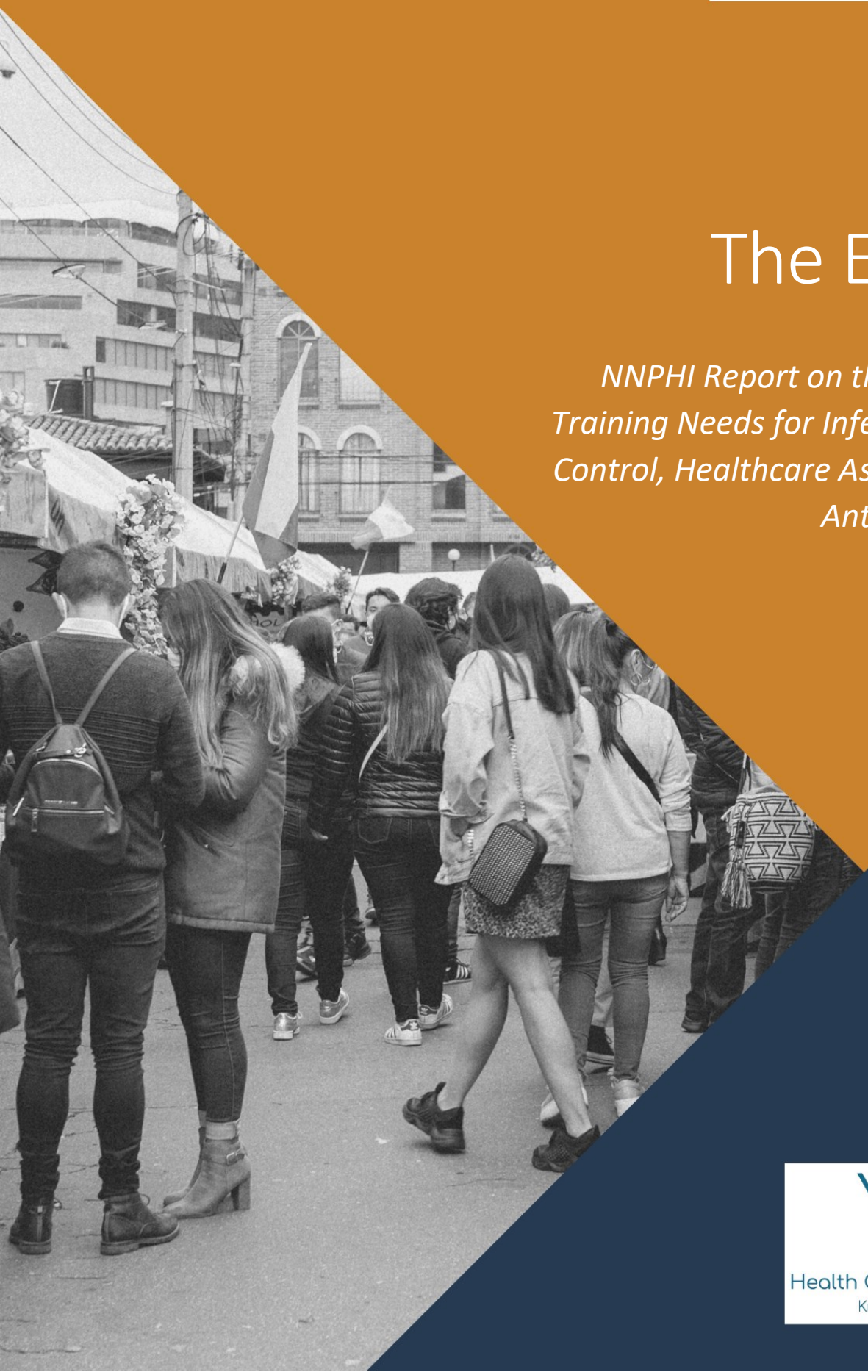
National Network of Public Health Institutes



The Essentials

NNPHI Report on the Essential Skills and Training Needs for Infection Prevention and Control, Healthcare Associated Infections & Antimicrobial Resistance

March 23, 2023

Health Communications Consultants
Knowledge, Innovation, & Equity.

The Essentials: NNPHI Report on Essential Skills and Training Needs for Infection Prevention and Control, Healthcare Associated Infections, & Antimicrobial Resistance

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Contents

List of Abbreviations

ABBREVIATION	DEFINITION
AMR	Antimicrobial Resistance
APIC	Association of Professionals in Infection Control
AR	Antimicrobial Resistance
ASTHO	Association of State and Territorial Health Officials
CBT	Cognitive behavioral therapy
CDC	Centers for Disease Control and Prevention
CIC	Certification in Infection Control
CSTE	Council of State and Territorial Epidemiologists
D&I	Diversity and Inclusion
EI	Emotional Intelligence
HAI	Healthcare Associated Infections
HCC, INC.	Health Communications Consultants, Inc.
HHS	U.S. Department of Health and Human Services
IPC	Infection Prevention and Control
LS	Listening Session
MPH	Master of Public Health
NACCHO	National Association of County and City Health Officials
NNPHI	National Network of Public Health Institutes
PH	Public Health
PHW	Public Health Workforce
PPE	Personal Protective Equipment
SHEA	Society for Healthcare Epidemiology of America
TRAIN	Learning Network

Executive Summary

The National Network of Public Health Institutes (NNPHI) as part of Centers for Disease Control and Prevention's (CDC) Project Firstline partnered with Health Communications Consultants, Inc. (HCC, Inc.) to 1) further operationalize essential skills related to infection prevention and control (IPC), Healthcare Associated Infections (HAI) and Antimicrobial Resistance (AR), 2) identify training and education needs related to these skills, and 3) provide recommendations for future training topics and modalities of training.

This report contains what was heard in the listening sessions, responses from the associated surveys, and an analysis of that information. Respondents (n = 65) insights into essential skills were grouped into three overarching categories, referred to as The Essentials:

The Essentials		
Essential (for all) Transferable Skills	**Essential (for workforce/specific roles) Performance Objectives**	**Essential (for all) Values/Attitudes**
Strategic Thinking Situation Awareness Problem Solving Emotional Intelligence Communication	Information Management Information Analysis Change Management Leadership Policy Engagement	Openness to Learn Self-efficacy Diversity & Inclusion Networking Community Building & Sustainment Trust Teamwork

The essential transferrable skills and essential values are universal in this workforce and should be practiced and evaluated for personnel during their academic training and performance reviews. The essential performance objectives are workforce or role specific. This taxonomy is helpful, not only because it is a clearer organization of *The Essentials* as it is based on the *function of each construct as it applies to the public health work (PHW),* but also because this functional basis directs instructional and training methods.

With *The Essentials* identified, the next challenge was to provide guidance to train and support these important competencies. Participants reported that currently eLearning and virtual instructor-led training are their most frequently used training modalities, even though they felt the most effective is a blended approach (using multiple modalities) and instructor-led training in IPC, HAI, and AR.

That said, selecting the best modality is a matter of addressing this question: **What delivery method allows instructors to observe the desired performance?** While some people will always prefer certain instructional methods over others, the ultimate litmus test is efficacy, and the modality for delivery ought to be determined with that priority. Learning engineers with knowledge in adult learning, learning technology, and assessment design should be part of IPC, HAI, and AR curricular development. Therefore, this report provides guidance for designing effective training by incorporating research in emotional intelligence.

Introduction

Health Communications Consultants, Inc. (HCC, Inc.) is providing assessment and evaluation to ascertain the essential skills and training needs of the public health workforce (PHW) involved in Infection Prevention and Control (IPC), Healthcare Associated Infections (HAI), Antimicrobial Resistance (AR) activities. This project has four goals:

Identify and recruit participants for at least five virtual listening sessions with the following audience segments:

Directors or training managers of national IPC- and HAI/AR-involved organizations
State-level IPC and HAI/AR directors and managers in states with centralized governance models
State-level IPC and HAI/AR directors and managers in states with decentralized governance models
Non-clinical public health workers involved in IPC and HAI/AR in healthcare settings.
Non-certified and non-credentialed early career individuals (e.g., public health nurses, epidemiologists) or students working in IPC and HAI/AR
Other audiences as needed or identified by collaborators.

Facilitate at least five virtual listening sessions recorded using Zoom or a similar platform.

Analyze data from completed listening sessions.

Present findings via a final written report and corresponding slide deck(s) for presentation(s) to internal and external partners.

Background

Infection prevention and control (IPC) refers to the practical, evidence-based practices and procedures that when applied consistently in health care settings, can prevent, or reduce the risk of transmission of microorganisms. A healthcare-associated infection (HAI) is an infection that develops as a result of medical care and develops during, or soon after, receiving healthcare services or being in a healthcare setting. These unanticipated infections can develop during medical or surgical treatment in a hospital, outpatient surgery center, clinic, doctor's office, nursing home, rehabilitation facility, or while receiving wound care services or other home-care visits by a health professional [1]. Antimicrobial Resistance (AR) occurs when bacteria, viruses, fungi, and parasites change over time and no longer respond to medicines. This makes AR infections harder to treat and increases the risk of disease spread, severe illness, and death [2].

HAIs and ARs are a threat to patients, and subsequently, public health safety. These kinds of infections are a significant cause of illness and death; they can have serious emotional, financial, and medical consequences. Knowledge of IPC procedures among the PHW are crucial to IPC as compliance with IPC measures is critical for worker safety, patient protection, and community health.

IPC, HAI, and AR related activities require substantial technical skills and knowledge. However, there is no standardization in competency and capacity building for the workforce. There is inconsistency in training, variability in competency, variability in capabilities from varying sectors, facilities, and settings. These gaps are further enhanced by inadequate infrastructure, resource and workforce shortages, inadequate training, and variable education levels in the workforce.

With this level of inconsistencies, it can be difficult to know where to begin to develop public health teams for IPC, HAI and/or AR. IPC, HAI and/or AR activities are part of the PHW mission to detect, monitor, mitigate, and prevent the spread of disease in the community and healthcare settings.

About this report

The body of the present report summarizes what was heard in the listening sessions and is supplemented with quantitative data collected in recruitment and post-listening session surveys. The aim is to address the question, what, beyond the technical and domain specific skills in IPC, HAI, & AR work is ESSENTIAL? Public Health workers are tasked with a myriad of duties. While these responsibilities challenge workers to draw from their domain-specific technical knowledge, that kind of knowledge is not sufficient to meet all (quite possibly, most) public health work objectives. These workers need to know disease prevention, pathogenesis, and mitigation factors; they need to know how those factors apply to health-related equipment and materials. But they also need complex interpersonal abilities that transcend the moment, so that their goals to promote and preserve public health can be achieved.

These are the skills, objectives, and values that, with domain-specific knowledge, make up what will be referred to in this report as *The Essentials*. The body of the present report provides an overview of how the authors identified *The Essentials* and what that means for training.

The appendixes provide full details of the work that identified these *Essentials*, including data, methodological processes, and detailed descriptions of the results. The logic used to arrive at a functional taxonomy is explained and recommendations based on the findings are clarified in detail.

Acknowledgments

The authors wish to acknowledge with gratitude NNPHI for funding the listening session and its associated analysis. We also want to acknowledge Sabrianna Zoretsky-Longo of Sabyish Designs and Rae Hanson for their contributions.

This project is supported by the Centers for Disease Control and Prevention of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance award (NOFO OT18-1802, titled Strengthening Public Health Systems and Services through National Partnerships to Improve and Protect the Nation's Health) totaling $3,500,000 with 100 percent funded by CDC/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by CDC/HHS, or the U.S. Government.

Methods

To understand the essential skills for the public health workforce (PHW) in infection prevention and control, the training and educational needs related to those essential skills and recommendations for future training topics and modalities, we conducted an observational, cross-sectional evaluation. The following overview provides highlights of the methods; a full description is contained in Appendix A: Methods.

Participants

Potential participants were identified through State and Territorial contacts within the CDC State-based HAI Prevention and other professionals, through convenience sampling of our research team's PH networks, snowball sampling (extending the invitation to potential recruits via email and social media) to broaden the participant pool. The target population has IPC, HAI, and/or AR public health work experience.

See Appendix B: Recruitment materials (pre-listening session) for:

- Initial Email to Potential Participants
- Recruitment Flyer
- Follow-up Email to Potential Participants
- Email Invitations and Reminders

Tools

The evaluation methods had three sections for data collection: 1. Recruitment Survey, 2. Listening Sessions and 3. Post Listening Session Survey. A recruitment email and flyer were sent to the participant pool with consent assessed with continuation of the recruitment process. Follow up email communications and telephone calls were also used to elicit participation.

