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Strengthening State, Tribal, Local, and Territorial Public Health Agencies Through US Centers for Disease Control and Prevention Fellowship Programs

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Abstract

Context: Public health fellowship programs play a vital role in strengthening the workforce across state, tribal, local, and territorial (STLT) public health agencies.

Program: The US Centers for Disease Control and Prevention's Epidemic Intelligence Service (EIS) and Laboratory Leadership Service (LLS) fellowships provide structured opportunities for trainees to be placed within STLT public health agencies, where they are intended to contribute directly to essential public health functions. Through these assignments, the objective is for trainees to gain practical experience while STLT public health agencies benefit from additional capacity and public health expertise.

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This study was reviewed by Centers for Disease Control and Prevention (CDC), deemed not research, and was conducted consistent with applicable federal law and CDC policy. See 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Evaluation: Findings from a rapid evaluation showed that EIS and LLS trainees offer crucial support to STLT public health agencies' delivery of Foundational Public Health Services. The trainees also provide surge support during emergency response events, including infectious disease outbreaks and environmental toxins.

Discussion: Public health fellowships are a collaborative model of how federal programs can help alleviate longstanding public health workforce challenges, including difficulties recruiting, hiring, and retaining qualified professionals. Integration of trainees into STLT public health agency operations fosters knowledge transfer, strengthens local capabilities, and supports sustained delivery of public health services. Our findings provide additional evidence that public health fellowship programs can serve as essential support for the national public health workforce.

Keywords

Foundational Public Health Services; public health fellowships; STLT public health workforce

Introduction

State, tribal, local, and territorial (STLT) public health agency staff serve on the frontlines, protecting the health and safety of the American people. These professionals are tasked with delivering Foundational Public Health Services (FPHS), which reflect the minimum program areas and capabilities that STLT public health agencies, regardless of their size or resources, should provide for the communities they serve.¹ The FPHS framework identifies the following 5 foundational areas: communicable disease control; chronic disease and injury prevention; environmental public health; maternal, child, and family health; and access to and linkage with clinical care. These foundational areas cover the basic public health programs and expertise needed to serve communities. Additionally, the framework outlines 8 foundational capabilities needed within an agency's infrastructure, which range from assessment and surveillance to community partnership development. STLT public health agencies use the framework to build and strengthen local delivery of FPHS to address both immediate and long-term population health outcomes.

Although the FPHS form the core of public health functions, often STLT public health agencies must deliver services with insufficient capacity.² A major contributor to insufficient capacity is workforce gaps.³ Recent estimates indicate the public health field needs approximately 80 000 additional full-time staff, representing an increase of 80% from 2019 staffing levels, to deliver the core FPHS.² This shortage is complex and involves challenges with recruiting, hiring, and retaining qualified staff and securing sufficient and sustainable funding.^{3,4}

Public health workforce training programs are one strategy to support STLT public health agency workforce gaps and provide FPHS in their jurisdictions.^{3,4} The U.S. Centers for Disease Control and Prevention's (CDC) Division of Workforce Development (DWD) offers a portfolio of competency-based and experiential-service fellowship and training programs designed to bolster national public health workforce capacity.⁵ Public health agencies, STLT or otherwise, may apply annually to serve as host sites for DWD's fellows, such as those in the Epidemic Intelligence Service (EIS) and Laboratory Leadership Service (LLS),

among other fellowships. For 2 years, EIS and LLS trainees are embedded within their host public health agency, where they complete discipline-specific training while working on priority projects and activities selected by their host sites. CDC funds trainee salaries, benefits, and fellowship-associated costs like travel or software licenses, and host sites provide a workspace and experienced public health professionals to serve as supervisors. The placements are mutually beneficial arrangements supplementing public health agencies' workforce while trainees gain invaluable knowledge and experience in applied public health. By providing structured opportunities to gain practical experience, these fellowships can serve as a crucial mechanism for augmenting the STLT public health workforce and strengthening their workforce capacity to deliver FPHS.

