

Essential Functions of Chronic Disease Epidemiology In State Health Departments

A Report of the Council of State and Territorial Epidemiologists

**Chronic Disease Epidemiology
Capacity Building Workgroup**

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Essential Functions of Chronic Disease Epidemiology In State Health Departments

Executive Summary

Background

As illustrated by many key measures, the burden of chronic diseases on our nation is significant:

- Chronic diseases account for the majority of mortality, morbidity and disability in the United States.
- More than 15% of the adult population suffers from a chronic disabling condition, such as arthritis, heart disease, hypertension or diabetes.
- Direct health care costs for people with chronic conditions account for 75% of the total national expenditure for health care.
- Behaviors that lead to many chronic diseases, such as smoking, unhealthy diet, lack of physical activity and alcohol use, account for approximately 800,000 deaths in the United States annually.

In order to monitor chronic diseases and administer prevention and control programs, the Institute of Medicine recommended in 1988 that state health departments “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.”¹ Chronic disease epidemiologists provide the skills and expertise necessary to carry out these recommendations through chronic disease programs.

During the past ten years, many states have strengthened their chronic disease epidemiology capacity, resulting in a positive impact on chronic disease programs and practice. Despite this progress, chronic disease epidemiology capacity at many health departments remains low. According to a 2003 survey by the Council of State and Territorial Epidemiologists, half of states reported having “no, minimal, or partial” capacity for chronic disease epidemiology². In thirteen states, chronic disease programs are supported by three or fewer epidemiologists; three states have no chronic disease epidemiologists.

The Centers for Disease Control and Prevention (CDC), the Association of State and Territorial Chronic Disease Program Directors (ASTCDPD), and the Council of State and Territorial Epidemiologists (CSTE) have been working together to address the concerns about chronic disease epidemiology capacity in state health departments. In 2000, these groups developed a vision for chronic disease activities, which states that by 2004:

Health departments nationwide will have access to adequate epidemiology capacity in order to develop sound, data-driven public health programs and policies that promote health and quality of life by preventing illness, injury and disability from chronic diseases.

Purpose of This Report

This report describes and prioritizes the activities that chronic epidemiologists are undertaking to fulfill this vision. It will help state health departments define the highest priority functions and

¹ Institute of Medicine. The Future of Public Health. Washington, DC: National Academy Press, 1988

² <http://www.cste.org/pdffiles/ecacover1.pdf>.

responsibilities of chronic disease epidemiologists in their agencies. This information provides the basis for determining the capability of a state health department to utilize epidemiology to reduce the burden of chronic diseases in their state's population.

Methods

The identification of those functions that constitute the most critical chronic disease epidemiology activities resulted from the work of the CSTE Chronic Disease Epidemiology Capacity Building Workgroup, which included representatives from eight state health departments, as well as CSTE, ASTCDPD, and the CDC. Additional input was obtained through interviews with key informants, including state epidemiologists, program directors and vital records managers from thirteen other states. The workgroup reviewed past writings on chronic disease epidemiology essential functions, as well as other public health essential functions, and organized the most relevant functions within the framework of the Ten Essential Public Health Services³.

Findings

In state health departments across the nation, chronic disease epidemiologists engage in a broad range of activities, including functions that support all of the Ten Essential Public Health Services. However, for three of the Essential Public Health Services – surveillance, communication and consultation – chronic disease epidemiologists perform functions that are critical to health departments. These have been categorized as Tier 1 Essential Functions. The following table (see p. vii) provides abbreviated definitions of the Tier 1 functions, along with examples of appropriate activities that chronic disease epidemiologists perform to carry out these functions.

For four of the Essential Public Health Services, chronic disease epidemiologists typically play a supportive or coordinating role. These functions – evaluation, education, investigation and mobilization – have been organized into Tier 2. The remaining three Essential Public Health Services – innovation, regulation and utilization – are included in Tier 3, where chronic disease epidemiologists typically play a more limited role in delivering the service.

Part I of this report describes previous efforts made to identify the critical functions of chronic disease epidemiology, as well as the background and need for the current report. Part II provides detailed discussion of the essential functions of chronic disease epidemiology, organized in relationship to the Ten Essential Public Health Services. In addition to detailed function descriptions, Part II includes illustrations and examples from the key informants. Part III concludes the report with a summary of current chronic disease capacity and key recommendations. The recommendations restate the point stressed in previous reports that support for chronic disease epidemiology by senior public health management is a critical factor in the development, maintenance and effective use of state chronic disease epidemiologic capacity.

Conclusions

Chronic disease epidemiology provides state health departments with a set of skills and expertise that is critical to public health decision-making. With the assistance of chronic disease

³ <http://www.phppo.cdc.gov/nphpsp/10EssentialPHServices.asp>

epidemiologists, senior health officials, chronic disease program managers and other decision-makers can interpret and understand data better, and can translate that information into effective public health action.

"Having a State Chronic Disease Epidemiologist has enabled New Hampshire to base our programs and policy decisions on data, increased our level of sophistication in a number of disease prevention and health promotion programs, and enhanced our credibility with our partners throughout the state." -- Bill Kassler, State Medical Director, NH Department of Health and Human Services

"In the short time that we have had an epidemiologist, we have seen the difference. Our partners call on us for data and our epidemiologist is invited to numerous meetings representing the department and presenting on various chronic disease topics. While we have always been a key partner, our value has increased ten fold!" --Barbara Yamashita, Chief, Community Health Division, HI State Department of Health

Essential Public Health Services	Tier 1 Essential Chronic Disease Epidemiology Functions	Examples of Appropriate Activities
<i>Monitor health status to identify and solve community health problems.</i>	Surveillance Chronic disease epidemiologists collect, analyze and interpret science-based data to assess the burden of chronic disease, provide information on the distribution and risk factors of chronic diseases necessary for public health program planning and implementation, and assist in evaluating the success of public health programs.	Data from critical surveillance systems (e.g., vital statistics, BRFSS, YRBSS, YTS, cancer registries, and hospital discharge) are analyzed on a regular basis (often annually) to determine trends and patterns of chronic diseases and related risk factors by age, sex, race/ethnic group, socioeconomic status and geographic area. Rates are age-adjusted and include confidence intervals when appropriate.
<i>Inform, educate and empower people about health issues.</i>	Communication Chronic disease epidemiologists disseminate the results of epidemiologic efforts to support science-based decisions about health issues by policy-makers, programs leaders and the general public	Epidemiologic analyses of surveillance data are interpreted and disseminated widely in print and electronic formats on a regular basis (often annually) to people, communities and appropriate decision-makers. Epidemiologic reports are tailored appropriately for the intended audiences. Interpretation and recommendations reflect appropriate use of epidemiologic methods, including age-adjustment, confidence intervals, and other methods. Data are routinely placed in an appropriate context, e.g. by comparing state rates with U.S. rates, Healthy People 2010 objectives, or state-generated objectives.
<i>Develop policies and plans that support individual and community health efforts.</i>	Consultation Chronic disease epidemiologists provide decision-makers with information necessary for planning, implementing and evaluating public health programs and policies, and for establishing goals and priorities related to chronic disease.	Chronic disease program managers, senior public health decision-makers and communities have adequate and timely information regarding disease occurrence and risk factors to develop sound, data-driven policies and programs that promote health and quality of life by preventing illness and premature mortality from chronic diseases. "Burden" or "epidemiology" sections of grant/cooperative agreement applications routinely contain input from a trained chronic disease epidemiologist. Chronic disease prevention and control plans include and use epidemiologic information. Chronic disease epidemiologists are involved in the evaluation of public health programs.

Part 1. Introduction

History and Purpose of Essential Functions White Paper

As the burden of chronic disease increases in this country, state health departments face mounting pressure to respond. Many state health departments have been addressing chronic conditions for more than a decade. However, the soaring rates of diabetes, asthma and obesity and the increasing prevalence of chronic conditions associated with an aging population provide added impetus for enhancing surveillance systems, instituting new interventions and evaluating changes in outcomes.

Chronic diseases are illnesses that are prolonged, do not resolve spontaneously and may not be cured completely. Chronic conditions of public health importance are conditions with a high burden of death, illness or disability; high health care costs; and/or significantly reduced quality of life.

