NACCHO
National Association of County & City Health Officials

HAI and AR: Opportunities for Local Health Departments in Prevention and Response

A Landscape Analysis

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Contents

Executive Summary

Local Health Departments (LHDs) have established relationships with healthcare facilities in their communities—including nursing homes, skilled nursing facilities, and short-stay acute care hospitals—and conduct outbreak investigation, share information, and provide education to prevent and control HAIs/AR in these settings. Acknowledging the expanding role and potential opportunities for LHDs to strengthen prevention and improve infection control, NACCHO engaged WE Public Health, LLC to conduct a landscape analysis exploring the roles and responsibilities of LHD staff in reducing and preventing HAI/AR, education and training requirements, and strategies for strengthening relationships with healthcare partners. The analysis consisted of a review of existing literature, reports, and online resources, a collection of relevant documents from LHDs, and key informant interviews conducted over a period of 3 months.

During the analysis period, several new HAI/AR-related tools and resources become available from CDC, ASTHO, and NACCHO, including an outline of specific activities (and a workplan template) that LHDs can take to implement the CDC's Interim LHD Strategy for HAI/AR. As possible, these new resources were incorporated into the analysis.

Several opportunities for LHDs to build capacity in HAI/AR were identified:
- Make partnership-building a core job responsibility that is consistently performed, not just when there is an emergency
- Engage staff outside of traditional IPC roles to support the partnership-building requirements necessary to successfully engage in HAI/AR work
- Identify other LHD programs that may already have relationships with key healthcare facilities and leverage these
- Become well-informed about State HAI Programs and responsibilities to further support the aim of building strong partnerships

In addition, the analysis revealed that many of the skills necessary for LHDs to support HAI/AR are already included in major public health frameworks, including the *Ten Essential Public Health Services*, the *Public Health Accreditation Standards for LHDs*, the *Core Competencies for Public Health Professionals*, and the *Strategic Skills for Public Health*, among others. However, two concepts/skills critical to public health practice were not reflected in the data – Systems Thinking and Health Equity. These can be seen as opportunities for LHDs to add value to overall HAI/AR prevention and response efforts within their jurisdictions.

Introduction

Healthcare-associated infections (HAIs) are among the leading causes of preventable deaths in the United States. Antimicrobial resistance (AR) compounds the challenge of HAIs, and the impacts of COVID-19 have further exacerbated the problem of AR.[1] Local health departments (LHDs) play an integral role in HAI prevention and response by collecting and analyzing data to identify outbreaks, investigating reportable diseases, coordinating communications across multiple health facilities, and containing the spread of infections in community and healthcare settings.[2]

The National Association of County and City Health Officials (NACCHO) provides subject matter expertise and resources to help LHD leaders develop public health policies, programs, and services to ensure that people in their communities are protected from disease. Acknowledging the expanding role and potential opportunities for LHDs to strengthen prevention and improve infection control, NACCHO engaged WE Public Health, LLC to conduct a landscape analysis to explore three questions:
1. What are the current LHD workforce roles and responsibilities in reducing and preventing HAI/AR?
2. What are the education and training requirements for LHD workforce engaged in HAI/AR-related work?
3. What strategies can be employed to strengthen relationships between LHDs and clinical healthcare partners?

The following is a summary of the analysis.

Methods

The original scope of the analysis relied primarily on existing literature and reports; however, after reviewing all available literature, the project team determined that alone, it was insufficient to answer the original three questions. Therefore, additional data was collected through a call for documents from LHDs and key informant interviews.

Data Collection

The landscape analysis included three data collection strategies (see Appendix A for complete protocol):
- Literature and Training Scan
- LHD Document Collection
- Key Informant Interviews

Literature and Training Scan

The scan included an examination of published journal articles and reports as well as a search of national public health and healthcare organization websites and online public health training repositories. The team limited its search primarily to items published in 2016 or later and used key search terms as well as several criteria for exclusion. (Appendix B).

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[1] COVID-19: U.S. Impact on Antimicrobial Resistance, Special Report 2022. Retrieved November 12, 2022 from https://www.cdc.gov/drugresistance/covid19.html

[2] 2019 Healthcare-Associated Infection & Antibiotic Resistance Assessment Findings. Retrieved from. https://www.naccho.org/uploads/downloadable-resources/NACCHO-HAI-Assessment-Infographic_FINAL.pdf

PubMed, the Journal of Public Health Management and Practice, and the following websites and training repositories were scanned in August and September 2022:

- Association of State and Territorial Health Officials (ASTHO)
  Website provides resources and tools for state health departments

- National Association of County and City Health Officials (NACCHO)
  Website provides resources and tools for LHDs

- CDC Healthcare-Associated Infection Prevention Resources
  Website provides resources and tools for LHDs to build HAI/AR activities into their work

- CDC Project Firstline Partner Organizations
  Website includes all organizations funded under the CDC's Project Firstline, who may post other materials related to HAI/AR

- Association of Professionals in Infection Control and Epidemiology (APIC)
  Website includes a description of the professional organization's competency model (APIC Competencies)

- Train
  National learning network that provides quality training opportunities for professionals who protect and improve the public's health.

- Public Health Learning Navigator
  Catalog of training that has been peer-reviewed for quality. All relevant trainings identified on publichealthlearningnavigator.org were also listed on Train.org and identified in that search.

LHD Document Collection

To gain a deeper understanding of LHD workforce roles in HAI/AR, the project team requested three types of documents from LHDs.
1. Job descriptions for any staff who have HAI or Infection, Prevention, and Control (IPC) roles included in their job and/or are building partnerships/liaising with area healthcare providers
2. HAI/AR IPC plans
3. Workforce Development Plans or similar (if HAI/AR is included)

The request was targeted to LHDs known to have some interest or engagement in HAI/AR through participation in NACCHO topic-specific workgroups and/or who had received funding specific to HAI/AR through the Building Local Operational Capacity for COVID-19 (BLOC COVID) program. Documents were collected online through an online form (see Appendix A) that was open for 30 days in September-October 2022.

NACCHO staff sent emails along with a link to the document collection form to 204 individuals representing 92 LHDs across 31 states. In addition, 6 individuals from four national organizations are members of these groups and received the request as well. Requests were sent to the greatest number of individual staff from CA (31), TX (26), IL (16), AL (14), CT (13), VA (11), and OH (10). Requests were sent to the greatest number of LHDs from TX (13), CA (8), OH (8), and IL (6).

Key Informant Interviews

The project team sent requests for key informant interviews to staff from 10 regional public health training centers. Additionally, NACCHO staff sent requests to conduct interviews with three national organizations working on the CDC Project Firstline Initiative (American Hospital Association, American Academy of Pediatrics, and National Network of Public Health Institutes), and three NACCHO staff who lead the HAI/AR programmatic area. A request for interviews was also inadvertently sent to some LHD staff who received the request to submit documents. A correction was sent shortly thereafter, but one LHD staff had already scheduled an interview, which the project team decided to include.

Each interview was conducted by 2 project team members. One team member facilitated the interview while the 2nd member took notes. The interviews were loosely structured, allowing interviewers to probe on topics generated by the interviewee and move between questions as the direction of the discussion dictated. Each interview was recorded and later transcribed.

Data Analysis

All documents identified through the scan of literature, reports, and online resources were listed in a spreadsheet and categorized by source into 5 separate tabs: National Organization Documents, CDC Documents, APIC Documents, Journal Articles, and Trainings. Within each tab, documents were listed on their own row with columns for document name, date, description, and notes. All columns except notes were populated with verbatim information from each document (i.e., year of publication for the date, journal article abstract or published document summary for description). As each document was reviewed, the project team extracted key summary information for inclusion in the notes column. The Trainings tab has a column for learning objectives rather than notes.