We used existing EIS and LLS fellowship data sources to show how trainees support STLT public health agencies. To illustrate trainee contributions to host site workforce capacity, we described where recent trainees had been assigned and the nature of their day-to-day assignments. To demonstrate value to their host sites, we shared perspectives from host site supervisors of recently graduated trainees. To highlight how trainees can serve STLTs when temporary surges in workforce are needed, we showed trainee participation in STLT public health agency-led rapid response activities. Together, our findings describe how public health workforce training programs can alleviate workforce strains and enhance foundational services provided by STLT public health agencies to their communities.

Methods

From February to April 2024, we conducted a rapid evaluation of EIS and LLS trainee support to STLT public health agencies. We focused on describing direct support provided by trainees placed within STLT public health agencies. We also described indirect support through requests from STLT public health agencies for specialized rapid response assistance. The analysis was retrospective and leveraged existing fellowship data. Descriptive analyses were used to summarize quantitative data via Excel spreadsheet exports from each source.

Workforce capacity

Geographic distribution of trainees placed in STLT public health agencies who started in 2022 and 2023, that were active in March 2024, was obtained from existing host site tracking data, which is maintained similarly across EIS and LLS administrative platforms. EIS and LLS trainees assigned to STLT agencies have a DWD staff member to serve as their CDC supervisor during their fellowship training. These supervisors completed structured templates in Excel, providing the FPHS areas and capabilities that trainee work activities supported within their hosting STLT public health agency.

Perceived value

Host site supervisors routinely provide feedback on their respective trainees and their progress in the fellowship program. End-of-program survey feedback from STLT public health agency staff who supervised recent trainee graduates were harmonized to allow for analysis across fellowship programs. Harmonization refers to reviewing questions for comparability and combined analysis based on the question type and response options.⁶

Harmonization yielded data from 15 of 21 host site supervisors of EIS trainees who graduated in 2023, including 1 staff member from a tribal epidemiology center, and all 5 host site supervisors for LLS trainees who graduated in 2022 and 2023.

Rapid response

At any time, STLT public health agencies can request CDC support for short-term specialized rapid response assistance. These are short-term deployments, typically usually lasting up to 3 weeks, outside of their host site assignment. Trainees assigned to STLT or other agencies might be deployed to support these requests. We analyzed rapid response requests from STLT public health agencies during October 2022 to March 2024 using administrative data tracked in existing fellowship management systems. We reviewed response activities and aligned them to the FPHS framework.

Results

Workforce capacity

In February 2024, a total of 72 trainees were assigned to STLT public health agencies in 33 states, the District of Columbia, Puerto Rico, and US Virgin Islands (data not shown). Most trainees were assigned to host sites in state ($n = 45$) and local ($n = 24$) health departments (Table 1). Trainees supported all FPHS areas through their work in their host sites, with most engaging activities supporting communicable disease control. In total, 96% ($n = 55$) of EIS and 87% ($n = 13$) of LLS trainees engaged in activities supporting this FPHS area. Support for host sites in other FPHS areas varied by fellowship. Specifically, EIS trainees supported all other FPHS areas; 67% ($n = 38$) were engaged in environmental public health activities and 7% ($n = 4$) supported access to and linkage with clinical care activities. Other LLS trainee activities were directed to chronic disease and injury prevention, and environmental public health. Among the FPHS capabilities, 100% ($n = 57$) of EIS and 93% ($n = 14$) of LLS trainees supported assessment and surveillance (Table 1).

Perceived value

Among the 20 host site staff who supervised EIS and LLS trainees in 2022 and 2023 and completed an end-of-program survey, 95% ($n = 19$) valued trainee contributions and 80% ($n = 16$) were willing to supervise a trainee again (Table 1). In total, 95% of respondents ($n = 19$) indicated that their host site gained knowledge or skills from their assigned trainee.

