CDC/ATSDR
Strategic Plan
for
Public Health
Workforce Development

Toward a life-long learning system
for public health practitioners

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Letters from Koplan, et al.

EXECUTIVE SUMMARY

Background

The practice of public health is changing. In the early 20th century, public health focused on communicable disease prevention, occupational health, and environmental considerations. As the century progressed, the scope of public health concerns expanded to include reproductive health, chronic disease prevention, and injury prevention. Now, as the century draws to a close, other areas of focus for public health are emerging (or re-emerging): genetics, preventing bioterrorism and violence, handling and disposal of hazardous waste, and an ever-widening range of issues which impact the health of the public.(1)

During the past several decades, governmental public health agencies became the health care provider of last resort for indigent populations. Today, 39% of these public health agencies' funds are spent on personal health services.(2) This emphasis on personal health care led to deficiencies in other key competency areas of community-based practice, such as community health assessment, community health planning, and environmental health. As a result of Medicaid managed care, many public health departments are no longer providing personal health care services. The dramatic shift from personal to population based services has been further accelerated by organizational restructuring, privatization of public services, statutory changes, individual leadership initiatives and performance standards for public health departments. The demands on the public health workforce now include expectations for competency in behavioral sciences, community mobilization, health communications, policy development, and other areas for which many are unprepared by either educational preparation or work experience.(3)

The majority of the nation's public health workers have not been trained to deal with the challenges they will be facing in the 21st century.(4) The gap between current capabilities and future needs continues to widen.(5) CDC/ATSDR needs a dependable and well trained workforce to achieve progress its priority areas: strengthening science for public health action; collaborating with partners for prevention; promoting healthy living in healthy communities at every stage of life and working with partners to promote global health. A competent workforce capable of performing the essential services is necessary for long-term success. This report focuses on how CDC/ATSDR can better align its resources to address the training and continuing education needs of the external public health workforce.

The Public Health Workforce

The U.S. public health workforce consists of approximately 500,000 individuals currently employed by a range of organizations involved in public health practice including governmental public health agencies, other public sector agencies, health care delivery organizations, voluntary organizations, community-based groups, academia, and other entities.(6)

FIGURE 1: Public Health Practice Sites: The Professional Public Health System
          Workforce by Setting
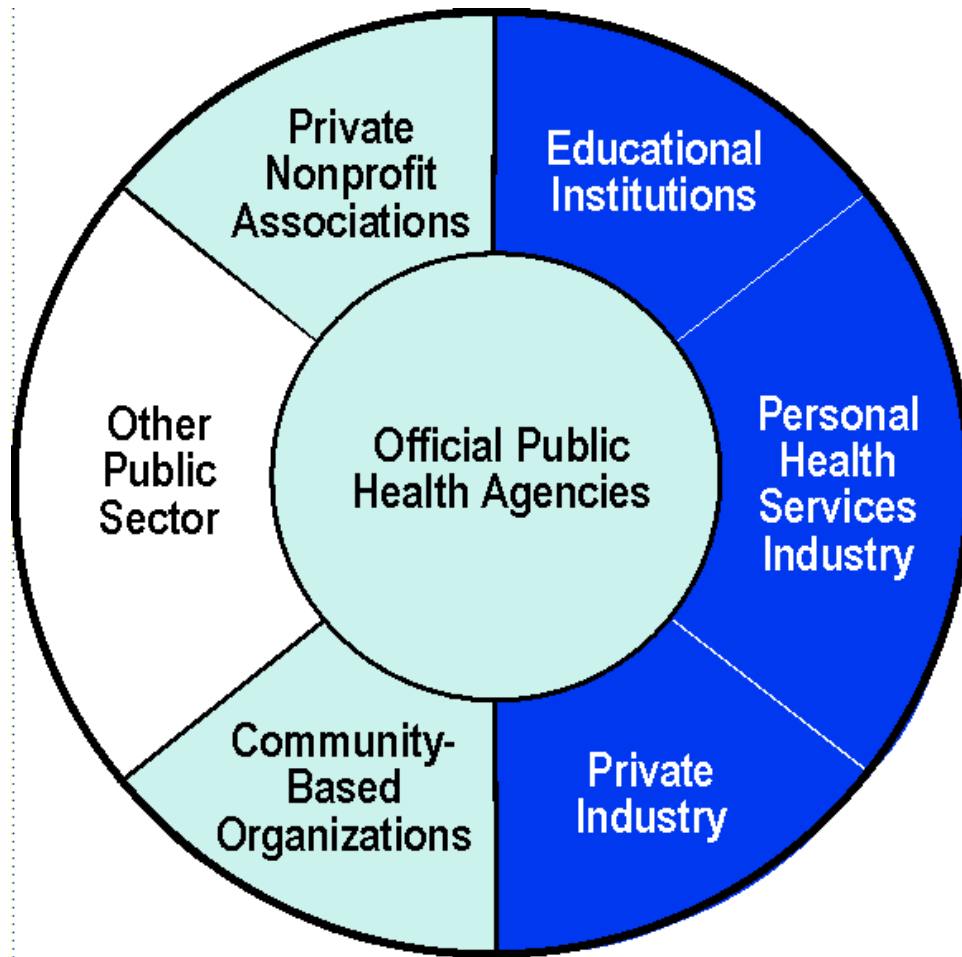
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The public health workforce is defined less by where they work than by what they do which is to provide essential public health services to communities throughout the nation.(7) (Table 1) The most common occupations are nurses, managers, environmental health specialists, managers, nutritionists and local educators (Figure 2). The vast majority of this workforce have no formal training in public health and have little background in the core functions, essential services or the competencies required for public health practice and how various system components are interrelated. At a minimum, public health workers need a fundamental understanding of what public health is, what it does and how it accomplishes its mission to "promote physical and mental health and prevent disease, injury and disability."

TABLE 1.   Ten Essential Public Health Services

1.   MONITOR HEALTH status to identify 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 health and personal health WORKFORCE.

9.   EVALUATE effectiveness, accessibility, and quality of personal and population-
         based health services.

10.   RESEARCH for new insights and innovative solutions to health problems.

From: Public Health Functions Steering Committee, *Public Health America*, July 1995.

FIGURE 2.   Workforce Composition: Percentage of local health departments having
              at least one full-time employee in the listed job classification, U.S.,
              1992-1993.
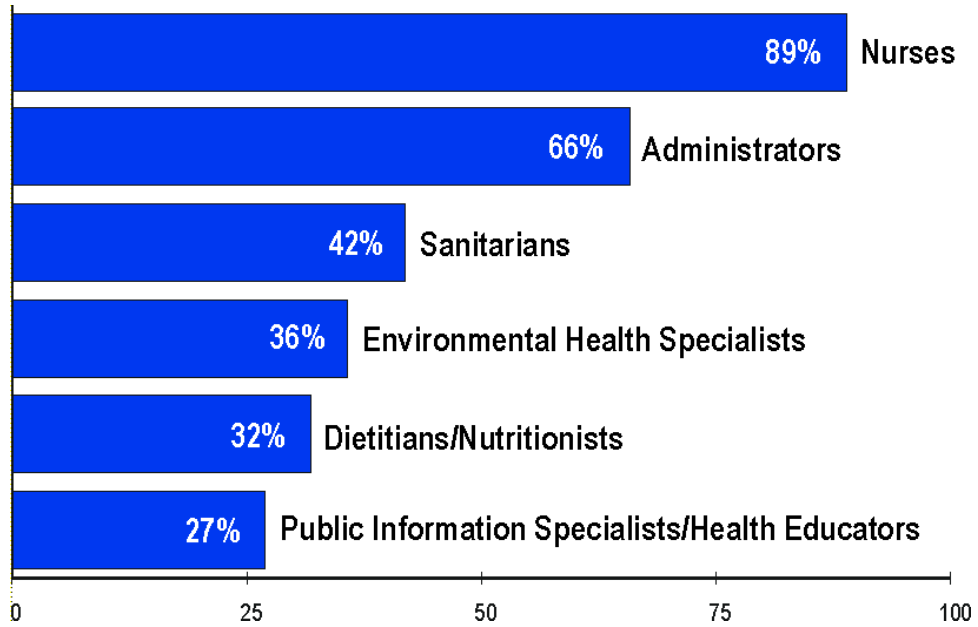
Adapted from Gerzoff, et. al., *J Public Health Management*, 5(3) 1-9.© 1999, Aspen, Publishers,
Inc.

Competency Needs

The public health workforce needs a well rounded realm of knowledge, skills, and abilities in response to the expanding scope and functions of public health practice. Competency needs can be divided into three broad categories:

1. Basic Competency: Provides a fundamental understanding of what public health is, what it does and generally how it achieves its mission (e.g., courses or programs such as "Orientation to Public Health Practice,"or "Public Health 101").

2. Cross cutting (Core) Competencies: Provides general knowledge, skill and ability in areas which enable performance of one or more essential service. Table 2 lists at least seven distinct competency areas that are the foundation for performing essential services. For example, competence in epidemiology, policy development, health communications, community needs assessment and mobilization, behavioral sciences, cost-effectiveness can be defined as cross cutting. These competencies requirements can be further refined based on one's discipline, functional role, organizational setting or programmatic focus.

3. Technical Competencies: Provides technical knowledge, skills and abilities needed for a defined program area (e.g., control of infectious disease, chronic disease prevention, environmental health, genetics testing). These technical competencies often build upon basic and core competencies and represent unique application of skills to a particular health problem or issue (e.g., emergency response for bioterrorism).

TABLE 2.   Cross Cutting (Core) Competencies for Public Health Practice

COMPETENCY AREA	EXAMPLES
Analytic	• Identifies potential strategic issues through ongoing macro environmental scanning. • Obtains and interprets information regarding risk factors. • Knows data collection process, technology, transmission capability, and computer systems storage/retrieval capacities in order to access health related information.
Communication	• Listens to others in an unbiased manner and respects points of view of others. • Promotes the expression of diverse opinions and perceptions. • Persuades and influences individuals and groups by increasing knowledge, shaping attitudes, and modifying behaviors towards disease prevention and health promotion.
Policy Development	• Interprets information regarding the health status of individuals or populations in order to formulate and prioritize goals and objectives. • Educates health care, legislative and media representatives about the need for new public health programs.
Cultural	• Appreciates the importance of diversity within the public health workforce. • Learns appropriate methods for interacting with stakeholders from varied cultural, racial and ethnic groups. • Identifies opportunities for improving stakeholder/public health worker interaction.
Basic Public Health Science	• Can relate the PH core functions to essential public health services. • Understands the role of assessment, assurance and policy development in the delivery of the essential services. • Understands how to accomplish effective community engagement.
Leadership & Systems Thinking	• Helps define key values and uses these principles to guide action. • Understands the need to see interrelationships rather than cause-effect chains. • Empowers others to create and implement plans based on a shared vision.
Management & Information Management	• Matches budget priorities with strategic plan • Manages information systems for collection, retrieval and use of data for decision-making.

Throughout CDC's 52 year history, a majority of the training and continuing education has focused on developing technical competencies. CDC has addressed cross cutting (core) competencies through various courses such as Principles of Epidemiology, Prevention Effectiveness, Program Evaluation, the Public Health Leadership Institute, and products like CDCynergy, a CD-ROM-based health communications planning course. To date, the agency does not offer a course or learning experience which addresses basic competency in public health.

The responsibility for competency identification and validation in public health is ongoing and is not exclusively a CDC/ATSDR role. Professional disciplines (e.g., medicine, nursing, environmental health, health education) will continue to define competencies and related training needed for specific types of practice. Academia, other federal, state and local agencies, and associations will continue to provide training and continuing education based on needs assessment. To achieve measurable impact, all these activities must be better aligned and coordinated in the future. The active involvement of the Health Resources and Services Administration (HRSA), which has a legislative mandate for health professions workforce planning and research, in the development of the CDC/ATSDR strategic plan has laid the foundation for a more unified approach at the federal level to the issue of public health workforce development. Clearly the success of public health workforce development depends upon a unified vision and leadership among a broad array of partners. It is our hope that this report stimulates dialogue and action.

Status of CDC/ATSDR Activities

A survey of the Centers, Institutes and Offices (CIOs)at CDC indicated that more than $50 million was spent on FY 99 training for the external public health workforce. This training can generally be described as national in scope, provided by CDC's partners and based in the classroom. Today's training efforts are relatively new; more than 50% of such efforts were initiated during the mid-1990s. Reported activities reached at least 664,000 individuals, over 500,000 through distance and distributed learning networks like the Public Health Training Network and National Laboratory Training Network. Other CDC sponsored programs/courses reached 74,435; extramurally funded Training Centers reached an additional 84,150; and conferences awarding continuing education credits reached at least 4,800. Each CIO reports similar challenges in planning, developing, delivering and evaluated its training and continuing education efforts and in using new learning technologies. Even when external workforce training is not a high priority for a center or division, leaders recognize that programmatic success is ultimately linked to a trained, competent workforce. Whether training needs assessments are conducted by individual divisions, externally funded training centers, or through other mechanisms, the findings point to similar needs for basic and cross cutting (core) competencies, (e.g., cultural competence, informatics, systems thinking, evaluation, and health communications).

Major Barriers to Achieving a Competent 21ˢᵗ Century Public Health Workforce

Despite important recent advances in understanding the composition and competency needs of the public health workforce, major barriers exist in assuring the ongoing competency of this workforce.

1. In contrast to other professions, an updated inventory of the workforce does not exist. As a result, planning is hampered by a lack of knowledge of the population in need of training and continuing education. Further, a standard nomenclature on occupational title and organizational setting has not been used to enumerate the public health workforce. Finally, information from which to forecast personnel needs or related training requirements is limited.

2. A national consensus does not exist on the basic and cross cutting competencies or curricula/content elements needed in public health. While progress is being made in competency identification/validation for specific disciplines or technical content areas, significant gaps still exist in the availability/accessibility of needed job-related training and continuing education.

3. An integrated delivery system for life-long learning does not exist. Although current approaches provide useful learning opportunities, the learner faces a fragmented array of choices which use different technologies, may be of unequal quality or value, and often lack user-friendly systems for registration, course support and feedback.

4. Inadequate incentives exist for participation in training and continuing education. National competency standards do not exist for public health workers which could positively influence participation in life-long learning activities.

5. A uniform approach and commitment to evaluation are absent, whether the object of evaluation is the individual, program/curricula or the system itself, (i.e., workforce development initiatives).

6. Financing of workforce training and continuing education is hampered by the absence of a coherent policy framework and strategies for funding these activities. For example, HRSA reports lack of congressionally appropriated dollars for Title VII of PHS Act program authorities as an obstacle in financing its training and continuing education responsibilities for the public health workforce.

This task force report reviews each of these barriers and proposes strategies and action steps for CDC/ATSDR to address each of them.

Major Strategies for Achieving a Competent Public Health Workforce

The goal of the CDC/ATSDR strategic plan is a to have a national workforce competent to deliver essential services. No strategy for achieving a competent workforce can succeed without collaboration and cooperation among a broad range of partners. The practice of public health is interdisciplinary and multi-sector. The task force report was developed through an interactive process and included representatives from both the external practice community, academia, managed care as well as from each CIO within CDC. In addition, representatives from HRSA, a key federal partner, were directly involved in preparing this report. The following strategies represent a comprehensive and integrated approach to achieving the goal of a competent public health workforce for the 21st century and include recommended actions through which CDC/ATSDR can provide leadership.

Strategy 1:   Monitor Workforce Composition and Forecast Needs. The task force recommends a systematic, ongoing monitoring of public health workforce composition using newly-developed standard occupational classification (S.O.C.) nomenclature and a standard set of work site descriptions. In addition to monitoring composition, a process should be developed to forecast future needs and recommend changes in workforce composition in relation to trends in public health practice. Since the Bureau of Health Professions within HRSA has the statutory authority for health professions workforce data collection, analysis and research, CDC/ATSDR assumes a continued and strengthened collaboration with HRSA to ensure that needed information is consistently gathered and used in planning.

Strategy 2:   Identify Competencies and Develop Related Content/Curriculum. The task force recommends the development of a basic public health practice curriculum for use by all public health workers and basic to advanced training in cross cutting (core) competency areas for certain categories of the public health workforce (e.g., nurses, environmental health workers, managers, etc.). The basic curriculum that is proposed reinforces the essential public health services as the description what public health does and identifies the competency areas that underlie public health practice regardless of work setting or functional role (Table 2). CDC/ATSDR can continue to address needs in specific categorical program areas with technical competency-based curricula and can reinforce the development of cross cutting (core) competencies.

Strategy 3: Design an Integrated Learning System. In light of the current fragmentation and bewildering areas of learning opportunities, the task force recommends a nationwide learning system with a unifying structural design. When viewed from the perspective of the learner/customer, the structural system should have three elements:

1. An online "shopping guide" and registration system;

2. Delivery of training, continuing education and/or other workforce development programs; and

3. Feedback on and documentation of individual competency.

Operationally, the system can be viewed as having three levels: local, state, and national, each with varying roles and responsibilities. Local health agencies can identify those in need of training and, in collaboration with other partners, be responsible for creating and maintaining approaches and incentives designed to foster individual and organizational learning. State health agencies, in collaboration with schools of public health, other academic institutions, and health care delivery organizations should be responsible for the ongoing assessment of needs, coordination and support of workforce development programs, assurance of quality, and evaluation of competency. To forge the commitment to discharging these responsibilities, the task force recommends that state (or multi-state) regional learning centers be established to serve every state. Finally, national leadership must be assured to provide for standards and policy development, research, and availability of quality learning experiences.

At each level of the system (local, state, national), there is a need for critical administrative and support functions common to all successful training and educational efforts, regardless of their point of origin, content, or media for delivery. National standards should be adopted for the use of technology and for the design of learning programs, based upon current industry and professional guidelines.

Strategy 4: Provide Incentives to Assure Competency. The task force has determined that participation in learning experiences must be stimulated by a synergistic set of incentives and competency certification. These incentive and certification mechanisms must function at the national, state and local levels in relationship to existing personnel systems, if they are to have the desired effect of stimulating participation in learning programs. This holds true, not only for public agencies, but also for private or non-profit organizations. These incentives should be linked to financial compensation and/or to career development. Competency certification

should exist to assure minimum levels of competency in certain areas of public health practice and be tied to eligibility requirements for certain jobs. The organizational accountability for demonstrating a comprehensive approach to workforce development can be made explicit by developing and disseminating performance standards for local and state public health systems.

Strategy 5: Conduct Evaluation and Research. The commitment to evaluation must be explicit and demonstrated at every level in the learning system: individual, program/curricula or structural/operational level, and system level. The effectiveness of individual learning should be evaluated consistently using uniform methods. The impact of specific programs/ curricula or organized networks dedicated to training or continuing education should be evaluated for effectiveness and impact. In addition, comprehensive evaluation at the system level should be performed periodically to assess broad policy and coordination issues.

Strategy 6: Assure Financial Support. Without stable funding, which assures the availability of financial resources needed to develop, coordinate, support, and evaluate learning programs, the vision for a unified system will not be realized. Although learners will continue to have access to training under any scenario, they may or may not receive training which consistently builds their ability to perform the essential services. To address the need for financial resources, the task force recommends a review of existing grant policies and exploration of other innovative approaches to funding and financing so that efforts in public health workforce development are aligned with long term strategies.

Coordination and Accountability

We recommend that a single organizational locus be assigned responsibility for coordinating external workforce development activities within CDC/ATSDR. This program or office should be responsible for overseeing the development of policies and standards, as well as convening partners, as needed, to address issues and to provide support and technical assistance to CIOs and outside partners in implementing this strategic plan. This office should be directly accountable to the Director of CDC/Administrator of ATSDR. Adequate resources should be provided to address these responsibilities.

Summary

The task force recommends that CDC/ATSDR take a leadership role along with other partners in creating a nationwide system for life-long learning in public health practice. The goal of the learning system is to consistently and measurably improve the ability of the workforce to perform the essential services. This represents a renewed commitment to provide learning opportunities to the approximate 500,000 U.S. public health workers throughout their careers, regardless of their geographic location, role or level of responsibility. While providing opportunities for training and continuing education is insufficient to guarantee workforce competency, consistently delivering high quality and relevant learning experiences is a requirement for long term success. Standards must be developed to make appropriate use of technology and ensure program quality. Incentives, including certification, must be developed that have relevance at the local and state level. Financing policies must be developed to assure the financial solvency needed to support operation of the system. Finally, a program or office CDC/ATSDR must be established that is responsible for assuring consistent leadership in this vital area.

Currently, each CIO determines training needs for the external workforce based on its specific mission. By having a shared vision based on the essential services framework and required competencies, each CIO can not only achieve its programmatic agenda but incrementally develop workforce competence and capacity across multiple public health functions. By establishing a program or office that is accountable for workforce development, we can collaborate effectively with our external partners and internally across and within the CIOs. If we and our partners are to make a difference in public health practice, we must use the essential services as a framework and align resources to build the basic, cross cutting and technical competencies required to perform these services. Considering the cost of new learning technologies and the numbers to be trained and retrained, every effort should be made to pool resources to address cross cutting needs.