The invitations to participate included a link to a Qualtrics survey which contained administrative information such as informed consent and scheduling, as well as pre-listening session survey questions. Participants were given the option of six (6) 90-minute listening sessions to participate. Once the participant selected a day and time, an email invitation with a unique identifier was sent to the participants. A reminder email 1 day prior to the scheduled date was used to ensure timely participation. Persons unable to make their initial selection were communicated with to reschedule for their second selection or for a later listening session date.

See Appendix C: Data collection tools for:

- Recruitment Survey
- Listening Session Conversation Tool
- Post-Listening Survey

Procedure

The listening sessions were conducted in a phenomenological method to encourage open conversation on the topics. A conversation tool was created to help guide the methods. Prior to entering the Zoom Platform, participants were renamed using the unique identifier assigned to them to ensure anonymity in the evaluation processes. Participants were encouraged to keep their cameras on, but it was not required. A PowerPoint slide deck with a welcome and thank you slide containing access to the post listening survey were created to initiate and end the conversation. The post listening survey link was provided to participants at the conclusion of the listening session and provided again prior to the closure of the survey. To be eligible for the participant incentive, participants must complete the post listening survey. The MPHI Institutional Review Board determined all research methods presented were exempt.

See Appendix D: Procedural tools for:

Welcome & thank you slides
Post listening session email templates

Analysis

Descriptive analysis was conducted on the recruitment survey and post listening survey data. Open coding was conducted on the listening session transcripts by three independent coders to break the data into discrete parts. The categorical codes used in the open coding were developed prior to listening sessions based on the Strategic Skills for the Governmental Public Health Workforce[3], Core Competencies for Public Health Professionals[4] Competencies for Population Health Professionals,[5] and the National Consortium for Public Health Workforce Development de Beaumont Foundation[6]. Axial coding was utilized to draw connections between the codes. Codes were aggregated and condensed into thematic categories. The identified skills were translated into training by using a mapping process.

See Appendix A: Methods for more details regarding the analysis and the phenomenological approach employed in this work.

Results

Recruitment Descriptive Analysis

Highlights from the recruitment survey follow. See Appendix E: Results, Recruitment Survey Data for a full list of results.

Qualtrics identified 101 responses within the platform for the recruitment survey from December 15, 2022, through February 3, 2023. Thirty-six (36) responses did not have any contact information and were removed from the analysis. There were sixty-five (65) total respondents in the recruitment survey. Four (4) surveys were noted as incomplete with a 59%, 24%, 12%, and 12% completion rate. The remaining 61 surveys were at 100% completion. The average duration for completion was 6.7 minutes with a range of 1.9-43.2 minutes, median of 4.8 minutes.

There were 54 organizations represented by the survey participants.

Organizations Represented

AdventHealth (formerly Florida Hospital)
AK SOE
ASTHO
Bon Secours Mercy Health
Boulder County Public Health
California Department of Public Health, HAI Program
Connecticut Department of Public Health
Covered California (CA State Government)
Department of Health
DOH-DOCD/DIB
Florida Department of Health
Florida Department of Health in Polk County
Great Plains Tribal Chairmen's Health Board
Hawaii Department of Health
HCA Healthcare North Florida Division
HDOH
Indian Health Service
KY Dept for Public Health
Lantana Consulting Group
LDH
Maine CDC
MDH
MDHHS
Michigan Department of Health and Human Services
Moffat County Public Health
Moffitt
MT DPHHS
NACCHO
Nebraska Health Department
Novant health
Oakland County Health Division
Oregon Health Authority
Orlando Health
PA Department of Health: HAIP/AS Program
PA DOH Bureau of Epidemiology
Pennsylvania Department of Health
RB Health Partners
Rhode Island Department of Health
San Antonio Metro Health
SC DHEC
South Dakota Department of Health
Southeast Utah Health Department
State of NH - HAI
TDH
Tennessee Department of Health
Tennessee State Department of Health
TGen North
UF Health Shands
Utah Department of Health and Human Services
VCPH
Washington County Public Health
Washington State Department of Health
Westchester County Department of Health
Williamson County & Cities Health District

Figure 1: Recruitment Survey Organizations Represented

The responses were stratified to identify and recruit public health workforce participants within the pre-identified audience segments. The 65 participants represent several states including Alaska, Arizona, California, Colorado, Connecticut, District of Columbia, Florida, Hawaii, Kentucky, Louisiana, Maine, Maryland, Michigan, Montana, Nebraska, New Hampshire, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, and Washington. Representation from each governance structure included 31% Decentralized Governance, 18% from Shared Governance, 17% from Centralized Governance, 17% from Mixed Governance, 9% from Largely Centralized, 5% from Largely Shared, 3% from Largely Decentralized. Within the listening sessions, participants that identified as state-level IPC and HAI/AR directors and managers in states with centralized governance models were represented by Hawaii and New Hampshire (N=2), in states with decentralized governance models were represented by Connecticut, Montana, Utah, and Washington (N=4) and in mixed governance by Pennsylvania.

The population sample is highly degreed and certified. The Master of Public Health (MPH) was the most mentioned advanced degree, and the Certification in Infection Control (CIC) was the most mentioned certification among the sample. Non-certified, non-credentialed (N=6) and non-certified (N=17) were among the participants in the listening sessions. Additional information can be found in the Recruitment Survey Data. All respondents (100%) had experience in IPC, HAI and/or AR. Approximately 60% had experience in all 3 areas of IPC, HAI, and AR (N=39).

Experience ranged from less than 6 months to greater than 15 years. The highest frequency was 38% with 2 years to 5 years of experience (N=25). Those that identified as early career <5 years (N=19) represented 46% of listening session participants. 57% of all respondents had experience supervising or managing others (N=37) with the majority having 2 years to 5 years (N=14). Of those that participated in a listening session, 61% (N=25) have supervising and managing experience with 36% (N=9) within the 2–5-year range and 32% (N=8) in the 6 months to 1 year range.

Most work settings were within the state health agency at 48% of all respondents (N=31) and 51% (N=21) among listening session participants. Employers were identified as the state government for all respondents (N=30; 46%) and listening session participants (N=21; 51%).

Thirty-one (N=31) respondents identified as professional and non-scientific (non-clinical). Fifty-nine percent (59%) of listening session participants identified as non-clinical public health workers involved in IPC and HAI/AR in healthcare settings (N=24). There were 4 listening session participants that identified as directors or training managers of national IPC and HAI/AR involved organizations which represents 9.8% (N=4) of listening session participants.

There were 8 participants that responded to the recruitment survey but opted not to participate in a listening session. They represent Alaska, California, Colorado, Hawaii, Tennessee, Michigan, and New York.

The recruitment methods successfully identified and recruited a significant number of participants that satisfy the pre-identified audience segments.

Listening Sessions

Of the 54 willing participants, forty-one (41) participated in one of six listening sessions, with one person participating in two listening sessions (1 and 2) but whose demographics were analyzed in listening session 1. Data collected during the listening session are reported in full in Appendix E: Results, Listening Sessions.

The original Essential Skills topics were represented to varying degrees across each session. The following graphic demonstrates the extent to which these topics appeared by listening session (larger circles indicate a higher frequency count). For example, this visualization allows one to see that in Listening Session #1, Problem Solving was discussed more than Diversity & Inclusion and that Problem Solving was discussed more frequently in Listening Session #1 as compared to Listening Session #5. Additional visualizations can be found in the appendices.

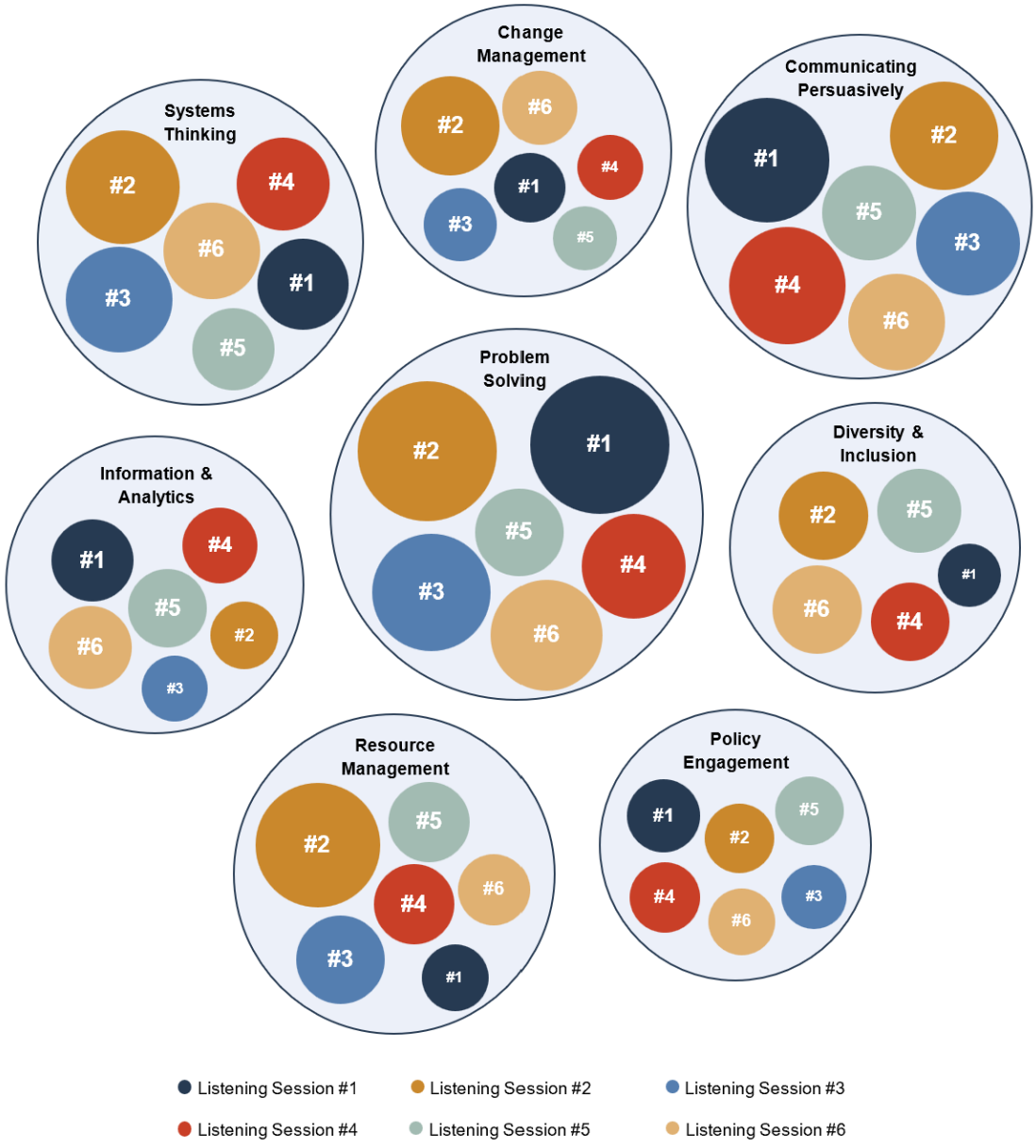

Figure 2: Frequency of Essential Skills across all listening sessions

To see how themes dominated different listening sessions, the HCC, Inc. team used additionalError! Reference source not found. visualizations. The visualization below shows the aggregate of all 6 sessions. Problem Solving remains a dominate skill as well as Diversity and Inclusion.

Figure 3: Word Cloud of Essential Skills heard across all Listening Sessions

The methods described in Appendix G were applied to cluster themes into the following categories: Transferable skills, Values & Attitudes, and Performance Objectives.

The Essentials		
Essential (for all) Transferable Skills	**Essential (for workforce/specific roles) Performance Objectives**	**Essential (for all) Values/Attitudes**
Strategic Thinking Situation Awareness Problem Solving Emotional Intelligence Communication	Information Management Information Analysis Change Management Leadership Policy Engagement	Openness to Learn Self-efficacy Diversity & Inclusion Networking Community Building & Sustainment Trust Teamwork

Figure 4: Essential Performance Factors identified through Listening Sessions

Definitions and infographics for each of the skills are provided In Appendix G: Participants speak about *The Essentials*.

Post Listening Session Survey

Qualtrics identified 58 responses within the platform for the post listening session survey from January 4, 2023, through February 16, 2023. Seventeen (17) responses did not have any contact information and were removed from the analysis. Seven (7) participants had duplicate entries of which 1 had 2 duplicates. Three (3) of the duplicates were not complete entries and were removed from the analysis. The remaining 4 were compared for additional information and were provided cumulatively.

Of the 41 participants who attended a listening session, 33 completed a post listening session survey. The chart below shows the number of participants per listening session who completed a post listening session survey. The response rate per listening session is 25% LS1, 78% for LS2, 88% for LS3, 100% for LS4 and LS and 80% for LS6. There were 33 participants with 38 responses. The average duration for completion was 12 minutes with a range of 3 minutes-49 minutes and median of 7.6 minutes. There was one outlier that took 65 hours. This data point was not included in the analysis.

