Scientific Education and Professional Development

Center for Surveillance, Epidemiology, and Laboratory Services (CSELS)
Division of Scientific Education and Professional Development (DSEPD)

Overview

Our Mission: To improve health outcomes through a competent, sustainable, and empowered public health workforce

Our Services

The changing public health landscape brings opportunities for embracing new approaches and also challenges the workforce to learn new skills for addressing evolving needs. We are committed to achieving our vision of a public health workforce prepared to meet emerging and future challenges.

Our Work

- Develop and deliver quality learning to strengthen the education, training, and professional development of the public health workforce.
- Enhance service, response, and consultation for fellowships, learning resources, and other public health workforce development activities.
- Provide leadership in national public health workforce efforts.
- Maximize our potential for achieving impact.

Our Programs and Activities

- Academic Partnerships to Improve Health (APIH): Public Health Fellowships
- Accreditation for CDC Learning Activities
- Career Paths to Public Health (CPP)
- CDC-Hubert Global Health Fellowship
- CDC Steven M. Teutsch Prevention Effectiveness Fellowship (PEF)
- Developing Quality Public Health Learning Products
- Epidemic Intelligence Service (EIS)
- Epidemiology Elective Program (EEP)
- Laboratory Leadership Service (LLS) Fellowship Program
- Population Health Workforce Initiative (PHWI)
- Presidential Management Fellows (PMF) Program
- Preventive Medicine Residency and Fellowship (PMR/F)
- Promoting Quality Public Health Learning Opportunities
- Public Health Informatics Fellowship Program (PHIFP)
- Strengthening Health Systems Through Interprofessional Education (SHINE)

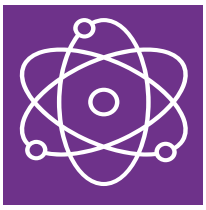
Public health workforce development → **Quality learning, valuable service, national leadership** → **Diverse, competent, sustainable public health workforce** → **Improved capabilities to provide essential public health services**

Division Highlights—FY2016

The Prevention Effectiveness Fellowship (PEF) demonstrates the value of prevention.

Since 1985, **143 PEF graduates** produced more than **3,700 publications** on the economic consequences of public health interventions

State and local public health laboratories now participate in the Laboratory Leadership Service (LLS) Fellowship.



LLS gives early career laboratory scientists a strong foundation in **laboratory safety and quality** and prepares them for future public health leadership

Our continuing education (CE) activities provide quality training—at no cost to learners.

More than **329,000 free CE credits**, contact hours, and units were awarded at a value of nearly **$3 million** to learners

Our CDC Learning Connection website has enhanced access to CDC trainings.

More than **112,000 people** from **209 countries** visited the CDC Learning Connection

Our fellows and trainees provide valuable on-the-job service to health departments, partner organizations, and CDC programs.

102 trainees were placed in **37 states and territories**

EIS officers were involved in **153 investigations** in their jurisdiction

They responded to **52 Epi-Aids** in the U.S. and internationally

Moving Toward the Future

We look toward the future of the public health workforce by

- **Increasing the effectiveness** of workforce development in epidemiology, laboratory management, informatics, prevention effectiveness, population health, and policy
- **Improving response capacity** and support for urgent domestic and international needs through short-term technical assistance
- **Strengthening the skills** of the current health workforce through quality, accredited, skills-based training.

Academic Partnerships to Improve Health (APIH): Public Health Fellowships

In recent years, public health and health care have become more focused on population health. Partnerships and interprofessional collaboration are essential to improving population health outcomes and health equity. APIH focuses on **improving the health of individuals and communities** through alliances among academic associations, universities, and CDC. Using fellowships and workforce innovation projects, APIH serves as a **CDC-wide conduit** for public health workforce activities to **enhance population health education** for medical, nursing, and public health students.

Our Services

- Provide **training opportunities to recent graduates** at the master's, doctoral, and post-residency levels in various public health disciplines.
- Increase interest in **public health careers** and help students develop relevant skills for those careers.
- Further the synergy between health systems and public health by developing an innovative **population health curriculum.**
- Assess the value of **multidisciplinary approaches to education** to improve the health of our communities.

APIH **aligns academic associations with CDC** to collaborate on initiatives that meet education and training needs of the population health workforce. The partner associations are

- American Association of Colleges of Nursing (AACN)
- Association of American Medical Colleges (AAMC)
- Association for Prevention Teaching and Research (APTR)
- Association of Schools and Programs of Public Health (ASPPH)
- State and local teachers associations.

Our Work

- Facilitate CDC-wide **collaboration with partner organizations** on workforce innovation.
- Place partner organizations' **fellows in high-impact roles,** benefitting CDC as well as the sponsoring partners' professional disciplines.
- Develop and enhance **educational tools and resources**.

Our Impact

- **Fellows are groomed to be leaders in community-based health.** From 2012 to 2016, **76 fellows** have participated in this service-based learning program. They are mentored by a CDC expert and help meet critical staffing needs within the agency. Many fellows gain global health experience working at the Center for Global Health in Atlanta or at international locations.
- **Our partners are highly influential.** Partners represent more than **500,000 learners** in various medical disciplines, providing both high-quality fellows and important influence in protecting health.
- **We create a collaborative sharing environment for public health education.** Our expanded **MedEdPORTAL**, a go-to resource for clinicians and students, includes a public health collection that contains more than **320 resources** submitted by faculty, federal agencies, and other organizations. Our online communities of practice count more than **350 members**. Our Population Health Connect listserv counts more than **430 subscribers**.
- **We shape the way public health is taught to future practitioners.** In 2013, we worked with AACN to publish a supplement to *The Essentials of Baccalaureate Education for Professional Nursing Practice*. This publication defines how public health nursing should be taught. More than **1,500 copies** of the guide have been distributed or downloaded. AACN's supplemental toolkit for faculty has been distributed to more than **12,000 educators and practitioners**.
- **We want students to choose public health.** We actively encourage medical, nursing, and other graduate students to choose a career in community-based health, and we encourage educators to help lay a path for them. From 2013 to 2015, we conducted **9 webinars** that reached more than **1,100 students, faculty, and practitioners** to showcase public health as a career and the innovative ways it can be integrated into medical and nursing education.

APIH
Academic Partnerships to Improve Health
Innovation • Integration • Impact

APIH has established online **communities of practice (CoPs)** for public health education in medicine and nursing. CoPs are groups of people who share knowledge, stories, and tools in their field of interest and help one another solve problems. Our CoPs provide a forum for schools to share their innovations and support peer-to-peer learning. We have more than **350 members** including faculty, students, and public health professionals.

APIH public health fellowships cover topics designed to reach all areas of the health system. Examples include

- An APTR/CDC fellowship focused on **policy issues** related to public health staffing and training
- An AAMC/CDC fellowship focused on engaging **corporate chief medical officers** in partnerships for public health
- An AACN/CDC fellowship focused on developing ways to address **students' chronic health conditions** in school settings

Accreditation for CDC Learning Activities

CDC's continuing education (CE) accreditation activities support the agency's role of ensuring high-quality training is available for the health workforce to protect the nation's health. CDC is accredited by seven organizations to provide **continuing education for health professionals** in the United States.

Our Services

- Improve **workforce knowledge, competence, and attitudes** that strengthen U.S. and global public health practice by promoting lifelong learning.
- Provide **accreditation services** for CDC programs and CDC-funded partner programs' educational activities.
- Ensure CDC's continuing education courses meet the standards and requirements for **reporting and assessment** set by the accrediting organizations.
- Connect health professionals with **accredited activities and support tools**.
- Look for ways to continuously improve the **quality and efficiency** of CDC's accreditation process.
- Offer CE for health professionals to help them meet **professional licensure** requirements.

Our Work

- **Share CE data** with CDC programs to evaluate learning activities.
- **Maintain and update systems** for tracking course registrations, courses completed, CE earned, and other information.
- **Pilot new models** for accrediting education and training activities more expediently.