The current scope of chronic disease programmatic activities in state health departments includes risk factors, as well as disease and disability. Programs vary between states but generally cover some or all of the following focus areas: aging, alcohol, arthritis, asthma, cardiovascular disease, cancer, diabetes, hypercholesterolemia, hypertension, nutrition, oral health, osteoporosis, overweight/obesity, physical activity, tobacco, clinical and community preventive services, injury, violence, and occupational and environmental health.

The emphasis on chronic disease and the resources available for chronic disease programs vary widely from state to state. One particularly significant variable is the use of chronic disease epidemiologists in state health departments, either as key staff within chronic disease programs or as experts available for consultation across programs. Chronic disease epidemiologists provide the skills and expertise necessary for chronic disease programs to carry out the Institute of Medicine's 1988 recommendation to "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."⁴

While some states have established significant capacity in chronic disease epidemiology, others have only one or two staff with epidemiology training available for chronic disease programs; a few states have no chronic disease epidemiologists. The majority of these positions are supported with federal funds, either through categorical funding for disease-specific programs or through the STEPPS (State-Based Epidemiology Public Health Program Support) program, which is focused on increasing the availability of chronic disease epidemiologists in state health departments.

In 1992, the Council of State and Territorial Epidemiologists (CSTE) issued a position statement calling for increased chronic disease epidemiology capacity at the state level. At that time, only three states were receiving salary support for chronic disease epidemiology positions from the National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). By 2003, that number had increased to 25. The increased state capacity in chronic disease epidemiology has resulted, in part, from the vision statement put forth in 2000 by the Centers for Disease Control and Prevention (CDC), CSTE and the Association of State and Territorial Chronic Disease Program Directors (ASTCDPD). This states:

⁴ Institute of Medicine. *The Future of Public Health*. Washington, DC: National Academy Press, 1988

Health departments nationwide will have access to adequate epidemiology capacity in order to develop sound, data-driven public health programs and policies that promote health and quality of life by preventing illness, injury and disability from chronic diseases.⁵

There have been a number of efforts by CSTE and the CDC to assess the adequacy of chronic disease epidemiology resources in state health departments. In 2001, at the request of CSTE and CDC, Remington and Frey identified effective strategies for improving the placement of chronic disease epidemiologists in state health departments, along with factors that affect capacity building, retention and quality of staff⁶. In 2003 CSTE performed a comprehensive assessment of chronic disease epidemiology capacity in state and territorial health departments. The results of that assessment are discussed later in this report.

The primary focus of these efforts has been assessing capacity. Less emphasis has been placed on defining the appropriate role of chronic disease epidemiologists in state health departments. In an effort to begin defining that role, CSTE, NCCDPHP and ASTCDPD developed a recommendation that all state health departments have at least one experienced State Chronic Disease Epidemiologist who will collaborate with other epidemiologists and state chronic disease program managers to carry out the responsibilities described in Figure 1⁷.

⁵ Developing State-Based Chronic Disease Epidemiology Capacity Nationwide: A coordinated strategic plan proposed by ASTCDPD, CSTE, and NCCDPHP. 2000.

⁶ PL Remington and CA Frey, "Evaluation of State-Based Chronic Disease Epidemiology Placement Activity". Prepared for the Council of State and Territorial Epidemiologists, 2001.

⁷ Developing State-Based Chronic Disease Epidemiology Capacity Nationwide: A coordinated strategic plan proposed by ASTCDPD, CSTE, and NCCDPHP. 2000.

Figure 1. Role of State Chronic Disease Epidemiologists

- Coordinate and conduct chronic disease surveillance according to nationally developed standards, including Chronic Disease Indicators (CDI), National Public Health Surveillance System (NPHSS) and National Electronic Disease Surveillance System (NEDSS).
- Disseminate results of chronic disease surveillance regularly and widely in a variety of formats.
- Provide appropriate epidemiology technical support to state chronic disease programs, assuring that:
 - Documents produced by chronic disease epidemiology programs such as reports and grant and cooperative agreement applications receive appropriate epidemiology input,
 - Epidemiology capacity/activities are coordinated across individual chronic disease programs,
 - Epidemiology support to state Community Health Status Indicators Project (CHSI) activities that are related to chronic disease control are coordinated at the state level.
 - Appropriate evaluation of chronic disease programs is conducted.
- Maintain an epidemiology point of contact with NCCDPHP.
- Monitor and update at least every two years the adequacy of the state's chronic disease epidemiology capacity.
- Maintain a state strategic plan for filling gaps identified during the capacity assessment process.

Recommendations in Figure 1 refer to a central, coordinating State Chronic Disease Epidemiologist position in a state health department. CSTE and CDC have also had a strong interest in defining appropriate roles and functions for all chronic disease epidemiology positions, whether located within a chronic disease program or a centralized epidemiology unit. This interest led to a CSTE Position Statement in 2000 that urges CDC to provide states with resources to develop the capacity and competency of epidemiologists to achieve effective chronic disease programming, and to help CSTE supplement state efforts to assure that chronic disease epidemiologists are retained at the state level.

Following the 2000 position statement, CSTE produced a white paper in 2001 that provided recommendations to assist state health departments with the integration of chronic disease epidemiology functions and positions into their organizational structures. That white paper was revised, condensed and published in the July 2003 issue of the *Journal of Public Health Management and Practice*⁸.

Based on the 2000 position statement and the 2001 white paper, CSTE and CDC identified a need to more specifically define the critical roles of chronic disease epidemiologists in state health departments. The purpose of the current white paper is to describe those critical roles as Essential Functions that are derived from the primary responsibilities of the health departments themselves. This white paper also describes the current capacity of state health departments to carry out these essential functions, based on the results of the 2003 CSTE capacity survey⁹, and identifies tools and recommendations to remove barriers to their effective implementation.

⁸ PL Remington, E Simoes, RC Brownson, and PZ Siegel. 2003. The role of epidemiology in chronic disease prevention and health promotion programs. *J Public Health Management Practice*. 9(4), 258-265.

⁹ CSTE. 2004. National Assessment of Epidemiologic Capacity in Chronic Disease: Findings and Recommendations. In Press.

CSTE, CDC and the authors of the current white paper anticipate that as a result of this report, at a minimum, the following will occur:

- State health departments will use the Essential Chronic Disease Epidemiology Functions identified in this report to help define the activities and responsibilities of chronic disease epidemiologists in their agencies;
- Information about the Essential Functions identified in this report will be linked with the prior and current work on chronic disease epidemiology capacity to provide a complete picture of the capabilities of state health departments to utilize epidemiology in response to chronic disease issues;
- The Essential Functions will form the foundation for future work related to chronic disease epidemiologists, including the definition of competencies, the development of training programs, and the development of measures to help state health departments determine the adequacy of their chronic disease epidemiology activities.

Essential Functions Development Process

To establish essential functions for chronic disease epidemiologists in state health departments, CSTE and CDC formed the Chronic Disease Epidemiology Capacity Building Workgroup, consisting of chronic disease epidemiologists from eight state health departments around the country. NCCDPHP and ASTCDPD were also represented on the group. The workgroup collected and reviewed available information, including publications on chronic disease epidemiology capacity, internal CDC and CSTE communications on potential roles and responsibilities for chronic disease epidemiologists, and examples of essential functions from other public health disciplines. A complete list of the background materials utilized by the workgroup is included in Appendix 1.

Based on the background materials, the workgroup defined a draft set of essential functions. After internal review and editing, the workgroup produced a revised set of essential functions and then sought to validate the list through a key informant interview process. State epidemiologists, chronic disease epidemiologists, program directors and vital records managers from thirteen additional state health departments were provided with copies of the revised essential functions and were questioned through a structured interview process. In an effort to get input from large and small, high capacity and low capacity states around the country, health departments were selected for participation in the key informant interviews based on state population size, geographic region, and self-reported chronic disease epidemiology capacity. Interviewees were asked whether the defined essential functions seemed appropriate for their agencies, and what changes they would suggest. Interviewees were also asked for examples of projects or activities in their agencies that highlighted one or more of the essential functions. Finally, interviewees were asked to identify barriers to implementing the essential functions and suggestions for removing those barriers. The questions used in the key informant interview process are included in Appendix 2. A summary of the comments made by key informant interviewees is included in Appendix 3.

Following the key informant interviews, the workgroup incorporated comments and suggested changes into the list of essential functions, and prepared this white paper to provide the context and rationale for the list.