The notes were coded in Dedoose using a set of initial codes that the project team compiled from the following sources:
- Codes for the trainings were derived from the NACCHO report, *Local Health Department Infection Prevention and Control Training Needs*.
- IPC-related codes were derived from the journal article, *Advancing the Profession: An Updated Future-Oriented Competency Model for Professional Development in Infection Prevention and Control*.
- Codes related to the role of local public health came from the NACCHO toolkit, *Healthcare-Associated Infections: A Toolkit for Local Health Departments*.

Transcribed interview data and documents submitted by LHDs were also coded in Dedoose using the same coding scheme. Additional codes were added during the review and coding process based upon the content within the data sources, including topics such as educational requirements that were listed in job descriptions. Many excerpts from documents were coded in multiple code categories. For example, mentions of skills or training needs in documents were double coded as appropriate to indicate the APIC competency being described in addition to the specific training need. Codes under the topic of strengthening relationships between healthcare and public health were added based upon information shared during key informant interviews.

After all data were coded, the results were analyzed to determine the most common themes across all data sources as well as by specific type of data source (e.g., the most common themes from interviews as compared to the most common themes in trainings).

The project team also developed several crosswalks to compare the APIC Core Competencies and Professional Standards[3] with the findings from the data as well as several existing public health frameworks and competency sets, including:

- Local Health Department Strategy for Response, Control, and Prevention of Healthcare Associated Infections (HAI) and Antibiotic Resistance (AR)
- Core Competencies for Public Health Professionals
- Strategic Skills for Public Health

Finally, job descriptions and trainings were organized into categories of similarity to elicit themes (e.g., all job descriptions with Epidemiologist in the title were grouped together).

Results

Literature and Training Scan

A total of 36 journal articles, reports, and other relevant online resources were reviewed. Online resources included items such as a communications toolkit, an HAI/AR implementation toolkit, and a description of ways state health departments can get involved in HAI/AR, among others.

A total of 33 online trainings met search criteria and were included in the analysis. The most common training topics (identified in 14 trainings) included basic infection prevention content such as disease transmission pathways, pathogen hosts and reservoirs, and hand hygiene. Many of these came from Project Firstline and are focused on COVID-19. Ten trainings addressed Antimicrobial Stewardship / AR, including a series of trainings developed by the CDC. Four trainings were related to Data Collection and Reporting, with 3 of these specific to the National Healthcare Safety Network (NHSN) tracking system.

LHD Document Collection

Fourteen LHDs from 10 states responded to the request for documents. Thirteen of these of serve a population of 250,000 or more and 9 LHDs serve a population of 500,000 or more (Table 1).

Table 1: LHD submissions by population and state

Count of LHDs Respondents by Population		Count of LHD Respondents by State			
Population Served	# States	State	Count	State	Count
100,000 to 249,999	1	AL	1	KS	1
250,000 to 499,999	3	CA	4	KY	1
50,000 to 99,999	1	CT	1	MO	1
500,000 to 999,999	5	FL	1	OH	1
Over 1 million	4	IL	2	TX	1
Grand Total	14			Grand Total	14

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[3] APIC publishes updated professional and practice standards for infection preventionists. (2016). *American Journal of Infection Control*, *44*(9), 963. https://doi.org/10.1016/j.ajic.2016.07.002

A total of 52 documents were collected, including:
- Job Descriptions: 40 descriptions received from 13 LHDs
- HAI/AR Infection Prevention Plans, Workforce/Training Plans: 7 documents received from 5 LHDs
- Other documents: 5 other documents received from 4 LHDs
  Other documents included:
  - *An information statement summarizing the work of a newly formed HAI coalition*
  - *Findings from a customer service survey sent to long-term care facilities within the jurisdiction*
  - *Description of Enhancing Laboratory Capacity (ELC) funding work plan*
  - *Description of an initiative to improve relationships with healthcare facilities as well as prevention and reporting.*
  - *Preparedness report*

Job Descriptions

The job descriptions varied in the level of detail: some included minimum qualifications while others did not; some included thorough knowledge, skills, and abilities in addition to duties while others were less comprehensive. Some positions were explicitly labeled as temporary, grant-funded, and/or specific to COVID-19. Across all job descriptions, there was minimal mention of AR skills or duties as compared to the HAI skills, which focused on outbreak detection, case investigation, and educating the community about infection prevention. Epidemiology, public health, and IPC experience were often required for entry-level and early-career positions.

A total of 34 job titles were identified across 7 job categories (Table 2). Epidemiologist was the most common job title, including both specific and broad epidemiology titles of varying seniority such as Epidemiologist I/II/Senior, Epidemiology Team Lead, and HAI Epidemiologist.

Public Health Nurse and Disease Investigator/Disease Specialist were the second most-noted job titles, including Public Health Nurse I/II/III, Public Health Nurse Supervisor, and Nursing Program Manager. While nursing roles included consultation with healthcare facilities, Disease Investigator/Disease Specialist duties focused primarily on investigation and outbreak management.

Infection Preventionist was mentioned three times in job descriptions, including one description whose job title was Infection Preventionist. Administrator and environmental health job descriptions were also shared; however, these roles did not have explicit HAI/AR responsibilities.

Plans and Other Documents

Whereas the LHD job descriptions submitted did not explicitly describe AR roles or responsibilities; the IPC Plans and Workforce/ Training Plans did. One training listed in a workforce plan specifically identified *C. diff* as a focus area and one IPC plan specifically calls out multidrug resistant organism surveillance and prevention.

Several of the documents submitted described training resources available to staff and training that is delivered to community partners. Training topics included:
- Antimicrobial Stewardship / Antimicrobial Resistance
- Data Collection and Reporting
- Infection Prevention 101 or Basics of Infection Prevention, including hand hygiene
- Project Firstline trainings or LHD adaptations of these
- Safety (injection safety, disinfectants)
- Providing IPC Guidance and Conducting Provider Education
- Supporting Implementation of IPC Practices
- Conducting Infection Control Assessments

Table 2: Job Categories, Titles, and Sample Responsibilities Extracted from Job Descriptions
Note: Categories were created by the project team to organize similar jobs.

Job Category	Job Titles	Sample Responsibilities
Epidemiologist	• Epidemiologist I/II/Senior • Epidemiology Team Lead • Epidemiology Supervisor • HAI Epidemiologist • Biological Scientist I (Healthcare-Acquired Infection Epidemiologist Position) • Biological Scientist II • Program Manager of Epidemiology • Epidemiology Surveillance Project Manager • Quality Assurance Specialist	• Field investigations of endemic or epidemic situations of infectious or chronic diseases • Communicates with healthcare providers, social service agencies, schools, state, regional, and local officials, and others concerning disease and injury investigation, prevention, and control • Conducts evaluations of control measures related to communicable, chronic, or environmental diseases or injuries • Assists with the development and evaluation of surveillance systems to provide for early detection of outbreaks • Independently conducts complex statistical analysis and hypothesis testing • Coordinates local efforts with statewide efforts and participates on ad-hoc committees and task forces • Assist in database development and maintenance
Public Health Nurse	• Public Health Nurse I/II/Senior • Public Health Nurse - Immunizations • Public Health Nurse Supervisor • (Nursing) Program Manager	• Assists with case-finding during outbreaks through contacts with physicians, school authorities, health and welfare agencies, professional and lay groups, and individuals • Provides consultations to assess infection control processes in accordance with…guidelines • Provides health education to individuals/groups on topics of their concert and interest
Disease Investigator / Specialist	• Disease Case Investigator • Team Lead - Disease Case Investigator • Disease Investigator • Disease Specialist • Communicable Disease Specialist	• Investigates communicable disease and implement control and preventative measures to reduce impact in the community • Performs surveillance, including outbreak, care, and contact investigations • Prepares, submits, and maintains records for local, state, and federal agencies
Infection Preventionist	• Epidemiologist IV (Infection Prevention Specialist) • Infection Preventionist	• Develops protocols for reducing infection risk and coordinates the investigation and response activities associated with outbreaks • Conducts research, reviews current literature, attends meetings and seminars, and analyzes data to keep abreast of new developments in infection control; disseminates updated information to appropriate departments and individuals • Provides guidance and oversight for IPC activities in all healthcare and other congregational settings within jurisdiction
Administrator	• Assistant Director of Communicable Disease and Epidemiology • Healthcare Administrator • Temporary COVID Manager • Medical Officer	• Supports projects where substantive administrative, policy, and/or technical issues require specialized analysis, recommendation, and implementation • Establishes local public health surveillance systems • Advises, clarifies, and assists in policy development of clinical guidelines and protocols
Environmental Health Specialist	• Environmental Health Specialist/Senior • Environment Health Sanitarian II	• Maintains liaison with other public health agencies • Collaborates with other health personnel in epidemiological investigations and control
Other	• Health Information Specialist II	• Plans, develops, and coordinates public health information, multimedia projects, and materials for the HAI program

