

## TRAINING PROGRAMS TO STRENGTHEN PENNSYLVANIA'S PUBLIC HEALTH RESPONSE

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This report describes Pennsylvania's 9-year experience in implementing training programs to strengthen public health response to emerging infectious diseases. During the biannual 3-5-day-long Pennsylvania Public Health Institute (PHI) events, which have been held since 2000, courses have covered topics such as emerging infectious disease outbreaks, monitoring of antimicrobial-resistant pathogens in retail food, and zoonotic diseases commonly associated with companion animals. Core competency courses include the legal basis for public health and epidemiology for nonepidemiologists. Emerging infectious disease seminars offered to clinicians since 2005 have focused on the emergence of community-associated methicillin-resistant *Staphylococcus aureus* and *Clostridium difficile* antibiotic-associated diarrhea. Complementing the PHI, the Pennsylvania Department of Health's monthly Epidemiology Journal Club offers additional interactions with presenters from academic institutions and federal agencies. Lunch-time forums also provide a venue for health department staff to share their work with colleagues. Innovative use of modern communication technology increases participation of frontline health workers in Journal Club events, and video conference capability offers flexibility in the selection of presenters. Pennsylvania's experience over the past 9 years demonstrates that with political will, commitment from content experts, and adequate administrative support, modest state and federal resources can be used to sustain public health training programs tailored to local needs.

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**F**RONTLINE PUBLIC HEALTH WORKERS in state and local government agencies need ever-expanding knowledge and skills to address the evolving nature of communicable diseases. The recent emergence of oseltamivir-resistant influenza A (H1N1) viruses during the 2008-09 seasons illustrates the unpredictable nature of pathogens, which require dynamic, continually updated public health approaches to prophylaxis and disease management.<sup>1,2</sup> The emergence of new diseases such as West Nile virus or community-acquired methicillin-resistant *Staphylococcus aureus* (MRSA) and the threat of bioterrorism attacks have also posed even broader challenges, as the public health community has had to devise new prevention and control strategies.<sup>3</sup> Appropriate training of frontline public health workers on evolving practices, including disease-specific guidelines, is essential to consistent implementation of these strategies.

Training of frontline public health workers is also required to further develop and refine core skill sets, including analysis, communications, program development and evaluation, and leadership. Training of the public health workforce cannot be expected to be completed during formal education at degree-granting institutions; professional development should be a continuum promoted by state and local public health agencies. The 2006 Institute of Medicine (IOM) report on ensuring an infectious diseases workforce for the 21<sup>st</sup> century recommends a range of efforts to strengthen the public health infrastructure.<sup>4</sup> Those efforts include collaborations with schools of public health and medical academic centers to enhance training of public health workers.

## STRENGTHENING PENNSYLVANIA'S PUBLIC HEALTH RESPONSE

The Commonwealth of Pennsylvania decided in 2000 to implement a program to provide relevant and timely training for public health staff. This program, called the Public Health Institute (PHI), was organized as a twice yearly set of 3-5-day-long education sessions. The first letter of invitation for the spring 2000 event stated: "We believe the Institute confirms the Department's commitment to providing important professional training opportunities for our own staff as well as our partners and sister government agencies. ..." (Robert S. Zimmerman, written communication, February 2000). Another important objective of the PHI is to facilitate "networking and collaboration within the Department and with community partners."<sup>5</sup>

Since the first session of the PHI, numerous topics have been addressed, and sessions continue to be planned for upcoming years. Although our focus in this article is on the experiences of offering training in infectious diseases and core competency at the PHI, other opportunities for educational development that are offered by the Pennsylvania

Department of Health will be discussed, including the Epidemiology Journal Club and the Lunch and Learn seminar series.