Part 2. Review of Essential Functions

Overview of the Essential Functions

Efforts to define essential functions for public health programs began after the 1988 publication of the Institute of Medicine's "Future of Public Health," a document that criticized the status of the nation's public health system. That document defined the three core functions of public health assessment, policy development and assurance¹⁰. In the early 1990's public health officials clarified and expanded the list of core functions, creating a unified list of "essential public health services" that was produced jointly by the CDC and all national public health associations¹¹.

The Chronic Disease Epidemiology Capacity Building Workgroup elected to use the Ten Essential Public Health Services as an organizing framework, believing that the adoption of this model would assure that all critical activities of public health agencies would be addressed. The workgroup also felt that the Ten Essential Services model is familiar to public health officials, and would help increase their understanding of the role of chronic disease epidemiologists in supporting these activities.

Within each essential service, the workgroup identified the critical roles played by chronic disease epidemiologists. Each essential function articulates what chronic disease epidemiologists do in support of that essential service, how they carry out their work, and why.

Through the course of developing the definitions for each essential function, the workgroup recognized that the nature of the role of chronic disease epidemiologists varies by essential service. For some essential services, epidemiologists play a leadership role when responding to chronic disease issues. For other essential services, epidemiologists provide more of a supporting role. This understanding was reinforced during the key informant interviews, when the majority of the respondents commented that their roles in certain essential services was minor, while other essential services dominated their responsibilities in their agencies.

Because of this, the workgroup organized the Ten Essential Services and the Chronic Disease Epidemiology Essential Functions that support those services into three tiers. Tier 1 contains the essential services for which chronic disease epidemiology is critical to delivering the service. Tier 2 contains the essential services for which chronic disease epidemiology typically plays a supportive or coordinating role in delivering the service. Tier 3 reflects those essential services for which chronic disease epidemiology typically plays a more limited role in delivering the service.

¹⁰ Institute of Medicine. The Future of Public Health. Washington, DC: National Academy Press, 1988

¹¹ JA Harrell, EL Baker and the Essential Services Workgroup. 1995. The Essential Services of Public Health. American Public Health Association.

Figure 2 summarizes the Ten Essential Functions of Chronic Disease Epidemiology. Table 1 contains the complete definitions for the Essential Functions. Following the table, each Essential Function is addressed in more detail, with a rationale for the roles and responsibilities that are included in each function, as well as its placement in a tier, and an example of the Essential Function in action at a state health department.

Figure 2. Chronic Disease Epidemiology Essential Functions

Tier 1 (chronic disease epidemiology is critical to delivering these services)	Tier 2 (chronic disease epidemiology plays a supportive or coordinating role in delivering these services)	Tier 3 (chronic disease epidemiology plays a more limited role in delivering these services)
Surveillance Consultation Communication	Evaluation Education Investigation Mobilization	Innovation Regulation Utilization

Table 1. Chronic Disease Epidemiology Essential Functions

	Essential Public Health Services	Chronic Disease Epidemiology Essential Functions
Tier 1 Functions -- Chronic disease epidemiology is critical to delivering these essential services.	<i>Monitor health status to identify and solve community health problems.</i>	Surveillance: <i>Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health (MMWR Rec & Reports, 2001, vol. 50, no. 13, page 2).</i> Utilize surveillance methods and tools to: - Assess the burden of chronic disease, including morbidity, mortality, quality of life, and cost, in the general population and disparities among sub-populations - Identify trends in chronic disease in the general population and sub-populations, and new problems of public health importance - Identify and track causes and risk factors associated with chronic disease, including demographic, social, behavioral, genetic, policy, environmental, and health conditions - Evaluate changes in disease, health events and risk factors associated with public health interventions. Add value to critical data sources, including vital records and population-based surveys (for example, the Behavioral Risk Factor Surveillance System (BRFSS)): - Analyze data from these sources and ensure the effective application of findings from these and other data sources to carry out essential surveillance activities; - Implement quality control methods or contribute to their development; and - Provide important input to managers of data systems to encourage data integrity and inclusion of information relevant to chronic disease surveillance - Ensure that these surveillance systems incorporate the key characteristics of public health surveillance systems: usefulness, simplicity, flexibility, data quality, acceptability, accuracy, and representativeness. <i>Chronic disease epidemiology has a unique emphasis on working across organizational and categorical boundaries. Both the focus of chronic disease epidemiologists (e.g., chronic health conditions and their underlying causes, including risk factors) and the tools that they use (e.g., surveillance systems and data sources) cross traditional disease, programmatic and organizational boundaries. Thus, chronic disease epidemiologists provide leadership in state health departments by coordinating information and resources across multiple systems existing in numerous public and private agencies to ensure comprehensive disease surveillance. While chronic disease epidemiologists rely largely on analysis of existing data, they may also undertake new data collection to enhance surveillance efforts.</i>
	<i>Inform, educate, and empower people about health issues.</i>	Communication: - Report findings of surveillance efforts and investigations - Interpret the results for action by decision-makers and the general public - Ensure that the results are incorporated appropriately into communications and publications - Identify the population at risk and help create appropriate messages for reaching that population - Ensure that the target audience understands the context and scientific basis of any findings related to chronic disease or acute health events, and has all the relevant information necessary for making decisions and taking appropriate public health or personal health action.
	<i>Develop policies and plans that support individual and community health efforts.</i>	Consultation: - Collect, assemble, analyze, and interpret surveillance and evaluation data to provide decision makers with information necessary for planning and evaluating public health programs and policies, and for establishing goals and priorities related to chronic disease; - Guide and educate decision makers in the interpretation and use of this information, assuring that scientific evidence is appropriately incorporated into program planning and new policies; and - Review, synthesize, and interpret articles from the literature to ensure that program plans and new policies are evidence-based, and that plans are directly linked to desired outcomes. - Provide technical assistance on accessing and understanding epidemiologic information to the lay public, legislators, and partners of the public health system, including medical professionals, academicians, non-profit organizations, and others.

	Essential Public Health Services	Chronic Disease Epidemiology Essential Functions
Tier 2 Functions -- Chronic disease epidemiology typically plays a supportive/coordinating role in delivering these essential services	<i>Evaluate effectiveness, accessibility, and quality of personal and population-based health services.</i>	Evaluation: - Design, implement, and coordinate scientifically-sound evaluations of the outcomes of health services, health promotion and disease prevention programs, assessing effectiveness, accessibility and quality - Assist program managers and decision-makers by providing information on using evaluation results to increase the effectiveness of existing programs and to design new programs that address identified needs - Perform evaluation research activities including the analysis and interpretation of data about program impacts, using both qualitative and quantitative methods.
	<i>Assure a competent public and personal health care workforce.</i>	Education: - Provide or assist in the development of training and technical assistance for state and local public health staff in the use of surveillance tools, study design, data analysis methods and tools, and data interpretation - Ensure that chronic disease programs throughout the public health system employ consistent approaches and methods for surveillance, disease investigations, and evaluation - Ensure that public health officials understand the role of data and how to use it in decision-making - Integrate chronic disease epidemiology expertise into program planning and implementation, ensuring that competent staff are available to assist in taking appropriate public health actions to address chronic diseases - Aid health care providers in developing evidence-based guidelines for screening and managing chronic diseases.
	<i>Diagnose and investigate health problems and health hazards in the community.</i>	Investigation: - Promptly investigate unusual chronic disease occurrence - Identify and quantify health risks associated with environmental exposures and personal and social risk factors - Diagnose long-term community health threats based on these risk factors - Collect and correlate data from disparate sources and collaborating with multiple public health and personal health programs and agencies.
	<i>Mobilize community partnerships and action to identify and solve health problems.</i>	Mobilization: - Create and facilitate partnerships between public health officials, academic centers, health care organizations, and others to identify and define health problems affecting the community - Use the data collected through such partnerships to inform community members, policy makers and others, enabling them to craft and implement action plans for solving the defined health problems - Ensure that action plans are based on appropriate interpretation of current data and research-based best practices and include science-based links between interventions and desired outcomes

	Essential Public Health Services	Chronic Disease Epidemiology Essential Functions
Tier 3 Functions -- Chronic disease epidemiology typically plays a limited role in delivering these essential services.	<i>Research for new insights and innovative solutions to health problems.</i>	Innovation: - Review scientific literature, perform original research, and collaborate with academic centers and with other public health professionals to develop new approaches for conducting surveillance, investigations and evaluations, and to design innovative public health interventions, with a particular emphasis on prevention - Provide public health decision-makers with interpretation of scientific research and its implications for public health programs
	<i>Enforce laws and regulations that protect health and ensure safety.</i>	Regulation: Collect, analyze and report data on critical health issues related to chronic diseases to: - Enable public health and other officials to take action regarding violations of current laws and regulations - Inform policy makers seeking to enhance laws and regulations that protect the public's health and safety of their potential impact on the public's health.
	<i>Link people to needed personal health services and assure the provision of health care when otherwise unavailable.</i>	Utilization: Collect, analyze and report data on availability, access, and utilization of personal health services and prevention and health promotion programs among population subgroups, including trends over time.