Key Informant Interviews

Requests for interviews were sent to 16 individuals. Six individuals did not respond to the request. Three responded indicating that they did not have the appropriate expertise to participate in an interview. Eight accepted the request and were interviewed for approximately 40 minutes each (Table 3).

Table 3: Summary of Interviews Conducted

Key Informants	Interviews Requested	Interviews Conducted
LHD Staff	0	1
NACCHO Staff	3	3 (1 interview with 3 staff)
Public Health Training Centers	10	4
Project Firstline Partners	3	0

The LHD staff person interviewed shared perspectives on the funding mechanisms behind HAI/AR work, training needs of staff, and how the role of LHDs in HAI/AR efforts can vary depending on the role played by the state health department. The staff doing IPC or HAI work (this LHD does not focus on AR) are typically individuals with a bachelor or master's degree in healthcare or policy who are trained in-house upon being hired.

The NACCHO Infectious Disease staff interviewed reiterated the findings from the review of LHD documents that HAI/AR duties are often not called out in specific roles. HAI/AR work that happens within a LHD is often included with communicable disease work. "*HAIs are just one of many communicable diseases and the response is the same.*"

Discussion

Current LHD Workforce Roles and Responsibilities in Reducing and Preventing HAI/AR

There is minimal literature on the role of LHDs in AR and antimicrobial stewardship. What literature does exist in this area is focused on how to model an AR program off an existing HAI program. Information about the roles of health department staff in HAI/AR is limited to reports produced by CDC, ASTHO, and NACCHO. The roles and responsibilities described in the CDC's *Interim Local Health Department Strategy for Response, Control, and Prevention of HAI and AR* align with those found in the job descriptions (Table 4), with three exceptions. These responsibilities were *not* included in job descriptions.
- CDC Interim Strategy objective 3.2 Implement infection prevention activities using available data to tailor and focus efforts
- CDC Interim Strategy objective 3.3 Implement antibiotic stewardship activities using data to tailor and focus efforts
- CDC Interim Strategy objective 3.4 Support HAI/AR activities that promote health equity and are aligned with state health equity priorities

NACCHO staff explained that the transition from response and disease control to prevention in the HAI/AR space has been a challenge for LHDs. HAI/AR work has commonly been a state health department activity because that is where funding has been allocated. There are additional resources now being directed to LHDs for this work, and this can benefit communities by having local staff available to quickly respond and incorporate local knowledge. Additionally, most of the regulatory responsibility for licensed healthcare

facilities is held at the state level. LHDs can separate themselves from this regulatory aspect of public health and position themselves as a trusted local partner and resource.

Across the data sources analyzed, LHDs are well-positioned to play the following roles in HAI/AR prevention and response:

1. Trusted partner, who can jump in and help with implementation of IPC practices
2. Subject matter expert with information about best practices
3. Convener across multiple public health and healthcare facilities
4. Communicator across multiple public health and healthcare facilities
5. Provider of education and guidance about IPC to multiple types of healthcare facilities
6. Provider of data and analysis

Table 4: CDC Interim Local Health Department Strategy for Response, Control, and Prevention of HAI/AR and Corresponding Themes in Job Descriptions

Interim LHD Strategy Objectives	Roles Specified in LHD Job Descriptions
Objective 1.1 Engage with state HAI/AR program to determine priorities, state and local roles and responsibilities when working together, and to maintain coordination between the LHD and the state.	Connect with state HAI program
Objective 1.2 Grow and sustain relationship between healthcare and public health at the local level tailored to meet the LHD's, healthcare facilities', and providers' needs.	Convene healthcare and local partners Work across facilities to coordinate response*****
Objective 1.3 Engage public health, healthcare, academic, and community partners in growing the partnership network to prevent HAI/AR in all patient populations within the local jurisdiction.	Convene healthcare and local partners
Objective 2.1 Increase LPH staff capacity, expertise, confidence, and confidence to conduct HAI/AR activities, in alignment with the overall state HAI/AR program strategy.	Provide and interpret guidance***** Make risk reduction recommendations
Objective 2.2 Increase LPH awareness of latest HAI/AR guidance, data, programs, policies that impact their community.	Provide and interpret guidance*****
Objective 2.3 Increase interjurisdictional infrastructure and sustainability of local HAI/AR IPC activities, in alignment with the overall state or regional strategy.	Work across facilities to facilitate response*****
Objective 2.4 Develop and/or update local healthcare preparedness and response plans to have capacity for responding to emerging HAI/AR threats and outbreaks.	Support policy development
Objective 3.1 Implement HAIR/AR outbreak and response strategies using data to identify appropriate participation in local, regional, and state-wide approaches.	Investigate infections and outbreaks***** Collect and analyze surveillance data*****
Objective 3.2 Implement infection prevention activities using available data to tailor and focus efforts.	
Objective 3.3 Implement antibiotic stewardship activities using data to tailor and focus efforts.	
Objective 3.4 Support HAI/AR activities that promote health equity and are aligned with state health equity priorities.	

*****Item noted in 5 or more job description

Education and Training Requirements for LHD Workforce Engaged in HAI/AR-Related Work

Education and Certification

Most job descriptions reviewed require a bachelor's degree. Some nursing positions do not require a bachelor's degree, and instead require licensure and completion of a nursing program. The majority (more than 70%) of job descriptions require at least one year of specific experience (i.e., related to the duties); however, about one-quarter require *no more* than one year of specific experience. Most (more than 80%) epidemiologist positions require a masters' degree in epidemiology, an MPH degree, or equivalent.

Specific certification requirements beyond formal education were uncommon. However, some states have certifications or licenses for HAI/AR-related roles such as Environmental Health Specialist certifications or Illinois' Disease Intervention Specialist certification. Only two job descriptions (both from the same LHD) specifically require a certification in infection control (CIC, administered by APIC), and only one job description required FEMA training.

Training Needs

The [Report of Local Health Department Infection Prevention and Control Training Needs](#) released by NACCHO in August 2021 identified 4 areas of training needs: 1) Building and Maintaining Partnerships, 2) Providing IPC Guidance and Conducting Provider Education, 3) Supporting Implementation of IPC Practices, and 4) Conducting Infection Control Assessments.

The trainings reviewed do not cover application of skills listed in this report; rather, training focuses on providing specific content knowledge and awareness. A [NACCHO HAI Toolkit for LHDs](#) does note that implementing strategies within healthcare requires relationships beyond established coalitions (speaking to the training need to 'build and maintain partnerships') and provides some general relationship-building and partnership tools such as [FSG's Collective Impact resources](#), and the Immunization Coalition's [Resources for Starting a Coalition](#).

Competencies

The APIC IP Competencies are intended for staff who work in healthcare facilities, with patient safety as the primary goal. While LHDs focus on communities and whole populations – not individual patients – the APIC IP Competencies do hold relevance for public health practitioners. Using the competencies (Figure 1) as a proxy for education and training needed by the LHD workforce to engage in HAI/AR prevention and response activities, IPC Operations and IPC Informatics were the most identified topics across all data sources (Table 5).