## ORGANIZATION OF PENNSYLVANIA'S TRAINING PROGRAMS

### *The Public Health Institute*

Each year since 2000, 3-5-day-long PHI biannual events have been conducted in Pennsylvania. To increase participation by frontline public health workers, PHI events are held in rotating geographic regions throughout the Commonwealth. Typically, the fall institute is jointly organized with the Pennsylvania Public Health Association for the benefit of key partners, including public health students and faculty, as well as professionals in private and nonprofit organizations. Invitations to the PHI are primarily disseminated through e-mails with links to online registration and detailed course information on the PHI home page.<sup>5</sup>

Administrative aspects and scope of courses offered through the PHI events changed substantially in 2001. PHI activities were originally funded through state appropriations and overseen by the Pennsylvania Department of Health's Drug and Alcohol Programs and single county authorities (eg, Philadelphia or Allegheny County).<sup>6</sup> After the 2001 attacks on the U.S. by terrorists and the ensuing anthrax attacks, Pennsylvania and all other states received funds for bioterrorism preparedness.<sup>7</sup> Increased federal support enabled creation of the Pennsylvania Department of Health's Office of Public Health Preparedness, and PHI activities were expanded and transferred to this office. Senior leadership of the Pennsylvania Department of Health, cognizant of the opportunity created by increased federal funding, encouraged use of the already established PHI forum to address multiple emerging public health needs. Also essential was the commitment of content experts in the department and their key partners in state-based academic institutions. Continued appropriations by the state, federal support for public health emergency preparedness efforts, and creativity in use of resources has sustained PHI for the past 9 years.

### *Selection of Courses, Trainers, and Attendees*

Typically, courses for the PHI are proposed by individuals in the Pennsylvania Department of Health and external partners, including faculty in academic centers and schools of public health. Courses are selected by a PHI committee consisting of the PHI coordinator, health educators from regional offices, and a representative from the Division of Workforce Development and Training. Criteria for course selection include feedback from previous PHI participants,

trainers' backgrounds, and usefulness of the proposed course to public health workers' responsibilities. A brief questionnaire is administered in most PHI courses to assess participants' perception about trainers, course objectives, and relevance of the course to work responsibilities.

Qualified trainers are crucial to the success of the PHI. Considerable advance planning and logistical support have been devoted to recruiting and supporting a wide variety of speakers. Trainers are invited months in advance and are reimbursed for travel-related expenses; nonfederal employees are given a modest honorarium.

For example, courses on epidemiology and emerging infectious diseases offered from 2003 to 2008 were developed by an epidemiologist at the Department's Bureau of Epidemiology in collaboration with colleagues from the Maryland Department of Health; CDC content-expert epidemiologists from the Immunization Safety Office of the Chief Science Officer, National Antimicrobial Resistance Monitoring System, and mycotic and enteric diseases programs; an epidemiologist from the U.S. Department of Agriculture's Food Safety and Inspection Service; and infectious disease specialists and researchers affiliated with academic institutions including the Centers for Education and Research in Therapeutics at the University of Pennsylvania School of Medicine, the Penn State College of Medicine Milton S. Hershey Medical Center, the University of Pittsburgh Graduate School of Public Health, and Children's Hospital of Philadelphia.

Approximately 90% of attendees at the PHI since 2000 have been state public health employees, primarily from the Department of Health, but a few participants work in other state agencies, including the Department of Corrections, the Department of Public Welfare, the Department of Aging, and the Pennsylvania Emergency Management Agency. Health-related staff including those from public health programs in local and county health departments, schools, and health and long-term-care institutions participate in PHI. Over the years, PHI programs have attracted an increasing number of attendees. Whereas fewer than 200 public health workers participated in the first PHI in 2000, 371 persons participated in various training events during the spring 2008 Institute, held in State College, Pennsylvania. This is in part because attendance for Department of Health staff is considered part of their work-duty.

### *Balancing Infectious Disease Training with Other Pressing Public Health Needs*

Although PHI maintains a strong emphasis on public health preparedness and emergency response, it also strives to offer other public health topics. These include basic and intermediate epidemiology, data management and informatics, general communicable diseases, chronic diseases,

HIV/AIDS, viral hepatitis, injury prevention, community health service to special populations, and community partnerships.