Tier 1 Essential Functions – Surveillance

Chronic disease epidemiology is critical to delivering this essential service

Essential Public Health Service	Chronic Disease Epidemiology Essential Function
Monitor health status to identify and solve community health problems.	Surveillance: <i>Public health surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health (MMWR Rec & Reports, 2001, vol. 50, no. 13, page 2).</i> Utilize surveillance methods and tools to: • Assess the burden of chronic disease, including morbidity, mortality, quality of life, and cost, in the general population and disparities among sub-populations • Identify trends in chronic disease in the general population and sub-populations, and new problems of public health importance • Identify and track causes and risk factors associated with chronic disease, including demographic, social, behavioral, genetic, policy, environmental, and health conditions • Evaluate changes in disease, health events and risk factors associated with public health interventions. Add value to critical data sources, including vital records and population-based surveys (for example, the Behavioral Risk Factor Surveillance System (BRFSS)): • Analyze data from these sources and ensure the effective application of findings from these and other data sources to carry out essential surveillance activities; • Implement quality control methods or contribute to their development; and • Provide important input to managers of data systems to encourage data integrity and inclusion of information relevant to chronic disease surveillance • Ensure that these surveillance systems incorporate the key characteristics of public health surveillance systems: usefulness, simplicity, flexibility, data quality, acceptability, accuracy, and representativeness. <i>Chronic disease epidemiology has a unique emphasis on working across organizational and categorical boundaries. Both the focus of chronic disease epidemiologists (e.g., chronic health conditions and their underlying causes, including risk factors) and the tools that they use (e.g., surveillance systems and data sources) cross traditional disease, programmatic and organizational boundaries. Thus, chronic disease epidemiologists provide leadership in state health departments by coordinating information and resources across multiple systems existing in numerous public and private agencies to ensure comprehensive disease surveillance. While chronic disease epidemiologists rely largely on analysis of existing data, they may also undertake new data collection to enhance surveillance efforts.</i>

Rationale:

To all workgroup members, and to the majority of key informant interviewees, Surveillance is the major role of chronic disease epidemiologists in state health departments. Surveillance systems include the collection of data that is critical for public health decision-making (e.g., implementing or expanding public health programs, tailoring interventions for new populations, highlighting new health risks). The chronic disease epidemiologist's role in surveillance is multi-faceted, as described in the essential function, but has a unique focus on interpretation of data. Many other groups in health departments are involved in collecting surveillance data, most notably vital records offices that generally have the responsibility for operating and assuring the quality of key data systems. However, the chronic disease epidemiologist is the individual who is best positioned, through knowledge and skills, to understand the implications of the data related to chronic disease, to place the data in its necessary context and to develop recommendations

based on the results. Those recommendations may include modifications to the surveillance system to more accurately target answers to critical public health questions. Chronic disease epidemiologists also provide the leadership necessary to bring together relevant data from multiple surveillance systems for public health program use and to build comprehensive surveillance for chronic diseases.

Example:

Michigan Department of Community Health asthma epidemiologists publish asthma mortality statistics by age, sex, racial group and trend over time, and season of the year. This activity indicates that preventable asthma deaths are still occurring in young age groups (<35 years of age) and highlights racial disparities in asthma mortality rates. Vital Statistics records that identify asthma deaths are used as a first step in Asthma Mortality Review investigations. The Mortality Review investigations analyze information on availability, access and utilization of asthma management, including prescription and use of appropriate asthma medications, referrals to specialists, exposures to triggers, etc. Data also include information on socioeconomic status, social pressures and support, and employment and insurance status. All of these data are used by decision-makers to prevent future asthma deaths.

Tier 1 Essential Functions – Communications

Chronic disease epidemiology is critical to delivering this essential service

Essential Public Health Service	Chronic Disease Epidemiology Essential Function
<i>Inform, educate and empower people about health issues.</i>	Communication: • Report findings of surveillance efforts and investigations • Interpret the results for action by decision-makers and the general public • Ensure that the results are incorporated appropriately into communications and publications • Identify the population at risk and help create appropriate messages for reaching that population • Ensure that the target audience understands the context and scientific basis of any findings related to chronic disease or acute health events, and has all the relevant information necessary for making decisions and taking appropriate public health or personal health action.

Rationale:

Closely linked with surveillance in importance and function, communications was deemed by the workgroup and the interviewees as a critical role for chronic disease epidemiologists. Through communication, results of surveillance efforts, cluster investigations and other activities are relayed to decision-makers in public health and to the public. In many states, chronic disease epidemiologists are actively involved in preparing press releases and reports for the public, and assuring that the information conveyed and the conclusions drawn are scientifically accurate. The epidemiologists also provide the context for this information and translate results, risk factors, and other key information into language that is appropriate for the target audience. This role is evident when epidemiologists provide press interviews, answer questions at public meetings, or respond to inquiries from the legislature. The role is further evident in internal public health department meetings, and in meetings between organizations, where chronic disease epidemiologists present the results of analyses of specific chronic disease issues and provide expert opinion on the implications of those findings. Often epidemiologists must fulfill this role and respond to questions or concerns within a very short time frame. As one chronic disease program director noted, "When you have 20 minutes to answer a question, if the expertise is not in the house, you are not able to respond the way you need to."

Example:

The Indiana State Department of Health, in collaboration with the American Cancer Society, produced an extensive report for the general public called "Indiana Cancer Facts and Figures." The purpose of the report was to educate the public on current cancer trends in the state, prior to developing a comprehensive cancer control plan. Much of the information contained in the report was generated by chronic disease epidemiologists, using data from multiple state data sets including cancer registries, birth records, the BRFSS, and the Indiana Youth Tobacco Survey. This glossy publication has been used extensively by the state Legislature, community organizations and local health departments for education and as a reference document for decision-making. <http://www.in.gov/isdh/factsfigures2003.pdf>.

Tier 1 Essential Functions – Consultation

Chronic disease epidemiology is critical to delivering this essential service

Essential Public Health Service	Chronic Disease Epidemiology Essential Function
<i>Develop policies and plans that support individual and community health efforts.</i>	Consultation: • Collect, assemble, analyze, and interpret surveillance and evaluation data to provide decision makers with information necessary for planning and evaluating public health programs and policies, and for establishing goals and priorities related to chronic disease; • Guide and educate decision makers in the interpretation and use of this information, assuring that scientific evidence is appropriately incorporated into program planning and new policies; and • Review, synthesize, and interpret articles from the literature to ensure that program plans and new policies are evidence-based, and that plans are directly linked to desired outcomes. • Provide technical assistance on accessing and understanding epidemiologic information to the lay public, legislators, and partners of the public health system, including medical professionals, academicians, non-profit organizations, and others.

Rationale:

The third essential function in the first tier of essential services is consultation, which is closely related to both communication and surveillance. Surveillance reflects the collection and interpretation of information. Communication conveys information to decision-makers. Consultation is the culmination of both these activities. To perform this role, chronic disease epidemiologists analyze the total body of evidence on a chronic disease issue; they apply their knowledge to actively advise program managers, senior health officials and others on the meaning and implications of the findings. According to one interviewee, “Administrators expect chronic disease epidemiologists to provide information necessary to guide program planning and to assure that interventions are evidence-based.” The consultation role is most evident when public health agencies create policy, including developing or responding to legislation and program planning.