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CDC/ATSDR'S PLAN for PUBLIC HEALTH WORKFORCE DEVELOPMENT

Background

The public health workforce–no matter how dedicated its workers may be-- is unevenly trained in the basic tenets of public health. Recent estimates of this gap range from 66% to 93% depending upon the scope of the study(1,2). This is a long standing problem because public health is in some ways a collective of many other disciplines. A coherent, life-long learning approach to training for those working in the field is long overdue.

As we enter the 21st century, government public health agencies, both at the local and the state level, are redefining organizational boundaries as at the same time they face major uncertainties (3,4). Despite these uncertainties, consensus exists on several basic points. Governmental public health agencies are the central entities responsible for delivering essential public health services at the local and state level(5). They are to be held accountable for the performance of programs needed to provide these services to communities. These agencies must continue to function to assure that every citizen has access to basic public health services. Increasingly, these agencies must work in partnership with private sector organizations, voluntary agencies, other governmental organizations, and community groups, who are increasingly involved in providing essential public health services(6,7).

The public health community is actively engaged in a wide range of activities to keep the current workforce up to date and to anticipate future needs(8,9). The Centers for Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry (CDC/ATSDR) has a unique role in workforce development and routinely complements efforts already underway. From its inception, this planning process for strengthening the public health workforce was designed to foster participation, collaboration and dialogue both within CDC/ATSDR and with partners at the federal, state, and local levels, managed care organizations, and academia.

The Health Resources and Services Administration (HRSA) is a critical federal partner in preparing the public health workforce for the challenges of the 21st century. The direct involvement of HRSA staff in this planning process was considered key to long term results. Other critical partners included leaders from Association of State and Territorial Health Officials, (ASTHO), National Association of County and City Health Officials (NACCHO), Association of Schools of Public Health (ASPH), and American Association of Health Plans (AAHP). In addition, individuals representing professional associations and state roles in administrative, nursing, laboratory and distance learning were involved. Local area representatives included medical directors and staff from two local health departments. We anticipate the ongoing involvement of the public health community and other partners in shaping the implementation of this plan.

Assessment of Current Activities

Through its Centers, Institutes, and Program Offices (CIOs),CDC/ATSDR provides numerous training and educational opportunities to the public health workforce nationwide. While this decentralized approach achieves program specific training objectives, it does not enable strategic alignment of overall agency resources to strengthen science for public health action. An inventory of current activity was conducted as a baseline for the planning process.

CDC/ATSDR training reached at least 665,000 members of the external workforce in Fiscal Year 99. Over 500,000 of these were reached through distance/distributed learning networks like the Public Health Training Network (PHTN) and the National Laboratory Training Network (NLTN). In addition, CDC-sponsored educational programs reached 74,435 workers in 1999, and extramurally funded Training Centers reached an additional 84,150 public health workers. National conferences, sponsored by CDC, which award continuing education credits, reached an additional 4,800.

The duration of training programs varies significantly. The longest established training program at CDC, for the Epidemiology Intelligence Service, began in 1951. While no record is available of the cumulative number of participants reached by CDC training over its 52 year history, in the past 10 years alone, 1.5 million people were reached through distance/distributed educational networks. During this same period, an additional 1 million public health workers were reached via more traditional educational methods. Today's training courses are relatively new, with more having begun during the mid-1990s.

Training can be characterized as national in scope, provided by CDC's partners, and based in the classroom. For example, 72% of the programs reported were described as national in scope and at least 10% of CDC-sponsored programs have an international focus. Only 18% of the training is provided directly by CDC/ATSDR itself. More commonly, CDC leverages training through its partners (i.e., other federal agencies, private organizations, contractors, or local/community based entities) who provide the training.

The following areas were perceived gaps in training currently being offered for the external workforce: genetics, informatics, social marketing/health communications, cultural competence, informatics, behavioral sciences, epidemiology of chronic disease, and leadership skills. Most programs reporting expected to maintain or even increase training in the future. Several mentioned the need for improved marketing of available training to the intended audiences. Several CIOs believe that coordination of training needs to be improved within and across centers. The target audience for training is expanding to include more in the private sector. More technical assistance in designing, developing and delivering training using new learning technology is desired as well as assistance in selecting contractors and conducting needs assessments.

CDC has a leadership responsibility to provide its partners with the skills and resources necessary to effectively translate public health science into public health practice. Many external customers perceive CDC as a "training organization" for public health. The CDC has a unique role in closing the gap between current public health workforce competencies and the skills needed to perform essential public health services. CDC leadership in developing the public health infrastructure is already well recognized.

The first steps toward improving internal coordination and aligning CDC resources with external demands are listed below and were incorporated into the final recommendations from the task force.

• Develop and maintain a centralized, electronic database that captures the range of CDC/ATSDR-sponsored training activities. This database must be accessible by CDC employees as well as our partners.

• Create a network of workers at CDC responsible for training within respective CIOs whose purpose is to foster collaboration of training throughout CDC and the public health community.

• Launch a concerted, systematic effort to disseminate previously developed, high quality training programs via distance and distributed learning methods whenever feasible.

Assessment of External Need

Despite a growing consensus on the need for public health agencies to focus efforts on the core functions and essential services of public health, significant barriers exist to achieving this vision. Recent detailed case studies of 6 urban health systems(10) revealed resource and capacity limitations affecting their ability to adopt new roles in the core public health functions of assessment, policy development, and assurance.

In these case studies and in other research, a central barrier to adopting new public health roles and responsibilities are the limitations in the skills, knowledge, abilities, and attitudes of the public health workforce(11). Specifically, public health workers (and those employed by other organizations providing essential public health services) often lack the skills to perform specific functions such as community health assessment, community planning and policy development , and assessment of compliance with environmental and other regulatory standards(12,13,14,15). Typically, public health workers possess the skills to perform conventional tasks typical of traditional responsibilities, but gaps exist in their skills needed to perform "newer" community-based activities, such as assessment, policy development, and assurance.

In preparing this report and verifying workforce development needs, the task force members reviewed significant published and unpublished reports as well as a broad array of projects underway within other federal agencies, schools of public health and

professional associations related to workforce development which were particularly relevant to the six broad strategies outlined in the CDC/ATSDR report. In addition to the references cited in the report, additional information on activities for developing the public health workforce is available on request from the Office of the Director, Public Health Practice Program Office, CDC.

Major Barriers to Achieving a Competent 21st Century Public Health Workforce

Several root causes have been identified which contribute to these competency gaps in the public health workforce.

1. In contrast to other professions (12), an inventory of the composition of the workforce, updated periodically, does not exist; as a result, planning to address workforce needs is hampered by a lack of knowledge of the population in need of training and continuing education. Further, a standard nomenclature on occupational title and organizational locus have not been incorporated into a national database on the composition of the public health workforce. Finally, no systematic projection of the future composition needs of the workforce exists.

2. A national consensus does not exist on the core competencies and core curriculum needed to enhance the competency of the public health workforce, or specific components of the workforce. Further, no single repository of information on existing curricula materials exists to facilitate "one-stop shopping" for learning opportunities.

3. An integrated delivery system for life-long learning does not exist; although current approaches provide useful learning opportunities, the learner is faced with a bewildering, fragmented array of choices. These approaches use varying technological method for delivery, with uneven adherence to established principles of effective adult learning.

4. Inadequate incentives exist for participation in learning opportunities and, most importantly, uniform national competency standards do not exist for public health workers (or even categories of the workforce) which could influence the participation in training and continuing education programs.

5. A uniform approach to evaluating the effectiveness of learning experiences, integrated learning networks, and the overall training system is absent.

6. Financing of workforce training and continuing education is hampered by the absence of a coherent policy framework and strategies for funding these activities.

The Planning Process

To help overcome these barriers to building competency in the public health workforce, a task force was charged with creating a strategic plan to guide CDC/ATSDR programs over the early decades of the 21st century. This strategic plan will be implemented by CDC/ATSDR in collaboration with partners including other federal agencies, state and local colleagues, academia, and other partners.

This strategic plan was prepared under the leadership of CDC's Public Health Practice Program Office with significant input from other CIOs involved in addressing training and continuing education of the external public health workforce. These include the National Center for Chronic Disease Prevention and Health Promotion, National Center for Infectious Diseases, National Center for Injury Prevention and Control, National Center for Environmental Health, National Center for Health Statistics, National Center for HIV, STD, and TB Prevention, the National Immunization Program, Epidemiology Program Office, National Institute for Occupational Safety and Health, and the Agency for Toxic Substances and Disease Registry. CDC's Office of Program Planning and Evaluation, Office of Health Communications, Office of Global Health and the Office of Equal Opportunity Employment and Human Resources Management, Organizational Development Branch provided specific support.

Vision for a Life-long Learning System

In public health, a strong infrastructure gives us the capacity be prepared to respond – the ability to be prepared for both acute and chronic threats to the nation's health, whether they are bio-terrorist attacks, emerging infections, disparities in health status, or increases in chronic disease and injury rates. Our "preparedness" for responding to health threats and anticipating them in the future is our day-to-day work. Being prepared also yields another important output: Public health's historic leadership role as an agent of social change. The role we have played over the last several decades in fundamentally altering public views of tobacco, highlighting the link between diet and physical activity and chronic diseases, and countering myths about HIV/AIDS – along with many others – reflect public health's ability and responsibility to take a stand. "Infrastructure" is not just about the pieces that constitute a system; it's also about what we get from those pieces. Whether we think of public health's infrastructure as a vast network of laboratories, health departments, and computers, or as our workforce's preparedness for doing battle with diseases and disabilities – either way, we know it is in an unacceptable state of disrepair.

At CDC, we have been defining the pieces of infrastructure or preparedness in three categories:

7. The people who work in the field of public health;

8. The information and communication systems that help us collect and disseminate accurate data; and

9. The organizations at the state and local level that are on the front lines of public health.

The workers who practice public health are the most important element of our nation's public health infrastructure and our ability to be prepared for the future. The public health workforce – no matter how dedicated its individual members may be – is unevenly trained in the basic tenets of public health. This has been a longstanding problem in our field, in part because we are in some ways a collective of many other disciplines. Four out of five public health employees nationwide – totaling 400,000 workers – have no degree, certificate, or formal education in public health. Seventy-five percent of local public health agency directors have no formal training in public health. Certainly most of these are specialists in other fields, dedicated to their work, and have trained themselves about the public health aspects of their jobs, through trial and error. Yet no matter how effective they are, the lack of formal training for such a huge proportion of our workforce can only hinder efficiency and progress.

A coherent, life-long approach to training for many workers involved in the field of public health has never been defined or implemented before, but such a plan is long overdue. It is a critical component of shoring up the public health infrastructure and preparing us for the challenges of the 21st century. As we face the new millennium, we must renew our commitment to developing the public health workforce -our front line for preparedness. This strategic plan outlines tangible steps in that direction.

Summary of Recommendations

The task force identified six broad strategies which we can use as a blueprint to invest in the capacity of the public health workforce and made specific recommendations to guide implementation.

FIGURE 3. Toward an Integrated Life-Long Learning System for Public Health

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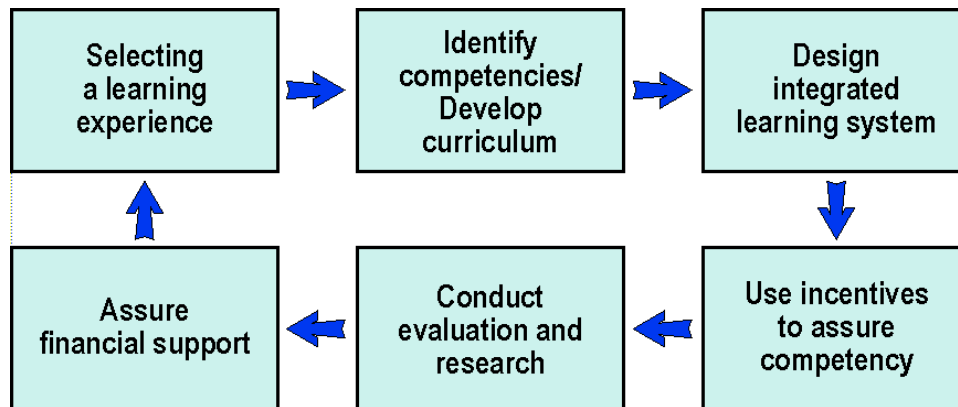
STRATEGY 1:
Monitor Workforce Composition and Project Future Needs

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The following recommendations are made by the task force regarding the measurement and description of workforce composition:

1. CDC and HRSA should collaborate to determine common terminology in describing public health workforce development issues including translating existing public health occupations into Standard Occupational Classification (SOC) designations. CDC and HRSA should determine best methods for adopting and using SOC designations in training and continuing education.

2. CDC and HRSA should describe public health practice settings consistently. The definitions used by Kennedy et. al., *Journal of Public Health Management Practice*, 1999, 5(3) 10-19) are recommended.

3. CDC/ATSDR should develop a capacity to forecast future workforce composition and competency needs.

STRATEGY 2:
Identify Competencies and Develop Content/Curriculum

The following recommendations are made by the task force regarding the required core competencies for all public health workers, the elements to include in a basic curriculum for all public health workers, as well as how CDC/ATSDR categorical training can be aligned to improve the ability of the public health workforce to perform the essential services.

1. The task force recommends that the competencies outlined in this report are required by all public health workers to effectively deliver the essential services. These competencies should drive the development of basic and cross cutting training for the public health workforce and should underlie technical, programmatic or categorically focused training.

2. CDC/ATSDR, in collaboration with federal, state, local and academic partners, should take leadership in formulating and disseminating a model curriculum for the basic competency content needed by all public health workers to understand the mission of public health. At a minimum, this content would include the following elements: the history, values, core functions, essential services and competencies needed to perform the essential services of public health.

3. CDC/ATSDR should use the essential services and core competencies matrices as organizing principles in developing, coordinating, and aligning all training programs for the external workforce (including technical training) so that there is consistency between and among programs when targeted to the same audience, skill set, and/or performance area (i.e., essential service).

STRATEGY 3:
Design an Integrated Learning System

The following are recommended by the task force so that the CDC/ATSDR and its partners can facilitate the creation of a life-long learning system for the public health workforce.

1. Establish a master on-line catalogue of CDC/ATSDR learning resources.

2. Adopt technology, instructional design and administrative support standards for CDC/ATSDR training and education programs.

3. Make all appropriate CDC/ATSDR training available over the Internet by the year 2001.

4. Modernize and expand the local, state and CDC-based infrastructure for sustaining a life-long learning system including support for the creation of state and local learning centers.

STRATEGY 4:
Provide Incentives to Assure Competency

The following are recommended by the task force regarding the role of CDC/ATSDR in assuring the competency of the workforce through the use of individual and organizational incentives.

1. Identify and support the best practices and incentives for developing workforce competency.

2. Establish organizational accountability for a systematic approach to workforce development through national performance standards, (e.g., National Public Health Performance Standards Program).

3. Improve access of local and state public health workers to professional education in public health by supporting accredited programs such as graduate certificate programs in schools of public health.[1]

4. Pursue the development of national certification programs for the public health workforce with professional organizations/associations and academic programs.

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[1]detailed recommendations regarding CDC-sponsored Graduate Certificate Programs will be provided in a separate report, 1st Quarter, Year 2000.

STRATEGY 5:
Conduct Evaluation and Research

The following recommendations are made by the Task Force so that CDC/ATSDR can develop evidence based practices in the area of public health workforce development:

1. Build capacity to evaluate and conduct research on workforce development. Develop partnerships for interagency initiatives to increase awareness and visibility for training evaluation issues and trends.

2. Adopt a framework for evaluation and develop standards and guidelines to consistently evaluate training and continuing education of the public health workforce at the individual, program/curricula and learning system(s) level.

3. Establish an agency-wide system to collect, analyze, and report training evaluation data of CDC's programs. The desired end-product from such a comprehensive and integrated system would be an annual report outlining current levels of activity, outcomes, and future directions.

4. Support extramural research on the competencies needed by the public health workforce and on scientifically based approaches to workforce development which enable performance of the essential public health services.

STRATEGY 6:
Assure Financial Support

The following are recommended by the task force for CDC/ATSDR financing policy to support a nationwide system for life-long learning in public health practice.

1. CDC/ATSDR should encourage grantees to pool funds from existing funding streams to support cross cutting workforce development and should adopt policies enabling such integrated financing.

1. CDC/ATSDR should increase funding for cross cutting workforce development and pool funds from its existing and new funding streams to support cross cutting workforce development.

2. CDC/ATSDR should develop and support innovative approaches to funding workforce development, including leveraging funds across federal agencies and foundations, encouraging coalitions among grantees, and encouraging the use of non-profit intermediaries to facilitate innovative approaches.

Coordination and Accountability

The task force further recommends that a single organizational locus, directly accountable to the Director of CDC /ASTDR Administrator, be specified as responsible for the coordination of external public health workforce development activities.

STRATEGIC DIRECTIONS

STRATEGY 1:
Monitor Workforce Composition and Project Future Needs

Introduction

Today's public health workforce is complex, and for the purposes of this strategic plan is defined as those individuals whose major work focus is delivery of one or more of the essential services of public health, whether or not those individuals are on the payroll of a governmental, private, voluntary or not-for-profit public health agency. A majority continue to be employed by state and local health departments and the health units of the U.S. Department of Health and Human Services. Public health workers, however, are also found in public health programs located in other units of government, such as departments of environment, agriculture, labor, education, natural resources, transportation, or policy. Sizeable numbers work in the personal healthcare system. Their work is varied and may focus on health promotion, health statistics, prevention and detection of nosocomial infections or community health planning.

HRSA has statutory responsibility for enhancing the capabilities of the existing and future public health workforce through formal education and training. Education and training activities for public health professionals are supported through financial assistance funding mechanisms and other types of procurement to stimulate and influence innovations in student and workforce trainees' recruitment, retention, data collection, curriculum change, community connections, and work in under served areas.

CDC/ATSDR continues to rely upon the frontline public health worker to implement categorical programs at the state and local level. The changing nature of the workforce reinforces the need for adopting a standardized way to characterize both the occupations and practice settings of the workforce. Consistent application of these standardized tools will assist CDC/ATSDR in gaining a richer understanding about the characteristics and needs of the public health workforce, thereby allowing us to more effectively set priorities, and plan and fund future training and continuing education targeted to their needs.

Historical Development of the Public Health System and Workforce

In the United States, public health developed slowly and in a localized manner before the Civil War. Similarly, the practice disciplines and training of public health practitioners has been evolutionary. For example, mid-19th century public health was focused on sanitary reform; its practitioners were more closely aligned with engineering than with medicine. (16) This perspective of sanitary reform was consistent with a sentinel report, written by Lemuel Shattuck in 1850. Shattuck's report, written under the auspices of the Massachusetts Medical Society, addressed various aspects of sanitation, including water supply, sewage, garbage disposal, burial grounds, and

isolation of disease. Shattuck's report also recommended the formation of a state board of health. Nevertheless, Shattuck's recommendations were not adopted for 20 years.(17)

During this 20-year period, dramatic scientific discoveries were made, and these, coupled with sweeping social changes, fundamentally changed public health and the orientation of its practitioners. The fields of medicine and public health adopted scientific perspectives. It was the development of a new scientific field -- bacteriology -- that shifted the dynamic within public health from sanitation to medicine.(18) Explosive population growth and the nation's movement from an agrarian to an urban society also contributed to the development of public health.

By the latter part of the 19th century, several state and local health departments had been established; their formation led to alliances between public health departments and academic institutions. These alliances resulted in the creation of public health laboratories, which were key in reinforcing the relationship between scientific medicine and the diagnosis and control of disease.(19)

By the early 20th century, attempts to enumerate, describe, and develop a common framework for the education of the public health worker began. One of the first of these efforts was launched in 1919 by the Rockefeller Foundation. This 5-year study, initially conceived as a report on public health nursing in the United States, had among its committee membership many of the early leaders in the field of public health. C.E.A. Winslow chaired the committee, and Josephine Goldmark, a social reformer who was well known within the scientific study community, served as the secretary. Entitled "Nursing and Nursing Education in the United States," the resultant report described public health practice from the perspective of the public health nurse. Typical work days, practice settings, educational preparation, and relationships between public health nurses and other practitioners were described. Goldmark estimated the number of public health nurses in the field to be 11,000 in 1923, though she projected that 50,000 were needed.(20)

Federal efforts in public health grew in the early 20th century. The Marine Hospital Service, established in 1798, was renamed the U.S. Public Health Service. The Children's Bureau was formed in 1912, and the Sheppard-Towner Act of 1922 established the Federal Board of Maternity and Infant Hygiene.(21) The Sheppard-Towner Act served as the impetus for developing public health standards and established the model for federal-state partnerships that continues to be followed today.(22) Rapid growth in public health programs and its workforce occurred at the federal and state levels between 1930 and 1960.(23) The passage of the Medicare and Medicaid in 1966 reinforced the growth of the public health sector, but by 1973 the Health Maintenance Act served to slow the growth of public health by endorsing the use of health maintenance organizations. By the mid-1980s, a shift within public health occurred which resulted in an emphasis on state responsibility in carrying out public health programs.(24) This shift, coupled with cost containment efforts, changed the character of the public health workforce.