CDC is accredited by seven professional organizations	
Physicians	Accreditation Council for Continuing Medical Education
All health professionals	International Association for Continuing Education and Training
Certified health educators	National Commission for Health Education Credentialing, Inc.
Certified public health professionals	National Board of Public Health Examiners
Nurses	American Nurses Credentialing Center's Commission on Accreditation
Pharmacists	Accreditation Council for Pharmacy Education
Veterinarians	American Association of Veterinary State Boards

Our Impact

- **A well-trained workforce is critical for protecting the public.** CDC's CE activities are designed to keep health professionals up-to-date on knowledge and practice in their field. The better trained they are, the better equipped they can be to keep the public safe and improve health. Accreditation ensures the courses they take are high quality—meeting standards set by accrediting organizations.
- **There's something for everyone—at no cost.** Professional continuing education can be costly. CDC's accredited courses are free and cover a wide range of topics, including health promotion, disease prevention, injury and disability, preparedness, and rapid-response education for emerging threats. They are easy to access through formats such as e-learning, journal articles, podcasts, printed materials, webinars, conferences, and workshops.
- **We continue to expand course offerings and support tools.** Plans for expanded offerings include healthcare worker trainings to address the latest global health threats like Zika.

In FY2016, more than **310,000 learners** earned free CE—equating to over **$3 million** in value to learners

Approximately **120 learning activities** are accredited by CDC each year

In FY2016, CDC awarded nearly 329,000 CE credits, contact hours, and units	
CNE for nurses	230,498
CME for physicians	41,805
Certificate for participation in CME for nonphysicians	30,328
CHES for health education specialists	14,050
CEU for other professionals	8,936
AAVSB for veterinarians	1,554
CPE for pharmacists	1,381

Career Paths to Public Health (CPP)

CPP ignites and inspires interest among the nation's future public health scientists by supplying **middle and high school teachers and their students** with an orientation to applied epidemiology and public health. We promote health literacy, provide professional development to teachers, and collaborate with them to create core resources and competency-based curricula for their colleagues around the world to use—introducing students to epidemiology and public health.

Our Services

- Develop **resources, tools, and competency-based lesson plans** designed to introduce the science of public health and epidemiology to middle and high school students in partnership with teachers and education-based organizations.
- Provide high-quality **professional development** for teachers.

We reach **middle and high school teachers and their students** by working with

- CDC programs
- Science Olympiad
- National Science Teachers Association
- State and local health departments
- State and local teachers associations.

The CPP website features an important resource for educators: CDC's **Epidemiology and Public Health Science Core Competencies for High School Students**—the only set of national standards for **teaching epidemiology and public health** at the high school level. It provides a framework for educators to use in teaching an entire course in this discipline. These **national standards** link with the Next Generation Science Standards and the Association of Schools and Programs of Public Health (ASPPH)-recommended critical component elements of an undergraduate major in public health.

Our Work

Every year, the **Disease Detectives Event** competition connects us with **8,000 schools** and **16,000 middle and high school students**

- Maintain the **Career Paths to Public Health website**, which provides a free online collection of teaching materials, tools, and activities that teachers use to introduce students to basic scientific concepts, provide them with experience in data analysis and interpretation, and promote critical thinking.
- Conduct the **CDC Science Ambassador Fellowship** to train middle and high school science and math teachers in public health, curriculum design, and teaching strategies. Fellows attend a 5-day workshop with CPP staff and CDC scientists to produce lesson plans aligned with CDC's Epidemiology and Public Health Science Core Competencies for High School Students. Fellows pilot the lesson plans in the classroom, present them at local teacher conferences, and help develop public health resource materials. The lesson plans and materials are added to CPP's resource collection.
- Supervise and write the exams for the middle school and high school **Disease Detectives Event at the national Science Olympiad**—an annual extramural team science competition designed to improve the quality of science education by fostering interest in a variety of science, engineering, and technology topics for grades 3–12. We maintain web-based event materials that coaches and students use to prepare for the competition and learn about public health. We have developed, provided guidance for, and sponsored the event since first partnering with the Science Olympiad in 1999. CDC also participates in and tests new strategies at a regional Disease Detectives Event tournament.

Our Impact

- **We are unique.** The CPP partnership between CDC and education-based organizations is one-of-a-kind, solely focused on teachers, students, and future public health workforce development. It has expansive reach to teachers and students across the nation and the globe. Our focus is on developing awareness of and interest in public health and supporting a strong early science foundation for the health workforce of the future.
- **Partnerships connect us with students across the nation.** By collaborating with education-based organizations, we have the capacity to reach teachers and students nationwide.
- **Our materials are free and easily accessible.** The Career Paths to Public Health website is a major distribution channel for quality epidemiology and public health educational materials. Teachers visit the site to find lesson plans, activities, and other teaching aids that have undergone rigorous review by CDC subject matter experts. Teachers can adapt the materials to a variety of teaching methods and approaches.

Since 2004, **206 STEM teachers** from **37 U.S. states and territories** and **3 other countries** have collaborated with CDC scientists to publish more than **100 K–12 public health lesson plans**

Visit our website
www.cdc.gov/careerpaths

Get ready for the next Science Ambassador Workshop
www.cdc.gov/scienceambassador

Enter a Disease Detectives Event
www.cdc.gov/diseasedetectives

CDC-Hubert Global Health Fellowship

The CDC-Hubert Global Health Fellowship (Hubert Fellowship) is designed to encourage **medical and veterinary students** to gain a **global perspective of public health** through an experiential learning opportunity. Our fellows have worked on a wide variety of issues important to the health of the global community, such as avian influenza (bird flu), foodborne parasites, HIV/AIDS, rabies, birth defects, rotavirus, vaccines, and emerging infectious diseases.

Our Services

- Develop skills in **global applied epidemiology** for medical and veterinary students.
- Administer a program that
  - ✓ Begins at CDC with a **4-day orientation**
  - ✓ Continues at the fellows' school with **training and preparation courses**
  - ✓ Culminates in a **6- to 12-week field assignment** with mentoring by CDC and other experts.
- Arrange for medical and veterinary students to get **hands-on experience** working on a priority public health issue in a developing country.

Candidates for the Hubert Fellowship are 3rd- and 4th-year **medical or veterinary students**. The program is conducted in **collaboration** with

- CDC Foundation
- CDC programs
- International ministries of health
- Schools accredited by the Liaison Committee on Medical Education, American Osteopathic Association, and American Veterinary Medical Association.

Our Work

- Integrate the Hubert Fellowship with **other fellowship activities** at CDC, especially the postdoctoral Epidemic Intelligence Service (EIS) fellowship.
- Provide a **skills-based curriculum** with training in outbreak investigations, public health surveillance, global health, and cultural competency using adult learning principles.
- Use innovative methods to track our graduates' forward progress and **evaluate the contribution** of the Hubert Fellowship to the EIS program and the CDC workforce.

Our Impact

- **The Hubert Fellowship creates pathways to a career.** Since 1998, we've trained more than 145 students—80% of them medical students. Many of our fellows go on to the EIS program, which in turn generates public health leaders at CDC, across the United States, and internationally.

Nearly **10%** *of Hubert fellows* are accepted into **EIS**

- **Fellows bring a global context to the U.S. workforce.** Students get a firsthand look at the health challenges facing communities worldwide. As they progress in their careers, they can apply what they learned in their field assignments to similar problems at home—from infectious and chronic diseases, to environmental factors, to issues of health and safety.

- **Our program is a model for other CDC fellowships.** Collaboration with EIS is vital to the Hubert Fellowship's success. We work together to plan our curricula. EIS officers help review and score fellowship applications, participate in orientation, and mentor Hubert fellows. We've also coordinated recruitment between the two programs to increase the number of underrepresented minority applicants.

Hubert Fellows Make a Difference

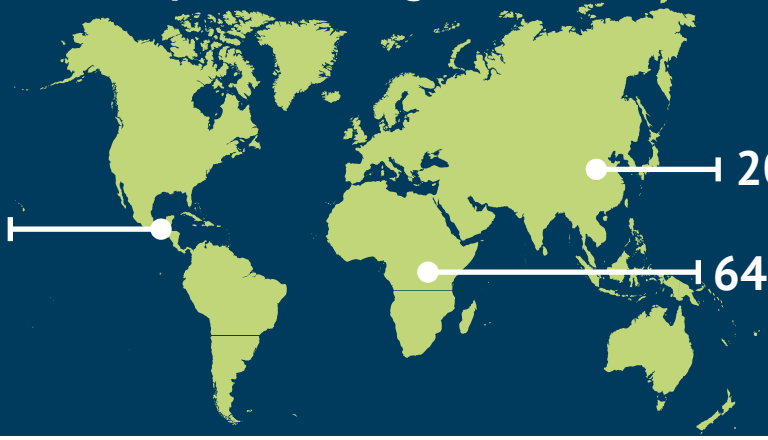
During their field assignments, Hubert fellows have

Helped determine the spread of disease-causing microorganisms in the **Thai bat population**, which will help educate people who live and work near bat caves about rabies prevention

Studied a **pneumonia vaccine,** introduced to Kenya in 2011, to learn about the vaccine's safety and adverse effects

Worked with health officials in Peru to better understand and improve treatment for **Chagas disease**—a life-threating disease carried by insects that affects 6–7 million people worldwide.