Interestingly, Quality Improvement was not well-reflected across the data sources. However, QI is a key public health competency included in the Ten Essential Public Health Services (Improve and innovate through evaluation, research, and quality improvement), as well as the Public Health Accreditation Standards (Domain 9: Improve and innovate public health functions through ongoing evaluation, research, and continuous quality improvement) and throughout the Core Competencies for Public Health Professionals.

Table 5 highlights the APIC IPC Competencies that were most mentioned across all data sources. The frequency of mention of each competency is categorized as low (1-4 mentions), medium (5-9 mentions), high (10-15 mentions), or very high (more than 15 mentions).

Table 5: APIC Competency Domains, Competencies, and Corresponding Instances Across Data Sources

Domains	APIC Competencies	Training	Job Descriptions	Plans and Other LHD Documents	Interviews
Leadership	Communication		High	Low	Low
	Critical Thinking		Low		
	Collaboration		Medium	Low	
	Behavioral Science	Low			
	Program Management		Medium	Low	
	Mentorship		Low	Low	
Professional Stewardship	Accountability				
	Ethics		Low		
	Financial Acumen				
	Population Health				
	Continuum of Care				
	Advocacy				
Quality Improvement	IP Subject Matter Expertise			Low	
	Performance Improvement				
	Patient Safety	Low		Low	
	Data Utilization		Low		
	Risk Assessment and Risk Reduction		Low	Medium	Low
IPC Operations	Epidemiology and Surveillance	Low	Very High	Medium	Low
	Education	Low	High	Low	Low
	IPC Rounding		Low		
	Cleaning, Disinfection, Sterilization	Low		Low	
	Outbreak Detection and Management	Low	Very High	Medium	Low
	Emerging Technologies				Low
	Antimicrobial Stewardship	Medium	Low	Low	Low
	Diagnostic Stewardship			Low	
IPC Informatics	Surveillance Technology		Low	Low	Low
	E-Medical Records & Data Warehouse		Low	Low	
	Data Mgmt, Analysis, & Visualization		High	Low	Low
	Diagnostic Testing Data & Techniques		Low		
Research	Evaluation of Research			Low	
	Comparative Effectiveness Research				
	Implementation & Dissemination				
	Research/Evidence-Based Practice		Low		

Strategies to Strengthen Relationships between LHDs and Clinical Healthcare Partners

Building partnerships was noted across the data sources as a key role for LHDs, but this was not reflected consistently in job descriptions. Further, where partnerships were mentioned, they were primarily described as transactional (e.g., partner to conduct outreach investigation, select a single point of contact per facility, provide information to healthcare facilities, etc.). The NACCHO *Report of LHD Infection Prevention and Control Training Needs* dove deeper into the nuances of partnerships, sharing the following lessons from LHDs:

- Developing trusting relationships with community healthcare partners takes time and frequent contact
- Clarifying roles and articulating how LHDs can support HAI activities is critical to ensure public health is not viewed as regulatory
- Establishing effective HAI strategies occurs through shared learning
- Implementing strategies within hierarchal healthcare systems requires developing relationships beyond established coalitions

These lessons were echoed in the interviews. Allowing time to build trust, diving in to help during times of need, and engaging with community were all noted.

Opportunities and Recommendations

COVID-19 response has accelerated efforts to better understand and leverage the key role LHDs can play in infection prevention and response, including HAI/AR. Since the project team began this landscape analysis, several new HAI/AR-related tools and resources have become available from CDC, ASTHO, and NACCHO, including an outline of specific activities (and a [workplan template](#)) that LHDs can take to implement the CDC's Interim LHD Strategy for HAI/AR.

Opportunities to Add Value to HAI/AR Prevention and Control

The analysis revealed that many of the skills necessary for LHDs to support HAI/AR are already highlighted across major public health frameworks, including the Ten Essential Public Health Services, the Public Health Accreditation Standards for LHDs, the Core Competencies for Public Health Professionals, and the Strategic Skills for Public Health. However, two concepts/skills critical to public health practice were not reflected in the APIC competencies, nor the data sources included in the analysis. These can be seen as opportunities for LHDs to add value to overall HAI/AR prevention and response efforts within their jurisdictions.

1. **Systems Thinking:** Skills in systems thinking have long been regarded as essential for understanding, adapting, and responding to an increasingly complex public health landscape. It acknowledges that health is influenced by multiple determinants including environmental, social, economic, and political factors, and that improvements in health require action across multiple dimensions. One advisor for this work referred to the current system of HAI/AR prevention and response as a "Swiss cheese approach." The APIC competencies are intended for healthcare professionals within healthcare facilities and while 'systems approach' is briefly mentioned, it is not emphasized. This provides an opportunity for LHDs to shine in their role as chief health strategist, employing a system thinking mindset and approaches to HAI/AR work.

2. **Health Equity:** In recent years, the field of public health has begun to acknowledge persistent inequities in health and confront systems and structures designed to reinforce racism, including their own. Virtually all major public health frameworks have been or are being reoriented to center health and racial equity. Neither the APIC competencies nor any of the data sources reviewed identified how racism and other social determinants may drive inequitable HAI/AR outcomes. Although the current literature on racial/ethnic inequities in HAI is limited, the available studies suggest that minoritized patients experience higher rates of HAIs than their white counterparts.[4] And, given all the evidence that outcomes across all health indicators are worse for persons of color, it is hard to imagine this would not also hold true for HAI/AR. LHDs have an opportunity to play a lead role in using data and information to highlight HAI/AR inequities, and to intentionally implement and evaluate prevention efforts aimed at improving equity. With recent increases in federal funding and nation-wide initiatives to build capacity in approaches that promote equity, HAI/AR efforts can benefit from what is being learned through these initiatives as well.

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[4] Chen, J. , Khazanchi, R. , Bearman, G. , & Marcelin, J. R. (2021). Racial/ethnic inequities in healthcare-associated infections under the shadow of structural racism: Narrative review and call to action. Current Infectious Disease Reports, 23(10), 17. 10.1007/s11908-021-00758-x - [DOI](#) - [PMC](#) - [PubMed](#)

Opportunities to Strengthen Relationships with Healthcare Partners

Several opportunities for LHDs to strengthen relationships with healthcare partners were also identified:

1. **Make partnership and relationship-building a core job responsibility that is consistently performed, not just when there is an outbreak or emergency:** As one project advisor noted, "*you don't exchange business cards during an emergency response – relationship building happens outside the response*." Although collaboration and coordination across facilities was noted across data sources, it was not clearly defined in job descriptions as a core responsibility. This is an opportunity for LHDs to reinforce relationship and partnership-building through job descriptions and performance assessments. Examples include:
   - Include requirements related to having built partnerships with or engaged with healthcare facilities and other community partners in job requirements.
   - Include deliberate and meaningful partnership building as a core job responsibility and include related measures of performance. For example, job functions could include visiting or checking in with a specified number of healthcare facilities per month or participation in community meetings and events (e.g., healthcare coalition).
   - Dedicate staff to spend a certain number of hours supporting healthcare facilities per month, including education about HAI/AR, reviewing current processes, and making suggestions for improvement, and providing connections to resources and information.
   - Assign staff to play a consultant role for healthcare facilities – a thought partner who can help facilities access additional resources and guidance.
   - Assign staff the role of maintaining current lists with contact information of all healthcare facilities.
   - When staff performance is assessed, a key factor for assessment includes demonstration of connection with community and healthcare partners.

