

National Assessment of Epidemiologic Capacity in Public Health: Findings and Recommendations

PREPAREDNESS

DETECTION

PREVENTION

CONTROL

EVALUATION

COUNCIL OF STATE AND TERRITORIAL EPIDEMIOLOGISTS



National Assessment of Epidemiologic Capacity: Findings and Recommendations

March 2003



Council of State and Territorial Epidemiologists

ACKNOWLEDGEMENTS

The Council of State and Territorial Epidemiologists (CSTE) conducted this assessment with support from its cooperative agreement with the Centers for Disease Control and Prevention.

The Epidemiology Capacity Assessment workgroup CSTE accomplished this project with cooperation from the state health departments, Centers for Disease Control and Prevention (CDC), Health Resources and Services Administration (HRSA), Indian Health Service (IHS), Association of State and Territorial Health Officers (ASTHO), Association of Schools of Public Health (ASPH), and American Public Health Association (APHA).

A special thank you is extended to the ten state agencies that participated in the piloting stages of the assessment: Alabama, Arkansas, Connecticut, Florida, Iowa, Kansas, Maine, Missouri, Nebraska and New Mexico. We appreciate the involvement that each state devoted to this project. Contributing CSTE staff members include: LaKesha Robinson, Kevin Gibbs, Steven Clay, Shah Roohi, Donna Knutson, and Pat McConnon. We also acknowledge the invaluable contributions from the CSTE Epidemiology Capacity Assessment Lead – Matthew Boulton and lead CSTE staff member – Knachelle Hodge.

EXECUTIVE SUMMARY

BACKGROUND

Increased vigilance to threats of bioterrorism has caused the nations public health system to confront new obstacles. The Institute of Medicine and the U.S. Department of Health and Human Services suggest a need to build a comprehensive public health infrastructure capable of responding to both acute and chronic threats to the Nation's health, including detection, control and prevention of major health problems. In response to this call, the Council of State and Territorial Epidemiologists developed an instrument to assess U.S. state and territorial health agencies core and infectious disease epidemiologic capacity.

METHODS

The Epidemiology Capacity Assessment (ECA), structured around the Ten Essential Services of Public Health, was developed into two components: core epidemiology and infectious disease epidemiology. After piloting in 10 states, the 108-question assessment was administered to all states and territories electronically and by paper between November 2001 and April 2002. State Epidemiologists and/or their delegates were asked to complete the assessment.

RESULTS AND DISCUSSION

As the first survey of a comprehensive nationwide assessment of core epidemiology infrastructure, this baseline information will be important in evaluating the impact of future funding for epidemiology capacity in the nation.

Federal dollars for epidemiology and surveillance programs in states account for 61% of total support while state support accounts for 36%. Federal expenditures are likely to increase with recent bioterrorism funding and state support is likely to decrease with mounting state budgetary shortfalls. Large regional variations in per person expenditures for epidemiology programs (national average \$2.22) are evident in the considerable disparities seen amongst states in almost

all areas of epidemiology capacity. Few states reported having high capacity in program areas other than infectious disease.

The ECA survey found that most state and territorial epidemiologists think they have insufficient staff and resources. A comparison can be made to a 1992 survey where there were approximately 1,700 full time equivalent positions engaged in epidemiology surveillance, while the current survey found less than 1,400 epidemiologists working in state and territorial health departments. These figures indicate that there has been no growth in the epidemiology workforce over the last decade. This lack of workforce growth has occurred despite the significant expansion in the scope of responsibilities for epidemiology over this same period of time. Approximately 42% of the current epidemiology workforce in state and territorial health departments lacks formal academic training in epidemiology and few engage in systematic research and publication activities.

Although most states reported high level capacity for monitoring nationally notifiable diseases (72%), very few appear to have surveillance systems that include emergency medical services, emergency departments or have the capacity to adequately monitor non-notifiable conditions or pathogens with bioweapons potential.

Racial disparities have become a priority for public health leaders in reducing disease incidence. However, the assessment found that state health agencies rarely provide cultural competency training to infectious disease epidemiologists. Databases such as Medicaid, CHIP, State household surveys, Bureau of Labor statistics, and PRAMS were utilized by less than 30% of state and territorial health agencies. Use of these databases may aid in the development of prevention efforts addressing health issues of minority populations.

The Ten Essential Public Health services are intended to allow health departments to progress with greater clarity and uniformity in carrying out state public health functions. This assessment

found that epidemiology programs in state and territorial health departments are not fully able to provide these services as outlined by the Institute of Medicine.

RECOMMENDATIONS

- States and territories need increased epidemiology capacity now: they need more highly trained epidemiologists in greater numbers to control and prevent common, endemic diseases as well as to respond to new and emerging health problems, health hazards, and outbreaks. Due to severe budgetary crises in states and territories, funding for increased capacity must come from the federal government.
- The epidemiology capacity within state and territorial health departments should be assessed periodically to monitor the progress in building epidemiology capacity across the nation.
- The measurement of epidemiology capacity in state and territorial health agencies should include both objective and subjective tools that should remain relatively constant so that trends can be detected.
- Epidemiology capacity assessments should be used to allocate resources in health departments and to develop priorities and policy for building and maintaining public health infrastructure.
- There should be standards established for states' epidemiology capacity. Large variations seen in this assessment for yearly and per person expenditures are reflected in significant differences in epidemiology capacity from state to state.
- Given the relative paucity of trained epidemiologists outside the infectious disease area, there needs to be special emphasis placed on increasing the number of trained epidemiologists in program areas such as environmental health, maternal child health, injury, and occupational epidemiology.
- This survey indicates significant deficiencies in infectious disease and all other areas of epidemiology infrastructure. As such, there needs to be much greater advocacy and awareness of the essential role of epidemiology in the public health system.

TABLE OF CONTENTS

BACKGROUND	1
METHODS	3
RESULTS	5
CORE CAPACITY QUESTIONNAIRE	5
INFECTIOUS DISEASE CAPACITY QUESTIONNAIRE	7
DISCUSSION	12
RECOMMENDATIONS.....	15
REFERENCES.....	16
APPENDIX A	
APPENDIX B	

BACKGROUND

In 1988, the Institute of Medicine outlined in *The Future of Public Health* the status of public health in the United States and generated a set of ‘core functions’ of public health. The study stated, “this nation has lost sight of its public health goals and has allowed the system of public health activities to fall into disarray”¹. Recommendations from the report outlined that every health agency should regularly and systematically collect, assemble, analyze, and make available information on the health of the community, including statistics on health status, community health needs, and epidemiologic and other studies of health problems. In 1997, a study was undertaken to determine if forward momentum created by the IOM report continued. The study reported that there were several key areas lacking in implementation such as policy development, personal health services, and some areas of infrastructure².

With today’s heightened consciousness of bioterrorism, the nation’s public health system has a new set of obstacles to overcome. These threats call for a resilient public health system and well-prepared workforce. The U.S. Department of Health and Human Services (HHS) has emphasized the need for a closely linked nationwide network utilizing local, regional and state health resources. HHS also states that the network should possess the capability for detection and reporting of unusual patterns and have substantial laboratory resources³. In public health a strong infrastructure may provide the capacity to prepare for and respond to both acute and chronic threats to the Nation’s health. Such an infrastructure serves as the foundation for planning, delivering, and evaluating public health. The recent IOM report, *The Future of the Public’s Health in the 21st Century*, states that government public health agencies are in need of support and resources⁴. The Committee on Assuring the Health of the Public in the 21st Century found that “the governmental public health infrastructure has been neglected, and an overhaul of its components is needed to ensure quality of services and optimal performance”⁴.

Epidemiology can be considered the central science of public health. Epidemiologists are needed for the management of major public health problems including detection, control and prevention. Health data and surveillance systems provide information on illness, disability, and

death from acute and chronic conditions; injuries; personal, environmental, and occupational risk factors; preventive and treatment services; and costs.

CSTE is one of a number of public health organizations to have developed an instrument to assess the capacity of data and information systems in health departments. The Council of State and Territorial Epidemiologists (CSTE) Epidemiology Capacity Assessment (ECA) instrument was originally developed in 1997 and piloted in 10 states for the purpose of self-assessment. Revision of the ECA Tool was prompted by the Healthy People 2010 Objective 23-14 which calls for an “increase in the proportion of Tribal, State and local public health agencies that provide or assure comprehensive epidemiology services to support essential public health services”⁵, including quickly detecting, investigating and responding to diseases in order to prevent unnecessary transmission.

In January 2001, a small advisory group was organized under the charge of the CSTE Executive Committee to begin revision of the ECA tool. The ECA tool was reviewed by individuals from federal and national organizations such as the Centers for Disease Control and Prevention (CDC), Health Resources and Services Administration (HRSA), Indian Health Service (IHS), Association of State and Territorial Health Officers (ASTHO), Association of Schools of Public Health (ASPH), and American Public Health Association (APHA). Also included in the review process were individuals from academia and state health department employees.

The tool evolved into a full assessment of data and epidemiology capacity structured around the ten essential services. The current tool, included in Appendix A of this report, consists of two components: core epidemiology and infectious disease questionnaires. This instrument is one of several modules developed, the others being questionnaires in chronic diseases, maternal and child health, and food safety. All are formatted to the framework of the Ten Essential Services of Public Health.

The Public Health Functions Steering Committee of the American Public Health Association (APHA) adopted the Essential Services of Public Health in the fall of 1994 with the goal of creating a national standard for public health: the Ten Essential Services of Public Health. The Ten Essential Services are:

1. Monitor health status to identify and solve community health problems.
2. Diagnose and investigate health problems and health hazards in the community.
3. Inform, educate, and empower people about health issues.
4. Mobilize community partnerships to identify and solve health problems.
5. Develop policies and plans that support individual and community health efforts.
6. Enforce laws and regulations that protect health and ensure safety.
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable.
8. Assure a competent public and personal health care workforce.
9. Evaluate effectiveness, accessibility and quality of personal and population-based services.
10. Research for new insights and innovative solutions to health problems.

A public health agency's epidemiologic capacity is its ability, based on human and other resources, to perform those epidemiologic functions necessary to achieve its defined goals and objectives⁶. The purpose of this assessment was to measure the baseline status of core and infectious disease epidemiologic capacity in U.S. states and territories.

METHODS

The core component of the assessment examines the resources available for building a solid public health epidemiology infrastructure, including monetary support and workforce competency. The first 22 questions of the ECA are the core capacity assessment, and the last 86 questions are the infectious disease component.

A draft version of the tool was piloted in 10 states, including Alabama, Arkansas, Connecticut, Florida, Iowa, Kansas, Maine, Missouri, Nebraska, and New Mexico. Data for the final version of the ECA were collected between November 2001 and April 2002. This version was administered by paper and electronically, and the respondent could select their preferred format. The assessment included instructions for the form to be completed by the State Epidemiologist and/or delegate(s), in addition to other agency epidemiologists when appropriate.

The ECA was transmitted to 51 states (including District of Columbia) and 5 territories. In the data analyses, these locations were grouped into the following region categories:

1. Northeast (n=9): CT, MA, ME, NH, NJ, NY, PA, RI, VT;
2. Midwest (n=12): IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD, WI;
3. South (n=17): AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV;
4. West (n=13): AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY; and
5. Territories (n=5): American Samoa, Commonwealth of Northern Mariana Islands, Federated States of Micronesia, Guam and Puerto Rico.

Follow-up telephone calls and emails were made to those states that did not respond to initial requests to complete the assessment. Forty-six states and territories provided responses. Once the assessments were returned, data were analyzed using SAS. Frequencies were calculated for selected questions from the ECA tool. Data were tabulated for all respondents together as well as by region.

In the analyses of core capacity, the following program abbreviations are used: BT=bioterrorism; CD=chronic disease; EH=environmental health; ID=infectious disease; INJ=injury; MCH=maternal and child health; OH=occupational health; and OrH=oral health.

RESULTS

The response rate for the 51 states and 5 territories combined was 79% (n=44). The response rate for the states and the District of Columbia alone was 80%. Response rates by region were as follows: Northeast = 78%; Midwest = 83%; South = 82%; West = 77%; and Territories = 60%. Appendix B contains frequency data for each question.

Core Capacity Questionnaire

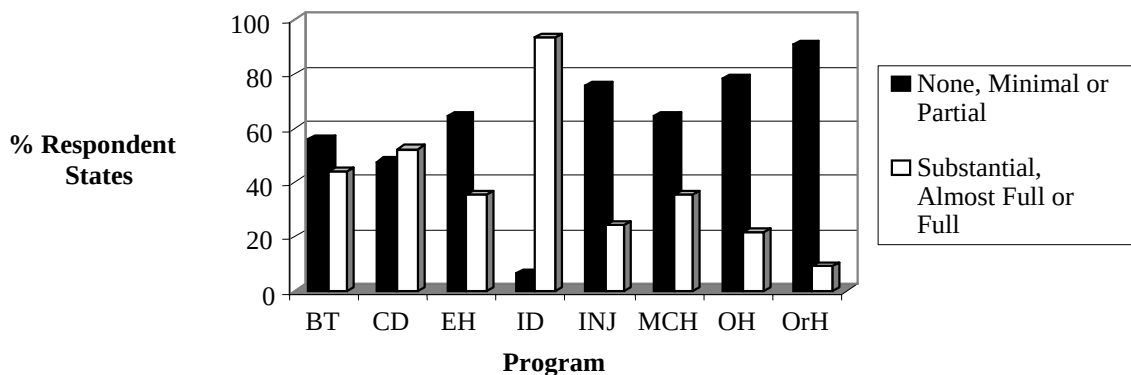
The average total state expenditures for epidemiology programs (n=26) were \$8,849,857 and the average expenditure per person was \$2.22. The latter statistic ranged from \$0.80 in the Midwest region to \$3.36 in the South region. Table 1 shows that for the 27 responding states and territories, a majority of epidemiologic activities funding came from federal sources (Q4)*.

Table 1. Funding sources for Health Departments epidemiology activities (%) (N=27)	
Federal Funds	61.27
State Funds	36.57
Other Funds	2.16

Figure 1 presents the capacity levels by program areas with responses grouped into two categories (the bottom two and upper two response categories are grouped). Infectious and chronic disease programs were the only two programs in which more than half of the responding states reported having substantial or full capacity. “No or minimal” capacity was reported by 28.6% of respondents in environmental health, 53.7% in occupational health, and 65.1% in oral health.

* Questions may be found in Appendix A and frequency of responses for a specific question in Appendix B.

Figure 1: Capacity Level of Epidemiology and Surveillance Programs within State and Territorial Health Departments



Respondents were asked to provide the number of employees working as epidemiologists by program and level of training (Q6a). 1,366 persons work as epidemiologists in all program areas combined. 47.7% (652/1366) of these work in infectious disease. Less than 50 employees nationwide work in each of the areas of injury, occupational health, or oral health in state health departments.

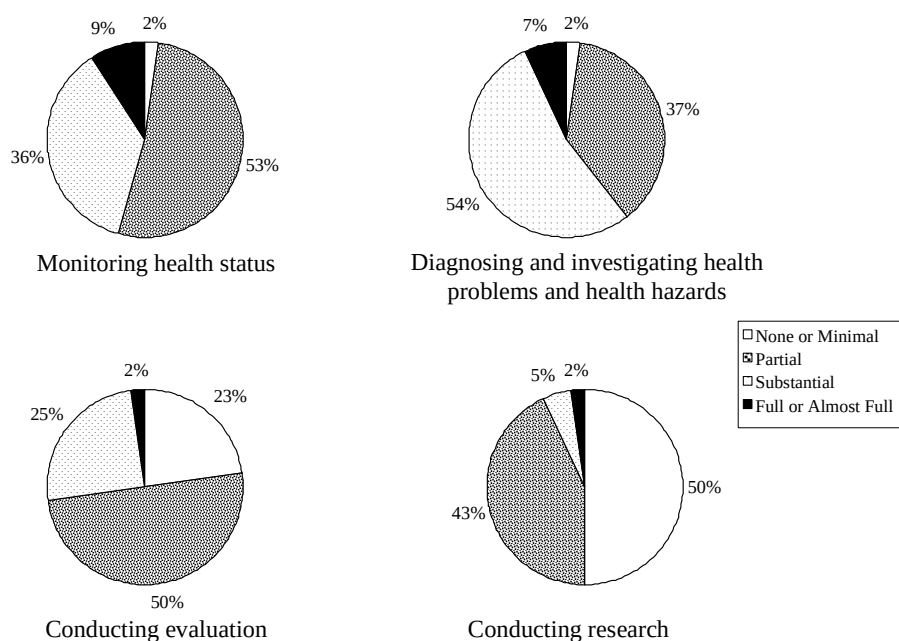
28.6% of the epidemiologists had doctoral level training; 40.0% had masters level training, 18.4% had bachelor level training and 13% had other types of training. The region with the greatest percentage of doctoral level epidemiologists was the West (35.9% or 89/248). The region with the smallest percentage of doctoral level epidemiologists (15.9%) and the highest percentage of epidemiologists with other types of training (28.4%) was the Territories. Of the 1,366 epidemiologists, 57.7% (n=787) had formal training in epidemiology (Q6b).

The median salary range was highest for MDs, and the ranking of median salary range by degree from doctoral to bachelor and other (Q6d). Salaries varied by region with no apparent trend: the highest median salary range for MDs was in the South, for PhDs in the Midwest, and for Masters level in the Northeast.

