

PUBLIC HEALTH LABORATORY WORKFORCE NEEDS

As evidenced by COVID-19 and other emerging infectious disease outbreaks over the last several years, the public health laboratory workforce needs to remain flexible and diverse in its ability to respond to a broad range of threats, both man-made and natural in origin.

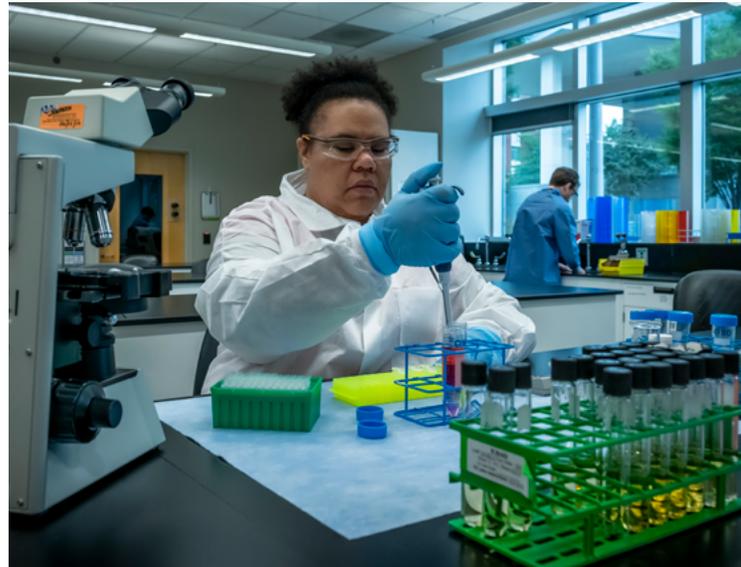
In order to support this diversity and complexity, the workforce encompasses laboratory scientists and professionals with infectious disease education, training and experience in microbiology, virology, molecular technology, genomics, pathogenesis, evolutionary biology and ecology, data management and other related fields. Similar breadth in education, training and experience is also possessed by public health laboratory scientists in the parallel fields of human genetics and newborn screening, environmental science, biomonitoring, informatics, laboratory leadership, data science, biosecurity, laboratory safety, quality systems, training and education.

Public health laboratory professionals view their work through a system lens, supporting the [10 Essential Public Health Services](#).¹ From investigation and monitoring, to regulations and policy, to training, applied research and partnerships, public health laboratories are a key component to assuring not only population health, but health equity. While infrastructure such as facilities, equipment, reagents and supplies are critical, the foundation of all public health laboratory services relies on a qualified professional and paraprofessional workforce.

WORKFORCE NEEDS

The continuous long-term erosion in the funding support for the core public health infrastructure has dramatically impacted workforce shortages within public health laboratories. Laboratory science, however, continues to grow in complexity and coupled with the rapid advances in technology such as bioinformatics, has elevated educational requirements and competencies. Yet while workforce knowledge and skills are in higher demand, the precipitous decrease in clinical laboratory science programs has resulted in a concurrent decrease in appropriately-trained and qualified individuals. Recruitment and retention pipelines are also burdened by administrative hurdles in laboratory hiring processes and job classifications, as well as a disparity in compensation between the public health laboratory workforce and the private sector. These major factors, among others, result in strong competition for fewer individuals. In the [Focus on Public Health Laboratories: A Workforce Survey Report](#), which contains a breakdown of salaries by position and region, only 37% of respondents were satisfied with pay. In addition, 30% of survey respondents indicated an intent to leave the workforce within the next five years.²

The prolonged duration of the response to the COVID-19 pandemic exacerbated the negative impact of under-staffing. Public health laboratories demonstrated incredible resilience but strained under the intense pressure to ramp up and sustain long-term surge capacity. At the same time, the “customary and usual” work of the public health laboratories was either delayed, or simply not done. Staff were also called upon to add a range of logistical, training, community outreach and data analytical duties to their wet-bench based duties, supporting non-traditional testing sites such as long-



A laboratory scientist conducts testing at the Virginia Division of Consolidated Laboratory Services, the state's public health laboratory. (Photo: APHL, 2019)

term care facilities, pop-ups and drive-throughs. Laboratories shifted to 24/7 operations and staff worked long hours for months on end with no relief and limited opportunity for added compensation. As a result, some suffered burnout while others resigned or retired, leaving the laboratory community to face long-term emotional trauma and increasing low morale.

Public health laboratories need highly trained and experienced professionals and paraprofessionals at every level of the complex environment in which they operate. Funding must support training at the undergraduate, graduate, and post-graduate levels to establish pipelines of new employees. Paid fellowship and internship opportunities are critical to give early-career professionals field exposure. Compensation needs to be competitive with the private sector and provide for career advancement. Short-term investments to plug the current gap are insufficient—a long-term, sustained investment within the public health laboratory workforce is vital to ensure they can meet and sustain their core mission.