Hubert Fellowship Global Assignments: 2011–2016



CDC Steven M. Teutsch Prevention Effectiveness Fellowship (PEF)

The PEF fills a critical need for **demonstrating the value of prevention**. Fellows conduct research that provides vital information to health policy decision makers about how best to allocate and use resources to maximize the impact of their public health programs. Over the past 20 years, CDC has recruited and trained a highly effective core of health economists through the PEF. The goal of this fellowship—the **largest 2-year postdoctoral training program** of its kind in the United States—is to ensure there are well-trained health economists with expertise in policy analysis and skills to consider economic issues in public health programs.

Our Services

- **Recruit and match fellows** to CDC programs in which they study the impact of prevention programs.
- **Implement a curriculum** that encompasses population health, analysis, policy, and leadership competencies.
- **Facilitate service and technical assistance** to state and local health departments and other partners through short-term field assignments and consultations.

PEF fellows include **professionals with doctoral degrees** in specialties such as economics, decision analysis, policy, engineering, and health services research

Fellows collaborate with **CDC centers and programs**, and state and local **public health departments**

PEF research helps **policymakers, Congress, and other government agencies** make informed decisions about health promotion and disease prevention programs

Our Work

- **Strategically market** the PEF to economists, engineers, health services researchers, and others from nontraditional backgrounds to enhance candidate diversity.
- Engage with programs across the agency in an intensive screening and review process to **select and match** as many fellows as possible with their first-choice programs at CDC.
- Develop curriculum, mentoring, career development opportunities, and other support to **transition new graduates** into CDC's research environment.
- **Create opportunities** for fellows to share their work through scientific manuscripts, policy briefs, teaching educational sessions, and presenting at national meetings and conferences.
- **Collaborate with experts** from other government agencies, academia, and the private sector around trainings and seminars to enhance perspectives of fellows and other CDC staff.

Our Impact

- **The PEF has developed 2 decades of government leaders in health economics.** There are more than 140 PEF alumni, nearly half of whom remained at CDC and represent 90% of the agency's economists. Many others are employed by other federal agencies.
- **PEF fellows enhance CDC's response to emerging health threats.** PEF fellows supported the Ebola outbreak response by serving in-country. PEF fellows also served on the team that developed the "Ebola Model" estimates of the number of potential cases of Ebola under a range of scenarios.
- **PEF graduates contribute to the health economics body of literature**. PEF graduates have published an estimated 3,700 papers in peer-reviewed journals over the past 20 years.

Highlights From the PEF Fellows 2014 Graduating Class

- Published **26 papers** in peer-reviewed journals
- Delivered **33 trainings** to 592 CDC staff and partners
- Made **25 presentations** at conferences
- **7 of the 10 fellows** secured jobs at CDC after graduation

PEF Contributions to Health Economics Knowledge and Practice

Research by PEF fellows has produced results with crucial public health impact. Their work has demonstrated that

Eliminating one of the **pneumococcal conjugate vaccine booster shots** from the four-shot series could save $500 million per year ($300 million for CDC) with minimal adverse health effects.

Eliminating **cost-sharing for recommended preventive services**—an important provision of the Affordable Care Act—significantly increased use of these services.

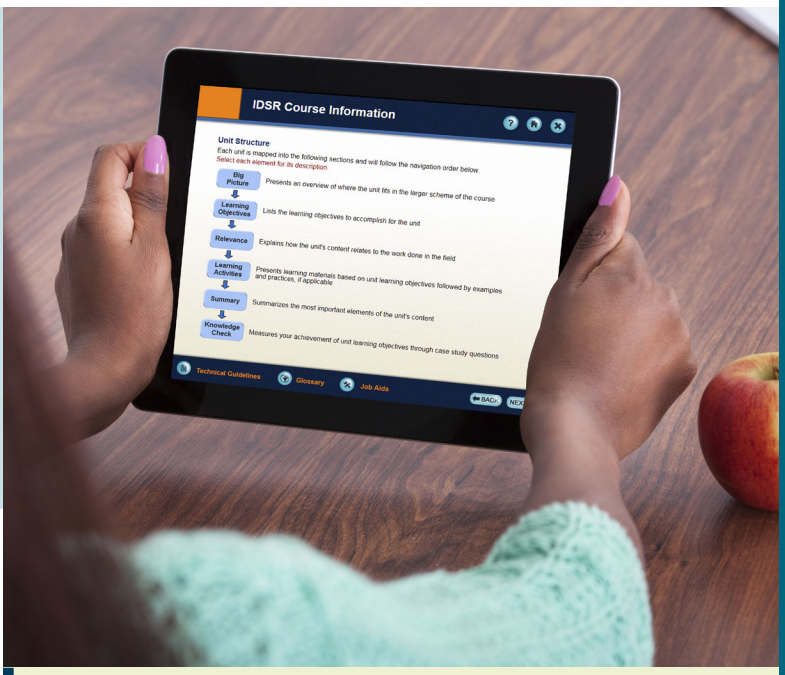
CDC central line-associated bloodstream infection education efforts prevented 40,000–75,000 infections and produced net benefits of at least $640 million from 1990 to 2008.

The **Tips From Former Smokers** campaign—the first federally funded national mass media anti-smoking campaign—cost only $393 for every life saved and was a highly cost-effective intervention.

Learn more about our program at www.cdc.gov/PEF.

Developing Quality Public Health Learning Products

We design and develop high-quality learning to help CDC programs meet professional development needs of the public health workforce. We provide **comprehensive training development services** for CDC programs and training fellowships. We also help build the capacity of health educators, e-learning developers, and trainers through the **eLearning Workgroup (eLWG)** and **CDC E-Learning Institute (ELI)**. By developing quality learning, we ensure learners receive effective training to apply best practices in the field of public health.



Our Services

- Design and develop innovative **technology-based training** for CDC programs. An example is **Quick-Learn lessons**—a form of e-learning designed to address one or two objectives and take less than 20 minutes to complete.
- Develop **interdisciplinary training** for CDC fellowship programs.
- Provide ongoing **professional development** by connecting health educators, e-learning developers, and trainers for peer support and sharing quality materials, tools, and resources.

We build capacity among **education and training professionals** through

- **eLWG**, a collaborative workgroup for CDC staff to share expertise and establish CDC best practices for e-learning design and development
- **ELI**, a 4-month fellowship primarily for state and local health department training staff to build skills in developing innovative e-learning products by working with CDC and other public health e-learning mentors.

Our Work

- Consult with CDC programs and partners on **training design and development.**
- Provide resources that help those new to e-learning **understand the basics** and assist e-learning developers with **creating quality products.**
- Help CDC fellowships meet **quality learning standards,** and build collaboration and **improve efficiencies** for training.
- Evaluate and update **fellowship curricula** based on evaluation data and program needs.

Our Impact

- **A well-trained workforce is critical for protecting the public's health.** The development of **skills-based training** that we continuously assess and improve ensures learners receive the highest quality training. A quality-trained workforce is better equipped to keep the public safe and improve health.
- **Quality e-learning tools allow CDC to expand expertise of the health workforce.** Training courses and tools have covered a range of topics for health professionals both nationally and internationally.
- **Our learning tools are recognized for excellence.** In 2015, our **safety training toolkit** for healthcare workers deployed to fight Ebola in West Africa won a Bronze Award in the 17th Annual Digital Health Awards. The toolkit teaches the principles of infection prevention and control using lectures and interactive exercises.
- **We have a well-defined model for advancing health education and training.** With groups like **ELI and eLWG**, we give learning professionals a "virtual" space to mentor one another, stay on top of industry standards, and actively engage in finding solutions, making decisions, and moving their field of practice forward. CDC and its partners reap the benefits of a better prepared workforce and more efficient and effective practices, which ultimately helps us deliver better health-related services to our communities.
- **E-learning is cost savings.** It helps employers save money by allowing employees to participate in training without having to travel. We provide tools and guidance to educators at state and local health departments on effective ways to transition from more resource-intensive classroom training. This helps health departments grow their own experts rather than having to hire outside consultants or trainers.
- **We build tools and capacity for e-learning.** We developed the **Quick-Learn Design Toolkit**, which provides a template and guide for developing a short e-learning experience based on a single learning objective. The toolkit is available for use by both CDC and external partners.