As shown in Figure 2 below, 61% of respondents reported having substantial, almost full, or full capacity to diagnose and investigate health problems and hazards and 45% reported having

substantial, almost full, or full capacity to monitor health status. Capacity to conduct evaluation and conduct research was considerably less (Q7).

Figure 2. General State Health Department Capacity and Evaluation



Infectious Disease Capacity Questionnaire

Essential Service 1: Monitor Health Status to Identify Community Health Problems

There were three indicators for this Essential Service: providing surveillance of reports of disease and conditions, providing expanded scope and capability of state health department epidemiology surveillance systems, and conducting and supporting local initiatives that periodically monitor health status. Most states and territories (72%) reported that they have “full” or “almost full” capacity to monitor all diseases and conditions placed under the National Notifiable Disease Surveillance System (NNDSS) (Q23). Less than 25% of states and territories reported that they have “full” or “almost full” capacity to require health care providers to report infectious disease conditions not included in NNDSS (Q25).

Question 26 queried both access to and surveillance use of 24 different data systems. Access to ambulatory/emergency room systems was reported by 38.6%, to emergency medical service systems by 34.9%, to Poison control systems by 34.9%, to antimicrobial resistance systems by 60.5%, to Medicaid systems by 50%, and to CHIP systems by 23.4%. Use of these systems for surveillance was even less, although it correlated with access. 18.6% of states and territories reported that they have “full” or “almost full” capacity for routine analysis and reporting of data from any of the surveillance databases (*Q26a*).

Regarding written protocols for detection, investigation and response to emergencies, 51.2% reported substantial, almost full, or full capacity for bioterrorism events, compared to 52.5% for radiologic events and 54.7% for natural disasters (*Q28*). Less than 10% of states and territories reported having “full” or “almost full” capacity to maintain surveillance systems for health outcomes related to emergencies including bioterrorism events, radiologic events, environmental/other hazardous substances, explosions, natural disasters and injuries (*Q29*).

53.5% of the states and territories reported substantial, almost full, or full capacity in infectious disease epidemiology to monitor the health status of the population (*Q31*).

Essential Service 2: Diagnose and Investigate Health Problems and Health Hazards

The indicators for Essential Service 2 include providing epidemiologic response to disease outbreaks or crisis incidents and conducting epidemiologic investigations, surveys and studies that are directed at defining or identifying specified public health problems. 61.9% of respondents reported that they had “full” or “almost full” capacity to have initiated or participated in epidemiologic investigations in the past year (*Q33*). For outbreaks not investigated, the most frequently reported factors limiting ability were delayed notification of case reports (95.2%), limited staff (78.6%), competing priorities for use of public health resources (73.8%), jurisdictional issues (40.5%), and laboratory capacity (31.0%) (*Q34*). 63.6% of the states and territories reporting having substantial, almost full, or full [adequate] capacity in infectious disease epidemiology [in general] to diagnose and investigate problems and health hazards (*Q40*).

Essential Services 3 through 10:

The table below summarizes results for the remaining eight essential services. Appendix A provides exact wording of each question, and Appendix B provides additional details concerning the tabulation of responses to a particular question.

Table 2. Summary Results for Essential Services 3 through 10				
Essential Service	Indicator	Question	Capacity	
			None or partial (%)	Substantial, full or almost full (%)
Inform, educate, and empower people about health issues	3A	43: Does ID epi support efforts to inform of status of epi issues	15.9	84.1
	3B	47: Does ID epi use non-mass media venues to inform public	48.8	51.2
Mobilize partnerships	4A	48: Does ID epi have effective relationships with non-ID epis	43.2	56.8
	4C	56: Does ID epi collaborate with community groups	55.8	44.2
Develop plans for individual and community health	5A	61: Written protocol for epi investigations	45.5	54.5
	5B	64: Are epis involved in selection of data to monitor agency objectives	37.2	62.8
	5B	65: Does agency use sentinel surveillance or 2° surveillance to monitor health of high interest groups	62.8	37.2
Enforce laws and regulations	6A	68: Are reported cases reviewed to ensure meet case definition	18.2	81.8
	6B	70: Do ID epi routinely assist in development of legislation and regulations	34.1	65.9
	6B	71: Do epis have opportunity to suggest revisions to statutes	25.0	75.0

Table 2. cont.				
Link people to needed personal health services	7A	73 (part 4): Do ID epis evaluate delivery service programs	79.6	20.4
Assure competent workforce	8A	76: Does agency have training for ID epis	61.4	38.6
	8B	82: Is there requirement for ID epis to obtain continuing education	95.4	4.6
	8C	86: Does agency provide ID epis training in cultural competency	80.9	19.6
Evaluate personal and population-based services	9A	87: Does agency have capacity in ID epi to evaluate activities	79.1	20.9
	9A	88: Does ID epi evaluate surveillance systems	75.0	25.0
	9B	93: Are QA surveillance problems monitored over time	77.3	22.7
	9B	97: Does ID epi develop annual reports	74.4	25.6
Research for solutions to health problems	10A	98: Does ID epi conduct research	79.5	20.5
	10B	106: Does ID epi apply research to public health practice	25.0	75.0

Two additional tables are displayed below for questions that were not structured in the none/partial/substantial/almost full/full capacity response format. These results concern Essential Service 4 (Question 52) and Essential Service 10 (Question 105), and they are displayed below, in addition to being part of Appendix B, because of their importance to the overall interpretation of the results.

Table 3. (Question 52) State HD ID epidemiology personnel ongoing collaboration to improve epidemiology, surveillance, response, investigation and special studies

	N	%
Academic epidemiologists	30	68.18
Universities	34	77.27
HMO medical directors	10	22.73
Local medical Society	20	45.45
Infectious Disease clinicians	37	84.09
Infection control practitioners	41	93.18
Sentinel Physicians	34	77.27
State medical society	33	75.00
Local and regional medical examiners and coroners	26	59.09
Local and regional hospitals	36	81.82
Independent laboratories	25	56.82
Other state agencies	35	79.55
Private medical insurance companies	7	15.91
Peer review organizations	11	25.00
US military hospitals and bases, and VA	26	59.09
Other	9	20.45

Table 4. (Question 105) Factors limiting State Health Departments ability to conduct studies, research, cost benefit analysis or analytic studies

	Epidemiology Studies N (%)	Epidemiologic research N (%)	Cost benefit analysis N (%)	Analytic studies N (%)
Lack of expertise	6 (13.64)	8 (18.18)	28 (63.64)	6 (13.95)
Difficulty funding controls	8 (18.18)	5 (11.36)	4 (9.09)	9 (20.93)
Too few cases to have a meaningful study	23 (52.27)	13 (29.55)	9 (20.45)	16 (37.21)
Lack of epidemiology staff	30 (68.18)	31 (70.45)	28 (63.64)	28 (65.12)
Too many competing priorities	38 (86.36)	38 (86.36)	35 (79.55)	37 (86.05)
Not included in the job description	1 (2.33)	8 (18.18)	10 (22.73)	6 (14.29)
Insufficient support	18 (40.91)	20 (45.45)	21 (47.73)	21 (48.84)
Lack of resources	33 (75.00)	35 (79.55)	34 (77.27)	34 (79.07)
Other	1 (2.27)	2 (4.55)	1 (2.27)	0 (0.0)

DISCUSSION

The Epidemiology Capacity Assessment was conducted between November 2001 and April 2002, and it was self-administered primarily by State Epidemiologists. This survey represents the first comprehensive nationwide assessment of core epidemiology infrastructure in the public health system ever performed. The timing of the survey was fortuitous coming as it did just prior to the award of new bioterrorism grant funding to every state. This baseline assessment of epidemiology infrastructure will be invaluable in evaluating the impact of future funding on building and improving epidemiology capacity nationwide.

The ECA was designed to evaluate epidemiology capacity within the context of the ten essential public health services. This survey design is in keeping with the Healthy People 2010 Objective 23-14 which calls for an “increase in the proportion of Tribal, State and local health agencies that provide or assure comprehensive epidemiology services to support the essential public health services.” The use of the ten essential services as the foundation of public health capacity assessments has become more commonplace and affords greater ease of interpretation when comparing across different areas of public health. Other entities such as the Association of State and Territorial Health Officials⁷, the National Association of County and City Health Officials, and the National Public Health Performance Standards Program⁸ promote the use of the ten essential service methodology. In future surveys it may be useful to also correlate a given state’s assessment with more objective measures of epidemiology capacity such as infectious disease incidence or costs associated with hospitalization for specific chronic diseases.

The ECA survey found that federal expenditures for epidemiology and surveillance programs in the states were almost twice that of state support with federal expenditures likely to increase given new bioterrorism funding and state support likely to fall in the face of their growing budgetary shortfalls. There were very large regional variations in per person expenditures for epidemiology programs, which are reflected in the significant disparities seen amongst states in almost all areas of epidemiology capacity. The majority of states reported having greater capacity in infectious disease than all other program areas of epidemiology and surveillance.

This is to be expected given public health's long historic tradition of working in communicable diseases and recent funding initiatives like epidemiology and laboratory capacity and emerging infections programs. Significantly, only half of all state reported having substantial or full capacity in chronic disease epidemiology and most states characterize their capacity as low (i.e. none, minimal or partial) in all other major areas of epidemiology capacity including environmental health, maternal and child health, injury, and occupational epidemiology. Not surprising is that only 25% of states reported having significant capacity to conduct programmatic evaluation in these same public health areas.

In its 2002 report, the Institute of Medicine (IOM) commented, "an adequately sized and appropriately trained workforce performing competently is an essential element of the public health infrastructure"⁴. The ECA survey found that most state and territorial epidemiologists think they have insufficient staff and resources. A 1992 survey of state and territorial epidemiologists found there were approximately 1,758 full-time equivalent positions engaged in infectious and non-infectious disease surveillance⁹. Although there were methodological differences between the 1992 survey and the CSTE assessment, the estimated number of epidemiologists for each is relatively close and reflects little, if any, growth in epidemiology personnel over the ten-year span separating the two surveys. This lack of workforce growth has occurred despite the significant expansion in the scope of responsibilities for epidemiology over this same period of time. Over 40% of the state's epidemiology workforce lacks formal academic training in epidemiology and only a small minority of states systematically engages in any type of research and publication activities.

The epidemiology workforce must be able to respond in a timely manner to a wide array of health problems. The complex and large issues that confront infectious disease epidemiologists in states include, but are not limited to, surveillance for West Nile virus infections; analyzing trends in hepatitis C infection; monitoring changes in the prevalence of antibiotic resistance to multiple organisms, and preparing for either a bioterrorist attack or pandemic influenza. Although most states reported high level capacity for monitoring nationally notifiable diseases, very few appear to have surveillance systems that include emergency medical services,

emergency departments or have the capacity to adequately monitor non-notifiable conditions or pathogens with bioweapons potential. The assessment did not gather information about microbiology laboratory capacity, but it did find that many outbreaks were not investigated because of delays in notification. While this might be attributed to shortcomings of surveillance systems, it might also be indicative of shortcomings in diagnostic laboratory capacity (e.g. PCR technology for pertussis or viral gastroenteritis) that could significantly delay or preclude disease reporting.

In the past five years public health leaders have articulated the need to reduce racial disparities in disease incidence. Unfortunately, one finding of the assessment was that state health agencies infrequently provide training to infectious disease epidemiologists in cultural competency. Furthermore, the Medicaid, CHIP, State household surveys, Bureau of Labor statistics, and PRAMS data bases were each used for surveillance by less than 30% of respondents. These databases, however, may help design prevention efforts that address health problems of medically indigent minority populations.

The Ten Essential Services allow health departments to progress with greater clarity of purpose and uniformity for state public health capacities and functions. The list of services was not designed specifically for infectious disease activities; instead, these are services that should be provided by public health agencies. Some of the services, i.e., numbers 1 and 2, are more directly applicable to the work of infectious disease epidemiologists than others, e.g. 7, 8, and 9. The Institute of Medicine suggests that state health departments should facilitate the execution of the Essential Public Health Services by directly carrying them out or by supporting the efforts of local public health departments⁴. According to this assessment, epidemiology programs in state and territorial health departments are not able to fully provide the Ten Essential Services.

RECOMMENDATIONS

- States and territories need increased epidemiology capacity now: they need more highly trained epidemiologists in greater numbers to control and prevent common, endemic diseases as well as to respond to new and emerging health problems, health hazards, and outbreaks. Due to severe budgetary crises in states and territories, funding for increased capacity must come from the federal government.
- The epidemiology capacity within state and territorial health departments should be assessed periodically to monitor the progress in building epidemiology capacity across the nation.
- The measurement of epidemiology capacity in state and territorial health agencies should include both objective and subjective tools that should remain relatively constant so that trends can be detected.
- Epidemiology capacity assessments should be used to allocate resources in health departments and to develop priorities and policy for building and maintaining public health infrastructure.
- There should be standards established for states' epidemiology capacity. Large variations seen in this assessment for yearly and per person expenditures are reflected in significant differences in epidemiology capacity from state to state.
- Given the relative paucity of trained epidemiologists outside the infectious disease area, there needs to be special emphasis placed on increasing the number of trained epidemiologists in program areas such as environmental health, maternal child health, injury, and occupational epidemiology.
- This survey indicates significant deficiencies in infectious disease and all other areas of epidemiology infrastructure. As such, there needs to be much greater advocacy and awareness of the essential role of epidemiology in the public health system.

REFERENCES

1. IOM. National Academy of Science, Institute of Medicine. *The Future of Public Health*. Washington, DC; National Academy Press. 1988.
2. Scutchfield, F.D., Beversdorf, C.A., Hiltabiddle, S.E. and Violante, T. *A Survey of State Health Department Compliance with the Recommendations of the Institution of Medicine Report, The Future of Public Health*. Journal of Public Health Policy. 1997;10(88-94),.
3. HHS. U.S. Department of Health and Human Services. HHS Fact Sheet: *Bioterror funding provides blueprint to build a strong new public health infrastructure*. January 2002.
4. IOM. National Academy of Science, Institute of Medicine. *The Future of the Public's Health in the 21st Century*. 2002, Draft.
5. HHS. U.S. Department of Health and Human Services. Healthy People 2010. 2nd ed. With *Understanding and Improving Health and Objectives for Improving Health*. 2 vols. Washington, DC: U.S. Government Printing Office. November 2000.
6. Brown, W. *Epidemiologic Capacity of State Health Agencies: A Guide for Assessment. Final Report*. CSTE. 1998.
7. Bender, K., Landrum L.B., and Bryan J.L. *The role of states in ensuring essential public health services: development of state-level performance measures*. J Public Health Management Practice. 2000; 6(5): 26-30.
8. Corso, L.C., Wiesner P.J., Halverson, P.K., and Brown C.K. *Using the essential services as a foundation for performance measurement and assessment of local public health systems*. J Public Health Management Practice. 2000; 6(5): 88-92.
9. Osterholm, M.T., Birkhead, G.S., and Meriwether, R.A. *Impediments to Public Health Surveillance in the 1990s: The Lack of Resources and the Need for Priorities*. J Public Health Management Practice. 1996; 2(4), 11-15.

APPENDIX A

CSTE Epidemiology Capacity Assessment Tool



Council of State and Territorial Epidemiologists

CSTE Epidemiology Capacity Assessment Tool

BACKGROUND:

The Epidemiology Capacity Assessment (ECA) Tool was originally developed in 1997 and piloted in 10 states for the purpose of self-assessment – the .pdf version of the old tool and an associated final report may be downloaded at <http://www.cste.org/resources.htm>.

CSTE's revision of the ECA Tool was prompted by the HP 2010 Objective 23-14 – calling on the organization to provide a broad snapshot of epidemiology capacity in states to perform essential public health services, including monitoring health status, diagnosing and investigating health problems and health hazards, and conducting evaluation and research.

In January 2001, an advisory group was organized under the charge of the CSTE Executive Committee to begin the revision process. The current questionnaire is one of several modules developed. CSTE will be implementing additional epidemiology capacity assessment questionnaires in Chronic Disease, Maternal and Child Health, Environmental Health, Occupational Health, and Injury Control in the near future, and as resources permit.

Your state's information is crucial to the success of this important national initiative, and will provide policymakers, and federal and state partners the information they need about the status of epidemiology capacity in the Nation's health departments. More specifically, the information submitted by your state will be used to sketch out regional and national trends in epidemiology capacity, and findings will be shared with all participating states. However, CSTE will not release state-specific information in any reports unless otherwise approved by the state(s).

For more information contact:

Shah Roohi sroohi@cste.org or LaKesha Birdwell lbirdwell@cste.org

Ph: (770) 458-3811 - Fax: (770) 458-8516



INSTRUCTIONS:

This assessment is comprised of two parts. Part I consists of 22 questions and focuses on the agency's overall capacity in epidemiology. Part II contains 86 questions, and assesses epidemiology capacity in infectious disease and emergency management.

Questionnaire respondents may include the State Epidemiologist and/or delegate(s), in addition to other agency epidemiologists when appropriate.

QUESTIONNAIRE DUE DATE IS ON OR BEFORE DECEMBER 3, 2001.