A recent PHI (spring 2008) event, for example, provided a 4-day program that included 34 workshops (of which 31 were accredited for continuing education units, CEUs). Of these 34 workshops, 17 were full-day workshops and the rest were half-day courses. Topics ranged from "Legal issues in public health" to "Traumatic brain injury and visual consequences." Communications-oriented workshops covered such topics as "Applied public health advocacy" and "Autism as a public health problem." General infectious disease courses at the spring 2008 PHI addressed ongoing key public health issues including recreational water illnesses such as cryptosporidium and giardia infections.<sup>5</sup>

### *Emerging Infectious Disease Courses and Clinician Seminars*

Since 2002, courses on emerging infections (also referred to as courses in "modern plagues"—see Figure 1) have been offered during the PHI sessions. Initially offered both at introductory and intermediate levels, these courses were designed to increase understanding of the factors that drive the emergence of specific pathogens.<sup>8</sup> The curriculum changed over time to encompass specific public health topics such as antimicrobial resistance in foodborne pathogens of animal origin, healthcare-acquired infections, and ongoing emerging infectious disease outbreaks (Table 1). For example, courses in the spring 2008 PHI reviewed recent outbreaks and emerging threats including the 2006-07 multistate outbreak of human *Salmonella* Schwarzengrund infections associated with dry pet food,<sup>9</sup> emergence of drug-resistant nonvaccine pneumococcal infections in the era of vaccination,<sup>10</sup> and strategies to enhance vaccine adverse event reporting.<sup>11</sup>

Starting in the spring of 2005, PHI seminars designed to address both clinical management as well as epidemiologic characteristics of emerging infections were introduced in response to specific requests received from healthcare providers (Table 1). For example, the seminar on clinical management, epidemiology, and prevention of community-associated MRSA (CA-MRSA) was offered in May 2005 at the Penn Stater Conference Center in response to a request made by the Director of Athletic Medicine at Pennsylvania State University. Codirected by an epidemiologist from the Pennsylvania Department of Health and a clinician from the participating institution, these seminars were well attended (60 participants on average) and offered healthcare providers and frontline public health officials an opportunity for interaction. Presented in late afternoon and early evening (4:00 P.M.-8:00 P.M.), public health seminars for clinicians offered appropriate continuing medical education credits for qualifying participants. Partly because of public



Figure 1. Prairie dog used to popularize emerging infectious disease courses. Prairie dogs were associated with the 2003 outbreak of monkeypox in the western hemisphere. Additional information is available at: [www.cdc.gov/ncidod/monkeypox/](http://www.cdc.gov/ncidod/monkeypox/)

concerns about recent outbreaks of CA-MRSA in local high schools, there was media coverage of this seminar on local television channels and it was covered in print media.<sup>12,13</sup>

Some of the PHI clinician seminars offer opportunities to share with healthcare providers the findings of completed outbreak investigations. For example, the 2006 seminar on *C. difficile* antibiotic-associated diarrhea was presented to healthcare providers in central Pennsylvania after the completion of a recent outbreak investigation.<sup>14</sup> Although PHI clinician seminars have been mostly directed toward healthcare providers in human medicine, a seminar on antimicrobial stewardship in veterinary medicine was offered during the spring 2008 PHI. The timing of the antimicrobial stewardship seminar was synchronized with the annual meeting of the Pennsylvania Veterinary Medical Association, which was held concurrently at the same site. The antimicrobial stewardship seminar was organized in collaboration with the Pennsylvania Veterinary Medical Association and 2 major academic institutions: the Pennsylvania State University Department of Veterinary and Biomedical Sciences and the University of Pennsylvania School of Veterinary Medicine.

