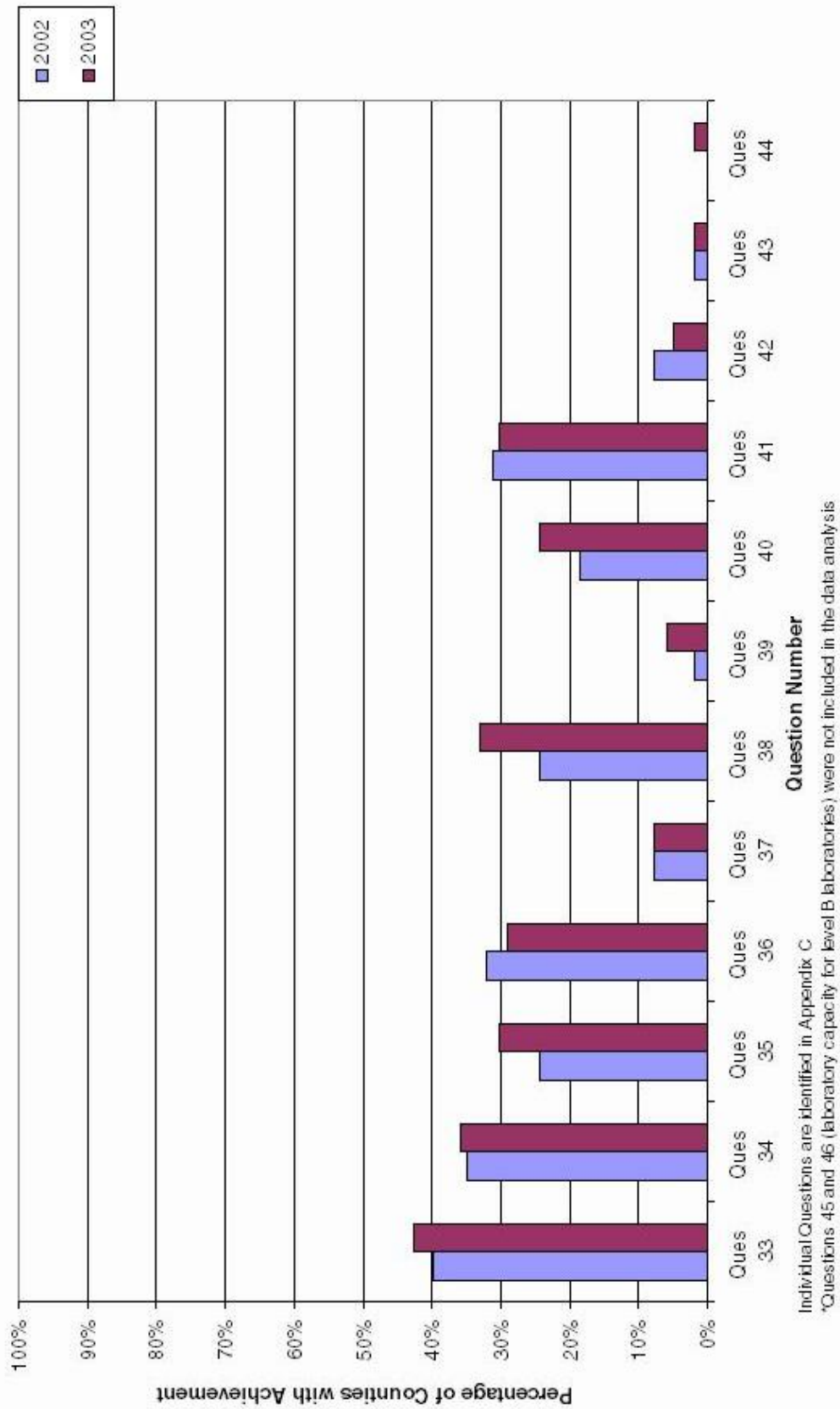
Focus Area C includes 12 questions from the PHPPO assessment tool, grouped in one critical capacity (critical capacity C-A).¹⁰ The preparedness index for Focus Area C increased from 18.7 percent in year one to 20.6 percent in year two, a 10.4 percent improvement. This is the lowest index score for any focus area and any national critical capacity and also the smallest improvement for any focus area index observed between the two surveys. These relatively low indexes may reflect the difficulty to generate heavy investments necessary to improve local laboratory capacity within a relatively short period of time. The low indexes may also be the result of the questions included in the PHPPO tool that measure the capacity for Focus Area C. These questions tend to be less applicable to Kansas LHDs than questions asked for other critical capacities, because in some cases they address functions that in Kansas are centralized in the state laboratory.

Most question scores showed an improvement between the two surveys, but three of them were lower in 2003 than in 2002 (Figure 6). There seems to be an overall difficulty in achieving the preparedness goals for this focus area, as none of the questions related to this capacity (even those that can be considered relatively basic) were successfully addressed by a majority of health

¹⁰ Another Focus Area C critical capacity (C-B) applies only to level B and C laboratories, which in Kansas are not part of local health departments, and its questions were not included in this analysis.

departments. Only 44 health departments have good contact information on their level A laboratories (Question 33), only 31 can assure 24/7 laboratory support (Question 35), and only 30 report that they have access to testing facilities for category A bioterrorism agents (Question 36).

**Figure 6. State Level of Achievement for Focus Area C
Laboratory Capacity/Biologic Agents Questions*
Kansas (2002 and 2003)**



Key Findings for Focus Area E

Achievements

- The preparedness index improved by 25.7 percent (from 42.0 percent to 52.8 percent) between 2002 and 2003.
- 94 LHDs are connected to the state system via secure electronic link.
- Most LHDs have public alert systems in place.

Gaps

- Procuring local technical support is problematic.
- Few LHDs have a public Web site.
- Electronic data exchange is limited.

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

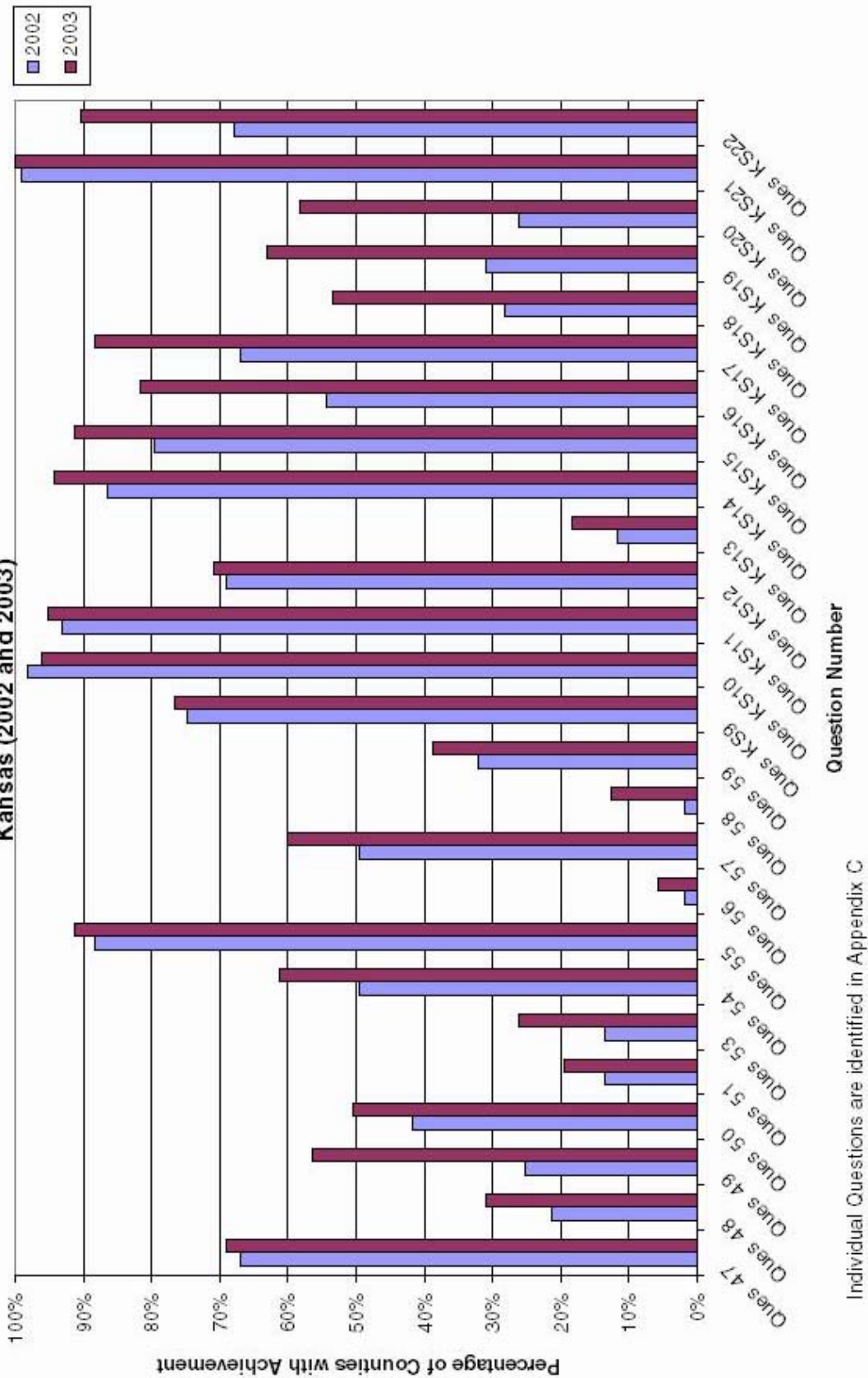
Focus Area E includes 12 questions from the PHPPO assessment tool (grouped in three critical capacities)¹¹ and 14 Kansas-specific questions, some of which address basic features, such as having surge protectors and anti-virus software available. The preparedness index for Focus Area E moved from 42.0 percent in year one to 52.8 percent in year two, a 25.7 percent improvement. Considerable progress appears to have been made in the areas of connectivity and infrastructure, a likely reflection of substantial investments made in this area at the state and local levels (Figure 7). Ninety-four health departments reported that they are connected to the state public health agency via a secure electronic link (Question 55), and 71 indicated that they have public health alert systems in place (Question 47).

Most health departments have difficulty in assuring adequate technical support for their information technology systems (Question 51). This may help explain why relatively few respondents report having a public Web site (Question 58). Most health departments have not established electronic links to local data sources (Questions 53 and 56), although most of them have identified key partners for their agency (Question 54). Electronic data exchange in Kansas

¹¹ Critical Capacity E-C and E-D were combined in the PHPPO assessment tool into one group.

has been considered to be a state agency function, which may explain why few health departments report independent progress in this area.

Figure 7. State Level of Achievement for Focus Area E
Health Alert Network/Communications and Information Technology Questions
Kansas (2002 and 2003)



Key Findings for Focus Area F

Achievements

- The preparedness index improved by 22.6 percent (from 23.6 percent to 28.9 percent) between 2002 and 2003.
- Most LHDs have a directory of media contacts.

Gaps

- Scarce topic-specific material has been prepared in anticipation of emergency events.
- There is limited communication with special populations, such as translation of documents.

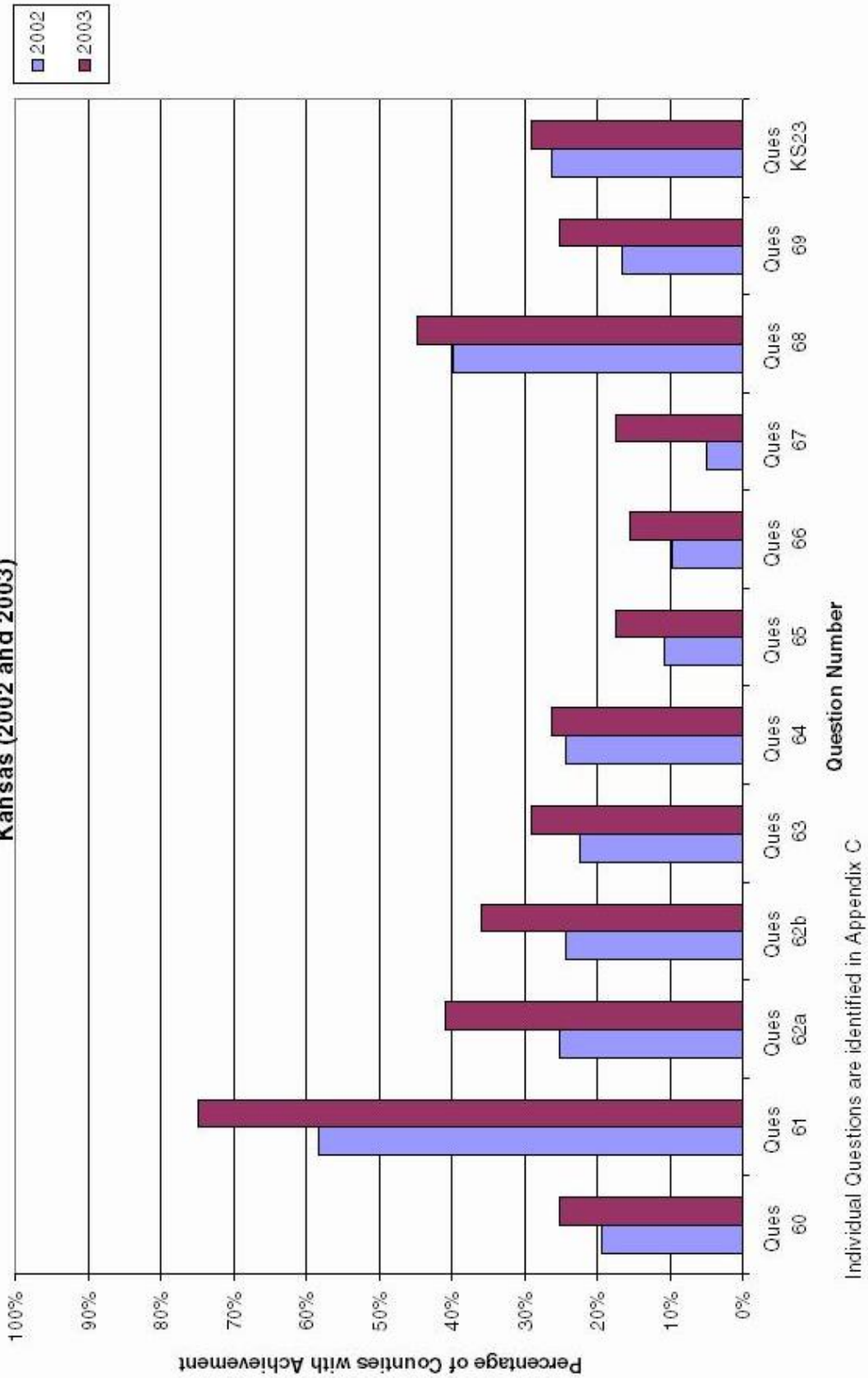
Focus Area F: Risk Communication and Health Information Dissemination

Eleven questions from the PHPPO assessment tool (grouped in one critical capacity) and one Kansas-specific question were included in this focus area. The preparedness index for this area moved from 23.6 percent in year one to 28.9 percent in year two, a 22.6 percent improvement. Between 2002 and 2003, levels of achievement improved for all questions related to the critical capacities in this focus area (Figure 8). Despite a substantial improvement from the first to the second survey, LHDs appear to struggle to fulfill some of the activities for this focus area. Many health departments have implemented only limited activities to be prepared for public information campaigns that they may need to run during a public health crisis. Most emergency response and crisis communication plans lack some essential components (Question 60), and needs assessments are incomplete (Question 63). Most health departments report that they have a directory for local media contacts (Question 61), although only 46 health departments reported in 2003 that they had a policy to routinely send all media calls to their public information officers (Question 68).¹² Local agencies have difficulty in obtaining access to skilled professionals to assist them in public information and risk communication tasks (Question 65) and have prepared little topic-specific material to be used during a crisis (Question 66). Finally, limited attention

¹² It is unclear from the survey how many health departments, in fact, have a designated public information officer, since that question was never directly asked.

has been devoted to communication issues related to minorities and special populations (Question 67 and KS-23), with only 30 LHDs reporting that they have informational materials translated into two or more foreign languages.