Please submit one fully completed questionnaire for your state by email, fax or regular mail to:

**Shah Roohi or LaKesha Birdwell
CSTE National Office
2872 Woodcock Boulevard, Suite 303
Atlanta, Georgia 30341**

**Email: sroohi@cste.org or lbirdwell@cste.org
Fax: (770) 458-8516**

Answer every question by checking off the choice that best match your agency's situation. Enter additional text to explain your answers where needed. If you select "Other," please specify your response in the space provided.

Most questions use a four-point scale to assess the overall extent to which the health agency meets the specified standards. PLEASE SELECT ONLY ONE RESPONSE CHOICE UNLESS OTHERWISE INDICATED. Response choices include:

Fully or almost fully	Between 75 and 100 percent of the activity or resource described within the question is met.
Substantially	Between 50 and 75 percent of the activity or resource described within the question is met.
Partially	Between 50 and 25 percent of the activity or resource described within the question is met.
Not at all or minimally	Less than 25% of the activity or resource described within the question is met.

According to Last (*A Dictionary of Epidemiology*, 4th Ed., 2001), an Epidemiologist is defined as "an investigator who studies the occurrence of disease or other health related conditions or events in defined populations. The control of disease is often also considered to be a task for the epidemiologist." The discipline of Epidemiology is defined as the "study of the distribution and determinants of health related states or events in specified populations, and the application of this study to control of health problems. "Study" includes surveillance, observation, hypothesis testing, analytic research, and experiments. "Distribution" refers to analysis by time, place, and classes of behavioral factors that influence health. "Determinants" are all the physical, biological, social, cultural, and behavioral factors that influence health. "Health related states and events" include diseases, causes of death, behaviors such as use of tobacco, reactions to preventative regimens, and provisions and use of health services. "Specified populations" are those with identifiable characteristics such as precisely defined numbers. "Applications to control..." makes explicit the aim of epidemiology—to promote, protect, and restore health."

For more information contact:

Shah Roohi sroohi@cste.org or LaKesha Birdwell lbirdwell@cste.org
Ph: (770) 458-3811 - Fax: (770) 458-8516



Primary respondent's contact information:	
First name	
Last name	
Degree(s)	
Title	
Agency	
Address	
Address	
City	
State	
Zip	
Telephone	
Fax	
Email	

PART I - Core questionnaire (include names and program titles of other contributing respondents below)	
Name	Program Title
PART II - Infectious Disease Questionnaire (include names and program titles of other contributing respondents below)	
Name	Program Title

PART I – Core questionnaire - PRINT CLEARLY

Important – Please consult other agency and program epidemiologists for questions pertaining to domains not under your area of responsibility

1. What is the total population of your State Health Department's (HD) area of responsibility? (Please specify the year for the population estimate.)

Population _____ Year _____

2. What percentage of the total population is served by the existing epidemiologic capacity of your State HD?

Percentage _____

3. What is the per capita expenditure for the current epidemiology capacity at your State HD?

Total epidemiology expenditure \$ _____
divided by total population served _____
= \$ _____ per person

4. What are the funding sources for your HD's epidemiology activities? (Check all that apply)

☐ Federal funds Specify percentage? _____
☐ State funds Specify percentage? _____
☐ Other _____ Specify percentage? _____

5. How is epidemiology organized in your State HD? (Check all that apply)

☐ Organized as a bureau, division, office, section or unit
☐ Individual epidemiologists are housed within specific programs
☐ Individual epidemiologists are deployed throughout the state to serve regions/districts/counties
☐ Other _____

6. For which of the following areas does your State HD have an epidemiology and surveillance program? (Check all that apply)

Bioterrorism / emergency management	Chronic disease	Environmental health	Infectious disease
☐ Not at all or minimally	☐ Not at all or minimally	☐ Not at all or minimally	☐ Not at all or minimally
☐ Partially	☐ Partially	☐ Partially	☐ Partially
☐ Substantially	☐ Substantially	☐ Substantially	☐ Substantially
☐ Fully or almost fully	☐ Fully or almost fully	☐ Fully or almost fully	☐ Fully or almost fully
Injury	Maternal and child health	Occupational health	Oral health
☐ Not at all or minimally	☐ Not at all or minimally	☐ Not at all or minimally	☐ Not at all or minimally
☐ Partially	☐ Partially	☐ Partially	☐ Partially
☐ Substantially	☐ Substantially	☐ Substantially	☐ Substantially
☐ Fully or almost fully	☐ Fully or almost fully	☐ Fully or almost fully	☐ Fully or almost fully
Other epidemiology and surveillance programs:			

6a. Describe the number of employees working as epidemiologists in the following areas in your State HD. List all employees by highest degree. Describe half-time employees as ½.

	Bioterrorism / emergency management	Chronic disease	Environmental health	Infectious disease
MD				
DDS				
DVM				
DrPh, PhD, other doctoral				
MPH, MSPH, other master				
BA, BS, BSN, other bachelor				
Disease Intervention Specialists				
Other:				
	Injury	Maternal and child health	Occupational health	Oral health
MD				
DDS				
DVM				
DrPh, PhD, other doctoral				
MPH, MSPH, other master				
BA, BS, BSN, other bachelor				
Disease Intervention Specialists				
Other:				
Other epidemiology and surveillance programs:				

6b. Of the above listed employees, how many have formal training in epidemiology (i.e. MPH, PhD, DrPH, EIS, PHPS, or other widely recognized training programs in epidemiology)?

	Bioterrorism / emergency management	Chronic disease	Environmental health	Infectious disease
Number of trained employees (Enter 0 for none)				
	Injury	Maternal and child health	Occupational health	Oral health
Number of trained employees (Enter 0 for none)				
Other epidemiology and surveillance programs: _____				

6c. Describe the number for the following in your health agency. (Enter 0 for none)

	Number
EIS Officers assigned to your health agency	
EIS <u>Graduates</u> employed in your health agency	
EIS <u>Graduates</u> assigned to your state by CDC	
Temporary/contract epidemiology staff	
Graduate level epidemiology students conducting projects and/or internships	

6d. Describe the salary scale for the epidemiologists working in your health department:

Training	Salary scale
MD	From \$ To \$
DDS	From \$ To \$
DVM	From \$ To \$
PhD, DrPh, other doctoral	From \$ To \$
MPH, MSPH, other Master	From \$ To \$
BA, BS, BSN, other bachelor	From \$ To \$
Disease Intervention Specialists	From \$ To \$
Other:	From \$ To \$

7. In general, does the State HD have adequate capacity in the following across all program areas?

Monitoring health status	Diagnosing and investigating health problems and health hazards	Conducting evaluation	Conducting research
☐ Not at all or minimally	☐ Not at all or minimally	☐ Not at all or minimally	☐ Not at all or minimally
☐ Partially	☐ Partially	☐ Partially	☐ Partially
☐ Substantially	☐ Substantially	☐ Substantially	☐ Substantially
☐ Fully or almost fully	☐ Fully or almost fully	☐ Fully or almost fully	☐ Fully or almost fully

8. In general, do State HD epidemiology personnel have adequate capacity or support in the following across all program areas?

	Not at all or minimally	Partially	Substantially	Fully or almost fully
Computer hardware platform is consistent with needs	☐	☐	☐	☐
Hardware is replaced at least every 3 years	☐	☐	☐	☐
Access to computer technical support adequate	☐	☐	☐	☐
Generally able to update software when needed	☐	☐	☐	☐
Adequate office space available	☐	☐	☐	☐
Adequate clerical help available	☐	☐	☐	☐
Grant writing support available	☐	☐	☐	☐
Budgeting / fiscal management support adequate	☐	☐	☐	☐
Contracts and grant management support adequate	☐	☐	☐	☐
Support for dealing with personnel issues adequate	☐	☐	☐	☐
Legislation monitoring and drafting support adequate	☐	☐	☐	☐
Legal consultation adequate	☐	☐	☐	☐
Support for writing policies and procedures adequate	☐	☐	☐	☐
Strategic and annual planning support adequate	☐	☐	☐	☐

9. Do State HD epidemiology personnel have access to the recent versions (i.e. no older than 3 years) of the following types of software? (Check all that apply)

- ☐ General office software packages to compose letters, develop spreadsheets, prepare presentations, etc.
- ☐ Reference management software (Endnote, Reference Manager, etc.)
- ☐ Data conversion software (DBMSCOPY, etc.)
- ☐ Database management software (Access, ORACLE, etc.)
- ☐ Qualitative data management software (SPSS, etc.)
- ☐ Statistical analysis (SAS, etc.)
- ☐ GIS software
- ☐ Internet browser
- ☐ Email software

10. What is the computer desktop platform used by most of the State HD epidemiology personnel? (Check all that apply)

- ☐ Windows 95/98/NT/2000
- ☐ Mac
- ☐ Unix
- ☐ Linux
- ☐ Sun/Solaris
- ☐ Other _____

11. What is the Internet browser currently used by State HD epidemiology personnel? (Check all that apply)

- ☐ Internet Explorer 4.0 or higher
- ☐ Netscape 4.0 or higher
- ☐ Other _____

12. How do State HD epidemiology personnel access Internet? (Check all that apply)

- ☐ LAN/network
- ☐ Dial-up

13. Does the State HD have the capability for web-based data reporting?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

13a. If so, please list departments and programs using web-based reporting:

13b. If not, are there plans for developing a web-based reporting system? Please explain:

14. Do epidemiology personnel have adequate access to medical libraries and reference material?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

15. Who in the State HD primarily leads the organizational/agency agenda for public health epidemiology? (Check all that apply)

- ☐ State Epidemiologist
- ☐ Program epidemiologists
- ☐ State Health officer
- ☐ Assistant State Health Officer
- ☐ Senior department manager
- ☐ Other _____

16. Is there a written organizational mission statement of the purpose of your State HD's epidemiology activities?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

17. Does the State HD have an organizational plan or charter to guide all epidemiology activities within the agency? If no, skip sub-question.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

17a. Is it coordinated among all related programs?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

18. Does the State HD have a data privacy/confidentiality officer (or someone in a similar function)?

☐ No ☐ Yes

19. Does the State HD have an Information Systems Security Officer?

☐ No ☐ Yes

20. Does the State HD have written policies regarding any of the following? (Check all that apply)

- ☐ Information privacy
- ☐ Information security
- ☐ Release of data
- ☐ Interorganizational sharing of data
- ☐ None of the above

21. Are data shared across agency programs? If no, skip sub-questions.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

21a. Does this include identifiable data? If no, skip sub-question.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

21b. Which of the following guide the sharing of research level/confidential data within your agency?

- ☐ Institutional Review Board
- ☐ Data review board
- ☐ Other _____

22. Are data shared with outside organizations? If no, skip sub-questions.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

22a. Which of the following do you share data with?

- ☐ Local/district health departments
- ☐ Hospitals
- ☐ Community-based agencies
- ☐ Other _____

22b. Explain the scope of data sharing:

- ☐ Aggregate or statistical reports
- ☐ Confidential or research data
- ☐ Other _____

22c. Which of the following guide the sharing of research level/confidential data between your agency and outside organizations?

- ☐ Institutional Review Board
- ☐ Data review board
- ☐ Other _____

PART II - Infectious Disease (ID) Questionnaire – PRINT CLEARLY

Important – Please consult other agency and program epidemiologists for questions pertaining to domains not under your area of responsibility

ESSENTIAL SERVICE #1	Monitor Health Status to Identify Community Health Problems
INDICATOR 1a:	Provide Surveillance of Reports of Diseases and Conditions to Routinely Monitor Population Health Status
INDICATOR 1b:	Provide Expanded Scope and Capability of State HD Epidemiology Surveillance Systems
INDICATOR 1c:	Conduct or Support Local Initiatives that Periodically Monitor Public Health Status

INDICATOR 1A: PROVIDE SURVEILLANCE OF REPORTS OF DISEASES AND CONDITIONS TO ROUTINELY MONITOR POPULATION HEALTH STATUS

23. Do State HD ID epidemiology personnel monitor all diseases and conditions placed under the National Notifiable Disease Surveillance System (NNDSS)?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

24. Do State HD ID epidemiology personnel routinely collect data regarding race and ethnicity for cases of reportable disease among Native Americans, Hispanics, Asians, Native Hawaiians, and other “minority” subpopulations?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

25. Do State HD ID epidemiology personnel routinely require health care providers to report other infectious disease conditions that are not included in the NNDSS?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

INDICATOR 1B: PROVIDE EXPANDED SCOPE AND CAPABILITY OF STATE HD EPIDEMIOLOGY SURVEILLANCE SYSTEMS

26. Do State HD epidemiology personnel have access to surveillance data for the following (with at most a six month lag time for the most recently available data)? (Check all that apply)

Data System	Accessible to ID epidemiology Personnel	Used for Surveillance ID epidemiology Personnel
Ambulatory/ emergency room	☐ Yes	☐ Yes
Antimicrobial resistance (i.e. VRE, PIP)	☐ Yes	☐ Yes
Birth	☐ Yes	☐ Yes
Birth defects	☐ Yes	☐ Yes
BRFSS	☐ Yes	☐ Yes
Bureau of labor statistical annual survey	☐ Yes	☐ Yes
CHIP	☐ Yes	☐ Yes
Death	☐ Yes	☐ Yes
Emergency medical services	☐ Yes	☐ Yes
Fetal death	☐ Yes	☐ Yes
HIV/AIDS case registry	☐ Yes	☐ Yes
Hospital discharge	☐ Yes	☐ Yes
Immunization	☐ Yes	☐ Yes
Lead	☐ Yes	☐ Yes
Medicaid	☐ Yes	☐ Yes
National notifiable diseases database	☐ Yes	☐ Yes
Perinatal	☐ Yes	☐ Yes
Poison control	☐ Yes	☐ Yes
Population/census	☐ Yes	☐ Yes
PRAMS	☐ Yes	☐ Yes
State household surveys	☐ Yes	☐ Yes
STDs	☐ Yes	☐ Yes
Tuberculosis case registry	☐ Yes	☐ Yes
Tuberculosis lab molecular analysis registry	☐ Yes	☐ Yes
Other:	☐ Yes	☐ Yes
Other:	☐ Yes	☐ Yes
Other:	☐ Yes	☐ Yes
Other:	☐ Yes	☐ Yes
Other:	☐ Yes	☐ Yes
Other:	☐ Yes	☐ Yes
Other:	☐ Yes	☐ Yes
Other:	☐ Yes	☐ Yes
Other:	☐ Yes	☐ Yes
Other:	☐ Yes	☐ Yes

26a. Do State HD ID epidemiology personnel routinely analyze and report data from any of these databases?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

26b. Are these databases available to other agency departments/personnel within the State HD for analysis?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

26c. Can these data be accessed for review and analysis at the local level

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

26c.1. Explain mechanism:

☐ Web-based data dissemination by State HD
☐ Published data reports in hard copy
☐ Other _____

26d. Which of the following are reported to the State HD on a real time basis (i.e. via the web)?

☐ ER data
☐ Lab data
☐ Physician office reports
☐ Other: _____
☐ None of the above

26e. Does your State HD generally have the capacity to link databases for more detailed analysis?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

26f. Are tables generally published for the majority of the above listed databases? If no, skip to next sub-question.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

26f.1. If so, are these tables generally published on your agency's web site?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

26f.2. Are queries created on the web for the majority of the above listed databases?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

27. Does your State HD utilize early warning systems for detecting unusual occurrences of health outcomes? If no, skip sub-question.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

27a. Explain method:

☐ Visual
☐ Statistical
☐ Other _____

27b. Which of the following does your State HD access and review on a daily basis?

☐ Emergency department utilization
☐ Hospital admissions
☐ Ambulance runs
☐ 911 call data
☐ Data on unexplained death
☐ Syndromic surveillance
☐ Poison control centers
☐ Pharmaceutical use
☐ Veterinarian or animal based surveillance
☐ Other _____

28. Does your State HD maintain written protocols for detection, investigation and response to the following types of emergencies?

	Not at all or minimally	Partially	Substantially	Fully or almost fully
Bioterrorism events	☐	☐	☐	☐
Radiologic events	☐	☐	☐	☐
Environmental/other hazardous substances events	☐	☐	☐	☐
Explosions	☐	☐	☐	☐
Natural disasters (floods, etc)	☐	☐	☐	☐
Injuries	☐	☐	☐	☐
Other	☐	☐	☐	☐

29. Does your State HD maintain surveillance systems for health outcomes related to the following types of emergencies? If no, skip sub-question.

	Not at all or minimally	Passive system currently exists	Mechanism exists for active surveillance if an event occurs	Active surveillance
Bioterrorism events	☐	☐	☐	☐
Radiologic events	☐	☐	☐	☐
Environmental/other hazardous substances events	☐	☐	☐	☐
Explosions	☐	☐	☐	☐
Natural disasters (floods, etc)	☐	☐	☐	☐
Injuries	☐	☐	☐	☐
Other	☐	☐	☐	☐

29a. List components (check all that apply):

	Systems to monitor health events	Systems to identify changes or patterns	Systems to investigate underlying causes or factors
Bioterrorism events	☐ Yes	☐ Yes	☐ Yes
Radiologic events	☐ Yes	☐ Yes	☐ Yes
Environmental/other hazardous substances events	☐ Yes	☐ Yes	☐ Yes
Explosions	☐ Yes	☐ Yes	☐ Yes
Natural disasters (floods, etc)	☐ Yes	☐ Yes	☐ Yes
Injuries	☐ Yes	☐ Yes	☐ Yes
Other	☐ Yes	☐ Yes	☐ Yes

30. Do State HD ID epidemiology personnel conduct or support local-level assessments of the population's health needs? If no, skip sub-question.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

30a. Which datasets do these assessments include? _____

31. In general, does the State HD have adequate capacity in infectious disease epidemiology to monitor the health status of the population?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

INDICATOR 1C: CONDUCT OR SUPPORT LOCAL INITIATIVES THAT PERIODICALLY MONITOR PUBLIC HEALTH STATUS

32. Do State HD epidemiology personnel conduct or support planning and evaluation of community-based public health initiatives? If no, skip sub-question.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

32a. Which programs, conditions and datasets do these assessments include?