Example:

A chronic disease epidemiologist in the Wyoming Department of Health was the lead on developing a comprehensive report summarizing the burden of cardiovascular disease in the state. The report not only showed data summarizing the risks for residents of Wyoming, including maps showing where CVD rates are the highest, it also contained guidance on recognizing symptoms of CVD and suggestions on modifying lifestyles to reduce risk. Of particular interest to policy-makers were sections of the report that detailed the financial impact of CVD to the health care system in the state. The report utilized data from the BRFSS CVD module, vital records systems, hospital discharge data and hospital financial data. The comprehensive nature of the report, along with effective analyses describing the impact of CVD on state residents, gave policy-makers a solid guidance document for making decisions about potential interventions. http://wdh.state.wy.us/cvd/burden_booklet.pdf

Tier 2 Essential Functions – Evaluation

Chronic disease epidemiology typically plays a supportive/coordinating role in delivering this essential service

Essential Public Health Service	Chronic Disease Epidemiology Essential Function
<i>Evaluate effectiveness, accessibility and quality of personal and population-based health services.</i>	Evaluation: • Design, implement, and coordinate scientifically-sound evaluations of the outcomes of health services, health promotion and disease prevention programs, assessing effectiveness, accessibility and quality • Assist program managers and decision-makers by providing information on using evaluation results to increase the effectiveness of existing programs and to design new programs that address identified needs • Perform evaluation research activities including the analysis and interpretation of data about program impacts, using both qualitative and quantitative methods.

Rationale:

Epidemiologists generally do not lead evaluation activities, but they have an important supporting and coordinating role. In most public health agencies, evaluations are carried out by programs or are contracted out, often to academic centers. However, epidemiologists make critical contributions to developing evaluation designs to assure that the data accurately reflect program outcomes. Effective evaluation involves epidemiologists early in the planning stages (including, for example, the initial concept development and grant preparation phases). Epidemiologists inform decision-makers about the status, process and outcomes of the programs and interventions being evaluated. Involving epidemiologists early in the process also places them in a better position to assist with the interpretation of the evaluation results. Epidemiologists play a critical role in the interpretation of evaluation data, which is enhanced by their participation in the early evaluation phases.

Example:

Researchers from eight academic institutions work in partnership with the Office of Tobacco Prevention and Control at the Texas Department of Health to accomplish statewide tobacco prevention goals. The research team, known as TexTob, was formed to help plan and evaluate the Texas Tobacco Prevention Initiative. This pilot study was requested by the Texas Legislature to determine the effectiveness of tobacco prevention efforts in a limited area prior to statewide implementation. Chronic disease epidemiologists are active participants in this coalition, providing monitoring of community contractors as well as the Youth Tobacco Awareness Prevention Program, and analyzing data from the Texas Youth Tobacco Survey and the BRFSS. The data from these activities are used for both process (monitoring the program activities) and outcomes (assessing the effectiveness of the activities) evaluations.

<http://www.tdh.state.tx.us/otpc/pilot/evaluation.html>

Tier 2 Essential Functions – Education

Chronic disease epidemiology typically plays a supportive/coordinating role in delivering this essential service

Essential Public Health Service	Chronic Disease Epidemiology Essential Function
<i>Assure a competent public and personal health care work force.</i>	Education: • Provide or assist in the development of training and technical assistance for state and local public health staff in the use of surveillance tools, study design, data analysis methods and tools, and data interpretation • Ensure that chronic disease programs throughout the public health system employ consistent approaches and methods for surveillance, disease investigations, and evaluation • Ensure that public health officials understand the role of data and how to use it in decision-making • Integrate chronic disease epidemiology expertise into program planning and implementation, ensuring that competent staff are available to assist in taking appropriate public health actions to address chronic diseases • Aid health care providers in developing evidence-based guidelines for screening and managing chronic diseases.

Rationale:

Chronic disease epidemiologists provide training and technical assistance to individuals in their own agencies and throughout the public health system. In any public health organization, many people without formal training in chronic disease epidemiology collect, review, summarize and act on chronic disease information. By providing training and technical assistance, chronic disease epidemiologists promote higher quality outcomes for these activities. This role includes assuring that appropriate methods are used, which encourages greater consistency in analytical methods and data interpretation across health agencies. Technical assistance is also an element of consultation, as demonstrated by the active involvement of epidemiologists in helping health officials understand how to use data in decision-making. The role extends outside the health department, since chronic disease epidemiologists are also involved in promoting the use of evidence-based guidelines for screening and managing chronic conditions.

Example:

The Washington State Department of Health Assessment Operations Group (AOG) identified a need for a more consistent approach to data analyses among staff within their agency and in local health agencies. Utilizing the same methods for data analyses supports better decision-making when comparing analyses between programs and agencies. The AOG, led by the agency's State Epidemiologist for Non-Infectious Conditions, developed guidelines for six key data analysis issues: confidence intervals for public health assessment, population denominators, racial and ethnic groups in data analyses, rates for public health assessment, rural-urban classification systems for public health assessment, and small numbers. These guidelines are used throughout the state health department and in local health agencies, and have helped raise the quality of the state's chronic disease assessments and other reports that provide the scientific basis for public health decision-making.

<http://www.doh.wa.gov/Data/Guidelines/guidelines.htm>.

Tier 2 Essential Functions – Investigation

Chronic disease epidemiology typically plays a supportive/coordinating role in delivering this essential service

<i>Essential Public Health Service</i>	<i>Chronic Disease Epidemiology Essential Function</i>
<i>Diagnose and investigate health problems and health hazards in the community.</i>	<i>Investigation:</i> • Promptly investigate unusual chronic disease occurrence • Identify and quantify health risks associated with environmental exposures and personal and social risk factors • Diagnose long-term community health threats based on these risk factors • Collect and correlate data from disparate sources and collaborating with multiple public health and personal health programs and agencies.

Rationale:

In health departments around the country, chronic disease epidemiologists analyze suspicious clusters of cancer cases, which is the example most frequently cited for the essential function of Investigation. These investigations involve most of the other essential functions, including surveillance, consultation and communication, and are often conducted in an atmosphere of intense public concern. Investigations rely heavily on and must coordinate data from a variety of sources, including vital records systems and environmental protection agencies. In addition to cancer cluster investigations, chronic disease epidemiologists are frequently called upon to respond to public concerns regarding potential environmental exposures that may lead to future chronic health problems. These situations require literature reviews and other analyses to help predict the risk to the public from particular exposures. A third category of investigation involves assessing the implications from new or changed personal or social risk factors in a community, such as violence and obesity. In many of these investigations, particularly those involving a suspected environmental exposure, chronic disease epidemiologists generally serve in a supporting role, with the lead being managed by environmental health specialists, local health agencies or other organizations.

Example:

In the spring of 1995, in response to community concerns, the New Jersey Department of Health (now the New Jersey Department of Health and Senior Services or NJDHSS) was requested to evaluate the incidence of childhood cancer in the Toms River section of Dover Township. Epidemiologists in the NJDHSS reviewed data from the state cancer registry from 1979 through 1995. While conducting the study, NJDHSS maintained frequent communication with the Citizens Action Committee on Childhood Cancer Cluster that was formed by concerned parents and other citizens of Dover. NJDHSS determined that childhood cancer incidence in the Dover area was elevated, particularly for leukemia and brain and Central Nervous System cancer in the youngest female age group (0 to 4 years). The time trend analysis provided limited evidence of periods of time when rates were higher than expected. These results served to focus future epidemiological studies of childhood cancer in Dover Township, which were conducted in an effort to determine potential causes.

<http://www.state.nj.us/health/eoh/hhazweb/cansumm.pdf>

Tier 2 Essential Functions – Mobilization

Chronic disease epidemiology typically plays a supportive/coordinating role in delivering this essential service

Essential Public Health Service	Chronic Disease Epidemiology Essential Function
<i>Mobilize community partnerships and action to identify and solve health problems.</i>	Mobilization: • Create and facilitate partnerships between public health officials, academic centers, health care organizations, and others to identify and define health problems affecting the community • Use the data collected through such partnerships to inform community members, policy makers and others, enabling them to craft and implement action plans for solving the defined health problems • Ensure that action plans are based on appropriate interpretation of current data and research-based best practices and include science-based links between interventions and desired outcomes

Rationale:

Mobilization is the process of bringing together individuals, groups and organizations to effect a change in a particular health problem in a community. Often, mobilization activities occur after chronic disease epidemiologists and others analyze data and determine that the problem exists. Occasionally, mobilization occurs because of a perceived problem; chronic disease epidemiologists may be asked to analyze and interpret available data to validate the nature of the problem. Generally, chronic disease programs or other organizations in the community initiate the partnerships. However, chronic disease epidemiologists also play an important coordinating and supporting role because the success of these partnerships depends on data-driven decision-making. In particular, any program planning and interventions that are initiated by the partnership must be built on a foundation of research-based best practices. This foundation assures a strong, science-based link between the intervention and the desired outcome, which increases the likelihood of achieving the desired outcome. Chronic disease epidemiologists have the skills and expertise necessary to cull through the literature and identify best practices, to analyze the data, to understand which interventions are most likely to be effective, and to track the progress of the interventions toward meeting their objectives.