**Figure 8. State Level of Achievement for Focus Area F
Risk Communication and Health Information Dissemination Questions
Kansas (2002 and 2003)**



Key Findings for Focus Area G

Achievements

- The preparedness index improved by 48.3 percent (from 28.7 percent to 42.6 percent) between 2002 and 2003 (the largest focus area increase).
- Most LHDs report educational and training activities for health care professionals.
- Distance learning capabilities more than doubled.

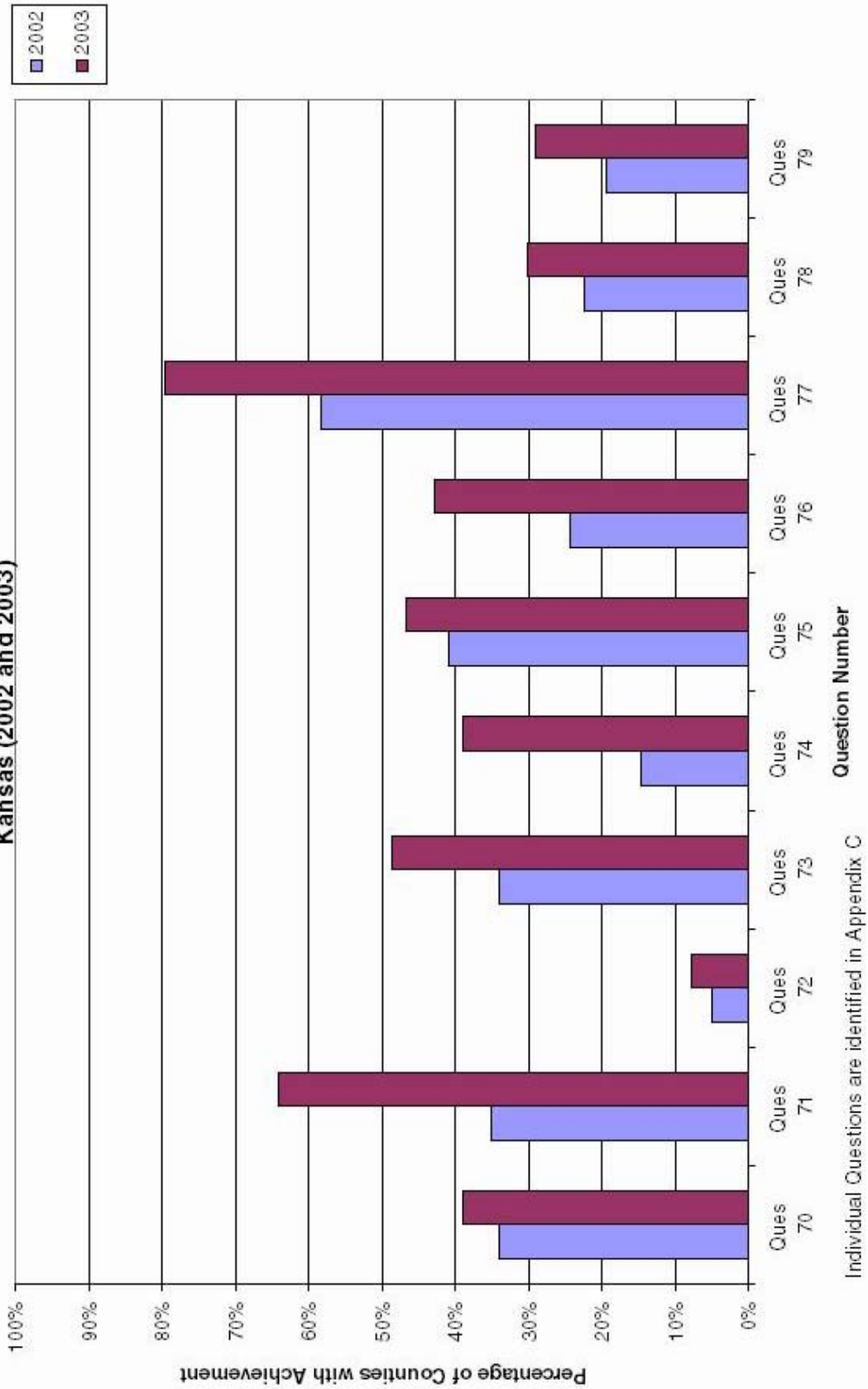
Gaps

- Few LHDs report educational and training activities targeting their own staff.
- Job descriptions and training needs assessments are incomplete.
- Access to satellite download facilities is rare.

Focus Area G: Education and Training

The preparedness index for the one critical capacity in Focus Area G (which includes 10 questions from the PHPPO tool) moved from 28.7 percent in year one to 42.6 percent in year two, a 48.3 percent improvement (Figure 9). This is the largest change in a focus area preparedness index observed between the two surveys. Local health departments appear to have accomplished more objectives in educational and training activities for health professionals (Question 71) than in those aimed at their own employees. Less than a third of the health departments report having job descriptions that define staff skills necessary for emergency roles and responsibilities (Question 79), and few conduct internal training needs assessments (Question 70). The use of distance learning technologies more than doubled between the two surveys (Question 74), although the majority of health departments reported in year two that they did not have access to satellite downlink capabilities (Question 75). Finally, very few health departments implemented formal education and training agreements for partnerships with outside agencies (Question 72), an activity that is particularly challenging in rural areas.

**Figure 9. State Level of Achievement for Focus Area G
Education and Training Questions
Kansas (2002 and 2003)**



Key Findings for Kansas-Specific Competencies

Achievements

- The preparedness index improved by 34.8 percent (from 39.2 percent to 52.9 percent) between 2002 and 2003.
- Most LHDs have developed relationships with other counties for emergency response.

Gaps

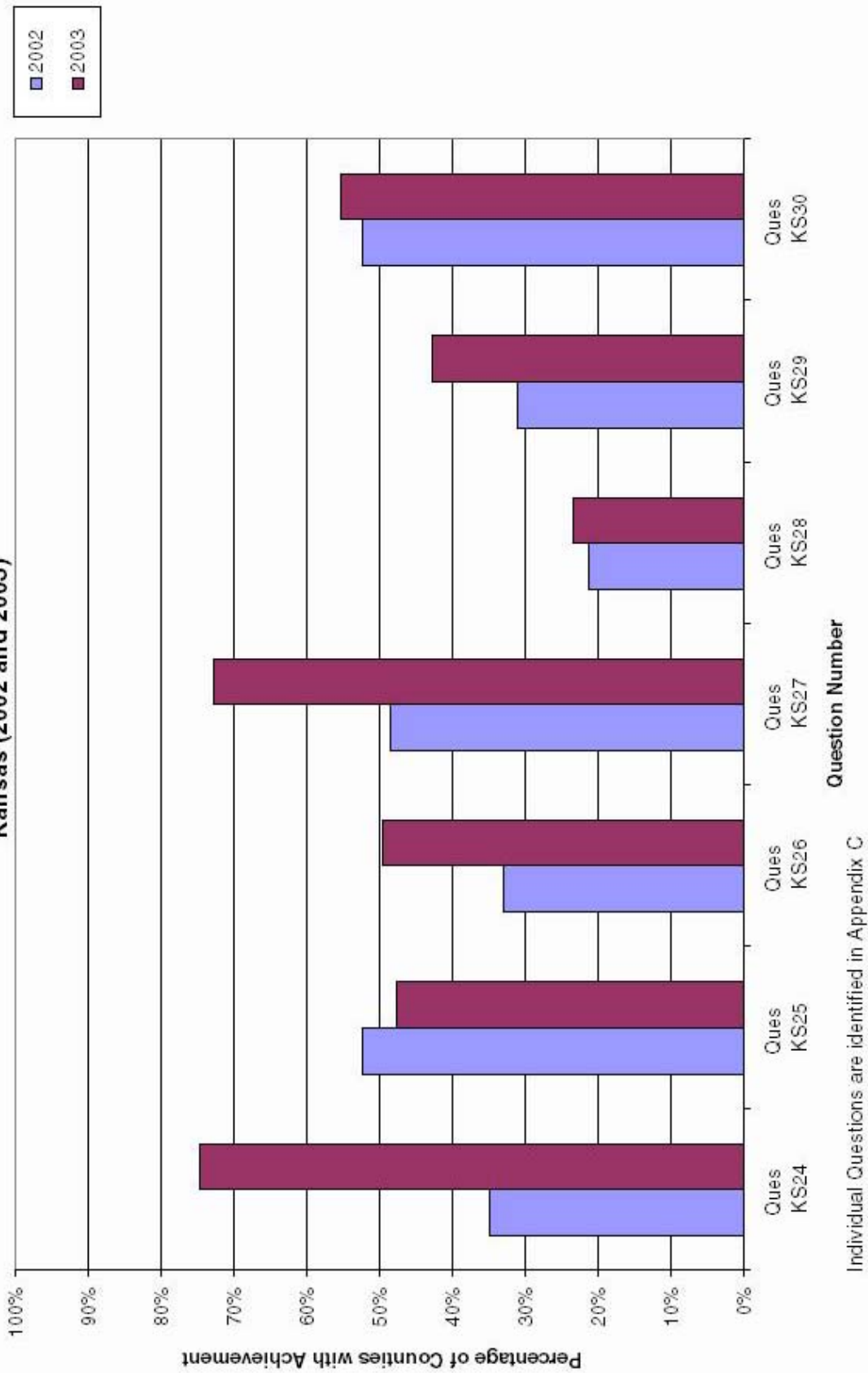
- Few LHDs have alternative plans for communication with area hospitals.
- Few LHDs have plans to receive morbidity and mortality data from hospitals.

Kansas-Specific Competencies

Seven Kansas-specific questions not linked to any of the existing focus areas were included in the surveys. These questions were grouped in two groups (the equivalent of critical capacities in other focus areas), referred to in this document as Kansas-specific competencies I and II.

These competencies relate primarily to the integration of bioterrorism plans with other emergency response and hospital plans, both within the county and in surrounding jurisdictions. Substantial progress was reported in these areas, and the preparedness index for these combined competencies moved from 39.2 percent in year one to 52.9 percent in year two, an improvement of 34.8 percent (Figure 10). Seventy-seven LHDs reported that they are developing relationships for emergency responses with other counties (Question KS-24), and 75 have agreements with a local hospital to receive information during a public health emergency (Question KS-27). Only slightly more than 20 percent of health departments reported that they have an alternative communication plan if the hospital's communication system fails (Question KS-28), and few have plans to receive morbidity and mortality data from their area hospitals (Question KS-29).

**Figure 10. State Level of Achievement for KS-Specific Competencies
Kansas (2002 and 2003)**



Key Findings by Population Density

- Low population density is associated with preparedness indexes that are lower than the state average.
- Considerable variability of preparedness index exists throughout the state (highest county index in the state was 4.4 times higher than lowest county index).
- Indexes improved in all population density groups, but less so in frontier and rural counties.

RESULTS BY POPULATION DENSITY

When the information submitted by LHDs was analyzed by population density peer groups, there was a clear association between population density and preparedness indexes, with more densely populated counties showing better indexes than sparsely populated ones. In both 2002 and 2003, the average county overall preparedness index was progressively higher for each more densely populated group (Table 4). Counties in the densely settled rural, semi-urban, or urban groups (which include 36 counties and 86.1 percent of the state population) had, on average, a preparedness index higher than the state index. The difference between the average index in a group and the state index is measured in Table 4 by the ratio between these two indexes. The average county overall preparedness index for urban counties in 2003 was 46 percent higher than the same average for frontier counties, and 29 percent higher than the state index. Of the 47 counties with a preparedness index in 2003 greater than the state index, 22 (47 percent) were in the urban, semi-urban, or densely settled rural groups, despite the fact that counties in these groups represent only 34 percent of the total number of counties in the state.

Table 4. Average County Overall Preparedness Index by Population Density Peer Groups (2003)

	Frontier	Rural	Densely settled rural	Semi-urban	Urban	Kansas
County overall preparedness index – average	38.1 %	41.3 %	47.7 %	52.0 %	55.8 %	43.3 %
County overall preparedness index – range	18.9 % to 67.1 %	17.3 % to 60.9 %	32.9 % to 67.2 %	35.3 % to 73.3 %	35.7 % to 75.5 %	17.3 % to 75.5 %
Ratio highest index : lowest index in group	3.6	3.5	2.0	2.1	2.1	4.4
Ratio between average county overall index for group and state index*	0.88	0.95	1.10	1.20	1.29	1.0 (reference)

*A number greater than 1 indicates an average index for the group greater than the state index.