ESSENTIAL SERVICE #2	Diagnose and Investigate Health Problems and Health Hazards in the Community
INDICATOR 2a:	Provide Epidemiologic Response to Disease Outbreaks or Crisis Incidents
INDICATOR 2b:	Conduct of Epidemiologic Investigations, Surveys and Studies Directed at Defining or Identifying Specified Public Health Problems

INDICATOR 2A: PROVIDE EPIDEMIOLOGIC RESPONSE TO DISEASE OUTBREAKS OR CRISIS INCIDENTS

33. Has the State HD initiated or participated in any epidemiologic investigations of disease outbreaks or public health emergencies in the last year?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

33a. If no, state reason and skip to sub-questions _____

33b. If so, describe frequency per month _____

33c. Were these disease outbreaks or public health emergencies investigated promptly and in a timely manner?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

34. Of outbreaks that are not investigated, which factors limit the State HD's ability to investigate?

(Check all that apply)

- ☐ Delayed notification of case reports
- ☐ Epidemiological expertise
- ☐ Laboratory capacity
- ☐ Statistical support
- ☐ Limited staff
- ☐ Ability to pay overtime
- ☐ Travel policy constraints
- ☐ Competing priorities for use of PH resources
- ☐ Politics
- ☐ Jurisdictional issues
- ☐ Other _____

35. Is there adequate laboratory support for the State HD to promptly diagnose reportable health problems?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

36. Do trained State HD personnel conduct epidemiological follow-ups of all reported cases?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

37. Is each case that is to be followed-up on referred immediately and directly to the individual responsible for that follow-up?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

38. Is each referred case tracked to confirm appropriate, timely, and complete follow-up?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

39. If the condition is transmissible, are the majority of follow-ups initiated in time to prevent the occurrence of additional cases?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

INDICATOR 2B: CONDUCT OF EPIDEMIOLOGIC INVESTIGATIONS, SURVEYS AND STUDIES DIRECTED AT DEFINING OR IDENTIFYING SPECIFIED PUBLIC HEALTH PROBLEMS

40. In general, does the State HD have adequate capacity in infectious disease epidemiology to diagnose and investigate health problems and health hazards?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

41. Do State HD ID epidemiology personnel use epidemiological principles and methods (i.e. comparisons with last year's data; analysis by population subgroup; etc.) to determine whether an "unusual event" (i.e., an outbreak or an elevated frequency of some health event, risk factor, etc.) may be occurring in your target population?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

42. Is there an individual in the State HD responsible for initiating or alerting others to the need for an investigation or study?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

ESSENTIAL SERVICE #3	Inform, Educate and Empower People About Health Issues
INDICATOR 3a:	Communicate the Importance and Need for Epidemiologic Investigations, Surveys and Studies that Address Public Health Concerns and Issues
INDICATOR 3b:	Promote Effective Media Campaigns and Marketing Strategies Targeted to Improve Community Health Status

INDICATOR 3A: COMMUNICATE THE IMPORTANCE AND NEED FOR EPIDEMIOLOGIC INVESTIGATIONS, SURVEYS AND STUDIES THAT ADDRESS PUBLIC HEALTH CONCERNS AND ISSUES

43. Do State HD ID epidemiology personnel support efforts to keep HD administration, staff, other related agencies, health care providers, collaborators and the mass media informed of the status of public health epidemiology related issues? *(i.e. an epidemiological assessment of the situation, description of protective actions individuals and communities should take, public health interventions implemented and their assessed effectiveness)*

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

44. Are investigation reports shared with other interested parties, such as the public and mass media representatives?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

45. With whom do State HD ID epidemiology personnel share public health summary reports? (Check all that apply)

- ☐ Public Health Administration
- ☐ Medical community
- ☐ Local health departments
- ☐ Community groups
- ☐ State and area health departments
- ☐ Other Related State Agencies
- ☐ Governors Office and State Legislature
- ☐ Federal agencies
- ☐ Media
- ☐ Other _____

INDICATOR 3B: PROMOTE EFFECTIVE MEDIA CAMPAIGNS AND MARKETING STRATEGIES TARGETED TO IMPROVE COMMUNITY HEALTH STATUS

46. Do State HD ID epidemiology personnel actively cultivate relationships with the mass media representatives to promote an understanding of epidemiologic principles and practices and assure maximum exposure for public health positions and policies.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

47. Do State HD ID epidemiology personnel utilize various non-mass media venues (i.e. posters, pamphlets, videos etc.) to keep the public informed of public health interventions implemented and their assessed effectiveness?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

ESSENTIAL SERVICE #4	Mobilize Partnerships to Identify and Solve Health Problems
INDICATOR 4a:	Build Effective Partnerships Within State and Local Public Health Arena
INDICATOR 4b:	Build Effective Partnerships with Key Individuals in Related State and Federal Agencies, National Organizations, Educational Institutions, Professional Societies and Health Care Providers
INDICATOR 4c:	Build Effective Coalitions with Community-Based Agencies, Groups and Organizations

INDICATOR 4A: BUILD EFFECTIVE PARTNERSHIPS WITHIN STATE AND LOCAL PUBLIC HEALTH ARENA

48. Do State HD ID epidemiology personnel have effective working relationships with other HD program epidemiologists and personnel in other units responsible for the maintenance of NON-infectious disease data bases?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

49. Do State HD ID epidemiology personnel have effective working relationships with Local Health Directors, other community based partners, and epidemiologists?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

50. Do State HD ID epidemiology personnel support annual statewide meetings, regional training programs or other forums to foster the building of such partnerships?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

INDICATOR 4B: BUILD EFFECTIVE PARTNERSHIPS WITH KEY INDIVIDUALS IN RELATED STATE AND FEDERAL AGENCIES, NATIONAL ORGANIZATIONS, EDUCATIONAL INSTITUTIONS, PROFESSIONAL SOCIETIES AND HEALTH CARE PROVIDERS

51. Do State HD ID epidemiology personnel have access to an up-to-date list (no older than 12 months) of individuals or organizations to notify when an outbreak investigation or epidemiology study is initiated?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

52. With which of the following do State HD ID epidemiology personnel have an ongoing collaboration to improve epidemiology, surveillance, response, investigation and special studies? (Check all that apply)

- ☐ Academic epidemiologists
- ☐ Universities
- ☐ HMO medical directors
- ☐ Local Medical Society
- ☐ Infectious disease clinicians
- ☐ Infection control practitioners
- ☐ Sentinel Physicians
- ☐ State medical society
- ☐ Local and regional medical examiners and coroners
- ☐ Local and regional hospitals
- ☐ Independent laboratories
- ☐ Other state agencies
- ☐ Private medical insurance companies
- ☐ Peer review organizations
- ☐ US military hospitals and bases, and VA
- ☐ Other _____

53. Do State HD ID epidemiology personnel publish a periodic bulletin for public health audiences and outside partners (labs, ICPs, HMOs, etc.) discussing current events, health alerts, policy changes, result of recent investigations, and training opportunities?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

54. Aside from death certification, do State HD ID epidemiology personnel collaborate with medical examiners and/or coroners on any of the following? (Check all that apply)

- ☐ Epidemiology research
☐ Disease reporting
☐ Other _____
☐ None of the above

INDICATOR 4C: BUILD EFFECTIVE COALITIONS WITH COMMUNITY-BASED AGENCIES, GROUPS AND ORGANIZATIONS

55. Do State HD ID epidemiology personnel have an up-to-date list (no older than 12 months) of community partners (individuals or organizations) who share interests in supporting public health promotion and disease control interventions?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

56. Do State HD ID epidemiology personnel collaborate with community-based partners on shared projects?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

ESSENTIAL SERVICE #5	Develop Policies and Plans That Support individual and Community Health Efforts
INDICATOR 5a:	Support of Epidemiology Program Organization and Development by the State Health Department
INDICATOR 5b:	Influence of the Epidemiology Program Upon Development of other State Health Department Programs, Plans and Policies

INDICATOR 5A: SUPPORT OF EPIDEMIOLOGY PROGRAM ORGANIZATION AND DEVELOPMENT BY THE STATE HEALTH DEPARTMENT

57. Who in the State HD primarily leads the organizational agenda for infectious disease epidemiology? (Check all that apply)

- ☐ State Epidemiologist
☐ Program epidemiologists
☐ State Health officer
☐ Assistant State Health Officer
☐ Senior department manager
☐ Other _____

58. Is there a written organizational statement of the purpose of the ID epidemiology activities?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

59. Does the State HD have an organizational plan or charter to guide ID epidemiology activities within the agency?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

60. Does the State HD have a current protocol to guide case-finding, case and suspect investigation, and case and contact management?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

61. Does the State HD have a written protocol for conducting epidemiologic investigations or studies?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

62. Does the State HD have written guidelines for determining when, or the circumstances for which, an investigation or study is warranted or required?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

63. Does the State HD have a written protocol for conducting surveillance?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

INDICATOR 5B: INFLUENCE OF THE EPIDEMIOLOGY PROGRAM UPON DEVELOPMENT OF OTHER STATE HEALTH DEPARTMENT PROGRAMS, PLANS AND POLICIES

64. Are State HD epidemiologists involved in the selection of indicator data to be collected and interpreted to track progress in accomplishing the public health agency's objectives? If no, skip sub-question.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

64a. What HD entity performs this activity? _____

65. Does the State HD routinely use sentinel surveillance or second generation surveillance (including monitoring of behaviors and other factors related to health risk) to develop and monitor prevalence/incidence of factors related to health among high interest subpopulations?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

65a. Please describe: _____

66. Do State HD ID epidemiology personnel produce written reports to agency management which include data to support documented problems? If no, skip sub-question(s).

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

66a. Do these reports include cost or impact of the current or proposed policy?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

67. Are State HD ID epidemiology personnel able to respond to requests for analyzing public health policy or practice issues such as reviewing an existing policy or examining the possible need for a new policy?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

67a. If no, please describe _____

ESSENTIAL SERVICE #6	Enforce Laws and Regulations that Protect Health & Ensure Safety
-----------------------------	---

INDICATOR 6a:	Assure Compliance with All State Laws, Rules and Regulations Related to Disease Reporting, Case Follow-Up and Investigation
---------------	---

INDICATOR 6b:	Influence Development of State Statutes or Proposed Legislation
---------------	---

INDICATOR 6A: ASSURE COMPLIANCE WITH ALL STATE LAWS, RULES AND REGULATIONS RELATED TO DISEASE REPORTING, AND CASE FOLLOW-UP AND INVESTIGATION

68. Are all reported cases which State HD epidemiology personnel are responsible for reviewed to ensure that they meet the operating public health surveillance case definition?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

69. Are all reported cases which State HD epidemiology personnel are responsible for reviewed by experienced staff to identify need for follow-up?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

INDICATOR 6B: INFLUENCE DEVELOPMENT OF STATE STATUTES OR PROPOSED LEGISLATION

70. Do State HD ID epidemiology personnel routinely assist in the development or review of proposed legislation to assure the epidemiological basis of regulations and requirements?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

71. Do State HD epidemiologists have an opportunity to critique and suggest epidemiologic-based revisions to update existing state statutes?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

72. Have any recommendations coming out of interactions between epidemiologists, health department managers, and legislators influenced the enactment of epidemiologically sound statutes, rules or regulations?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

ESSENTIAL SERVICE #7 Link People to Needed Personal Health Services and Assure the Provision of Health Care When Otherwise Unavailable

INDICATOR 7a: Influence Development, Implementation and Evaluation of State Health Department Programs and Intervention Strategies

INDICATOR 7A: INFLUENCE DEVELOPMENT, IMPLEMENTATION AND EVALUATION OF STATE HEALTH DEPARTMENT PROGRAMS AND INTERVENTION STRATEGIES

73. Do State HD ID epidemiology personnel assure the provision of health care by conducting the following activities?

	Not at all or minimally	Partially	Substantially	Fully or almost fully
Collect and assemble data	☐	☐	☐	☐
Analyze data from multiple sources	☐	☐	☐	☐
Assist in program planning and implementation	☐	☐	☐	☐
Evaluate public health delivery service programs and other health interventions	☐	☐	☐	☐

74. Have these activities included sub-populations that are underserved or otherwise disadvantaged with regard to medical service access?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

ESSENTIAL SERVICE #8	Assure a Competent Public and Personal Health Care Workforce
INDICATOR 8a:	Provide Appropriate Orientation, Training and Technical Support to Assure Competency of Epidemiology Program Workforce
INDICATOR 8b:	Provide Continuing Education and Professional Development to Improve Staff Technical Expertise, Leadership Skills and Assure Overall Program Development
INDICATOR 8c:	Provide Appropriate Orientation and Training to Assure Cultural Competency of Epidemiology Program Workforce

INDICATOR 8A: PROVIDE APPROPRIATE ORIENTATION, TRAINING AND TECHNICAL SUPPORT TO ASSURE COMPETENCY OF EPIDEMIOLOGY PROGRAM WORKFORCE

75. Does the State HD have an infectious disease epidemiologist that oversees many or all infectious disease program areas?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

76. Does the State HD have training plans for ID epidemiology personnel?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

77. Which of the following subject matters are NOT covered by current State HD training courses? (Check all that apply)

- ☐ Survey technique
- ☐ Report production
- ☐ Profile development (i.e. summary of health indicators for a program or population)
- ☐ Study design
- ☐ Data collection
- ☐ Data analysis
- ☐ Data interpretation
- ☐ Data release (i.e. transaction, security, privacy, relationship of HIPAA to public health)
- ☐ Data translation
- ☐ Data presentation
- ☐ Cultural competency skills
- ☐ Leadership skills
- ☐ Other _____
- ☐ None of the above

78. Are skilled personnel available in each of the following areas to support epidemiology policies and activities in your State HD? (Check all that apply)

- ☐ Case and contact management
- ☐ Case and suspect investigation
- ☐ Case finding
- ☐ Chart abstraction
- ☐ Communication or dissemination of data
- ☐ Data entry into databases
- ☐ Data interpretation
- ☐ GIS analysis
- ☐ Grant writing
- ☐ Information Technology
- ☐ Linkage of data sets
- ☐ Needs assessment
- ☐ Program evaluation
- ☐ Qualitative methods
- ☐ Statistical analysis
- ☐ Surveillance design
- ☐ Survey design
- ☐ Surveyors
- ☐ Web site development
- ☐ None of the above

79. Are all State HD surveillance and investigation staff oriented to the protocol to guide case-finding, case and suspect investigation, and case and contact management?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

80. Are completed case investigations reviewed and evaluated by a trained epidemiologist?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

81. Do State HD epidemiology personnel follow the American College of Epidemiology's ethical principles and practices (<http://www.acepidemiology.org/policystmts/EthicsGuide.htm>) in conducting investigations and studies?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

INDICATOR 8B: PROVIDE CONTINUING EDUCATION AND PROFESSIONAL DEVELOPMENT TO IMPROVE STAFF TECHNICAL EXPERTISE, LEADERSHIP SKILLS AND ASSURE OVERALL PROGRAM DEVELOPMENT

82. Is there a job-related requirement for the State HD ID epidemiology personnel to obtain continuing education hours?

- ☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

82a. Prepare manuscripts for publication in peer review journals?

- ☐ No ☐ Yes

83. Which of the following professional development activities does the State HD promote for ID epidemiology staff? (Check all that apply)

- ☐ Library time / Journals /Text books
- ☐ In-services
- ☐ Conferences
- ☐ Training courses
- ☐ Presentations at national, regional and state meetings
- ☐ On-the-job-training
- ☐ Other _____
- ☐ None

84. Are State HD ID epidemiologists, who do not have advanced degrees in epidemiology, specifically trained in epidemiology principles and practices?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

85. Does the State HD provide or sponsor training for Local HDs/community level staff in data analysis, interpretation, and practical application?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

INDICATOR 8C: PROVIDE APPROPRIATE ORIENTATION AND TRAINING TO ASSURE CULTURAL COMPETENCY OF EPIDEMIOLOGY PROGRAM WORKFORCE

86. Do State HD ID epidemiology personnel receive any type of HD sponsored cultural competency trainings or orientation programs for dealing with routine surveillance and outbreak investigations involving racial, ethnic and culturally diverse communities?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

ESSENTIAL SERVICE #9	Evaluate Effectiveness, Accessibility, and Quality of Personal and Population-Based Services
INDICATOR 9a:	Provide Evaluation and/or Quality Assurance for Operational Aspects of the State Health Department Epidemiology Surveillance System
INDICATOR 9b:	Utilize Quality Assurance Process to Improve Performance of the State Health Department Epidemiology Program

INDICATOR 9A: PROVIDE EVALUATION AND/OR QUALITY ASSURANCE FOR OPERATIONAL ASPECTS OF THE STATE HEALTH DEPARTMENT EPIDEMIOLOGY SURVEILLANCE SYSTEM

87. In general, does the State HD have adequate capacity in infectious disease epidemiology to conduct evaluation activities?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

88. Does the State HD periodically evaluate surveillance systems for sensitivity, representativeness, and timeliness?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

89. Does the State HD periodically evaluate surveillance activities for quality assurance purposes? If no, skip sub-questions.

