

A Model for Public Health Workforce Development Using the National Public Health Performance Standards Program

Margaret A. Potter, Gerald Barron, and Joan P. Cioffi

Workforce development programs in public health should link improvements in workers' performance with improvements in their agencies' performance. The "ten essential services" of public health provide criteria for measuring both individual worker training (as in workforce competency standards) and agency performance (as in the Centers for Disease Control and Prevention's National Public Health Performance Standards Program). This shared foundation was the basis for a model strategic training program developed for use in a 500-employee urban county health department. Full implementation of this model as a foundation for assessment, curriculum development, and evaluation requires careful attention to management issues, confidentiality of employee records, and evaluation methodologies.

KEY WORDS: evaluation, performance standards, public health infrastructure, workforce

Much professional commitment, financing, and practical effort have gone into workforce development programs for public health over the past decade. The U.S. Health Resources and Services Administration (HRSA) launched its Public Health Training Centers in 2000 and now funds 14 of these centers in schools of public health.¹ The Centers for Disease Control and Prevention (CDC) created Centers for Public Health Preparedness in 2001 and, in 2003, it will be sponsoring 19 academic centers, 7 specialty centers, and 5 exemplar centers.² Further, the CDC has convened a national partnership of professionals, federal and state agencies, and academicians in its effort to define a stra-

tegic plan for public health workforce development.³ This plan makes the training of public health workers a central component in the overall building of a public health infrastructure throughout the country.

At an operational level, however, these workforce development programs have lacked a conceptual framework within the larger context of public health systems. These systems may be defined as the infrastructure, the operations, and the outcomes that determine the health of a population.⁴ Without this conceptual framework, individuals' training needs assessments may proceed without aligning the goals of individual learning, job performance, and agency effectiveness. Curricula may be developed that serve one but not all of these goals. Overall workforce efforts may not improve systematically over time, or they may not be able to demonstrate outcomes persuasively.

The concept of training workers to improve organizational effectiveness may be new to public health, but

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Margaret A. Potter, JD, is Associate Dean and Director, Center for Public Health Practice, University of Pittsburgh, Pennsylvania.

Gerald Barron, MPH, is Deputy Director, Allegheny County Health Department, and Adjunct Associate Professor of Public Health Practice, University of Pittsburgh, Pennsylvania.

Joan P. Cioffi, PhD, is a Senior Service Fellow at Centers for Disease Control and Prevention, Public Health Practice Program Office in Atlanta, Georgia.

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it is not a new concept. Measuring training effectiveness in terms of a “return on investment” has been an expectation in the corporate sector for decades. There, the goal often relates to increasing profitability or demonstrating cost savings through process improvements or decreased absenteeism. In public health, however, the goal of training is ultimately to improve health outcomes. In both the corporate and the public health sectors, it is difficult to show causality between a training intervention and the desired system-level outcome.

The case study described in this article explores a conceptual model for workforce development programs in public health and some of the scientific and practical questions that such a model raises. The CDC’s National Public Health Performance Standards Program (NPHPSP) provides the foundation for this model. It establishes a common set of criteria based on the “ten essential services”⁵ for placing workforce development in its proper context of strategic planning, for assessing training needs, for developing curriculum, and for evaluating the effectiveness of training—all toward the goal of improving the health of populations. The model presented here recognizes principles and methods that have been reasonably well established in the corporate sector. It sharpens the focus on both practical and scientific issues that require further work by policy makers, trainers, and agency leaders.

This article presents a literature review that juxtaposes the definitions of public health practice with the values and methods of adult education in the corporate sector. A description of the case in which this model was developed and critiqued follows: an HRSA-funded public health training center working in collaboration with a 500-employee urban health department. The model is presented in overall concept with illustrations from experience. This case provides an opportunity to examine the model for its feasibility, challenges, and scientific implications. The article concludes with some recommendations and implications for applying the model elsewhere.

● Background: Public Health Practice and Corporate Training

The idea that *individual employees’* training should enhance the *total organization’s* performance has a long history in the development and evaluation of corporate-sector adult education programs. This body of theory and experience holds important insights for public health training programs, as these have been defined over the past decade. Before reviewing that history, the origins and current goals for training specifically in public health are presented.

The definition of goals for public health workforce development

A national blue-ribbon panel formulated the ten essential services of public health in the early 1990s as part of an effort to define the mission and functions of public health.⁶ It is a list of cross-cutting responsibilities that have come to define public health practice in the United States. More specifically, the ten essential services form the foundation for public health infrastructure development in at least two of its major components: workforce capacity and organizational capacity.