In its first 4 years, more than **40 state, local, and international health professionals** completed the ELI fellowship program

Since 2009, eLWG has expanded to include nearly **100 CDC e-learning professionals**

Take our Quick-Learn lessons
www.cdc.gov/learning/quick_learns.html

Use our Quick-Learn Design Toolkit
www.cdc.gov/learning/quality/toolkit.html

Epidemic Intelligence Service (EIS)

Think of any major disease outbreak or other public health threat, and chances are a CDC EIS officer—or disease detective—was one of the first on the scene. Since 1951, CDC has trained **more than 3,600 EIS officers**. During their training they serve on the front lines of public health, protecting Americans and the global community as "boots on the ground" epidemiologists. They respond to urgent public health threats by identifying the cause, rapidly implementing control measures, and collecting evidence to recommend how to prevent future events.

Our Services

- EIS is a **"training through service"** model. More than 90% of this training occurs under the guidance of seasoned mentors (usually EIS alumni). Our core curriculum retains "tried and true" methods used for more than 65 years, but also adapts to current public health needs.
- Each year **70–80 new physicians, veterinarians, scientists, and other health professionals** learn to
  - ✓ Apply **epidemiologic skills** critical for identifying, preventing, and controlling major threats to the public's health
  - ✓ Become **public health rapid responder**s, stepping up at a moment's notice to investigate health threats in the United States and around the world.
- EIS offers graduates a **gateway to finding successful careers** that allow them to have an important impact on health policy and decision making.

EIS officers reach people from U.S. cities to remote global villages who are threatened by disease outbreaks or other threats to the public's health. EIS responds in partnership with

- State and local health departments
- CDC programs
- Commissioned Corps of the U.S. Public Health Service
- Federal agencies working in public health
- International ministries of health.

*EIS officers were involved in **153 investigations** in their jurisdictions in 2016*

Our Work

- **Supervise and support** EIS officers.
- Collect data to **inform recruitment strategies, training programs, and conference content** that target the skills EIS officers need and prepare them for postgraduate success.
- **Collaborate with experts** both inside and outside CDC to maintain high-quality training and placement of EIS officers.
- **Respond to trends** in requests for assistance to ensure continued timely deployment of EIS officers.

Our Impact

- **We train tomorrow's public health leaders.** EIS alumni have gone on to become CDC directors; leading CDC scientists; acting surgeons general; WHO assistant directors-general, regional directors, and country directors; public health and medical school faculty and deans; city health commissioners; and state epidemiologists. Others are leaders in industry, foundations, nongovernmental organizations, and the media.
- **EIS officers are on call to protect people.** When a disease outbreak occurs or natural disaster strikes, we can mobilize our officers to go anywhere in the world to investigate and assist. EIS has provided rapid response to urgent health threats for more than 60 years—from investigations of possible biological warfare during the Korean war, to the smallpox and polio eradication campaigns, to the discovery of Legionnaires' disease and Lassa fever, to responses to Hurricane Katrina and 9/11, and of course the 2014 Ebola outbreak.

More than **80%** of EIS program graduates enter the public health workforce

More than **30%** of state or large city epidemiologists are EIS alumni

In FY2016, EIS officers responded to **52** requests for assistance in the U.S. and internationally

In FY2016, EIS officers contributed almost 2,400 days of work to the Zika response—like this EIS officer inspecting possible mosquito breeding areas in American Samoa

Epidemiology Elective Program (EEP)

Through EEP, **medical and veterinary students** are trained in public health and applied epidemiology and gain a **population health perspective** that influences their career choices and practice beyond graduation. An elective rotation in public health and applied epidemiology is vital in introducing future physicians and veterinarians to the practice of public health and provides valuable role models for pursuing public health careers.

In 1975, CDC initiated EEP for senior medical students to increase awareness of and interest in public health and epidemiology. In 1982, the program added veterinary students. During **6- to 8-week rotations**, students help investigate and solve important, **real-world health problems** including infectious disease outbreaks, natural disasters, chronic disease issues, and access to health care. They collaborate with other public health professionals on these investigations, often working closely with **Epidemic Intelligence Service (EIS) officers**—CDC's "disease detectives."

Our Services

- Introduce **senior medical and veterinary students** to preventive medicine, public health, and the principles of applied epidemiology.
- Develop skills through **hands-on experience** in applied epidemiology for senior medical and veterinary students.
- Connect some students with experienced **CDC epidemiologists** as mentors to help them
  - ✓ Learn through hands-on experience
  - ✓ Participate in surveillance of an important public health problem
  - ✓ Analyze health data for new disease risk factors
  - ✓ Work in the field to investigate an outbreak
  - ✓ Coauthor a publication of major health importance.

EEP enrolls **fourth-year medical and veterinary students**. The program is conducted in **collaboration** with

- CDC programs
- Indian Health Service
- National Park Service
- Schools accredited by the Liaison Committee on Medical Education, American Osteopathic Association, and American Veterinary Medical Association.

More than ***1,850*** senior ***medical and veterinary*** students have enrolled in EEP

Our Work

- Arrange for **60 to 70 medical and veterinary students** each year to get hands-on experience working on a priority health problem in a CDC program, Indian Health Service, or National Park Service assignment.
- Complement and **work with other CDC fellowships**, especially EIS.
- Follow students after they graduate and **evaluate their contributions** to EIS, CDC, and public health.

Our Impact

- **Graduates become our nation's health leaders.** Many EEP students go on to careers protecting the public's health. This career path may begin with their participation in the postdoctoral EIS fellowship. Many have become CDC Preventive Medicine Residents, certified by the American Board of Preventive Medicine.
- **EEP sets an example for efficient use of training resources.** We begin the process of applied epidemiology training within CDC. Our students participate in short-term epidemiology projects, attend CDC presentations and EIS seminars, assist EIS officers in the field (including Epi-Aid investigations), and coauthor scientific articles. Some go on to more indepth training as EIS officers.

EEP funnels young talent into the public health workforce

Since 1975, **249 graduates** have entered ***EIS***

More than **60%** of them took jobs in ***public health***

More than **40%** of those in public health went to work for ***CDC***

"I have been on the fence about whether I want to pursue EIS, and this elective has made me realize the EIS is definitely in my future."
~2015 EEP veterinary student

"This is an experience I will never forget and that I will carry with me as I pursue a career in preventive medicine."
~2015 EEP medical student

Laboratory Leadership Service (LLS) Fellowship Program

The LLS Fellowship Program prepares **early-career laboratory scientists** to become future public health laboratory leaders. Our focus on integrating **safety and quality** as principal elements in all their work is vital to protecting the public's health, safety, and security. Launched in 2015, this **2-year competency-based fellowship** furthers CDC's and partners' commitment to advancing laboratory biosafety and quality.

The LLS program lays a strong foundation for graduates to attain future leadership positions in public health laboratories. LLS aligns with CDC's **Epidemic Intelligence Service (EIS)** to promote interdisciplinary training, applied learning, and networking between laboratory scientists and epidemiologists.

Our Services

- Deliver a high-quality competency-based curriculum that combines **classroom learning with applied service** to develop future public health laboratory leaders.
- Promote opportunities for fellows to conduct **cutting-edge research** in applied public health laboratory sciences.
- Offer opportunities for fellows to design, implement, and evaluate public health laboratory **quality management** systems.
- Provide **management and leadership training** for fellows to complement their scientific expertise.
- Build a joint **professional network** between LLS fellows and EIS officers.
- Improve the **safety culture** of public health laboratories by training fellows to perform comprehensive laboratory risk assessments and mitigations.

LLS **candidates** are early-career scientists with doctoral degrees in a laboratory-related discipline.

The program works in **partnership** with

- Association of Public Health Laboratories
- CDC laboratory leadership, including the Office of the Associate Director for Laboratory Science and Safety and associate directors for laboratory science
- CDC laboratory scientists
- Epidemiologists
- State and local public health laboratorians.