Within each population density group, there was considerable variability in the county overall preparedness index, as indicated by the range of indexes and the ratio between the highest and the lowest county index observed within each group (Table 4). Variability was more pronounced among counties with lower population density. For frontier counties, the county with the highest preparedness index had an index 3.6 times greater than the county with the lowest index, while among urban counties that ratio was reduced to 2.1. At the state level, the county with the highest overall preparedness index (an urban county) had an index 4.4 times higher than the county with the lowest index (a rural county), an indication of the high level of preparedness variability in the state.

A similar trend of increasing preparedness indexes with increasing population density was observed for focus area-specific preparedness indexes (Table 5). With few exceptions, focus area indexes tend to be higher (and in some cases substantially higher) in more densely populated than in less densely populated counties, and state rates tend to be higher than rates in frontier and rural groups, but lower than rates in more densely populated counties.

Table 5. Average Focus Area Preparedness Indexes by Population Density Group (2003)

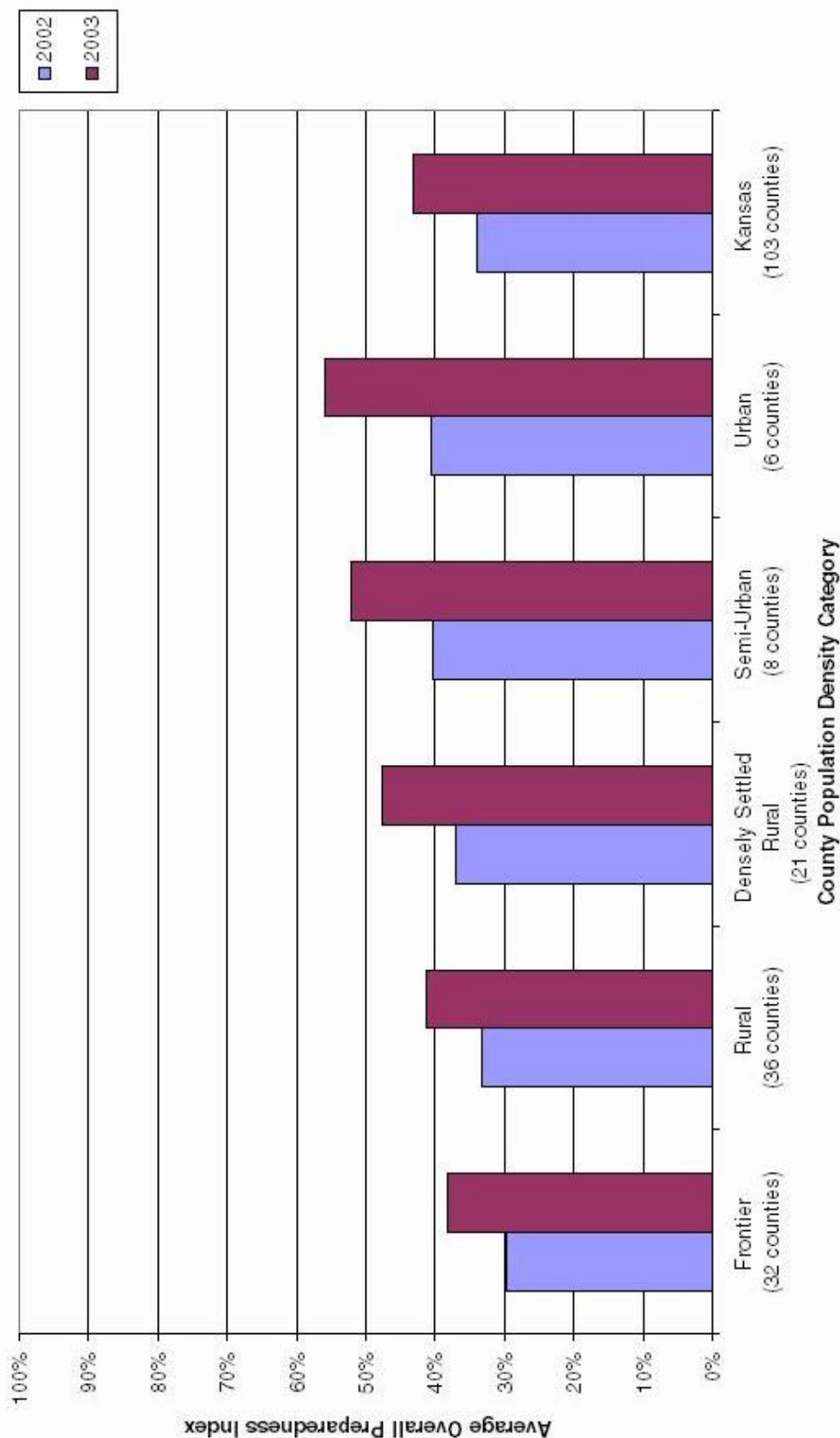
Focus area	Frontier	Rural	Densely settled rural	Semi-urban	Urban	Kansas
Focus Area A	51.9 %	55.0 %	62.7 %	60.4 %	73.6 %	57.1 %
Focus Area B	40.1 %	45.2 %	54.1 %	61.5 %	60.6 %	47.9 %
Focus Area C	13.0 %	20.4 %	23.4 %	36.5 %	31.9 %	20.6 %
Focus Area E	45.8 %	52.1 %	59.5 %	63.7 %	57.4 %	52.8 %
Focus Area F	25.9 %	25.8 %	32.0 %	34.7 %	46.2 %	28.9 %
Focus Area G	36.9 %	40.8 %	45.7 %	53.8 %	58.3 %	42.6 %
Kansas-Specific areas	52.5 %	49.7 %	56.2 %	53.6 %	62.5 %	52.9 %

Average overall county preparedness index and average focus area-specific indexes improved in all peer groups between the 2002 and the 2003 survey (Table 6 and Figures 11 through 18). The only exception was the index for Focus Area C, which remained unchanged for frontier counties (but improved for all other groups). The improvement observed between the two surveys was not always of the same magnitude across the different groups. Urban and semi-urban groups experienced on average slightly greater proportional changes than frontier and rural groups, indicating that the gap between these peer groups is not closing and may in fact be widening.

Table 6. Change in Average County Overall Preparedness Index between 2002 and 2003 by Population Density Group

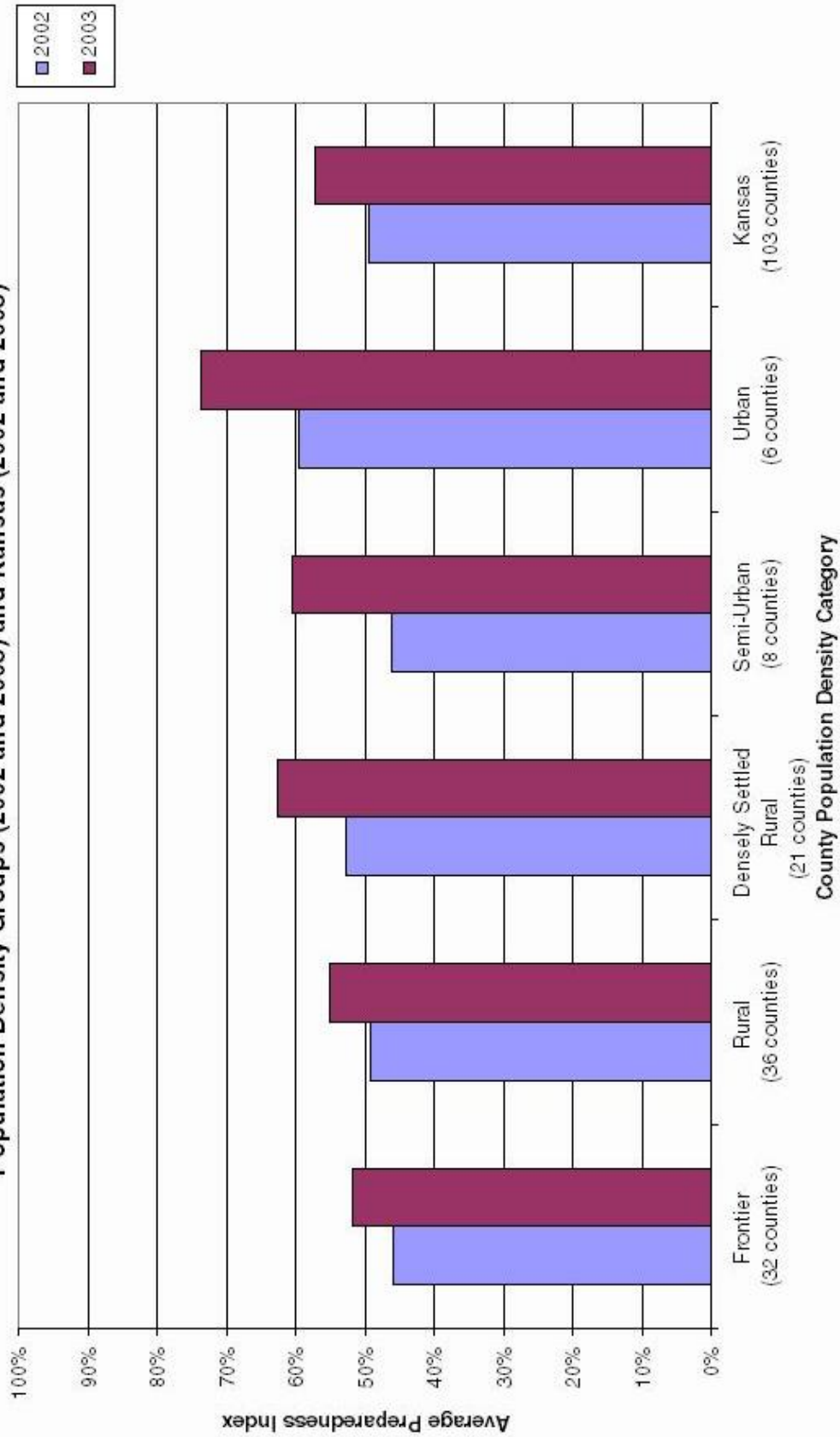
Population density group	2002	2003	Percent increase
Frontier	29.8%	38.1%	28.1%
Rural	33.2%	41.3%	24.4%
Densely settled rural	37.1%	47.7%	28.3%
Semi-urban	40.3%	52.0%	29.2%
Urban	40.5%	55.8%	38.0%
Kansas overall	33.9%	43.3%	27.7%

**Figure 11. Average County Overall Preparedness Index for
Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)**



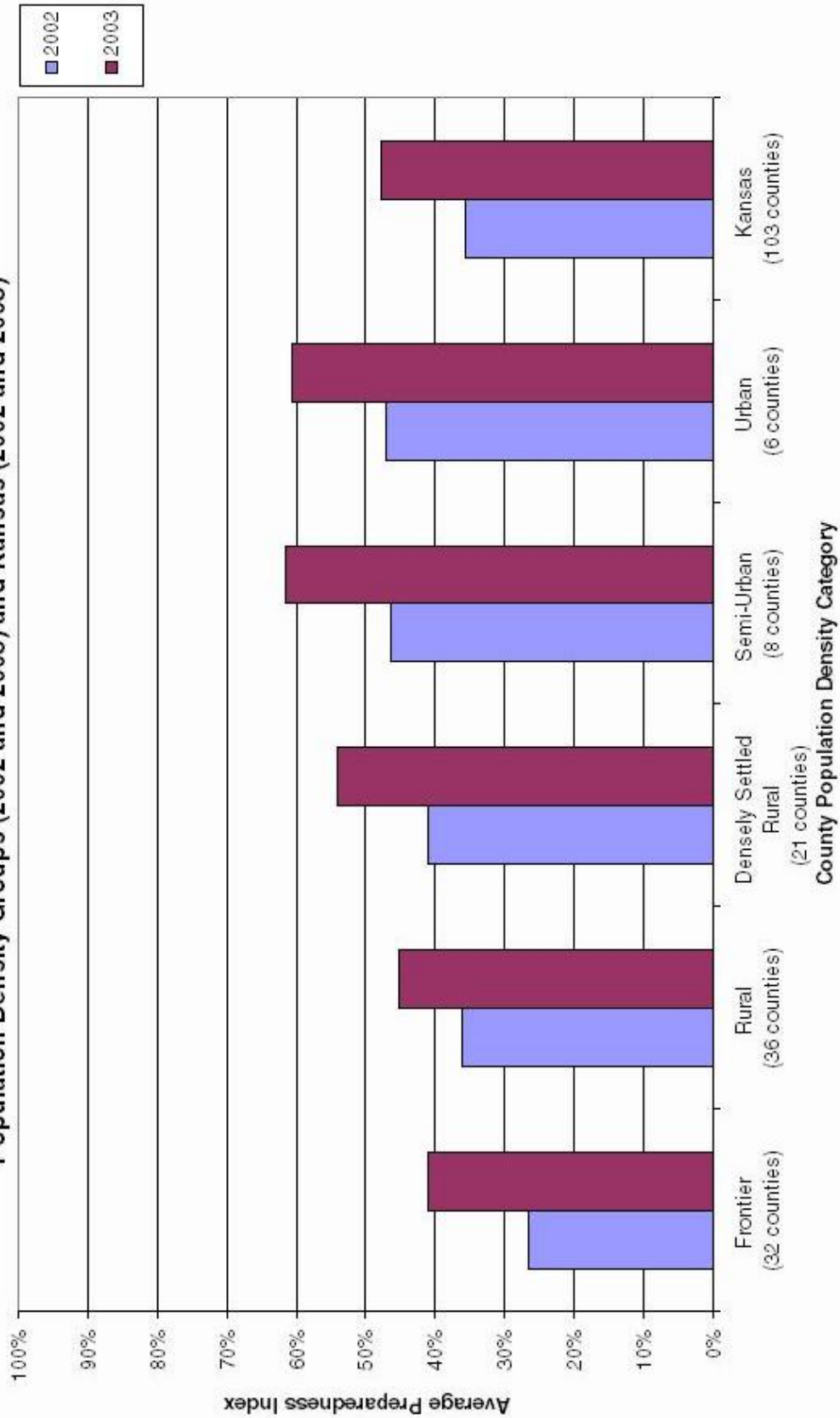
Population Density is described on Map B-1, Appendix B