Issues in Describing the Public Health Workforce

The Department of Health and Human Services report entitled, *Public Health Workforce: An Agenda for the 21ˢᵗ Century,*(24) identified key obstacles and next steps to measure the supply of competent personnel to provide needed health services. The report was the product of a subgroup on workforce development of the HHS Public Health Functions Steering Committee, chaired by the Surgeon General and comprised of federal and non-federal stakeholders. First, the report recommended identification of a lead agency to provide leadership in assessing the size, composition, and distribution of the workforce as related to essential services of public health. In the process of following its national/legislative responsibilities in public health workforce, HRSA, in collaboration with a few members of the subgroup, developed an initial implementation plan for selected recommendations in the 21ˢᵗ century report. Further, responsibility for reporting on this implementation effort to the steering committee fell to HRSA.

The report also identified a need for standard nomenclature related to occupational classification reporting in official agencies (health, environmental health and protection, mental health, substance abuse; local, state, and nation) and private and voluntary organization. HRSA was influential in these revisions of the Standard Occupation Classifications (SOC) due to a long- standing relationship between HRSA's health professions' research and planning staff and key staff at the Bureau of Labor Statistics. HRSA staff served on the BLS Interagency Group for Revision of the SOCs and were able to bring in the necessary recommendations for revisions of health professions occupations including public health. Included in Appendix C of that report is the recommended revision to the SOC for the field of public health made by the SOC Revision Policy Committee in 1996. These 15 additional occupational categories provide classes for epidemiologists, environmental engineers, health educators, social workers, counselors, and others not included in the existing 13 categories. The current status of SOCs related to public health is summarized in Appendix I.(26-29)

The report recommended the use of data collected by the Bureau of Labor Statistics (using the SOC System) along with census surveys to track shifts in the staffing mix of personnel among the governmental, private, and voluntary sectors. An associated recommendation is to work with the Office of Management and Budget to facilitate identification of public health work sites, or sectors. Because the sector, or industry, is not specified in the SOC categories for occupation (based on job title, not setting), separate classification is needed. At the least, review of the existing Standardized Industry Classification (SIC) for adequacy of categories to identify public health work sites, such as official agencies and private and public organizations, is needed.

Also mentioned was the need to identify the demographics of the workforce; existing OMB categories for race and ethnic origin are adequate for this purpose along with gender identification.

In summary, the 21st century report recommends that a lead agency continue to provide leadership to assess the size, composition by occupation, demographics, and work site or sector so that demand for public health workers who are racially and culturally diverse can be determined. HRSA has indicated its intention of serving in that role.

Estimates of Workforce Size and Composition

The *Public Health Workforce: Agenda for 21st Century* includes a table describing selected studies assessing the workforce. Investigators were private foundations, public agencies, national associates and universities. Methods and data sources were surveys, convenience samples of workshop participants, and review of membership records and published personnel data from states. Occupational categories were used and estimates were provided for vacancies and shortages in public health occupational categories.

Worth mentioning here are three studies published subsequent to the 1997 report. These describe relevant methods or provide recent estimates of the actual or required numbers of public health workers by occupation and diversity.

Texas: Kennedy and colleagues at the University of Texas School of Public Health(30) estimated the size of Texas' professional public health workforce in 1995 by employment settings, job characteristics, and individual characteristics by mail survey of workers. Although the estimates of 17,700 public health workers employed and demographic characteristics of 50% female and 70% white are specific to Texas, the study provided a new classification scheme for work settings that is useful for characterizing the multi-sector nature of public health practice (see Figure 1, Executive Summary). In Texas, about 55% of workers were employed in agencies that provide population-based public health services; two-thirds of these worked in official state, local, and federal agencies. About 45% were providing institutional public health services in schools, private industry, and the personal health services industry. Occupational categories used were consistent with the SOC System. Results showed that one-half of the state's public health professionals were in four occupational categories: nurse; auditor, inspector or surveyor; environmental health worker; and environmental health engineer. Although comparative data from other states or nationally are not available, this study was useful in documenting that the professional public health workforce in Texas is small relative to the state's total health workforce (less than 3%) and in providing a comparison for other states of percentages by work settings, demographics, and occupation.

Washington State: In 1998, HRSA funded a profile and training needs assessment of community/public health professional employees of the Washington State Department of Health.(31) The workforce was predominately white (85%), college educated (89%), and almost 75% reported that they were licensed, certified, or registered in a health related specialty. The survey defined 15 possible occupational categories grouped into 9 occupational clusters.

U.S. Local Health Departments: In 1992, the National Association of County and City Health Officials (NACCHO) and CDC surveyed U.S. local health departments (LHDs) and included questions about staffing patterns and numbers. Analysis of these results showed that nurses, environmental specialists, sanitarians, and administrators constitute the core of the public health workforce in small and mid-sized LDHs. As expected, larger LHDs had a greater variety of employees. Numerous vacancies were found in many of the core job categories. The greatest demand was for nurses, physician assistant, nurse practitioners, and health educators.(32)

Ongoing Efforts

During FY 2000, HRSA has funded a project that will examine existing data sources to determine an accurate estimate of the number and (if possible) the professional background or initial training of the currently employed public health workers. Project coordinators will work with staff at CDC/ATSDR, HRSA and others to combine existing documentation on the size of the public health workforce and utilize existing training needs assessments to provide a clearer picture of the size, distribution and current development interests of public health workers.

NACCHO will survey local public health departments in November 1999 to determine the number of employees in 17 of the 28 SOC categories for public health. This public health infrastructure survey is a collaborative effort among NACCHO, the Robert Wood Johnson Foundation, and Mathematica Policy Research, Inc. Among other topics, the survey will collect data on workforce composition. Respondents will report the number of full-time-equivalent employees (FTEs) hired directly and through contracts using a variation of the Standard Occupation Classification (SOC) system. In this survey, designated occupations in public health were adopted to provide needed data and test the classifications most vital to their department and why these are vital. The study sample will include approximately l, l00 local health departments, including an over-sampling of health departments serving large populations. The survey was mailed in November 1999. Preliminary data is expected to be available by Spring 2000.

Challenges

Although the essential public health services provide a framework for understanding the work performed by public health workers, the boundaries of these services are ill defined. Those performing the services have various job descriptions and titles. The settings in which the work is performed vary and there is no consensus of sector/setting description. Employees have varied educational backgrounds, licensure, registration and certification requirements.

The following principles can guide future action and use of workforce composition data for decision-making:

1. Diversity- The public health workforce is diverse and changing and faces a demographic imperative that challenges the old way of doing business. Included in this workforce must be groups diverse according to race and ethnicity, gender, locations (rural and urban), age, educational background and discipline.

2. Level of detail- The SOC categories provide a common starting point for future analysis, however, additional work must to be done to translate former studies and current job descriptions into those categories, and into work settings, and job responsibilities/functions before there is meaningful data to inform policy.

3. Additional study designs-multi-phase/multistage studies will be needed for accurate estimates of workforce composition.

Recommendations

1. CDC and HRSA should collaborate to determine common terminology in describing public health workforce development issues including translating existing public health occupations into SOC designations.

2. CDC and HRSA should collaborate to determine best methods for adopting and using SOC designations to ensure their use in needs assessments and evaluating training and continuing education. (Appendix I)

3. Similarly, there is a need to describe practice settings consistently. It is recommended that practice settings be consistently described using the definitions published by Kennedy et. al. in the *Journal of Public Health Management Practice*, 1999, 5(3) 10-19.

STRATEGY 2:
Identify Competencies and Develop Content/Curriculum

Introduction

The task force focused on understanding the state of national consensus on the competencies (knowledge and skills) needed by frontline public health workers to deliver the essential services of public health. Next, they reviewed examples of core content/curricula used to shape a "public health perspective" and prepare workers for future practice.

The following questions were explored:

1. What are the core competencies needed by individuals to perform the essential public health services?

2. Which competencies or competency sets are cross cutting, (e.g., required by all public health workers regardless of role, setting, or programmatic focus)?

3. Which competencies or competency sets are program specific?

4. To what extent do existing courses/curricula targeted to the currently employed public health practitioner address core competencies?

5. What is the core content (curricula) needed to prepare the public health workforce for practice in the 21st century?

Historical Perspective

The 1988 Institute of Medicine (IOM) report, *The Future of Public Health,* outlined the steps needed for public health agencies in the United States to assure their future. Leaders should focus on three population-based core functions: assessment, assurance and policy development. They should also renew their focus on working with communities – to assess health status and to ensure the delivery of needed public health services. The report precipitated a flurry of activity among the partners in public health prevention - APHA, ASPH, ASTHO, the Environmental Council of the States, NACCHO, NASADAD, the National Association of State Mental Health Program Directors, the Public Health Foundation and the U.S. Public Health Service - to further define and refine the issues presented by the IOM. This culminated in the Public Health Functions Steering Committee formulating and adopting a vision and a mission for public health, a statement of what we do in public health, and a listing of the essential services that relate to the three core functions.(33) The steering committee's report provided the first elucidation of competencies required for providing each of the

essential public health services.(34) This work on competencies continues to be expanded and codified by several groups, specifically the Faculty-Agency Forum and the Kellogg Foundation, which is developing complementary community-based public health competencies. The Center for Health Policy and Health Services Research of Columbia University recently prepared a series of analyses laying out the preparation needed for currently employed public health professionals for changes in the health system. "Healthy People 2010 Objectives, " presently being finalized, incorporates an entire section entitled "Public Health Infrastructure," with a goal to "ensure that the public health infrastructure at the federal, state, and local levels has the capacity to provide essential public health services." (35)

Despite almost a decade of discussion, most public health workers in the United States still lack formal training in public health and know little or nothing about the core functions, essential services, required competencies, their inter-relationships and their relevance to the future of public health.

Progress in validating required competencies and in developing related learning opportunities is slow. Today only two comprehensive books are available on the practice of public health: "Public Health: What it is and How it Works" by B.J. Turnock (36) and "Principles of Public Health Practice" by F.D. Scutchfield and C.W. Keck; both were published in 1997.(37)

Several health departments, consortia of health departments, and schools of public health have created training programs to prepare the workforce for anticipated changes in the 21st century (i.e., core content for a public health perspective). Typically, these efforts present the rich history of public health in America, describe public health in transition, define the core functions and essential services of public health, and discuss the competencies required to ensure the effective delivery of essential public health services. Unfortunately, this innovative training reaches only few public health workers in the United States.

Core Competencies for the Public Health Workforce

Is there an emerging national consensus on the core competencies needed to perform the essential services? To address this question, the task force reviewed the following documents:

The Public Health Workforce: An Agenda for the 21st Century, the full report of the Public Health Functions Project. Appendix E defines the universal competencies for each essential service, from the report prepared by the Competency-Curriculum Workgroup of the Subcommittee on Public Health Workforce, Training, and Education, 1995.

"Collaborative Competence in the Public Health Agency: Defining Performance at the Organizational and Individual Employee Levels," a multi-year collaborative study

conducted by Jane Nelson, Ph.D., MPH, Associate Director, Center for Public Health Practice, Rollins School of Public Health at Emory University, Atlanta, Georgia.

Preparing Currently Employed Public Health Professionals for Changes in the Health System," an analysis of the competencies and training needed by administrator, educator, environmental specialist, nurse, and physician to perform the essential services. Prepared by Kristine M. Gebbie, DrPH, RN, Director of the Center for Health Policy and Health Services Research of Columbia University, and colleagues.

"Assessment and Planning Excellence for Community Partners for Health – APEX CPH," a strategic planning tool for local public health, developed by NACCHO in partnership with CDC, ASTHO, APHA, NALBOH and the PHF, and scheduled to be published in December 1999. (Personal communication, Dr. Paul Wiesner).

Competencies can be defined as the knowledge, skills and abilities demonstrated by organization or system members that are critical to the effective and efficient function of the organization or system. The function of the public health system is the promotion of health and the prevention of disease. It is critical that the competencies addressed by those in public health inform and enable the public health system–organizations and individuals–as it transitions to a population-based prevention focus.

The competencies must be identified, validated, assessed, and developed in the context of the essential public health services and in the relationship of these services to positive health outcomes. Broadly defined, competencies are actions that can be described in behavioral terms and can be observed in the performance of individual or system components. Measuring competency (individual or organizational) is part of a system for continuous improvement in public health.

Some LDHs responded proactively to *the Future of Public Health* recommendations by realigning their structure and operations of the local health department toward population and community-focused practice. The story of the Columbus, Ohio, Health Department describes such a transition. The learning process involved all staff members including managers, and professional/ technical and support personnel.

The work of the Public Health Functions Steering Committee and others(38-41) led to the conclusion that there is a universal set of competencies required to perform the essential services. Examples of each competency area are presented in Table 2, Executive Summary.

Later work(42,43) emphasized the importance of delineating competencies based on specific settings within local health departments (e.g., clinical, organizational, community) and as demonstrated at different organizational levels (e.g., senior management, middle management/ credentialed and technical/support staff). By describing behaviors in a way that links individual or organizational action to outcomes, the relationship between these actions and achieving public health goals is made clear.

In discussing the competencies required to perform the essential services, experts developed a variety of ways to categorize the needed skills. Although there is not a uniformly agreed upon "language," this should not represent a barrier to action. For example, Table 3 plots each of the essential services against "universal" competency areas defined in the Public Health Functions Report and by others. These competency categories include analytic, communication, policy development, cultural, basic public health science, visionary leadership/empowerment and systems thinking, and management/information management.

A LEARNING ORGANIZATION:
COLUMBUS, OHIO, HEALTH DEPARTMENT

"Few would deny the tremendous change that is occurring in our personal and professional lives. Technology, managed care, reduced reimbursements, population-based interventions, Web sites, collaborations and more, face us in a never-ending assault on our sanity and serenity. The field of public health is trying to deal with this change with a collection of professionals doing separate, and only sometimes coordinated, work. If we are to achieve our vision of a healthy people in healthy communities, we need to create opportunities where the disparate pieces of the public health workforce work better together.

The Columbus Health Department has been consistently revisiting the issue of how it can be a more effective public health agency and decided to create and maintain a modern public health workforce by instituting a public health learning process for all staff.

We realized that in addition to on-going specific professional training, all staff needed exposure to concepts dealing with public health core functions and essential services. We also wanted to emphasize communication, coordination and collaboration across disciplines and programs and through all levels of the organization. We firmly believe this commitment will continue us down the road of achieving our vision of making Columbus "The Healthiest City in America." In other words, we set out on a journey by taking the first step of enhancing the knowledge, skills, and abilities, or core competencies of all staff, which is critical to achieving our vision. Success will be achieved when all staff feels as if they are public health ambassadors, both on and off the job. It is, after all, the workforce that makes public health work."
(From *Public Health in Transition: Training the Local Public Health Department Workforce*, Holtzhauer, F., et.al. Manuscript submitted for publication, 1999).

TABLE 3. Essential Services vs. "Universal" Competency Matrix

COMPETENCY CATEGORIES	ESSENTIAL SERVICES									
	1	2	3	4	5	6	7	8	9	10
Analytic										
Communication										
Policy Development										
Cultural										
Basic Public Health Science										
Leadership & Systems Thinking										
Mgmt & Information Mgmt										

Table 4 (Table 2, Executive Summary) provides some examples of each competency area, which were derived from the ongoing competency validations of the Public Health Functions Steering Committee and others.

TABLE 4.   Cross Cutting (Core) Competencies for Public Health Practice

COMPETENCY AREA	EXAMPLES
Analytic	• Identifies potential strategic issues through ongoing macro environmental scanning. • Obtains and interprets information regarding risk factors. • Knows data collection process, technology, transmission capability, and computer systems storage/retrieval capacities in order to access health related information.
Communication	• Listens to others in an unbiased manner and respects points of view of others. • Promotes the expression of diverse opinions and perceptions. • Persuades and influences individuals and groups by increasing knowledge, shaping attitudes, and modifying behaviors towards disease prevention.
Policy Development	• Interprets information regarding the health status of individuals or populations in order to formulate and prioritize goals and objectives. • Educates health, legislative and media people about the need for new public health programs.
Cultural	• Appreciates the importance of diversity within the public health workforce. • Learns appropriate methods for interacting with stakeholders from varied cultural, racial and ethnic groups. • Identifies opportunities for improving stakeholder/public health worker interaction..
Basic Public Health Science	• Can relate the core functions to the ten essential services. • Understands the role of assessment, assurance and policy development in the delivery of the essential services. • Understands how to accomplish effective community engagement.
Leadership & Systems Thinking	• Helps define key values and uses these principles to guide action. • Understands the need to see interrelationships rather than cause-effect chains. • Empowers others to create & implement plans based on a shared vision.
Management & Information Management	• Establishes budget priorities based on strategic plan • Manages information systems for collection, retrieval and use of data for decision-making.

Table 5 represents competency categories that are critical to performance in a specific essential service. Table 6 demonstrates the same matrix with a brief presentation of the needed abilities and skills at each competency/essential service intersection. Understanding that the competencies/essential services relationship can be depicted in various ways, prototype forms are presented in Table 7,8,9. These show how consideration of practice settings, job classifications, level of responsibility or level of experience might influence needed competencies. Each example demonstrates the usefulness of the essential services and competency matrix as a organizing principle in planning workforce development in public health, e.g., "Competencies by Level of Responsibility" (Table 7);" Individual Competencies as Responsibilities Increase" (Table 8); and "Individual Competencies Needed for Each Standard Occupational Classification" (Table 9). Table 10 demonstrates how the competency area "Systems Thinking" translates into measurable behavior at the client/personal services, organization or community level.

Recommendation on Core Competencies

We believe that, over time, a systematic approach to defining required competencies will result in improved performance of public health workers. A systematic approach to competency development using the essential services framework and built upon previous competency validations will stimulate the further development of relevant cross cutting training for frontline workers, promote systems thinking at every level of the workforce and facilitate interdisciplinary learning at the local level. Although there is not a national consensus on how competency should be defined, there is sufficient agreement to proceed.

The workgroup recommends that CDC/ATSDR use the competency matrices presented here to develop training and continuing education for the external workforce. Identifying required competencies to perform essential services should precede and drive development of training and continuing education for the public health workforce, regardless of the programmatic or categorical focus of the content.

A description of the competencies required of public health workers to effectively deliver the essential services can be developed through a systematic process. By developing competency-based training for all public health workers based upon the essential services framework, there will be continuous improvement in individual and organizational capacity to achieve desired public health outcomes. See Tables 2-10 for examples of core competencies for all public health workers, specific occupational classifications, practice settings, levels of responsibility, status in career path (entry to advanced) and/or functional focus (client, organizational, community).

Core Content/Curriculum for 21st Century Public Health Practice

We reviewed the examples of core curricula and training activities designed to prepare currently employed public health workers for the future:

4. "Public Health Improvement Plan, Education and Training, Competency Model," Washington State Department of Health, 1996. The purpose of the document is to assist in the development of training and education to support the state's public health improvement plan, and is built around the core functions.

5. "A Program for the Certification of Public Health Administrators in the State of Illinois," a joint effort of the Illinois Public Health Association, the Illinois Association of Public Health Administrators and the Illinois Association of Boards of Health. 1999. The program defines the academic and training requirement and the documented performance for each essential service.

6. "South Central Workforce Development Curriculum: Community Partnerships Perspectives," an overview designed for all public health employees. Also presented is the outline for three advanced training sessions: Community Partnerships, Measuring Progress, and Communication.

7. "Comparison of Training Needs Based on Essential Public Health Services," Appendix C of "Preparing Currently Employed Public Health Professionals for Changes in the Health System," prepared by the Center for Health Policy and Health Services Research of Columbia University.

8. "The Changing Role of the Public Sector in Health," a course offered to MPH students and public health workers by the Center for Public Health Practice, Department of Health Policy and Management of the Rollins School of Public Health at Emory University. This course is designed around the core functions and essential services.

A curriculum is a planned course of study on a particular topic. Curriculum includes all the resources required to implement a course of study (lessons, resource materials, instructor guides, etc.). We reviewed the a variety of curricular materials used to plan and implement training to prepare currently employed public health workers in state and local health departments for the future. Comparing these varied documents demonstrated the universality and relevance of certain topics or core teaching content, especially for an Orientation to Public Health or Public Health 101-type course. These topics are listed in Table 11.

Again, while there is no national consensus on a core course/curriculum for all public health workers, the topics identified in Table 11 represent a starting point for further development.