As applied to workforce capacity, the ten essential services define what workers *do* and point to the so-called competencies—what they should know how to do.⁶ Researchers and trainers are currently using essential service-based competencies to provide a comprehensive basis for assessing workers’ training needs,⁷ to define topics for training curriculum development,⁸ and to catalogue training courses.⁹

As applied to organizational capacity, the ten essential services form criteria for measuring an agency’s performance. In the NPHPSP, the CDC and the National Association of County and City Health Officials (NACCHO) have developed an essential service-based tool for strategic planning called “mobilizing action through planning and partnership” (MAPP).^{10,11}

The fact that both sets of goals—workforce development and organizational planning—share a foundation in the ten essential services suggests an approach to modeling workforce training programs. The premise for most of the current public health training initiatives is that improvements in workers’ public health competencies should result in improved performance by their agencies.^{3,12} If so, then the ten essential services should not only frame the assessment of workers’ competencies, the creation of training curricula, and the evaluation of trainees’ improved job performance, but also frame the determination of whether training enhances the employer’s organizational capacity.

Evaluation of training: The roles of systems theory and organizational culture

In the field of corporate human resources development, old myths held that training makes a difference and that its purpose is to achieve learning objectives. (Instructional objectives, in contrast, may give direction to training but do not always result in better performance.) To influence organizational effectiveness, four kinds of needs should be considered: *business needs* (or institutional needs; the goals of the unit, department, or organization), *performance needs* (on-the-job behavioral requirements), *training needs* (what must be learned to perform successfully), and *work environ-*

ment needs (what systems/processes within the work environment must be modified if performance needs are to be achieved).¹³

Kirkpatrick¹⁴ proposed a four-tiered evaluation model to measure training outcomes. Level 1 assesses *reaction*—how well the trainees liked a program. Level 2 measures *learning*—changes in knowledge, skills, or attitudes. Level 3 measures on-the-job behavior (performance) after training. Level 4 measures *system results*—reduced costs, increased quality or quantity of production, or improved efficiencies. While evaluations at levels 1, 2, and 3 are common, level 4 evaluations are infrequent. Brinkerhoff¹⁵ argued that training that does not produce behavioral results may nonetheless have value and suggests measuring impact and worth (“Did it make a worthwhile difference?”).

Senge¹⁶ provided the conceptual framework for linking individual to organizational learning in his seminal book *The Fifth Discipline*. The basis lay in so-called disciplines, two of which were individual in practice (personal mastery and mental models), two others of which were necessarily group oriented (shared vision and team learning), and the fifth of which was the “cornerstone” discipline of systems thinking. All, he believed, were necessary for building the learning organization—one whose workers are capable of expansion of capacities over time, collective aspiration, and progressive joint learning. Thus, his work gave a unified vision for achieving personal, work group, and organizational effectiveness.

Kennedy and Moore¹⁷ applied Senge’s principles to the development of public health training programs. They observed the need to account not only for the workers and the work they do but also for the organizational settings in which they perform. Dato et al.¹⁸ described how learning organization theory may be adapted to public agencies in the context of workforce training.

Schein¹⁹ described the learning culture of organizations as a set of characteristics, each measured or viewed along a continuum with an optimal point for encouraging ongoing learning and change. These characteristics included, for example, the relationship between the organization and its environment; for this, the continuum ran from environmental dominance at one extreme to organizational dominance at the opposite end, with organizational dominance as the optimal point for learning. This framework and its underlying theory leave much latitude for adaptation to organizational types; however, for public health organizations, the cultural characteristics and their optimal states have yet to be defined.

Nelson et al.²⁰ developed a set of tools to adapt the concepts of learning organization and learning culture for use in public health systems. Their work fuses

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the languages of learning organizations and essential public health services into a set of seven “critical competencies.” It offers highly detailed and adaptable resources intended for use as a work group’s self-assessment, thus making it practical for use by various types of agencies in diverse locales.

The preceding literature review shows that theories are mature and that practical resources exist for linking the effectiveness of worker training with the improvement of organizational performance in the public health field. What remains is to propose a training model that builds on these theories and resources.