While at work in CDC's laboratories, LLS fellows

Provide **on-the-job service** as they participate in applied public health laboratory research

Learn to apply public health **laboratory competencies** to real-world public health scenarios

Develop skills in **laboratory science, safety, and quality management** systems, gaining valuable preparation for future leadership positions

Our Work

- Provide an **intensive 1-month training program** at the beginning of the fellowship—with expert instructors from CDC, state and local public health laboratories, and other partners—followed by a more advanced classroom training later in the fellowship.
- Match each fellow with a **public health laboratory,** where they work under the mentorship and guidance of established laboratory scientists and gain real-world experience helping to solve urgent public health problems.
- Provide activities that make **integration of safety and quality** a focus of on-the-job training.
- Respond through **Lab-Aids**, a laboratory research response parallel to the EIS Epi-Aid service, through which public health laboratories can request assistance on short notice from fellows and CDC staff when urgent health problems arise.
- Build our program on the successful and well-established **EIS framework and infrastructure models**.

Our Impact

- **We fill a critical gap in laboratory training. LLS helps CDC meet its commitment to enhanced laboratory safety by quickly addressing needs.** Our program is also a proving ground for newly established performance skills for public health laboratory training that other training programs may want to adopt.
- **We provide a cornerstone in CDC's national and global model of excellence for public health laboratories.** LLS graduates maintain the highest quality public health laboratory science by applying principles of safety and quality management systems.
- **Fellows learn the value of collaboration.** Since the LLS and EIS programs are aligned, participants in both programs start their careers as colleagues, creating a model for future collaborations between laboratory scientists and epidemiologists.

In 2015, LLS celebrated several firsts

February 2015: First class of seven fellows matched with their CDC host laboratories

July 2015: First laboratory safety and quality management training provided to fellows

July 2015: First fellow deployed on a Lab-Aids assignment, working with EIS officers to investigate *Mycobacterium avium* infections in heart surgery patients

December 2015: First fall course held, providing advanced laboratory safety and quality management training for fellows

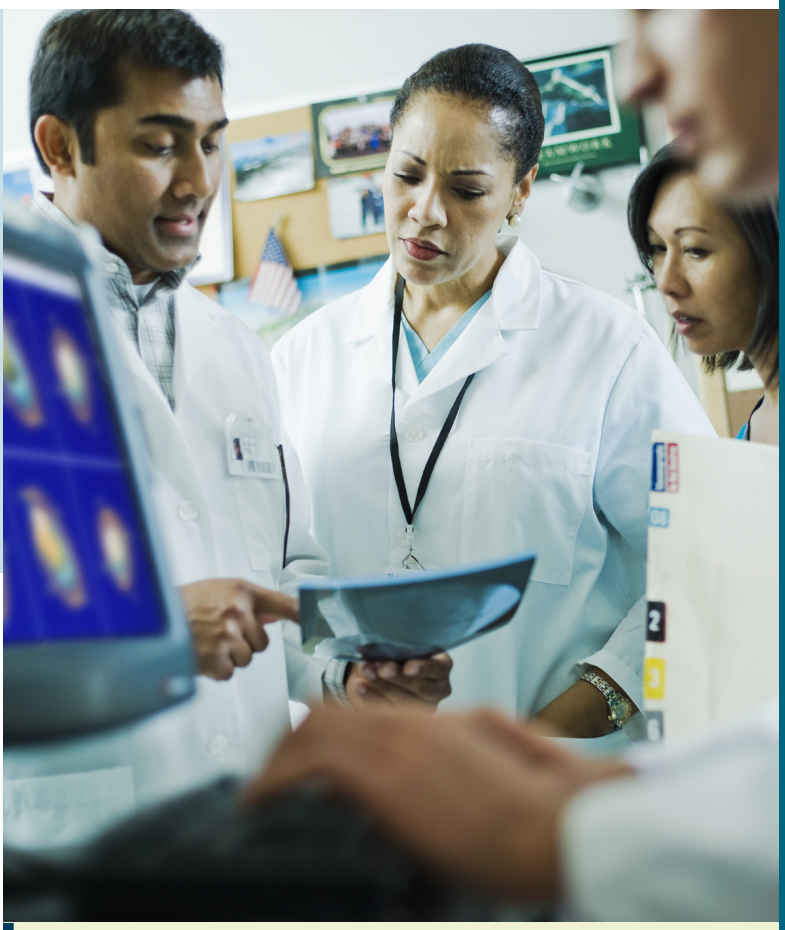
Laboratory Leadership Service

"The Laboratory Leadership Service. . .will create tomorrow's leaders in laboratory science and safety."

~Dr. Thomas Frieden, CDC Director

Population Health Workforce Initiative (PHWI)

Improving health outcomes in the United States is a significant driver of CDC's PHWI, which adds a **population health focus** to existing CDC fellowships. We serve as an **overarching curriculum and mission** for longstanding fellowships in preventive medicine, informatics, health policy, and health economics. We engage fellows with unique opportunities to solve complex problems by collaborating with health departments, community health agencies, and health care delivery organizations. Our aim is to **link health departments and healthcare systems** to improve the community's health while also grooming professionals who can lead in the emerging population health environment.



Our Services

- Create **multidisciplinary teams** of population health professionals to integrate health departments and healthcare systems.
- Use **interprofessional education** to train population health professionals and prepare them for collaborative approaches to problem solving.
- Ensure PHWI efforts **complement existing CDC fellowship programs** and other major national initiatives associated with population health.
- Unify existing fellowships with a **common curriculum and mission** in population health workforce development, giving learners in a variety of disciplines hands-on training and a common understanding of population health policy development and service delivery.

PHWI aims to develop the **next generation of population health leaders** in areas of public health, health care, and community health. To do this, we **collaborate** with

- Academic partners like the Association of American Medical Colleges and the Association of Schools and Programs of Public Health
- State and local public health agencies
- CDC programs
- Communities with dedicated population health training sites to host CDC fellows
- Healthcare sector
- International ministries of health.

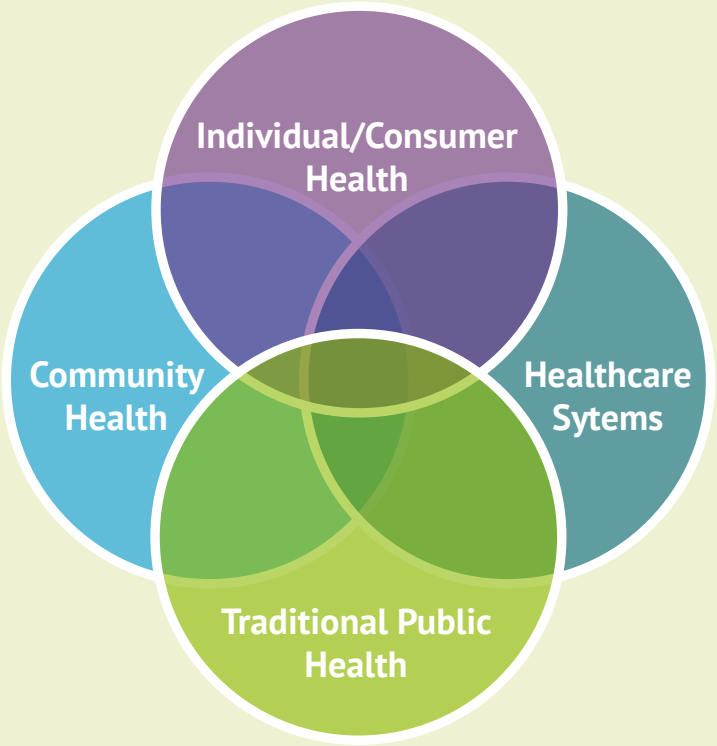
Our Work

- **Develop a population health curriculum** that covers multiple disciplines and links fellows with relevant and timely training resources.
- **Engage partners** in recruiting training sites and developing the curriculum.
- **Restructure and realign** existing fellowship programs and cooperative agreements to include a population health focus.

Our Impact

- **PHWI is where other training programs intersect.** CDC has well-established fellowship programs in preventive medicine, public health informatics, prevention effectiveness, and policy and management. They are well-positioned to integrate the public health and healthcare systems. Under PHWI, fellows from different disciplines are placed in interrelated work environments to bring their unique skills together to resolve issues and address health challenges.
- **We prepare the next generation of population health leaders.** To meet tomorrow's workforce needs and better protect the nation's health, public health agencies, healthcare systems, and communities must come together. As a result of PHWI, fellows provide an infusion of leadership talent and partnerships that CDC and local agencies, hospitals, and clinics can build on. These are the healthcare partnerships of the future.
- **We bring health departments and health systems together to improve the well-being of communities nationwide.** Using PHWI's total population health approach, health departments play a significant role in convening major stakeholders from various sectors of the community—such as health care, industry, education, and public safety—to strategize health priorities and promote a culture of wellness as diverse as the needs of the people they serve.