**Figure 12. Average County Preparedness Index for Focus Area A
(Preparedness Planning and Readiness Assessment) for
Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)**



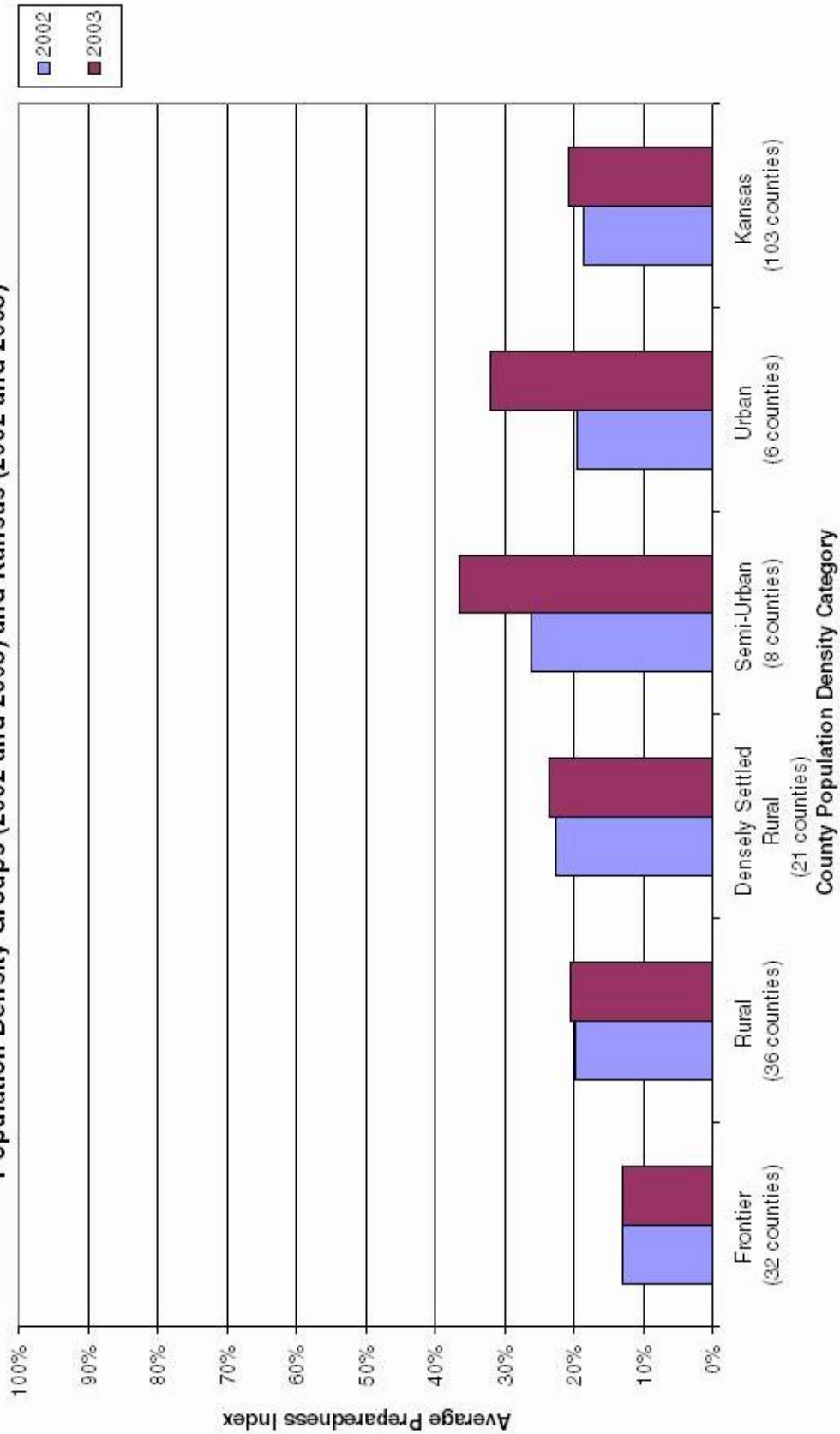
Population Density is described on Map B-1, Appendix B

**Figure 13. Average County Preparedness Index for Focus Area B
(Surveillance and Epidemiologic Capacity) for
Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)**



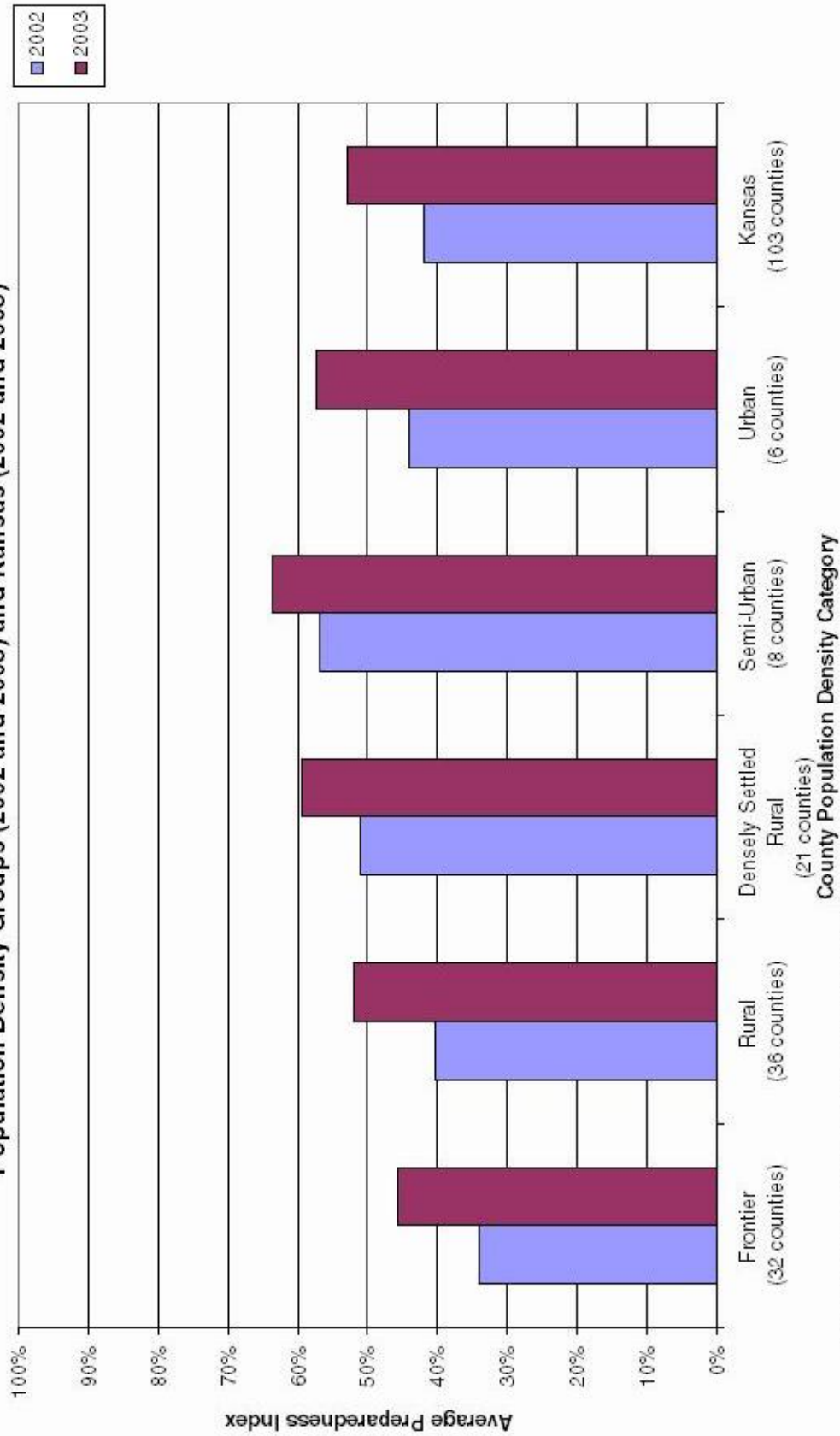
Population Density is described on Map B-1, Appendix B

**Figure 14. Average County Preparedness Index for Focus Area C
(Laboratory Capacity-Biologic Agents) for
Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)**



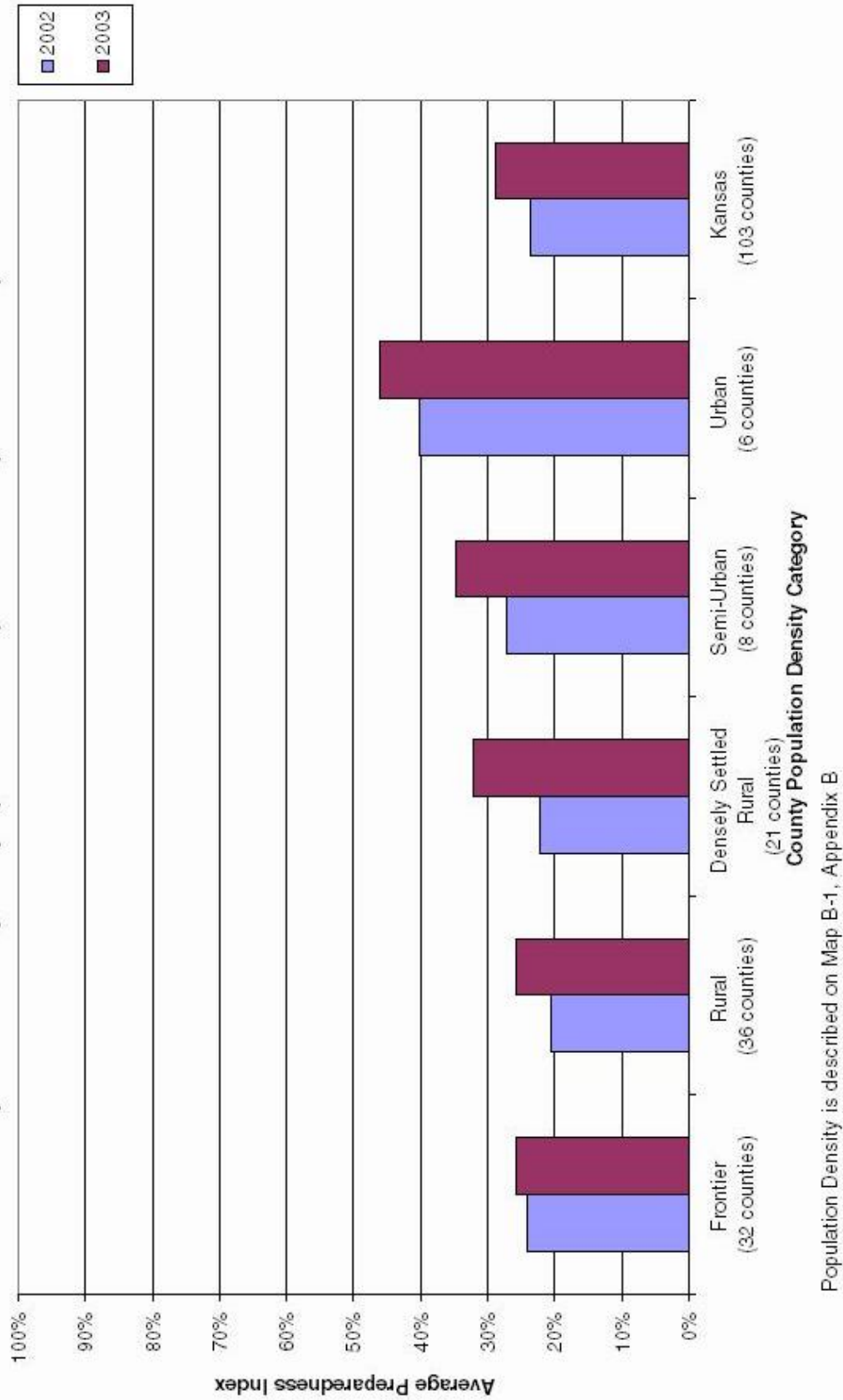
Population Density is described on Map B-1, Appendix B

**Figure 15. Average County Preparedness Index for Focus Area E
(Health Alert Network/Communications and Information Technology) for
Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)**