### *Core Competencies for Public Health Professionals in Pennsylvania*

The PHI continues to craft courses that meet the needs of the public health workforce at all levels, including the domains of core competencies defined by the Public Health Foundation: (1) analytic/assessment, (2) policy development, (3) communication, (4) cultural competency, (5) community dimensions of practice, (6) basic public health sciences, (7) financial management, and (8) leadership and systems thinking.<sup>15</sup>

Also taken into account are the core functions of public health as elaborated in the *Public Health in America Statement*, including such essential services as monitoring health status, investigating health problems, and enforcing laws and regulations that protect health and ensure safety.<sup>16</sup>

Although core competency courses have been offered in PHI since 2001, starting in 2008 courses in these categories were organized by an epidemiologist in the Bureau of Epidemiology in collaboration with the Pennsylvania Department of Health's Division of Workforce Development and Training. This change was suggested by

Table 1. Courses on Selected Emerging Infectious Disease Topics, Pennsylvania Public Health Institute, 2004-2008

<i>Date and Location</i>	<i>Course Title</i>	<i>Description of Course</i>
2004, May 24-28 Williamsport, Pennsylvania	Application of Epidemiology in Tracking Modern Plagues	Covered factors that drive emergence of pathogens, outbreak investigation involving viral hepatitis A, SARS, and <i>Escherichia coli</i> O157:H7. Instructors: a surveillance epidemiologist and an infectious disease specialist.
	Epidemiology of HIV/AIDS for Program Managers	Addressed importance of adherence to HIV/AIDS treatment regimen from the perspective of an infectious disease physician. Followed by discussion of social factors associated with spread of HIV/AIDS and opportunities missed by public health leaders throughout the world. Instructors: An infectious disease specialist and communications specialist from CDC.
2005, May 25-26 State College, Pennsylvania	Modern Plagues: Emerging Infections	Covered topics in emerging infectious disease, including role of the National Antimicrobial Resistance Monitoring System (NARMS) in surveillance for food-borne pathogens of animal origin, hospital-acquired infections, and practical information on submission of clinical isolates to the public health laboratory. Instructors: Two epidemiologists and a laboratory technologist.
	Clinical Management, Epidemiology, and Prevention of Community-Associated, Methicillin-Resistant <i>Staphylococcus aureus</i> (CA-MRSA) among Sports Participants	Focused on the emergence, risk factors, and molecular epidemiology of CA-MRSA and the impact of this pathogen on the empiric basis for prescribing antimicrobials. Followed by a discussion on the emergence of MRSA in the community, including outbreaks of MRSA among sports participants.
2005, October 24-28 Pittsburgh, Pennsylvania	Modern Plagues: Emerging Infections	Covered epidemiology of food-borne diseases and surveillance for antimicrobial resistance locally and internationally. Discussed outbreaks and prevention strategies for CA-MRSA infections. Instructors: NARMS epidemiologist from CDC, MRSA epidemiologist from CDC, and a microbiologist.
	Clinical Management and Prevention of CA-MRSA	Covered trends in emergence of CA-MRSA and discussed recent outbreaks in Pittsburgh high schools and impact of CA-MRSA on empiric prescribing in the outpatient setting. Instructors: MRSA epidemiologist from CDC, adult and pediatric infectious disease specialists.
2006, May 22-26 State College, Pennsylvania	Modern Plagues: Emerging Infections of Animal Origin	Covered strategies used to monitor emergence of drug-resistant bacteria in retail food. Followed by discussion of zoonotic diseases associated with such dermatologic conditions as dermatophytosis and CA-MRSA. Instructors: NARMS epidemiologist from CDC and a veterinary dermatologist.
2006, Sept. 20-22 Harrisburg, Pennsylvania	<i>Clostridium difficile</i> Antibiotic-Associated Diarrhea (CDAD)	Reviewed role of laboratory in control of <i>Clostridium difficile</i> outbreaks, testing methods, epidemiology, and clinical management. Instructors: Pathologist and an infectious disease specialist.
2008, May 19-23 State College, Pennsylvania	Monitoring Vaccine-Preventable Diseases and Vaccine Safety	Introduced public health officials to important aspects of the national vaccine safety surveillance system. Followed by discussion of the emergence of drug-resistant non-vaccine-related pneumococcal infections. Examples taken from data from the Children's Hospital of Philadelphia illustrated impact of drug resistance for children with community-acquired pneumonia. Instructors: Epidemiologist from the Office of Chief of Science at CDC and infectious disease specialists.
	Antimicrobial Stewardship in Veterinary Medicine	Covered the use of antimicrobials in small and large animals, emergence of resistance, and ways to implement prudent use of antimicrobials in veterinary medicine. Instructors: NARMS epidemiologist from CDC and specialists in veterinary medicine.