Example:

In collaboration with partners statewide, the New Hampshire Department of Health and Human Services is producing action plans on tobacco, asthma and oral health. These action plans are built on data compiled by chronic disease epidemiologists, and provide the basis for community mobilization strategies. The action plans would not have been possible without the availability of current data to define the magnitude of the problem and to establish baselines to evaluate future progress. Surveillance efforts for these three programs were based on national recommendations, primarily from the CDC, allowing New Hampshire to produce information that permits comparisons across states. <http://www.endowmentforhealth.org/docs/33.pdf>

Tier 3 Essential Functions – Innovation

Chronic disease epidemiology typically plays a limited role in delivering this essential service.

<i>Essential Public Health Service</i>	<i>Chronic Disease Epidemiology Essential Function</i>
<i>Research for new insights and innovative solutions to health problems.</i>	<i>Innovation:</i> • Review scientific literature, perform original research, and collaborate with academic centers and with other public health professionals to develop new approaches for conducting surveillance, investigations and evaluations, and to design innovative public health interventions, with a particular emphasis on prevention • Provide public health decision-makers with interpretation of scientific research and its implications for public health programs

Rationale:

Innovation refers to a research and design role. In this role, epidemiologists perform the necessary background work of literature reviews, research and analyses to stay current in best practices and to identify new approaches for addressing public health issues. By placing Innovation in the third tier, the workgroup acknowledged that this function is often carried out at academic centers rather than at health departments. However, it is a critical function; research provides the information needed by health departments to design new solutions to new health problems. Innovation and research also allow health departments to better understand existing health problems in populations and communities, and to better tailor interventions so that outcomes are improved. There is wide variability in how this function is carried out in health departments. Some departments place considerable emphasis on innovation, with research being a major role for epidemiologists; others perform no research and rely completely on academic centers. Workgroup members and key informant interviewees agreed that access to literature and involvement in research is important for chronic disease epidemiologists in state health departments. This assures that they are current in their knowledge and information, and are able to provide effective support to chronic disease programs. Involvement in research may be accomplished through collaboration with academic centers or with other public health agencies, as well as through direct research activities.

Example:

Epidemiologists and chronic disease program staff in the Massachusetts Department of Public Health recognized that standard survey instruments were missing significant populations in their state, including Native Americans, Vietnamese and Cape Verdeans. They worked with representatives of these communities to develop new survey tools, with part of the survey administered verbally in the appropriate language by someone familiar with that language and culture. The questions are based on the BRFSS to allow state and national comparisons, but the community also has the opportunity to assure that the survey addresses its specific concerns.

Tier 3 Essential Functions – Regulation

Chronic disease epidemiology typically plays a limited role in delivering this essential service.

<i>Essential Public Health Service</i>	<i>Chronic Disease Epidemiology Essential Function</i>
<i>Enforce laws and regulations that protect health and ensure safety.</i>	Regulation: Collect, analyze and report data on critical health issues related to chronic diseases to: • Enable public health and other officials to take action regarding violations of current laws and regulations • Inform policy makers seeking to enhance laws and regulations that protect the public's health and safety of their potential impact on the public's health.

Rationale:

The role of chronic disease epidemiologists in regulation is limited to collecting, analyzing and interpreting data that may be used to enforce current laws or to create new ones. This includes laws that relate to data collection, such as cancer registry laws, as well as those that constitute public health interventions, such as tobacco control laws. In this role, epidemiologists assist regulators and decision-makers in determining potential health impacts from violations of existing laws, or by projecting health outcomes from laws that are under consideration. This function is closely linked to both consultation and investigation. Regulation is a small role for chronic disease epidemiologists in most states, but one that can have significant impact on important health issues.

Example:

In his efforts to raise the current tax on tobacco products, the Governor of Alaska relied heavily on data from chronic disease epidemiologists in the state's Department of Health and Social Services. All known information about tobacco use and consequences in the state was compiled into a comprehensive report, including economic and health costs. This report was used extensively by the Governor and the Legislature as they considered all the issues associated with raising the tobacco tax. The proposed tax increase passed, although in its final form it was limited to cigarettes only. <http://epi.alaska.gov/pubs/tobaccofeb04.pdf>.

Tier 3 Essential Functions – Utilization

Chronic disease epidemiology typically plays a limited role in delivering this essential service.

Essential Public Health Service	Chronic Disease Epidemiology Essential Function
<i>Link people to needed personal health services and assure the provision of health care when otherwise unavailable.</i>	Utilization: • Collect, analyze and report data on availability, access, and utilization of personal health services and prevention and health promotion programs among population subgroups, including trends over time.

Rationale:

As with regulation, the role of chronic disease epidemiologists in utilization is limited to collection, analysis and interpretation of data on personal and population-based health services and programs. The focus of the role is on the access, availability and utilization of these services, with an emphasis on the ability of population subgroups to obtain the services they need. This information is used by program planners and decision-makers to modify existing programs or to create new programs that will improve access to and utilization of personal and population-based health services. Utilization is a public health issue that changes significantly over time, with public policy, personal behaviors and population changes all influencing an individual's or a population subgroup's ability to receive health care. For this reason, the tracking of trends among the population subgroups is critical. Chronic disease epidemiologists provide the expertise for assessing changes over time and identifying the health outcomes that have occurred or potentially will occur.

Example:

The Nebraska Medicaid Managed Care Program, with the aid of chronic disease epidemiologists, has been using standard measures since 1999 to track chronic diseases and care provision in the Medicaid population in Nebraska. The program identifies the number of Medicaid enrollees with asthma and the percent who are receiving appropriate medications by age and plan, and highlights the difference in an equivalent group of fee-for-service patients. This information is presented to state Medicaid staff and the health plans, who in turn present it to physicians and educate Medicaid enrollees. The monitoring of chronic disease indicators has helped the plans determine if their programs to control asthma are working in the broad sense and enables them to target their efforts more directly for particular physician groups and particular Medicaid age groups.

Part 3. Implementing Essential Functions in State Health Departments

Summary of Current Chronic Disease Epidemiology Capacity

To effectively implement these essential functions, state health departments must have adequate resources in chronic disease epidemiology. The recently completed CSTE assessment of chronic disease epidemiology capacity shows that capacity varies among states, with capacity clearly low in a number of states and likely insufficient in most if not all¹². The results of this assessment are summarized in Figure 3.

¹² CSTE. 2004. National Assessment of Epidemiologic Capacity in Chronic Disease: Findings and Recommendations. In Production.