The Total Population Health Approach



Collaboration provides a strong foundation for health. Leveraging talent, expertise, and infrastructure leads to better health for the entire community. The multidisciplinary aspect of PHWI supports the full spectrum of population health.

Presidential Management Fellows (PMF) Program

Since 1977, the PMF Program has attracted outstanding **graduates from various academic disciplines** who are committed to excellence in federal service, leadership, and management. It is a distinguished, highly competitive **2-year career training program in leadership and management** for recent graduates with master's, law, or doctoral degrees. The government-wide program is run by the Office of Personnel Management. Fellows serve in many federal agencies.

CDC adopted the PMF Program in 1988. Since then, we have recruited more than **280 exceptional fellows.** In 2014, the program added a track for fellows with backgrounds in **science, technology, engineering, and math (STEM)**. This allows the government to address a critical skill gap. At CDC, our outstanding PMF STEM candidates fill positions in areas such as epidemiology, economics, biostatistics, biology, toxicology, information security, biohazard threats, and geographic information systems.

PMF PRESIDENTIAL MANAGEMENT FELLOWS PROGRAM
U.S. OFFICE OF PERSONNEL MANAGEMENT

Our Services

- Provide an effective **skills-based curriculum** that combines on-the-job training with classroom-based learning and mentorship.
- Develop a **robust recruitment plan and placement process**, with a special focus on increasing the number of STEM fellows at CDC in areas such as biohazardous threats, emerging diseases, chemistry, food science, nutrition, resource economics, toxicology, and veterinary medicine.
- Illustrate the **value and impact** of the program at CDC.

Our Work

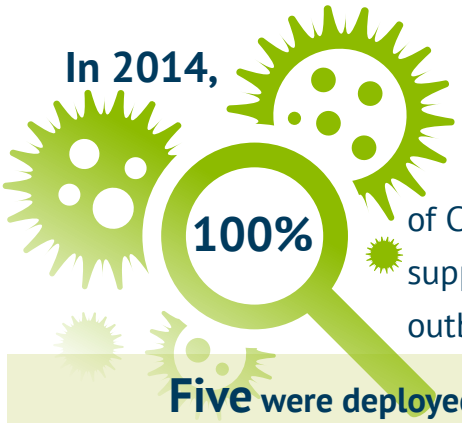
- **Recruit and place candidates** in health policy, management, and leadership training positions at CDC.
- Work with a curriculum development committee of former PMF graduates and education subject matter experts to **enhance the traditional PMF curriculum** and **incorporate a STEM focus**.
- **Track PMF activities** to assess how the fellows perform, how effective they are at CDC, and how well the curriculum meets their needs.
- **Highlight fellows' accomplishments** at CDC in showcases such as annual PMF symposia and reports.

Our Impact

- **The PMF Program brings the best and brightest into public service.** It is the federal government's premiere pipeline for moving advanced degree graduates into government leadership positions. Candidates undergo a rigorous screening process that whittles down an initial pool of thousands of applicants to approximately 600–800 finalists. The CDC PMF Program attracts more than 250 applicants annually from a variety of academic disciplines and consistently hires one of the largest cohorts of fellows at HHS.

- **PMF alumni become CDC leaders.** They have gone on to senior staff positions as policy directors, center directors, and the agency's chief of staff. STEM fellows are trained to lead the federal science and technology enterprise, manage research and development programs, develop technically-informed policies and regulations, and respond to natural and manmade disasters.

- **Fellows are valuable to CDC's mission.** PMFs produce important work to help advance public health. Fellows and alumni have made significant contributions to public health policy, program planning and evaluation, and strategic communications at CDC and across federal agencies. As part of their training, fellows must complete an assignment in another CDC office or federal agency or at a state or local health department. These assignments allow fellows to cultivate critical partnerships as they learn to apply their knowledge and skills.



of CDC's PMFs supported the Ebola outbreak response

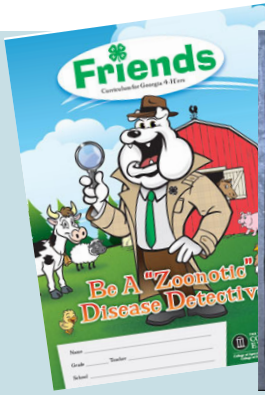
Five were deployed to West Africa

Presidential Management Fellows include **recent master's, law, or doctoral** graduates—including those with STEM degrees—who are committed to public health.

PMF positions are tailored to each fellow's career goals, offering hands-on training and mentorship experience. The program provides a **pathway to CDC management and policy leadership** positions. Most PMF positions are located at CDC headquarters in Atlanta, Georgia. Others are in CDC facilities in Maryland, Ohio, Pennsylvania, Colorado, Washington, DC, and several international locations.

Since 1988, CDC has **recruited** more than **280 PMFs**

Approximately **87%** have been **permanently employed** at CDC



PMFs have produced innovative work at CDC. For example, through a **partnership with 4-H,** one of our fellows led a group of scientists, communications experts, and artists in producing a **magazine for fifth and sixth grade students.** The magazine, called *Friends,* teaches students about preventing zoonotic disease (diseases that spread between animals and humans, like swine flu and *Salmonella* infections). **Graphic novellas target junior high students** to teach them about zoonotic disease, help them understand CDC's role in public health outbreaks, and spur their interest in science.

Preventive Medicine Residency and Fellowship (PMR/F)

Since 1972 the PMR/F program has provided national leadership in graduate medical and health professional education. We develop public health leaders prepared to efficiently identify and address major population health issues. Our fellows develop skills in project management, program evaluation, policy analysis, grant management, and community health improvement.

Our Services

- Develop the **leadership and management skills** necessary for population health leaders by coordinating the
  - ✓ **Preventive Medicine Residency (PMR)**, established in 1972, which has a 24-month track for physicians without an MPH and a 12-month track for those with an MPH
  - ✓ **Preventive Medicine Fellowship (PMF),** a 12-month fellowship established in 1983 for nurses, veterinarians, and dentists with an MPH
  - ✓ **Population Health Training in Place Program,** established in 2015 for physicians and doctoral-level learners to develop leadership and management skills in population health practice while remaining in their jobs.
- Provide **training opportunities** that focus on growing and applying critical leadership skills needed for policy development, program evaluation, and community health improvement.

Learn more about PMR/F

E-mail: prevmed@cdc.gov
Phone: 404-498-6181

PMR/F learners include

- Selected Epidemic Intelligence Service graduates (physicians and veterinarians) and other comparably trained professionals
- Other health professionals—nurses, dentists, physician assistants, and international medical graduates.

To develop leaders in public and population health, PMR/F works **in partnership with**

- Federal, state, local, and tribal health departments
- Public and population health stakeholders
- Private and nongovernment organizations.

Our Work

- **Recruit and place** top applicants in public health, health care, and community health settings where they are mentored by experienced practitioners.
- **Maintain a high-quality curriculum** and supervised practical experience to expand leadership skills needed to develop efficient, effective, and sustained public and population health programs that improve community health.
- **Provide global leadership** in the field of preventive medicine education.
- **Collaborate with capacity development initiatives** at CDC and other organizations to strengthen the public and population health workforce.

Our Impact

- **We're addressing a critical shortage of preventive medicine physicians.** A 2007 Institute of Medicine report found that the nation needs more trained public health workers, including public health and preventive medicine physicians. Through PMR/F, CDC offers opportunities for health professionals to train in a high-demand specialty and provide a vitally needed service to communities and the nation.
- **We develop leaders in population health.** Residents and fellows learn to design, launch, and assess public health programs, develop or analyze health policy, or conduct a community health improvement project. Some work at CDC, while others play critical roles in state and local health departments, at universities, or in private sector agencies. In 2015, we launched a new professional development program—the **Population Health Training in Place Program**—for CDC staff to develop leadership and management capacity to improve health care, lower patient costs, and improve the health of populations.
- **Ours is the only nonmilitary, federal-level preventive medicine residency.** We provide a unique training program for medical graduates who want to pursue careers in population health. The PMR meets the residency requirement of the American Board of Preventive Medicine for the public health and general preventive medicine specialty.