● Building a Model for Public Health Training

The Pennsylvania and Ohio Public Health Training Center (POPHTC) designed an essential services-based framework for assessment and evaluation of training needs in the 500-worker health department serving Allegheny County in Pennsylvania. Simultaneously, the agency used an essential services-based assessment tool to identify strengths and weaknesses in its organizational capacity. It used the MAPP assessment tool, containing the same measures of capacity based on the ten essential services that were developed for the NPHPSP. POPHTC took both sets of results and aligned them, so that essential service-related deficits that appeared in both received the highest priority in the subsequent design of a training curriculum. The methods and results of POPHTC’s training needs assessment process appeared in an earlier publication.⁷ The following describes the strategic planning process that contributed to the emerging training model.

● Strategic Planning as an Element of Workforce Development

In the late 1990s, the Allegheny County Health Department (ACHD) realized that it needed to do an evaluation of its organizational capacity to perform the core functions of public health assessment, policy development, and assurance. A large committee representing a cross-section of its staff (including division and program managers) became involved in a preliminary assessment process. Its consensus and recommendations raised concern that ACHD lacked a strategic planning

process and a strategic plan. The agency's leadership therefore applied to NACCHO to become a beta test site for APEX-CPH, the newly developed strategic planning tool for public health that was refined and renamed MAPP.¹¹ Thus, ACHD began the MAPP process, which involved a series of strategic assessments. One focused on the local public health system and used the NPHPSP, based on the ten essential services as its criteria. After conducting and analyzing all the MAPP assessments, ACHD held a strategic planning retreat with its management staff, community stakeholders, and members of the board of health. The results highlighted seven of the ten essential services for which staff training could be expected to improve performance in order of priority (highest first):

1. Evaluate the effectiveness, accessibility, and quality of personal, environmental, and population-based health services.
2. Link people to needed personal health services, and ensure the provision of health care when otherwise unavailable.
3. Mobilize community partnerships to identify and solve health and environmental problems.
4. Ensure a competent public, environmental, and personal health care workforce.
5. Develop policies and plans that support individual and community efforts to preserve health and protect the environment.
6. Monitor health status to identify community health and environmental problems.
7. Inform, educate, and empower people about health and environmental issues.

The strategic assessment process also revealed the need for ACHD's staff to improve skills in cultural competency, data analysis, and communications—all in the context of improving community health.

● Creating the Training Model

Spring 2000 was the first year of implementation, but through its academic sponsor (the University of Pittsburgh's Graduate School of Public Health), POPHTC had a long-standing formal collaboration with the ACHD that included commitment to design and implement a training program for employees as defined by the strategic assessment. The separate assessment of training needs had been completed with managers and supervisors, and these needs had been prioritized on the basis of the MAPP analysis described above. To summarize that process briefly, Delphi panels composed of agency administrators and division chiefs prioritized items from lists of essential service-

based competencies as indicators of agency-wide training needs. Later, the division chiefs further ranked the priorities for their own employees through a written survey. Next, the division chiefs met to discuss training priorities in terms of particular job applications, and the POPHTC staff summarized their language, cross-walking it to match the competency lists. The agency's senior leadership considered this prioritized list of training competencies in light of results from the MAPP assessment of strategic weaknesses. They determined that, to address deficits of individuals, divisions, and the agency as a whole, the initial training program should focus on program evaluation and communications.

At that time, POPHTC convened an assessment and evaluation committee comprised of academicians from several schools of public health and practitioners from local health agencies in two states. The committee's task was to design an assessment and evaluation model for training programs to be delivered to the ACHD's staff later that year. Figure 1 presents the results of the POPHTC committee's work. The explicit goal of this training model was to ensure synergy among the separate goals of individual learning, improved job performance, and strategic organizational development.

The model's four-step process should be seen as cyclical, continuously repeating over time. Step I of the model incorporates what ACHD had already done: a MAPP assessment of organizational capacity based on the ten essential services, the outcome of which was to identify those essential services needing improvement. Competencies associated with each such essential service are identified for use in the next step of the model. In Step II, the competency-based assessment process focuses on divisions and programs within the agency and on individuals within their divisions. This step allows for the prioritization of competencies that would be targeted for curriculum development and training program delivery, taking into account both the strategic deficits of the organization based on MAPP and the perceived training needs of workers by their supervisors. Step III is the delivery of training that deliberately links essential service-based competencies with actual job-relevant tasks and skills. In other words, tasks directly relevant to essential service performance at the individual and divisional levels within the agency are built into the training curriculum. Step IV is to evaluate the impact of training on the performance of relevant competencies at the individual and divisional levels, the results of which are finally linked back to subsequent strategic evaluation at the organizational level.