Figure 3. Summary of Current Chronic Disease Epidemiology Capacity in State Health Departments

From “National Assessment of Epidemiologic Capacity in Chronic Disease: Findings and Recommendations,” CSTE, In Production

- The median summary self-assessment measure of chronic disease epidemiologic capacity from this assessment was 5 on a scale of 0 to 10, and 74% of states reported a capacity score of 4 or greater.
- 43% of responding states did not appear to have a State Chronic Disease Epidemiologist or person recognized as such even if not formally titled. 43% of states had fewer than 5 chronic disease epidemiologists (CDEs); 6% had none. Except for the 10 most populous states, which tended to have more CDEs, the number of CDEs was not directly related to state population.
- Four states (8%) reported no doctoral level CDE. 31% of states have no Epidemiology category in their personnel system.
- States were more likely to hire CDEs with CDC cooperative agreement funds (77%) than with state funds (51%); some states, of course, used both. In terms of CDEs, 44% of all CDEs were supported by CDC cooperative agreement funds, compared with 35% supported with state funds.
- For all diseases and risk factors covered by the assessment, more states have CDEs working on the disease or risk factor than states have CDEs formally dedicated to the study of the topic. For example, 87% of states report that CDEs work on the risk factor physical activity, but only 23% of states report that they have at least one-quarter CDE dedicated to studying physical activity.
- Easy and timely access to key data sets is not uniform, with less than half (45%) of states reporting easy and timely access to state mortality data, and only two-thirds reporting easy and timely access to cancer registry (62%) and BRFSS data (68%). CDEs cannot conduct timely analyses and prepare timely reports if access to data is not timely.
- In about one-third of states, CDEs did not have or did not know if they had an established consultant for complex sampling schemes (38%) and analytic methods (34%).
- More than 90% of states reported that CDEs performed subgroup analyses and age-adjusted overall mortality rates, indicating a reasonable level of competence and, hence, capacity. However, sex- and race/ethnic-specific rates were age-adjusted in fewer states (84%), and confidence intervals for overall mortality rates were calculated by 64% of states.
- In about one-third of states (36%), CDEs did not have reasonably convenient access to a scientific library. Although nearly all states reported that CDEs had Internet access, for many articles only the abstract is available on the Internet.
- In more than a third of the states (39%), CDEs reported inadequate clerical support.
- In about half of responding states (54%), CDEs were located organizationally within the chronic disease program unit, and in about one-quarter of states (26%), they were located in the epidemiology unit.

The study authors note that this assessment has important limitations. A particular problem was the definition of “chronic disease epidemiologists.” While there was a considerable effort to provide states with a clear definition prior to their completing the survey, it was very apparent

that there was uncertainty amongst many respondents on which positions to count as chronic disease epidemiologists. This issue was also raised by some respondents during the key informant interviews about the essential functions. One recommendation that accompanies the capacity assessment results is that CSTE and CDC develop a uniform national definition for chronic disease epidemiologists.

The study authors also note that the definition of “capacity” itself is somewhat unclear. For the purposes of the assessment, capacity was defined to include the number, training and experience of chronic disease epidemiologists, topics of work, access to data, analytical methods, data interpretation, dissemination of products, partnerships and miscellaneous measures of support (e.g., computers, libraries). Other measures could have been included, such as queries about program evaluation activities. Uniform methods for measuring chronic disease epidemiology capacity, along with uniform definitions for chronic disease epidemiologists, would benefit the entire public health system.

A final limitation noted was that, while 46 states and the District of Columbia responded to the survey, four states did not participate. It is not clear whether or how much their input might have modified the results.

Resources Available to Guide Planning for Chronic Disease Epidemiology Activities

A variety of resources are available to guide state health departments seeking to enhance their chronic disease epidemiology activities. Some of these relate to surveillance activities in general, and some are more specific to chronic disease epidemiology.

- *Updated Guidelines for Evaluating Public Health Surveillance Systems*. MMWR Recommendations & Reports Vol 50, No. RR13, July 27, 2001 – A key tool for establishing and evaluating surveillance systems.
- *Appendix. Operations Checklist*. MMWR Recommendations & Reports Vol 53, No. RR05, May 7, 2004. <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5305a2.htm> -- This document was developed for foodborne disease investigations, but the concepts also apply to chronic disease epidemiology.
- *Using Chronic Disease Data: A Handbook for Public Health Practitioners*. Office of Surveillance and Analysis, NCCDPHP, CDC. 1992.
- National Center for Chronic Disease Prevention and Health Promotion. <http://www.cdc.gov/nccdphp/index.htm> -- The NCCDPHP has information on chronic disease programs and activities, and a listing of exemplary state programs.
- *Indicators for Chronic Disease Surveillance*. <http://cdi.hmc.psu.edu> – The Chronic Disease Indicator initiative is a joint project of CSTE, ASTCDPD and NCCDPHP to increase the consistency and availability of chronic disease surveillance data at the state and federal levels.
- *Chronic Disease Surveillance in Canada*. Health Services Coordination Division, Centre for Surveillance Coordination, Population and Public Health Branch, Health Canada. July, 2003. http://www.hc-sc.gc.ca/pphb-dgspsp/csc-ccs/pdf/hscchronic_disease_surveillance_background_paper_e.pdf -- While focused on Canadian chronic disease issues, this document provides valuable insights into sources for and uses of chronic disease data, and strategies for addressing gaps in chronic disease surveillance programs.

- CDC Epidemic Intelligence Service (EIS) – States can apply to the CDC to receive an EIS assignee for two years to supplement and enhance state chronic disease programs. <http://www.cdc.gov/eis/>
- CSTE Applied Epidemiology Program – This fellowship program is designed to train recent graduates in the expanding field of applied epidemiology, to create and train a core group of public health epidemiologists, and to strengthen capacity in applied epidemiology across public health institutions. <http://www.cste.org/Workforcedev/main1.htm>
- Understanding the Role of Epidemiology in Public Health -- This Web site is designed to help local and state health department staff quickly access epidemiology information available on the Web. <http://healthlinks.washington.edu/nwcphp/epi/resources/index.html>
- *Canadian Journal of Public Health* 2002; 93(1) (Special insert): I1-I8. Ontario Public Health Association – *The Art and Science of Evidence-Based Decision Making: Epidemiology Can Help!* Explores how epidemiological skills and approaches can improve decision-making in public health. http://www.hc-sc.gc.ca/pphb-dqspsp/csc-ccs/pdf/epidemiology_e.pdf

Strategies to Enhance Capacity to Perform Essential Functions

As the recent chronic disease epidemiology capacity assessment highlights, many state health departments do not have the epidemiology resources they need to respond to chronic disease issues. While developing and reviewing the essential functions, workgroup members and key informant interviewees also discussed the barriers facing state health departments in performing these functions, and possible approaches to get past the barriers to enhance current capabilities. As part of this process, the workgroup reviewed recommendations from the joint CSTE/ASTCDPD/NCCDPHP strategic plan for developing state-based chronic disease epidemiology capacity.

Table 2 lists the barriers identified through this process, along with some of the factors that contribute to them and a variety of strategies that have been suggested for overcoming them. These strategies can be employed by state health departments, the CDC or CSTE, and, in some cases, by all three.

Table 2. Strategies for Enhancing Capacity to Perform Essential Functions		
Barrier	Contributing Factors	Strategies
Inadequate funding for chronic disease epidemiology activities	• Little or no state funding support • Restrictive categorical approach to federal funding	• Cultivate support from senior health officials and from legislators for chronic disease issues • Combine funding from different sources, starting with federal funds to establish new positions if necessary, but transitioning to state funds as soon as possible • Allow flexibility in categorical programs to support epidemiologists who cross program boundaries • Use categorical federal funds, but require that each position be funded at least in part with noncategorical funding such as Block Grant or CSTE funds • Establish policies for NCCDPHP awards that would require part of the funds to be used for "state" chronic disease epidemiology positions

Table 2. Strategies for Enhancing Capacity to Perform Essential Functions		
Barrier	Contributing Factors	Strategies
		- Educate states about using direct assistance to hire federal assignees - Establish adequate infrastructure among NCCDPHP, ASTCDPD and CSTE to sustain these efforts
Difficulty hiring epidemiologists	- Lack of epidemiologist classification in civil service rules - Low salaries - Lack of available trained epidemiologists	- Develop a standardized, nationally recognized definition for chronic disease epidemiologists - Assure that epidemiologist salaries are appropriately matched to skill and expertise requirements of position - Establish working relationships with academic centers to promote applied epidemiology education and training
Difficulty retaining epidemiologists	- Isolation from other epidemiologists - Disconnect from current epidemiology research - Low salaries - Difficulty obtaining training	- Promote cross-state partnerships in chronic disease epidemiology to encourage interaction and information exchange - Promote collaborations with academic centers to link epidemiology practice with research - Assure that epidemiologist salaries are appropriately matched to skill and expertise requirements of position - Specify in grants that training is mandatory (and provide funds for the training) - Establish a chronic disease epidemiology mentoring program for state health department staff
Insufficient time and resources for necessary activities	- Disproportionate consumption of time and resources required by cluster investigations - Grant requirements that force reporting in certain formats	- Develop common tools on risk communication to help reduce public concern over clusters - Streamline and simplify data reporting requirements for grants
Lack of public support	- Lack of public understanding on chronic disease issues - Focus on other issues such as bioterrorism	- Develop messages to help the public understand the systemic and societal nature of the risk factors associated with chronic disease - Develop messages to help the public understand the relative risk from chronic disease versus other types of risk
Disconnect between policy and science	Lack of interaction between decision-makers and scientific experts	- Encourage involvement of epidemiologists in development of policy and communication documents, including press releases, to assure sound scientific foundation for conclusions and actions - Develop recommendations for integrating chronic disease epidemiology functions and positions into state health department organizational structures

In a follow-up report to the CSTE/NCCDPHP/ASTCDPD strategic plan, Remington and Frey identified effective strategies for improving the placement of chronic disease epidemiologists in state health departments, along with factors that affect capacity building, retention and quality of staff¹³. They conducted structured interviews with 25 states, selecting the states based on population size, history of STEPPS activity and current chronic disease epidemiology capacity. Capacity was defined as “the ability of an organization to use epidemiologic concepts, methods, and practices to achieve its public health objectives.”