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

89a. Please explain methods routinely used to perform quality assurance:

89b. Do epidemiology personnel share the QA findings with others?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

90. Is the State HD able to determine and monitor under-reporting bias for improvement over time?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

91. Are efforts routinely made to improve the timeliness and completeness of reporting?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

92. Is the proportion of reported cases with initially missing information monitored over time for QA purposes?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

INDICATOR 9B: UTILIZE QUALITY ASSURANCE PROCESS TO IMPROVE PERFORMANCE OF THE STATE HEALTH DEPARTMENT EPIDEMIOLOGY PROGRAM

93. Are disease-specific estimates of QA problems (i.e. degree of under reporting, missing information on case reports, etc.) monitored for improvement over time?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

94. Generally, are efforts made to improve QA problems?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

95. For each investigation or study, regardless of the outcome, is there a written report describing the event, the investigative findings, the intervention(s) applied, and the outcomes?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

96. Is an evaluation of each investigation provided to the investigator?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

97. Do HD ID epidemiology personnel develop annual reports with an evaluation of performance measures and program objectives?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

ESSENTIAL SERVICE #10	Research for New Insights & Innovative Solutions to Health Problems
------------------------------	--

INDICATOR 10a:	Conduct or Support of Public Health Research and Development Projects by State Health Department Epidemiology Program
INDICATOR 10b:	Assure Appropriate Use of New Public Health Knowledge

INDICATOR 10A: CONDUCT OR SUPPORT OF PUBLIC HEALTH RESEARCH AND DEVELOPMENT PROJECTS BY STATE HEALTH DEPARTMENT EPIDEMIOLOGY PROGRAM

98. In general, does the State HD have adequate capacity in infectious disease epidemiology to conduct research activities?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

99. Have State HD ID epidemiology personnel conducted retrospective or prospective studies in the last 24 months?

☐ No ☐ Yes (if, so how many? ____)

100. Have State HD ID epidemiology personnel conducted community-based public health interventions stemming from epidemiological assessments of need in the last 24 months?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

101. Have State HD ID epidemiology personnel been involved in cost-benefit analysis studies in the last 24 months?

☐ No ☐ Yes (if, so how many? ____)

102. Have State HD ID epidemiology personnel conducted analytic studies in the last 24 months?

☐ No ☐ Yes (if, so how many? ____)

103. Have State HD ID epidemiology personnel published in peer reviewed journals in the last 24-months?

☐ No ☐ Yes (if, so how many? ____)

104. Have State HD ID epidemiology personnel conducted presentations at national level professional conferences in the last 24-months?

☐ No ☐ Yes (if, so how many? _____)

105. Which of the following limit the State HD's ability to conduct studies, research, cost benefit analysis or analytic studies? (Check all that apply)

Epidemiology studies	Epidemiologic research	Cost benefit analysis	Analytic studies
☐ Lack of expertise	☐ Lack of expertise	☐ Lack of expertise	☐ Lack of expertise
☐ Difficulty finding controls	☐ Difficulty finding controls	☐ Difficulty finding controls	☐ Difficulty finding controls
☐ Too few cases to have a meaningful study	☐ Too few cases to have a meaningful study	☐ Too few cases to have a meaningful study	☐ Too few cases to have a meaningful study
☐ Lack of epidemiology staff	☐ Lack of epidemiology staff	☐ Lack of epidemiology staff	☐ Lack of epidemiology staff
☐ Too many competing priorities	☐ Too many competing priorities	☐ Too many competing priorities	☐ Too many competing priorities
☐ Not included in the job description	☐ Not included in the job description	☐ Not included in the job description	☐ Not included in the job description
☐ Insufficient support	☐ Insufficient support	☐ Insufficient support	☐ Insufficient support
☐ Lack of resources	☐ Lack of resources	☐ Lack of resources	☐ Lack of resources
☐ Other	☐ Other	☐ Other	☐ Other
☐ None	☐ None	☐ None	☐ None

INDICATOR 10B: ASSURE APPROPRIATE USE OF NEW PUBLIC HEALTH KNOWLEDGE

106. Do State HD ID epidemiology personnel routinely apply research findings to public health practice?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

107. Do State HD ID epidemiology personnel actively facilitate the use of new public health knowledge to improve program development and administration?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

108. Do State HD ID epidemiology personnel actively assist local public health entities to use new scientific knowledge?

☐ Not at all or minimally ☐ Partially ☐ Substantially ☐ Fully or almost fully

Thank you for completing this questionnaire - the information submitted by your state will be used to sketch out regional and national trends in epidemiology capacity, and findings will be shared with all participating agencies. However, CSTE will not release state-specific information in any reports unless otherwise approved by the state(s).

Your comments: _____

APPENDIX B

Frequencies for the ECA Tool

PART I – Core questionnaire

1. What is the total population of your State Health Department's (HD) area of responsibility? (Please specify the year for the population estimate.) (N=44)

	Minimum	Maximum	Median	Mean
Population	57,291	21,000,000	3,381,804	4,660,401

2. What percentage of the total population is served by the existing epidemiologic capacity of your State HD? (N=40)

	Minimum	Maximum	Median	Mean
% population	50	100	100	97.7

3. What is the per capita expenditure for the current epidemiology capacity at your State HD?

	Minimum	Maximum	Median	Mean
Total Epidemiology Expenditure (N=26)	35,518	73,732,442	2,700,000	8,849,858
Per Person Expenditure (N=27)	0.04	23.43	0.70	2.22

Regional Comparison:

	Average Total Epidemiology Expenditure	Average Per Person Expenditure
National	\$ 8,849,857	\$ 2.22
Northeast Region	\$ 3,843,842	\$ 1.86
Midwest Region	\$ 5,895,660	\$ 0.80
South Region	\$ 13,849,315	\$ 3.36
West Region	\$ 6,572,924	\$ 2.04
Territories	\$ 35,518	\$ 0.64

4. What are the funding sources for your HD's epidemiology activities? (Check all that apply) (N=43)

	Yes N (%)	Minimum	Maximum	Median	Mean
Federal Funds	42 (97.67)	2.00	99.60	64.5	61.27
State Funds	42 (97.67)	0.04	100	34.00	36.57
Other Funds (N=41)	8 (14.29)	2.00	40.00	9.00	14.58

The regions were divided as follows **Northeast**: CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest**: IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South**: AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West**: AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories**: ASM, FSM, Guam, PR, and VI (N=3).

Regional Comparison:

	Average Federal Funds %	Average State Funds %	Average Other Funds %
National	61.27	36.57	2.16
Northeast Region	67.80	32.20	---
Midwest Region	58.00	42.00	---
South Region	60.73	36.46	2.81
West Region	64.37	29.86	5.77
Territories*	32.33	35.00	0.67

* All Territories did not report full funding sources.

5. How is epidemiology organized in your State HD? (Check all that apply) (N=43)

	N	%
Organized as a bureau, division, office, section or unit	33	76.74
Individual epidemiologists are housed within specific programs	32	74.42
Individual epidemiologists are deployed throughout the state to serve regions/districts/counties	12	27.91
Other (N=42)	42	100.00

6. For which of the following areas does your State HD have an epidemiology and surveillance program? (Check all that apply)

	None or minimal N (%)	Partial N (%)	Substantial N (%)	Almost Full or Full N(%)
Bioterrorism (N=43)	3 (7.0)	21 (48.8)	10 (23.3)	9 (20.9)
Chronic Disease (N=44)	4 (9.1)	17 (38.6)	14 (31.8)	9 (20.5)
Environmental Health (N=42)	12 (28.6)	15 (35.7)	10 (23.8)	5 (11.9)
Infectious Disease (N=44)	---	3 (6.8)	14 (31.8)	27 (61.4)
Injury (N=41)	8 (19.5)	23 (56.1)	7 (17.1)	3 (7.3)
Maternal and Child Health (N=42)	3 (7.1)	24 (57.1)	13 (31.0)	2 (4.8)
Occupational Health (N=41)	22 (53.7)	10 (24.4)	7 (17.1)	2 (4.9)
Oral Health (N=43)	28 (65.1)	11 (25.6)	3 (7.0)	1 (2.3)

The regions were divided as follows **Northeast:** CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest:** IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South:** AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West:** AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories:** ASM, FSM, Guam, PR, and VI (N=3).

6a. Describe the number of employees working as epidemiologists in the following areas in your State HD. List all employees by highest degree. Describe half-time employees as ½. *

TOTALS BY PROGRAM	BT	CD	EH	ID	INJ	MCH	OcH	OrH	TOTAL
MD	24	25	13	75	2	12	2	---	152
DDS	---	1	---	---	---	---	---	6	7
DVM	8	3	10	35	---	1	---	2	59
DrPH, PhD, other doctoral	10	42	33	44	7	29	7	1	172
MPH, MSPH, other master	48	75	83	228	34	52	17	9	546
BA, BS, BSN, other bachelor	27	24	32	140	4	14	6	6	252
Disease Intervention Specialist	4	6	8	113	2	0	4	8	145
Other:	3	4	5	19	---	3	---	---	34
TOTAL	123	179	183	652	49	111	35	32	1366

* Total N varies for each column and row

Regional Comparisons:

	BT	CD	EH	ID	INJ	MCH	OH	OrH	Totals
National Totals									
Doctoral Level	41	72	56	153	9	42	8	9	390
Master Level	48	75	83	228	34	52	17	9	546
Bachelor Level	27	24	32	140	4	14	6	6	252
Other Level	7	10	13	132	2	3	4	8	179
Total	123	179	183	652	49	111	35	32	1366
Northeast Region									
Doctoral Level	2	11	12	33	1	5	3	0	66
Master Level	7	15	20	61	8	12	6	3	132
Bachelor Level	1	2	3	39	1	1	1	0	48
Other Level	0	0	3	42	0	0	4	0	49
Total	10	28	38	174	10	18	14	3	294
Midwest Region									
Doctoral Level	8	18	8	28	0	11	4	1	78
Master Level	18	19	5	77	3	10	5	0	136
Bachelor Level	7	0	4	48	0	0	1	0	60
Other Level	2	0	1	4	0	0	0	0	7
Total	35	37	18	157	3	21	10	1	282
South Region									
Doctoral Level	23	25	21	52	2	13	1	5	143
Master Level	10	23	38	63	15	17	1	2	168
Bachelor Level	11	8	15	32	1	3	1	1	71
Other Level	1	4	4	62	0	3	0	0	74
Total	45	59	77	209	18	36	3	8	455
West Region									
Doctoral Level	5	14	12	36	6	13	1	3	89
Master Level	12	13	15	23	8	11	3	2	86
Bachelor Level	7	10	5	17	2	7	0	1	49
Other Level	2	2	2	16	2	0	0	0	24
Total	25	39	34	92	18	31	4	6	248
Territories									
Doctoral Level	3	3	3	4	0	1	0	0	14
Master Level	2	6	6	4	0	2	2	2	24
Bachelor Level	1	4	5	5	0	3	3	4	25
Other Level	2	4	3	8	0	0	0	8	25
Total	8	17	17	21	0	6	5	14	88

The regions were divided as follows **Northeast:** CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest:** IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South:** AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West:** AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories:** ASM, FSM, Guam, PR, and VI (N=3).

6b. Of the above listed employees, how many have formal training in epidemiology (i.e. MPH, PhD, DrPH, EIS, PHPS, or other widely recognized training programs in epidemiology)?*

	BT	CD	EH	ID	INJ	MCH	OcH	OrH	TOTAL
# Trained Employees	75	122	104	347	36	62	24	18	787
# Total Employees	123	179	183	652	49	111	35	32	1366
%	60.6	68.0	56.8	53.1	74.0	55.8	68.4	54.8	57.7

* Total N varies for each column and row

Regional Comparison:

	BT	CD	EH	ID	INJ	MCH	OH	OrH	Total
National									
# Trained Employees [N (%)]	75 (60.6)	122 (68.0)	104 (56.8)	347 (53.1)	36 (74.0)	62 (55.8)	24 (68.4)	18 (54.8)	787 (57.7)
# Total Employees	123	179	183	652	49	111	35	32	1366
Northeast Region									
# Trained Employees [N (%)]	9 (82.5)	19 (67.3)	32 (84.0)	97 (55.5)	7 (70.0)	12 (66.7)	9 (64.3)	2 (66.7)	9 (62.9)
# Total Employees	10	28	38	174	10	18	14	3	294
Midwest Region									
# Trained Employees [N (%)]	22 (61.3)	35 (95.1)	13 (73.0)	107 (67.8)	3 (99.4)	10 (47.4)	8 (78.6)	1 (100)	198 (70.3)
# Total Employees	35	37	18	157	3	21	10	1	282
South Region									
# Trained Employees [N (%)]	32 (71.3)	40 (67.5)	36 (46.9)	97 (46.6)	11 (62.0)	22 (61.1)	2 (66.7)	4 (50.0)	244 (53.7)
# Total Employees	45	59	77	209	18	36	3	8	455
West Region									
# Trained Employees [N (%)]	10 (39.4)	24 (63.0)	18 (54.3)	41 (44.2)	12 (66.7)	13 (42.6)	1 (13.9)	3 (41.7)	121 (48.9)
# Total Employees	25	39	34	92	18	31	4	6	248
Territories									
# Trained Employees [N (%)]	3 (37.5)	4 (23.5)	5 (29.4)	6 (28.6)	---	5 (90.9)	5 (100)	8 (57.1)	39 (44.6)
# Total Employees	8	17	17	21	---	6	5	14	88

The regions were divided as follows **Northeast:** CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest:** IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South:** AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West:** AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories:** ASM, FSM, Guam, PR, and VI (N=3).

6c. Describe the number for the following in your health agency. (Enter 0 for none)*

	National Sum	Mean	Minimum	Maximum
EIS Officers assigned to your health agency	23	0.52	0	2.0
EIS <u>Graduates</u> employed in your health agency	76.5	1.82	0	8.0
EIS <u>Graduates</u> assigned to your state by CDC	15.1	0.37	0	5.0
Temporary/contract epidemiology staff	32.0	0.89	0	9.0
Graduate level epidemiology students conducting projects and/or internships	81.0	1.98	0	20.0

* Total N varies for each column and row

6d. Describe the salary scale for the epidemiologists working in your health department*:

National:

	Mean	Median	Minimum	Maximum
MD				
From	\$ 87,550	\$ 87,190	\$ 50,000	\$ 144,000
To	\$ 122,890	\$ 119,019	\$ 75,000	\$ 187,137
DDS				
From	\$ 65,682	\$ 62,572	\$ 40,000	\$ 100,000
To	\$ 94,105	\$ 90,000	\$ 60,000	\$ 140,000
DVM				
From	\$ 56,190	\$ 50,000	\$ 38,976	\$ 116,200
To	\$ 78,525	\$ 75,083	\$ 50,000	\$ 127,400
PhD				
From	\$ 54,666	\$ 53,000	\$ 27,000	\$ 80,000
To	\$ 74,085	\$ 70,428	\$ 40,000	\$ 112,000
MPH				
From	\$ 38,479	\$ 37,900	\$ 25,000	\$ 65,000
To	\$ 58,814	\$ 56,965	\$ 38,000	\$ 83,000
BA				
From	\$ 34,328	\$ 33,642	\$ 22,644	\$ 55,000
To	\$ 55,421	\$ 54,175	\$ 36,000	\$ 80,996
DIS				
From	\$ 33,485	\$ 30,971	\$ 19,764	\$ 68,641
To	\$ 48,843	\$ 47,088	\$ 29,474	\$ 76,000
Other				
From	\$ 27,664	\$ 30,000	\$ 19,900	\$ 33,092
To	\$ 46,543	\$ 50,000	\$ 34,550	\$ 55,078

* Total N varies for each column and row

The regions were divided as follows **Northeast:** CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest:** IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South:** AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West:** AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories:** ASM, FSM, Guam, PR, and VI (N=3).



Northeast Region:

		Mean	Median	Minimum	Maximum
MD	From	\$86,444	\$90,173	\$54,142	\$108,677
	To	\$116,193	\$121,585	\$85,612	\$130,000
DDS	From	\$62,572	\$62,572	\$62,572	\$62,572
	To	\$81,546	\$81,546	\$81,546	\$81,546
DVM	From	\$54,939	\$56,001	\$44,720	\$63,035
	To	\$74,719	\$75,712	\$65,905	\$81,546
PhD	From	\$56,262	\$55,488	\$44,720	\$76,362
	To	\$74,535	\$70,428	\$63,196	\$93,086
MPH	From	\$43,122	\$42,252	\$38,641	\$48,214
	To	\$66,450	\$63,050	\$54,611	\$80,966
BA	From	\$38,461	\$38,641	\$31,304	\$46,187
	To	\$59,684	\$55,826	\$49,025	\$80,996
DIS	From	\$39,746	\$33,223	\$26,000	\$68,641
	To	\$48,427	\$46,300	\$38,173	\$62,572
Other	From	\$33,092	\$33,092	\$33,092	\$33,092
	To	\$55,078	\$55,078	\$55,078	\$55,078

The regions were divided as follows **Northeast:** CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest:** IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South:** AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West:** AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories:** ASM, FSM, Guam, PR, and VI (N=3).