In general, the following assumptions apply:

- Local area autonomy in planning relevant curriculum is assumed to be a factor critical for long term success of any workforce development initiative.
- Competencies and content apply to all public health workers but presentation/ materials need to be relevant to an individual's level of responsibility (e.g., managerial/executive; professional staff; support staff).
- Advanced training in specific areas may be required based on one's functional role and/or level of responsibility (e.g., leaders need advanced training in visionary leadership, information management).
- Within any one programmatic area, entry, intermediate and advanced levels of training can be developed. As one moves through these levels, content may be in greater depth than at prior levels, or new content introduced. For example, every public health nurse working in Maternal and Child Health should be expected to use basic analytic skills to interpret epidemiological information about the population of interest. The advanced public health nurse in Maternal and Child Health might be expected to develop new analyses of data about a community of interest and translate that into material upon which a community coalition could be founded.

Recommendations on Core Content/Curriculum

We made two recommendations: The first relates to the need for core training for all public health workers and the second, to aligning current CDC/ATSDR training so that it consistently develops competencies which improve the performance of the essential services.

1. CDC/ATSDR in collaboration with federal, state, local and academic partners, should take leadership in formulating a model for the basic core content needed by all public health workers to understand the mission of public health. At a minimum, this should include the following elements: the history, values, core functions, essential services and related required competencies to perform the essential services of public health.

2. While the primary target audience for the proposed course/curriculum are employees of state and local health departments, we recognize that federal employees, specifically those in CDC/ATSDR and HRSA, could also benefit. The curriculum model should be widely shared within the public health community. Therefore, we further recommend that any core content/curriculum for public health workers be prepared in a variety of delivery formats to facilitate training large numbers of personnel within a reasonable time. Advanced/ customized courses would be developed as required to meet the needs of those with different levels of responsibility or programmatic focus in public health.

3. CDC /ATSDR should relate all training provided to the external public health workforce to the essential services and the competencies required by public health

workers to perform these essential services. For example, any CDC program offering training would be expected to "locate" its content within at least one version of the matrices presented here. To the extent possible, the content of that training would be expected to use language that is consistent with other programs addressing that same competency, essential service, target audience, level or cell within the matrix. For example, training to build competency in communication skills related to essential service # 3, informing the community should be similar regardless of categorical/programmatic focus. When the learner's discipline is a critical factor (e.g., public health nurse), this provides another opportunity for consistency in reinforcing needed competencies. The goal is improved alignment and coordination of training provided to state and local health departments so that individual capacity to perform the essential services is systematically enhanced.

Task Force Report on Public Health Workforce Development

TABLE 5.   Essential Services and Core Public Health Competencies

	Analytic Skills	Comm. Skills	Pol. Dev. Skills	Cultural Skills	Basic PH Science	Ldrshp/ Systems	Mgmt. Skills
Monitor Health	uuuu	uu		uu	uuuu	u	u
Diagnose/ Investigate	uuuu	uuu	u	uuu	uuuu	u	
Inform Community	u	uuuu	u	uuuu	u	uu	u
Mobilize Partners		uuuu	u	uuuu		uuuu	u
Develop Policy	u	uuu	uuuu	uuuu	u	uuuu	uu
Enforce Laws		uuu	u	u	u	uu	u
Link to/ Provide Care	u	uu	u	uuu	uu	u	u
Assure Competent Workforce	u	uu		u	uu	uu	u
Evaluate	uuuu	uu	u	uu	uuu	u	u
Research	uuuu	uu		uu	uuu		

Key:
Degree to which Competency is needed to perform essential service; uuuu Critical competency set; uuuuImportant competency set; uu Relevant competency set; u Useful competency set. Little or no application of this competency set. Vertical Axis: Essential Services of Public Health as identified in *Public Health in America*; Horizontal Axis: Competency Sets as identified in *Agenda for the 21st Century* and elaborated by others.

Comments:
The terminology of the two axes was developed by two different groups of people and uses some of the same words. The intersection of the two is intended to identify which competencies (or set of competencies) are essential for the workforce to deliver a given essential service. Each intersection can be differentially developed for staff at the leadership, program or professional and support level. For example, *leadership and systems skills* are a critical component of two essential services: *mobilize partners* and *develop policy*. Agency or program directors will need advanced leadership and systems development skills, while program staff may need a different set of skills that are more supportive. Support staff need to understand the systems nature of communication about policy so that they assure an appropriate flow of information during the policy development process. While the assignment of weights is approximate, it reflects work done by several different research groups and analytic projects. Some of the intersections can be developed as generic capacity, available for application in any public health program area at any level of community. Others will need extensive adaptation to the skills and knowledge needed by a specific program area.

TABLE 6.   Essential Services and Selected Examples of Core Competencies

	Monitor Health	Diagnose/ Investigate	Inform Community
Analytic Skills	Define problem.; Determine data use; Select variables; Interpret data;	Make inferences from data collection; Uses risk assessments; Understand study designs	Understand risk assessments
Comm. Skills	Communicate effectively (listens, respects, promotes expression of diverse opinions); Present information; Lead/ participate in group; Communicates health risks	Facilitates interviews; Writes reports appropriate to audience; Uses media (print/other) effectively	Use media effectively; ; Provides accurate, audience appropriate information
Policy Dev. Skills	Collect/summarize relevant data	Collect/summarize. relevant data; State options; Articulates implication; State feasibility/ outcomes; Understands legal implications of recommended actions	Knows how to use legal/ political systems for policy development
Cultural Skills	Functions effectively in diverse cultural settings	Uses culturally appropriate methods for situation	Identifies relevant cultural factors; Develops culturally appropriate communications strategies; Involves community
Basic Public Health Science	Applies behavioral/ social sciences, biostatistic, epidemiology methods	Applies behavioral/social sciences, biostatistics, epidemiology; Demonstrates effective use of laboratory sciences	Understands & applies principles/research from psycho social/behavioral; Education & learning methods
Leader- ship & Systems	Helps define organizational values; Demonstrates ethical conduct; Conducts strategic planning	Encourages development of traditional/non-traditional networks within a community or local public health system to achieve health goals	Understand how agencies operate; Creates a shared vision; Fosters individual accountability/responsibility to act on behalf of the organization and client
Mgt Skills & Info Mgt			Establishes measurable goals/objectives based on strategic plan

TABLE 6. Essential Services and Selected Examples of Core Competencies *(continued)*

	Mobilize Partners	Develop Policy	Enforce Laws	Link to/ Provide Care
Analytic Skills		Identifies potential issues		Identify health needs of special populations
Comm. Skills	Advocates for public health; Lead/participates in groups; Use media; Uses technology appropriately to send/receive information	Writes clear/concise policy statement; Uses technology to transmit/receive messages	Communicates effectively (listens, respects, promotes expression of diverse opinions); Provides information in appropriate language/ format	Write clear/concise policy statement;
Policy Dev. Skills		Collect/summarize relevant data; State options; Articulates implications; State feasibility/outcomes; Use decision analysis; Identifies relevant laws/ regulations/policies	Collect/summarizes relevant data; Identify laws/regulations/ policies related to special programs	Collect/summarize relevant data; State options; Articulate implications; State feasibility/out-comes; Decide on actions
Cultural Skills	Interacts sensitively in diverse situations; Uses principles of community engagement	Interacts sensitively in diverse situations	Interacts in a culturally appropriate manner	Understand forces contributing to any service/access problems; Develop culturally appropriate strategy or improved services
Basic Public Health Science	Applies evidence-based principles of community engagement		Understand risk assessment	Use knowledge of public health to increase access to needed services; Use case management skills
Leader-ship & Systems	Establishes multi-sector partnerships; Fosters innovative use of resources to meet public health needs	Uses environmental scans to inform policy decisions	Collaborates with other agencies	Provide or ensure access to health care; Prepare plans to handle emerging health threats and system changes
Mgt Skills & Info Mgt	Develops/implements operational plans to achieve identified needs	Implements policy; Establishes systems to monitor compliance; Summarizes results for decision-makers	Manages & monitors the regulation process	Negotiate and manage contracts for personal health services as required

TABLE 6. Essential Services and Selected Examples of Core Competencies *(continued)*

	Assure Competent Workforce	Evaluate	Research
Analytic Skills	Monitor workforce composition and forecast needs using appropriate data sources	Establish performance indicators & monitoring systems to evaluate programs; Apply process improvement methods	Identifies research questions, defines variables; Identifies data sources; Assures data integrity; Makes inferences from data
Comm. Skills	Write clear/concise policies and procedures;	Provide well written, visually effective information/reports useful for decision-making	Communicates findings from research in manner appropriate to the audience
Policy Dev. Skills	Establish systematic approach to workforce development-recruitment, staffing, incentive systems, etc.	Collect/summarize relevant data; Identify laws/regulations/ policies related to special programs	Uses research findings to inform policy development
Cultural Skills	Use diversity management to ensure a trained, culturally diverse workforce		Develops a research agenda to address racial, ethnic health disparities
Basic Public Health Science	Provide/participate in competency based public health practice curriculum which includes basic public health sciences	Understands methods of health services research; Understands the historical development of public health agencies	Understand basic research methods in public health; Define/assess health status/ determination of health/etc.; Apply basic public health sciences; Understand the historical role of public health agencies
Leader-ship & Systems	Develop workforce development strategy in collaboration with leaders of state/local public health system	Advocates for continuous quality improvement at every level; Links rewards to quality improvement	Applies research findings to improve system performance
Mgt Skills & Info Mgt	Establish human resources management systems & uses information technology to improve system effectiveness	Monitor program performance	Demonstrates effective project management skills

TABLE 7. Competencies Matrix by Career Level

Soc:_____ Epidemiologist_____ Practice Setting: State Health Agcy_____

	Level of Responsibility		
	– Entry	– – Intermediate	– – – Advanced
Monitor			
Investigate			
Educate			
Mobilize			
Develop Policies			
Enforcement			
Linkage to Services			
Prepare Workforce			
Evaluate			
Research			

TABLE 8. Individual Competencies Matrix as Responsibilities Increase

Soc:_____ Epidemiologist_____ Practice Setting: State Health Agcy_____

Essential Services	Required competencies as responsibilities increase E.g. Staff - Team Leader- Manager	
Monitor	+	+
Investigate	+	+
Educate/Inform	+	+
Mobilize	+	+
Develop policy	+	+
Enforce law	+	+
Linkages to/ provide services	+	+
Assure competent workforce	+	+
Evaluate	+	+
Research	+	+

TABLE 9.   Individual Competencies Needed for Standard Occupational Classification
            Matrix

	Standard Occupational Classification				
	Environ'l Health Specialist	Health Educator	Health Services Admin.	Nurse	Physician
Monitor					
Investigate					
Educate					
Mobilize					
Develop Policy					
Enforcement					
Linkage to Services					
Prepare Workforce					
Evaluate					
Research					

TABLE 10.   Systems Thinking - Behavioral Examples

COMPETENCY:
Systems thinking is defined as future oriented problem solving and decision-making.

• Understands the need to see interrelationships rather than cause-effect chains;
• Is proactive and manages the processes of change;
• Promotes and facilitates organizational learning;
• Is creative and flexible in identifying and evaluating alternatives and anticipates the consequences of actions and responses;
• Optimizes opportunities to improve health status of community.

TABLE 10.   Systems Thinking - Behavioral Examples *(continued)*

INTER-ACTION LEVEL	OBSERVABLE BEHAVIOR
Individual/ Client	• Restates issues from the client's perspective. • Involves the client and family in solving the problem. • Shows outcomes and benefits of prevention in order to enable client to take responsibility for his/her own health. • Understands the client's community and the elements that may impede or promote the development of healthy lifestyles and behaviors.
Organi-zation	• Provides an environment for creating, acquiring, and transferring knowledge leading to behavior change and organizational improvement. • Promotes and manages change as a process for positive growth and continuous quality improvement. • Generates organizational policy, processes, and procedures to support performance of core public health functions and provision of essential public health services. • Acknowledges that a problem exists and involves stakeholders at all levels of organization in building a solution. • Understands that public health agency is one component of dynamic community health system in a time of rapid change and role redefinition.
Community	• Identifies the primary cause and direct and indirect contributing factors of health issues in complex sociocultural settings. • Provides health-related data and information showing relationships, trends, and patterns in a format that is clear and useful to community policy makers. • Anticipates consequences of alternate solutions to community health problems. • Involves relevant stakeholders in both the definition of the problem and the formulation, implementation, and evaluation of the solution.

TABLE 11.   Elements for Basic Competency in Public Health.

Examples of core content for "Orientation to Public Health" or "Public Health Prospectives" for state and local health department employees.	
History of Modern Public Health - Early Beginnings	• London Cholera Epidemic • 1796 Immunization of U.S. Soldiers for Smallpox • Sanitation: safe food, water, and sewage • Immunization; public health nursing
Public Health in Transition: Forces of Change	• Medicaid • Health care reform • Managed care • The Institute of Medicine Report: The Future of Public Health
Public Health: A Dynamic System	• Public health agency as a learning community • Public health as an interdisciplinary practice • Core Functions and Essential Services • Multi sector partnerships – roles and functions • Organizational and professional standards
Core Functions and Essential Services	• Definitions • Dynamic interaction • Competencies needed for 21st century public health practice
Competencies - Definitions and Applications	• Analytic • Communications • Policy Development • Cultural • Basic Public Health Science • Visionary Leadership and Systems Thinking • Management and Information Mgt. • Others-tbd (e.g., Ethics/Confidentiality)
Local Public Health Systems: Working with Communities	• Definition of community • Developing partnerships for public health action • Improving community health outcomes- Tools of the Trade- e.g., APEX-CPH-Assessment Protocol for Excellence in Community Public Health; HP 2010

STRATEGY 3:
Design an Integrated Learning System

Introduction

The American public health workforce, the most important asset for the prevention of disease, injury, and premature death, will be maintained at a high level of competence by means of a strong, nationwide learning system having the following characteristics:

1. Strong training and education partnerships that support the idea of life-long learning and share the responsibility of governance, financing the system, and maintaining the infrastructure;

2. Expertly designed, high priority, practice-based training programs that deliver the educational opportunities needed to build the competencies when and where they are required;

3. Technologically smart learning environments readily accessible to public health workers;

4. Interoperable technology for developing and delivering training programs and supporting the learners that participate in them;

5. Multiple avenues for learner support and feedback that take into account the needs of different public health audiences; and

6. Effective evaluation of systems.

This workgroup report describes the learning system design features needed to address these characteristics.

Planning Assumptions

In describing an ideal design for the future, we developed a series of assumptions about the workforce, effective learning programs, as well as human and technical capacity requirements:

1. Public Health Workforce

   • The public health workforce is becoming larger, more diverse, and more geographically dispersed;
   • New and reemerging public health threats appear regularly and thus require regular enhancement of skills;

- Most public health workers lack formal public health training and are often inadequately trained to perform the essential services of public health;
- Formidable barriers to receiving necessary training for adequate performance (such as money, time, convenience, relevant courses, course quality, and access) exist; and
- Workforce knowledge and skill deficits have a direct effect on public health practice.

2. Effective Learning Programs

- Adult learners, due to differences in learning styles, will require a range of learning modalities and media;
- Principles and "best practices" in training and education, such as those defined by the American Council on Education, should guide program development;
- Continuing education and training programs for adult learners must be engaging, interactive experiences that are job related;
- The use of distance and distributed learning will continue at an accelerated pace;
- The majority of the workforce is learning how to learn at a distance, initially via self-study in print, live video, and now via the World Wide Web;
- Traditional classroom teaching will continue to be important, but will be drastically reshaped by the use of technology; and
- A formal plan is needed by every major public health entity to guide workforce development and the use of learning technology in training and continuing education.

3. Human and Technical Capacity Requirements

- A critical mass of diverse, specialized professional instructional designers, producers and learner support personnel is needed to develop, deploy, support, and evaluate individual programs as well as the system itself;
- Faculty in distance learning programs must learn how to design and deliver learning programs for new media environments and must be supported by a team of production and technical specialists;
- Specialized facilities and equipment are needed at CDC/ATSDR and elsewhere to perform an increasingly sophisticated range of functions;
- Learner support systems are needed to facilitate the learning process;
- The installation rate of computers in public health connected to the Web is accelerating. At the same time, Internet band width is evolving at a steady rate, thus providing the means to reach more people with advanced multimedia learning resources and learner support capability; and
- The installation base of public access analog satellite infrastructure is in place now. This is being replaced by new digital satellite systems, such as direct broadcast television and direct PC television.

Current Status of Learning Systems

In addition to developing a series of planning assumptions, the task force members prepared an environmental scan and Strength/Weakness/Opportunity/Threat (SWOT) analysis of trends which will affect learning system design considerations. Major findings are as follows:

1. Activities and Trends External to CDC/ATSDR

    • Eighty percent of *Fortune 500* companies will be implementing Web-based training (WBT) by the year 2000;(44-47)
    • By the year 2000, computer training development will increase globally by 90% with 20 percent being WBT;(48)
    • The Presidential Learning Technology Initiative and the Department of Health and Human Services Distributed Learning Systems Strategic Plan are stimulating a rapid federal evolution in learning technology; the philosophy of life-long learning and learning organizations are evolving; competitive intelligence is becoming prevalent and is seen as a driving force in these federal activities;(49)
    • Other federal agencies, e.g., Veterans Administration (VA), Food and Drug Administration (FDA), Health Care Financing Administration (HCFA), Health Resources and Services Administration (HRSA), and National Institutes of Health (NIH) are developing distance learning infrastructure and new programs. CDC has a long history in collaborating with these agencies and will continue to benefit from these vital workforce development partnerships.
    • Seventy percent of the accredited schools of public health now have some form of distance learning capacity and are producing a growing number of continuing education and degree conferring courses. A few even offer a distance-based MPH degree

2. Analysis of CDC/ATSDR Learning Systems

    Strengths
    • CDC has a long and distinguished history and sizable investment in training and education. These activities are seen as critical to the mission of most CIOs;
    • Many public health organizations at the federal, state, and local levels have made modest investments in learning systems infrastructure;
    • The CDC Director/ATSDR Administrator has launched the development of an agency-wide and public health system-wide strategic plan for workforce development, indicating this to be a top priority for CDC/ATSDR;
    • The Public Health Training Network (PHTN) has set the standard for the systematic use of distance learning in public health. As a leader, CDC has developed a performance model, extensive partnerships, specialized expertise, and a patchwork of essential production and distribution technology; and
    • Growing experience with distance learning and other new approaches to workforce development have demonstrated value and have increased receptivity to change.

Weaknesses
- Currently, there are many different approaches, many different systems, and variable organizational capacity at federal, state and local levels, and existing systems are not well linked, leveraged, or coordinated. There is a need for a single organizational hub for leadership/oversight;
- State and local level providers/participants/end-users do not have easily available hardware/software and the technical skills to utilize desktop learning systems. Even when they do, they don't have the availability to the technical support needed to solve learner problems;
- There is no set of standard approaches to conducting and assessing costs and benefits of training and continuing education at CDC/ATSDR; and
- CDC/ATSDR's distance learning human and technical infrastructure has significant limitations.

Opportunities
- Expanded use of computers and the Internet provides an opportunity for broader access to technology-based learning;
- New research in effective methods of adult learning provides insights that are useful in developing new learning experiences; and
- A new building, the Scientific Communications Center, is now being designed to serve as the state of the art headquarters and production hub for 21st century training and distance learning activities.

Design Considerations

4. Partnership Development: When one envisions establishing a public health wide life-long learning system for the 21st century, the first thought is of the size and complexity of the task and the type and amount of resources needed; therefore, it would not be easily feasible or even desirable for one agency or organization to undertake such an endeavor on its own. In fact, this approach could result in numerous, small, narrowly focused systems that would have the potential of duplicating efforts and not meeting needs, being technically isolated, and confusing from the learner's perspective. CDC's recent experience in establishing the Public Health Training Network (PHTN), National Laboratory Training Network (NLTN), the STD Training Center Network , the TB Model Centers, etc., strongly suggests that a partnership approach is the most successful model.

2. Uniformity of Approach and Coordination of Effort: Several distance learning network development efforts have been successful individually, but collectively they have not resulted in a single coordinated approach that is learner friendly and seamless to users. Taken together, they do not have an organized curriculum nor do they deliver the broad array of learning experiences required by all of the diverse segments of the workforce, when and where they are needed. Another shortcoming of this ad hoc approach is that, while it has enabled a fast, inexpensive start-up by using the existing, but varied production and delivery infrastructure, it has not

resulted in an interoperable, technology based approach which allows learners easy to use, direct access to the majority of learning resources. Furthermore, because it lacks a single or a systematic method of governance, funding and accountability at any level, it has been difficult to move forward with a united, system-wide effort to establish a shared, robust, technologically modern learning infrastructure. Uniform approaches and improved coordination are needed.

3. Clarification of Roles and Responsibilities: Partnerships permit the development of a unifying vision, a strategy to share human, technical, and financial resources, and a plan to distribute the roles and responsibilities to carry out the many complex tasks necessary to operate successfully.