2. **Identify other LHD programs that may already have relationships with key healthcare facilities and leverage these:** Public health functions and programs require coordination with multiple community partners. HAI/AR staff can identify where existing relationships exist and engage with those staff/programs for introductions. For example:
   - Staff within healthy-aging programs may have contacts with long-term care facilities. HAI/AR staff could request introductions or participate in existing meetings or interactions with these facilities. Further, LHDs face some similar challenges in understanding and optimizing their role with healthcare facilities in prevention and early detection of cognitive decline, which might provide some opportunities for cross-learning with staff working in these program areas.
   - Staff responsible for community health assessment and improvement planning may have contacts with healthcare facilities, specifically non-profit hospitals who must complete community health needs assessment. HAI/AR staff could participate in community health assessment efforts to connect with and build relationships with staff of these hospitals.
   - Emergency response and HAI/AR activities are often closely aligned. The more consistent emergency response funding could be leveraged to support ongoing HAI/AR efforts. Further, LHDs often connect with healthcare coalitions through their roles in emergency preparedness and response. HAI/AR staff can be engaged with healthcare coalitions as well, to support partnership building.
   - One common public health service area not noted in any data sources is dental care. LHDs can explore dental services offered or coordinated by the health department to implement HAI/AR prevention with these providers.

3. **Engage staff outside of traditional IPC roles to support HAI/AR:** The staff who fulfill HAI/AR functions have scientific and clinical experience but may lack specific skills related to partnership and relationship-building. For example, epidemiologists bring expertise in data collection and analysis; nursing staff are trained in infection prevention and universal precautions; and Disease Investigation Specialists are well-

trained in interviewing and gathering details from a wide variety of people. HAI/AR teams could look to other staff may bring capacities related to relationship and partner-building. Staff who are involved in community health, community health assessment and improvement, and community outreach may bring necessary skills for building meaningful partnerships with healthcare facility staff and be valuable HAI/AR team members.

4. **Become well-informed about State HAI Programs and Responsibilities:** There were mentions across the data sources about the importance of understanding and connecting with the State HAI program. Maintaining this connection can help the LHD position itself as a trusted partner to healthcare facilities, rather than a regulator, which is often the case with state health departments. Examples include:
   - Learn about the HAI reporting requirements in your state
   - Identify and review your state's HAI plan
   - Use the CDC Guide for Facilitating Conversation with State HAI/AR Program

Future Considerations

WE Public Health offers the following additional considerations for the NACCHO HAI/AR Project Team.

Capacity-Building and Technical Assistance (CBTA) Opportunities:

- Response to COVID-19 has required public health and healthcare facilities to coordinate more than ever before. LHDs have an opportunity to maintain these relationships for future HAI/AR work. NACCHO could provide some guidance and tools to do this now, before the relationships become dormant.
- To further support relationship-building and partnership, consider requiring LHDs to participate as teams with health facility representatives in at least some of the NACCHO-sponsored CBTA opportunities. For example, LHDs could apply to be part of a CBTA program with 1-2 healthcare facility partners, who engage together through all CBTA activities and complete a specific project together.
- FEMA offers free training in emergency preparedness/response, including some training on emerging infectious diseases that may be relevant. It was noted that these trainings can be hard to find. NACCHO could play a role in identifying these trainings and making them available to LHDs.
- Use of NHSN data was mentioned by one interviewee as a valuable source of information for LHDs. However, the LHD representative we spoke with said that access is not needed, because it is more of a state function. NACCHO has an active policy statement supporting increased access to NHSN data by LHDs. NACCHO may wish to further explore the utility of this data for LHDs and support advocacy efforts as appropriate to make the data available.

Other Opportunities

- HAI/AR may provide a unique opportunity to lift the experience of rural LHDs. Because rural LHD staff wear multiple hats and fulfill multiple functions, operating in partnership is a necessity. Rural LHDs may be able to share valuable guidance about the benefits of collaborating with multiple partners.
- One notable and potential model program was identified by the project team at The Los Angeles County Department of Public Health Hospital Outreach Unit's Liaison Public Health Nurse Project. This program is designed to strengthen capacity and bridge the care continuum with hospitals to prevent/control infectious disease by assigning LHD public health nurses to hospitals in the jurisdiction to support reporting, surveillance, and collaboration. [5]

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[5] Sakamoto, S., Terashita, D., and Balter, S. (2020). Liaison Public Health Nurse Project: Innovative Public Health Approach to Combat Infectious Disease in Hospitals. Journal of Public Health Management and Practice. 26:6, 557-61. Accessed Aug 17, 2022.

Appendices

A. Landscape Analysis Approach and Protocol
B. Search terms
C. Crosswalk of APIC Competency Domains and Core Competencies for Public Health Professionals
D. Crosswalk of APIC Competencies and Strategic Skills for Public Health

Appendix A: Landscape Analysis Approach and Protocol

Components

The environmental scan includes three components:

1. Literature Review,
2. Key Informant Interviews, and
3. Document Gathering

Literature Review:

WE Public Health will conduct a comprehensive literature review to identify all existing journal articles, reports prepared by national organizations (NACCHO, CDC, APIC), and training listing of free IPC trainings available to the public health workforce. All sources identified will be compiled into a data matrix/catalog.

Key Informant Interviews:

WE Public Health is contracted by NACCHO to conduct an environmental scan of current local health department (LHD) health care-associated infections/antimicrobial resistance (HAI/AR) workforce roles and responsibilities as well as current education and training requirements for this work. WE have gathered substantial information through existing documents and literature, and WE hope to gather more details from NACCHO staff, Public Health Training Centers (PHTCs) and Project Firstline partner organizations.

Interviews Requested
- NACCHO Staff (up to 5 persons) *group or individual discussions
- Public Health Training Centers (6) *individual interviews
- Project Firstline Partner Organizations (5) *individual interviews

Topics of Interest by Interviewee

Topics of Interest	Interviewees
LHD roles related to HAI/AR, policies on HAI/AR training and competencies; training needs, strategies for healthcare and LHD collaboration	NACCHO Staff (up to 5)
Training or Needs Assessments specific to HAI/AR or IPC AND Insights on LHD roles related to HAI/AR, policies on HAI/AR training and competencies; training needs, strategies for healthcare and LHD collaboration	<u>10 Regional Public Health Training Centers (up to 6)</u> Region I – New England Public Health Training Center Region II – Region 2 Public Health Training Center Region III – Mid-Atlantic Regional Public Health Training Center Region IV – Region IV Public Health Training Center Region V – Region V Public Health Training Center Region VI – South Central Public Health Training Center Region VII – Midwestern Public Health Training Center Region VIII – Rocky Mountain Public Health Training Center Region IX – Western Region Public Health Training Center Region X – Northwest Public Health Training Center
LHD roles related to HAI/AR, policies on HAI/AR training and competencies; training needs, strategies for healthcare and LHD collaboration	Project Firstline partners prioritized for interviews*: (up to 5) American Academy of Pediatrics** American Medical Association** American Hospital Association** (HRET) American Nurses Association** Asian and Pacific Islander American Health Forum National Association of County and City Health Officials

	National Council of Urban Indian Health (NCUIH) National Hispanic Medical Association** National Indian Health Board National Network of Public Health Institutes

*Note publicly available contact information for Project Firstline point of contact is only available for the National Indian Health Board. WE can reach out to these organizations to determine the point of contact, or WE welcome any contact information available from NACCHO.

**Note these organizations are medical-focused, and WE ask NACCHO to provide guidance on if outreaching these organizations would be beneficial.

Outreach and Conducting Interviews
To schedule interviews, WE will draft emails and send directly to interviewees OR WE will draft emails to be sent by NACCHO to interviewees, as indicated:

Interviewee Group	NACCHO send	WE send	Notes
NACCHO staff	x		
Public Health Training Centers		x	
Project Firstline Partners	x		

WE will request that individuals schedule times using a shared calendar link. These interviews are expected to last about 30 minutes each.