Midwest Region:

		Mean	Median	Minimum	Maximum
MD	From	\$89,269	\$90,000	\$50,000	\$115,000
	To	\$125,551	\$119,800	\$75,000	\$155,000
DDS	From	\$83,533	\$83,533	\$67,066	\$100,000
	To	\$115,588	\$115,588	\$91,175	\$140,000
DVM	From	\$63,889	\$52,495	\$45,144	\$116,200
	To	\$83,019	\$75,800	\$65,016	\$127,400
PhD	From	\$59,584	\$54,000	\$45,144	\$80,000
	To	\$83,313	\$91,175	\$40,000	\$112,000
MPH	From	\$36,974	\$35,027	\$25,000	\$57,000
	To	\$59,684	\$60,000	\$40,000	\$83,000
BA	From	\$34,311	\$31,482	\$24,000	\$52,000
	To	\$56,940	\$54,175	\$36,000	\$76,000
DIS	From	\$31,482	\$31,482	\$30,971	\$31,992
	To	\$49,471	\$49,471	\$47,088	\$51,854
Other	From	---	---	---	---
	To	---	---	---	---

The regions were divided as follows **Northeast:** CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest:** IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South:** AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West:** AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories:** ASM, FSM, Guam, PR, and VI (N=3).

South Region:

		Mean	Median	Minimum	Maximum
MD	From	\$87,561	\$86,844	\$69,085	\$120,000
	To	\$128,713	\$120,000	\$94,107	\$187,137
DDS	From	\$46,547	\$44,640	\$40,000	\$55,000
	To	\$68,277	\$70,000	\$60,000	\$74,832
DVM	From	\$53,117	\$47,277	\$38,976	\$74,000
	To	\$76,147	\$75,083	\$65,000	\$95,000
PhD	From	\$52,785	\$50,000	\$27,000	\$80,000
	To	\$71,447	\$65,640	\$49,000	\$110,000
MPH	From	\$36,011	\$37,000	\$27,000	\$45,000
	To	\$57,130	\$50,604	\$45,000	\$79,000
BA	From	\$29,868	\$30,000	\$22,644	\$38,000
	To	\$50,254	\$46,500	\$42,204	\$62,441
DIS	From	\$25,753	\$22,105	\$19,764	\$40,000
	To	\$48,648	\$46,268	\$29,474	\$76,000
Other	From	\$24,950	\$24,950	\$19,900	\$30,000
	To	\$42,275	\$42,275	\$34,550	\$50,000

The regions were divided as follows **Northeast:** CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest:** IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South:** AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West:** AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories:** ASM, FSM, Guam, PR, and VI (N=3).

West Region:

		Mean	Median	Minimum	Maximum
MD	From	\$86,940	\$82,000	\$61,056	\$144,000
	To	\$118,167	\$108,000	\$90,000	\$176,000
DDS	From	\$73,955	\$78,864	\$58,000	\$85,000
	To	\$109,799	\$116,000	\$90,000	\$123,396
DVM	From	\$55,139	\$50,000	\$40,000	\$85,000
	To	\$80,268	\$75,000	\$50,000	\$116,000
PhD	From	\$51,045	\$50,000	\$40,308	\$65,000
	To	\$67,781	\$68,104	\$45,000	\$90,000
MPH	From	\$40,594	\$34,978	\$32,000	\$65,000
	To	\$55,593	\$52,000	\$38,000	\$75,024
BA	From	\$38,245	\$39,000	\$28,224	\$55,000
	To	\$57,605	\$56,000	\$47,000	\$75,024
DIS	From	\$37,271	\$31,812	\$25,000	\$55,000
	To	\$49,443	\$53,328	\$35,000	\$60,000
Other	From	---	---	---	---
	To	---	---	---	---

The regions were divided as follows **Northeast:** CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest:** IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South:** AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West:** AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories:** ASM, FSM, Guam, PR, and VI (N=3).

Territories:

		Mean	Median	Minimum	Maximum
MD	From	---	---	---	---
	To	---	---	---	---
DDS	From	---	---	---	---
	To	---	---	---	---
DVM	From	\$50,000	\$50,000	\$50,000	\$50,000
	To	\$76,000	\$76,000	\$76,000	\$76,000
PhD	From	---	---	---	---
	To	---	---	---	---
MPH	From	---	---	---	---
	To	---	---	---	---
BA	From	---	---	---	---
	To	---	---	---	---
DIS	From	---	---	---	---
	To	---	---	---	---
Other	From	---	---	---	---
	To	---	---	---	---

The regions were divided as follows **Northeast:** CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest:** IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South:** AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West:** AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories:** ASM, FSM, Guam, PR, and VI (N=3).

7. In general, does the State HD have adequate capacity in the following across all program areas? (N=44)

Regional Comparison:

	Not at all or minimally N (%)	Partially N (%)	Substantially N (%)	Fully or almost fully N (%)
National				
Monitoring Health Status	1 (2.27)	23 (52.27)	16 (36.36)	4 (9.09)
Diagnosing and investigating health problems and health hazards	1 (2.33)	16 (37.21)	23 (53.49)	3 (6.98)
Conducting Evaluation	10 (22.73)	22 (50.00)	11 (25.00)	1 (2.27)
Conducting Research	22 (50.00)	19 (43.18)	2 (4.55)	1 (2.27)
Northeast Region				
Monitoring Health Status	0 (0.0)	2 (28.57)	5 (71.43)	0 (0.0)
Diagnosing and investigating health problems and health hazards	0 (0.0)	2 (28.57)	5 (71.43)	0 (0.0)
Conducting Evaluation	0 (0.0)	5 (71.43)	2 (28.57)	0 (0.0)
Conducting Research	4 (57.14)	2 (28.57)	1 (14.29)	0 (0.0)
Midwest Region				
Monitoring Health Status	1 (10.00)	5 (50.00)	3 (30.00)	1 (10.00)
Diagnosing and investigating health problems and health hazards	1 (10.00)	3 (30.00)	4 (40.00)	2 (20.00)
Conducting Evaluation	4 (40.00)	4 (40.00)	2 (20.00)	0 (0.00)
Conducting Research	5 (50.00)	4 (40.00)	0 (0.00)	1 (10.00)
South Region				
Monitoring Health Status	0 (0.0)	7 (50.00)	6 (42.86)	1 (7.14)
Diagnosing and investigating health problems and health hazards	0 (0.0)	4 (28.57)	10 (71.43)	0 (0.0)
Conducting Evaluation	3 (21.43)	7 (50.00)	4 (28.57)	0 (0.0)
Conducting Research	6 (42.86)	8 (57.14)	0 (0.0)	0 (0.0)
West Region				
Monitoring Health Status	0 (0.0)	7 (70.00)	1 (10.00)	2 (20.00)
Diagnosing and investigating health problems and health hazards	0 (0.0)	5 (55.56)	3 (33.33)	1 (11.11)
Conducting Evaluation	3 (30.00)	4 (40.00)	2 (20.00)	1 (10.00)
Conducting Research	6 (60.00)	3 (30.00)	1 (10.00)	0 (0.0)
Territories				
Monitoring Health Status	0 (0.0)	2 (66.67)	1 (33.33)	0 (0.0)
Diagnosing and investigating health problems and health hazards	0 (0.0)	2 (66.67)	1 (33.33)	0 (0.0)
Conducting Evaluation	0 (0.0)	2 (66.67)	1 (33.33)	0 (0.0)
Conducting Research	1 (33.33)	2 (66.67)	0 (0.0)	0 (0.0)

The regions were divided as follows **Northeast:** CT, MA, ME, NH, NJ, NY, PA, RI and VT (N=7); **Midwest:** IA, IL, IN, KS, MI, MO, MN, ND, NE, OH, SD and WI (N=10); **South:** AL, AR, DC, DE, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, and WV (N=14) **West:** AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA and WY (N=10); **Territories:** ASM, FSM, Guam, PR, and VI (N=3).

8. In general, do State HD epidemiology personnel have adequate capacity or support in the following across all program areas? (N=44)

	Not at all or minimally N (%)	Partially N (%)	Substantially N (%)	Fully or almost fully N (%)
Computer hardware platform is consistent with needs (N=43)	---	6 (14.0)	16 (37.2)	21 (48.8)
Hardware is replaced at least every 3 years (N=43)	1 (2.3)	14 (32.6)	18 (41.9)	10 (23.3)
Access to computer technical support adequate	2 (4.5)	14 (31.8)	20 (45.5)	12 (18.2)
Generally able to update software when needed	---	12 (27.3)	20 (45.5)	12 (27.3)
Adequate office space available	1 (2.3)	21 (47.7)	15 (34.1)	7 (15.9)
Adequate clerical help available	1 (2.3)	22 (50.0)	19 (43.2)	2 (4.5)
Grant writing support available	13 (29.5)	24 (54.5)	6 (13.6)	1 (2.3)
Budgeting/fiscal management support adequate	2 (4.5)	13 (29.5)	24 (54.5)	5 (11.4)
Contracts and grant management support adequate	3 (6.8)	17 (38.6)	17 (38.6)	7 (15.9)
Support for dealing with personnel issues adequate (N=43)	3 (7.0)	16 (37.2)	19 (44.2)	5 (11.6)
Legislation monitoring and drafting support adequate	4 (9.1)	13 (29.5)	19 (43.2)	8 (18.2)
Legal consultation adequate (N=43)	2 (4.7)	8 (18.6)	20 (46.5)	13 (30.2)
Support for writing policies and procedures adequate (N=43)	6 (14.0)	14 (32.6)	19 (44.2)	4 (9.3)
Strategic and annual planning support adequate	6 (13.6)	18 (40.9)	18 (40.9)	2 (4.5)

9. Do State HD epidemiology personnel have access to the recent versions (i.e. no older than 3 years) of the following types of software? (Check all that apply) (N=44)

	N	%
General office software packages to compose letters, develop spreadsheets, prepare presentations, etc.	42	95.5
Reference management software (Endnote, Reference Manager, etc.)	9	20.5
Data conversion software (DBMSCOPY, etc.)	15	34.1
Database management software (Access, ORACLE, etc.)	39	88.6
Qualitative data management software (SPSS, etc.)	30	68.2
Statistical Analysis (SAS, etc.)	39	88.6
GIS software	34	77.3
Internet browser	43	97.7
Email software	43	97.7

10. What is the computer desktop platform used by most of the State HD epidemiology personnel? (Check all that apply) (N=44)

	N	%
Windows 95/98/NT/2000	44	100
Mac	---	---
Unix	1	2.27
Linux	---	---
Sun/Solaris	---	---
Other	---	---

11. What is the Internet browser currently used by State HD epidemiology personnel? (Check all that apply) (N=44)

	N	%
Internet Explorer 4.0 or higher	36	81.82
Netscape 4.0 or higher	21	47.72
Other	---	---

12. How do State HD epidemiology personnel access Internet? (Check all that apply) (N=44)

	N	%
LAN/network	43	97.73
Dial-up	8	18.18

13. Does the State HD have the capability for web-based data reporting? (N=41)

	N	%
Not at all or minimally	20	48.78
Partially	21	47.72
Substantially	3	7.32
Fully or Almost Fully	3	7.32

14. Do epidemiology personnel have adequate access to medical libraries and reference material? (N=42)

	N	%
Not at all or minimally	2	4.76
Partially	8	19.05
Substantially	18	45.24
Fully or Almost Fully	13	30.95

15. Who in the State HD primarily leads the organizational/agency agenda for public health epidemiology? (Check all that apply) (N=44)

	N	%
State Epidemiologist	34	77.27
Program epidemiologists	15	34.09
State Health officer	15	34.09
Assistant State Health Officer	3	6.82
Senior department manager	14	31.82
Other	4	9.09

16. Is there a written organizational mission statement of the purpose of your State HD's epidemiology activities? (N=42)

	N	%
Not at all or minimally	7	16.67
Partially	9	21.43
Substantially	15	35.71
Fully or Almost Fully	11	26.19

17. Does the State HD have an organizational plan or charter to guide all epidemiology activities within the agency? If no, skip sub-question. (N=40)

	N	%
Not at all or minimally	15	37.50
Partially	15	37.50
Substantially	8	20.00
Fully or Almost Fully	2	5.00

17a. Is it coordinated among all related programs? (N=26)

	N	%
Not at all or minimally	2	7.69
Partially	16	61.54
Substantially	7	26.92
Fully or Almost Fully	--	--

18. Does the State HD have a data privacy/confidentiality officer (or someone in a similar function)? (N=44)

	N	%
No	24	54.55
Yes	16	61.54

19. Does the State HD have an Information Systems Security Officer? (N=44)

	N	%
No	24	54.55
Yes	16	61.54

20. Does the State HD have written policies regarding any of the following? (Check all that apply) (N=43)

	N	%
Information privacy	37	86.05
Information security	31	72.09
Release of data	37	86.05
Interorganizational sharing of data	28	65.12
None of the above	4	9.30

21. Are data shared across agency programs? If no, skip sub-questions. (N=44)

	N	%
Not at all or minimally	---	---
Partially	23	52.27
Substantially	18	40.91
Fully or Almost Fully	3	6.82

21a. Does this include identifiable data? If no, skip sub-question. (N=43)

	N	%
Not at all or minimally	7	16.28
Partially	23	53.49
Substantially	10	23.26
Fully or Almost Fully	3	6.98

21b. Which of the following guide the sharing of research level/confidential data within your agency? (N=40)

	N	%
Institutional Review Board	19	47.50
Data review board	11	27.50
Other	25	62.50

22. Are data shared with outside organizations? If no, skip sub-questions. (N=40)

	N	%
Not at all or minimally	2	5.00
Partially	19	47.50
Substantially	16	40.00
Fully or Almost Fully	3	7.50

22a. Which of the following do you share data with? (N=42)

	N	%
Local/district health departments	38	90.48
Hospitals	24	57.14
Community-based agencies	34	80.95
Other	20	47.62

22b. Explain the scope of data sharing: (N=41)

	N	%
Aggregate or statistical reports (N=42)	41	97.62
Confidential or research data	25	60.98
Other	7	16.67

22c. Which of the following guide the sharing of research level/confidential data between your agency and outside organizations? (N=40)

	N	%
Institutional Review Board	23	57.50
Data review board	11	27.50
Other	21	52.50

PART II - Infectious Disease (ID) Questionnaire

INDICATOR 1A: PROVIDE SURVEILLANCE OF REPORTS OF DISEASES AND CONDITIONS TO ROUTINELY MONITOR POPULATION HEALTH STATUS

23. Do State HD ID epidemiology personnel monitor all diseases and conditions placed under the National Notifiable Disease Surveillance System (NNDSS)? (N=43)

	N	%
Not at all or minimally	---	---
Partially	2	4.65
Substantially	10	23.26
Fully or Almost Fully	31	72.09

24. Do State HD ID epidemiology personnel routinely collect data regarding race and ethnicity for cases of reportable disease among Native Americans, Hispanics, Asians, Native Hawaiians, and other “minority” subpopulations? (N=44)

	N	%
Not at all or minimally	4	9.09
Partially	5	11.36
Substantially	12	27.27
Fully or Almost Fully	23	52.27

25. Do State HD ID epidemiology personnel routinely require health care providers to report other infectious disease conditions that are not included in the NNDSS? (N=42)

	N	%
Not at all or minimally	6	14.29
Partially	14	33.33
Substantially	12	29.57
Fully or Almost Fully	10	23.81

INDICATOR 1B: PROVIDE EXPANDED SCOPE AND CAPABILITY OF STATE HD EPIDEMIOLOGY SURVEILLANCE SYSTEMS

26. Do State HD epidemiology personnel have access to surveillance data for the following (with at most a six month lag time for the most recently available data)? (Check all that apply)*

Data System	Accessible to ID epidemiology personnel N (%)	Used for Surveillance ID epidemiology personnel N (%)
Ambulatory/ emergency room	17 (38.64)	9 (21.95)
Antimicrobial resistance	26 (60.47)	23 (56.10)
Birth	36 (81.82)	19 (46.34)
Birth defects	21 (47.73)	11 (26.83)
BRFSS	38 (86.36)	23 (56.10)
Bureau of labor statistical annual survey	15 (34.88)	5 (12.20)
CHIP	10 (23.36)	6 (14.63)
Death	39 (88.64)	33 (78.57)
Emergency medical services	15 (34.88)	6 (14.63)
Fetal death	26 (59.09)	11 (26.83)
HIV/AIDS case registry	37 (84.09)	34 (80.95)
Hospital discharge	28 (63.64)	18 (42.86)
Immunization	38 (88.37)	32 (78.05)
Lead	35 (79.55)	19 (46.34)
Medicaid	22 (50.00)	9 (21.95)
National notifiable diseases database	33 (75.00)	31 (73.81)
Perinatal	15 (34.88)	8 (19.51)
Poison control	15 (34.89)	8 (19.51)
Population/census	37 (86.05)	30 (73.17)
PRAMS	26 (60.47)	11 (26.83)
State household surveys	9 (20.45)	6 (14.63)
STDs	40 (90.91)	36 (85.71)
Tuberculosis case registry	41 (93.18)	36 (85.71)
Tuberculosis lab molecular analysis registry	17 (39.53)	14 (34.15)

* Total N varies for each column and row.