The POPHTC committee's model required a competency-based assessment of training needs and a competency-based, practical approach to curriculum design. POPHTC defined competency-based assessment as

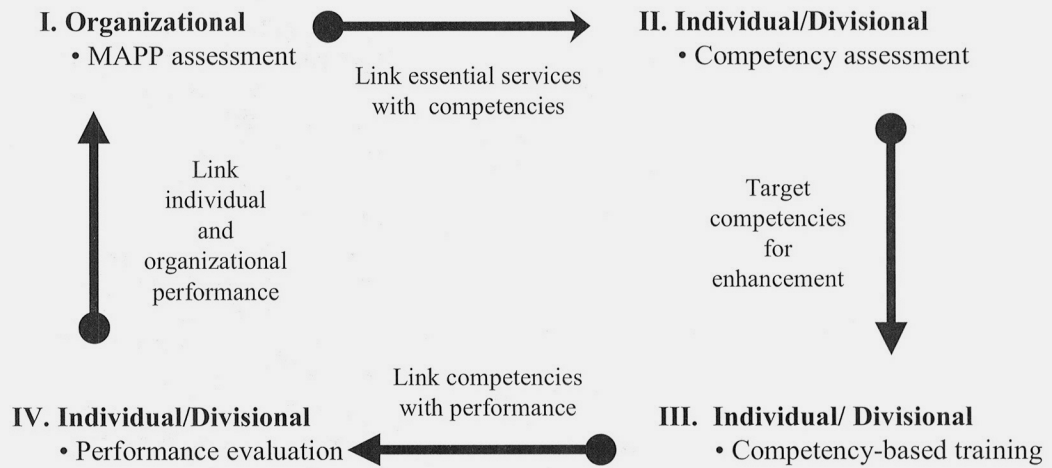


FIGURE 1. Essential service-based training model for public health.

the strategic selection of core competencies for training workers in the performance of essential services of public health. Figure 2 illustrates how the committee’s model envisions that the ten essential services are to be translated into the content of a training curriculum. Since, for example, the ACHD’s strategic assessment (at Step I of the model) identified a need for the organization to improve its performance of Essential Service 9 (“Evaluate the effectiveness, accessibility, and quality

of health services”), one focus of curriculum development was on those competencies necessary to carry out this service. For Essential Service 9, these competencies include many within the domains of analytic, communications, and cultural.⁶ Within each domain are specific areas of knowledge, skill, and attitude that can be enhanced through training. For example, in the analytic domain, training to improve competency can be focused on “Determining appropriate uses of data”

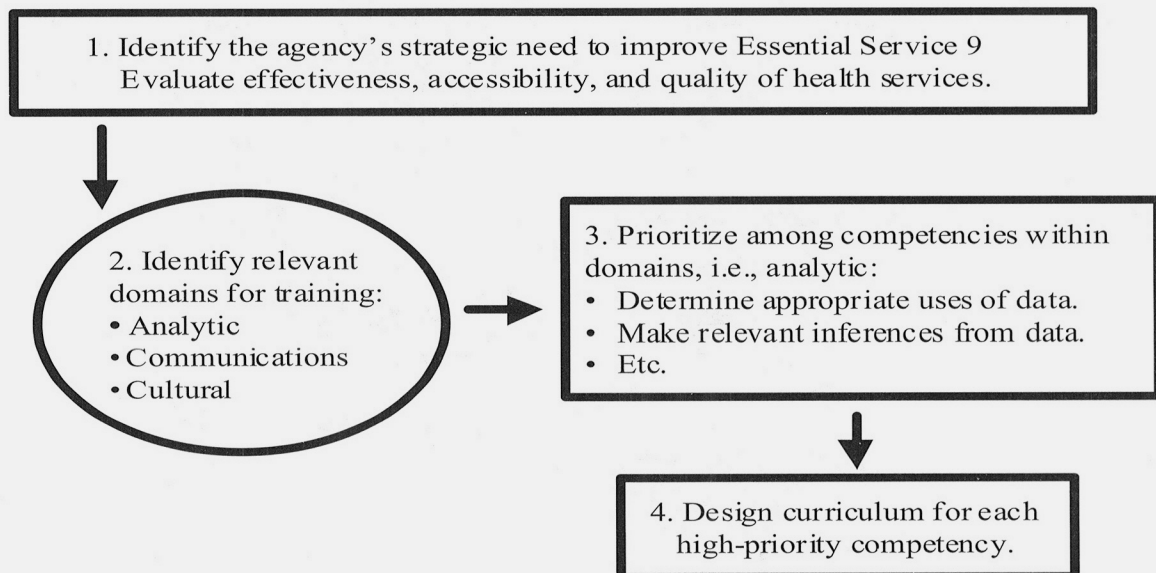


FIGURE 2. Curriculum development process.

and “Making relevant inferences from data,” among other areas. These specifically detailed competencies are the foundation of the curriculum, which is then developed using examples and exercises from the intended trainees’ routine work.