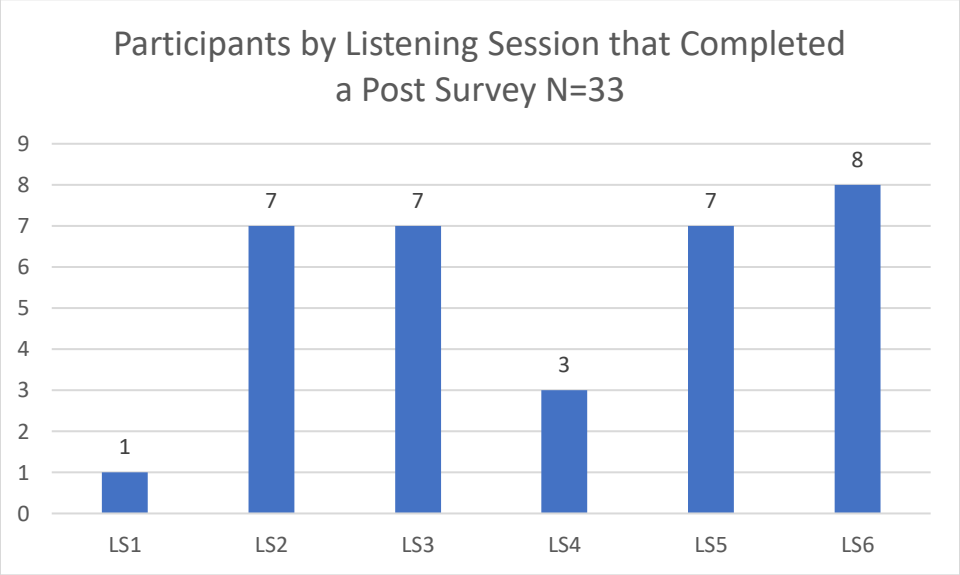

Figure 5: Participants by Listening Session who completed a Post Listening Survey

When asked to share their motivation for participating in the listening session, participants' responses were placed into 6 themes shown in descending frequency order.

- Better Supporting the Field and the Community (15)
- Camaraderie-Shared Experience (11)
- Improve Training (5)
- Individual Professional Development (3)
- Curiosity/Recruitment (2)
- Improving Advocacy Efforts from External Organizations (1)

Question 5, which inquired about essential skills supported what was heard in the listening sessions. The responses were placed into 23 themes stratified by the 3 overarching categories and presenting in descending frequency order. Other responses are presented below.

Essential (for all) Transferable Skills

- Communication (20)
- Emotional Intelligence (10)
- Listening (8)
- Adaptability-Flexibility (7)
- Critical Thinking (6)
- Personable (5)
- Persuasion (4)
- Problem Solving (3)
- Compassion-Passion (3)
- Resource Management (3)
- Rapport Building (3)
- Time Management (3)
- Decision Making (2)
- Competent Writer (2)
- Quality Improvement (2)
- Professionalism (1)
- Innovation/Creativity (1)

Essential (for all) Values/Attitudes

- Relationship building/Networking (9)
- Adaptability-Flexibility (7)
- Integrity/Trust (4)
- Learning (3)
- Quality Improvement (2)
- Team Player (2)
- Self-Motivation (1)
- Professionalism (1)

Essential (for workforce/specific role) Performance Objectives

- Resource Management (3)
- Leadership (3)
- Time Management (3)
- Data Skills (2)

Other

- Obtaining CIC.
- Experience with disease investigations.
- Ability to conduct literature review.
- Product Assessment.
- Ability to connect all disciplines of healthcare and environmental services in a OneHealth Approach
- PPE donning and doffing protocol.
- Google, tracking things down on the internet.

- Organizing large, multiple datasets
- Translate sometimes conflicting guidance from regulatory authorities into practical guidance that facilities can operationalize.
- Knowledge of disease and mitigation.
- Clinical experience.

There were 5 skills that were placed into two categories: Resource Management and Time Management were both included in the Essential (for all) Transferable Skills and Essential (for workforce/specific roles) Performance Objectives, while Adaptability -Flexibility, Quality Improvement, and Professionalism was included in the Essential (for all) Transferable Skills and Essential (for all) Values/Attitudes.

It is noteworthy that most of the "Other" responses were from respondents who did not participate in a listening session. Most of the responses could be categorized as technical skills rather than soft skills.

When asked directly about training and coursework respondents referred to CIC, TRAIN, APIC, SHEA, CDC, CSTE, NACCHO, NHSN, Project Firstline, ASTHO, Emotional Interviewing and Other. These responses are very broad and as seen in the aggregate data do not allow for reasonable conclusions. As such, HCC, Inc. reviewed each of the sites mentioned and curated a list of training resources that specifically address IPC, HAI and/or AR. The resource list is contained in the appendices in Q6 Training & Coursework.

Table 12 shows that the training modality most used by the population sample was eLearning (24%), followed by virtual instructor-led training (20%), instructor-led training (18%), video learning (18%), blended approach (using multiple modalities) (11%), augmented reality (3%) and virtual reality (3%). When asked to rank the training modalities for effectiveness the respondents favored the blended approach, followed by instructor-led training, and e-learning. The virtual instructor-led training ranked 4th for effectiveness in training.

Limitations

The report authors acknowledge limitations. First, participant recruitment may have been influenced by the definition of "public health workforce" (PHW). That is, the listening sessions included people who self-identified as working in public health and/or infection control. However, this is not the only way to define the population, and what it means to "work" in these areas is disputable. For example, there were no health facility maintenance staff workers in the sample, although they may arguably work in public health and infection control. The sample for this report includes workers of the types listed in Appendix E. The authors acknowledge that, with a different recruitment focus, the "essentials" identified may have been different.

In a similar vein, while there were participants from Tribal and Federal agencies in the recruitment survey data collection, none participated in the listening sessions. Future work should not simply "include" those perspectives but also seek to understand impediments to participation in activities of this nature, so that strategies to overcome them can be generated. We hypothesize that personnel in these contexts may lack the resources to participate.

Additionally, there is little observational research capturing PHW carrying out essential skills in the field. Domain-specific observed examples, when compared to the experiential accounts provided in the phenomenological interview, provide validation to the thematic clusters identified during analysis. As we will recommend below, future work should include capturing on-site essential behaviors and disseminating the results of a comparative analysis.

Lastly, while the topics of health equity and D&I arose in the conversations, the authors did not recruit based on ethnicity, sexual identity, or any other demographic representation outside of the public healthcare role. These identifiers may be relevant to understanding potential training and operationalization of *The Essentials.*

Discussion

The listening sessions were aggregated, and the process described in Appendix G was applied to reach the following framework.

The aim of the overarching project is to (1) clearly identify *Essentials* and (2) see what that means for training and work-force development.

The taxonomy offered provides insight for clarification. From there, we can see the relationships, and move toward more effective training.

Here is an example:

Consider that you want to train "Strategic thinking". In the image above, imagine that is what the characters are doing.

1. The purpose of Strategic thinking needs to be made clear (designated in the top left bubble "Purpose"). Adults need to know why they are learning something.
2. **Prerequisites** need to be identified (designated in the bottom left bubble "Requires these skills"). **These must be in place before the target can be developed.** Knowing this helps to properly sequence instruction.
3. **Enabled competencies** should also be identified beforehand (designated in the right bubble "Is required for these skills). This helps sequence curriculum, and helps professionals better understand "what's next" in their career.
4. **Some competencies co-develop in feedback loops.** In the "Strategic Thinking" illustration above, you can see that "Situation Awareness" improves when people think strategically (because they are *predicting*), but Situation Awareness also *helps* people think more strategically. It is a cycle or loop.

Appendix G: Analysis of *The Essentials* breaks down each of the skills, objectives, and values in detail, with illustrations, but what follows is the tabulated competencies.

Transferrable Skills

The first set of *The Essentials* in this framework is **Essential Transferable Skills**. These skills are ones that, according to the listening sessions, are demanded of all PH/IPC workers on a regular basis. That is, these skills will be expected of *everyone*. They are also highly transferable, meaning that these skills will be applied in different contexts and by personnel in various roles.

What should we train?	Why does it matter?	What must precede training this?	What skills become possible when you can do this?	What skills should be trained alongside this?
Transferable Skills	Purpose	Requires	Is required for	Creates feedback loops with/ is both a requirement and a dependency ...
Strategic Thinking	Predictive decision making	Systems Thinking Reframing (EI -Perspective Taking) Reflecting (Metacognition, Learning)	Change Management Information Analysis Resource Management Policy Engagement	Prediction/Situation Awareness
Situation Awareness	Improve actions and decisions by understanding what is happening	Perception (Communication) Comprehension (Trust) *Prediction* (Strategic Thinking)	Change Management Information Analysis Resource Management Policy Engagement	Strategic Thinking Communication
Problem Solving	Allow a desired outcome	Strategic Thinking Information Analytics Openness to Learn Trust Teamwork Decision-making Situation Awareness	Resource Management Diversity & Inclusion	Communication Professionalism
Emotional Intelligence (EI)	Improve outcomes through relationships	All essential skills require a foundation of EI AND the other skills can be used to develop EI Self/Social vs. Perception/Action		
Communication	Distribute and/receive messages accurately	*Technical knowledge and skills (esp. In various modalities) Distinct from communication purpose		Situation Awareness Leadership Mentorship Professionalism Diversity & Inclusion

Table 1: Transferable Skills Framework

Performance Objectives

Analysis of the listening session data suggests a potential conflation between the terms, "skills" and "objectives." For the present analysis, HCC, Inc. suggests making a distinction. We use the word, "skills" to mean learnable behaviors, which can then be applied to achieve performance objectives.

This distinction serves two immediate purposes. First, the clarification facilitates shared understanding regarding the roles that these "essentials" play in achieving PH/IC success. Second, the distinction directs future instructional designs. By distinguishing between skills and the *application of skills*, designers can better identify learning/training methods to teach, reinforce, and assess those competencies.

The following table lists key performance objectives which emerged in the listening sessions.

What should we train?	Why does it matter?	What must precede training this?	What skills become possible when you can do this?	What skills should be trained alongside this?
Performance Objectives	Purpose	Requires these skills...	Is required for these skills...	Creates feedback loops with/ is both a requirement and a dependency ...
Information Management	Capturing, validating, storing, protecting data	*Specific technical skills such as data base and application use & explicit knowledge *Capturing qualitative data also requires *Emotional Intelligence* *Communication*	Information Analysis	
Information Analysis	Inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information, **informing conclusions,** and **supporting decision-making**	*Technical skill & explicit knowledge *Emotional Intelligence* (Perspective taking) *Strategic Thinking*	*Problem Solving* (Decision Making) (Situation Awareness) *Communication* (esp. Persuasive)	
Change Management	respond to changing environments and shape core elements that sustain programs in challenge and crisis	*Technical skill (processes, policies, etc.) & explicit knowledge Strategic Thinking Situation Awareness	Problem Solving	

What should we train?	Why does it matter?	What must precede training this?	What skills become possible when you can do this?	What skills should be trained alongside this?
Leadership	Influence others to achieve desired outcomes	Emotional Intelligence Policy/procedural knowledge Ethics Professionalism	Change Management Teamwork Resource Management	Mentorship
Policy engagement	To improve public health outcomes.	*Technical skill (processes, policies, etc.) & explicit knowledge Situation Awareness Leadership Emotional Intelligence Teamwork	Change management.	Communication Strategic Thinking Diversity & Inclusion
Strategic Partnerships	Advancing objectives	Emotional intelligence Situation Awareness	Leadership Teamwork	Diversity & Inclusion

Table 2: Performance Objectives Framework

Essential Values & Attitudes

These items are, like the preceding topics, **essential**, in that they make PH/IC and related work possible. However, it is important to distinguish them from **skills** in the psychomotor sense. These are more closely mapped to the **affective domain.** By mapping these "essentials" to the affective domain, they can be measured during training and on-the-job performance more accurately.

Take for example the Essential Value/Attitude, "Openness to learn." In the listening sessions, the willingness to keep an open mind or pursue new information was important to many participants. However, this is *not* a cognitive trait, as it is not just a matter of knowing that you can learn something. It is also *not* a psychomotor trait, wherein you practice learning. Rather, the topic being discussed was an ***affective*** behavior, where the dispositional stance made learning and problem solving possible.

The following table lists the key Values/Attitudes expressed in the listening sessions.