Department of Health's senior management to expand training on core competency courses. Core courses are not mandated; however, satisfactory performance of the competencies represented by these courses is required for agency personnel, and training sessions in these areas allow staff to obtain needed tools, strategies, and techniques. The collaboration of public health experts and training professionals ensures that key course content and adult learning principles and instructional design are incorporated in these and all other training sessions. Below is a description of courses offered in 2008:

- "Legal Considerations for Public Health Officials": This 1-day course examined public health law in the United States that affects the conduct of public health practice. Examples of creative interpretations of the law that allow for action to benefit the public's health were mixed with cases-in-point of situations in which the law has been a barrier to timely and effective public health interventions.
- "Epidemiology for Non-Epidemiologists": This day-long course provided an introduction to epidemiology and covered the 2 primary aspects of the science: descriptive epidemiology and analytic epidemiology. Presenters discussed some of the major milestones in the evolution of epidemiology from a qualitative to a quantitative discipline. Much of the workshop was devoted to definition and illustration of terms and processes used in epidemiology (eg, study design, confounding, bias, chance). An afternoon session covered outbreak investigation.
- "Applied Public Health Advocacy": In this 1-day course, the synergy among audience, content, and message were examined in a public health context. Participants were challenged to create messages from valid data and to deliver them with good effect to specified audiences. Course participants were asked to serve as analysts and advocates, as well as the specified target audience for a particular presentation. The course was designed to mix lecture, small-group discussion, and problem-solving sessions.

### *Additional Educational Opportunities*

#### **Epidemiology Journal Club**

Training at the PHI is complemented by educational activities such as the monthly Epidemiology Journal Club. Held since 2002, the Journal Club offers opportunities for public health workers and key partners to review scientific articles and exchange ideas. Each month a speaker from a public health agency or an academic institution is invited to present a current article from a scientific journal or the speaker's original research. Examples of topics discussed in recent Journal Clubs include human papilloma virus immunization in adolescents and young adults, emergency

department visits for antibiotic-associated adverse events, and *Mycobacterium bovis* infection in humans.

These meetings are promoted through the Pennsylvania Department of Health's website, which has a section devoted to the Epidemiology Journal Club.<sup>17</sup> Public health professionals, researchers, and other stakeholders, including people in national and international institutions, are invited via e-mail to attend Journal Club meetings. The website and the e-mail invitations include links to the article to be discussed and a biographical sketch of the presenter (Table 2).

Although physically located in Harrisburg, Pennsylvania, Journal Club meetings are broadcast live through the Department of Health's information technology network using EtherneTV. This allows public health officials in field offices throughout Pennsylvania to participate in Journal Club activities. For viewers in remote sites, interaction is facilitated through a call-in line that allows participants to ask questions and respond to the speaker. Although the number of staff using EtherneTV to view the Journal Club meetings varies depending on the article being discussed and on scheduling, there are usually between 20 and 60 participants. Additionally, each Journal Club meeting is also recorded and placed in an online, video-on-demand portion of the EtherneTV system (Table 2). This allows health department staff to watch the meeting at a later time. Articles, slide presentations, and other electronic files used in the meetings are archived for later review, and an e-mail notice is sent to staff after the meeting indicating where information relating to the meeting can be accessed. This is one example of the use of technology to facilitate PHI activities; others are summarized in Table 2.