As part of his PMF experience, Ernie Sullivent was assigned to the **Aerial Distribution of Rabies Vaccine** for the Regional Rabies Control program in the **Texas Department of State Health Services**. He evaluated the agency's oral rabies vaccination program in south, central, and west Texas. His evaluation showed that this program effectively eliminated rabies in the coyote and gray fox populations. This activity has **prevented an estimated 2,600 cases of rabies** in wild animals a year. There were two human deaths from rabies before the program began; there have been no cases of human rabies since.

Promoting Quality Public Health Learning Opportunities

For decades, health professionals have looked to CDC for quality, up-to-date education and training to improve practice and meet professional development goals. In 2010, the **CDC Learning Connection** was launched as a website to promote quality learning and help the health professional community find CDC trainings. Since then, the CDC Learning Connection has grown beyond a website to engage public health and healthcare professionals around the world through social media messaging and e-newsletters.

CDC Learning Connection is also a pathway to access **CDC TRAIN**—a dynamic learning management system that allows users to locate and track learning and enables CDC to manage training for a wide variety of learners. CDC TRAIN is a part of **the Public Health Foundation's TRAIN**, the nation's premier learning resource for professionals who protect the public's health. The system is currently used by 25 states and 3 federal agencies.

CDC Learning Connection
Connect. Learn. Improve health.
www.cdc.gov/learning

CDC TRAIN
CDC's online learning system

CDC Learning Connection features

- ✓ New learning opportunities that align with public health events and observances
- ✓ A no-cost way for CDC programs and partners to promote their trainings to a large audience of professionals
- ✓ The ability to view the site from any device, mobile or desktop
- ✓ The opportunity to subscribe to a monthly e-newsletter that delivers new CDC trainings directly to your inbox
- ✓ E-learning design tools and resources.

CDC TRAIN features

- ✓ A no-cost centralized delivery system for CDC programs and partners to manage and market their trainings
- ✓ Access to more than 7,700 courses in a variety of formats (classroom training, webinars, online self-study)—more than 1,500 developed by CDC programs
- ✓ Advanced search capabilities to find the right course
- ✓ User feedback through course ratings and discussion boards
- ✓ A transcript function for learners to track professional development.

Our Services

- Partner with the **Public Health Foundation**, a private nonprofit training organization.
- Work with leaders across the agency to identify **relevant and timely educational activities** to promote on CDC Learning Connection and add to CDC TRAIN.
- Conduct **outreach and promotion** to increase awareness of CDC TRAIN and CDC Learning Connection through electronic communication channels (e-newsletters, social media, website features, etc.) and presentations to internal and external audiences.

Our Impact

- **CDC Learning Connection and CDC TRAIN reach a growing worldwide audience.** These platforms get educational tools to health professionals quickly to respond to public health needs. In FY2016, more than **112,000 people** from **209 countries** visited the CDC Learning Connection website to find out about public health training opportunities. A course listed in CDC TRAIN can reach more than **1 million professionals** registered across the entire TRAIN system. In FY2016, more than **89,000 people** registered for public health trainings in CDC TRAIN.

Every day, more than **100 new learners** *join CDC TRAIN*

- **We engage the public health community in interactive ways.** As of FY2015, the monthly e-newsletter had more than **68,000 subscribers**. CDC Learning Connection's broad reach through electronic communication channels helps to increase public health workforce awareness of CDC's training opportunities.
- **CDC TRAIN helps programs and partners meet their training goals.** More than **74 CDC programs** and many funded partners now list their courses on CDC TRAIN to maximize course visibility. Several CDC programs actively use the system to evaluate trainings and manage the learning process for a group of learners.

CDC Learning Connection and **CDC TRAIN** are aimed at

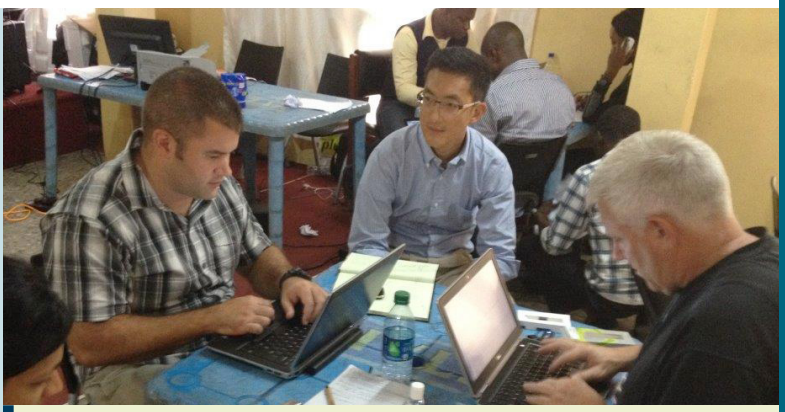
- **Learners**—Public health and healthcare professionals (e.g., epidemiologists, first responders, health educators, laboratorians, nurses, physicians, scientists, veterinarians)
- **Training Providers**—CDC and CDC-funded public or private organizations who provide and publicize public health training courses
- **Training Offerors**—CDC and CDC-funded public or private organizations who use CDC TRAIN to deliver, manage, and evaluate workforce training.

In FY2016, we supported the Zika response by ensuring Zika-related training and other activities were easily accessible from the CDC Learning Connection home page, the CDC Zika Virus website, and through a button to search CDC TRAIN.

Public Health Informatics Fellowship Program (PHIFP)

Public health information systems play an increasingly prominent role in helping move the right information to the right person at the right time—so the right public health decisions can be made. Health information systems and new sources of data are growing in complexity. This creates a need for **information systems that are thoughtfully designed** so the population health workforce can interpret data and solve public health problems. Now more than ever, public health and healthcare organizations need a competent workforce that can develop, manage, and evaluate these complex information systems.

PHIFP, established in 1996, provides on-the-job training for doctoral- or master's-prepared professionals. While working in CDC programs to **enhance our agency's informatics workforce**, fellows help state and local health departments and international public health agencies solve complex public health informatics challenges. They apply expertise in information science, computer science, and information technology to address current and future informatics needs.



PHIFP fellows include **professionals with doctoral or master's degrees** in

- Public health, medicine, health care, health services research
- Computer science, information science, information systems
- Statistics
- Epidemiology
- Public health informatics or a related discipline.

PHIFP aims to provide **robust informatics capacity** primarily to CDC, but also to other public health organizations.

Our Services

- **Provide extensive training and experience** preparing professionals to solve cutting-edge informatics issues in public health.
- **Develop a curriculum** that comprises 10% course work and 90% on-the-job training in both informatics and public health.
- **Place fellows in CDC programs** where they
  - ✓ Work on federal informatics projects like the BioSense Platform and the National Notifiable Diseases Surveillance System
  - ✓ Provide technical assistance to state and local health departments and international health agencies
  - ✓ Evaluate complex public health information systems.
- **Respond to Info-Aid requests** for fellows to provide analytic support to state and local health departments.

More than half *of PHIFP graduates continue in* ***public health***

Our Work

- **Recruit PHIFP fellows** for CDC programs that need informatics expertise, using a variety of tools including social media outreach and alumni engagement.
- **Conduct a comprehensive evaluation**—including surveys, interviews, and in-person visits with fellows and host sites—to determine whether the fellowship is meeting its goals.
- **Continuously improve the program** by regularly reviewing the curriculum, recruitment process, performance of both the program and the fellows, and the evolving informatics complexities and public health informatics needs.
- **Monitor and evaluate trends** in Info-Aid requests from state and local health departments to ensure appropriate deployment of fellows with the skills to address problems.
- **Engage with partners** including alumni, state and local health departments, and national public health organizations.

Our Impact

- **Our fellows develop expertise in a much-needed field.** They learn and work with teams involved in research and development of public health information systems, and they're trained to provide technical assistance to state and local health departments and international agencies. More than half continue working in public health after their fellowships. Others find jobs in academia, health care, and the private sector.
- **Informatics expertise is critical to CDC programs in the United States and abroad.** PHIFP fellows have helped to improve the implementation of information systems and conducted informatics evaluation projects. Several fellows participated in the Ebola emergency response both at CDC and in Guinea. PHIFP supports global health informatics needs by placing fellows on strategic global health security projects in multiple countries and training country staff in informatics.
- **Ours is the first public health fellowship designated as a Department of Labor (DOL) Registered Apprenticeship.** This means that CDC PHIFP graduates earn certificates from two federal agencies. Registering the apprenticeship opens up the possibility of DOL supporting the growth of CDC fellowships. In addition, because registering the apprenticeship involved establishing a Standard Occupation Classification for health informatics, DOL can now track the growth of this field.