Rapid response

Eighty-two trainees responded to 33 requests from STLT public health agencies for specialized rapid response assistance (Table 1). Requests came from STLT public health agencies in 20 states, American Samoa, and US Virgin Islands (data not shown). Response activities spanned the assessment and surveillance FPHS capability and two FPHS areas, communicable disease control and environmental public health, in addition to noncommunicable disease control and laboratory safety. In multiple instances, trainees from different programs worked together to support these specialized requests. For example, in June 2023, 1 EIS and 1 LLS trainee assisted the American Samoa Department of Public Health to investigate measles in children and to improve case and syndromic surveillance,

outbreak response, and laboratory testing capacity. Additionally, 3 EIS and 1 LLS trainee assessed conditions, barriers, and hazards among persons experiencing homelessness in Denver, Colorado, during October to November 2023. In another example, 3 EIS and 3 LLS trainees supported a laboratory operations investigation of lead contamination and exposure in St. Croix, US Virgin Islands in November 2023.

Discussion and conclusion

Our rapid evaluation showed that EIS and LLS fellows play a vital role in strengthening STLT public health agencies in foundational and emergency response services. Most recent trainees are in states, and some territories and freely associated states, although fewer trainees are assigned to host sites primarily serving tribal communities. Public health workforce shortages are substantial in rural and underserved areas.^{2–4} STLT public health agencies serving these communities face challenges such as limited resources, higher disease burden, and greater difficulty recruiting and retaining qualified public health professionals.³ Despite the wide geographic coverage, how trainee placements differ by population density or by community characteristics is unclear. Future assessments might explore trainee placements using a range of characteristics to illuminate specific areas where increased support might be directed. STLT public health agencies in these communities with no EIS or LLS trainees should consider how these fellowships can provide strategic support while navigating their workforce gaps. Increased support for STLT public health agencies through public health fellowships might help mitigate the challenges they experience in public health service delivery.

Regardless of geographic setting, EIS and LLS trainees support host sites across all FPHS areas, although with some distinctions between fellowships. As expected, EIS distributions showed these trainees support a broader range of public health program areas, compared with LLS trainees. Although laboratory functions play a crucial role in certain areas, they are not required across all public health program areas. In contrast, epidemiology functions are more broadly applicable and distributed across a wider range of program areas. Our findings also showed that EIS and LLS contribute substantially to enhancing assessment and surveillance capabilities in their host sites. These contributions support the intent of these 2 fellowship programs as EIS primarily provides trainees with training in applied epidemiology, including disease investigation epidemiologic research and surveillance; whereas LLS ensures its trainees are competent in public health laboratory operations, quality, and safety. A high demand exists for certain public health specialties, including epidemiologists and laboratorians.^{7,8} Furthermore, the recent COVID-19 pandemic illustrated the need for strong communicable disease control programs in addition to ensuring robust public health programming in other FPHS areas, such as chronic disease and environmental health.⁹ Given their diverse academic and professional backgrounds and the specialized didactic and experiential fellowship training, EIS and LLS trainees are well positioned to serve as qualified candidates who can fill crucial workforce capacities in STLT public health agencies.

Beyond the day-to-day work, EIS and LLS trainees also play a crucial role in supporting STLT public health agencies in rapid response to public health emergencies, whether as

part of their host site assignment or through short-term rapid response assistance. Future assessments of trainee contributions should investigate the barriers and facilitators that exist for STLT public health agencies requesting and engaging CDC for rapid response support. In recent years, numerous public health threats have emerged, including highly infectious disease outbreaks like recurrent Ebola, mpox, and measles and environmental emergencies such as hurricanes and wildfires. As demonstrated during the COVID-19 pandemic, staffing shortages are worsened during public health emergencies, and gaps in critical technical expertise hamper the ability of STLT public health agencies to effectively respond and provide adequate service delivery.^{2,3,10–12} Having trained professionals who can rapidly deploy during emergencies is necessary for accurate testing, surveillance, and response to different public health threats, including infectious diseases, chemical spills, and bioterrorism. STLT public health agencies should continue using the CDC's specialized rapid response assistance mechanisms as a flexible strategy to meet urgent workforce staffing needs during public health emergencies. EIS and LLS trainees have proven essential to bolster activities, such as field interviewing, contact tracing, specimen testing, data analysis, and developing effective communication messages. In addition to meeting staffing criteria, these fellowship placements and response assistance mechanisms to place fellows in STLT and provide response efforts come at minimal or no cost to jurisdictions, mitigating the challenge of financial compensation associated with surging the workforce during emergencies.¹⁰ These fellowships not only help fill gaps in routine service provision but also serve as an agile and trained pool of public health professionals capable of responding quickly to emerging health threats in communities across the nation.