What should we train?	Why does it matter?	What must precede training this?	What skills become possible when you can do this?	What skills should be trained alongside this?
Essential Values/Attitudes	**Purpose**	**Requires**	**Is required for**	**Creates feedback loops with/ is both a requirement and a dependency ...**
Openness to learn	Gain insights and/or options	Self-efficacy	Problem Solving Situation Awareness	Communication Professionalism

Diversity & Inclusion	Assure collaboration & coordination; reflect the dignity of all people (I.e., the "public" part of public health) "Population" --what do we mean?			Teamwork Communication Leadership Strategic Thinking Problem Solving Situation Awareness Emotional Intelligence
Self-efficacy	Supports decision making	Situation Awareness Metacognition	Professionalism Policy engagement Resource management Teamwork Problem Solving Leadership	
Networking/Community building & sustainment	*At colleague/organizational levels and in extension (public) levels Access and contribute to resources, knowledge, and emotional support to improve outcomes	Situation Awareness Openness to learn Communication	Leadership Policy engagement	Self-efficacy Diversity & Inclusion Strategic Thinking Problem Solving
Developing and Maintaining Trust	Creates **time/conditions** for desired outcomes to work by accepting vulnerability in anticipation of the desired outcome.	The competency with which essential skills are executed can develop or impede trust. **This means trust must be assessed alongside training. It is essential to elicit trust to get buy-in, participation, collaboration, etc. However, the impact of PH/IPC acts on trust are rarely measured empirically or used as a metric of assessment for outcomes (neither in field nor in training).**		
Teamwork	Accomplish tasks & objectives that are beyond an individual's capabilities	Problem Solving Emotional Intelligence Communication Self-efficacy Situation Awareness	Leadership Change management	Trust Networking/community building Strategic Partnerships

Table 3: Essential Values & Attitudes Framework

Recommendations

Based on the results, HCC, Inc. identified two *kinds* of recommendations, the first three recommendations below are focused on training and the latter five on operationalization. We recommend the following:

Recommendation 1:

Design *Essentials* training using emotional intelligence (EI) principles for instructional delivery, practice, and assessment.

According to Goleman (1998) [7], EI involves interactions within oneself as well as socially. Conducting such interactions requires both recognition as well as regulation (Fig 6). The listening sessions suggest that these interactions with self and others are integral to every aspect of IPC, HAI, and AR work.

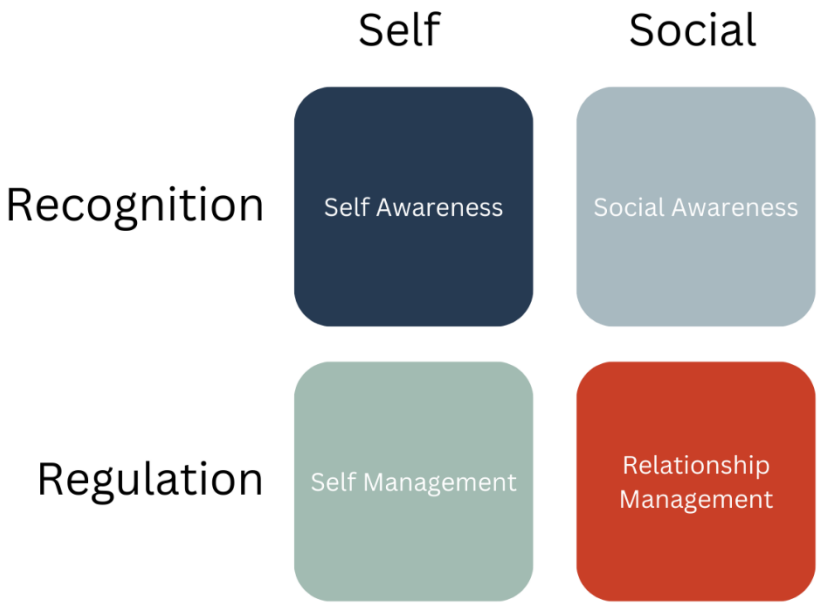

Figure 6: Modified from Goleman (1998) EI interactions [7]

Consequently, the recommendation is to assure that all instruction aligns to assure that *The Essentials* are practiced and assessed across all EI opportunities.

What does it look like to design training via EI principles?

EI in instructional design will support a more comprehensive instructional path, without extending cost. It does this by helping instructional designers match appropriate delivery and practice methods to the interactive aspect of a skill, objective, or value.

For example, Table 4 below shows design considerations that emerge when PH/IPC "essentials" are contextualized by the EI framework. The colored text gives examples.

	Self	Social
Recognition	Encourage reflection, independent processing, and self-critique Digital or traditional journals, reflective writing exercises, rubric-based self-assessment	Support/discussion groups (live or virtual), mentorship focused on reflection and systems thinking Online discussion boards, group-based After-Action Reviews, peer-assessment
Regulation	Scenario-based activities (live or virtual), self-guided CBT Scenarios (live or virtual) that include self-pacing and prompts to cue emotional regulation (e.g., "This may be a good time to take a big breath." Or "How are you feeling right now?").	Scenario-based activities, instructor led, mentorship focused on decision-making, problem-solving and other action-oriented/cause & effect situations Scenarios with contrasting cases, which allow for outcomes of decision points to be compared. This is particularly useful to demonstrate differences between novice and expert choices.

Table 4: Design considerations that emerge when The Essentials are contextualized by the EI framework

This means that instruction for anything, whether it is communication, problem-solving, or D&I, should encourage EI from all four quadrants. Learning and assessment activities should allow for self- and social- awareness and management.

Recommendation 2:

The decision to use online/distributed learning should be determined based on several factors:

1. The focus must be on the pedagogical goals, not the media. Form should follow function. Consider:
    - content accuracy and value
    - methodological suitability
    - assessment reliability
2. If learning is online, the activities must still support the necessary levels of individualized reflection, or the social connections required by the topic.
3. Scenario-based learning for complex scenarios (like those needed for leadership and strategic thinking competencies) requires assessment designs that evaluate decision-making under ambiguous circumstances.
    - Assessing a learner's management of ambiguity during online learning requires specific techniques (e.g., clear rubrics, expert-in-the-loop feedback, and well-defined objectives).
4. Online instruction should leverage synchronous and asynchronous features to support part-time learning and practice and just-in-time support.
5. All online instruction should be placed in the context of continuous learning and workforce development, helping the professionals who invest their time and resources understand how a learning opportunity will support their ongoing professional trajectory. That is, no learning stands alone.

Recommendation 3:

Capture PHW on-site behaviors to assure training address the right things and addresses them in the right ways.

The outcome of such an examination would be two-fold. First, it would provide specific examples against which to validate training and workforce needs assumptions. Second, this approach would inform future instructional and curricular designs, supporting a rapidly evolving workforce.

It is critical to separate *perceptions* of PHW work in-the-field versus what is actually happening. The data from these observations would have global application. While first-person experience is essential for understanding training needs, it is certainly not sufficient. Future work should include studying the diverse workforce in real-time. We suggest an interdisciplinary approach which would apply techniques from Human Factors psychology, with an emphasis on human-system interaction, and ethnography, with an emphasis on understanding PH/IPC demographic distinctions across situational contexts.

Recommendation 4:

Develop a recruitment tool that identifies *The Essentials* in conjunction with technical and domain-specific knowledge and skills.

Talent recruitment and retention is an overarching concern across PHW. Now that a taxonomy is established, it can be incorporated into objective and measurable performance thresholds, against which candidates' qualifications can be measured. Additionally, an effective recruitment tool ought to use guided mentorship (see recommendation below). Such a tool must prioritize flexibility but may offer consistency when unilaterally applied. If properly designed, this tool could be fielded across contexts, so that it is useful regardless of governance, organizational structure, or role.

Recruitment tools based on competencies (including *The Essentials*) can broaden candidate pools. The present project recognized potential bias regarding recruiting specific talent backgrounds (e.g., prioritizing nursing). This would allow recruiters to honor different career paths and experiences, while assuring that standards are upheld. By assuring that recruitment (and the compensation packages offered during the recruitment process) is based on fitting talent, stakeholders can better identify, prepare, and retain quality talent.

Recommendation 5:

Design and deploy career roadmaps for novice IPC, HAI, & AR professionals.

One clear theme that arose through the listening sessions is that, while there are many shared experiences, no two career paths are identical. While maps and tools exist, updated, customized, and personalizable maps would allow all PHW professionals to chart their own course, while also assuring that the most beneficial milestones are met along the way. These tools should build off successes in current tools and address gaps. Outcomes should include support for succession planning.

What may be even more important than directing novices in the field is the opportunity to channel teacher/training resources where they are needed. Research suggests that a given organization's learning structures are a mediating factor in the efficacy of integrated soft/hard skill performance [8]. An operationalizable roadmap can guide organizations to provide needed opportunities by anticipating their employee's "next steps."

Recommendation 6:

Provide context-specific guidance and tools to support local training.

Many public health professionals shift their practice focus during their careers, leaving local facilities to generate impromptu training responses. Throughout the listening sessions, the participants reported both experiencing these career shifts and needing to shift their own teams/employees. However, it is rare for supervisors to have in-depth education

when it comes specifically to the connections between workforce development and training. This situation creates high potential for gaps in both *The Essentials* as well as technical skills.

Context-based guidance and tools can help supervisors and other professionals understand how contextual factors (e.g., location, role, organizational structure, workforce diversity) impact the operationalization of their skills. Examining the role of context in training (including stable contexts like governance as well as adapting training materials to address dynamic changes) will be an important part of developing context-based support.

Recommendation 7:

Design and deploy mentorship curriculum to prepare mentors for PHW and increase their ubiquity across the workforce.

One of the most prevalent themes regarding training modality was "mentorship." Listening session participants described working with mentors as well as recommending mentors for junior personnel. However, there is no standardization in mentorship programs across PHW.

To develop mentorship as an instructional delivery and assessment method across PHW, we recommend training that encompasses key issues identified by Ivey & Duprey 2022 [9], including:

- Delineating objective and subjective outcomes
- Incentivization for mentor/mentee participation
- Measuring organizational outcomes
- Acknowledge challenges such as: mitigation of negative relationships, access to mentorship, representation, mentorship resource access, training, and compensation.

Recommendation 8:

Disseminate project findings regarding process and product in peer reviewed publication.

The phrase, "essential skills," is under-developed in PH research. While this was not an empirical study per se, the findings presented in this report could contribute to developing this highly needed area of inquiry. The phenomenological process used herein is replicable and allows for openness that is not afforded in most candidate techniques (e.g., surveys, focus groups) for conducting qualitative data collection. Further, the taxonomy presented herein offers a common language; it fills a gap by addressing what we mean when we say, "essential".

Publishing such observations and preliminary findings would contribute to (1) advocacy to support PHW, (2) guiding future research in this process, and (3) guiding future research in the taxonomic product, *The Essentials.* By inviting academic scrutiny, we raise it as an important topic while also distributing methodological refinement across the academic community.

Future Considerations

The following implications come directly from the analysis of the data collected during this present endeavor.

First, the findings suggest that the phenomenological interview method may have a beneficial effect for participants, in that it provides a vehicle for camaraderie, validation, and networking. That said, the components of the phenomenological interview that may trigger positive responses are not understood and the duration and degree to which these responses are experienced are unknown.

Second, future work should explore the perception of essential skills across the PHW, particularly seeking to identify differences among personnel who have been given outlets to explore their use of *The Essentials* and those who have not.

The data collected during this present study suggests a discrepancy; participants who joined a listening session prioritized different skills and training methods compared to participants who only engaged in the surveys.

Appendix A: Methods

Objective:

The listening sessions about essential skills and other training needs aim to 1) further operationalize essential skills identified in previous projects and identify any additional essential skills, 2) identify training and education needs related to these skills, and 3) provide recommendations for future training topics and modalities of training.

Population/sample size

Target sample: 30-70 participants recruited from IPC, HAI, and AR

The recruitment survey was used to identify and recruit participants for at least 5 virtual listening sessions with the following audience segments:

a. Directors or training managers of national IPC- and HAI/AR-involved organizations

b. State-level IPC and HAI/AR directors and managers in states with centralized governance models

c. State-level IPC and HAI/AR directors and managers in states with decentralized governance models

d. Non-clinical public health workers involved in IPC and HAI/AR in healthcare settings.

e. Non-certified and non-credentialed early career individuals (e.g., public health nurses, epidemiologists) or students working in IPC and HAI/AR

f. Other audiences as needed or identified by collaborators.

Recruitment method

Potential participants will be reached via email and/or social media. They will be asked to participate in a recruitment survey to assure that they meet the following criteria:

1. Currently work in public health with experience in infection prevention and control (IPC), healthcare associated infections (HAI) and/or antimicrobial resistance (AR).
2. Have access to Zoom and reliable internet for completion of listening sessions.
3. Are available to complete a listening session lasting up to 2 hours.