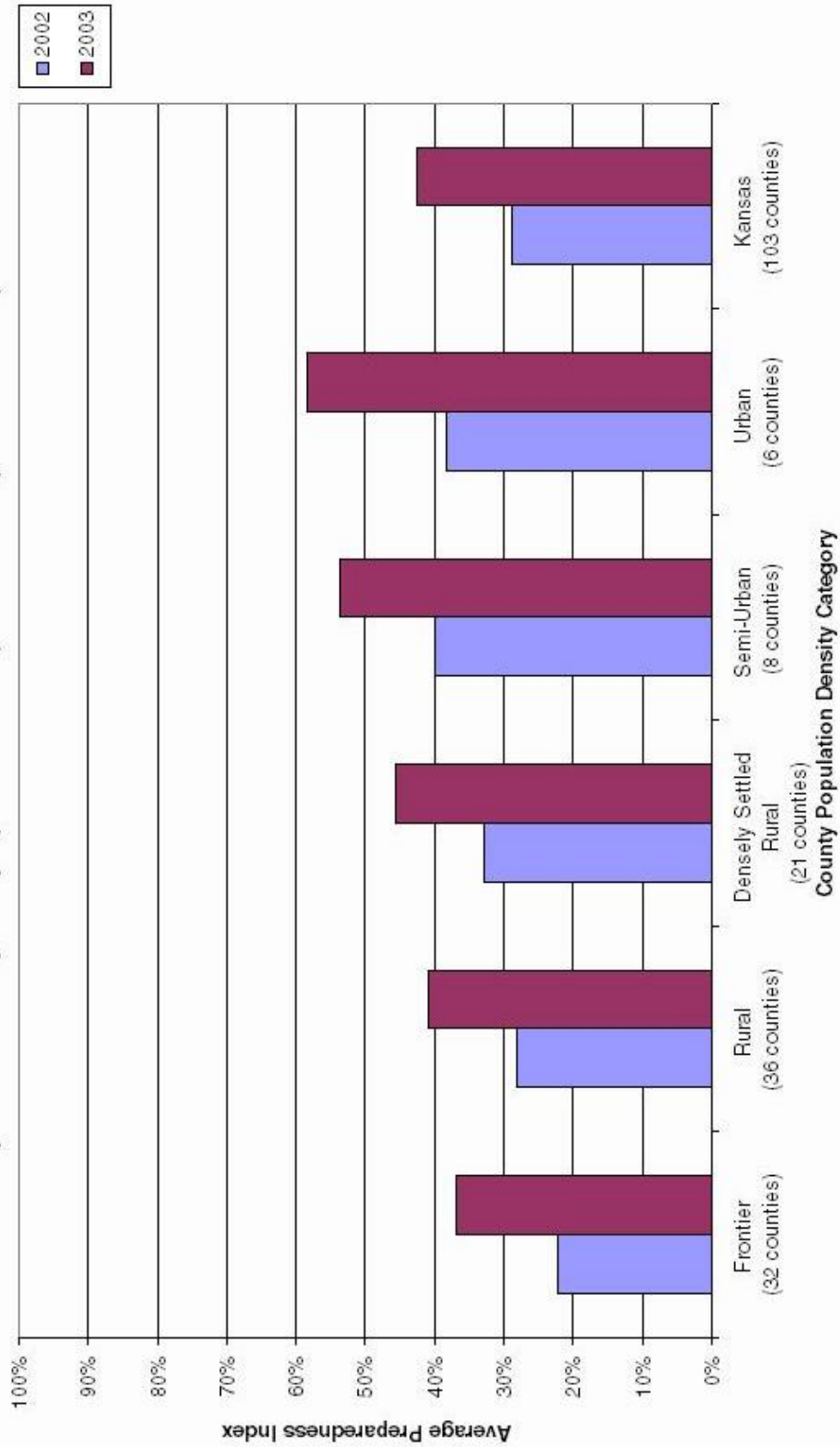


Population Density is described on Map B-1, Appendix B

**Figure 16. Average County Preparedness Index for Focus Area F
(Risk Communication and Health Information Dissemination) for
Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)**

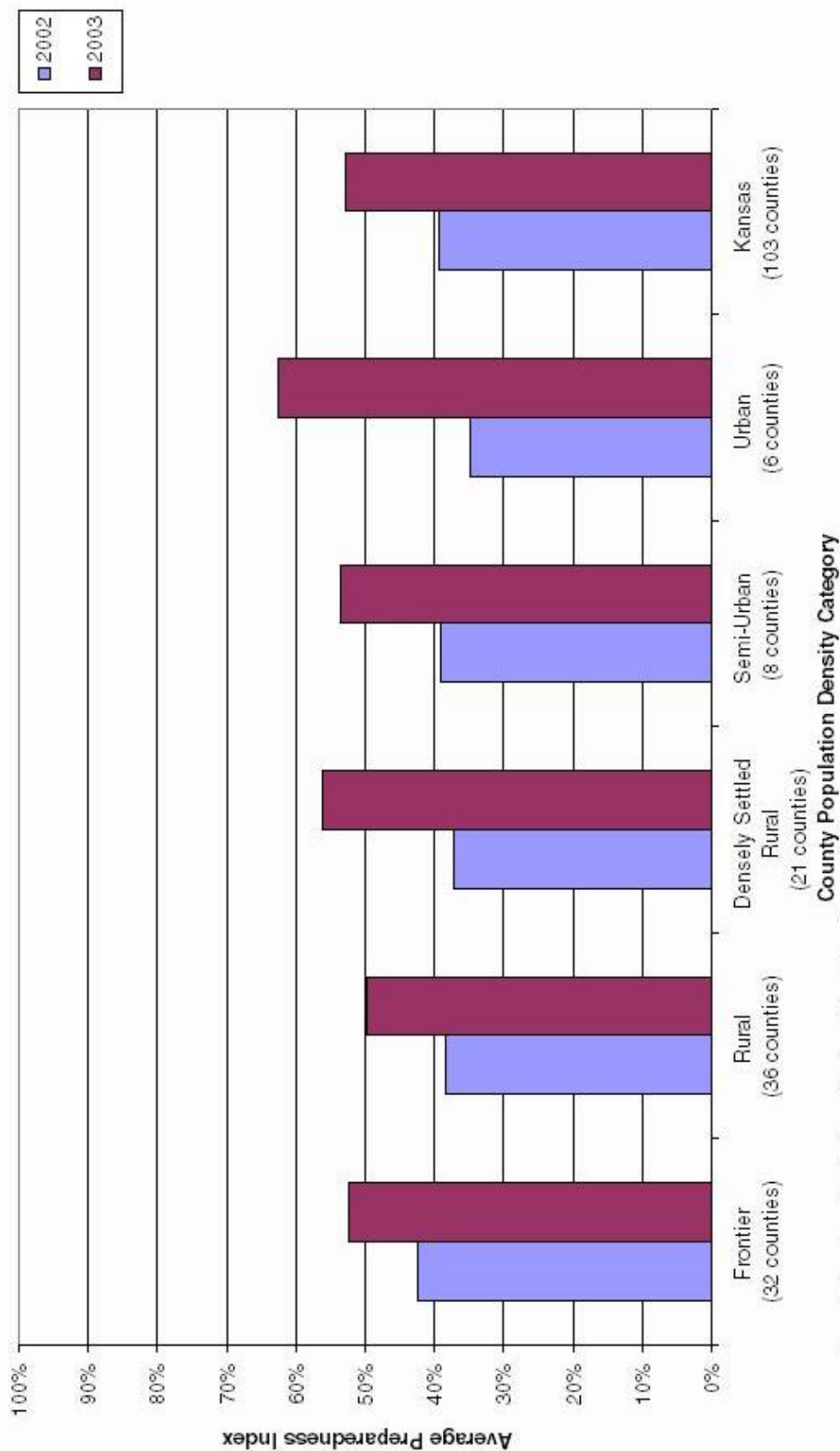


**Figure 17. Average County Preparedness Index for Focus Area G
(Education and Training) for
Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)**



Population Density is described on Map B-1, Appendix B

Figure 18. Average County Preparedness Index for KS-Specific Competencies for Population Density Groups (2002 and 2003) and Kansas (2002 and 2003)



Population Density is described on Map B-1, Appendix B

Key Findings for LHD Regions

- All regions improved their index between 2002 and 2003.
- Progress was greater in regions with a low index in 2002, suggesting that regional gaps may be narrowing.
- The ratio between the highest and the lowest regional index in 2003 was only 1.5, about one third of the ratio between the highest and the lowest *county* index.
- Regions with low population density had an index lower than the state index.
- Every region had at least one county with an index higher than the state average.
- Nine (60 percent) of the 15 regions had an average index higher than the state index.
- Twenty-one (37.5 percent) of the 56 counties with a county index lower than the state index participated in a region that had an average index higher than the state index.

RESULTS BY LHD REGION

As explained in the methods section, the information on preparedness provided by each county was analyzed by LHD region using two different approaches. The first method measured regional indexes as the *average* of the correspondent indexes of the counties included in each LHD region. For the second method, the *highest* county index in each LHD region was applied to the entire region. The results of these two methods are presented and compared in this section. Only overall preparedness indexes for the regions (based on the county overall preparedness indexes) are discussed in this report.¹³

¹³ For confidentiality purposes, LHD regions are not identified in this report.

Method I. Regional Index = Average County Index

Using the average index method, all LHD regions in the state showed a change between the 2002 and the 2003 survey, and the change was greater in regions that had a low preparedness index in 2002. As a result, the ratio between the highest and the lowest regional index dropped from 1.8 in year one to 1.5 in year two. These numbers are considerably lower (about one third) than similar ratios measured at the county level (already reported in Table 6). The decrease observed between the two surveys could be an indication that unlike county gaps, regional gaps may be narrowing over time.

In 2003, nine (60 percent) of the 15 LHD regions reached an average overall preparedness index greater than the state index (Table 7 and Figure 19). Regional index levels and regional population density were associated with each other. Neither of the two frontier LHD regions was able to bring its index above the state average, while all four semi-urban and urban regions were able to do so. This shows that just like individual counties, LHD regions with a low population density may face difficulties in reaching preparedness objectives.

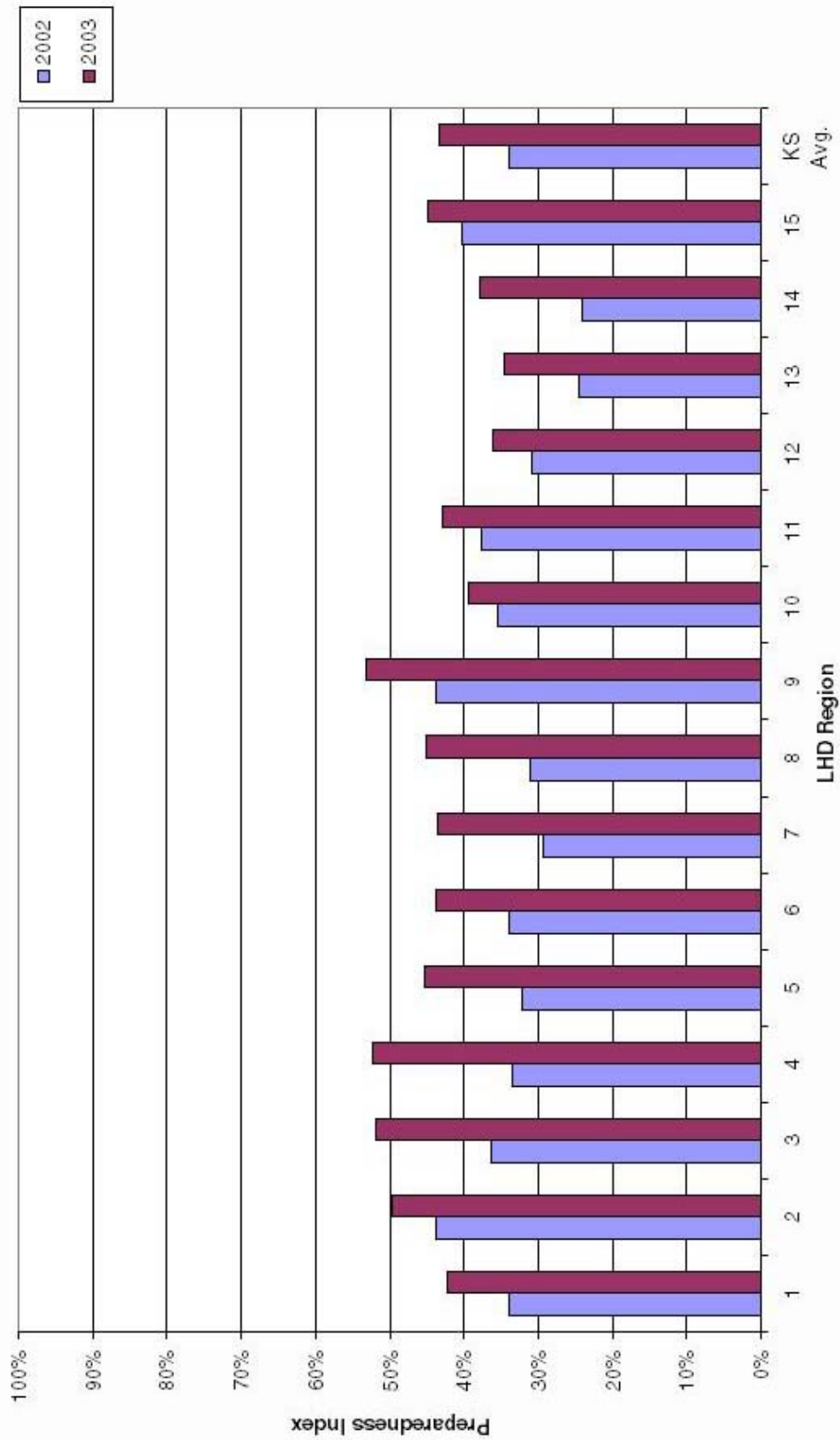
Table 7. LHD Regions with Average Overall Preparedness Index Greater than the State Index, by Region's Population Density Group

Population density group*	Number of regions in group	Regions with average index > state
Frontier	2	0 (0%)
Rural	7	4 (57%)
Densely settled rural	2	1 (50%)
Semi-urban	3	3 (100%)
Urban	1	1 (100%)
TOTAL	15	9 (60%)

* For details on the population density classification, see Appendix A.

Average regional preparedness indexes were not associated with the number of counties included in a LHD region, and high indexes were observed both in regions with few and in regions with many participating counties. When looking at the population size of the LHD regions, rather than the population density, there was no consistent association between resident population and average regional preparedness index, and some LHD regions with relatively high

**Figure 19. Average Overall Preparedness Index for LHD Regions
Kansas (2002 and 2003)**



For confidentiality purposes, LHD Regions are not identified in this report

population numbers had an average preparedness index lower than the state overall index. However, of the four LHD regions (two frontier and two rural) with a combined population of less than 50,000 people in each region, three had an average index lower than the state overall index, and the fourth had an index almost identical to the state average.¹⁴ This finding coincides with a belief among some public health officials that it is difficult for jurisdictions with a population less than 50,000 to effectively assure the delivery of essential public health services.

In order to assess the regionalization effort across the state, we estimated the proportion of the state population that lives in areas with a preparedness index higher than the state overall index with and without accounting for the existence of the regions (Table 8). An examination of only the county-level indexes shows that 2,089,479 people live in 47 counties with a county overall preparedness index higher than the state index. Using the average preparedness index for each region as a measure, we found that 2,249,760 people live in the 57 counties included in regions with an average index higher than the state index, which represents 10 more counties and over 160,000 more people than what was found using only the county indexes. Of these 57 counties, 21 (37 percent) had their own county overall preparedness index lower than the state index, but were able to exceed the state index as members of a LHD region with an average index greater than the state index.