Document Gathering:

WE Public Health is contracted by NACCHO to conduct an environmental scan of current local health department (LHD) health care-associated infections/antimicrobial resistance (HAI/AR) workforce roles and responsibilities as well as current education and training requirements for this work. WE have gathered substantial information through existing documents and literature, and WE hope to gather more details from BLOC-funded local health departments.

Requested Documents by Organization from which they are requested

Document Type	Requested Orgs
Job descriptions for anyone who has IPC roles included in their job and/or are engaging with healthcare facilities Job titles may include epidemiologist, nurse, disease investigator, environmental health specialist, sanitarian, IPC/infectious disease/communicable disease program manager, health educator, etc.	BLOC-funded LHDs Infectious disease workgroup participants Epi workgroup A few others
IPC Plan	BLOC-funded LHDs Infectious disease workgroup participants Epi workgroup A few others

Proposed Approach for Collecting Documents

WE will draft emails to be sent by NACCHO to local health department contacts and copying WE Public Health.

WE have created an online form where LHD staff can upload documents and provide any additional comments.

NACCHO Document Gathering

Dear Local Health Department Colleague:

NACCHO is currently engaged in an assessment of local health department (LHD) workforce roles, responsibilities, and current education and training requirements for staff whose work includes:
- **Health care-associated infections/antimicrobial resistance (HAI/AR)**
- **Infection prevention and control (IPC).**

This effort will inform the development of training and resources for LHDs across the nation.

Because of your work in HAI/AR /IPC or participation in related NACCHO Workgroups, we believe you have valuable information to share.

We are requesting that you please take a moment to share a few relevant documents that may help us better understand your efforts in HAI/AR and IPC. *These will be used only to inform our assessment and will not be shared outside of the NACCHO team working on this project.*

First and Last Name *

Email *

Organization *

File Upload

Please use the file uploader to share the following documents:

1. Job descriptions for any staff who:
   - Have HAI or IPC roles included in their job and/or are building partnerships/liaising with area healthcare providers. *May include: epidemiologist, nurse, disease investigator, environmental health specialist, sanitarian, IPC/infectious disease/communicable disease program manager, health educator, etc.*
2. HAI/AR Infection Prevention and Control (IPC) plans
3. Workforce Development Plans or similar (if HAI/AR is included)

If the uploader is not working, you may email nharty@wepublichealth.com.

File Upload *

Drag and drop files here or browse files

Please share any comments you have about this work:

Thank you!

☐ Send me a copy of my responses

Submit

Email Templates

Email Templates to Invite Interviewees

Draft Email to NACCHO Staff
Hello!

On behalf of NACCHO, WE Public Health is engaged in an effort to understand current local health department (LHD) workforce roles, responsibilities, and current education and training requirements for staff working in health care-associated infections/antimicrobial resistance (HAI/AR).

WE believe you have valuable insight into the needs of the public health workforce that could help inform this effort and would like to schedule a brief interview.

If you are available for a 30 minute conversation to discuss with us, please select a time using this Calendly link by Tuesday, October 4.

The WE Public Health contacts, Jennifer and Nicole, are included on this email.

Please direct questions to Nicole Harty at nharty@wepublichealth.com.

Draft Email to Public Health Training Centers
Hello!

On behalf of NACCHO, WE Public Health is engaged in an effort to understand current local health department (LHD) workforce roles, responsibilities, and current education and training requirements for staff working in health care-associated infections/antimicrobial resistance (HAI/AR).

As a Public Health Training Center, WE believe you have valuable insight into the needs of the public health workforce that could help inform this effort.

Would you be available for a 30 minute conversation to discuss with us, please select a time using this Calendly link by Tuesday, October 4. Alternatively, if you have any relevant documentation, you can share that directly with Nicole at nharty@wepublichealth.com

Please direct questions to Nicole Harty at nharty@wepublichealth.com.

Draft Email to Project Firstline Partners

Hello!

On behalf of NACCHO, WE Public Health is engaged in an effort to understand current local health department (LHD) workforce roles, responsibilities, and current education and training requirements for staff working in health care-associated infections/antimicrobial resistance (HAI/AR).

As a Project Firstline partner, WE believe you have valuable insight into the needs of the public health workforce that could help inform this effort. WE would like to speak with a representative from your organization about the role of LHDs in HAI/AR efforts and training needs for infection prevention and control.

If you are available for a 30 minute conversation to discuss with WE Public Health, please select a time using this Calendly link by Tuesday, October 4.

The WE Public Health contacts, Jennifer and Nicole, are included on this email.

Please direct questions to Nicole Harty at nharty@wepublichealth.com.

Email Templates for Document Gathering

Draft Email to BLOC-funded LHDs and Other Workgroups
Hello!

NACCHO is currently engaged in an assessment of local health department (LHD) workforce roles, responsibilities, and current education and training requirements for staff working in health care-associated infections/antimicrobial resistance (HAI/AR).

This effort will inform the development of training and resources for LHDs.

Because of your work in HAI/AR or participation in NACCHO Workgroups, we believe you have valuable information to share.

We are requesting that you please take a moment to share a few relevant documents that may help us better understand your efforts in HAI/AR and Infection, Prevention, and Control (IPC).
(These will be used *only* to inform our assessment and will not be shared outside of the NACCHO team working on this project).
- Job descriptions for any staff who:
  - Have HAI or IPC roles included in their job and/or
  - Are building partnerships/liaising with area healthcare providers.
  - *May include* epidemiologist, nurse, disease investigator, environmental health specialist, sanitarian, IPC/infectious disease/communicable disease program manager, health educator, *etc.*
- HAI/AR Infection Prevention and Control (IPC) plans
- Workforce Development Plans or similar (if HAI/AR is included)

Please use THIS LINK *(link removed)* to upload your documents by Tuesday, October 4.

Thank you for helping us serve you and local health departments across the country.

Please direct questions to Nicole Harty at nharty@wepublichealth.com.

Interview Guides

NACCHO Staff

Background
WE Public Health is contracted by NACCHO to conduct an environmental scan of current local health department (LHD) health care-associated infections/antimicrobial resistance (HAI/AR) workforce roles and responsibilities and current education and training requirements for local health department staff working in HAI/AR. WE have gathered substantial information through existing documents and literature, and WE hope to

gather more details from NACCHO staff based upon their experience supporting HAI/AR work with local health departments.

The conversation today will take approximately 30 minutes. We would like to record and transcribe the discussion so we have an accurate record of what you said. Any recording or transcription will be de-identified so it is not associated with your name or organization. At the end of the project, we will share de-identified notes and transcripts with NACCHO. All recordings will be erased when analysis is complete. The content of what you share today will not have any bearing on your current or future funding opportunities from NACCHO. Do we have permission to record this conversation?

Questions
Name of Interviewee:
Organization:
● Based on your experience with Project Firstline and other IPC work, what types of health department staff are working in HAI/AR (e.g., program managers, nurses, etc)? Please describe the job titles and level in the organization.
● Based on your experience with Project Firstline and other IPC work, what types of roles/responsibilities do these health department HAI/AR staff have?
● Have you seen any job descriptions for health department staff working in HAI/AR that you can share?
● Have you seen any policies related to training or education requirements for staff working in HAI/AR that you can share?
● Based upon your work in infection control with local health departments, what are the top three needs in training in infection control for local health department staff working in health care-associated infections and antibiotic resistance?
● Based upon your work in infection control with local health departments, what strategies do you think would be most effective in strengthening relationships between local health departments and healthcare facilities (hospitals, acute care, long-term care, dialysis)?
● Which of the APIC Infection Prevention and Control core competency domains (Leadership, Professional Stewardship, Quality Improvement, IPC Operations, IPC Informatics, Research) do you think are most applicable to local health department staff working in infection prevention and control?

LHD Staff

Background
WE Public Health is contracted by NACCHO to conduct an environmental scan of current local health department (LHD) work in health care-associated infections/antimicrobial resistance (HAI/AR), including workforce roles and responsibilities and current education and training requirements. WE have gathered substantial information through existing documents and literature, and WE hope to gather more details from Health Departments/NACCHO staff through brief interviews.