Procedure:

The listening sessions will consist of 3 stages:

1. Introduction & consent. Participants will be provided with the informed consent documents and may use a digital signature prior to the listening session. The opening of the session will include a brief review of the purpose of the session, an introduction of the researchers, a review of the process, and opportunity to ask any questions.
2. Listening session. The listening sessions will use the phenomenological method to encourage open conversation on the topics to be explored (for examples, see appendix).

    a. Phenomenological interview. [10, 11] This approach avoids interviewers inducing speculation (e.g., "Why do you think your supervisor wanted you to do that?" or "How would you feel if you had received a different kind of training?") while generating robust descriptors of experience.

b. Conversation starters. In cases where interviewees are reticent, interviewers will use these banked questions to encourage conversational flow.

3. Post-conversation survey. Participants will be asked to complete a brief survey before departure. This data will be used to (1) assess any consistency issues between opinions that are articulated in group conversation versus those that can be indicated anonymously and (2) look for self-identification cues to see how perception of self/role/abilities impact decision-making in the field.

Planned analysis:

1. Pre analysis *a priori* taxonomies are established to define conceptual categories and relationships between/among those categories. These include domain-specific groupings (e.g., epidemiology, public health) as well as cognitive psychology (e.g., internal states such as frustration, learning development).
2. All interview texts will be transcribed.
3. Transcriptions will be read by three interraters.
4. Readers will code for (1) phrases and terms that align with the step 1 taxonomies and (2) other meaningful/significant indications of experience.
5. Researchers will take the coded information and cluster for themes that are (1) trending across individual accounts or (2) impactful albeit uncommon.
6. Hypothesis formation based on clusters will drive the selection of additional statistical tests, if appropriate.

Phenomenology

The phenomenological approach applied in this analysis has been selected because the purpose of that approach is to understand the *nature of experience.* That is, these methods help answer, "what is *really* going on in the PH/IC workforce?" The answers to that question point toward what experiences the workforce should be prepared to face.

To extract **learning/training implications** from the listening sessions, transcript analysis follows the flow outlined by Creely (2018) [12].

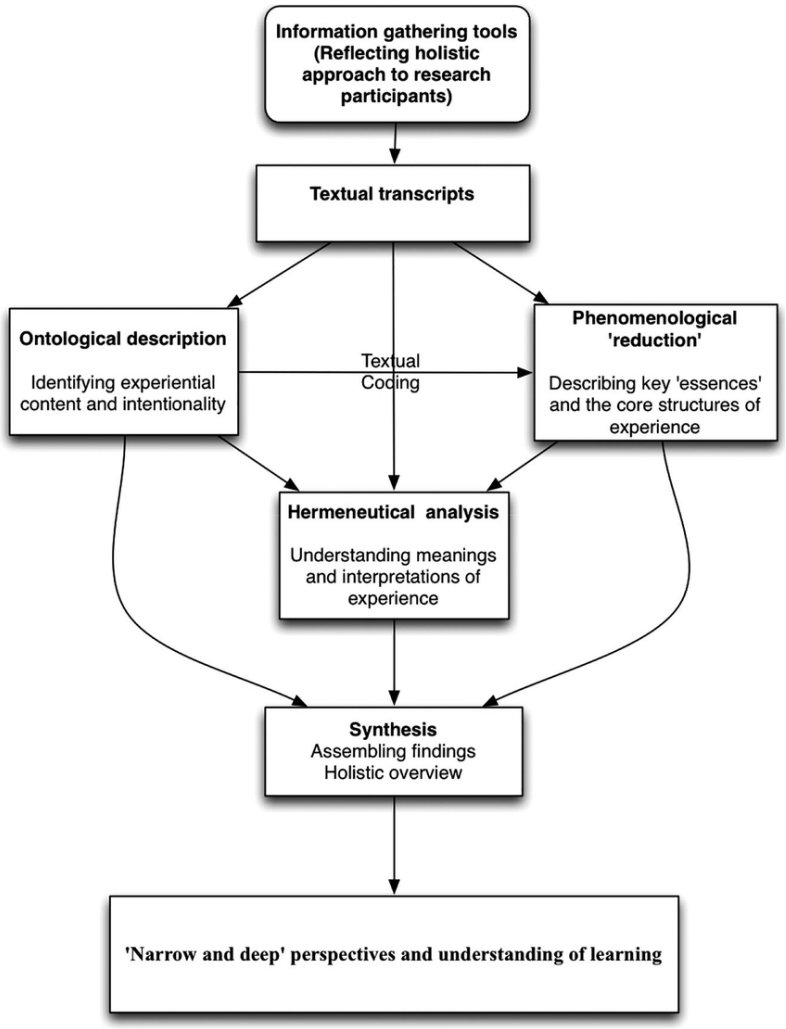

Figure 7: Creely (2018) Phenomenological research methods [12]

The Phase 1 coding done by the interraters identifies and reduces the experiences described. Using Hermeneutical methods, the researchers can organize these results into logically derived roles.

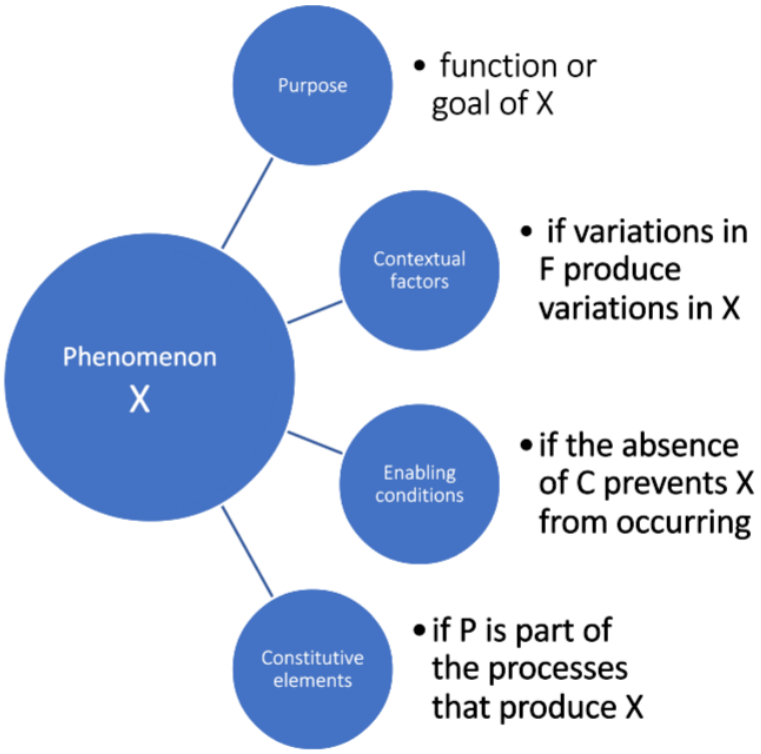

Figure 8: Synthesis Methodology

The synthesis stage reassembles those categories to provide a cohesive picture of the phenomenon. In this case, the team assigns purpose to every "essential skill." First, as the purpose of the project was to explore *essential* skills, all experiences analyzed are enabling conditions (their absence prevents some aspect of PH/IC work from occurring). The contextual factors are used to identify **Performance Objectives**, as members of the workforce need and apply these skills to high degrees of variability. This means, that while essential to the success of public health at large, an individual working in public health may not be required to engage in these activities (or may engage in only a support role, such as data entry for information management tasks or carrying out directives in a change management task–not actually managing)**.** The processes that produce PH/IC work experiences inform **Values/Attitudes.** These are every bit as essential as skills, but they are *how* something gets done to the highest quality (e.g., valuing what diverse perspectives bring or believing that you can accomplish something). The analysis also distills **Transferable Skills**, the performance behaviors that transcend roles and contexts. These become what is referred to in this report as *The Essentials.* While not an exhaustive list, it is a taxonomy in which emergent skills, objectives, and values can be placed.

The Essentials		
Essential (for all) Transferable Skills	**Essential (for workforce/specific roles) Performance Objectives**	**Essential (for all) Values/Attitudes**
Strategic Thinking Situation Awareness Problem Solving Emotional Intelligence Communication	Information Management Information Analysis Change Management Leadership Policy Engagement	Openness to Learn Self-efficacy Diversity & Inclusion Network/Community Building & Sustainment Trust Teamwork

The final stage of analysis seeks to clarify key "takeaways" from these listening sessions with implications for learning/training.

Appendix B: Recruitment materials (pre-listening session)

Initial Email to Potential Participants

PC 807: Project Firstline Listening Contractor Session

Recruitment Survey Email

Draft 3.1

Subject: We want to hear from you! Help Shape the Future Public Health Workforce

Dear Public Health Professional:

We need your voice for a series of upcoming listening sessions to understand the essential skills and training needs of the public health workforce in infection prevention and control (IPC), healthcare associated infections (HAI) and antimicrobial resistance (AR)!

The National Network of Public Health Institutes, as part of CDC's Project Firstline, has partnered with Health Communications Consultants, Inc. to 1) further operationalize essential skills related to IPC and HAI/AR, 2) identify training and education needs related to these skills, and 3) provide recommendations for future training topics and modalities of training.

These listening sessions are scheduled to take place between December 28, 2022, and February 10, 2023.

To determine your eligibility to participate, please tell us more about your experience via this survey link.

Participants will have the chance to be randomly selected for one of nineteen (19) annual memberships to the Association for Professionals in Infection Control (APIC), a value of $250!

Please feel free to distribute the attached recruitment flyer or forward this email to any colleagues you think may be valuable to participate in these listening sessions.

If you have any questions or comments, please feel free to contact me.

Sarah D. Matthews, PhD (she/her)

Recruitment Flyer

Follow-up Email to Potential Participants

Subject: Reminder: We want to hear from you! Help Shape the Future Public Health Workforce

Dear Public Health Professional:

Reminder, we want to hear from you. Please complete the survey link about your experience in infection prevention and control (IPC), healthcare associated infections (HAI) and antimicrobial resistance (AR)!

We need your voice for a series of upcoming listening sessions to understand the essential skills and training needs of the public health workforce in infection prevention and control (IPC), healthcare associated infections (HAI) and antimicrobial resistance (AR)!

The National Network of Public Health Institutes, as part of CDC's Project Firstline, has partnered with Health Communications Consultants, Inc. to 1) further operationalize essential skills related to IPC and HAI/AR, 2) identify training and education needs related to these skills, and 3) provide recommendations for future training topics and modalities of training.

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Please feel free to distribute the attached recruitment flyer or forward this email to any colleagues you think may be valuable to participate in these listening sessions.

If you have any questions or comments, please feel free to contact me.

Email Invitations and Reminder

EMAIL 1

Hello,

Thank you for agreeing to participate in the Listening Session on Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI), and Antimicrobial Resistance (AR). We are excited to learn more about your perspective and experiences. You are scheduled to attend the Listening Session on **INSERT DATE AND TIME.**

On the day of your scheduled Listening Session, please use the link below to access the Session and immediately change your Zoom Name to your unique anonymous identifier following the steps below. **Your unique identifier is ____.** This identifier will be used to protect the privacy of all participants. The transcripts for these recording sessions will capture that name when you are speaking.

Reminders for participation:

- Listening Sessions will be recorded, and *your participation is entirely voluntary*, you may stop at any time throughout the course of the session.
- If you are not actively speaking or preparing to speak, please keep muted.
- Keep the background noise to a minimum when you are unmuted.
- Speak clearly into the microphone on your computer or on the phone line.

- Refrain from shuffling papers, typing loudly, or talking amongst each other.
- Please take a moment and check where you placed your microphone. If you are in a room with other people sharing the same dial-in, place the microphone near the participants who are talking.
- If you have an external microphone this might be a better option than a built-in one for better sound quality.
- **Participants should not record the Listening Sessions.**

What to expect:

This Listening Session is one of six sessions. You have been placed in a group of 10-20 individuals. A facilitator will be posing questions to you for discussion. The listening sessions will be recorded, a written transcript will be produced and there are note-takes present on the zoom platform. Your responses will remain confidential, and no names will be included in the final external report. All data and analyses from these Sessions will inform the Centers for Disease Control and Prevention's Project Firstline and training opportunities related to Project Firstline from the National Network of Public Health Institutes (NNPHI) and partners.

Please contact Sarah Matthews (sarah.matthews@healthcommunicationsconsultants.com) with any questions or concerns.

Sincerely,

The Health Communications Consultants (HCC) Team

Appendix C: Data collection tools

Recruitment Survey

Recruitment Survey (delivered via Qualtrics)

https://healthcc.qualtrics.com/jfe/form/SV_2lRo9V84A1dmH2e

Understanding the Essential Skills and Training Needs of the Public Health Workforce in Infection Control and Prevention, Healthcare Associated Infections and Antimicrobial Resistance.

1. Thank you for your interest in participating in our listening sessions! By continuing in the survey, you acknowledge that your participation is voluntary. Your responses will be kept confidential and will be used to determine your eligibility for the listening sessions. You may choose to terminate your participation at any time and can skip any question you choose.