Table 8. Population Residing in Areas with Overall Preparedness Index Greater than the State Index

County index > state index*		Region average index > state index**	
Number of counties	Population	Number of participating counties	Population
47	2,089,479	57	2,249,760

*Out of 103 counties totaling 2,703,820 population (2003 Estimated)

**Out of 104 counties totaling 2,696,295 population (2003 Estimated)

In summary, when using the average county index method to measure regional preparedness, the creation of LHD regions increases the number of counties and people who live in areas of the

¹⁴ Given the relatively small number of counties with a population greater than 50,000, a similar analysis could not be conducted at the county level.

state with a better-than-average preparedness index. This illustrates the potential beneficial effect of resource sharing for counties with a preparedness index lower than the average.

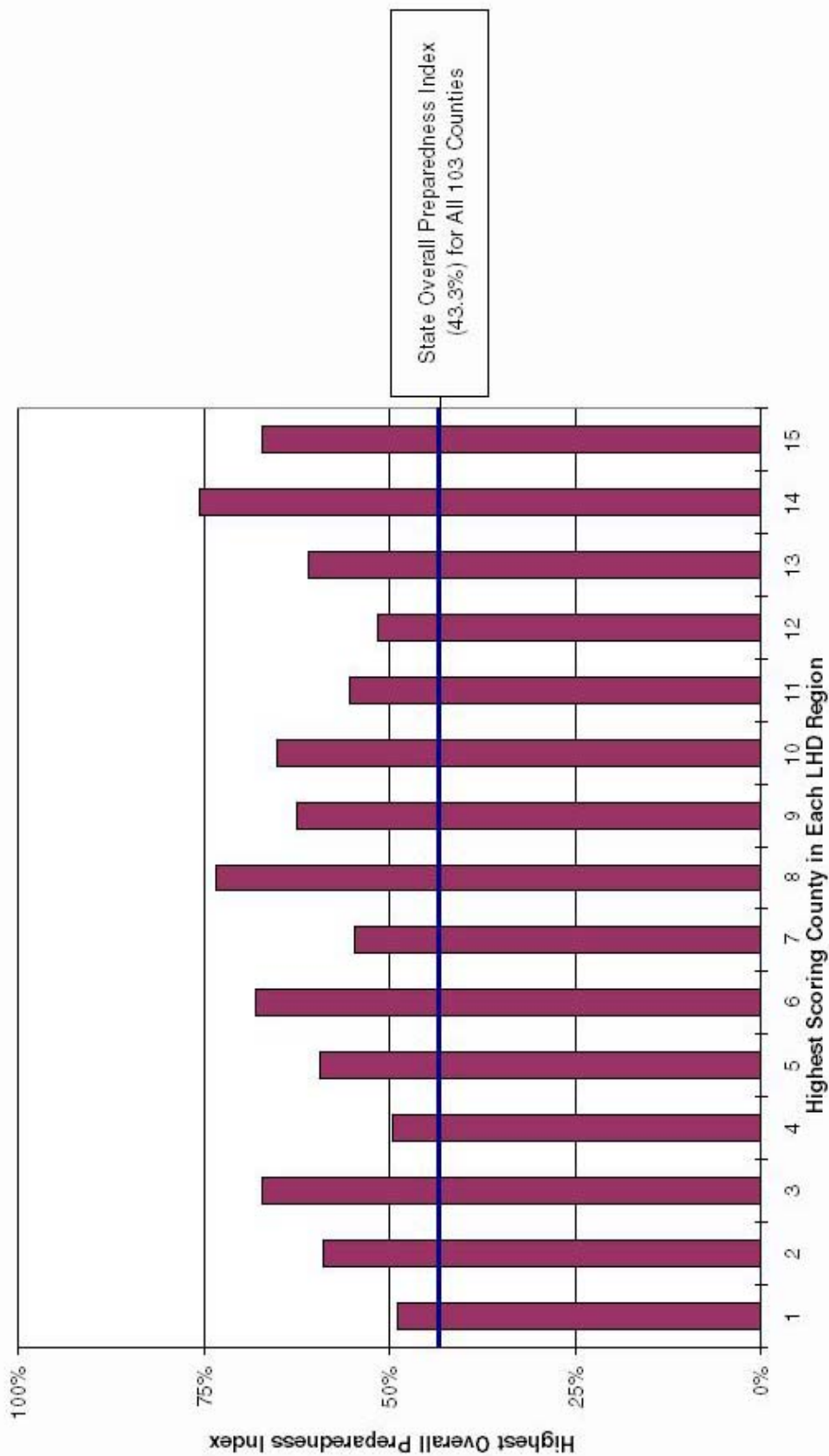
Method 2. Regional Index = Highest County Index

The second method used to measure regional capacity assumes that the preparedness index of a LHD region is equivalent to the *highest* overall county index in that region. Using this method, in all the LHD regions the highest county index (and thereby the regional index) was higher than the state overall index (Figure 20). Although frontier LHD regions had indexes somewhat lower than semi-urban and urban regions, in some rural regions, the highest county index was higher than in some urban and semi-urban regions.

In an attempt to explain why a county had reached an index higher than that of its regional partners, we looked at some characteristics of the 15 counties with the highest preparedness indexes in their respective LHD regions, but we were unable to find any consistent pattern. In particular, county population density did not appear to be a factor in making these counties successful, with nine of the 15 counties being either frontier or rural counties. Nor did population size relate to higher preparedness index scores, with some of the least populated counties in the state being the leaders in their respective LHD regions. Other factors, such as leadership, ability to recruit and retain skilled staff and interaction with local partners may influence the presence of relatively high preparedness index scores that were not captured on the survey instrument.

In summary, every LHD region, regardless of its overall population density, includes at least one county that was able to achieve a preparedness index higher than the state overall index. Some counties in less densely populated LHD regions obtained indexes better than those in more populated regions, and some less populated counties were able to exceed the index of all other counties in their regions.

**Figure 20. Highest County Overall Preparedness Index for LHD Region
Kansas (2003)**



Key Finding for Linkage to Essential Service Indicators

- Achievement indexes for essential service indicators closely mirror preparedness indexes for similar bioterrorism critical capacities.

LINKAGE TO ESSENTIAL SERVICES AND INDICATORS

The results of the linkage between questions from the PHPPO survey and performance standard indicators show trends similar to those observed when the questions are analyzed by critical capacity and focus area (Table 9). Achievement indexes for standard indicators in the state improved between the 2002 and the 2003 survey. The areas that showed particularly positive results were some of the planning and local networking activities. Laboratory support and some health education activities had lower achievement indexes, which in the case of the laboratory indicators improved only slightly between the two surveys.

Table 9. Achievement Index for Selected Performance Standard Indicators, Kansas (2002 and 2003)

Essential Service Indicators Results	# of Questions	2002 Index	2003 Index	% Change (+)
1- Monitor Health Status to Identify Community Health Problems				
1.1 Population-based Community Health Profile	2	30.6%	36.9%	20.6%
1.2 Access to and Utilization of Current Technology to Manage, Display, Analyze and Communicate Population Health Data	5	14.4%	19.8%	37.8%
1.3 Maintenance of Population Health Registries	1	22.3%	25.2%	13.0%
2- Diagnose and Investigate Health Problems and Health Hazards in the Community				
2.1 Identification and Surveillance of Health Threats	18	27.7%	37.0%	33.3%
2.2 Plan for Public Health Emergencies	15	46.4%	57.0%	22.9%
2.3 Investigate and Respond to Public Health Emergencies	6	43.2%	55.7%	28.8%
2.4 Laboratory Support for Investigation of Health Threats	12	16.0%	17.8%	11.1%
3- Inform, Educate, and Empower People about Health Issues				
3.1 Health Education	4	10.4%	18.4%	76.7%
3.2 Health Promotion Activities to Facilitate Healthy Living in Healthy Communities	0	-	-	-
4- Mobilize Community Partnerships to Identify and Solve Health Problems				
4.1 Constituency Development	6	56.8%	66.7%	17.4%
4.2 Community Partnerships	7	46.0%	56.9%	23.5%
5- Develop Policies and Plans that Support Individual and Community Health Efforts				
5.1 Governmental Presence at the Local Level	4	66.3%	80.1%	20.9%
5.2 Public Health Policy Development	0	-	-	-
5.3 Community Health Improvement Process	0	-	-	-
5.4 Strategic Planning and Alignment with the Community Health Improvement Process	1	38.8%	48.5%	25.0%
6- Enforce Laws and Regulations that Protect Health and Ensure Safety				
6.1 Planning and Implementation	2	83.5%	89.3%	7.0%

Table 9 (continued). **Achievement Index for Selected Performance Standard Indicators, Kansas (2002 and 2003)**

Essential Service Indicators Results	# of Questions	2002 Index	2003 Index	% Change (+)
6.2 Involvement in the Improvement of Laws, Regulations, and Ordinances	0	-	-	-
6.3 Enforce Laws, Regulations, and Ordinances	0	-	-	-
7- Link People to Needed Personal Health Services and Assure the Provision of Health Care when Otherwise Unavailable				
7.1 Identification of Populations with Barriers to Personal Health Services	0	-	-	-
7.2 Identifying Personal Health Services Needs of Populations	0	-	-	-
7.3 Assuring the Linkage of People to Personal Health Services	0	-	-	-
8- Assure a Competent Public and Personal Health Care Workforce				
8.1 Workforce Assessment	2	34.0%	43.7%	28.6%
8.2 Public Health Workforce Standards	2	20.9%	29.6%	41.9%
8.3 Life-Long Learning Through Continuing Education, Training, and Mentoring	8	30.5%	44.4%	45.8%
8.4 Public Health Leadership Development	0	-	-	-
9- Evaluate Effectiveness, Accessibility, and Quality of Personal and Population-Based Health Services				
9.1 Evaluation of Population-Based Health Services	0	-	-	-
9.2 Evaluation of Personal Health Services	0	-	-	-
9.3 Evaluation of the Local Public Health System	4	30.1%	37.9%	25.8%
10- Research for New Insights and Innovative Solutions to Health Problems				
10.1 Fostering Innovation	0	-	-	-
10.2 Linkage with Institutions of Higher Learning and/or Research	0	-	-	-
10.3 Capacity to Initiate or Participate in Timely Epidemiological, Health Policy, and Health Systems Research	0	-	-	-

CONCLUSIONS

Preparedness improved. This report provides compelling evidence that the significant investments in public health over the last few years have resulted in measurable improvement of the local public health preparedness system in Kansas. The results of comprehensive surveys conducted in 2002 and 2003 show that LHDs in Kansas have implemented a wide range of activities to enhance bioterrorism preparedness and that preparedness increased in specific and measurable ways. All index scores examined at the state level were higher in 2003 than 2002, and the state overall preparedness index improved by 27.7% between the two surveys. Nonetheless, progress was not made evenly in all counties and regions, or in all critical capacity areas.

Much room for improvement remains. The overall achievements of the preparedness activities implemented in the last few years need to be balanced with the finding that large disparities persist among different areas of the state. Despite the progress made, most state focus areas and critical capacity scores remain low. The state overall preparedness index in 2003 was 43.3 percent, a measurable indication that substantial room for improvement remains and that building a stronger public health capacity requires multiple years of effort. It is important to note that there are no accepted standards for what constitutes adequate preparedness for LHDs. The indexes and thresholds used in this study to measure preparedness were created by local experts and are among the first such measures created to assess bioterrorism preparedness in a quantifiable manner. It is clear that achieving a score of 100 percent for all counties is not a realistic goal, nor may it even be a desirable goal, given the resources that would have to be committed to do so. These indexes are, however, useful in tracking progress that is being made and for targeting resources to priority areas in higher need for improvement.

Wide variability in preparedness levels exists. The results of this analysis show wide variability in the level of measurable preparedness for bioterrorism throughout the state. The county with the highest overall preparedness index had an index that was more than four times higher than that in the county with the lowest index. Even within more homogeneous groups, a high level of variability remains, and the variability seems to be greater for counties with low population density. The results suggest that some LHDs have been more successful (and in some

cases, much more so) than others in leveraging the additional resources made available to them for bioterrorism preparedness. It would be interesting to further study the characteristics of these LHDs and design a profile of factors associated with their success, so that others can learn from that experience. It was clear from this analysis that population density was a factor associated with higher preparedness indexes, but some LHDs in very sparsely populated counties were able to achieve indexes higher than LHDs in urban areas. While local factors specific to individual LHDs may have played a role (e.g., differences in leadership, strength of local networks of partners, loss or acquisition of a key, skilled staff member), we were unable to detect other common characteristics of these agencies that were associated with their success.

High level of preparedness is more difficult in rural areas. One clear finding from the analysis is an association between the level of the preparedness indexes and population density. The average county overall preparedness index increases progressively from less to more populated groups of counties, and a similar trend is present among LHD regions. Exceptions do exist, and counties with above-average preparedness indexes are present in each of the population density groups considered. Overall, the finding that small jurisdictions have more difficulty reaching higher preparedness capacity is unequivocal. This is a well-known problem and researchers and policymakers have struggled for years to find sustainable ways for small communities to assure the delivery of essential public health services. Our analysis shows that even after a substantial infusion of resources, many LHDs in sparsely populated counties still have difficulty meeting their programmatic goals. It is also notable that the gap between less and more populated counties seems to be widening during this time, rather than narrowing.

It could be argued that since the vast majority of LHDs (including some small agencies in sparsely populated areas) measurably improved their preparedness indexes, with greater and more sustained financial support, most LHDs could achieve even higher levels of preparedness. Furthermore, a redistribution of resources toward those with greater need may be necessary to reduce the achievement gaps observed in this study. On the other hand, the results of this analysis could be interpreted to support the position that achieving preparedness in multiple, small LHDs would be difficult and costly, and that consolidation of services would be a more efficient use of available resources to achieve the desired level of preparedness throughout the

state. To a large extent, the interpretation and implications of these findings will depend upon the varying political and social perspectives affecting such decisions about local control and responsibility rather than objective evidence about the ideal policy.