The conversation today will take approximately 30 minutes. We would like to record and transcribe the discussion so we have an accurate record of what you said. Any recording or transcription will be de-identified so it is not associated with your name or organization. At the end of the project, we will share de-identified notes and transcripts with NACCHO - not the audio recordings themselves, and all recordings will be erased when analysis is complete.

The content of what you share today will not have any bearing on your current or future funding opportunities from NACCHO. Do we have permission to record this conversation?

Questions

Name of Interviewee:

Organization:

- What is your name and role within your organization?
- What is your role and responsibilities related to HAI/AR?
- Based on your experience, what types of health department staff are working in HAI/AR (e.g., program managers, nurses, etc)? Please describe the job titles and level in the organization. These may be the types of staff in the department you work for directly or staff at other local health departments in your jurisdiction with whom you work.
- What are the actual functions of the work? What do they do?
- Have you seen any job descriptions for health department staff working in HAI/AR that you can share? Perhaps you or someone from your department have already shared them at THIS LINK.
- Have you seen any policies related to training or education requirements for staff working in HAI/AR that you can share? These may be policies specific to your department or other departments with whom you collaborate.
- What would you say are the top three needs in training related to HAI/AR for local health department staff working in this area?
- What strategies have you seen to be most effective in strengthening relationships between local health departments and healthcare facilities (hospitals, acute care, long-term care, dialysis)?
- What strategies would you think would be most effective?
- The Association for Infection Prevention and Epidemiology has developed core competency domains related to Infection Prevention and Control (core competency domains). I'd like to ask which of these do you think are most relevant/applicable for health department staff?
  - Leadership,
  - Professional Stewardship,
  - Quality Improvement,
  - IPC Operations,
  - IPC Informatics,
  - Research

Public Health Training Centers

Background

WE Public Health is contracted by NACCHO to conduct an environmental scan of current local health department (LHD) work in health care-associated infections/antimicrobial resistance (HAI/AR), including workforce roles and responsibilities and current education and training requirements. WE have gathered substantial information through existing documents and literature, and WE hope to gather more details from Health Departments/NACCHO staff through brief interviews.

The conversation today will take approximately 30 minutes. We would like to record and transcribe the discussion so we have an accurate record of what you said. Any recording or transcription will be de-identified so it is not associated with your name or organization. At the end of the project, we will share de-identified notes and transcripts with NACCHO - not the audio recordings themselves, and all recordings will be erased when analysis is complete.

The content of what you share today will not have any bearing on your current or future funding opportunities from NACCHO. Do we have permission to record this conversation?

Questions

Name of Interviewee:

Organization:

- What is your name and role within your organization?
- What is your role and responsibilities related to HAI/AR?
- Based on your experience, what types of health department staff are working in HAI/AR (e.g., program managers, nurses, etc)? Please describe the job titles and level in the organization. These may be the types of staff in the department you work for directly or staff at other local health departments in your jurisdiction with whom you work.
- What are the actual functions of the work? What do they do?
- Have you seen any job descriptions for health department staff working in HAI/AR that you can share? Perhaps you or someone from your department have already shared them at THIS LINK.
- Have you seen any policies related to training or education requirements for staff working in HAI/AR that you can share? These may be policies specific to your department or other departments with whom you collaborate.
- What would you say are the top three needs in training related to HAI/AR for local health department staff working in this area?
- What strategies have you seen to be most effective in strengthening relationships between local health departments and healthcare facilities (hospitals, acute care, long-term care, dialysis)?
- What strategies would you think would be most effective?
- The Association for Infection Prevention and Epidemiology has developed core competency domains related to Infection Prevention and Control (core competency domains). I'd like to ask which of these do you think are most relevant/applicable for health department staff?
    - Leadership,
    - Professional Stewardship,
    - Quality Improvement,
    - IPC Operations,
    - IPC Informatics,
    - Research

Project Firstline Partners

Background

WE Public Health is contracted by NACCHO to conduct an environmental scan of current local health department (LHD) health care-associated infections/antimicrobial resistance (HAI/AR) workforce roles and responsibilities and current education and training requirements for local health department staff working in HAI/AR. WE have gathered substantial information through existing documents and literature, and WE hope to gather more details from Project Firstline partners based upon their experience implementing infection prevention and control trainings.

The conversation today will take approximately 30 minutes. We would like to record and transcribe the discussion so we have an accurate record of what you said. Any recording or transcription will be de-identified so it is not associated with your name or organization. At the end of the project, we will share de-identified notes and transcripts with NACCHO. All recordings will be erased when analysis is complete. The content of what you share today will not have any bearing on your current or future funding opportunities from NACCHO. Do we have permission to record this conversation?

Questions

Name of Interviewee:

Organization:

- Describe the population you work with:

- Based on your experience with Project Firstline, what types of health department staff are working in HAI/AR (e.g., program managers, nurses, etc)? Please describe the job titles and level in the organization.
- Based on your experience with Project Firstline, what types of roles/responsibilities do these health department HAI/AR staff have?
- Have you seen any job descriptions for health department staff working in HAI/AR that you can share?
- Have you seen any policies related to training or education requirements for staff working in HAI/AR that you can share?
- Based upon your work with Project Firstline, what are the top three needs in training in infection control for local health department staff working in health care-associated infections and antibiotic resistance?
- Based upon your work with Project Firstline, what strategies do you think would be most effective in strengthening relationships between local health departments and healthcare facilities (hospitals, acute care, long-term care, dialysis)?
- For Medical: How can health departments best build a relationship with you. What strategies?
- Do you have any additional information/resources that you think would be helpful? (Request to email or send us links)

Appendix B: Search Terms

The following search terms were used for the literature and training scan.

	PubMed	Journal of Public Health Management & Practice	Websites	Training Repositories
Search Terms	HAI & public health Health care-associated infection Antibiotic resistance	HAI/AR HAI Health care-associated infection Antibiotic resistance	HAI Healthcare-associated infection, Antibiotic resistance Infection prevention	Infection prevention Antibiotic & antimicrobial under topic areas: infectious disease and emergency preparedness and response
Exclusion Criteria	Published before 2016 Non-US based research and reports Anything focused on descriptive epidemiology of HAIs Cost analyses Research studies of specific HAIs Methods and research about combating HAIs in the hospital setting			

Appendix C: Crosswalk of APIC Competency Domains and Core Competencies for Public Health Professionals

Crosswalk: Core Competencies for Public Health Professionals with APIC Competency Domains								
CORE COMPETENCIES FOR PUBLIC HEALTH PROFESSIONALS			**APIC Competency Domains**					
Domains		**Competencies**	**Leadership**	**Professional Stewardship**	**Quality Improvement**	**IPC Operations**	**IPC Informatics**	**Research**
Data Analytics and Assessment Skills	1.1	Describes factors that affect the health of a community				X		
	1.2	Accesses existing quantitative and qualitative data			X		X	
	1.3	Collects quantitative and qualitative data			X	X	X	
	1.4	Analyzes quantitative and qualitative data			X	X	X	
	1.5	Manages quantitative and qualitative data	X				X	
	1.6	Uses quantitative and qualitative data			X	X	X	
	1.7	Applies public health informatics in using data, information, and knowledge				X	X	
	1.8	Assesses community health status				X		
Policy Development and Program Planning Skills	2.1	Develops policies, programs, and services	X		X	X	X	X
	2.2	Implements policies, programs, and services			X			X
	2.3	Evaluates policies, programs, services, and organizational performance	X					
	2.4	Improves policies, programs, services, and organizational performance	X					
	2.5	Influences policies, programs, and services external to the organization	X	X				
	2.6	Engages in organizational strategic planning	X					
	2.7	Engages in community health improvement planning	X			X		
Communication Skills	3.1	Determines communication strategies	X	X	X		X	X
	3.2	Communicates with internal and external audiences		X		X		
	3.3	Responds to information, misinformation, and disinformation		X		X		
	3.4	Facilitates communication among individuals, groups, and organizations	X	X	X	X		
Health Equity Skills	4.1	Applies principles of ethics, diversity, equity, inclusion, and justice		X				
	4.2	Engages in continuous self-reflection about one's biases		X				
	4.3	Recognizes the diversity of individuals and populations		X				
	4.4	Reduces systemic and structural barriers that perpetuate health inequities						