By submitting this survey, you consent to participation and affirm you are 18 years or older. If you have any questions about this evaluation, please contact Sarah Matthews, PhD, via email at sarah.matthews@healthcommunicationsconsultants.com.

2. (Demographics-Text Box) Please provide the following information:

Name
Organization Name
County
State
Email
Phone number
Degrees or License
Certifications

3. (Multiple Choice) Do you work or have experience working in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) and/or Antimicrobial Resistance (AR)?

Choices:

a. Yes, I have experience in all 3 areas.
b. Yes, I have experience in IPC and HAI but not AR.
c. Yes, I have experience in HAI and AR but not IPC.
d. Yes, I have experience in IPC and AR but not HAI.
e. Yes, I have experience in IPC only.
f. Yes, I have experience in HAI only.
g. Yes, I have experience in AR only.
h. No, I do not have experience in any of these areas.

Branch (Skip Logic) for "No" Response to Question 3: Goes to Question 3a1.

Branch (Skip Logic) for "Yes" Response to Question 3: Goes to Question 3a.

3a1. (Skip Logic and Display Logic: Skip Destination from Q3) Thank you for your response. For this evaluation we are looking for participants with experience working in Infection Prevention and Control (IPC), Healthcare-Associate Infections (HAI) and/or Antimicrobial Resistance (AR)?

(End Block)

3a. (Skip Destination from Q3) Approximately how much time have you worked in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) and/or Antimicrobial Resistance (AR)?

Choices:

a. Less than 6 months
b. 6 months to 1 year
c. 2 years to 5 years
d. 6 years to 10 years
e. 11 years to 15 years
f. Greater than 15 years

3b. During your years of experience in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR) did you supervise or manage others?

Choices:

a. Yes
b. No
c. Unknown

Branch (Skip Logic) for "Yes" Response to Question 3b: Goes to Question 3b2.

Branch (Skip Logic) for "No" Response to Question 3b: Goes to Question 4.

Branch (Skip Logic) for "Unknown" Response to Question 3b: Goes to Question 4.

3b2. (Skip Destination from Q3b) During your years of experience in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) and/or Antimicrobial Resistance (AR) how long did you supervisor or manage others?

a. Less than 6 months
b. 6 months to 1 year
c. 2 years to 5 years
d. 6 years to 10 years
e. 11 years to 15 years
f. Greater than 15 years

4. (Multiple Choice) (Skip Destination from Q3b) Which best describes the work setting in which developed experience in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?

1. Local health agency
2. State health agency
3. Territorial health agency
4. Federal health agency
5. Tribal health agency
6. Educational/academic institution
7. Private nonprofit organization
8. Private foundation

9. Personal health service industry
10. Other private industry (Text Box)

5. (Multiple Choice) Which **best** describes the employer(s) in which you developed experience in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?

a. Local government
b. Tribal government
c. State government
d. Federal government
e. Nongovernment
f. Other (Text Box)

6. Which **best** describes your occupation in which you developed experience in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?

a. Management and leadership (e.g., director, manager, supervisor, health officer)
b. Professional and scientific (non-Clinical) (e.g., epidemiologist, laboratory worker, information specialist, emergency preparedness, environmentalist, health educator, occupational health)
c. Professional and scientific (Clinical) (e.g., nurse, physician, dentist, nutritionist, dietitian, oral health professional, behavioral health professional, medical examiner, etc.)
d. Technical and outreach (e.g., animal control worker, community health worker, home health worker, other technical and outreach)
e. Support Services (e.g., clerical, business support, grants specialist, human resources, attorney, other business support)
f. Other (e.g., student, volunteer, intern) (Text box please describe)

7. I am willing to participate in a virtual focus group to provide information on the essential skills and training needs for the public health workforce involved in infection prevention and control (IPC), healthcare associated infections (HAI) and antimicrobial resistance (AR) activities?

Choices:

1. Yes, I am willing to participate in a virtual focus group.

2. No, I am not willing to participate in a virtual focus group, but I am willing to answer two additional questions. (Branch)

Branch for "No" Response to Question 7: Goes to Question 7a.

Branch for "Yes" Response to Question 7: Goes to Question 7a1.

7a1. (Multiple Choice-Multiple Select) (Skip Destination and Display Logic from Q7) Which Listening Session (Virtual Focus Group) Date and Time would you prefer? Please select your **top 2** choices.

Choices:

a. Wednesday, January 4, 2023, 2:00PM-4:00PM EST (11:00AM-1:00PM PST)
b. Friday, January 20, 2023, 12:00PM-2:00PM EST (9:00AM-11:00AM PST)
c. Monday, January 23, 2023, 1:00PM-3:00PM EST (10:00AM-12:00PM PST)
d. Wednesday, January 25, 2023, 12:00PM-2:00PM EST (9:00AM-11:00AM PST)
e. Monday, January 30, 2023, 1:00PM-3:00PM EST (10:00AM-12:00PM PST)

f. Tuesday, February 7, 2023, 12:00PM-2:00PM EST (9:00AM-11:00AM PST)

7a. (Text Box) (Skip Destination from Q7) Essential skills are sometimes called "soft skills". They are skills that help you apply technical skills in a way that helps people. In your opinion, what do you think are the **essential skills** needed for working in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR) activities?

7b. (Text Box) Please list the **training or coursework** that you find the most useful in your work in each of areas: Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR). (Note: Please use website links, names of documents, etc. Put NA if training or resources are not used for the specified area).

7c. (Multiple selection) Which training modalities have you used in the areas of Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)? (Select all that apply)

a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)
b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accesses through a tablet, phone, or headset)
c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)
d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)
e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)
f. Video Learning (Delivers training content through video modules.)
g. Blended approach (Using multiple modalities) (Text Box)
h. Other (Text Box)

7d. (Ordered selection) Rank the training modalities from the "**most (1)" to "least (8)**" effective in the areas of Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?

a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)
b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accesses through a tablet, phone, or headset)
c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)
d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures or workshops.)
e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)
f. Video Learning (Delivers training content through video modules.)
g. Blended approach (Using multiple modalities) (Text Box)
h. Other (Text Box)

8. Do you have any additional thoughts or comments to share? (Text Box)

(End Block)

We thank you for your time spent taking this survey. Your response has been recorded.

Listening Session Conversation Tool

Protocol reminders:

- Make note if a participant drops.
- Assign participant numbers.
- During conversation, encourage multiple people to answer the same question, but with their unique stories. --the goal is to find similarities and contrasts.
- With each story, make note of phrases that indicate:

Emotion (e.g., "I felt frustrated." or "We were so happy that worked out!"). Follow up on emotive statements with clarifying what happened after the event that triggered that emotion (was it sustained or replaced with a different event).

Process (e.g., "It was easy because…" or "We have a requirement to do XYZ"). Clarify how they came to learn that process.

Context complexity (e.g., "We couldn't do X because Y" or "We were told to do A but that never works because of B"). Ask about contingency plans and how they have been prepared for unanticipated challenges.

Conversation Segment	Interviewer prompt/question	Notes
Welcome	We want to start with thanking you for participation. Please remember that your participation is entirely voluntary. In the invitation, you were assigned a participant identification number. Please use this number as your identifier in the name field on Zoom. (Allow participants to rename themselves, then start the recording.) We are recording these listening sessions. If you do not wish to be recorded, please leave the zoom platform now. If you are not actively speaking or preparing to speak, please keep muted. • Keep the background noise to a minimum when you are unmuted. • Speak clearly into the microphone on your computer or on the phone line. • Refrain from shuffling papers, typing loudly, or talking amongst each other. • Please take a moment and check where you placed your microphone. If you are in a room with other people sharing the same dial-in, place the microphone near the participants who are talking. • If you have an external microphone this might be a better option than a built-in one for better sound quality. • Please take a moment and accurately put your zoom name into the name	*Note: this should be delivered conversationally, to help participants feel comfortable. It does not need to be read verbatim.* *Portions that refer to informed consent details may be abbreviated, with a gentle reminder to review the consent and contact information, with an invitation to ask any questions.*

	section. The transcripts for these recording sessions will capture that name when you are speaking. You have been invited to participate in this listening session hosted by the National Network of Public Health Institutes (NNPHI) and under the research direction of Health Communications Consultants, Inc. The purpose of this listening session is to understand the essential skills and training needs of the public health workforce in infection prevention and control (IPC), healthcare associated infections (HAI), and antimicrobial resistance (AR). The information learned in this learning session will help to 1) identify and operationalize essential skills, 2) identify training and education needs related to these skills, and 3) provide recommendations for future training topics and modalities of training. This listening session is one of five sessions. You have been placed in a group of 10-20 individuals. A facilitator will be posing questions to you for discussion. The listening sessions will be recorded, a written transcript will be produced and there are note-takes present on the zoom platform. Your responses will remain confidential, and no names will be included in the final external report. Participants should not record the listening sessions. You can choose whether or not to participate in the listening session and you may stop at any time during the course of the session. Please note that there are no right or wrong answers to the posed questions. We want to hear the many varying viewpoints and would like for everyone to contribute their thoughts. Please feel free to be honest even when your responses counter those of other group members. Your participation benefits the public health workforce by improving the training content and modalities to support IPC and combat HAI and AR. No risks are anticipated beyond those experienced during an average conversation. Should you choose to participate, you are asked to respect the privacy of other listening session group members by not disclosing any content discussed during the session. Health Communications Consultants, Inc. will analyze the data and your responses will remain confidential. If you have any questions or concerns about the listening sessions, please contact Dr. Sarah Matthews at sarah.matthews@healthcommunicationsconsultants.com. Does anyone have any questions about the listening session before we begin? *Answer any questions.* One more reminder before we begin: Your participation is entirely voluntary. There is no penalty for dropping at any time. At this time, by continuing to be logged on to the Zoom platform, you indicate that you understand the information presented and agree to participate fully under the conditions stated above.	
Conversation	OK, we'd like to start the listening session by explaining a bit about the process for this conversation. Our priority today is to listen to you tell your stories. We hope to understand the training you've received and how it connects or fails to connect with the work you do in public health specifically around infection control and prevention (IPC), healthcare associated infections (HAI) and antimicrobial resistance (AR).	The general pattern for these questions is: 1) "tell me about a specific time when you _____." 2) listen for examples of essential skills and follow up with "tell me more about _____". 3) listen for

	This means, I don't want to assume that I know what is in your head, so I will frequently be asking you to clarify things that may feel pretty obvious to you. So, don't be surprised when you hear me say something like, "what do you mean by ____ (and use your own phrase)?" or "Could you describe what that was like?" *If there are terms to define that will be used throughout the conversation, now is the time to do so.* So, let's begin with thinking about your most recent training… **Could anybody describe a recent training they've received specifically for infection control and prevention (IPC)? Healthcare associated infections (HAI)? Antimicrobial resistance (AR)?** *Note, allow for pauses and for participants to take time…especially with these ice-breaking conversations.* **If no one answers the initial question, ask if anyone has received valuable training.* *Once someone gives that answer, follow on with questions:* **How have you used that specific training? Can you give me an example?** **Has anyone had a similar experience?** **What about the opposite experience from that kind of training?** **Can somebody give me an example of how your governance structure affects your work?** **Is this generally true for others? Can you give me an example?** **Let's switch gears a bit…Has anyone had an experience in their work in IPC, HAI, or AR where you felt entirely unprepared? Maybe a situation where you found yourself either "winging it" or thinking "well, that would have been nice to know!"** **Talk to me about your experiences working with teams or subordinates who weren't prepared for their work. What happened?** **What skills would be helpful for working in IPC?** (From directors or training managers especially).	indicators of sub-skills and related skills. 4) ask for any similar experiences. 5)ask for different/contrasting experiences. Then, we can loop through these questions with similar phrasings but focusing on variations, such as by context, access to resources, organizational differences, and outcomes. While there may be some questions that are speculative (such as asking what skills would be helpful), most of the questions must be focused on what *has worked or has failed to work,* so that it can be grounded in experience.
Closing	Well, I hate to cut the conversation, because you have provided us with important insight–and I am certain there is much more! So in our last few minutes, I want to give you all a chance to tell me what you think is the most important thing we should know when it comes to preparing others to do the work that needs to be done in this field? *Be sure to follow on with questions like, "are there learning delivery methods you think need to be used more?" and "are there training practices that need to be stopped?"* Thank you so much for participating. If you'd like to see the results of our study, the contact information is on the communications we've provided. We anticipate having initial results available by Spring 2023. We have an exit survey we'd like you to complete; at the end of the survey you'll enter your preferred method for receiving your participation incentive. *Provide link to exit survey.*	

Post Listening Survey

(Text-Informational) Thank you for participating in the listening session for understanding the essential skills and training needs of the public health workforce in infection control and prevention, healthcare associated infections and antimicrobial resistance. Please complete this closeout survey for our evaluation and the opportunity to be selected at random for one of nineteen (19) APIC Annual Memberships.