RECOMMENDATIONS

- **Provide \$412 million* annually to increase the current public health laboratory workforce by 3,000 FTEs across all job categories with appropriately-qualified professionals and paraprofessionals through immediate contracts, with obligation to sustain as full-time permanent employment at competitive salaries.** A recent APHL survey response from 84 directors of state, local, large city and territorial public health laboratories demonstrated a range of need from 30% increase to as high as 75% increase in full-time equivalent staff (FTE), to meet on-going demands and establish appropriate preparedness and response capabilities. Streamlining the hiring processes to ensure timely recruitment and offering competitive compensation are essential to attracting and retaining this new workforce.³
- **Expand the national public health laboratory pipeline to graduate and post-graduate programs and provide \$80 million annually to support 520 CDC-APHL fellowships.** Currently the CDC-APHL Public Health Laboratory Fellowship Program matches only 20-35 funded fellows annually across all scientific program areas. Fellowships are needed to support the full range of scientific disciplines required in public health laboratories, applying their education, and gaining critical knowledge and skills to a range of important and emerging public health problems. Individual fellows need funding for two-year rotations, including:
 - Infectious Disease (200)
 - Environmental Sciences (200)
 - Newborn Screening (40)
 - Bioinformatics (20)
 - Quality and Safety (20)
 - Training and Outreach (20)
 - Laboratory Management (20)
- **Establish a new national public health laboratory pipeline to undergraduate programs and provide \$1.81 million annually to support 250 new undergraduate internships.** Of 31 public health laboratories recently surveyed, only 39% responded that they offer internships. Internships provide entry-level career opportunities to gain field experience for up to 12 weeks full-time to support summer or winter surges and outbreaks due to waterborne, foodborne, vector-borne or respiratory seasonal diseases.

* Figure includes salary and fringe benefits only and does not reflect Indirect.

- **Provide \$3.1 million to 20 clinical training programs to develop and support, with scholarship funds, baccalaureate-level training programs coordinated between public health laboratories and academic institutions with courses in clinical laboratory science (MLS/MLT).** Of 31 public health laboratories recently surveyed, only 42% responded that they have MLS student rotations (bachelor's and master's level) and 10% have MLT student rotation through their laboratory. Only 29% of respondents also reported having written agreements with academic programs. The proposed program will include a one-year traineeship in a public health laboratory and graduates of the program will be considered as eligible to sit for the Medical Technologist Licensure Examination. Alternatively, the program could include a one-year rotation in a clinical lab as an alternate to the one-year CLS course work.
- **Provide \$15 million to CDC to include 20 FTEs and 10 contractors to bridge, train and sustain a capacity-building community with public health and clinical laboratories to collectively support training and development of the current laboratory workforce.** Of the 800,000 laboratory professionals who work across 295,000 CLIA-certified laboratories, less than 10% of the nation's clinical laboratory professionals currently access CDC training and workforce development resources. This program would expand the reach of CDC's training and workforce development resources for both the public health laboratory and clinical laboratory community—including those who perform point-of-care testing—building critical bridges between healthcare and public health. The program will include data-driven development, promotion and dissemination of laboratory capacity-building initiatives and resources that enhance the laboratory community's ability to combat emerging threats, learn evolving practices and stay current with the newest standards and technologies.
- **Provide \$3 million to expand to 12 additional doctoral level scientists in the two-year CDC Laboratory Leadership Service (LLS).** LLS is a CDC service-learning, multidimensional program that encompasses competencies related to applied public health laboratory research, laboratory operations and quality management, the science of biosafety, bioinformatics, advanced communications and leadership training. LLS provides opportunities for fellows to serve public health agencies and learn through field experiences and domestic or international emergency responses.
- **Provide \$5 million to include 8 FTEs and 5 contractors to develop a National Center for Public Health Laboratory Workforce Development to ensure the implementation of a comprehensive national strategy that is supported through applied research and data science.** The Center will focus on workforce profiles and characterization to help inform public policy, education and training programs, recruitment and retention practices, career and leadership development, and the impact to essential public health services.
- **Provide \$8 million annually to support 56 outreach scientists across state and territories to develop, implement, and sustain a strategy to support STEM and careers in public health laboratory science.** Sponsorship of tours and partnership in STEM experiences, such as science and career fairs, is essential to provide learning opportunities with demonstrated career paths in public health laboratory science.

- 1 US Centers for Disease Control and Prevention. 10 Essential Public Health Services. 2021. <https://www.cdc.gov/publichealthgateway/publichealthservices/essentialhealthservices.html>
- 2 Association of Public Health Laboratories. Focus on Public Health Laboratories: A Workforce Survey Report. 2018. <https://www.aphl.org/aboutAPHL/publications/Documents/IR-2018May-2016-Workforce-Survey-Report.pdf>
- 3 Medical Laboratory Observer. MLOs 2020 Annual Salary Survey of laboratory professions. 2020. <https://www.mlo-online.com/management/careers/article/21134640/mlos-2020-annual-salary-survey-of-laboratory-professionals#:~:text=In%20MLO's%202020%20salary%20survey,%2497%2C328%20in%20the%202019%20survey>