The interviews highlighted organizational issues as an area where many states can improve the function of their chronic disease epidemiology programs. Most respondents recommended that epidemiologists collaborate across the organization while maintaining a close working relationship with individual chronic disease programs. According to the Remington and Frey report, the preferred model is to have the chronic disease epidemiologists working together in a central unit, with a functional relationship to chronic disease program managers.

Chronic disease epidemiologists also noted that support from the senior managers in the health department is critical to the success of their programs. According to one respondent, “Lack of institutional commitment is a major barrier to building capacity in state health agencies.” There is a higher perception of commitment to chronic disease epidemiology in states that were described as having high capacity than in low capacity states. Support by administration varies, and respondents found it challenging to keep senior administration informed and supportive.

The barriers to improving chronic disease epidemiology capacity described by Remington and Frey were similar to those identified in this white paper, including the lack of available trained and qualified candidates, inadequate personnel classification systems, low salaries and lack of opportunity to engage in professional and academic work. To address these barriers, Remington and Frey developed many recommendations that were similar to the ones in Table 3. Remington and Frey also prepared specific recommendations for CDC and CSTE, including:

- Expand the role and scope of the STEPPS program, selectively targeting the lowest capacity states for placement and technical assistance in getting STEPPS assignees.
- Provide technical assistance through the STEPPS program to all states for increasing their chronic disease epidemiology capacity and serve as a national broker for state recruitment efforts for chronic disease epidemiologists.
- Improve the technical assistance and consultation programs around chronic disease epidemiology, tailoring these programs to meet unique state needs, including providing management and leadership training to chronic disease epidemiologists, especially those at a senior level, focusing on how to promote their programs and influence decision-makers.
- Work nationally to educate state health officials on the role of and need for chronic disease epidemiology programs in state health agencies.
- Increase funding for chronic disease epidemiology programs.
- Coordinate networking opportunities for state-based chronic disease epidemiologists.

¹³ PL Remington and CA Frey, “Evaluation of State-Based Chronic Disease Epidemiology Placement Activity.” Prepared for the Council of State and Territorial Epidemiologists, 2001.

Next Steps

The establishment of the Chronic Disease Epidemiology Essential Functions lays the foundation for a number of activities that will contribute to the enhancement of this important public health discipline. The Chronic Disease Epidemiology Essential Functions workgroup recommends the following activities:

1. Update the 1992 NCCDPHP manual “Using Chronic Disease Data; A Handbook for Public Health Practitioners” – While this manual has been very useful for many state chronic disease programs, it is not now widely available. An update would not only allow for widespread dissemination, but would also allow the inclusion of specific examples for incorporating the essential functions into practice.
2. Define core competencies for chronic disease epidemiologists – The essential functions outline the critical roles for chronic disease epidemiologists in state health departments. A necessary next step is defining what kinds of knowledge, skills and attributes epidemiologists need to carry out these functions. Reaching national agreement on competencies will enable schools of public health and other training programs to develop curricula that will assure graduates can provide the essential functions to state health departments. Further, core competencies help guide individuals who are interested in chronic disease epidemiology as a career. Finally, the competencies, combined with the essential functions, can be used by state health departments to create or enhance job classifications that are more specifically targeted to the epidemiology needs of chronic disease programs.
3. Develop performance measures for chronic disease epidemiology activities – The essential functions define the roles and responsibilities of chronic disease epidemiologists in state health departments. There is currently no way to measure how well these roles and responsibilities are being fulfilled in support of chronic disease programs or other health department needs. The Essential Functions provide the basis for crafting specific performance measures that can be used by state health departments to assess the functioning of their chronic disease epidemiology activities. Such measures must be developed through a national consensus process, with extensive involvement of epidemiologists, program managers and senior health officials.

Further, the Chronic Disease Epidemiology Essential Functions can be used by state health departments to help define the roles, responsibilities and scope of activities for chronic disease epidemiologists in their agencies. CSTE and CDC will also link the essential functions with the prior work on chronic disease epidemiology capacity to provide a complete picture of the capabilities of state health departments to utilize epidemiology in response to chronic disease issues.

Appendix 1

List of Background Materials Referenced by Chronic Disease Epidemiology Essential Functions Workgroup

Developing State-Based Chronic Disease Epidemiology Capacity Nationwide: A coordinated strategic plan proposed by the Association of State and Territorial Chronic Disease Program Directors (ASTCDPD), the Council for State and Territorial Epidemiologists (CSTE) and the National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP). Presented at CSTE Annual Conference, 2000.

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E Simoes. Comments. Former State Chronic Disease Epidemiologist in Missouri and current Director of the Prevention Research Centers program at CDC/NCCDPHP.

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<http://www.doh.wa.gov/standards/default.htm>

Appendix 2

Chronic Disease Epidemiology Essential Functions

Key Informant Interviews

Questions

1. After reviewing the draft list of chronic disease epidemiology essential functions, do you agree with the essential functions identified? Are there elements that are missing? Are there any modifications you would suggest?
2. Does your agency have one or more chronic disease epidemiologists who are carrying out any of these essential functions? Which essential functions? What activities other than these essential functions have epidemiologists in your agency performed?
3. Are staff other than those designated as chronic disease epidemiologists in your organization responsible for carrying out any of these essential functions? If so, what staff positions are carrying out which of those functions?
4. Can you give examples of specific activities or incidents that highlight chronic disease epidemiologists carrying out one or more of these essential functions?
5. What do you think senior health officials in your agency would identify as essential functions for chronic disease epidemiology?
6. What incentives and barriers do you see for carrying out the chronic disease epidemiology essential functions in your agency? What recommendations do you have for removing the barriers you have identified?

Appendix 3

Results of the Key Informant Interviews

The key informant interview process showed overall agreement on the essential functions that had been identified by the workgroup. The interview respondents felt that the list was all encompassing, and general enough to include the roles and responsibilities of most chronic disease epidemiologists. Several respondents commented that the essential functions are all things that chronic disease epidemiologists should be doing.

The primary roles noted for chronic disease epidemiologists were surveillance, communication and consultation. There is more limited involvement in the other functions, varying by state. Respondents noted that chronic disease epidemiologists don't just interact with other public health officials, but also with organizations outside of public health agencies, including schools, health care organizations and non-profit groups.

Respondents were asked to identify staff in their agencies other than chronic disease epidemiologists who carry out these essential functions. The two categories of staff most frequently mentioned were environmental health and vital records specialists. Environmental health was cited as carrying out regulation and investigation activities. Vital records staff were cited as carrying out surveillance and data analysis activities. Several respondents noted that mobilization, communication, education and evaluation are more likely to be handled by program managers, and that senior health officials handle policy development.

In addition to giving their own opinions on the essential functions, respondents were asked if they thought the senior health officials in their agencies would agree with the list. The respondents felt that senior health officials would likely agree with the list, and would appreciate the linking of the essential functions with the Ten Essential Public Health Services. There was acknowledgement that senior health officials and elected officials may not recognize a role for chronic disease epidemiologists in particular essential services. In general, the respondents felt that the chronic disease epidemiology essential functions would help inform these officials.

Many of the respondents had specific suggestions for language changes in the essential functions. These changes were incorporated by the workgroup into the final version. The respondents were also asked for examples of activities that demonstrate the essential functions in their agencies. These examples are included with the detailed description of each essential function on the preceding pages. Finally, the respondents were asked to identify barriers to implementing the essential functions and recommendations for overcoming these barriers. Their suggestions were incorporated into the section on barriers.