Federal Agencies:
At the federal level rests the primary responsibility for leading the effort to design and implement a life-long learning system, and their active engagement is pivotal to its success as a national plan. A shared national vision for a united approach to workforce development is crucial for generating and marketing the plan. Federal agencies, such as the National Institutes of Health (NIH), Health Resources and Services Administration (HRSA), Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), Agency for Toxic Substances and Diseases Registry (ATSDR), and Health Care Financing Administration (HCFA), all have a role in workforce development and share a primary responsibility for leading such an effort, and many are currently engaged in trying to design, a unified approach to workforce development.

Roles and responsibilities for federal agencies partners:
• Convene and manage dialogue;
• Lead efforts to generate and market workforce development plans;
• Adopt and/or develop system standards and assure their use;
• Provide oversight and coordination for human, technical and operational performance;
• Develop partnerships and support leadership activities among academic institutions;
• Assure availability of learning opportunities;
• Provide access to resources and funding; and
• Provide research and development evaluation activities.

State Agencies:
State and local level public health organizations are central to the success of a public health learning system. States must participate in designing the system and in many ways, duplicate activities carried out at the federal level to assure needed capacity. They will need to establish an organizational hub to coordinate states and local efforts in linking training, educational, and distance

learning activities. This will enable future investments made by these agencies at any level to continue to enhance the human and technical infrastructure needed for workforce development, assuring adequate leadership planning and coordination.

Roles and responsibilities for state partners:
• Participate in learning system design; establish locus for coordination
• Work with ASTHO to encourage and support the vision of life-long learning;
• Promote program attendance and participation;
• Adopt and promote use of learning system technology standards;
• Produce and deliver new programs; and
• Assist country and community distance learning capacity building and provide technical assistance.

Local Health Agencies:
Local health agencies provide the organizational "home" for the vast majority of the public health workforce; and, therefore, must invest in the needed infrastructure to participate in technology supported learning.

Roles and responsibilities for local agency partners:
• Invest in learning technology;
• Promote program attendance and participation;
• Support formation of local learning centers;
• Provide incentives to employees to become life-long learners;
• Perform training and capacity needs assessment; and
• Provide evaluation information.

Professional Associations:
National professional associations represent major segments of the public health workforce. They are in the closest touch with, and most knowledgeable about, the groups that they represent, and thus, are in a better position to understand their constituent's needs and capacities. National associations such as the Association of State and Territorial Health Officers (ASTHO), American Association of Schools of Public Health (ASPH), Association of State and Territorial Directors of Nursing (ASTDN), Association of Public Health Laboratories (APHL), National Association of City and County Health Officers (NACCHO), and Association of Local Boards of Health (NALBOH) are examples of critical partners.

Roles and responsibilities for professional associations:
• Support the idea of creating a life-long learning system;
• Promote continuing education;
• Assess needs and capacity;
• Participate in standards development and facilitate adaptation;

- Publicize and advocate for learning programs; and
- Sponsor development of courses for their audiences.

Private Foundations:

Private, not for profit, philanthropic foundations have been supportive of initiatives that help to improve the health of the nation. Many are currently funding public health workforce efforts (e.g., Robert Woods Johnson, Kellogg, Robert Woodruff, and CDC Foundation).

Roles and responsibilities of foundation partners:
- Convene planning and needs assessment groups;
- Fund and support unique initiatives designed to create and test new models for workforce development;
- Perform specialized learner support functions;
- Sponsor the development of new learning programs.

Schools of Public Health:

There are currently 28 accredited schools of public health offering resident graduate degrees. Schools of public health have been delivering continuing education and degree programs for decades; and over 70% now offer some of their courses via distance learning.

Roles and responsibilities for schools of public health:
- Provide faculty, learning environment, and specialized expertise in a variety of public health areas;
- Design curriculum;
- Deliver training and continuing education;
- Conduct research and development and evaluation studies; and
- Develop and deliver learning programs on emerging public health issues.

Voluntary, Non-Profit Organizations:

Voluntary, non-profit, community-based organizations are in a unique position to identify with many of the workforce development needs which can be met by means of a technologically supported life-long learning system. These important organizations such as those that support HIV, tuberculosis, and cancer prevention have earned the reputation of being indispensable adjuncts to the public health workforce at the community level. They should partner with local health departments in meeting their professional development needs, or to identify where additional training is needed.

Roles and responsibilities of voluntary, non-profit organizations:
- Partner with local health system agencies;

- Invest in the needed infrastructure to participate in technology supported learning;
- Identify workforce needs;
- Participate in nationally delivered distance learning programs; and
- Partner with others to address needs and monitor impact.

Private Networks:

Private networks are the privately owned, for profit, subscription satellite and Internet networks. They can provide access to important audiences outside those that are located in formal public health settings such as medical, emergency response, long-term care, minority populations, and academic institutions. Examples of these networks include the Health and Science Television Network, Long-term Care Network, General Electric Tip TV, Health and Science Television Network, Community College Network, America's Continuing Education Network, and Community College Network.

Roles and responsibilities of private networks:
- Provide a valuable source of original programs;
- Pay royalties for rebroadcast rights for CDC programs; and
- Analyze and evaluate audience needs and/or performance.

4. Funding

Funding is an essential element of a life-long learning system. Financial partners are needed to pay costs for tuition, new program design and development, system enhancement, building a robust infrastructure, data collection, and research and evaluation. (See Strategy 6: Assure Financial Support).

Design Features

In describing the features for an idealized design, we considered features associated with learner needs and system management features such as operational considerations, administrative functions, marketing, infrastructure/technology standards, and learner support systems.

1. Learner Perspective

The learning system should assist the learner in:
• Selecting an appropriate learning experience that matches their needs for competency development with training opportunities;
• Participating in the training and/or educational program selected; and
• Demonstrating the required competency taught in the program

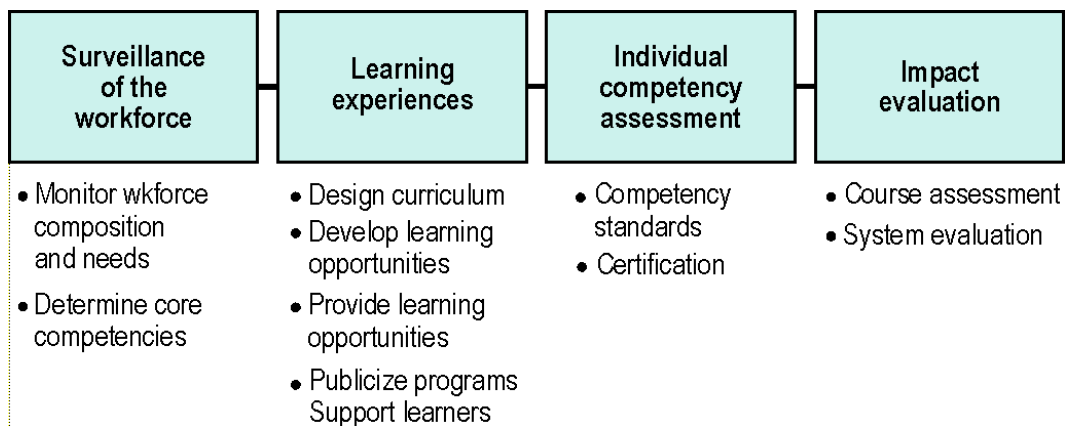The learning system architecture should ensure:
• Accessibility to learners anywhere;
• Universal high speed connectivity to Internet;
• Well designed web-based interface functions to permit selection, registration, scheduling participation in training;
• Provide access to subject matter experts;
• Linkage to sources for learning materials;
• Linkage to learning communities; and
• Appropriate opportunities to demonstrate competence (exam, simulation).

FIGURE 4. The Public Health Learning System

From the perspective of the LEARNER

Selecting a learning experience	Participating in the learning experience	Demonstrating individual competency

- Online inventory
- "Consumer Report"
- Registration

- Training/C.E.
- Career development

- Competency assessment
- Certification
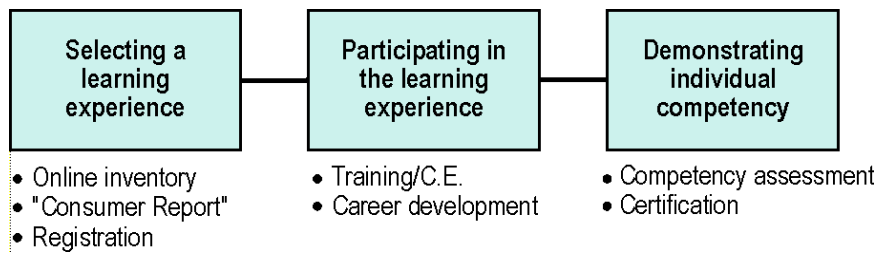
From the perspective of the "TEACHING TEAM"

Surveillance of the workforce	Learning experiences	Individual competency assessment	Impact evaluation

- Monitor wkforce composition and needs
- Determine core competencies

- Design curriculum
- Develop learning opportunities
- Provide learning opportunities
- Publicize programs Support learners

- Competency standards
- Certification

- Course assessment
- System evaluation

2. Operational Considerations

Currently, learning is taking place in a variety of physical environments such as classrooms and offices. Video technology may be terrestrial two-way, compressed video conference systems, or full-motion, one-way analog, satellite broadcasts. Interaction is provided through telephone, fax, and e-mail. Programs are also delivered via computer, CD-Rom, and Internet media. The system capacity needed to support the activities for the future will be extensive, technologically intensive, requiring specialized facilities, infrastructure, and expertise, as well as extensive partnerships.

Measurement systems including the ability to assess, document, and prioritize learner needs, and record participation in learning experiences;

- Design, develop, market, deliver, and support learning experiences that are high quality and job relevant, based upon contemporary adult learning principles in a range of media;
- Development of competency standards and curriculum; and
- Impact evaluation.

3. Responsibility and Accountability

    The system capacity must rest on a firm support structure that serves as the foundation for all other activities and provides the "glue" to hold the system together. The essential elements of the support structure requires each major partner organization to establish a point of leadership empowered to create a vision for planning, managing, and operating their part of the system. This hub would be held accountable for fulfilling the roles assigned to it and would coordinate and organize activities, permitting it to operate efficiently on its own and in concert with the rest of the system. It would work effectively within the life-long learning system and would monitor adherence to technical and quality standards.

4. Marketing the Vision

    Another major support structure is marketing and evaluation of the system. Marketing the concept of a life-long learning system that will alter the paradigm of training and education, and will require an effective, data-driven, coordinated effort over time. The data from participants' performance, program effectiveness, network activity, system success, public health impact and organization improvement will fuel the marketing effort and provide data for improvement throughout the system. These findings will also assist in attracting new partners who will bring new talent and resources to the overall system.

5. Infrastructure and Standards

    The learning system must be supported by a robust modern technical infrastructure and united network development effort. To date, the partners in the various training and education networks have capitalized quite well upon existing technology infrastructure. This infrastructure built and installed over the last three decades includes traditional classrooms, audio telephone bridges, analog video production facilities, a few analog C and Ku band television broadcast studios, hundreds of public access analog satellite receivers scattered around the nation in various government, academic and private institutions, and an increasingly large number of Internet- connected computers.

    To facilitate future work, critical system partners must adopt and promote a set of life-long learning system technical standards. It is critical that these be guided by the vision of emerging technology in the digital domain, next-generation Internet, universal connectivity, artificial intelligence and establishing a foundation for an enterprise-wide knowledge management system. Standards adopted under the Health Alert Network and PHTN initiative represent the foundation for these standards. Now, all organizations can use these standards to guide and focus their investments in those technologies that expand the shared infrastructure, promote system wide interoperability, and yield a ubiquitous, high speed, always on, technology foundation for learning on the desk top of every public health worker.

With development of the technical standards for production and delivery of learning programs, public health leadership must also develop and adopt network operation standards. In addition, training and education program production standards must be developed to assure that adult learning principles are routinely applied to the design and development of training and educational experiences. This includes special attention being given to promoting learner centered interface design to ensure effective interaction between the learners and the media, faculty, content, and other learners. These production standards will assure a high quality learning experience that is effective in building the desired competency.

6. Learner Support

Finally, at the heart of a modern support structure is a learner support system that is designed for use by all partners in a life-long learning system. This will provide the critical administrative and support functions common to all successful training and educational efforts, regardless of origin, presentation, or the media used for delivery, and will remain mindful that training for the present workforce will differ from that provided to new employees entering the workforce. Currently, most educators have moved away from manual systems and adopted some form of automated capability, e.g., optical scanning technology. A modern learning system must accomplish these functions with an enterprise-wide set of shared standards for an ubiquitous PC based high speed Internet connected system. This system must link all learners by means of a user-friendly interface and a seamless suite of applications that provide desktop access to a master catalogue of all learning resources:
• Online registration and automated confirmation of acceptance;
• Virtual bookstore;
• Electronic pre- and post-course testing with instant grading and feedback;
• Program chat rooms, threaded discussions, and faculty access;
• Post-course evaluation, grading, and award recognition of continuing education for successful completion;
• Transcripts for all continuing education credit earned;
• Still picture, full motion and video archive; and
• Fingertip technical support.

Recommendations for Design of an Integrated Learning System

To achieve the vision of a united life-long learning system, we recommend that CDC/ATSDR:

6. Establish a mechanism to assure top level leadership in governing, planning, managing, funding, coordinating, operating, and evaluating such a system for CDC/ATSDR;

7. Increase use of the Internet for life-long learning by: Establishing a master on-line catalogue of CDC/ATSDR learning resources in year 2000; implementing version II of the Integrated Learner Support System by mid FY 2000; and making all appropriate CDC/ATSDR training available over the internet by the year 2001;

8. Modernize and expand the local, state, and CDC-based infrastructure for sustaining a life-long learning system, including support for the creation of state and local learning centers to coordinate, promote and facilitate the learning process; and

9. Adopt technology, instructional design and delivery standards as well as administrative support standards for CDC/ATSDR training and education programs.

STRATEGY 4:
Use Incentives to Assure Competency

Introduction

Approximately two thirds of the public health workforce have no formal public health education (50). The issues related to ensuring competencies for public health workers are as diverse as the workforce itself. Traditional methods of assuring individual competency in health-related fields include:

• Credentialing, which involves the establishment of requirements and evaluation of individual qualifications for entry into a particular status;
• Regulatory mechanisms to govern practice, such as professional licensure; and
• Voluntary advanced education and certification to enhance professional satisfaction and/or to meet employment requirements.

Institutional or organizational competency to perform defined health care functions are assessed through audits and accreditation procedures, e.g., Joint Commission on Accreditation of Health Care Organizations (JCAHO).

Incentives are tangible or intangible factors that encourage a person to act. Incentives for pursuing learning throughout one's career can include:

1. Direct compensation through "pay for knowledge or skills programs" and/or promotion;

2. Tuition reimbursement and subsidized training opportunities;

3. Reward and recognition programs; and

4. Enhanced personal satisfaction. Additional types of reinforcements for career development may stem from human resources system requirements, such as performance appraisals, or from quality assurance and monitoring systems and professional peer review.

It is beyond the scope of this document to define and describe the full scope of potential incentive systems. Employers, human resource professionals, and others who determine compensation and incentive practices at local, state and federal agencies must work in concert to enable and reward life-long learning.

This strategy discussion focuses on :

1. Credentialing in public health as an individual incentive for pursuing life-long learning; and

2. The role of the National Performance Standards Program in reinforcing organizational accountability for a systematic approach to workforce development at the state and local level.

DEFINITIONS

Certification   Is a process by which an agency or association grants recognition to an individual who has met certain predetermined qualification specified by the agency or association, such as graduation from an accredited or approved program and acceptable performance on a qualifying examination or series of examinations.

Credentialing   Is a broad term that encompasses issues of regulation, policy, education, and practice. Credentialing of individuals involves authenticating an individual through specified means to provide evidence of qualifications or authority for entry into a particular status.

Credentials are awarded, usually in written form, to individuals who have met the specified qualifications which may based on certification, education, licensure, or some combination of these, for instance:

- Certification - Certified Health Education Specialist (CHES)
- Education - Master of Public Health (MPH)
- Licensure - Medical Doctor (MD) or Registered Nurse (RN)
- Registration - Registered Environmental Health Specialist (REHS)

Credentials are also awarded to institutions which have met specified qualifications, for example, accreditation of programs and of colleges and universities and JCAHO accreditation of health care facilities.

Degrees   Are an academic rank awarded to a person who has successfully completed a course of study.

Licenses   Are permits from the government or other authority to do something or to carry on a certain trade, for example, an RN is a graduate nurse who has been licensed by a state authority after completing a required course of study and passing a qualifying examination.

Registration   Is a term used in some professions for the same process as certification, for example, a Registered Environmental Health Specialist is a nationally recognized credential to signify a level of expertise and competence based on education and experience.

Credentialing in Public Health: A Dilemma

Public health is an interdisciplinary field of practice. Numerous systems have been
developed to ensure individual competency in a specific discipline. There is no unified
approach to assuring competency as related to the field of public health itself. This
means that some public health workers have stringent professional credentialing and
licensing requirements, while others have few, and still others have virtually none at all.

Nursing has requirements for professional licensure that must be met regardless of
where they practice, the same is true for physicians. Both of these professional groups
may voluntarily seek additional credentialing or certification to demonstrate their
competency in public health, but there is no requirement to do so. Advanced
educational degrees or specialty certifications are sometimes required by employers for
specific positions or job categories.

In nursing and environmental health, the two largest professional groups of the public
health workforce, there is variability in entry level education. Nurses may enter practice
upon completing a 2-year associate degree, a hospital diploma program, or a 4-year
undergraduate program. Approximately 60% of public health nurses lack a
baccalaureate degree, thus a Master of Public Health is unattainable.(51)

Even greater variability exists for environmental health specialists; entry level
education differs greatly from state to state and even within a state. Requirements
fluctuate from no minimum education, to a high school diploma, a 2-year associate
degree, a 4-year undergraduate degree, or a specified number of science courses and
practice experience. To complicate the issue further, registration to practice is not
required in every state. Similar to nursing, a Master of Public Health degree is an
unrealistic expectation for most practicing environmental specialists.(52,53)

Much of the work on building a competent public health workforce has focused on five
key professional groups: administrators, environmental professionals, health educators,
nurses and physicians., which represent approximately two thirds of the professional
disciplines within public health.(54) Table 12 illustrates the complexity and
inconsistency within the public health workforce using the five major professional
groups and demonstrating the phases of career continuum from entry to advance
practice in general and specialty practice. It is important to note the great variability
that exists within individual professions based on factors including education, location,
professional requirements, and the nature of a position. This chart is not intended to be
all-inclusive; not all professional requirements and state statutes are shown. (55,56)

The chart illustrates a career path continuum of life-long learning from the requirements
for entry to general practice, with additional requirements for entry to public health
practice, and then additional requirements for more advanced public health practice.
The latter, for example, would entail positions of management and leadership.
Educational preparation varies within professions and, thus, is not standardized across
the public health workforce. Likewise, requirements for licensure or certification vary

greatly. Therefore, any subsequent requirements for continuing education (i.e., life-long learning) to maintain licensure or certification cannot be uniform.

Livingood et al.,(57) examined the issue of credentialing for public health workers by interviewing and surveying public health leaders and credentialing experts. While a plurality of public health leaders noted benefits to increasing credentialing of public health workers, there was no consensus on the form that credentialing should take or the level at which it should occur. (58,59) National certification was regarded as the most viable form of credentialing by a small margin, but state licensing and making the possession of a Master of Public Health degree a criteria for credentialing were strongly opposed. Opinions were so divided on most aspects of public health credentialing that the author stated: "*The lack of consensus and the vehemence of some opposing positions indicate that movements toward credentialing should proceed cautiously... and that efforts to build consensus should precede any implementation efforts.*"

Currently, much national dialog taking place is about credentialing to assure competency within certain professions and for the public health workforce as a whole, considering the related issues of regulation, policy, education, and practice. This dialog and existing credentialing systems within professions based on regulatory and practice requirements point to the need for further exploration of credentialing for the public health workforce. The strategic importance of including professional organizations/associations and academic programs currently involved in certifications related to health and public health related occupations in any dialogue on credentialing in public health can not be overemphasized.

Using Incentives to Assure Competency

State and local health departments recognize that public health practice is changing. Efforts to ensure the competency of the public health workforce can range from increasing access to training/continuing education programs, to certification programs and even mandatory programs for employees in specific job categories. The case studies presented here illustrate the commitment, leadership and long term vision required.

1. Case Study #1:
   Local Level Initiative-Alameda County-Community Health Team. This case study addresses a multi year effort to transition frontline public health workers in an LDH from a primary focus on personal health services to a team and population based practice.

2. Case Study #2: State Level Initiative-New Jersey Certification for Health Officials. This describes recent efforts to use licensure and continuing education requirements to ensure a competent workforce in New Jersey.

3. Case Study #3: Federal Level Initiative-Graduate Certificate Programs in Public Health. This describes a federal initiative to stimulate the development of certificate programs and distance learning capability in schools of public health. This initiative afforded three cohorts of frontline public health workers the opportunity to participate in an accredited School of Public Health Certificate Program regardless of their geographic location.