26a. Do State HD ID epidemiology personnel routinely analyze and report data from any of these databases? (N=43)

	N	%
Not at all or minimally	3	6.98
Partially	13	30.23
Substantially	19	44.19
Fully or Almost Fully	8	18.60

26b. Are these databases available to other agency departments/personnel within the State HD for analysis? (N=43)

	N	%
Not at all or minimally	4	9.30
Partially	17	39.53
Substantially	19	44.19
Fully or Almost Fully	3	6.98

26c. Can these data be accessed for review and analysis at the local level? (N=41)

	N	%
Not at all or minimally	8	19.51
Partially	19	46.34
Substantially	13	31.71
Fully or Almost Fully	1	2.44

26c.1. Explain mechanism (N=36):

	N	%
Web-based data dissemination by State HD	19	52.78
Published data reports in hard copy	35	97.22
Other	10	27.78

26d. Which of the following are reported to the State HD on a real time basis (i.e. via the web)? (N=40)

	N	%
ER data	2	5.00
Lab data	10	25.00
Physician office reports	3	7.50
Other	10	25.00
None of the above (N = 39)	22	56.41

26e. Does your State HD generally have the capacity to link databases for more detailed analysis? (N=42)

	N	%
Not at all or minimally	6	14.29
Partially	25	59.52
Substantially	11	26.19
Fully or Almost Fully	---	---

26f. Are tables generally published for the majority of the above listed databases? If no, skip to next sub-question. (N=41)

	N	%
Not at all or minimally	7	12.50
Partially	13	23.21
Substantially	20	35.71
Fully or Almost Fully	1	1.79

26f.1. If so, are these tables generally published on your agency's web site? (N=34)

	N	%
Not at all or minimally	7	12.50
Partially	13	23.21
Substantially	13	23.21
Fully or Almost Fully	1	1.79

26f.2. Are queries created on the web for the majority of the above listed databases? (N=32)

	N	%
Not at all or minimally	23	41.07
Partially	7	12.50
Substantially	2	3.57
Fully or Almost Fully	---	---

27. Does your State HD utilize early warning systems for detecting unusual occurrences of health outcomes? If no, skip sub-question. (N=43)

	N	%
Not at all or minimally	---	---
Partially	18	41.86
Substantially	16	37.21
Fully or Almost Fully	9	20.93

27a. Explain method: (N=26)

	N	%
Visual	20	35.71
Statistical	15	26.79
Other	4	7.14

27b. Which of the following does your State HD access and review on a daily basis? (N=22)

	N	%
Emergency department utilization	8	14.29
Hospital admissions	3	5.36
Ambulance runs	1	1.79
911 call data	3	5.36
Data on unexplained death	5	8.93
Syndromic surveillance	10	17.86
Poison control centers	3	5.36
Pharmaceutical use	---	---
Veterinarian or animal based surveillance	2	3.57
Other	3	5.36

28. Does your State HD maintain written protocols for detection, investigation and response to the following types of emergencies?

	Not at all or minimally N (%)	Partially N (%)	Substantially N (%)	Fully or Almost Fully N (%)
Bioterrorism Events (N=43)	7 (16.3)	14 (32.6)	15 (34.9)	7 (16.3)
Radiologic Events (N=40)	10 (25.0)	9 (22.5)	5 (12.5)	16 (40.0)
Environmental/other hazardous substances events (N=40)	9 (22.5)	18 (45.0)	6 (15.0)	7 (17.5)
Explosions (N=38)	20 (52.6)	10 (26.3)	4 (10.5)	4 (10.5)
Natural disasters (floods, etc) (N=39)	3 (7.1)	16 (38.1)	15 (35.7)	8 (19.0)
Injuries (N=37)	16 (43.2)	11 (29.7)	8 (21.6)	2 (5.4)
Other (N=19)	12 (63.2)	2 (10.5)	2 (10.5)	3 (15.8)

29. Does your State HD maintain surveillance systems for health outcomes related to the following types of emergencies? If no, skip sub-question. (N = 41)

	Not at all or minimally N (%)	Partially N (%)	Substantially N (%)	Fully or Almost Fully N (%)
Bioterrorism Events (N=43)	5 (11.6)	7 (16.3)	27 (62.8)	4 (9.3)
Radiologic Events (N=42)	18 (42.9)	7 (16.7)	15 (35.7)	2 (4.8)
Environmental/other hazardous substances events (N=40)	13 (32.5)	13 (32.5)	11 (27.5)	3 (7.5)
Explosions	20 (51.3)	9 (23.1)	9 (23.1)	1 (2.6)
Natural disasters (floods, etc)	12 (30.0)	11 (27.5)	17 (42.5)	---
Injuries	18 (46.2)	10 (25.6)	11 (28.2)	---
Other (N=16)	3 (60.0)	1 (20.0)	1 (20.0)	---

29a. List components (check all that apply) (N=40):

	Systems to monitor health events N (%)	Systems to identify changes or patterns N (%)	Systems to investigate underlying causes or factors N (%)
Bioterrorism Events	35 (87.50)	27 (67.50)	28 (72.50)
Radiologic Events	18 (45.00)	12 (30.00)	15 (37.50)
Environmental/other hazardous substances events	21 (52.50)	11 (27.50)	16 (40.00)
Explosions	13 (32.50)	3 (7.50)	7 (17.50)
Natural disasters (floods, etc)	18 (45.00)	9 (22.50)	11 (27.50)
Injuries	17 (42.50)	9 (22.50)	11 (27.50)
Other (N=37)	2 (5.41)	1 (2.70)	1 (2.70)

30. Do State HD ID epidemiology personnel conduct or support local-level assessments of the population's health needs? If no, skip sub-question. (N=43)

	N	%
Not at all or minimally	17	39.53
Partially	13	30.23
Substantially	10	23.26
Fully or Almost Fully	3	6.98

31. In general, does the State HD have adequate capacity in infectious disease epidemiology to monitor the health status of the population? (N=43)

	N	%
Not at all or minimally	4	9.30
Partially	16	37.21
Substantially	19	44.19
Fully or Almost Fully	4	9.30

INDICATOR 1C: CONDUCT OR SUPPORT LOCAL INITIATIVES THAT PERIODICALLY MONITOR PUBLIC HEALTH STATUS

32. Do State HD epidemiology personnel conduct or support planning and evaluation of community-based public health initiatives? If no, skip sub-question. (N=43)

	N	%
Not at all or minimally	10	23.26
Partially	22	51.17
Substantially	9	20.93
Fully or Almost Fully	2	4.65

INDICATOR 2A: PROVIDE EPIDEMIOLOGIC RESPONSE TO DISEASE OUTBREAKS OR CRISIS INCIDENTS

33. Has the State HD initiated or participated in any epidemiologic investigations of disease outbreaks or public health emergencies in the last year? (N=42)

	N	%
Not at all or minimally	---	---
Partially	3	7.14
Substantially	13	30.95
Fully or Almost Fully	26	61.90

33c. Were these disease outbreaks or public health emergencies investigated promptly and in a timely manner? (N=43)

	N	%
Not at all or minimally	---	---
Partially	5	11.63
Substantially	19	44.19
Fully or Almost Fully	19	44.19

34. Of outbreaks that are not investigated, which factors limit the State HD's ability to investigate? (Check all that apply) (N=42)

	N	%
Delayed notification of case reports	40	95.2
Epidemiological expertise	8	19.0
Laboratory capacity	13	31.0
Statistical support	7	16.7
Limited staff	33	78.6
Ability to pay overtime	2	4.8
Travel policy constraints	4	9.5
Competing priorities for use of PH resources	31	73.8
Politics	4	9.5
Jurisdictional issues	17	40.5
Other (N = 41)	4	9.8

35. Is there adequate laboratory support for the State HD to promptly diagnose reportable health problems? (N=43)

	N	%
Not at all or minimally	2	4.55
Partially	7	16.28
Substantially	20	46.51
Fully or Almost Fully	14	32.56

36. Do trained State HD personnel conduct epidemiological follow-ups of all reported cases?
(N=43)

	N	%
Not at all or minimally	1	2.33
Partially	15	34.88
Substantially	18	41.86
Fully or Almost Fully	9	20.93

37. Is each case that is to be followed-up on referred immediately and directly to the individual responsible for that follow-up? (N=43)

	N	%
Not at all or minimally	---	---
Partially	8	18.60
Substantially	22	51.16
Fully or Almost Fully	13	30.23

38. Is each referred case tracked to confirm appropriate, timely, and complete follow-up? (N=43)

	N	%
Not at all or minimally	5	11.63
Partially	14	32.56
Substantially	17	39.53
Fully or Almost Fully	7	16.28

39. If the condition is transmissible, are the majority of follow-ups initiated in time to prevent the occurrence of additional cases? (N=43)

	N	%
Not at all or minimally	1	2.33
Partially	12	27.91
Substantially	20	46.51
Fully or Almost Fully	10	23.26

INDICATOR 2B: CONDUCT OF EPIDEMIOLOGIC INVESTIGATIONS, SURVEYS AND STUDIES DIRECTED AT DEFINING OR IDENTIFYING SPECIFIED PUBLIC HEALTH PROBLEMS

40. In general, does the State HD have adequate capacity in infectious disease epidemiology to diagnose and investigate health problems and health hazards? (N=44)

	N	%
Not at all or minimally	2	4.55
Partially	14	31.82
Substantially	22	50.00
Fully or Almost Fully	6	13.64

41. Do State HD ID epidemiology personnel use epidemiological principles and methods (i.e. comparisons with last year's data; analysis by population subgroup; etc.) to determine whether an "unusual event" (i.e., an outbreak or an elevated frequency of some health event, risk factor, etc.) may be occurring in your target population? (N=44)

	N	%
Not at all or minimally	---	---
Partially	7	15.91
Substantially	19	43.18
Fully or Almost Fully	18	40.91

42. Is there an individual in the State HD responsible for initiating or alerting others to the need for an investigation or study? (N=43)

	N	%
Not at all or minimally	1	2.33
Partially	8	18.60
Substantially	16	37.21
Fully or Almost Fully	18	41.86

INDICATOR 3A: COMMUNICATE THE IMPORTANCE AND NEED FOR EPIDEMIOLOGIC INVESTIGATIONS, SURVEYS AND STUDIES THAT ADDRESS PUBLIC HEALTH CONCERNS AND ISSUES

43. Do State HD ID epidemiology personnel support efforts to keep HD administration, staff, other related agencies, health care providers, collaborators and the mass media informed of the status of public health epidemiology related issues? (i.e. an epidemiological assessment of the situation, description of protective actions individuals and communities should take, public health interventions implemented and their assessed effectiveness) (N=44)

	N	%
Not at all or minimally	---	---
Partially	7	15.91
Substantially	19	43.18
Fully or Almost Fully	18	40.91

44. Are investigation reports shared with other interested parties, such as the public and mass media representatives? (N=42)

	N	%
Not at all or minimally	2	4.76
Partially	9	21.43
Substantially	23	54.76
Fully or Almost Fully	8	19.05

45. With whom do State HD ID epidemiology personnel share public health summary reports? (Check all that apply) (N=44)

	N	%
Public Health Administration	40	90.9
Medical community	42	95.5
Local health departments	41	93.2
Community groups	32	72.7
State and area health departments	36	81.8
Other Related State Agencies	34	77.3
Governors Office and State Legislature	31	70.5
Federal agencies	38	86.4
Media	34	77.3
Other (N = 43)	9	20.9

INDICATOR 3B: PROMOTE EFFECTIVE MEDIA CAMPAIGNS AND MARKETING STRATEGIES TARGETED TO IMPROVE COMMUNITY HEALTH STATUS

46. Do State HD ID epidemiology personnel actively cultivate relationships with the mass media representatives to promote an understanding of epidemiologic principles and practices and assure maximum exposure for public health positions and policies. (N=44)

	N	%
Not at all or minimally	10	22.73
Partially	19	43.18
Substantially	9	20.45
Fully or Almost Fully	6	13.64

47. Do State HD ID epidemiology personnel utilize various non-mass media venues (i.e. posters, pamphlets, videos etc.) to keep the public informed of public health interventions implemented and their assessed effectiveness? (N=43)

	N	%
Not at all or minimally	6	13.95
Partially	15	34.88
Substantially	19	44.19
Fully or Almost Fully	3	6.98

INDICATOR 4A: BUILD EFFECTIVE PARTNERSHIPS WITHIN STATE AND LOCAL PUBLIC HEALTH ARENA

48. Do State HD ID epidemiology personnel have effective working relationships with other HD program epidemiologists and personnel in other units responsible for the maintenance of NON-infectious disease data bases? (N=44)

	N	%
Not at all or minimally	4	9.09
Partially	15	34.09
Substantially	20	45.45
Fully or Almost Fully	5	11.36

49. Do State HD ID epidemiology personnel have effective working relationships with Local Health Directors, other community based partners, and epidemiologists? (N= 44)

	N	%
Not at all or minimally	---	---
Partially	4	9.09
Substantially	24	54.55
Fully or Almost Fully	16	36.36

50. Do State HD ID epidemiology personnel support annual statewide meetings, regional training programs or other forums to foster the building of such partnerships? (N=43)

	N	%
Not at all or minimally	3	6.98
Partially	7	16.28
Substantially	21	48.84
Fully or Almost Fully	12	27.91

INDICATOR 4B: BUILD EFFECTIVE PARTNERSHIPS WITH KEY INDIVIDUALS IN RELATED STATE AND FEDERAL AGENCIES, NATIONAL ORGANIZATIONS, EDUCATIONAL INSTITUTIONS, PROFESSIONAL SOCIETIES AND HEALTH CARE PROVIDERS

51. Do State HD ID epidemiology personnel have access to an up-to-date list (no older than 12 months) of individuals or organizations to notify when an outbreak investigation or epidemiology study is initiated? (N=44)

	N	%
Not at all or minimally	1	2.27
Partially	8	18.18
Substantially	17	38.64
Fully or Almost Fully	18	40.91

52. With which of the following do State HD ID epidemiology personnel have an ongoing collaboration to improve epidemiology, surveillance, response, investigation and special studies? (Check all that apply) (N=44)

	N	%
Academic epidemiologists	30	68.18
Universities	34	77.27
HMO medical directors	10	22.73
Local Medical Society	20	45.45
Infectious disease clinicians	37	84.09
Infection control practitioners	41	93.18
Sentinel Physicians	34	77.27
State medical society	33	75.00
Local and regional medical examiners and coroners	26	59.09
Local and regional hospitals	36	81.82
Independent laboratories	25	56.82
Other state agencies	35	79.55
Private medical insurance companies	7	15.91
Peer review organizations	11	25.00
US military hospitals and bases, and VA	26	59.09
Other	9	20.45

53. Do State HD ID epidemiology personnel publish a periodic bulletin for public health audiences and outside partners (labs, ICPs, HMOs, etc.) discussing current events, health alerts, policy changes, result of recent investigations, and training opportunities? (N=44)

	N	%
Not at all or minimally	4	9.09
Partially	10	22.73
Substantially	11	25.00
Fully or Almost Fully	19	43.18

54. Aside from death certification, do State HD ID epidemiology personnel collaborate with medical examiners and/or coroners on any of the following? (Check all that apply) (N=43)

	N	%
Epidemiology research	14	32.56
Disease reporting	28	65.12
Other	7	16.28
None of the above	11	25.59

INDICATOR 4C: BUILD EFFECTIVE COALITIONS WITH COMMUNITY-BASED AGENCIES, GROUPS AND ORGANIZATIONS

55. Do State HD ID epidemiology personnel have an up-to-date list (no older than 12 months) of community partners (individuals or organizations) who share interests in supporting public health promotion and disease control interventions? (N=44)

	N	%
Not at all or minimally	7	15.91
Partially	18	40.91
Substantially	15	34.09
Fully or Almost Fully	4	9.09

56. Do State HD ID epidemiology personnel collaborate with community-based partners on shared projects? (N=43)

	N	%
Not at all or minimally	6	13.95
Partially	18	41.86
Substantially	18	41.86
Fully or Almost Fully	1	2.33

INDICATOR 5A: SUPPORT OF EPIDEMIOLOGY PROGRAM ORGANIZATION AND DEVELOPMENT BY THE STATE HEALTH DEPARTMENT

57. Who in the State HD primarily leads the organizational agenda for infectious disease epidemiology? (Check all that apply) (N=44)

	N	%
State Epidemiologist	40	90.91
Program epidemiologists	20	45.45
State Health officer	9	20.45
Assistant State Health Officer	3	6.82
Senior department manager	12	27.27
Other	3	6.82

58. Is there a written organizational statement of the purpose of the ID epidemiology activities? (N=44)

	N	%
Not at all or minimally	11	25.00
Partially	12	27.27
Substantially	11	25.00
Fully or Almost Fully	10	22.73

59. Does the State HD have an organizational plan or charter to guide ID epidemiology activities within the agency? (N=43)

	N	%
Not at all or minimally	12	27.91
Partially	17	39.53
Substantially	8	18.60
Fully or Almost Fully	6	13.95

60. Does the State HD have a current protocol to guide case-finding, case and suspect investigation, and case and contact management? (N=44)