#### **Lunch and Learn Seminars**

Other innovations include the creation in 2007 of a series of "lunch and learn" seminars, conducted by the Pennsylvania Department of Health's Bureau of Epidemiology. All public health officials are encouraged to participate in these 1-hour sessions, which provide a venue for health department employees to share their work with colleagues and stimulate discussion. Examples of recent topics include the status of Pennsylvania's web-based disease reporting system, the health impact of ingesting food contaminated with melamine, the investigation of deaths associated with non-pharmaceutical fentanyl in Pennsylvania during 2006-07, and a critical appraisal of public health literature.

#### *Direct Costs of the Training Programs*

Funds are provided from state and federal sources, so attendees are not charged a registration fee. The most recent direct cost figures available for the Public Health Institute events are for spring 2007 (Table 3). With 300 registered participants in the spring 2007 Public Health Institute, the direct cost per trainee to participate was \$316. For 4 days of

**PUBLIC HEALTH TRAINING PROGRAMS**

Table 2. Examples of Communication Technology Used in Training Programs in Pennsylvania

<i>Technology</i>	<i>Description</i>	<i>Audience</i>	<i>Examples of Use</i>
VBrick EtherneTV (web-streaming)	Provides live and recorded video to Department of Health staff through the agency's computer network	Over 1,500 department staff spread across the state	Epidemiology Journal Club meetings, statewide staff meetings, public domain satellite programs, news updates, original video productions
VBrick Presenter	Allows for live presentations, pairing video and PowerPoint presentations with real-time interaction through polling and audience questions	As an adjunct to VBrick EtherneTV, intended to reach health department staff	Staff meetings, presentations, interactive training, synchronous distance-learning events
SnagIt!	Captures computer applications and websites and converts them to an editable video file	Final videos can be placed online to reach agency staff, partners, and the general public	Computer applications, training, program demonstrations
Web-based Training	Creates websites used to convey information and provide evaluation on training topics	As a network of accessible hypertext markup language (html) files, these training opportunities can be shared with anyone who has a web browser	Mandatory training topics, new employee orientation, technical skills, case studies
Video Conferencing	Provides real-time conferencing for individuals in different geographic locations	Video conferencing equipment has become ubiquitous in modern offices, so agency staff can connect to any other site with the proper capabilities	Staff meetings, presentations, interviews

Table 3. Direct Costs Associated with the Pennsylvania Spring Public Health Institute, 2007<sup>a</sup>

<i>Product/Service Provided</i>	<i>Cost of Product</i>
Ring binders	\$3,980
Web-based registration software	\$3,695
Venue	\$39,149
Books	\$566
Copying services	\$272
Equipment and audiovisual support	\$ 4,959
Audio and accessories	\$1,225
Honorarium and travel	\$19,028
Hotel order forms (MLL)	\$16,857
Continuing education credits <sup>b</sup>	\$5,000 <sup>b</sup>
<b>Total Event Cost</b>	<b>\$94,731</b>

<sup>a</sup>Indirect costs, such as reimbursement for transportation for participants, are not included in this table.

<sup>b</sup>Estimated cost.

training, including a comfortable venue, all meals and coffee break snacks, and the opportunity to take as many as 3 full-day workshops or up to 7 combined full- and part-day workshops, this cost figure compares favorably with costs of training available to Pennsylvania staff from other agencies. The \$316 per person cost figure for PHI contrasts with the estimates for a recent national (out-of-state) public health meeting, for which the total cost per person was estimated at \$1,450. Less easy to quantify, but clearly valuable, is the informal exchange of ideas, best practices, lessons learned, and cautionary tales shared by participants during the workshops, as well as during meals and social activities.

**LESSONS LEARNED AND PROPOSED NEXT STEPS**

During the past 9 years, various training programs have been used to strengthen Pennsylvania's response to emerging pathogens and improve core competencies of frontline public health workers. Emerging infectious disease inservice training has been sustained through collaborations with state-based academic institutions and federal partners. Pennsylvania's PHI has provided a regular forum

for these training events as well as essential administrative, logistical, and financial support.