Regionalization efforts improve preparedness. Another important finding of this analysis is that the regionalization process undertaken in Kansas during the past two years is likely to have improved the level of preparedness in many areas of the state. All but one county in the state voluntarily joined a LHD region by 2003, a fact that is itself remarkable. Despite the difficulty in measuring preparedness at the regional level through a survey that was only targeted to individual counties, there is fairly good evidence that counties that joined a region (in particular frontier and rural counties) improved their overall capacity. Of the 102 counties that joined a region and responded to both surveys, 21 had an overall preparedness index lower than the state index, but joined a LHD region with an overall preparedness index higher than the state index. Every regional group that was created had at least one LHD with a preparedness index greater than the state overall index. All regional average preparedness indexes improved between the two surveys, but the same was not true for all individual county preparedness indexes, which decreased in 14 counties. Regionalization also seems to reduce the range of variability in preparedness throughout the state. It is important to note that creating a LHD region may not be sufficient to boost preparedness capacity to the desired level, and not all LHD regions were able to achieve comparable preparedness index scores. In particular, it appears that frontier and rural regions and regions with fewer than 50,000 residents are struggling to achieve results comparable to more populated regions.

Limited assessment activities may be used as components of a broader assessment of essential public health services. The tool used for the two surveys was adapted from the PHPPO assessment instrument. The instrument was developed under tight time constraints. The goal was to provide a standardized way to assess local public health emergency response capacity. While other tools to evaluate public health services and bioterrorism preparedness exist, the PHPPO tool has the advantage of allowing a fast, but relatively thorough and complete assessment. The tool probably could be improved and more thoroughly validated, but it proved useful in completing this project. The tool also was used to partially link the preparedness

assessment to the broader concept of essential public health services indicators. This provides a bridge between a time- and scope-limited activity and a strategic view of the full gamut of public health standards, functions and services that could be repeated during evaluation and assessment activities in other areas.

Local preparedness is only one component of state overall preparedness. The assessment tool used for these surveys was aimed at measuring preparedness capacity in local public health agencies only. However, delivery of public health services and response to bioterrorism events do not occur at the local level in a vacuum—they require a coordinated effort between local, state, and federal governmental and non-governmental entities. This study does not provide a full picture of statewide preparedness, since information was only available about capacity at the local level. Some of the functions addressed in the surveys depend in large part in Kansas on resources, coordination and leadership provided by state agencies, in particular KDHE. Therefore, some of the gaps identified through these surveys may require actions not only at the local, but also at the state level. For example: improvement of surveillance activities in LHDs, particularly in regard to data analysis and dissemination and regional surveillance, is unlikely without the active involvement of and affiliation with relevant state programs; electronic data exchange requires resources, standardization and coordination currently beyond the reach of most LHDs; and, translation of essential public health educational and informational material into foreign languages may be performed more efficiently through a statewide effort. Should KDHE complete an evaluation of its own preparedness activities using the PHPPO assessment tool developed for state assessments, a more complete and integrated analysis would be possible.

Future challenges: how much preparedness can we afford? The challenges facing the public health system in our state as we rebuild and expand its infrastructure are formidable indeed. The money allocated in the last two years to public health agencies for bioterrorism preparedness represented more than a ten-fold increase over previous years. This increase came after years of what many experts in the field consider chronic under-funding, and the resources had to be shared among over one hundred state and local agencies.

While determining the optimal level of preparedness for a local health department in Kansas was not part of this study, the findings show that when substantial funds are allocated, preparedness improves in specific and measurable ways. Policymakers must balance their desire to achieve even higher levels of preparedness throughout the state with the costs of providing the funds necessary for those enhancements. While some capacities can be achieved through a rapid, substantial capital investment (e.g., improved connectivity or access to advanced technologies), many public health preparedness activities do not lend themselves to quick solutions, and require a more prolonged and sustained effort than what can be generated over a period of one or two years. These activities, for example, may entail the widespread availability of highly skilled staff with advanced training in modern public health surveillance and control techniques, a goal that may require years of investment and training of the public health workforce.

In summary, LHDs in Kansas should be commended for the improvements they have achieved to date, and the findings of this report should be used in developing and measuring the effectiveness of future strategies for investing resources to improve preparedness for what many consider the inevitability of future bioterrorism events.

APPENDIX A

Methods Information

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

Focus areas	Critical capacities
<p>Focus Area A: 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>Focus Area B: 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
Focus Area C: Laboratory Capacity-Biological Agents	<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>
Focus Area E: Health Alert Network/Communications and Information Technology	<p>E-A - Ensure effective communications connectivity among public health departments, healthcare 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 systems 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>
Focus Area F: Risk Communication and Health Information Dissemination	<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
Focus Area G: Education and Training	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.

Table A-2. Analysis Algorithm for the Classification of Questions (for Focus Area A)

Critical Capacity	PHPPQ Question	Subquestion	ACHIEVED if:
A-1A - Strategic leadership, direction, coordination and assessment of activities to ensure state and local readiness, interagency collaboration, and preparedness	1	a. Does the Agency participate in a strategic planning process to improve public health?	a=Y and b=Y
		b Which activities are part of the agency's strategic planning process? (20 items)	If at least 10/20 =Y
			Y
	2 Does the agency update high level policy-makers and elected officials on progress toward goals in the community plan to improve public health?		
	3 In what manner and to what extent has the agency formalized working relationships with each organization for the purpose of emergency response?		
		Group a partners: local emergency management, local law enforcement, hospitals, p.h. agencies in neighboring jurisdictions	Group a=Y AND Group b=Y 3/4 have written agreement
		Group b partners: all others	50% of applicable entities= have written or verbal agreement

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area A)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
	4 Does the agency sponsor or participate in jurisdiction-wide conferences and workshops for emergency preparedness that bring together partners and stakeholders?		Y
	5 Please provide the requested information for each of the following individuals:		>2 boxes checked
6		<p>a For the agency bureau chiefs/ department heads (third level of management) and division/program directors (fourth level of management), estimate how many of these managers participated in leadership/management training</p> <p>b For the agency bureau chiefs/ department heads (third level of management) and division/program directors (fourth level of management), estimate how many of these managers participated in emergency management training</p>	<p>a=Y and b=Y</p> <p>1 MOST, <u>or</u> >1 SOME</p> <p>1 MOST, <u>or</u> >1 SOME</p>

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area A)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
A-II.B - Conduct integrated assessments of public health system capacities to aid and improve planning, coordination, and implementation	8 Has the agency identified legal counsel?		Y
A-II.A - Respond to emergencies caused by BT, etc. through the development and exercise of a comprehensive public health emergency plan and A-II.B - Ensure that state, local, and regional preparedness for and response to BT, etc. is effectively coordinated with Federal response assets	9 Does the agency have a staff member assigned the role and responsibilities of Emergency Response Coordinator (ERC)?		Y
	10 Does the agency's jurisdiction have formal arrangements with other jurisdictions to respond as a region (multi-city, multi-county, city-county) in emergencies?		Y
	11 Is the agency's public health emergency response plan integrated with the:		If d=N and 2/3 of a,b,c=Y
		a <i>Jurisdiction emergency response plan?</i>	Y
		b <i>Regional emergency response plan?</i>	Y
		c <i>State public health agency emergency response plan?</i>	Y
		d <i>(no response plan)</i>	NA

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area A)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
	12 How does the agency assess hospital readiness for emergency response?		If 1/3 of a, b, c=Y
		a Collaborates with state and federal partners	Y
		b Includes hospitals and their representatives in emergency response exercises	Y
		c The agency assesses hospital readiness through other activities	Y
	13 Which issues are addressed in the public health emergency response plan OR addressed in other sections/annexes of the jurisdiction/regional emergency response plan and referenced in the public health plan?		If 3/6 of a through f=Y
		a Plan Activation and Link to Emergency Operations Center (six items)	If 3/6=Y
		b Public Health and Medical Coordination (26 items)	If 13/26=Y
		c Surge Capacity (11 items)	If 6/11=Y
		d Protection of Environment (5 items)	If 3/5=Y
		e Personnel and Provisions (10 items)	If 5/10=Y
		f Recovery (7 items)	If 4/7=Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area A)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
	14 What is the present status of the agency's directory of emergency contact information?		If d=N and 1/3 of a, b, c=Y
		a Paper form only	Y
		b Electronic directories not consistent with (IT) Functions and Specifications	Y
		c Electronic directories consistent with (IT) Functions and Specifications	Y
		d The agency does not have a directory of emergency contact information	N/A
	15 Under what conditions does the public health agency test its ability to reach its own personnel and key external partners	14 categories	>50% of applicable persons tested after hours, OR >75% tested during hours
	16 Which has the agency done in the past 12 months?		If 3/6=Y
		a Conducted a tabletop exercise(s)	Y
		b Conducted a functional exercise(s)	Y
		c Participated in a regional exercise(s) conducted by federal agencies	Y
		d Responded to a public health emergency (e.g., chemical spill, bio-release, suspicious letter)	Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area A)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
		e. Corrected deficiencies in the emergency response plan	Y
		f. Convened jointly, at least once, with community response partners	Y
<u>Kansas-specific competencies</u>			
KS-1. NPS planning		a. Not in progress	If c = Y Y
		b. In progress	Y
		c. In place	Y
		d. Not applicable	N/A
KS-2. Documented commitments for NPS			
		a. Not in progress	If c = Y Y
		b. In progress	Y
		c. In place	Y
		d. Not applicable	N/A
KS-3. Priority groups of recipients			
		a. Not in progress	If c = Y Y
		b. In progress	Y
		c. In place	Y
		d. Not applicable	N/A

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area B)

Critical Capacity	PHPO Question	Subquestion	ACHIEVED if:
B-1.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	19 Do your state laws governing reports for notifiable conditions include:		If 9=N AND ≥4/8=Y
		1 through 8: included items	Y
		9: our state does not have any laws	NA
	20 Which does the agency have to receive reports of immediately notifiable conditions 24 hours per day/7days per week?		If f=N AND: (d=Y, or a and b and c=Y)
		a Toll free phone number	Y
		b Fax number	Y
		c Electronic reporting	Y
		d A designated contact person available 24/7 to receive reports	Y
		e Our state agency is responsible for receiving reports of immediately notifiable conditions	Y
		f Our agency does not receive reports of immediately notifiable conditions 24 hours per day/7 days per week	N/A

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area B)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
	21 Which aspects of its surveillance system for notifiable conditions does the agency assess?	Nine available options	≥3/9 available options=Y
	22 How does the agency attempt to strengthen relationships with reporting sources?	Five available options	≥3/5 available options=Y
	23 For each surveillance system listed, indicate: • Which surveillance activities the agency performs • How patient data are stored.	Eleven surveillance systems. Collect, store, analyze, compile, and disseminate data.	Y if all the following apply: collect data >5 and store data >5 and analyze > 3 and compile >3 and disseminate >3
	24 Does the agency have the capacity to enhance surveillance	<p>If a through d are all =Y</p> <p>a Expanding reporting sources to include (11 options) >3 Y</p> <p>b Instituting active surveillance for (3 options) >1 Y</p> <p>c Receiving, analyzing, and compiling reports on syndromic data that include (3 options) At least 1 Y</p> <p>d Alerting reporting sources Y</p>	

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area B)

Critical Capacity	PHPO Question	Subquestion	ACHIEVED if:
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. and 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	25. Has the agency formally assessed its epidemiology capacity?		Y
	26. Which responsibilities has the agency assigned to its epidemiology response coordinator?	a. Coordinate epidemiology response b. Coordinate with hospitals and/or infection control practitioners	If e = N AND >2 options = Y Y Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area B)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
		c. Respond 24 hours per day/7days	Y
		d. Lead and conduct epidemiologic investigations	Y
		e. The agency does not have an epidemiology response coordinator	NA
			If options a. + options b. >3
	27. Which personnel does the agency employ or have access to?	a. Employed, 10 options	
		b. Has access to, 10 options	
		c. Neither, 10 options	
	28. Which risk and vulnerability assessments do agency epidemiologists conduct?		If at least 2/3=Y
		a. Food	Y
		b. Water	Y
		c. Air	Y
	29. Does the agency have a plan to accommodate surge capacity for epidemiologic investigation?		If at least 2/3=Y
		a. Identification of epidemiologists	Y
		b. Identification of agency staff	Y
		c. Formal agreements with neighboring jurisdictions	Y
		d. No plan	N/A

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area B)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
	30. Does the agency have copies of pre-prepared medical management information?		Y
	31. How does the agency attempt to strengthen relationships with the animal health community?		If at least 2/4=Y
		a. Recruits local veterinarian(s) to act as liaison(s)	Y
		b. Includes local veterinarians in bioterrorism planning	Y
		c. Recruits local veterinarians to act as sentinel reporters	Y
		d. Others	Y
	32. Does the agency participate in CDC's Epidemic Information Exchange (Epi-X)		Y
<u>Kansas-specific competencies</u>			
	KS-4. Designated contact person		If c = Y
		a. Not in progress	Y
		b. In progress	Y
		c. In place	Y
		d. Not applicable	N/A
	KS-5. Information on how to contact		If c = Y
		a. Not in progress	Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area B)

Critical Capacity	PHPPQ Question	Subquestion	ACHIEVED if:
		<i>b. In progress</i>	Y
		<i>c. In place</i>	Y
		<i>d. Not applicable</i>	N/A
	KS-6. Protocols for epidemiologic investigations		Y
	KS-7. Protocols reviewed		Y
	KS-8. Protocols tested		Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area C)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
C-A - Develop and implement a jurisdiction-wide program to provide rapid and effective laboratory services in support of the response to BT, etc.	33. Which information does the agency have for all Level A labs in its jurisdiction?		If item 13 = N AND at least 7/12 items 1 through 12 = Y
		12 items	Y
		Item 13: no information	N/A
	34. Which activities does the agency conduct to build relationships with local Level A labs?		If at least 2/7 items = Y
		7 items	Y
	35. Can the agency assure 24/7 lab support?		If at least 2/4 items = Y
		a. Local members of HazMat teams	Y
		b. Local law enforcement officers and first responders	Y
		c. Local infectious disease experts	Y
		d. other groups	Y
	36. Which labs does the agency have access to?		If at least 2/3 items = Y
		a. Level A labs	Y
		b. Level B labs	Y
		c. Level C labs	Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area C)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
	37. Which special tests do local hospital/independent labs have access to?		If at least 4/5 items = Y
		a. blood and urine	Y
		b. environmental samples	Y
		c. Molecular typing	Y
		d. unusual pathogens	Y
		e. direct detection of organisms using molecular methods	Y
	38. Has the agency developed protocols and procedures to triage specimens/samples?		Y
	39. Does the agency have a safety officer?		Y
	40. Does the agency's specimen/sample transportation system:		If g=N AND at least 3/6 items a through f = Y
		a. meet agency expectations for proper specimen/sample handling?	Y
		b. meet agency expectations for timeliness?	Y
		c. Comply with current packaging and shipping regulations?	Y
		d. Accommodate electronic tracking of the specimen/sample?	Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area C)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
		e. Accommodate transporting chemical samples?	Y
		f. Accommodate transporting radiological samples?	Y
		g. The agency does not have a specimen/sample transportation system	N/A
	41. Are procedures for sharing laboratory reports among public health officials and law enforcement officers adequately addressed?		Y
	42. Has the public health lab director received Level A lab training?		Y
	43. have the public health lab staff received Level A lab training?		If c = Y OR d = Y Y
		a. None	Y
		b. Some	Y
		c. Most	Y
		d. All	Y
	44. Which of these agents can the public health lab rule OUT using available Level A lab protocols?		If at least 2/3 items = Y
		a. Anthrax	Y
		b. Plague	Y
		c. Tularemia	Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area C)