	N	%
Not at all or minimally	1	2.27
Partially	15	34.09
Substantially	9	20.45
Fully or Almost Fully	19	43.18

61. Does the State HD have a written protocol for conducting epidemiologic investigations or studies? (N=44)

	N	%
Not at all or minimally	3	6.82
Partially	17	38.64
Substantially	13	29.55
Fully or Almost Fully	11	25.00

62. Does the State HD have written guidelines for determining when, or the circumstances for which, an investigation or study is warranted or required? (N=44)

	N	%
Not at all or minimally	10	22.73
Partially	17	38.64
Substantially	10	22.73
Fully or Almost Fully	7	15.91

63. Does the State HD have a written protocol for conducting surveillance? (N=43)

	N	%
Not at all or minimally	7	16.28
Partially	16	37.21
Substantially	16	37.21
Fully or Almost Fully	4	9.30

INDICATOR 5B: INFLUENCE OF THE EPIDEMIOLOGY PROGRAM UPON DEVELOPMENT OF OTHER STATE HEALTH DEPARTMENT PROGRAMS, PLANS AND POLICIES

64. Are State HD epidemiologists involved in the selection of indicator data to be collected and interpreted to track progress in accomplishing the public health agency's objectives? If no, skip sub-question. (N=43)

	N	%
Not at all or minimally	5	11.63
Partially	11	25.58
Substantially	22	51.16
Fully or Almost Fully	5	11.63

65. Does the State HD routinely use sentinel surveillance or second generation surveillance (including monitoring of behaviors and other factors related to health risk) to develop and monitor prevalence/incidence of factors related to health among high interest subpopulations?(N=43)

	N	%
Not at all or minimally	11	25.58
Partially	16	37.21
Substantially	12	27.91
Fully or Almost Fully	4	9.30

66. Do State HD ID epidemiology personnel produce written reports to agency management which include data to support documented problems? If no, skip sub-question(s). (N=43)

	N	%
Not at all or minimally	6	13.95
Partially	17	39.53
Substantially	15	34.88
Fully or Almost Fully	5	11.63

66a. Do these reports include cost or impact of the current or proposed policy? (N=38)

	N	%
Not at all or minimally	10	26.32
Partially	16	42.11
Substantially	11	28.95
Fully or Almost Fully	1	2.63

67. Are State HD ID epidemiology personnel able to respond to requests for analyzing public health policy or practice issues such as reviewing an existing policy or examining the possible need for a new policy? (N=44)

	N	%
Not at all or minimally	3	6.82
Partially	15	34.09
Substantially	23	52.72
Fully or Almost Fully	3	6.82

INDICATOR 6A: ASSURE COMPLIANCE WITH ALL STATE LAWS, RULES AND REGULATIONS RELATED TO DISEASE REPORTING, AND CASE FOLLOW-UP AND INVESTIGATION

68. Are all reported cases which State HD epidemiology personnel are responsible for reviewed to ensure that they meet the operating public health surveillance case definition? (N=44)

	N	%
Not at all or minimally	---	---
Partially	8	18.18
Substantially	14	31.82
Fully or Almost Fully	22	50.00

69. Are all reported cases which State HD epidemiology personnel are responsible for reviewed by experienced staff to identify need for follow-up? (N=43)

	N	%
Not at all or minimally	1	2.33
Partially	6	13.95
Substantially	17	39.53
Fully or Almost Fully	19	44.19

INDICATOR 6B: INFLUENCE DEVELOPMENT OF STATE STATUTES OR PROPOSED LEGISLATION

70. Do State HD ID epidemiology personnel routinely assist in the development or review of proposed legislation to assure the epidemiological basis of regulations and requirements? (N=44)

	N	%
Not at all or minimally	3	6.82
Partially	12	27.27
Substantially	17	38.64
Fully or Almost Fully	12	27.27

71. Do State HD epidemiologists have an opportunity to critique and suggest epidemiologic-based revisions to update existing state statutes? (N=44)

	N	%
Not at all or minimally	1	2.27
Partially	10	22.73
Substantially	21	47.73
Fully or Almost Fully	12	27.27

72. Have any recommendations coming out of interactions between epidemiologists, health department managers, and legislators influenced the enactment of epidemiologically sound statutes, rules or regulations? (N=44)

	N	%
Not at all or minimally	1	2.27
Partially	11	25.00
Substantially	25	56.82
Fully or Almost Fully	7	15.91

INDICATOR 7A: INFLUENCE DEVELOPMENT, IMPLEMENTATION AND EVALUATION OF STATE HEALTH DEPARTMENT PROGRAMS AND INTERVENTION STRATEGIES

73. Do State HD ID epidemiology personnel assure the provision of health care by conducting the following activities? (N=44)

	Not at all or minimally N (%)	Partially N (%)	Substantially N (%)	Fully or almost fully N (%)
Collect and assemble data	4 (9.09)	7 (15.91)	18 (40.91)	15 (34.09)
Analyze data from multiple sources	5 (11.36)	13 (29.55)	16 (36.36)	10 (22.73)
Assist in program planning and implementation	6 (13.64)	15 (34.09)	15 (34.09)	8 (18.18)
Evaluate public health delivery service programs and other health interventions	13 (29.55)	22 (50.00)	7 (15.91)	2 (4.55)

74. Have these activities included sub-populations that are underserved or otherwise disadvantaged with regard to medical service access? (N=44)

	N	%
Not at all or minimally	7	15.91
Partially	16	36.36
Substantially	16	36.36
Fully or Almost Fully	5	11.36

INDICATOR 8A: PROVIDE APPROPRIATE ORIENTATION, TRAINING AND TECHNICAL SUPPORT TO ASSURE COMPETENCY OF EPIDEMIOLOGY PROGRAM WORKFORCE

75. Does the State HD have an infectious disease epidemiologist that oversees many or all infectious disease program areas? (N=43)

	N	%
Not at all or minimally	3	6.82
Partially	5	11.36
Substantially	12	27.27
Fully or Almost Fully	23	52.27

76. Does the State HD have training plans for ID epidemiology personnel? (N=44)

	N	%
Not at all or minimally	10	22.73
Partially	17	38.64
Substantially	13	29.55
Fully or Almost Fully	4	9.09

77. Which of the following subject matters are NOT covered by current State HD training courses? (Check all that apply) (N=41)

	N	%
Survey technique	25	44.64
Report production	19	33.93
Profile development	31	55.36
Study design	21	37.50
Data collection	16	27.57
Data analysis	15	26.79
Data interpretation	17	30.36
Data release	15	26.79
Data translation	24	42.86
Data presentation	19	33.93
Cultural competency skills	19	33.93
Leadership skills	21	37.50
Other	5	8.93
None of the above (N=40)	2	3.57

78. Are skilled personnel available in each of the following areas to support epidemiology policies and activities in your State HD? (Check all that apply) (N=44)

	N	%
Case and contact management	37	84.09
Case and suspect investigation	40	90.91
Case finding	40	90.91
Chart abstraction	31	70.45
Communication or dissemination of data	39	88.64
Data entry into databases	42	95.45
Data interpretation	35	79.55
GIS analysis	29	65.91
Grant writing	24	54.55
Information Technology	39	88.63
Linkage of data sets	25	56.82
Needs assessment	22	50.00
Program evaluation	18	40.91
Qualitative methods	19	43.18
Statistical analysis	37	84.09
Surveillance design	34	77.28
Survey design	31	70.46
Surveyors (N=43)	16	37.21
Web site development	31	70.45
None of the above (N=42)	1	2.38

79. Are all State HD surveillance and investigation staff oriented to the protocol to guide case-finding, case and suspect investigation, and case and contact management? (N=44)

	N	%
Not at all or minimally	4	9.09
Partially	12	27.27
Substantially	15	34.09
Fully or Almost Fully	13	29.55

80. Are completed case investigations reviewed and evaluated by a trained epidemiologist? (N=44)

	N	%
Not at all or minimally	5	11.36
Partially	13	29.55
Substantially	12	27.27
Fully or Almost Fully	14	31.82

81. Do State HD epidemiology personnel follow the American College of Epidemiology's ethical principles and practices (<http://www.acepidemiology.org/policystmts/EthicsGuide.htm>) in conducting investigations and studies? (N=34)

	N	%
Not at all or minimally	2	5.88
Partially	6	17.65
Substantially	14	41.18
Fully or Almost Fully	12	35.29

INDICATOR 8B: PROVIDE CONTINUING EDUCATION AND PROFESSIONAL DEVELOPMENT TO IMPROVE STAFF TECHNICAL EXPERTISE, LEADERSHIP SKILLS AND ASSURE OVERALL PROGRAM DEVELOPMENT

82. Is there a job-related requirement for the State HD ID epidemiology personnel to obtain continuing education hours? (N=43)

	N	%
Not at all or minimally	35	81.40
Partially	6	13.95
Substantially	2	4.65
Fully or Almost Fully	---	---

82a. Prepare manuscripts for publication in peer review journals? (N=42)

	N	%
No	4	9.52
Yes	38	90.48

83. Which of the following professional development activities does the State HD promote for ID epidemiology staff? (Check all that apply) (N=43)

	N	%
Library time/ Journals/ Text books	25	58.14
In-services	29	67.44
Conferences	41	95.35
Training courses	37	86.05
Presentations at national, regional and state meetings	36	83.72
On-the-job-training	33	76.74
Other (N=42)	7	7.14
None (N=42)	1	2.38

84. Are State HD ID epidemiologists, who do not have advanced degrees in epidemiology, specifically trained in epidemiology principles and practices? (N=42)

	N	%
Not at all or minimally	3	7.14
Partially	18	42.86
Substantially	13	30.95
Fully or Almost Fully	8	19.05

85. Does the State HD provide or sponsor training for Local HDs/community level staff in data analysis, interpretation, and practical application? (N=43)

	N	%
Not at all or minimally	4	9.30
Partially	22	51.16
Substantially	15	34.88
Fully or Almost Fully	2	4.65

INDICATOR 8C: PROVIDE APPROPRIATE ORIENTATION AND TRAINING TO ASSURE CULTURAL COMPETENCY OF EPIDEMIOLOGY PROGRAM WORKFORCE

86. Do State HD ID epidemiology personnel receive any type of HD sponsored cultural competency trainings or orientation programs for dealing with routine surveillance and outbreak investigations involving racial, ethnic and culturally diverse communities? (N=42)

	N	%
Not at all or minimally	15	35.71
Partially	19	45.24
Substantially	6	14.29
Fully or Almost Fully	2	4.76

INDICATOR 9A: PROVIDE EVALUATION AND/OR QUALITY ASSURANCE FOR OPERATIONAL ASPECTS OF THE STATE HEALTH DEPARTMENT EPIDEMIOLOGY SURVEILLANCE SYSTEM

87. In general, does the State HD have adequate capacity in infectious disease epidemiology to conduct evaluation activities? (N=43)

	N	%
Not at all or minimally	6	13.95
Partially	28	65.12
Substantially	5	11.63
Fully or Almost Fully	4	9.30

88. Does the State HD periodically evaluate surveillance systems for sensitivity, representativeness, and timeliness? (N=44)

	N	%
Not at all or minimally	9	20.45
Partially	24	54.55
Substantially	9	20.45
Fully or Almost Fully	2	4.55

89. Does the State HD periodically evaluate surveillance activities for quality assurance purposes? If no, skip sub-questions. (N=42)

	N	%
Not at all or minimally	12	28.57
Partially	14	33.33
Substantially	14	33.33
Fully or Almost Fully	2	4.76

89b. Do epidemiology personnel share the QA findings with others? (N=31)

	N	%
Not at all or minimally	3	9.68
Partially	9	29.03
Substantially	16	51.61
Fully or Almost Fully	3	9.68

90. Is the State HD able to determine and monitor under-reporting bias for improvement over time? (N=43)

	N	%
Not at all or minimally	17	39.53
Partially	22	51.16
Substantially	4	9.30
Fully or Almost Fully	--	--

91. Are efforts routinely made to improve the timeliness and completeness of reporting? (N=43)

	N	%
Not at all or minimally	3	6.98
Partially	20	46.51
Substantially	18	41.86
Fully or Almost Fully	2	4.65

92. Is the proportion of reported cases with initially missing information monitored over time for QA purposes? (N=43)

	N	%
Not at all or minimally	15	34.88
Partially	15	34.88
Substantially	13	30.23
Fully or Almost Fully	--	--

INDICATOR 9B: UTILIZE QUALITY ASSURANCE PROCESS TO IMPROVE PERFORMANCE OF THE STATE HEALTH DEPARTMENT EPIDEMIOLOGY PROGRAM

93. Are disease-specific estimates of QA problems (i.e. degree of under reporting, missing information on case reports, etc.) monitored for improvement over time? (N=44)

	N	%
Not at all or minimally	17	38.64
Partially	17	38.64
Substantially	9	20.45
Fully or Almost Fully	1	2.27

94. Generally, are efforts made to improve QA problems? (N=44)

	N	%
Not at all or minimally	5	11.36
Partially	21	47.73
Substantially	15	34.09
Fully or Almost Fully	3	6.82

95. For each investigation or study, regardless of the outcome, is there a written report describing the event, the investigative findings, the intervention(s) applied, and the outcomes? (N=42)

	N	%
Not at all or minimally	4	9.52
Partially	12	28.57
Substantially	17	40.48
Fully or Almost Fully	9	21.43

96. Is an evaluation of each investigation provided to the investigator? (N=43)

	N	%
Not at all or minimally	17	39.53
Partially	14	32.56
Substantially	9	20.93
Fully or Almost Fully	3	6.98

97. Do HD ID epidemiology personnel develop annual reports with an evaluation of performance measures and program objectives? (N=43)

	N	%
Not at all or minimally	19	44.19
Partially	13	30.23
Substantially	6	13.95
Fully or Almost Fully	5	11.63

INDICATOR 10A: CONDUCT OR SUPPORT OF PUBLIC HEALTH RESEARCH AND DEVELOPMENT PROJECTS BY STATE HEALTH DEPARTMENT EPIDEMIOLOGY PROGRAM

98. In general, does the State HD have adequate capacity in infectious disease epidemiology to conduct research activities? (N=44)

	N	%
Not at all or minimally	20	45.45
Partially	15	34.09
Substantially	9	20.45
Fully or Almost Fully	---	---

99. Have State HD ID epidemiology personnel conducted retrospective or prospective studies in the last 24 months? (N=43)

	N	%
No	30	69.77
Yes	13	30.23

100. Have State HD ID epidemiology personnel conducted community-based public health interventions stemming from epidemiological assessments of need in the last 24 months? (N=41)

	N	%
Not at all or minimally	16	39.02
Partially	16	39.02
Substantially	8	19.51
Fully or Almost Fully	1	2.44

101. Have State HD ID epidemiology personnel been involved in cost-benefit analysis studies in the last 24 months? (N=43)

	N	%
No	9	20.93
Yes	34	79.07

102. Have State HD ID epidemiology personnel conducted analytic studies in the last 24 months? (N=43)

	N	%
No	31	72.09
Yes	12	27.91

103. Have State HD ID epidemiology personnel published in peer reviewed journals in the last 24-months? (N=43)

	N	%
No	31	72.09
Yes	12	27.91

104. Have State HD ID epidemiology personnel conducted presentations at national level professional conferences in the last 24-months? (N=41)

	N	%
No	34	82.93
Yes	7	17.07

105. Which of the following limit the State HD's ability to conduct studies, research, cost benefit analysis or analytic studies? (Check all that apply) (N=44)

	Epidemiology Studies N (%)	Epidemiologic research N (%)	Cost benefit analysis N (%)	Analytic studies N (%)
Lack of expertise	6 (13.64)	8 (18.18)	28 (63.64)	6 (13.95)
Difficulty funding controls	8 (18.18)	5 (11.36)	4 (9.09)	9 (20.93)
Too few cases to have a meaningful study	23 (52.27)	13 (29.55)	9 (20.45)	16 (37.21)
Lack of epidemiology staff	30 (68.18)	31 (70.45)	28 (63.64)	28 (65.12)
Too many competing priorities	38 (86.36)	38 (86.36)	35 (79.55)	37 (86.05)
Not included in the job description	1 (2.33)	8 (18.18)	10 (22.73)	6 (14.29)
Insufficient support	18 (40.91)	20 (45.45)	21 (47.73)	21 (48.84)
Lack of resources	33 (75.00)	35 (79.55)	34 (77.27)	34 (79.07)
Other	1 (2.27)	2 (4.55)	1 (2.27)	---
None	---	---	---	---

INDICATOR 10B: ASSURE APPROPRIATE USE OF NEW PUBLIC HEALTH KNOWLEDGE

106. Do State HD ID epidemiology personnel routinely apply research findings to public health practice? (N=44)

	N	%
Not at all or minimally	4	9.09
Partially	7	15.91
Substantially	24	54.55
Fully or Almost Fully	9	20.45

107. Do State HD ID epidemiology personnel actively facilitate the use of new public health knowledge to improve program development and administration? (N=44)

	N	%
Not at all or minimally	1	2.27
Partially	10	22.73
Substantially	23	52.27
Fully or Almost Fully	10	22.73

108. Do State HD ID epidemiology personnel actively assist local public health entities to use new scientific knowledge? (N=44)

	N	%
Not at all or minimally	2	4.55
Partially	7	15.91
Substantially	31	70.45
Fully or Almost Fully	4	9.09