Emerging infectious disease courses at the PHI have continued to attract frontline public health workers because they are continually updated to reflect current problems and are presented by individuals with domain expertise, including epidemiologists engaged in research and infectious disease experts engaged in public health research. Our experience also demonstrates an innovative approach to addressing the training needs of clinicians and veterinarians by co-sponsoring seminars on infectious disease topics of mutual interest, such as the well-attended seminar on clinical management of CA-MRSA. This approach illustrates how public health agencies can meaningfully engage community partners, as suggested by Baker and Koplan shortly after the 2001 bioterrorism-related anthrax outbreaks.<sup>18</sup>

Our experience with emerging infectious disease courses at the PHI and the Epidemiology Journal Club suggests that state and local public health workers are interested in science-based practice and that highly qualified individuals are available to assist them. The use of modern communication technology offers flexibility in selection of presenters, and technology also allows frontline public health officials to participate in events. The key to recruiting appropriate speakers for the PHI and the Journal Club events is planning events at least 3 months in advance. Greater flexibility in the selection of speakers for the Journal Club could be achieved with modest funding to reimburse speakers for travel expenses. Additionally, our experience suggests that interactions among presenters and public health workers can yield mutual benefits. The interaction with faculty from academic institutions during Journal Club forums has resulted in identification of opportunities for summer internships and appointments for public health officials as adjunct faculty members.

Despite the successful implementation of the Public Health Institute as a workforce development program, to date the program has served only a fraction of public health workers in local government entities. The extent to which participants retain and apply information provided at the PHI has not been fully assessed. However, on short evaluations conducted after each course, emerging infectious disease courses and core competency topics are consistently rated above 90% for meeting stated objectives and usefulness to participants' assigned responsibilities. Future efforts will include evaluation of outcomes related to specific training programs—for example, application of principles and tools discussed in epidemiology courses. Other improvements include consultation with program managers in local health departments on course design and recruitment of trainers from local health departments.

Since its inception, the Public Health Institute has received strong support at the senior management level of the Commonwealth's Department of Health. As political administrations change, future success of the PHI will depend on continuation and augmentation of support to ensure

that training of staff remains a priority. The continued success of the PHI will require smooth working relations and the ongoing interest and commitment of various programs responsible for securing funding, administration, logistics, and course content. To minimize potential conflicts and duplication of efforts, there is a need for better communication, including a complete agreement on the objectives of the institute.

In summary, lessons learned in Pennsylvania offer insights into ways to maintain the vitality of public health workers in key areas of knowledge, including epidemiology, infectious and chronic disease surveillance, informatics, and public health preparedness. The biannual Public Health Institute serves as a focal point for large training events, but other activities carried out regularly throughout the year also offer opportunities for learning and interaction among public health officials and their key partners. Our experiences suggest that political will, administrative support, and the commitment of individuals responsible for developing training programs are essential to success. This is particularly important because PHI is funded through a combination of federal grants and state appropriations requiring compliance with strict guidelines. PHI can be a template for other health departments interested in developing new programs to create a technologically, scientifically, and strategically sophisticated workforce for public health practice.

## ACKNOWLEDGMENTS

We acknowledge with gratitude Robert Torres, Deputy Secretary for Administration, and Jalene Kolbe, Senior Counsel, for their assistance with the design of core competency courses; and Michael Huff, Deputy Secretary for Health Planning and Assessment, and John P. Bart, DO, Public Health Physician, for guidance and administrative support. We are also grateful to the faculty involved in teaching courses and to individuals who presented in Epidemiology Journal Club and seminars. Kathleen G. Julian provided excellent guidance on the revision of this manuscript. This work was supported in part by the Commonwealth of Pennsylvania and the Centers for Disease Control and Prevention's Public Health Emergency Preparedness Cooperative Agreement #5U90TP316967.

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*Manuscript received January 16, 2009;  
accepted for publication May 6, 2009.*

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