● Implementing the Model

Based on its training model, the POPHTC committee proposed an evaluation matrix; POPHTC staff cooperated with ACHD’s leadership to carry out its required processes. As shown in Table 1, the matrix specified a unit of observation or intervention, outcome indicators, methods, and intended results at each of the model’s four steps, as follows:

- At the Step I strategic planning level, the unit of observation was the agency; the indicators were performance criteria derived from the NPHPSP through MAPP as its assessment method. The result at this step was to identify seven of the essential services for strategic improvement, thus indicating a direction for training.
- At Step II, training assessment at the individual and divisional levels here was meant to be used with the results of MAPP assessment to select among essential service-related competencies and thus to prioritize them in the development of a training curriculum. Based on this decision, division chiefs selected individuals for training.
- At Step III, POPHTC conducted training. The focus here was on whether the trainees had learned the competencies that were taught. The units of observation for effectiveness of teaching were the individual trainees. Supervisors evaluated trainees

through standard agency procedures before and after training. They completed pre- and post-training tests as well as post-training satisfaction surveys. The training program plan called for the repetition of post-training tests several months later. Individuals, once again the unit of observation, had written specific job-related goals for each competency-based training module during the course of the training and had scaled their attainment of each goal at the conclusion of training. The training program plan called for these trainees to repeat the goal attainment scale six months later.

- At Step IV, the focus of performance evaluation is on whether the training improved the performance of strategically important essential services within the agency. The units of observation were individual, divisional, and organizational; the methods of measurement included surveys and pre- and post-tests of worker trainees, supervisory reviews of workers, and essential service performance (i.e., MAPP) assessments of the organization. One division chief within the agency (food safety) had required all nonclerical staff members to participate in the training program. Before training, that division had identified indicators of performance (work products such as written reports, client and employee feedback, and budget resources) associated with the competencies that would be addressed in the training curriculum. It was intended that these qualitative indicators would be compared before and at periodic intervals after training. For the agency, the POPHTC method called for comparing the MAPP performance indicators associated with areas of strategic weakness before and after training. Organizational learning criteria, based on Nelson et al.’s model,²⁰ would be measured after training. An-

TABLE 1 ● Framework for planning, assessment, training, and evaluation

	Unit(s) of intervention/ observation	Indicators	Methods	Results
I. Strategic planning	Organization	Performance measures based on ten essential services	MAPP assessment	Identify essential services for strategic improvement.
II. Assessment for training	<ul style="list-style-type: none"> • Program/division • Individual 	Competencies needed to carry out ten essential services	Competency-based assessment	Prioritize training curriculum for most needed competencies.
III. Training	Individual	Trainees selected for essential service role and responsibility	Competency-based curriculum	Deliver training to selected employees.
IV. Performance evaluation	<ul style="list-style-type: none"> • Individual • Program/division • Organization 	<ul style="list-style-type: none"> • Learner achievement • Teaching effectiveness • Performance improvement 	<ul style="list-style-type: none"> • Supervisory review • Essential Service performance • MAPP reassessment 	Improve performance of strategically important essential services.

other agency-wide indicator would be trainees' aggregated job performance evaluation scores, which were determined annually.

The agency served a county population of about 1.2 million, for which it had pre-training morbidity and mortality data related to Healthy People 2010 objectives. The POPHTC training model called for these data to be compared before and after training, after a "critical mass" of employees had received training. However, since no such change would be measurable sooner than some years later, the POPHTC model did not immediately address this ultimate outcome of improved health status.

● Critiquing the Model

The POPHTC model for assessment and evaluation of workforce training was developed in practice, rather than purely in theory. Parts of the model were developed in parallel with the training curriculum. Data collection and analysis for the evaluations described above are still in progress at the time of this writing; therefore, reporting of preliminary evaluation data will be published separately. Here, the focus is on whether the proposed methods were considered to be realistic and replicable in other training programs with other public health agencies. The POPHTC committee studied the model and observed its partial implementation over the course of about six months. In addition, staff of the CDC's Office of Workforce Policy and Planning reviewed the model from a national perspective and with expertise in corporate and adult training experience. The resulting critique rates the POPHTC model on its strengths and weaknesses and points out areas for future development on both practical and scientific grounds.