In addition to their CDC assignments, PHIFP fellows provide **short-term informatics assistance** to other federal agencies, state and local health departments, or global health authorities. For example, PHIFP fellow Loretta Amadi (above, left) is seen here with a data manager in a CDC office in Cairo, Egypt, conducting **workflow analysis of an information system** to improve data access and quality in the International Emerging Infections Program.

Strengthening Health Systems Through Interprofessional Education (SHINE)

Strengthening health systems to achieve improved health outcomes is a deliberate process. It involves the public health and healthcare systems creating a **workforce that spans boundaries and disciplines**. This interprofessional workforce can implement many changes critical to improving overall population health in communities across the nation. SHINE addresses the need for enhancing **public health informatics and workforce capacity** in health systems by connecting local and federal population health workforce development efforts.

This collaborative project—funded by CDC in partnership with the **Council of State and Territorial Epidemiologists** and the **National Association of County and City Health Officials**—sponsors **three complementary fellowships** that target public health workers at different stages in their careers. These fellowships are united by SHINE's commitment to bringing systems and disciplines together to achieve sustained improvements in overall health.

Our Services

We **develop, implement, and evaluate curricula** focused on informatics, health systems integration and transformation, and community engagement to train the public health workforce. SHINE fellowships strengthen state and local health departments by creating a platform for integrating public health and health systems. We use informatics, systems thinking, problem solving, and leadership to transform systems. Our three programs are

- **Applied Public Health Informatics Fellowship (APHIF)**, a 1-year training program in informatics for graduates with a **doctoral or master's level degree** in public health informatics, or a degree in epidemiology, statistics, computer science, or related field with **applied informatics experience** or an informatics certificate.
- **Health Systems Integration Program (HSIP),** a 1-year fellowship for **public health professionals with doctoral or master's degrees** that is designed to strengthen the links between public health and healthcare.
- **Informatics Training in Place Program (I-TIPP)**, a 1-year fellowship that helps **health department employees** gain knowledge and skills in informatics while they remain on their jobs. I-TIPP fellows get experience solving problems in informatics areas such as electronic health records, meaningful use of health data, and integrating health systems.

SHINE
Strengthening Health Systems through Interprofessional Education

Our Work

- Attract qualified applicants through **coordinated marketing and communications activities** with our public health partners. Our messaging emphasizes the importance of leveraging the evolving informatics and epidemiology landscape to achieve health systems and public health integration goals.
- Engage partner networks—including alumni, host sites, the U.S. Department of Labor, universities, and public health and healthcare professional associations—to help develop the **strategic framework** for SHINE programs.
- Assess all aspects of SHINE on a regular basis to ensure **continuous quality improvement**. This information helps us fine-tune our fellowships to provide a high-quality experience and meet current public health workforce needs. Assessment consists of
  - ✓ An annual review of the recruitment, funding, and curriculum development process
  - ✓ Evaluation of our fellows' learning experiences
  - ✓ Analysis of the informatics needs of the current workforce.

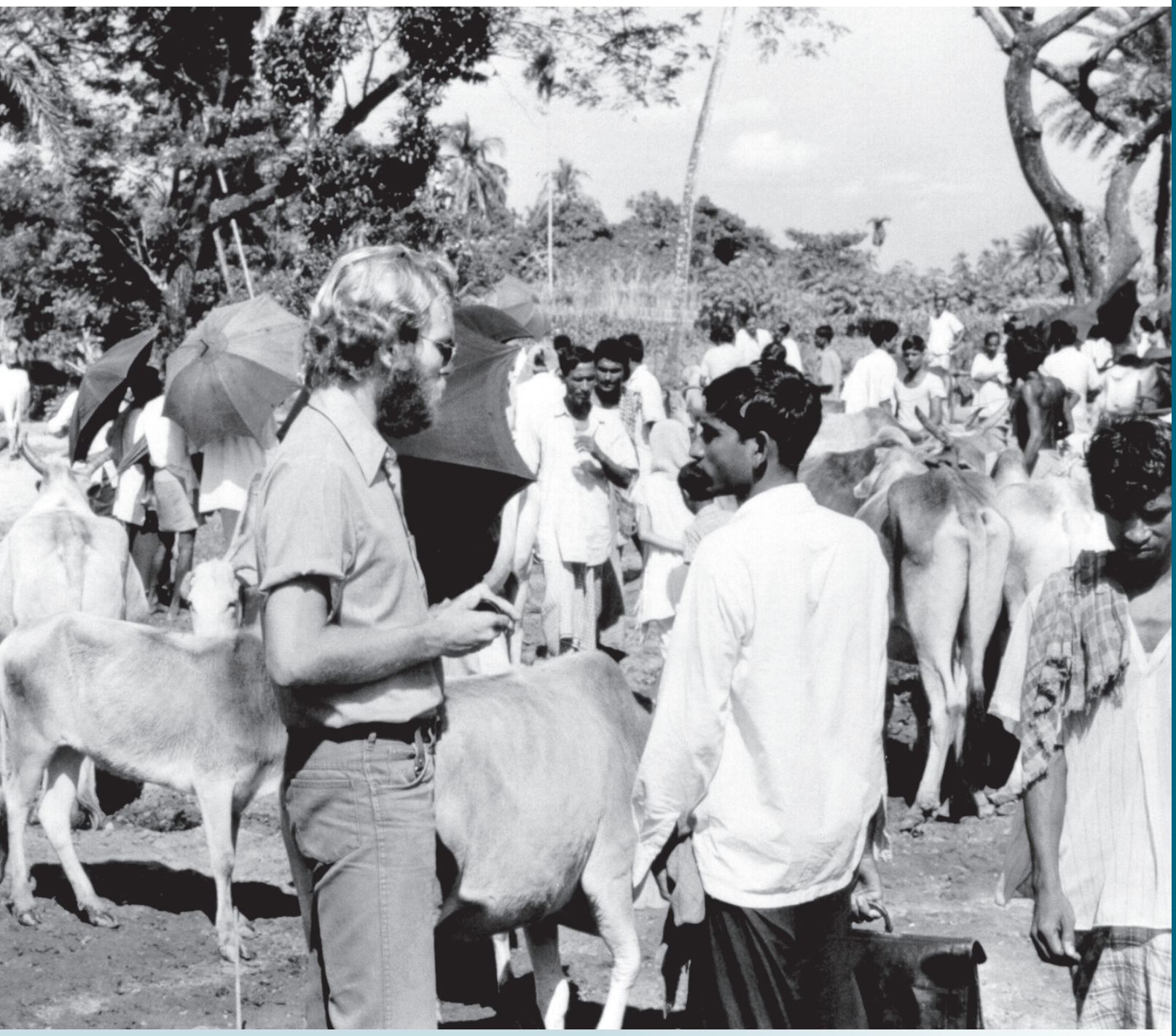
Our Impact

- **Our fellows fill important gaps in the public health workforce—both during their fellowships and afterward.** There's a need for greater numbers of well-trained population health professionals in a wide variety of settings. The SHINE fellowships, with their state and local emphasis, complement other CDC fellowships designed to enhance the workforce at federal and nonfederal organizations. SHINE fellows complete projects that meet real-world needs during their fellowships and bring much-needed skills in integration and informatics to their careers.
- **We develop informatics-savvy population health professionals.** Two of the SHINE fellowships focus on informatics—an area of growing importance to healthcare and public health agencies. SHINE provides training and hands-on experience in informatics, helping to meet the nation's increasing and urgent need for practice-ready experts in this area.
- **SHINE is a model for efficiency through collaboration.** Our three fellowship programs leverage funding, share resources, and develop course materials collaboratively, enabling us to maximize the opportunities available to our fellows and partners.

SHINE is an interdisciplinary, collaborative approach to educating the future public health workforce that uses an **interprofessional education and community approach.**

SHINE fellows include

- Entry- to mid-level health department employees
- Practitioners with a doctoral or master's degree
- Recent doctoral or master's level graduates.



This image shows former CDC Director Dr. Jeffrey Koplan on a field assignment in Bangladesh during the worldwide smallpox eradication effort in the 1970s. Dr. Koplan was an Epidemic Intelligence Service (EIS) Officer, Class of 1972. Established in 1951 and now part of CSELS, EIS is one of CDC's flagship programs.