Category	#	Competency						
	4.5	Implements organizational policies, programs, and services to achieve health equity and social and environmental justice			X			
	4.6	Contributes to achieving and sustaining a diverse, inclusive, and competent public health workforce	X	X				
	4.7	Advocates for health equity and social and environmental justice						
Community Partnership Skills	5.1	Describes conditions, systems, and policies affecting community health and resilience	X					
	5.2	Establishes relationships to improve community health and resilience			X	X		
	5.3	Maintains relationships that improve community health and resilience			X	X		
	5.4	Collaborates with community members and organizations	X	X	X	X		X
	5.5	Shares power and ownership with community members and others		X	X			
Public Health Sciences Skills	6.1	Describes systems, policies, and events impacting public health	X		X	X		
	6.2	Applies public health sciences in delivering the 10 Essential Public Health Services						
	6.3	Uses evidence in developing, implementing, evaluating, and improving policies, programs, and services	X		X			
	6.4	Contributes to the evidence base for improving health						
Management and Finance Skills	7.1	Describes factors that affect the health of an organization						
	7.2	Secures human resources	X					
	7.3	Manages human resources	X					
	7.4	Engages in professional development	X	X	X	X		
	7.5	Secures financial resources	X	X				
	7.6	Manages financial resources	X	X				
	7.7	Implements organizational policies, programs, and services to achieve diversity, equity, inclusion, and justice						
	7.8	Manages programs and services	X					
	7.9	Engages in contingency planning	X			X		
	7.1	Applies critical thinking in decision making	X		X	X	X	X
	7.11	Engages individuals and teams to achieve program and organizational goals						
	7.12	Facilitates collaboration among individuals, groups, and organizations	X		X	X		
	7.13	Engages in performance management			X			
Leadership and Systems Thinking Skills	8.1	Creates opportunities to achieve cross-sector alignment	X					
	8.2	Implements a vision for a healthy community	X					

	8.3	Addresses facilitators and barriers impacting delivery of the 10 Essential Public Health Services						
	8.4	Creates opportunities for creativity and innovation						
	8.5	Responds to emerging needs		X	X	X	X	
	8.6	Manages organizational change	X					
	8.7	Engages politicians, policymakers, and the public to support public health infrastructure	X	X				
	8.8	Advocates for public health		X				
PH Core Competencies Source		https://www.phf.org/resourcestools/Documents/Core_ Competencies_for_Public_Health_Professionals_202 1October.pdf						
APIC Competencies Source		https://apic.org/professional-practice/infection-prevent ionist-ip-competency-model/						

Appendix D: Crosswalk of APIC Competencies and Strategic Skills for Public Health

Crosswalk: APIC Competencies with Public Health Strategic Skills										
APIC Competencies		**PUBLIC HEALTH STRATEGIC SKILLS**								
		Effective Communication	Data-Based Decision Making	Justice, Equity, Diversity, Inclusion	Resource Management	Change Management	Systems and Strategic Thinking	Community Engagement	Cross-Sectoral Partnerships	Policy Engagement
Leadership *Infection preventionists (IPs) use leadership skills to establish a clear vision for IPC programs throughout the continuum of care. To establish that vision, the IP must collaborate with other leaders and colleagues to align IPC program goals with the strategic goals of the organization. Subdomains identify future-oriented skill sets to guide the IP in the process of influence, implementation, and innovation to generate and enhance the commitment, capabilities, methods, and resources needed to translate visions and plans into reality. The development of these skills throughout their career will prepare IPs for leadership opportunities that may arise in the future.*	Communication	X								
	Critical Thinking	X	X	X	X	X	X	X	X	X
	Collaboration	X		X				X		
	Behavioral Science					X		X	X	
	Program Management	X	X	X	X	X	X			
	Mentorship	X		X						
Professional Stewardship *The continuously changing world of health care and infection prevention requires dedicated stewards that will allow the profession to develop, adjust, and uphold a respectable and reliable reputation. IPs must be willing and ready to be held accountable for an entity larger then themselves and the organizations for which they work. IPs are responsible for and entrusted with the future of the profession and hold the potential to produce meaningful change within infection prevention practice. Professional stewardship and the subdomains it encompasses are future-oriented and develop as IPs advance in their knowledge, experience, and expertise.*	Accountability			X						
	Ethics			X						
	Financial Acumen		X		X					
	Population Health		X	X			X	X	X	
	Continuum of Care			X			X		X	
	Advocacy	X		X						X
Quality Improvement *Quality improvement is a fundamental framework that IPs must use to systematically improve care and reduce infections within their health care setting and throughout the continuum of care. Quality improvement requires meaningful analysis and use of data; a clear comprehension of how to assess risk, apply risk reduction strategies, and incorporate performance improvement methodology; and the ability to maintain a focus on patient safety. Progression*	IP as SME	X		X			X		X	
	Performance Improvement		X			X	X		X	
	Patient Safety	X		X			X		X	

Domain	Competency									
in the future-oriented quality improvement subdomains will allow IPs to implement stable processes, reduce variation, and improve outcomes to establish a culture of safe and quality care within their health care organizations and promote this culture throughout the profession.	Data Utilization	X	X		X		X		X	
	Risk Assessment and Risk Reduction	X		X	X	X	X			
IPC Operations *While all model domains address IPC content, this domain highlights specific future-oriented competency content that crosses clinical, technical, and leadership subdomains. The broad scope of functions contained in the IPC operations domain use proactive and reactive approaches to conduct surveillance, identify infection risks, implement infection interventions, and mitigate risks.*	Epidemiology and Surveillance	X					X		X	
	Education	X		X	X	X			X	
	IPC Rounding						X			
	Cleaning, Disinfection, Sterilization				X					
	Outbreak Detection and Management	X		X	X		X	X	X	X
	Emerging Technologies				X					
	Antimicrobial Stewardship	X	X	X	X	X	X	X	X	X
	Diagnostic Stewardship		X		X					X
IPC Informatics *Information and diagnostic technologies and their applications are rapidly evolving and highly dynamic. IPs must keep abreast of and proficient in using and leveraging systems to input, analyze, extract, and manage data to support and drive data integrity, streamlining of processes, innovative IPC practices, and positive patient outcomes. Future-oriented concepts such as rapid identification mechanisms for data and diagnostic laboratory tests, real-time decision making, data dissemination, machine learning, and artificial intelligence are all important.*	Surveillance Technology	X	X	X	X	X	X		X	X
	Electronic Medical Records & Data Warehouse		X	X			X		X	X
	Data Management, Analysis, and Visualization			X			X		X	
	Diagnostic Testing Data and Techniques	X	X	X	X	X			X	
Research *Research is an essential skill set that supports and advances the IPC field. The content in this domain highlights the importance of applied research and implementation science for the IP. Incorporating research constructs into the role equips the IP with the opportunity to synthesize, apply, and evaluate research information to develop and demonstrate IPC and epidemiological expertise.*	Evaluation of Research		X	X			X			
	Comparative Effectiveness Research		X	X			X			
	Implementation and Dissemination Science	X		X		X	X	X	X	X
	Research or Evidence-Based Practice			X					X	

APIC Competencies Source	https://apic.org/professional-practice/infection- preventionist-ip-competency-model/									
Public Health Strategic Skills Source	https://debeaumont.org/strategic-skills/									