This analysis has certain limitations. First, the fellowship data on trainee placements represent only 2 cohorts. Although this gives an idea of where and what type of work recent EIS and LLS trainees have supported in their host sites, a longer timeframe can provide a richer understanding of trainee contributions to STLT public health agency functions. Additionally, the nature of trainee work activities described is general and high-level and does not dive into the specifics of individual trainee projects or work activities. Future assessments might focus on specific trainee activities to provide more detailed insights into the day-to-day work conducted or supported through these fellowships. Additionally, future evaluations can include the Public Health Associates Program, which also embeds trainees in STLT public health agencies and might replicate this analysis to further illuminate CDC fellowship contributions to the public health workforce.^{13,14}

Public health fellowship programs play a vital role in strengthening and supporting STLT agencies by providing skilled trainees and graduates ready to enter the workforce full-time after fellowship completion. CDC embeds a considerable number of trainees in STLT public health agencies, meeting both foundational public health areas and specialized rapid response needs. This host site model allows trainees to benefit by gaining hands-on experience and developing a deep understanding of STLT agency operations. After their fellowship training, these graduates are equipped with skills to support the agencies they are placed in, whether at the federal, state, tribal, local, or territorial levels. Federal training programs can serve to cultivate a robust public health workforce within STLT public health agencies.

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Implications for Policy & Practice

- EIS and LLS provide skilled and effective trainees that increase STLT public health agency capacity during their 2-year fellowship. Graduates have a strong, standard foundation in Foundational Public Health Services that are a necessary asset for public health agencies.
- CDC trainees reinforce STLT public health agency capacity for robust health security. These public health professionals work to improve the nation's health and strengthen the nation's defense against domestic and global health threats.
- STLT public health agencies should consider CDC fellowship programs as strategic initiatives to alleviate strains while fostering a capable, effective, and public health workforce.

TABLE 1
EIS and LLS Trainee Support of STLT Public Health Agencies, February 2024 to April 2024

	EIS		LLS		Total	
	No.	%	No.	%	No.	%
Total trainees	172	100	40	100	212	100
Trainees assigned to STLT agencies	57	33	15	38	72	34
State	35	20	10	25	45	21
Tribal	0	–	0	–	0	–
Local	20	12	4	10	24	11
Territorial	2	1	1	3	3	1
STLT trainee support of FPHS						
Capabilities						
Assessment and surveillance	57	100	14	93	71	99
Accountability and performance management	0	–	15	100	15	21
Emergency preparedness and response	41	72	0	–	41	57
Community partnership development	17	30	0	–	17	24
Equity	12	21	0	–	12	17
Communications	15	26	0	–	15	21
Policy development and support	7	12	0	–	7	10
Organizational competencies	1	2	0	–	1	1
Areas						
Communicable disease control	55	96	13	87	68	94
Environmental public health	38	67	2	13	40	56
Chronic disease and injury prevention	13	23	3	20	16	22
Maternal, child, and family health	9	16	0	–	9	13
Access to and linkage with clinical care	4	7	0	–	4	6
Total host site supervisors providing feedback	15	100	5	100	20	100
Contributions were made to host site	14	93	5	100	19	95
Willing to supervise again	11	73	5	100	16	80
Host site gained knowledge or skills	14	93	5	100	19	95
Specialized rapid response assistance						
Completed response activities	28		5		33	

	EIS		LLS		Total	
	No.	%	No.	%	No.	%
Trainees participating	71	41	11	28	82	39

Abbreviations: STLTI, state, tribal, local, and territorial; EIS, Epidemic Intelligence Service; LLS, Laboratory Leadership Service; FPHS, Foundational Public Health Services. FPHS support. Trainee work activities can span multiple domains, so the sum of trainees supporting FPHS is greater than the denominator, which is the total number of trainees assigned to STLTI.