Critical Capacity	PHPPQ Question	Subquestion	ACHIEVED if:
C-B - As a member of LRN, ensure adequate and secure laboratory facilities, reagents, and equipment to rapidly detect and correctly identify biological agents likely to be used in a BT incident.	45. Which critical capacities does the public health lab have?		If at least 3/6=Y
		A. Worker Safety - 3 items	3/3 = Y
		B. Qualified Personnel for Testing and Quality Control/Assurance - 7 items	4/7 = Y
		C. Proficiency Testing - 2 items	2/2 = Y
		D. Specimen Retention - 1 item	Y
		E. Lab Security - 2 items	1/2 = Y
		F. Equipment and Supplies - 2 items	1/2 = Y
	46. Does the agency have a Laboratory Information Management System (LIMS)?		If Item 7 = N AND at least 4/6 items = Y
		Items 1 through 6	Y
		Items 7 - No LIMS	N/A

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area E)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
E-A - Ensure effective communications connectivity among public health departments, healthcare 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.	47. Which capacities does the public health agency's health alert system have?		If e = N AND at least 3/4 of a through d = Y
		a. Operates 24 hours per day/7 days per week	Y
		b. Can send health alerts within one hour of their final approval	Y
		c. Can receive health alerts within one hour of the time they were sent	Y
		d. Is tested at least once every three months	Y
		e. No health alert system	N.A.
48. Which protocols does the agency have to determine message priorities?			If at least 3/5 items = Y
		5 items	Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area E)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
E-B - Ensure a method of emergency communication for participants in public health emergency response that is fully redundant with e-mail.	49. Which communications technologies does the agency have?	18 items	If at least 6/18 items = Y Y
	50. Under what circumstances does the agency provide training?		If d = N AND at least 2/3 of a through c = Y
		a. When the equipment is first issued	Y
		b. For any employee who wants to become more proficient	Y
		c. Periodic refresher training	Y
		d. No training	N/A
	51. Which types of Information Technology (IT) expertise does the agency employ or have access to?	13 items	If at least 7/13 items = Y Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area E)

Critical Capacity	PHPPQ Question	Subquestion	ACHIEVED if:
E - C - Ensure the ongoing protection of crucial data and information systems for the management of secure information, system backups, and systems redundancy. and 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.	53. To what extent have your agency's programs transitioned to electronic data and messaging systems?		If c=Y
			OR
			d=Y
		a. No programs have transitioned	Y
		b. Some programs have transitioned	Y
		c. Most programs have transitioned	Y
		d. All programs have transitioned	Y
	54. Which has the agency accomplished?		If a=Y
			OR
			b=Y
		a. Determined with which partners etc.	
		b. Negotiated a timeline etc.	

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area E)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
	55. Is the agency connected to the state public health agency with a secure electronic link?		Y
	56. What percent of the following partners are connected to the agency with a secure electronic link?		If 2/3 of a, b, and c=Y
		a. Hospitals	>49%
		b. Level A labs	>49%
		c. Level B and C labs	>49%
	57. Which activities does the agency assign to one or more individuals?	5 items	If at least 3/5 items = Y Y
	58. Does the agency have a public website?		If item 9 = N AND at least 5/8 of items 1 through 8 = Y Y
		8 items	
		Item 9 - No web site	N/A
	59. Does the agency ensure that its electronic security systems are validated and verified by persons not associated with the agency?		Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area E)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
<u>Kansas-specific competencies</u>			
	KS-9. Inventory		Y
	KS-10. Surge protectors		Y
	KS-11. Virus protection		Y
	KS-12. Back up		Y
	KS-13 Incident response procedure		Y
	KS-14. Patient identifiers protected		Y
	KS-15. Password changes		Y
	KS-16. Locked workstations		Y
	KS-17. Diskettes and CD's secured		Y
	KS-18. Removing confidential data files		Y
	KS-19. Training in security		Y
	KS-20. Designated security officer		Y
	KS-21. Health Alert Network		Y
	KS-22. Firewall		Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area F)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
	61. What is the present status of the agency's directory of emergency contact information for media personnel and partner PIOs?		If d=N and 1/3 of a, b, c=Y
		A. Paper only	Y
		B. Electronic not consistent	Y
		C. Electronic consistent	Y
		D. No directory	N/A
	62.a. Does the agency periodically assess the risk/crisis communication and media relations training needs of its own staff?		Y
	62.b Does the agency participate with community organizations/agencies to assess the risk/crisis communication and media relations training needs of public health partners?		Y
	63. Which topics are included in the agency's training needs assessment?		If 8 = N AND at least 4/7 items = Y
		7 items	Y
		Item 8: no needs assessment	N/A
	64. Which information dissemination vehicles does the agency use?		If at least 6/15 items=Y
		15 items	Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area F)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
	65. Which personnel does the agency have (or have access to) for developing informational materials that can be used in emergencies?	10 items	Y
	66. Which topic-specific materials has the agency developed or obtained before they are needed in a crisis?	12 items	Y
	67. Has the agency engaged special populations?		Y
	68. Does the agency have a policy to routinely route all media calls to the public information officer?		Y
	69. How does the agency evaluate its emergency response/crisis communication plan?		If d = N AND at least 2/3 items a through c= Y
		a. Emergency preparedness drills and exercises	Y
		b. Debriefing with its public information staff	Y
		c. Revises its emergency response/crisis communication plan	Y
		d. No plan	N/A

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area F)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
<u>Kansas-specific competencies</u>			
	KS-23. Languages		If at least 2 or more languages listed, then = Y
		Open text	

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area G)

Critical Capacity	PHPPQ Question	Subquestion	ACHIEVED if:
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 prepared-ness 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.	70. Does the agency conduct an internal training needs assessment?		Y
	71. On which topics does the agency provide training?		If g = N AND at least 2/6 of a through f = Y
		a. Infections/syndromes	Y
		b. Epidemiology	Y
		c. Surveillance	Y
		d. Disease reporting	Y
		e. Public Health System	Y
		f. ICS	Y
		g. No training	N.A.

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (for Focus Area G)

Critical Capacity	PHPPQ Question	Subquestion	ACHIEVED if:
	72. With which partners does the agency have formal agreements?	10 items	If at least 3/10 = Y Y
	73. Which does the agency provide?	6 items	If at least 3/6 = Y Y
	74. Which distance learning technologies does the agency use?	7 items	If at least 4/7 = Y Y
	75. Does your agency have (or have access to) satellite downlink capabilities?		Y
	76. Which opportunities does the agency provide?	3 items	If at least 2/3 = Y Y
	77. Do agency staff participate in exercises and training?		Y
	78. How does the agency evaluate training?		If at least 3/5 = Y
	79. Does the agency have written job descriptions?	5 items	Y Y

Table A-2 (continued). Analysis Algorithm for the Classification of Questions (KS-Specific Competencies)

Critical Capacity	PHPPO Question	Subquestion	ACHIEVED if:
Coordination of services with local and regional providers	KS-24. With which counties is LHD developing relationships?	Free text. Formal and informal agreements. Plans to develop agreements.	At least 2 formal and 2 informal agreements.
	KS-25. Sharing any public health programs or services	Free text.	At least two programs shared with two counties.
	KS-26. Hospital relationships	Free text. Formal and informal agreements. Plans to develop agreements.	At least 1 formal or 2 informal agreements.
Communication with area hospitals	KS-27. Will area hospitals inform local health department about status during a disaster?		Y
	KS-28. Are there alternative communication arrangements?		Y
	KS-29. Do area hospitals report morbidity and mortality data?		Y
	KS-30. Which area hospitals have submitted a disaster plan?	Free text.	At least one hospital.

Table A-3. Cross-walk between PHPPO Questions and Essential Public Health Service Indicators

Essential Public Health Service	Essential Public Health Service Indicator	PHPPO Question Linked
1 Monitor Health Status to Identify Community Health Problems	1.1 Population-Based Community Health Profile (CHP)	1a/b, 23
	1.2 Access to and Utilization of Current Technology to Manage, Display, Analyze and Communicate Population Health Data	23, 51, 58, 64, 66
	1.3 Maintenance of Population Health Registries	23
2 Diagnose and Investigate Health Problems and Health Hazards in the Community	2.1 Identification and Surveillance of Health Threats	20, 21, 22, 23, 24, 25, 27, 28, 29, 47, 48, 49, 51, 60d/e, 64, 65, 66, 72
	2.2 Plan for Public Health Emergencies	9, 10, 11, 12, 13, 14, 15, 16, 26, 29, 30, 38, 61, 62, 63
	2.3 Investigate and Respond to Public Health Emergencies	9, 26, 27, KS-6, KS-7, KS-8
	2.4 Laboratory Support for Investigation of Health Threats	33, 34, 35, 36, 37, 39, 40, 41, 44, 45, 46, 56
3 Inform, Educate, and Empower People about Health Issues	3.1 Health Education	58, 64, 65, 67
	3.2 Health Promotion Activities to Facilitate Healthy Living in Healthy Communities	N/A
4 Mobilize Community Partnerships to Identify and Solve Health Problems	4.1 Constituency Development	1, 2, 3, 14, 57, 61
	4.2 Community Partnerships	1, 3, 4, 31, 54, 55, 56

Table A-3 (continued). Cross-walk between PHPPO Questions and Essential Public Health Service Indicators

Essential Public Health Service	Essential Public Health Service Indicator	PHPPO Question Linked
5 Develop Policies and Plans that Support Individual and Community Health Efforts	5.1 Governmental Presence at the Local Level	2, 10, 11, 77
	5.2 (Public Health Policy Development)	N/A
	5.3 Community Health Improvement Process	N/A
	5.4 Strategic Planning and Alignment with the Community Health Improvement Process	1
6 Enforce Laws and Regulations that Protect Health and Ensure Safety	6.1 Planning and Implementation	8, 19
	6.2 Involvement in the Improvement of Laws, Regulations, and Ordinances	N/A
	6.3 Enforce Laws, Regulations, and Ordinances	N/A
7 Link People to Needed Personal Health Services and Assure the Provision of Health Care when Otherwise Unavailable	7.1 Identification of Populations with Barriers to Personal Health Services	N/A
	7.2 Identifying Personal Health Services Needs of Populations	N/A
	7.3 Assuring the Linkage of People to Personal Health Services	N/A

Table A-3 (continued). Cross-walk between PHPPO Questions and Essential Public Health Service Indicators

Essential Public Health Service	Essential Public Health Service Indicator	PHPPO Question Linked
8 Assure a Competent Public and Personal Health Care Workforce	8.1 Workforce Assessment	70, 73
	8.2 Public Health Workforce Standards	78, 79
	8.3 Life-Long Learning Through Continuing Education, Training, and Mentoring	50, 62, 72, 73, 74, 75, 76, 77
	8.4 Public Health Leadership Development	N/A
9 Evaluate Effectiveness, Accessibility, and Quality of Personal and Population-Based Health Services	9.1 Evaluation of Population-Based Health Services	N/A
	9.2 Evaluation of Personal Health Services	N/A
	9.3 Evaluation of the Local Public Health System	16, 22, 33, 34
10 Research for New Insights and Innovative Solutions to Health Problems	10.1 Fostering Innovation	N/A
	10.2 Linkage with Institutions of Higher Learning and/or Research	N/A
	10.3 Capacity to Initiate or Participate in Timely Epidemiological, Health Policy, & Health Systems Research	N/A

Figure A-1. Converting Questions, Critical Capacities and Focus Areas into the Overall Preparedness Index

Index	Overall Preparedness Index																	
Focus Areas	A				B		C		E				F	G	Kansas-Specific			
Critical Capacities	A-I.A	A-I.B	A-II.A/B	A-KS	B-I.A	B-II.A/B	B-KS	C-A	C-B*	E-A	E-B	E-C/D	E-KS	F-A	F-KS	G-A	KS-I	KS-II
	1-6	8	9-16	KS 1-3	19-24	25-32	KS 4-8	33-44	45-46	47-48	49-51	53-59	KS 9-22	60-69	KS 70-79	KS 24-26	KS 27-30	
Questions																		

* Critical Capacity C-B (laboratory capacity for level B laboratories) was not included in the data analysis.

APPENDIX B

Population Density Information

*Table B-1. Classification of Counties by Population Density Group**

Population density group	Number of counties	Population
Frontier	33 (31.4%)	105,372 (3.9%)
Rural	36 (34.3%)	273,028 (10.0%)
Densely settled rural	22 (21.0%)	550,980 (20.2%)
Semi-urban	8 (7.6%)	342,194 (12.6%)
Urban	6 (5.7%)	1,451,933 (53.3%)
TOTAL	105 (100%)	2,723,507 (100%)

*Includes all 105 Kansas counties

*Table B-2. Classification of LHD Regions by Population Density Group**

Population density group	Number of regions	Population
Frontier	2 (13.3%)	54,810 (2.0%)
Rural	7 (46.7%)	441,964 (16.4%)
Densely settled rural	2 (13.3 %)	283,765 (10.5%)
Semi-urban	3 (20.0%)	1,068,434 (39.6%)
Urban	1 (6.7%)	847,322 (31.4%)
TOTAL	15 (100%)	2,696,295 (100%)

*Includes 104 Kansas counties that joined a LHD Region

APPENDIX C

Kansas Public Health Preparedness and Response Capacity Inventory

Available from the Kansas Health Institute.