4. Reinforcing Accountability for Workforce Development: The Role of the National Performance Standards Program

CDC/ATSDR, in collaboration with numerous health partners, is leading an effort to develop national standards for state and local public health practices (National Public Health Performance Standards Program.(60)) These standards and indicators are based upon the essential services of public health and describe in clear terms what public health systems should be doing in each essential service area. The information collected by the measurement tool will describe how well the local or state public health system is performing relative to the standards. The state and local surveys are undergoing pilot testing. Participation in the standards program is voluntary at this time.

One of the essential services requires state and local public health systems to "assure a competent public and personal health care workforce." The National Public Health Performance Standards Program affixes accountability for workforce development with the "leaders of the local public health system." Although the process is voluntary, CDC can explore how eligibility for funding can be linked to the National Public Health Performance Standards Program. For example, those receiving funds could be expected to document that they had in place "a systematic plan for workforce development which included provision for training in the essential public health services."

Federal, state and local leaders must be continuously challenged to change their mind-set about the way in which existing resources are used. The resources needed to support workforce development will require the redistribution and pooling of funds and personnel across programs, funding streams, counties, regions, states and institutions. It is not necessarily legislative mandates or restrictive program guidelines that lead to chronic under-funding of workforce development, but rather inertia and lack of will to find effective solutions. Specific recommendations for financing are addressed in Strategy 6-Assuring Financial Support.

Recommendations

The following are recommended by the task force regarding the role of CDC/ATSDR in assuring the competency of the workforce through the use of individual and organizational incentives:

1. Identify and support best practices and incentives in developing workforce competency;

2. Establish organizational accountability for a systematic approach to workforce development through the National Public Health Performance Standards Program;

3. Improve access of local public health workers to professional education in public health by supporting accredited programs such as graduate certificate programs in schools of public health;

4. Explore the development of national certification programs for the public health; and

5. Workforce with professional organizations/associations and academic programs.

TABLE 12.   Examples of Credentialing and Licensing Requirements

| | Entry to General Practices | | | |
	Basic Education	Licensure	Continuing Education	Certification/ Registration
Physicians	Required (4 yr. Undergraduate + Medical school)	Required	Required in 35 states for licensure renewal	Voluntary
Nurses	Required - but varies (2 yr. AD, Diploma program or 4 yr. Undergraduate)	Required	Required by 22 Boards of Nursing; Voluntary w/ 29 Boards of Nursing for licensure renewal	Voluntary
Environ-mental Specialists	Required - but varies (4 yr. Undergraduate or HS)	The term registered is used in place of licensure by some states	Required to maintain registration	Required in 18 states; Voluntary in 16 states; Not required in 16 states
Health Educators	Required - but varies (4 yr. Undergraduate or Masters)	N/A	Required to maintain certification as CHES	Voluntary (CHES)
Adminis-trators	Variable	N/A		N/A
Other PH Workers	N/A	N/A	N/A	N/A

TABLE 12.   Examples of Credentialing and Licensing Requirements *(continued)*

	Entry to PHP Additional Requirements	Advanced PHP Additional Education	Add'l Certs.
Physicians	Variable; Some positions may require MPH degree or PMR specialization	MPH, PMR, or other advanced preparatory may be required for some positions	
Nurses	Variable; Some states require on-the-job training in public health competencies for entry to public health nursing positions National certification is voluntary and provided by the American Nurses Credentialing Center's Comm. on Accreditation for 2 certificate levels, Community Health-Basic and Clinical Specification; CE required to acquire or renew ANCC certification	Advanced degree (MPH, other master, or doctorate) may be required for some positions	
Environmental Specialists	Variable; Some states require Bachelor level education; Some states require registration that may be either state sponsored or provided by the National Environmental Health Association; Some states require public health training	Advanced degree may be required for some positions	
Health Educators	Variable; Some positions may require CHES certificate; Some positions may require masters level preparatory		
Administrators	Master degree required in some states; At least 1 state (NJ) requires licensure and continuing education	Advanced degree may be required	
Other PH Workers	Variable		

CASE STUDY #1:
Local Level Initiative-Community Health Teams, Alameda County, California
Prepared by Joan Mazzetti, MPH and Kelly Nanney, MPH Alameda County

Background

In 1994, the Alameda County Public Health Department addressed the concern that the Department had grown too far away from the individuals and communities it served. Under the leadership of a new director, the Department actively engaged staff and community representatives in the process of redefining the role of public health. A series of town meetings were held throughout the county . Focus groups defined the priorities for the department. The outcome was a visionary document, frequently referred to as "the Red Book" (for the red cover). This became the first local document on the structure and purpose of community health teams and their place within the core functions of the Public Health Department. The Public Health Department currently serves a population of 1,408,100 and has a staff of 450 FTEs. The county is divided into five districts, each district is served by two community health teams.

Community Health Team Model

The development of a community health team model for Alameda County took several years. Funding constraints and union dissatisfactions stalled initial progress and resulted in critical changes to the final roles and functions of the team members within community and neighborhood settings. This model was completed in the summer of 1998. A full year of planning occurred prior to the implementation of 10 community health teams throughout the County in August, 1999. The current model identifies areas of competencies required for all members of the community health teams. Each team consists of a regional team leader (clinical nurse), two public health nurses, a community health outreach worker, clerical support, an environmental health specialist, and vector control liaison. A training series was developed to provide the necessary skills to the teams. Performance standards are incorporated into the job descriptions. The model emphasizes the importance of population-based services and community capacity-building activities. The success of the model is dependent on a broad definition of health and the commitment to increase the decision-making capacity of the communities. The teams focus at the neighborhood and community level. There is significant degree of variability in the size, leadership capacity and health issues defined in each neighborhood.

Building Competency for Community Health Practice

Training in the following content areas was considered a pre-requisite for successful implementation of the community health team model:

Team Building; Cultural Diversity; Unlearning Racism; Adjusting to Change; Conflict Resolution; Street Safety; Evaluation; Conducting Community Health Assessments through a Participatory Process; Public Health Resources; Building Partnerships with Hospitals; Asset Mapping; Developing Printed Materials; Social Marketing; Community Organizing; Epidemiology; Area Information Books; and Training Community Residents.

The trainers are from the Department Health Education & Promotion Committee, epidemiologists in the CAPE Unit (Community Assessment, Planing & Education), and private consultants. Training objectives, outlines, and outcome measures are required from the trainers and a commitment to provide technical assistance as needed for the teams to successfully meet the standards.

CASE STUDY #1:
Local Level Initiative-Community Health Teams, Alameda County, California
Prepared by Joan Mazzetti, MPH and Kelly Nanney, MPH Alameda County

Establishing Incentives

Training is mandatory for team members. Participants attend during work time. Participants are expected to demonstrate new behaviors on-the-job. Performance evaluations are based on the role standards.

Continuing Education Units

Public Health Nurses are eligible for continuing education units for most of the training. Environmental Health Specialist are not yet eligible for credits.

College Credit

Laney College, a local community college, agreed to provide college credit for the majority of the training series. Staff desiring college credit would be expected to pay a small fee for each credit earned. The community college is open to other options in the future, i.e., certificate program.

Obstacles

There are many obstacles in implementing organizational change. Staff are not yet comfortable in performing community-based activities. A key obstacle that limits overall progress is the deployment of financial and human resources. Inadequate and inflexible funding requires that community team staff time be split between the new community activities and the traditional, categorical services. This mixed practice model is more difficult for staff to implement There are limited general funds to conduct community building activities. Staff involved in planning and implementing the training have additional competing work responsibilities

Summary

This case study represents the attempts of a local health department to transform its operations to better reflect the needs of its community. These front line public health workers needed new skills to perform competently. A major on going obstacle to effectively transforming the nature of practice is not the resistance of staff but rather the limitations imposed by categorical funding streams which impede effective implementation and expansion of the community health model. Training public health staff for new roles will require additional funds or redistribution of existing categorical funds for cross-cutting needs.

Case Study #2:
State Level Initiative - New Jersey Department of Health and Senior Services
Additional information can be found at the NJDHSS, Office of Local Health web site at
http://www.state.nj.us/health/lh/olh.htm or by calling (609)292-4993.

Background

The New Jersey Department of Health and Senior Services (NJDHSS), Office of Local Health recently made a commitment to ensure the competency of the state's public health workforce to perform the Essential Public Health Services. They began this process with Health Officers and Registered Environmental Health Specialists, two categories of public health workers for which New Jersey has had statutory examination and licensure requirements that date back nearly 100 years. Following a successful 1-year pilot test in 1998, the New Jersey legislature authorized an amendment to the licensing regulations which set continuing education as a criteria for license renewal. Health Officers and Registered Environmental Health Specialists must now document the completion of at least 15 contact hours of approved continuing education annually to maintain an active license. For Health Officers, eight of the 15 contact hours must be acquired from courses that provide public health leadership training and skill development. Over 5000 individuals hold a Health Officer and/or Registered Environmental Health Specialist license of which approximately 1000 are employed in various state, local and private employer job categories. At the present time, 116 individuals are employed as Health Officers of a local health department and approximately 400 perform the duties of a Registered Environmental Health Specialist for a state or local governmental agency; all are required to meet the mandatory continuing education requirements to maintain an active license and to be employed under the authority of their license. New Jersey's examination, licensure and continuing education activities are administered and managed by the Office of Local Health.

Cost

The cost to licensees to fulfill the 15 hour continuing education requirement varies widely. For example, CDC satellite broadcasts are offered through a newly established statewide distance learning network for which participants pay a $15.00 per program fee to cover costs at downlink sites. Other programs are linked to public health association meetings, where continuing education costs become the meetings' registration fees, or are provided by colleges and universities where the cost is typically higher. In addition to the costs associated with continuing education, there is an annual $50.00 license renewal fee. In most cases, the public health agency covers all costs associated with their employees' continuing education and, in some cases, the license fee. While maintaining one's license is primarily viewed as the licensee's responsibility, the NJDHSS considers competency and skill development as a responsibility of both the individual and the public health agency.

Barriers

Many employers and employees were initially resistant to continuing education requirements due to concerns about cost and time away from work. The Office of Local Health has worked diligently to address these concerns by seeking input and implementing suggestions as part of the regulation development process, by approving nearly 300 low-cost/high quality programs to date, and by improving accessibility to continuing education through distance learning technologies. The grassroots support of several state public health associations has also been a key element in developing what is now a well-accepted and highly valued program.

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The NJDHSS has also been faced with barriers in its efforts to expand continuing education to other public health professions, such as nurses and health educators. Enforcing continuing education is more difficult because the NJDHSS does not directly license these professions, making it difficult for the State to track licensure and continuing education fulfillment. To overcome this barrier, the Office of Local Health is working at the agency level to link competency requirements to employment rather than licensure. Since 1969, local boards of health have been held to performance standards which require the licensure of public health nurses, and strict academic educational and experiential background for both nurses and health educators. These performance standards are currently being reworked with the expectation that local health departments will be required to demonstrate workforce competency and ongoing skill development through continuing education of these and other public health workers.

Incentives

While New Jersey's current performance standards require that each local health department have a program that provides for the continuing education of its workers, the Office of Local Health has undertaken many measures to ensure that the continuing education requirement does not pose too great a burden on individuals or public health agencies. It maintains a web site that offers an up-to-date listing of all approved continuing education courses, many of which are linked to existing meetings and conferences that workers typically attend. It also makes use of a statewide distance learning network to bring continuing education programs to ???????

Future Activities

With the success of its initiative to require continuing education of its health officers and registered environmental health specialists, New Jersey is now considering similar requirements for public health nurses, health educators, and other public health professions. Because of the diversity of the public health workforce, the Office of Local Health is seeking additional guidance and assistance from state professional associations so that existing systems can be leveraged to support continuing education. For example, national Certified Health Education Specialist (CHES) credentialing, which requires on-going continuing education of health educators, is being investigated.

New Jersey will be participating as a pilot test state for the national Local Public Health Performance Assessment Pilot Instrument and will used the information gathered to gain a better understanding of workforce development activities at the local level. In restructuring its own performance standards, the State expects to include a section on personnel standards reflecting its strong commitment to a competent workforce.

Case Study #2:
State Level Initiative - New Jersey Department of Health and Senior Services
Additional information can be found at the NJDHSS, Office of Local Health web site at
http://www.state.nj.us/health/lh/olh.htm or by calling (609)292-4993.

Summary

While there are real barriers to mandating continuing education, a strong commitment to public health workforce development by the NJDHSS has allowed New Jersey to be successful. Licensure of two primary public health professions has also helped ease the way in initiating such a program. Challenges associated with expanding the program to other public health professions are being realized and solutions are beginning to take shape. Grassroots efforts to advance continuing education continue to emerge among state professional organizations as they see the personal and professional value and need for improving their knowledge and expanding skills in public health practice in such a rapidly evolving environment.

To advance its efforts, New Jersey has strengthened existing activities and is developing new initiatives which support public health workforce development. Some of the supporting structures for this state agenda include:

1. Statutory and regulatory requirements for the examination, licensure and continuing education of health officers and registered environmental health specialists;

2. Updated licensure examinations which are reflective of current practice;

3. A statewide distance learning network to enhance continuing education opportunity;

4. Revised public health performance standards to strengthen workforce development requirements;

5. Healthy New Jersey 2010 objectives addressing public health capacity and worker competency; and

6. Partnering with academic institutions in the development of public health curricula.

In pursuing these initiatives, the NJDHSS is assuring that each is linked to and enhances the development of public health practice as it relates to the Essential Public Health Services.

Case Study#3:
Federal Level Initiative Increasing Access to Graduate Certificate
Programs in Public Health

Background

The Graduate Certificate Program (GCP) in Public Health was established in response to the need to provide working health professionals the necessary education and development to meet the ever changing environment of public health. Initially targeted at CDC's Public Health Advisor field staff, the program was later made available to other state and local health professionals. The goal was to work with schools of public health who could blend on-campus classroom instruction with distance education methods in order to allow the greatest flexibility to the learner and minimize the impact on the individual and the workplace.

In April 1996, CDC sent a Request for Proposal to all the schools of public health to generate applications for a contract to provide a unique and specifically designed curriculum. The University of Washington, Emory University, Tulane University and Johns Hopkins University were selected to develop and carry out the Graduate Certificate Program academic curriculum. To date, there have been 3 cohorts; only cohort 1 has completed the program. In total, 688 applied, 326 were accepted, and 316 actually started. Seventy from the first cohort of 97 completed the certificate. All in Cohort 1 were CDC employees. The remaining cohorts include 85 CDC employees and 134 other state/local/Indian Health Service employees.

Curriculum

The curriculum is completed in 15-18 months and allows the option of applying all credits earned to a graduate degree in public health. Each program offers core courses plus a selection of tracks e.g. Epidemiology, Health Education, Program Planning and Evaluation, Policy Development etc. Each School of Public Health has flexibility in identifying the core courses and in selecting the tracks to be offered. Potential students are able to match their individual learning needs/goals with the appropriate curriculum.

Cost

The Graduate Certificate Program costs approximately $20,000 per student (including computer and Internet access) but cost varies by school. Additional costs include: time from work (5-8 weeks on campus, per 15-18 month academic year), travel and per diem. Most course work is done through asynchronous distance education modalities. CDC/CIOs cover the all the cost for their employees. CDC funds the tuition expenses for the state and local participants in Cohorts 2 & 3.

Benefits

Learner/Employee: The learners are able to attend a school of public health while continuing full time employment. Geographical location is not a barrier to attending a school of public health. Even the most isolated participant (from rural locations or underfunded urban programs) is able to participate on equal footing, due to use of laptops and web-based learning. Credits earned apply toward a graduate degree. Costs are covered by the employer (or otherwise subsidized). Courses are directly applicable to public health practice. The participant immediately learns critical analytical skills, including sophisticated problem solving approaches. Completing a certificate program enables future opportunities for promotion/career advancement.

Case Study#3:
Federal Level Initiative Increasing Access to Graduate Certificate
Programs in Public Health

Employer: Employee continues work duties while in school. Course content is applicable to work duties. Employee's new knowledge expands capability of his/her work team and potentially the effectiveness of their organization. School projects can be linked to job duties/requirements. At the very minimum, student skills in use of technology are dramatically enhanced which is a value to the employing agency.

Schools of Public Health: GCP is a stimulus for Schools of public health (SPH) to develop distance learning programs for adult learners. Faculty learn new teaching/course development skills and increase knowledge of public health practice. GCP stimulates change in SPH curriculum to improve relevance of courses for practitioners. Also the IOM report recommended that the Schools establish firm practice links with the state and local public health agencies, GCPs are stimulating movement in the right direction.

Public Health: The IOM report recommended that SPH's provide the opportunity to learn the entire scope of public health practice since most public health workers have no formal training in public health. GCP move both SPH and the workforce in appropriate direction. The expectation is that local capacity of public health is improved by the competence of the individual public health worker, extends to the programs they work in thus ultimately impacting the delivery of services to the community.

Barriers
Learner/Employee: Work/life balance-the course is rigorous; students may experience difficulties in maintaining the pace over 15 - 18 months. Requires bachelor's degree and ability to pass other entry requirements

Employer: Significant financial commitment; state and local health departments may not be able to justify cost. May not be able to provide these opportunities to all eligible staff. Departmental productivity may suffer while staff in training. Employee may leave after training for another job.

Schools of Public Health: Faculty may resist change from classroom instruction to distance learning, i.e., "sage on the stage" to "guide at the side.". GCP/SPH advocates may be unable to obtain needed administrative support/long term commitment/resources for ongoing distance/distributed learning efforts.

Summary
Additional information will be needed to determine the long term impact of Graduate Certificate Programs. Graduate Certificate Programs (GCP) offer a unique opportunity for the adult learner to obtain credits toward a graduate degree in Public Health while continuing full time employment. The certificate itself can be adequate for the adult learner who does not wish to pursue a masters degree. The certificate programs enable some flexibility in selecting a specialized track e.g. epidemiology, policy, etc. The GCP stimulated the schools of public health to develop the infrastructure for delivering educational programs via distance/distributed learning. Once the infrastructure is established, these schools can work with partners in state, local and community agencies to make high quality programs accessible to the public health workforce. State and local health departments must determine how this type of learning opportunity could be subsidized in the future.

STRATEGY 5:
Conduct Evaluation and Research

Introduction

The task force members were charged to outline a strategy to conduct evaluation, research, and surveillance of the "life-long learning system for public health practitioners." They identified relevant evaluation models and best practices in public health, training, and development. Continuous improvement in a life-long learning system will result from a commitment to process and outcome evaluation; applied research; and to identifying macro-level indicators which monitor changes in public health practice at the local level (i.e., surveillance). This report section will focus on a framework for evaluating three levels within the learning system. The following questions address the three levels:

1. How should individual competencies be evaluated (after training)?

2. How should training programs/curriculum be evaluated?

3. How should effectiveness of the learning systems be evaluated?

Planning Assumptions

What are the goals of the learning system? What is the purpose of evaluating the learning system? The following assumptions are based on a review of the literature:

1. A learning system for public health practitioners:

   • Enhances individual skills through training, continuing education, and
     competency assessment;
   • Contributes to improved organizational effectiveness of the local public health
     system;
   • Promotes flexible and adaptive response by individuals and organizations to
     environmental change; and
   • Uses the essential public health services as a framework for describing both
     individual and organizational performance.

2. Essential public health services framework provides a unified theme for the learning
   system. Training and continuing education provided by a learning system for public
   health practitioners are built upon the competencies needed to perform the essential
   services. Competencies (basic, technical/categorical) for each essential service
   must be validated and then used in developing an integrated curriculum/set of
   learning experiences.

3. An integrated learning system for public health practitioners must be based upon:

   • Clear and unambiguous support and participation from senior leadership in public health;
   • Closer collaboration among trainers, program managers, and organizational leaders;
   • Relevant adult learning experiences which are clearly linked to practice through use of the essential services framework; and
   • Standards for excellence, (i.e., using principles of adult learning, instructional systems design, and other methods which ensure quality of learning system elements).

4. There is an absolute need for an ongoing and proactive evaluation of the effectiveness of the learning system., which should be built into critical points in the process from start to finish. All stakeholders have a role in designing and conducting this evaluation. There are well developed consistent methods for conducting evaluation regardless of the object to be evaluated.

5. Evaluation cannot make critical decisions or define success for its stakeholders.

6. The evaluation of training provided through the learning system should consider some of the following objectives:

   • Determine success in accomplishing objectives;
   • Identify strengths and weaknesses of program/curricula;
   • Compare costs to benefits;
   • Decide who should participate in the future;
   • Test the clarity and validity of curricula;
   • Identify participants who were most successful;
   • Determine if training is best suited to the need;
   • Establish database for decision-makers;
   • Demonstrate individual and organizational accountability.

7. Evaluation can be used to assess the effectiveness of the training. Careful planning can reduce evaluation costs, and a solid evaluation may help to reduce training costs later by highlighting opportunities for improved efficiency.