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Practical issues

First, this model measures organizational capacity of the agency, isolated from the public health system of which it is a part. MAPP and NPHPSP measure the capacities of local public health as a system that includes other agencies of government as well as private and community-based organizations. This discontinuity may be overcome either by targeting training to work-

ers drawn from both the agency and other parts of its local system and/or by identifying and capturing performance indicators appropriate to the system.

Second, the model requires substantial investments by the participating health agency. Due to the involvement of the ACHD's staff during the MAPP assessment process and the prior existence of its training committee, this agency was well positioned to have staff acceptance of the need for training. The training committee felt an ownership of the training modules and was much involved in their delivery and evaluation. Critical to success was the staff's understanding of the ten essential services concept, without which they would not support the concept of competency-based training. This understanding was the result of staff involvement throughout the four-step process. Most important, the top management and program managers of the agency had to make a sincere commitment to excellence in public health, and their staff had to be aware of this commitment. Commitment was needed due to the staff time that was required to work with others to develop the training curriculum, to attend training sessions, and to be involved in its evaluation. Promoting this understanding was the responsibility of the agency's top management.

Third, implementing this model raises a number of management issues for which the agency should prepare: Should supervisors be drawn into the process of comparing pre- and post-training evaluations of their staff members beyond what is necessary for annual performance reviews? Can and should the standard forms and procedures for conducting annual reviews be changed and adapted to satisfy the needs of training impact evaluation?

Fourth, workers' ethical, contractual, and legal rights should be observed. The privacy and confidentiality of job performance evaluations should be guarded; informed consent may be a necessary prerequisite for including any worker's data in the evaluation process. If any of the model's methods fall within the purview of civil service rules and collective bargaining agreements, human resources officials and employee union representatives should have opportunities for prior review and approval.

Scientific issues

The POPHTC model for assessment and evaluation of public health training is a work-in-progress from a methodological standpoint. Various scientific challenges arise from the complex nature of interactions among characteristics of the training program, individual performance, agency capacity, and health outcomes: Are the supervisor's reasons for selecting an employee for training consistent with the purposes

of training (Step II of the model)? How does the evaluation distinguish among potential causes of good and poor performance by the trainee (Step III)? Likewise, how does the evaluation distinguish among potential causes of good and poor performance by the agency (Step IV)? For example, adequacy of funding and other resources affects an agency's capacity to perform the ten essential services even when its employees have optimal training levels. Finally, does the evaluation isolate agency capacity and performance from other external factors that determine health outcomes in the population served? Assuring the validity of evaluation methods based on the POPHTC model requires further technical development.

Public health training interventions can be evaluated using previously described corporate sector models. As in the POPHTC model, a specific organizational performance indicator (like organizational effectiveness) should be identified and measured before and after training. Further clarifying the link between workforce development and health outcomes is difficult; however, modeling used by economists may prove helpful in guiding future research for public health. For example, in this issue of the *Journal of Public Health Management and Practice* (9:3), preliminary findings by Mete et al. (see the article titled "Are Public Health Services Available Where They Are Most Needed? An Examination of Local Health Department Services") explore the targeting of public health services at the county level to vulnerable populations. In the training model, the ultimate outcome of improved health is subject to influence by the efficiency of health services, which in turn is influenced *only in part* by health workforce characteristics and service quality.

Future research is needed to distinguish rigorously among the important dimensions of public health systems' quality and effectiveness. The specification of data indicators in the later stages of the POPHTC model should consider the public health agency "system" context for influencing health outcomes such as the use of health services, the targeting of health services by the local health agency, and the efficiency of health services (workforce characteristics, service quality, determinants of health care utilization, and effective use of health information). It also should incorporate indicators for any major health sector reforms (such as changes in insurance coverage).

● Conclusion

This article presents a case study of using a strategic approach to workforce development that may be applicable to local and state health agencies nationally. As the NPHPSP and its strategic planning tools become

more widely disseminated, agencies may adopt training approaches that are aligned with essential service goals. If so, the training model presented here could be useful. However, the full implementation of this model requires careful attention to agency management issues, employees' rights and expectations, and evaluation methods. Also, the substantial prior experience of corporate-sector training and economics research could be valuable to such workforce development efforts in public health.

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