If you have any questions about this evaluation, please contact Sarah Matthews, PhD, via email at sarah.matthews@healthcommunicationsconsultants.com.

1. (Demographics-Text Box) Please provide the following information.

    a. Name

    b. Organization

    c. State

    d. Unique Identifier

2. (Drop Down Selection) Which Listening Session did you participate?

    a. Wednesday, January 4, 2023, 2:00PM-4:00PM EST (11:00AM-1:00PM PST)

    b. Friday, January 20, 2023, 12:00PM-2:00PM EST (9:00AM-11:00AM PST)

    c. Monday, January 23, 2023, 1:00PM-3:00PM EST (10:00AM-12:00PM PST)

    d. Wednesday, January 25, 2023, 12:00PM-2:00PM EST (9:00AM-11:00AM PST)

    e. Monday, January 30, 2023, 1:00PM-3:00PM EST (10:00AM-12:00PM PST)

    f. Tuesday, February 7, 2023, 12:00PM-2:00PM EST (9:00AM-11:00AM PST)

3. (Text Box) Reflecting on your listening session conversation, do you have any additional information or clarifications to share?

4. Please share your motivation for participating in today's listening session.

5. (Text Box) Thinking about essential skills, sometimes referred to as “soft skills” or those skills most necessary for you to complete more technical and applied skills, what do you think are the essential skills needed for working in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?

6. (Text Box) Please list any specific trainings, coursework, or training topics you think are most useful for your work in: Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR). (Note: Please use website links, names of documents, etc. Put NA if training or resources are not used for the specified area).

7. (Multiple selection) Which training modalities have you used in the areas of Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)? (Select all that apply)

    a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)

b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accessed through a tablet, phone, or headset)

c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)

d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)

e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)

f. Video Learning (Delivers training content through video modules.)

g. Blended approach (Using multiple modalities) (Text Box)

h. Other (Text Box)

8. (Ordered selection) Rank the training modalities from the "most (1)" to "least (8)" effective in the areas of Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?

a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)

b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accesses through a tablet, phone, or headset)

c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)

d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)

e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)

f. Video Learning (Delivers training content through video modules.)

g. Blended approach (Using multiple modalities) (Text Box)

h. Other (Text Box)

9. (Text Box) Do you have any additional thoughts or comments to share?

10. Select one of the following statements.

a. I want to be entered for a chance to be randomly selected to receive 1 of 19 APIC Annual Memberships as an incentive for participating in this Listening Session.

b. I do not want to be entered for a chance to receive the participation incentive.

Appendix D: Procedural tools

Welcome & thank you Slides

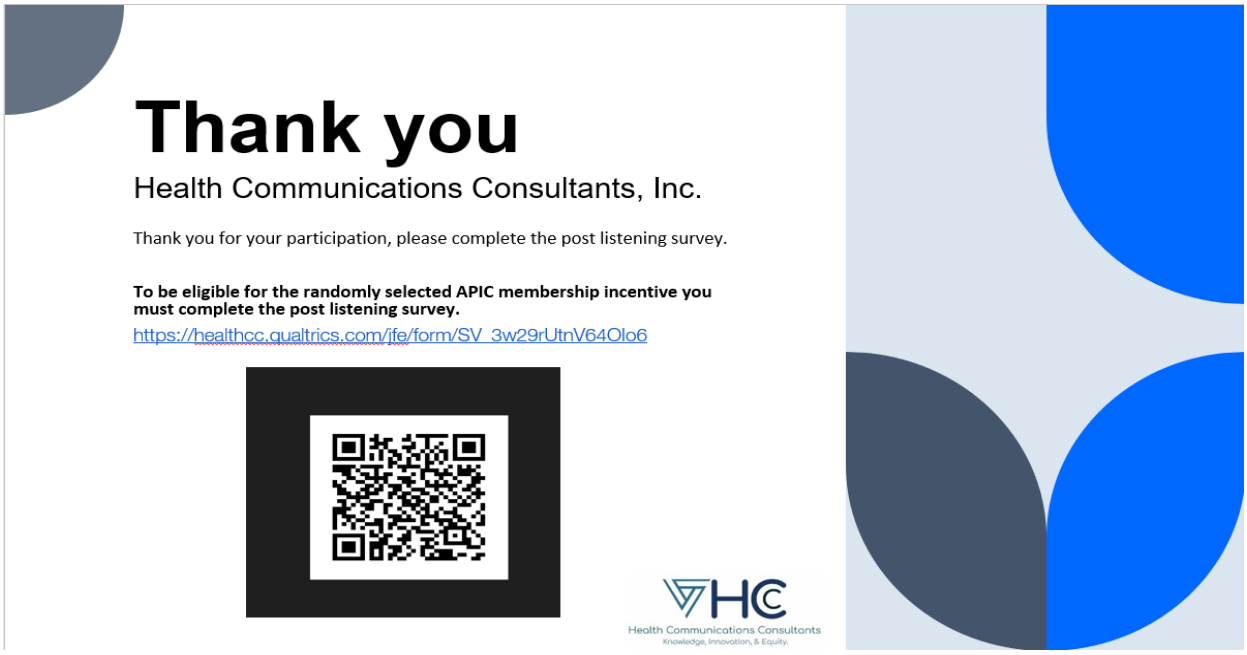


Figure 9: Welcome & Thank you PowerPoint Slides used in the Virtual Listening Sessions

Post-listening session email templates

Template for after participating in a listening session, needs survey.

Hello,

Thank you for your recent participation in our listening session on Essential Skills for Infection Prevention and Control, Healthcare-associated Infections, and Antimicrobial Resistance.

Your contribution to determining these essential skills is critical in helping strengthen the relationship between the Public Health workforce and Infection Prevention and Control. We would greatly appreciate if you could take 5-10 minutes to fill out our brief post-listening session survey to get a better understanding of the essential skills and training or coursework that is needed.

Sincerely,

The Health Communications Consultants, Inc.

Template for not completing the listening session, couldn't make it but we still want your input.

Thank you for your interest in our listening sessions on Essential Skills for Infection Prevention and Control, Healthcare-associated Infections, and Antimicrobial Resistance. We saw that you were unable to attend a session and we would still like to get your input.

To provide your input on essential skills and training, kindly fill out our brief survey.

Sincerely,

The Health Communications Consultants, Inc.

Appendix E: Results

Recruitment Survey Data

Initial recruitment email was sent on December 15, 2022, to 563 unduplicated email addresses to public health professionals with interest or experience in IPC, HAI and/or AR. The following results were noted:

- 4 emails no longer working.
- 34 had returned emails indicating the recipient was out of the office.
- 18 had additional contact information resulting in 31 additional emails.

On December 20, 2022, recruitment messages were shared on Facebook and LinkedIn through Dr. Matthews's network. As of December 21, 2022:

- 3 Reshares on FB (Public Health Professionals)
- 2 Likes on FB
- 183 Impressions on LinkedIn
- Engagements
    - 2 Reactions
    - 2 Reposts

On December 21, 2022, a brief analysis of the survey results showed that 36 responses were received.

- 4 responses were left blank for total of 32 completed responses.
- 32 responses all had some level of experience in IPC, HAI and/or AR demonstrating that the DL is accurate for the evaluation population.
- 2 respondents declined to participate in the virtual focus group.
- 7 respondents were not on the original DL demonstrating that the communication was being forwarded by the network.

Respondent emails were removed from the original DL and on December 21, 2022, showed that a reminder email was sent to the distribution list of 530 unduplicated emails.

- 1 email could not be found.
- 53 out of office automatic replies were received.

A request to Montana HAI State Coordinator to advocate for the project resulted in the reminder email being sent to their HAI State Coordinator network.

Review of recruitment survey responses on December 28, 2022, at 11: 30am.EST revealed.

- 52 respondents of which all have some level of experience in IPC, HAI, and/or AR.
- 47 of the respondents are willing to participate in a LS.

Upon review of the data, there was representation from each of the governance structures (n=30).

- 5 Centralized
- 2 Largely Centralized
- 9 Decentralized
- 2 Largely Decentralized

- 4 Mix
- 7 Shared
- 1 Largely shared.

In the recruitment survey when asked which best describes the work setting in which you developed experience in IPC, HAI and/or AR, we do not have any responses from:

- Territorial health agency
- Federal health agency
- Tribal health agency

Distribution lists were reviewed, and phone calls were made to any person who may fit these categories to personalize an invitation to join the evaluation. DL identified 4 individuals who fit these criteria and additional contacts were requested to NNPHI.

As of 1/3/2023 (8:20a.m.) there were 57 respondents of which 51 are willing to participate in the listening sessions.

One (1) respondent that identified as having a work setting in the federal health agency. We do not have any responses yet from work settings identified as:

- Territorial health agency
- Tribal health agency

We have 8 respondents that are identified as the state HAI contacts, 7 of whom are willing to participate in the listening sessions.

On January 9, 2023, NNPHI provided a list of nine (9) contacts within their network. Five (5) of the contacts were already on the main distribution list. A personalized invitation was sent to these contacts with telephone calls made to the three (3) that had identified numbers.

On February 3, 2023, the recruitment survey link was closed, and the following data was assessed for the participant pool.

Outcome: Based on the recruitment process, it is likely that the holiday season significantly impacted recruitment efforts. The response rate (65/563) is around 11.5% which aligns with the literature on the health workforce varying from 10% to 61% response rates.

All Respondents Data Recruitment Survey

Qualtrics identified 101 responses within the platform for the recruitment survey from December 15, 2022, through February 3, 2023. Thirty-six (36) responses did not have any contact information and were removed from the analysis. There were sixty-five (65) total respondents in the recruitment survey. Four (4) surveys were noted as incomplete with a 59%, 24%, 12%, and 12% completion rate. The remaining 61 surveys were at 100% completion. The average duration for completion was 6.7 minutes with a range of 1.9-43.2 minutes, median of 4.8 minutes.

The responses were stratified to identify and recruit public health workforce participants within the pre-identified audience segments. The 65 participants represent several states including Alaska, Arizona, California, Colorado, Connecticut, District of Columbia, Florida, Hawaii, Kentucky, Louisiana, Maine, Maryland, Michigan, Montana, Nebraska, New Hampshire, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, and Washington. Representation from each governance structure included 31% Decentralized Governance, 18% from Shared Governance, 17% from Centralized Governance, 17% from Mixed Governance, 9% from Largely Centralized, 5% from Largely Shared, 3% from Largely Decentralized.

State	Governance	Count	Percentage
Alaska	Mixed	1	2%
Arizona	Decentralized	1	2%
California	Decentralized	3	5%
Colorado	Decentralized	3	5%
Connecticut	Decentralized	1	2%
District of Columbia	Centralized	1	2%
Florida	Shared	11	17%
Hawaii	Centralized	7	11%
Kentucky	Shared	1	2%
Louisiana	Largely Centralized	1	2%
Maine	Mixed	1	2%
Maryland	Largely Shared	3	5%
Michigan	Decentralized	3	5%
Montana	Decentralized	1	2%
Nebraska	Decentralized	1	2%
New Hampshire	Largely Centralized	1	2%
New York	Decentralized	1	2%
North Carolina	Decentralized	1	2%
Oregon	Decentralized	2	3%
Pennsylvania	Mixed	3	5%
Rhode Island	Centralized	1	2%
South Carolina	Centralized	2	3%
South Dakota	Largely Centralized	3	5%
Tennessee	Mixed	6	9%
Texas	Largely Decentralized	2	3%
Utah	Decentralized	2	3%
Virginia	Largely Centralized	1	2%
Washington	Decentralized	1	2%
Totals		65	100%

Table 5: Recruitment Survey 12/15/2022-2/3/2023 State & Governance for All Respondents

State	Governance	Count	Total Count	Percentage
District of Columbia	Centralized	1	11	17%
Hawaii		7		
Rhode Island		1		
South Carolina		2		
Arizona	Decentralized	1	20	31%
California		3		
Colorado		3		
Connecticut		1		
Michigan		3		
Montana		1		
Nebraska		1		
New York		1		
North Carolina		1		
Oregon		2		
Utah		2		
Washington		1		
Louisiana	Largely Centralized	1	6	9%
New Hampshire		1		
South Dakota		3		
Virginia		1		
Texas	Largely Decentralized	2	2	3%
Maryland	Largely Shared	3	3	5%
Alaska	Mixed	1	11	17%
Maine		1		
Pennsylvania		3		
Tennessee		6		
Florida	Shared	11	12	18%
Kentucky		1		
Totals		**65**	**65**	**100%**

Table 6: Recruitment Survey 12/15/2022-2/3/2023 State & Governance for All Respondents

The next section contains data for Questions 3 through 8 on the recruitment survey. The data is stratified by listening session (LS). A bulleted list following each table summarizes the total participants (those who did not participate + those that participated in a listening session) and the listening session participants. The column heading with N=65 represents the total respondents and the column heading with N=41 represents the respondents who also participated in a listening session.