Background Information

With the understanding that evaluation methods stem from a core discipline that remains consistent regardless of the object being evaluated, we selected the CDC evaluation framework as most adaptable in describing a strategy for evaluating the levels within the learning system. (61) The Kirkpatrick Model, frequently used by human resources development (HRD) professionals to describe training evaluation, provides additional guidance in defining a comprehensive approach to evaluating the learning system.(62) In addition, evaluation questions will arise as a the strategic plan's recommendations are implemented.

CDC Framework

After reviewing several models, (63,64,65), the CDC evaluation framework was identified as most adaptable to the workgroup's needs and tasks. Program evaluation improves public health actions when useful, feasible, ethical, and accurate evaluation methods are used. The CDC framework is a guide for public health professionals in evaluating their programs. It is a practical, non-prescriptive tool, designed to summarize and organize essential elements of program evaluation. The framework comprises various steps in practice and standards for effective program evaluation. Adhering to the steps and standards of this framework will allow an understanding of each program's context and will improve how program evaluations are conceived and conducted.

The framework is composed of six steps that must be considered in any evaluation:

1. Engage stakeholders - Those persons involved in or affected by the program, and primary users of the evaluation.

2. Describe the program - Needs, expected effects, activities, resources, stages, context, logic model.

3. Focus the evaluation design - Purpose, users, uses, questions, methods, agreements.

4. Gather credible evidence - Indicators, sources, quality, quantify, logistics.

5. Justify conclusions - Standards, analysis/synthesis, interpretation, judgment, recommendations.

6. Ensure use and share lessons learned - Design, preparation, feedback, follow-up, dissemination.

Applying the CDC Program Evaluation Framework to Workforce Development

If applied to the context of training and continuing education (i.e., "a life-long learning system for the public health practitioner"), the six steps can be cross referenced with the three levels of the learning system (individual, program/curriculum, and system). Each level addresses one of the questions originally posed: How should individual competencies be evaluated? How should training programs/curricula be evaluated? How should the system be evaluated? Examples are presented in Table 13, which demonstrates the flexibility of the CDC evaluation framework for this purpose.

DEFINITIONS
The following definitions provide further description of the categories/types of evaluation presented in the matrix (66):

Personnel	Typically, it involves an assessment of job related skills through observation, measurement, or evaluation of job performance. The evaluation of job performance might be done through job simulations or validated written tests. This kind of evaluation is subject to types of ethical constraints. It is also subject to numerous methodological traps, for example, some systems are incapable in practice of generating negative ratings.
Performance	The evaluation of a specific achievement, through analyzing either output or outcome measures or through analyzing the process or the phases of the performance. Student work is a type of performance evaluation.
Products	The evaluation of functional artifacts or the evaluation of output. Historically used in the evaluation of different brands of a product such as a car, computer or lawn mower in which each brand of the product is put through the same test and rated. An example for training events would be a standardized test given to students to rate the effectiveness of one type of training modality over another, (e.g., distance/distributed learning versus classroom-based instruction).
Program	A program is defined by the goals which determine the actions of the staff and the development of projects. The program evaluation is the largest area of the evaluation although product evaluation may be the largest area of practice. It is the evaluation of how effective is the staff and the projects on achieving the goals established.
Policy	The evaluation of policies, plans, proposals, and possibilities. Good policy analysis usually covers every step and adds a shorter time in which to get an answer. The task of the policy analyst is different from that of the evaluator. The policy analyst works on providing valid research summaries.

TABLE 13. CDC Evaluation Framework Steps (with Examples).

	Evaluation Focus Areas (category)		
	Individual Competencies (Personnel/ Performance)	Training Events (Products)	Learning Systems (Program/ Policy)
Engage Stakeholders	Employee, supervisors, trainers, training sponsors	HRSA, CDC, PH Functions Committee (PHFC), ASPH, ASTHO, NACCHO, PHF	PHFC, CDC/HRSA, ASTHO, NACCHO, ASPH
Describe the Program	Executive leadership development for public health	Core curriculum for essential public health services	Workforce development initiatives
Focus the Evaluation Design	Pre-post assessment of leadership behaviors	Validate core competency content	Changes in system indicators
Gather Credible Evidence	Tests; Return Demonstrations; 360 Assessments; Direct Observations	Reactions, tests, on-job-performance.; Interviews; Comp. studies	HP2010 indicators; Baseline surveys; Accreditation of LPHS
Justify Conclusions	Participation in executive developmental changes on the job behaviors	Participants & sponsors satisfied with results	Inc. in accredited LPHS; HP 2010 objectives for workforce achieved; Include funding for training
Ensure Use	Share results; Expand program	Make core curriculum available to local health departments through distance/distribution learning	Surgeon General Report on Workforce Development

As a further enhancement to the CDC evaluation framework, members reviewed examples of evaluation models used specifically for human resource development activities. Kirkpatrick's model is widely known and basic. Kirkpatrick describes four levels of evaluation (reaction, learning, behavior and results). The levels are presented, in order, from simple and inexpensive to complex and costly. Each level has its advantages and disadvantages. It is important to plan the evaluation process at the same time the training activity is being planned. It is important to consider all levels at the outset, even though only one or two levels may be used ultimately.

- Reaction - How did the trainees like the program? (Level 1)
- Learning - What principles, facts, and techniques were learned? What attitudes were changed? (Level 2)
- Behavior - What changes in job behavior resulted from the program? (Level 3)
- Results - What were the tangible results of the program in terms of its objectives or goals for the organization? (Level 4)

The Kirkpatrick Model and other HRD models for evaluating training provide a level of detail in *focusing the evaluation design* and *gathering credible evidence*, especially in measuring individual performance and program/curriculum effectiveness.

Linking Evaluation to the Strategic Plan

Evaluation questions can be formulated for consideration for each of core strategies. At this time, only hypothetical examples are provided such as:

1. Competencies and Content
   - Is the program/curriculum based upon the essential public health services?
   - Does the curriculum content meet minimal acceptability requirements of the Public Health Functions Steering Committee?
   - Does a plan exist to evaluate the curriculum?
   - Are the instructional methods selected appropriately matched to the content and learner objectives?

2. Incentives
   - Is there a financial and/or non-financial incentive for participating in training/continuing education ?
   - Do learners participate in planning incentive systems?
   - What is the impact of Graduate Certificate Programs on school of public health curricula?

3. Policy and Finance
   - Is there a policy regarding certification for local public health officials at the state level?
   - Does the language of program guidance documents restrict use of categorical funds for training and continuing education on the essential public health services?

4. Learning System Design
   - Is a distance based learning program/curriculum effective in enhancing the performance of local health department staff on specific behavioral criteria?

Applied Research and Monitoring of the Learning System

Applied research of the learning system is defined as the identification and dissemination of best practices in improving the effectiveness of the training program/curriculum.

Monitoring or surveillance of the learning system is defined as establishing systems which track relevant performance indicators. These indicators can include, but are not limited to, measuring changes in:
• Workforce composition (SOCs);
• Certification or licensure requirements for SOCs;
• Self-reported performance of state and local public health systems participating in the National Public Health Performance Standards Program on indicators related to workforce development (e.g., Essential Service #8); and
• Other trends as measured through sentinel network(s) established for monitoring public health practice, (e.g., shifts in privatization of public health functions).

CONDITIONS THAT SUPPORT EVALUATION The following conditions must exist in order to create, support, and sustain an effective evaluation program, regardless of the object (s) being evaluated (68).	
Funding	Generally, an evaluation costs between 5 and 7% of a project's total budget. Funds and time for evaluation should be allocated in advance as a front-end planning step.
Resources	Resource availability influences evaluation more than any other factor. The resources needed include the time, talent, technology, information, money and other material assets available to conduct program activities. Program resource descriptions should convey the amount and intensity of program services and highlight situations where a mismatch exists between desired activities and resources available to execute those activities.
Policy	Knowledge of the policies will help in identifying what criteria have to be met for the planning and implementation of an evaluation plan related to workforce development, (e.g., human subjects and confidentiality issues).
Organizational Culture	The organizational culture can either promote or inhibit an organization's ability to achieve desired goals of a workforce development initiative. A thorough understanding of the organizational culture is necessary to identify issues, perceptions, or constraints that can affect the effectiveness of any evaluation program.

Recommendations

In general, evaluation of government programs has not been a past strength. Reasons for this may have to do with lack of resources to deliver the program, much less evaluate it; a feeling that the program is inherently good and recognized as such by all; or that evaluation is a "blunt instrument" used to end a program or to affix blame. To overcome these barriers to evaluating training and continuing education provided by CDC/ATSDR, we recommend the following:

1. Build capacity to evaluate and conduct research on workforce development. Develop partnerships for interagency initiatives to increase awareness and visibility for training evaluation issues and trends.

2. Adopt a framework for evaluation and develop standards and guidelines to consistently evaluate training and continuing education of the public health workforce at the individual, program/curricula and learning system(s) level.

3. Establish an agency-wide system to collect, analyze, and report the training evaluation data of CDC's programs. The desired end-product from such a comprehensive and integrated system would be an annual report which outlines current levels of activity, outcomes, and future directions.

4. Support extramural research on the competencies needed by the public health workforce and on scientifically based approaches to workforce development which enable performance of the essential public health services.

STRATEGY 6:
Assure Financial Support

Introduction

Funding is an essential element of a life-long learning system support structure. There are very few congressional or legislative training and education line items, so most monies for training the public health workforce derive from program funds, resulting in unstable funding streams. These funds are frequently reduced when budgets are tight, or tied to specific categorical needs and cannot be carried over from year to year. In addition, the manner in which federal funds are handled is tightly regulated, time consuming, administratively intense, and constantly changing. In short, current funding mechanisms are not set up to support the wide-ranging business needs of a life-long learning system.

This section contains recommendations to ensure that financing policies are adopted that will support the CDC/ATSDR strategic workforce development plan. These are operational in nature and essential to implementing the recommendations from the other workgroups. They address CDC's responsibilities in collaboration with external partners. The goal is to ensure financial support for workforce development activities across multiple public health sectors.

Assumptions

The following assumptions guided the development of recommendations:

1. The recommendations in the financing section should support the strategic components of the workforce development plan that appear in this report.

2. These recommendations should address the financial problems and barriers identified by the workgroups, through interviews with and inventories of current CDC/CIO training programs, and in other reports which have analyzed public health workforce development issues.

Assuring Financial Support for Workforce Development

The task force recommendations call for a new CDC/ATSDR approach to workforce development that departs from traditional approaches. The elements of this new approach include a basic public health curriculum for all public health professionals based on core competencies; coordination of training programs that have similar objectives and target audiences; technical and quality standards for learning systems; and development of individual and organizational accountability for learning through national certification programs and public health performance standards.

The essence of the new approach is its focus on core competencies for all public health professionals, practice-based standards, and an integrated delivery system for training and continuing education. Existing methods of financing public health workforce development are inconsistent with the new approach for two reasons:

1. They are almost exclusively categorical in nature; that is, funds from a given public health program are limited to supporting training specific to that program; and

2. CDC/ATSDR funding for extramurally conducted training, in virtually all cases, is provided to a single grantee organization, with little opportunity for that grantee to collaborate with other extramural organizations in the same geographic area.

It is clear from our analyzing the recommended training system and from extensively consulting with CDC programs and external partners that these features of the existing financing methods pose major barriers to the new training system. Categorical funding restrictions impede development of training for core, cross cutting competencies; and hinder potential collaborations in technical training and/or improving current delivery systems. A categorical focus will not support development of certification or practice standards.

Similarly, the predominant practice of extending extramural funding to a single grantee discourages the formation of collaborations among local and regional organizations -- e.g., health departments, schools of public health and business, and health care providers -- that can develop innovative solutions to workforce development that are responsive to local needs and can serve as models nationally.

CDC/ATSDR programs and external partners alike have repeatedly expressed the critical need for flexible financing mechanisms that can support a workforce development strategy that addresses competency needs and delivery mechanisms across multiple public health sectors, including inter-agency programs, public-private initiatives, and multi-state and regional efforts. Task force members and CDC/ATSDR representatives underscored the difficulty, given existing financing policies, in allocating funds to non-categorical training, a problem identified in official reports dating from 1994.(68,69,70) It is symptomatic that the FY 2001 CDC budget and performance plan (like those of earlier years) contain training activities in categorical programs but without any integrative framework or cross cutting elements as recommended by the task force.(71,72)

To design the new approach to workforce development recommended by the task force, the workgroup on financing reviewed existing financing mechanisms as well as innovative training programs which serve as models for the new approach. Case studies of two such models are presented here to demonstrate the benefits of a new, integrative approach to financing.

Case study 4 -- Management Academy for Public Health -- embodies the "decategorized" cross cutting model of funding in which CDC, HRSA, and two private foundations pooled funds to support a new program that delivers training in cross cutting management skills to local and state health department managers in four states.(73) Case study 5-- South Central Partnership -- shows how innovation is stimulated when federal training funds can be pooled by a voluntary collaborative of organizations at the state and regional level, in this case, those in Alabama, Arkansas, Louisiana, and Mississippi. (74)

Both case studies demonstrate the critical role that non-profit intermediary organizations can play in creating flexibility for innovative programs while retaining full accountability for the use of funds and for outputs and impact. Such flexible approaches to financing may enable grantees to use their resources more effectively to create comprehensive, cost-effective training opportunities. In addition, flexibility in selecting training content and establishing delivery systems maximizes value for each federal, state and local public health organization and multiplies the impact by leveraging the investment made by each partner.

Our recommendations for new financing strategies are critical to realizing the new strategic plan for workforce development. Innovative financing strategies will enable CDC/ATSDR programs and external partners to focus their collective attention on shared workforce development goals, achieve them in a cost-effective manner, and respond rapidly to the evolving public health needs of our communities and states.

Recommendations for Assuring Financial Support

1. CDC should encourage grantees to pool funds from existing funding streams to support cross cutting workforce development and adopt policies enabling such integrated financing.

2. CDC should increase funding for cross cutting workforce development and pool funds from its existing and new funding streams to support cross cutting workforce development.

3. CDC should develop and support innovative approaches to funding workforce development, including leveraging funds across federal agencies and private foundations, encouraging coalitions among grantees and encouraging the use of non-profit intermediaries to facilitate innovative approaches.

Case Study #4:
Management Academy for Public Health

Background

The Management Academy for Public Health is an innovative, public-private joint venture in public health workforce development, sponsored by CDC's Public Health Practice Program Office, the Health Resources and Services Administration (HRSA), the Robert Wood Johnson Foundation, and the W.K. Kellogg Foundation.

In 1999, the sponsors committed equal shares of funding -- for a total of $2.8 million -- to a 4-year demonstration project that will deliver high-quality training in managing public health agencies to over 600 managers of state and local health agencies in Georgia, North Carolina, South Carolina, and Virginia. The academy is operated jointly by the Kenan-Flagler Business School and the School of Public Health at the University of North Carolina at Chapel Hill. The CDC Foundation, a private, not-for-profit corporation, serves as an intermediary for the four sponsors and contracts directly with the University of North Carolina on their behalf.

The academy was established in response to the documented need, articulated in the 1988 IOM *The Future of Public Health* report, and other reports, that public health leaders at the state and local levels lack access to training in management skills which are critical to addressing new and emerging threats to health, persistent and increasing resource constraints, the impact of managed care, and other forces that threaten the viability of the public health system.

The purposes of the academy are to: Strengthen the management capability of state and local health departments by enhancing the skills of managers through development and training; Develop a high-quality, cost-effective, and sustainable regional management development training program; and Provide a model for replication in other regions.

In the 10-month, three-phase program, participants will engage in a 1-week intensive program on the Chapel Hill campus, Web-based courses and regional seminars during the following 9 months, and a final on-campus segment where they will apply their newly acquired knowledge and skills in applied problem-solving. Academy graduates will receive a certificate of training and competency in public health management.

Cost

The sponsors' funding will meet the cost of designing, developing, and delivering a new, applied public health management training program. The intent of the sponsors is that the academy serve as a demonstration for long-term, self-sustaining public health management training programs throughout the country. Because it is a demonstration, a significant portion of the academy's total cost will be for developmental activities that counterpart programs will not need to duplicate as they replicate the model in other regions.

Barriers

During the design stage of the academy concept -- which involved focus group analysis, site visits throughout the region, and interviews with more than 250 public health professionals -- the sponsors identified significant, potential barriers to participation in the academy. These included cost, time away from work, and a lack of professional incentive to participate.

To overcome these barriers, the sponsors recognized the need to fund participants' cost during the demonstration stage -- but also to require the University, as a condition of funding, to develop a strategy for long-term financial self-sustain ability. Second, the designers created the three phases of the program to allow participants to engage in distance-based training for all but 2-weeks of the 10-month program. Third, important incentives were given by engaging an academic institution of high reputation and prestige, by awarding a meaningful certificate for successful completion, and by enrolling esteemed public health managers in the first class.

In addition, the sponsors and UNC actively engaged with state and local health directors to determine their needs and expectations of the academy and then designed the program to meet those expectations.

Benefits

In the four-state demonstration region, 600 public health managers will acquire critical knowledge and skills in strategic management, coalition and partnership building, communications, finance, human resources, and other competencies.

State and local public health agencies in the region will improve their ability to identify public health needs, lead strategic initiatives to respond to those needs, partner with public- and private-sector organizations, apply information technology, leverage financial and human resources, and network with colleagues throughout the region.

A viable, self-sustaining model will be created for replication in other regions of the country, leading to nationwide availability of high-quality training opportunities for public health managers throughout the United States.

Ultimately, state and local health agencies across the country will improve their ability to protect the health of the public through strengthened management practice, more effective program delivery, and robust partnerships with health care and community organizations. The many programs that CDC and HRSA support through grants to state and local health agencies will benefit directly as those agencies expand their capacity to deliver effective programs.

Summary

The Management Academy for Public Health embodies important innovations in financing public health training.

1. The financing strategy that underlies the academy combines funds from four distinct sources -- two federal agencies, and two private foundations -- enabling each of the four to leverage its limited resources through partnership funding. None of the sponsors has the resources to support the academy on its own.

2. The academy training focuses explicitly on developing a critical core competency which comprises the cross cutting management skills vital to the effectiveness of every public health program.

3. The four sponsors use an independent, non-profit intermediary, the CDC Foundation, as the fiscal agent through which they efficiently pool funds and contract with the academy operator, the University of North Carolina.

Case Study #5:
South Central Partnership for Workforce Development

Background

The South Central Partnership for Workforce Development (SCPWD) is a continuation of the South Central Public Health Leadership Institute (SCPHLI), a successful collaborative between the Offices of Public Health in Louisiana, Arkansas, Mississippi and Alabama, the Tulane University School of Public Health and Tropical Medicine (TSPHTM), and the Centers for Disease Control and Prevention (CDC). Since 1995, the SCPHLI has conducted 4-year-long leadership development programs for 170 public health leaders in the four states. The partnership believes the SCPHLI has significantly enhanced the leadership capacity of the public health system in the south central states and will continue to do so for the foreseeable future.

Starting in November 1997, the partnership began building upon the successful relationship established by the four states, CDC and Tulane. At the same time, the Partnership expanded to include the University of Alabama at Birmingham School of Public Health. These partners came together for a strategic planning session to address the workforce development needs of the South Central states.

Based on existing studies, state surveys and member's experience, the partnership saw a great disparity in its workforce's capacity to respond to an expanded view of public health grounded in the core functions and essential services. Therefore, the partnership generated a collective vision to "create a vital public health workforce capable of transforming public health into the next century."

To date, this partnership of four states and two schools of public health has assessed its current capacities and assets, surveyed its workforce for baseline competencies and development needs, developed a list of training themes, formed workgroups for curriculum design, and developed syllabi. These efforts were accomplished with the financial assistance and support of the Health Resources and Services Administration (HRSA), Region VI of the U.S. Public Health Service (PHS), and consultation from CDC.

The partnership has also benefitted from the experience and capacity developed at TSPHTM with the Graduate Certificate program, the Louisiana Turning Point Initiative's Tools for Change Curriculum, and the University of Alabama at Birmingham's (UAB) distance learning curriculum in public health management. Additionally, the partnership has used the opportunity of the CDC's Health Alert Network funding to assist in developing the technical infrastructure to carry out video conferencing throughout the region.

Curriculum

At this point, course syllabi are well developed at three levels -- basic, intermediate and advanced -- in each of the following areas: Orientation to the Essentials of Public Health, Community Partnerships and Perspectives, and Epidemiology. TSPHTM will offer a full-credit course in Essentials of Public Health beginning in January 2000.

Case Study #5:
South Central Partnership for Workforce Development

Financing

For South Central Public Health Leadership Institute:
From its inception, the SCPHLI has been financed by pooling resources between the states by contracting with Tulane SPHTM, with additional support from CDC. The states have paid travel and per diem costs. The Public Health Leadership Institute costs are approximately $4,000 per scholar. Additional costs include time from work (10 days, over a 1-year period), travel and per diem. There are three on-site sessions with teleconferencing in between.

For South Central Partnership for Workforce Development:
The partnership envisions a similar pooling of dollars and assets in fully implementing its workforce development initiative. Efforts to date have been supported by seed funding from HRSA in FY 97-98 to support an inventory of assets. The U.S. Public Health Service also provided funding to design and pilot test a survey to determine workforce training needs and baseline competencies. The states and the universities have also absorbed the costs of curriculum development and carrying out the survey. The actual cost of completing the curricula, teaching the course, and managing the system are yet to be determined.

Benefits

The SCPWD will significantly enhance the capacity of the state and local health departments to carry out the essential public health services. The public health workforce in the South Central states will have an opportunity to expand its knowledge of the essentials of public health. A more select cohort of employees will have the opportunity, through video conferencing, to participate in several levels of the core curriculum, enhancing their skills in carrying out the core functions and essential services that relate to their positions. Advanced levels will be conducted to award credit toward certification in Public Health Practice or an MPH.

Implementing the SCPWD will significantly enhance the university's capacity to carry out distance learning programs. Faculty will be more knowledgeable of public health practice, and curriculum at schools of public health will reflect a greater relationship to practice and an understanding of core functions and essential services.

Barriers

Employees may find that advanced levels of the curriculum are demanding and that balancing work and home life may become more challenging.

States may need to contribute significant financial support to this initiative and will need to allow participants time away from daily duties. Federal agencies and other potential partners may similarly be asked for additional financial support.

Within schools of public health, some faculty may be resistant to using distance learning instruction and to changes or modifications to the curriculum. There also may be some concern about the extent of in-kind resources this effort will require: Planning a comprehensive curriculum; Offer specific courses; Evaluate program efficacy; Develop a Regional Public Health Training Center; and Develop a Regional Technology Network.

Case Study #5:
South Central Partnership for Workforce Development

Summary

Based on a history of working together and sharing resources, four states and two schools of public health have come together around a common vision of creating a vital public health workforce with enhanced competency in carrying out core functions and essential services. The effort has been enhanced by federal agency support from HRSA and PHS Region VI.

The partnership has assessed its current assets, surveyed its workforce for baseline competencies and developed course syllabi. The next steps include planning a comprehensive curriculum, offering specific courses, evaluating program efficacy, and developing a Regional Public Health Training Center and Technology Network.

Full implementation will require additional financial and in-kind support from states, federal agencies and other potential sources.

CDC/ATSDR STRATEGIC PLAN-NEXT STEPS

Achievement of a life-long learning system for public health practitioners requires vision and commitment. The six broad strategies outlined in this report will improve our ability to set measurable goals for ensuring a competent workforce prepared to deliver the essential services in the 21st century. In the next several months, the report recommendations will be further developed into an implementation plan by CDC/ATSDR staff.. On-going dialogue with our external partners will guarantee that these implementation efforts contribute to a national plan for public health workforce development.

Appendix I - Identifying the Public Health Workforce Using the SOC

The Standard Occupational Classification (SOC) System provides a starting point for identifying the public health workforce. The 1998 revision of the SOC was devised in response to the need for a standardized and comprehensive system of occupational data. Various government agencies such as the Bureau of Labor Statistics and the Bureau of the Census have similar, yet unique classification systems adapted to their needs. The revised SOC aims to provide a universal standardized system which all federal government agencies can use.[6]

The occupations listed in Table 1 reflect the new occupational categories that were recommended for the field of public health by the SOC Revision Policy Committee in 1996.[1] Recommendations included professions such as "Epidemiologist" and "Health Educator". The corresponding occupational titles represent the most detailed level of occupational listings in the 1998 Proposed SOC[2]. Although a final version of the SOC has yet to be published by the Office of Management and Budget[3], the proposed version of the SOC presently is being used by the department of Occupational Employment Statistics (OES) for its fourth quarter 1999 survey.[4]

The information in Table14 suggests that many of the new occupational categories recommended for the field of public health (such as "Epidemiologist" and "Health Educator) will be incorporated into the revised 1998 SOC, with the exception of "Public Health Policy Analyst".

TABLE 14: New Occupational Categories Recommended for the Field of Public Health and Corresponding Occupations in the SOC.

New Occupational Categories Recommended or the Field of Public Health	Occupational Categories in the 1998 Proposed SOC*
Epidemiologist	19-1041 Epidemiologist
Environmental Engineer	17-2081 Environmental Engineer
Environmental Engineering Technician & Technologist	17-3025 Environmental Engineering Technician
Environmental Scientist & Specialist	19-2041 Environmental Scientist & Specialist, Including Health
Environmental Science Technician & Specialist	19-4091 Environmental Science & Protection Technician, Including Health
Occupational Safety & Health Specialist	29-9011 Occupational Health & Safety Specialist
Occupational Safety & Health Technician & Technologist	29-9012 Occupational Health & Safety Technician
Health Educator	21-1091 Health Educator
Public Health Policy Analyst	none
Health Service Mgr/Health Service Administrator	11-9081 Medical & Health Services Manager
Public Health & Community Social Worker	21-1022 Medical & Public Health Social Worker
Mental Health & Substance Abuse Social Worker	21-1023 Mental Health & Substance Abuse Social Worker
Psychologist, Mental Health Provider	19-3031 Clinical, Counseling & School Psychologist
Alcohol & Substance Abuse Counselor, including Addiction Counselor	21-1011 Substance Abuse & Behavioral Disorder Counselor

* Occupational categories listed in the "1998 Proposed SOC" have yet to be finalized.

Table 15 lists recommendations for revisions to already existing SOC occupations. [1] Recommendations suggested the expansion of existing occupational titles such as "29-111 Registered Nurse" and "29-1069 Physician and Surgeon" to include occupations such as "Public Health Nurse" and "Public Health Physician," etc.

The information in Table 15 suggests that the 1998 SOC will not include subcategories for existing health care occupations that would distinguish those that are public health related. The health care occupations listed in the 1998 Proposed SOC (e.g. "29-111 Registered Nurse" and "29-1069 Physician and Surgeon") are too broad to accurately enumerate the public health workforce. Future research on public health workforce will need to make a distinction between clinical health care providers and "public health" clinicians. A classification system based on job *setting* or job *function* may be more beneficial for these occupations.

TABLE 15:   Recommendations for Existing Occupations for the Field of Public Health and Corresponding Occupations in the SOC

New Occupational Categories Recommended for the Field of Public Health	Occupational Categories in the 1998 Proposed SOC*
Public Health Physician	29-1069 Physician & Surgeon, All Other
Public Health Nurse	29-111 Registered Nurse
Public Health Dentist	29-1029 Dentist, All Other
Public Health Dental Worker	29-2021 Dental Hygienist
Public Health Veterinarian	29-1131 Veterinarian
Public Health Nutritionist	29-1031 Dietician & Nutritionist
Public Health Pharmacist	29-1051 Pharmacist
Public Health Laboratory Scientist	29-2099 Hlth Technologist & Tech, All Other
Pub. Hlth Attorney or Hearing Officer	23-1011 Lawyer
Health Information System/ Computer Specialist	11-3021 Computer & Information Systems Manager
Pub Rel./Public Information/ Health Communications/Media Specialist	27-3031 Public Relations Specialist
Biostatistician	None

Occupational categories listed in the "1998 Proposed SOC" have yet to be finalized.

APPENDIX

APPENDIX I

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GLOSSARY OF SELECTED TERMS

1. Accreditation - evaluation of academic programs which prepare individuals for professional practice and to determine whether such programs meet predetermined standards. May be carried out by public and private agencies or associations.

2. Career Development- consists of the personal actions one undertakes to achieve a career plan. These actions may be sponsored by the HR department or the manager, or they may be undertaken independently.

3. CEPH - Council on Education for Public Health-independent accrediting agency.

4. Certification - is a process by which an agency or association grants recognition to an individual who has met certain predetermined qualification specified by the agency or association, such as graduation from an accredited or approved program and acceptable performance on a qualifying examination or series of examinations.

5. Credentialing - is a broad term that encompasses issues of regulation, policy, education, and practice. Credentialing of individuals involves authenticating an individual through specified means to provide evidence of qualifications or authority for entry into a particular status.

6. Credentials - are awarded, usually in written form, to individuals who have met the specified qualifications which may based on certification, education, licensure, or some combination of these, for instance:

    •   Certification - Certified Health Education Specialist (CHES)
    •   Education - Master of Public Health (MPH)
    •   Licensure - Medical Doctor (MD) or Registered Nurse (RN)
    •   Registration - Registered Environmental Health Specialist (REHS)

    Credentials are also awarded to institutions which have met specified qualifications, for example, accreditation of programs and of colleges and universities and JCAHO accreditation of health care facilities.

    Degrees - are an academic rank awarded to a person who has successfully completed a course of study.

    Licenses - are permits from the government or other authority to do something or to carry on a certain trade, for example, a *Registered Nurse* is a graduate nurse who has been licensed by a state authority after completing a required course of study and passing a qualifying examination.

Registration - is a term used in some professions for the same process as certification, for example, a *Registered Environmental Health Specialist* is a nationally recognized credential to signify a level of expertise and competence based on education and experience.

7. Compensation - is what employees receive in exchange for their contribution to the organization. *Direct* compensation is related to wages and salaries, financial incentives and gain sharing. *Indirect* compensation refers to employee fringe benefits (insurance, retirement plans, etc.). *Financial incentive systems* can include commissions, Employee Stock options, Gain sharing, Maturity curves, Merit raises, Pay-for-Knowledge, piece work, production bonuses, profit sharing. Pay-for-Knowledge and Pay for Skills compensations systems give employees higher pay as an incentive for each new skill or job they learn.

8. Competence - a complex combination of knowledge, skills and values displayed in the context of task performance. Competency levels can include: entry/novice; experienced or specialist. Interpreted broadly, it is not simply trained behavior but thoughtful capabilities and a developmental process. Barrie, J., and Pace, R. W. "Competence, Efficiency, and Organizational Learning." *Human Resource Development Quarterly* 8, no. 4 (Winter 1997): 335-342.

9. Competency-based training - a training system that stems from detailed job and task analysis, and focuses on raising a trainee's competency level.

10. Core Competencies - actions which can be described in behavioral terms and observable in the performance of individuals or system component* capacity of public health agencies. Core competencies are required by the public health workforce to perform the essential services of public health. Core competencies for public health workers can be grouped into the following clusters: analytic; communications; policy development; cultural competence; basic public health science (e.g., behavioral, social sciences, epidemiology, environmental health, prevention of chronic and infectious disease and injuries); leadership, systems thinking and empowerment; management (financial planning, management skills) and information management.

    Organizational Competencies - the following areas are identified as key organizational competencies: visionary leadership; communication; information management; assessment, planning and evaluation; partnership and collaboration; systems thinking (future-oriented problem solving and decision making); and promoting health and preventing disease.

11. Core Functions - as applied to public health, core functions include assessment, policy development and assurance.

12. Curriculum - a course of study. The curriculum framework is the basic structure or design of a plan for a curriculum in a given discipline or area of professional preparation. It specifies the scope of the plan (the range of organizing elements to be covered e.g., concepts, content areas, broad areas of study) related instructional objectives and sometimes goals. A curriculum guide is commonly a written document concerned with the instructional plan for a specified topic, course of study or discipline.

Curriculum categories described in this report address the needs of individuals employed in public health as defined by their work setting, work content, and position. Curriculum categories include:

Basic (Public Health 101):
Target Audience - all professional public health workers and may include other staff; lay/volunteer workers, contract workers as identified by policy.
Prerequisite skills - none, ideally required as part of orientation phase and begins within 90 days of hire, interdisciplinary.
Scope/sequence - overview includes history of public health, core values of public health, core functions, essential services, description of competencies needed to perform essential services, other content as required by local area need, organizational focus, individual role/responsibility.

Cross cutting (Core Competencies):
Target Audience - professional public health workforce and others as determined by organizational/programmatic need, individual role/responsibility and career development objectives.
Prerequisite skills - basic + others tbd;
Scope and sequence - designed to develop core competencies skills from basic through intermediate and advanced skills as required by current role/responsibility and career path; content includes one or more of the core competency areas. Core competency areas include: analytic, communications, policy development; cultural competence; basic public health science (e.g., fundamentals of behavioral, social sciences, epidemiology, environmental health, prevention of chronic and infectious disease and injuries); leadership, systems thinking and empowerment; management (financial planning, management skills) and information management.

Technical or Categorical:
Target audience - as defined by the technical skill or categorical need (e.g., infectious disease, chronic disease, genetics); may include professional and non-professional staff

Prerequisite skills - core competencies which enable technical/categorical performance

Scope and sequence - based on definition of the technical requirements, categorical program objectives; may/may not be transferable to other work situations (e.g., pharmaceutical stockpiles for bioterrorism, immunization/vaccine supply management)

13. Distance Learning - A system and a process that connects learners with distributed learning resources characterized by:

    a. Separation of place and/or time between instructor and learner, among learners, and/or between learners and learning resource; and,
    b. Interaction between the learner and the instructor, among learners, and/or between learners and learning resource conducted through one or more media; use of electronic media is not necessarily required.

14. Education - See training.

15. Essential Public Health Services - The public health services described in the Public Health in America statement. These services include monitoring health status; diagnosing and investigating health problems; informing, educating, and empowering people; mobilizing community partnerships; developing policies and plans; enforcing laws and regulations; linking people to needed services; conducting evaluations; and conducting research.

16. Human resource development (HRD) - has as its primary focus the key competencies (knowledge, skills, attitudes) which through learning enable individuals to perform current and future jobs. KSAs...knowledge, skills and abilities...a list of special qualifications and personal attributes that an individual needs to have for a particular job. Knowledge refers to an organized body of information, usually of a factual or procedural nature which, if applied, makes adequate performance on the job possible. Skill refers to the proficient manual, verbal or mental manipulation of data or things. Ability refers to the power to perform an observable activity at the present time.

17. Human resources management - the area of organization life that focuses on the effective management of people.

18. Needs assessment - A formal process to identify problems and assess the community's capacity to address health and social service needs (examples include: APEX/PH, PATCH, Healthy Cities, and Model Standards).

    Training needs assessment - a systematic approach to training where the identification of training needs leads to course development and performance evaluation. Various approaches are used for determining training and

development needs. These include but are not limited to employee surveys/questionnaires, standardized interviews, and record reviews.

19. Performance (Evaluation) - The evaluation of a specific achievement, through analyzing either output or outcome measures or through analyzing the process or the phases of the performance. Student work is a type of performance evaluation.

20. Personnel (Evaluation)- Typically, it involves an assessment of job related skills through observation, measurement, or evaluation of job performance. The evaluation of job performance might be done through job simulations or validated written tests. This kind of evaluation is subject to types of ethical constraints. It is also subject to a number of methodological traps, for example, some systems are incapable in practice of generating negative ratings.

21. Policy (Evaluation)- The evaluation of policies, plans, proposals, and possibilities. Good policy analysis usually covers every step and adds a shorter time in which to get an answer. The task of the policy analyst is different from of the evaluator. The policy analyst works on providing valid research summaries.

22. Products (Evaluation)- The evaluation of functional artifacts or the evaluation of output. Historically used in the evaluation of different brands of a product such as a car, computer or lawn mower in which each brand of the product is put through the same test and rated. An example for training events would be a standardized test given to students to rate the effectiveness of one type of training modality over another, e.g., distance/distributed learning versus classroom-based instruction.

23. Program - A program is defined by the goals which determine the actions of the staff and the development of projects. The program evaluation is the largest area of the evaluation although product evaluation may be the largest area of practice. It is the evaluation of how effective is the staff and the projects on achieving the goals established.

24. Program evaluation - is the systematic collection of data related to a program's activities and outcomes so that decisions can be made to improve efficiency, effectiveness, or adequacy.

25. Public health -as defined in the IOM, 1988 report means the fulfillment of society's interest in assuring conditions in which people can be healthy.

26. Public health agency - as defined in Chapter 23 of Healthy People 2010, is a government or non-governmental entity authorized to provide one or more essential public health service. Included are health, mental health, substance abuse, environmental health, occupational health, educational and public health

agencies.

27. Public Health in America statement - A statement defining the public health vision, mission, and essential public health services. It was produced in 1994 by the Core Public Health Functions Steering Committee, comprised of representatives from the U.S. Public Health Service agencies, the American Public Health Association, the Association of Schools of Public Health, the Association of State and Territorial Health Officials, the Environmental Council of the States, the National Association of County and City Health Officials, the National Association of State Alcohol and Drug Abuse Directors, the National Association of State Mental Health Program Directors, and the Public Health Foundation.

28. Public health infrastructure - The systems, competencies, relationships, and resources that enable performance of the essential public health services in every community.

29. Public health surveillance - is the ongoing systematic collection, analysis, and interpretation of outcome-specific data for use in the planning, implementation, and evaluation of public health practice. A surveillance system includes the functional capacity for data collection and analysis as well as the timely dissemination of these data to persons who can undertake effective prevention and control activities. While the core of any surveillance system is the collection, analysis, and dissemination of data, the process can only be understood in the context of specific health outcomes." Thacker SB. Historical Development. In: Teutsch SM, Churchill RE. Principles and Practice of Public Health Surveillance. Oxford University Press, 1994.

30. Public health workforce - Individuals responsible for providing the services identified in the *Public Health in America* statement regardless of the organization in which they work. At the state level many workers in environmental, agricultural, and education departments have public health responsibilities and are included. This definition does not include those who occasionally contribute to the effort in the course of fulfilling other responsibilities. The Standard Occupational Classification (SOC) system used by the Bureau of Labor Statistics, Census Bureau, and Bureau of Health Professions also can be used.

31. Public health work settings -complete definitions of each setting are presented in Kennedy, V. et. al. "Public Health Workforce Information: A State-Level Study" *Journal of Public Health Management Practice*, 1999, 5(3).

    Providers of Population-Based Public Health Services
    a. Official Local, State, and Federal Public Health Agencies: These governmental entities are responsible for discharging the functions of community health assessment, policy development, and assurance. The universe of organizations includes both the "core" public and environmental

health departments that provide the broadest scope of services and those agencies that, in the context of a public health mission, provide a more limited set of services.

b.   Other Public Sector: These governmental entities are responsible primarily for functions other than public or environmental health but contain subsidiary units that provide a public or environmental health service.

c.   Private, Nonprofit Associations: These agencies most often focus on specific health problems or issues. Frequently part of an organizational network that includes national, state, and local components, they provide informational, policy development, research, and other public and environmental health services to their defined communities.

d.   Community-Based Organizations: These associations of citizens may focus on specific or general health problems---often in the context of larger social or economic issues---and are engaged in information exchange, policy development, and implementation of community health programs.

Providers of Institutional Public Health Services

1.   Personal Health Services Industry: Hospitals, outpatient facilities, long-term care facilities, health maintenance organizations, and other managed care organizations are the major types of organizations. Public health functions in these settings are carried out primarily for the benefit of the institution; for example, to promote and protect the health of employees and clients.

2.   Private Industry: Workplace health and safety programs, as well as employee health promotion programs, reflect public health functions conducted primarily for the benefit of the industrial organization.

3.   Educational Institutions: Primary, secondary, and post-secondary schools are major settings for the provision of institutional health and safety services. Post-secondary schools also produce community-wide health services by providing academic preparation for public health professionals.

32.   Standard Occupational Classification (SOC) system - The basic purpose of the SOC is to provide a mechanism for referencing and aggregating occupation-related data. The system is designed to maximize the analytical utility of statistics on labor force, employment, income, and other occupational data collected by Employment Services departments. The SOC provides a coding system for identifying and classifying occupations. There is an extensive amount of occupational detail existing within the SOC, and it is constructed with the flexibility to allow for this range of detail requirements. In creating the SOC, the Federal government intended that all major occupational data gatherers use this classification as the basic framework for their information collections. The SOC thus may serve as the Nation's comprehensive occupational classification system.

33.   Training - refers to instruction, which is generally not for credit, toward a diploma, certificate or degree and is more oriented toward improving skills or performance. (Harmon, 1994). Education - generally refers to course work for academic credit toward a diploma, certificate or degree. (Harmon, 1994).

Training and education for public health - does not include that which is predominately for curative illness and injury care but does include clinical preventive services or research and health services research. (Harmon 1994).

Curriculum for training and education for public health - should include aspects of at least one of the core public health sciences (health administration, epidemiology, biostatistics, environmental and occupational health, laboratory, behavioral science,) or one of the IOM core functions of public health involving assessment, policy development and assurance. (Harmon, 1994)

34. Workforce development - Workforce development is about enabling all people to have access to opportunities that enhance the development of their skills, knowledge, and aptitudes such that they are able to participate in productive work. Services include job development and placement, career guidance and counseling, assessment, labor market information dissemination, job training, benefits assistance, and other activities to assist job seekers, employers and students exploring the a particular field of work.

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74. Contact and web site for the South Central Partnership:Ann Anderson, Ph.D., Director South Central Public Health Leadership Institute,(504) 588-5397, http://www.tulane.edu/~sphtm/scphli.htm

Additional background information on this project can be viewed at http://www.phppo.cdc.gov/taskforce/. Call 770/488-8118 for questions.