Questions 3-8 Stratified by Listening Session

Q3. Experience

Q3. Do you work or have experience working in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) and/or Anti-microbial Resistance (AR)?									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
								2	2
Yes, I have experience in all 3 areas.	2	1	4	4	2	4	8	14	39
Yes, I have experience in AR only.			1						1
Yes, I have experience in HAI and AR but not IPC.	1					2		2	5
Yes, I have experience in HAI only				1			2	1	4
Yes, I have experience in IPC and AR but not HAI.								1	1
Yes, I have experience in IPC and HAI but not AR.			4	2	1	1		3	11
Yes, I have experience in IPC only.				1				1	2
Grand Total	**3**	**1**	**9**	**8**	**3**	**7**	**10**	**24**	**65**

Experience

N=65

- 100% respondents with Yes.
- N=39 Yes, I have experience in all 3 areas.
- N=11 Yes, I have experience in IPC and HAI but not AR.
- N=5 Yes, I have experience in HAI and AR but not IPC.
- N=4 Yes, I have experience in HAI only.
- N=2 Yes, I have experience in IPC only.
- N=1 Yes, I have experience in IPC and AR but not HAI.
- N=1 Yes, I have experience in AR only.
- N=2 Did not answer question.

N=41

- 100% respondents with Yes.
- N=25 Yes, I have experience in all 3 areas.
- N=8 Yes, I have experience in IPC and HAI but not AR.
- N=3 Yes, I have experience in HAI and AR but not IPC.
- N=3 Yes, I have experience in HAI only.
- N=1 Yes, I have experience in IPC only.
- N=0 Yes, I have experience in IPC and AR but not HAI.
- N=1 Yes, I have experience in AR only.

Q3a. Time Worked

Q3a. Approximately how much time have you worked in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) and/or Antimicrobial Resistance (AR)?									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
								2	2
11 years to 15 years		1		1		2		3	7
2 years to 5 years	1		5	3	1	2	4	9	25
6 months to 1 year			2			1		1	4
6 years to 10 years	1		1	1	1	1	5	6	16
Greater than 15 years	1		1	3	1	1		2	9
Less than 6 months							1	1	2
Grand Total	**3**	**1**	**9**	**8**	**3**	**7**	**10**	**24**	**65**

Time Worked-Years of Experience

N=65

- Less than 6 months N=2
- 6 months to 1 year N=4
- 2 years to 5 years N=25
- 6 years to 10 years N=16
- 11 years to 15 years N=7
- Greater than 15 years N=9
- Did not respond N=2

N=41

- Less than 6 months N=1
- 6 months to 1 year N=3
- 2 years to 5 years N=16
- 6 years to 10 years N=10
- 11 years to 15 years N=4
- Greater than 15 years N=7

Q3b. Supervise/Manage

Q3b. During your years of experience in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR) did you supervise or manage others?									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
								3	3
No	3		4	2	1	3	3	9	25
Yes		1	5	6	2	4	7	12	37
Grand Total	**3**	**1**	**9**	**8**	**3**	**7**	**10**	**24**	**65**

Supervise/Manage

N=65

- No N=25
- Yes N=37

Did not respond N=3

N=41

- No N=16
- Yes N=25

Q3b2. Supervise/Manage Time

Q3b2. During your years of experience in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) and/or Antimicrobial Resistance (AR) how long did you supervisor or manage others?									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
	3		4	2	1	3	3	12	28
11 years to 15 years								2	2
2 years to 5 years		1	2	1	1	1	3	5	14
6 months to 1 year			2	2		1	3	2	10
6 years to 10 years			1	2		1		3	7
Greater than 15 years				1	1	1			3
Less than 6 months							1		1
Grand Total	**3**	**1**	**9**	**8**	**3**	**7**	**10**	**24**	**65**

Supervise/Manage-Time

N=37

- Less than 6 months N=1
- 6 months to 1 year N=10
- 2 years to 5 years N=14
- 6 years to 10 years N=7
- 11 years to 15 years N=2
- Greater than 15 years N=3

N=25

- Less than 6 months N=1
- 6 months to 1 year N=8
- 2 years to 5 years N=9
- 6 years to 10 years N=4
- 11 years to 15 years N=0
- Greater than 15 years N=3

Q4. Work Setting

Q4. Which best describes the work setting in which developed experience in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
								3	3
Educational institution/Academic Institution				1				1	2
Federal health agency								2	2
Local health agency			1	2		1	2	5	11
Other private industry	1		2					1	4
Personal health service industry	1								1
Private foundation				1					1
Private nonprofit organization				1	3	3	1	1	9
State health agency	1	1	6	3		3	7	10	31
Tribal health agency								1	1
Grand Total	**3**	**1**	**9**	**8**	**3**	**7**	**10**	**24**	**65**

Q4. Other Text Box

Q4. Other Private Industry Text Box									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
Both nonprofit organization & State Health Department								1	1
Kaiser hospital			1						1

Work Setting

N=65
- Did not respond (N=3)
- Local health agency (N=11)
- State health agency (N=31)
- Territorial health agency (N=0)
- Federal health agency (N=2)
- Tribal health agency (N=1)
- Educational/academic institution (N=2)
- Private nonprofit organization (N=9)
- Private foundation (N=1)
- Personal health service industry (N=1)
- Other private industry (Text Box) (N=4)

N=41
- Local health agency (N=6)
- State health agency (N=21)
- Territorial health agency (N=0)
- Federal health agency (N=0)
- Tribal health agency (N=0)
- Educational/academic institution (N=1)
- Private nonprofit organization (N=8)
- Private foundation (N=1)
- Personal health service industry (N=1)
- Other private industry (Text Box) (N=3)

Q5. Employer

Q5. Which best describes the employer(s) in which you developed experience in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?

Row Labels	LS1	LS1/LS2	LS2	LS3	LS4	LS5	LS6	(blank)	Grand Total
				1				3	4
Federal government								2	2
Local government			1	2			1	5	9
Nongovernment			1	1	3	3	2	3	13
Other	2	1		2				2	7
State government	1		7	2		4	7	9	30
Grand Total	**3**	**1**	**9**	**8**	**3**	**7**	**10**	**24**	**65**

Q5. Other Text Box

Q5. Other Text Box									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
Consulting company		1							1
Nongovernment & State Government								1	1
partly state government and nongovernment				1					1
Private GI Specialty Practice	1								1
Private, non-profit				1					1

Employer

N=65
- Did not respond (N=4)
- Local government (N=9)
- Tribal government (N=0)
- State government (N=30)
- Federal government (N=2)
- Nongovernment (N=13)
- Other (Text Box) (N=7)

N=41
- Did not respond (N=1)
- Local government (N=4)
- Tribal government (N=0)
- State government (N=21)
- Federal government (N=0)
- Nongovernment (N=10)
- Other (Text Box) (N=5)

Q6. Occupation

Q6. Which best describes your occupation in which you developed experience in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
								3	3
Management and leadership (e.g., director, manager, supervisor, health officer)		1		1	1		1	6	10
Other (e.g., student, volunteer, intern)								1	1
Professional and scientific (Clinical) (e.g., nurse, physician, dentist, nutritionist, dietitian, oral health professional, behavioral health professional, medical examiner, etc.)	3		2	2		2	2	7	18
Professional and scientific (non-Clinical) (e.g., epidemiologist, laboratory worker, information specialist, emergency preparedness, environmentalist, health educator, occupational health)			5	5	2	5	7	7	31
Technical and outreach (e.g., animal control worker, community health worker, home health worker, other technical and outreach)			2						2
Grand Total	**3**	**1**	**9**	**8**	**3**	**7**	**10**	**24**	**65**

Q6. Other Text Box

Q6. Other (e.g., student, volunteer, intern) Text box									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
Grant administration and facilitation of TA								1	1

Occupation

N=65

•Did not respond N=3

•Management and leadership (e.g., director, manager, supervisor, health officer) N=10

•Professional and scientific (non-Clinical) (e.g., epidemiologist, laboratory worker, information specialist, emergency preparedness, environmentalist, health educator, occupational health) N=31

•Professional and scientific (Clinical) (e.g., nurse, physician, dentist, nutritionist, dietitian, oral health professional, behavioral health professional, medical examiner, etc.) N=18

•Technical and outreach (e.g., animal control worker, community health worker, home health worker, other technical and outreach) N=2

•Support Services (e.g., clerical, business support, grants specialist, human resources, attorney, other business support) N=0

•Other (e.g., student, volunteer, intern) N=1

Grant administration and facilitation of TA

N=41

•Management and leadership (e.g., director, manager, supervisor, health officer) N=4

•Professional and scientific (non-Clinical) (e.g., epidemiologist, laboratory worker, information specialist, emergency preparedness, environmentalist, health educator, occupational health) N=24

•Professional and scientific (Clinical) (e.g., nurse, physician, dentist, nutritionist, dietitian, oral health professional, behavioral health professional, medical examiner, etc.) N=11

•Technical and outreach (e.g., animal control worker, community health worker, home health worker, other technical and outreach) N=2

•Support Services (e.g., clerical, business support, grants specialist, human resources, attorney, other business support) N=0

Other (e.g., student, volunteer, intern) N=0

Q7. Participation

Q7. I am willing to participate in a virtual focus group to provide information on the essential skills and training needs for the public health workforce involved in infection prevention and control (IPC), healthcare associated infections (HAI) and antimicrobial resistance (AR) activities?									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
								3	3
No, I am not willing to participate in a virtual focus group.			1					7	8
Yes, I am willing to participate in a virtual focus group.	3	1	8	8	3	7	10	14	54
Grand Total	**3**	**1**	**9**	**8**	**3**	**7**	**10**	**24**	**65**

Q7a. Essential Skills

Q7a. Essential skills are sometimes called "soft skills". They are skills that help you apply technical skills in a way that helps people. In your opinion, what do you think are the **essential skills** needed for working in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR) activities?									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
Clinical experience whether this is in a clinical setting or working with clinical settings in a consultative role								1	1
communication, listening skills, flexibility in presentation of materials to best suit person receiving information, resources, knowledge of disease, mitigation			1						1
knowledge of HAIs and infection prevention, PPE donning and doffing protocol								1	1
organization, time management, organizing large/multiple data sets								1	1
Public speaking, google/tracking things down on the internet, being organized in thoughts and communications								1	1
Relationship and partnership building and maintenance. Resilience/ability to monitor and address burnout in a challenging landscape. Effective communication, including meeting and training facilitation. Magical powers to translate dry and sometimes conflicting guidance documents from regulatory authorities into practical guidance that facilities can actually operationalize with the resources and staffing that they have.								1	1

Q7b. Training or Coursework

Q7b Please list the **training or coursework** that you find the most useful in your work in each of areas: Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR). (Note: Please use website links, names of documents, etc. Put NA if training or resources are not used for the specified area).

Row Labels	LS 2	(blank)	Grand Total
APIC CIC/ CBIC training		1	1
APIC study materials and courses, state health department trainings, and CDC trainings		1	1
CDC guidelines - Hawaii state guidelines, DOH meetings re: IPC and HAI. https://www.cdc.gov/hai/pdfs/stateplans/hi.pdf https://hawaiicovid19.com https://www.cms.gov/files/document/covid-toolkit-states-mitigate-covid-19-nursing-homes.pdf https://www.coursera.org/?utm_source=recommendations&utm_medium=email&utm_campaign=19484&sfmc_id=90512066&sfmc_key=0031U00001sTZJoQAO UH Manoa - Covid 19 certification 6 credit course	1		1
Discussions with local infectious disease doctors, hospital IPs, and LTCF partners are the most useful in understanding what we're up against and what we might be able to have an impact on. I did not find APIC trainings for CIC certification very helpful.		1	1
The West Region ARLN has done some great trainings on MDRO response.		1	1

Q7c. Training Modalities

Q7c. Which training modalities have you used in the areas of Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)? (Select all that apply)			
Row Labels	**LS2**	**(blank)**	**Grand Total**
Blended approach (Using multiple modalities) (Text Box)	1		1
eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars), Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures or workshops.), Video Learning (Delivers training content through video modules.), Blended approach (Using multiple modalities) (Text Box)		1	1
eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars), Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures or workshops.), Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)		2	2
eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars), Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)		1	1
eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars),Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.),Video Learning (Delivers training content through video modules.)		1	1
Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.), Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.), Video Learning (Delivers training content through video modules.)		1	1

Q7d. Rank Training Modalities

Q7d. Rank the training modalities from the "**most (1)" to "least (8)**" effective in the areas of Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?

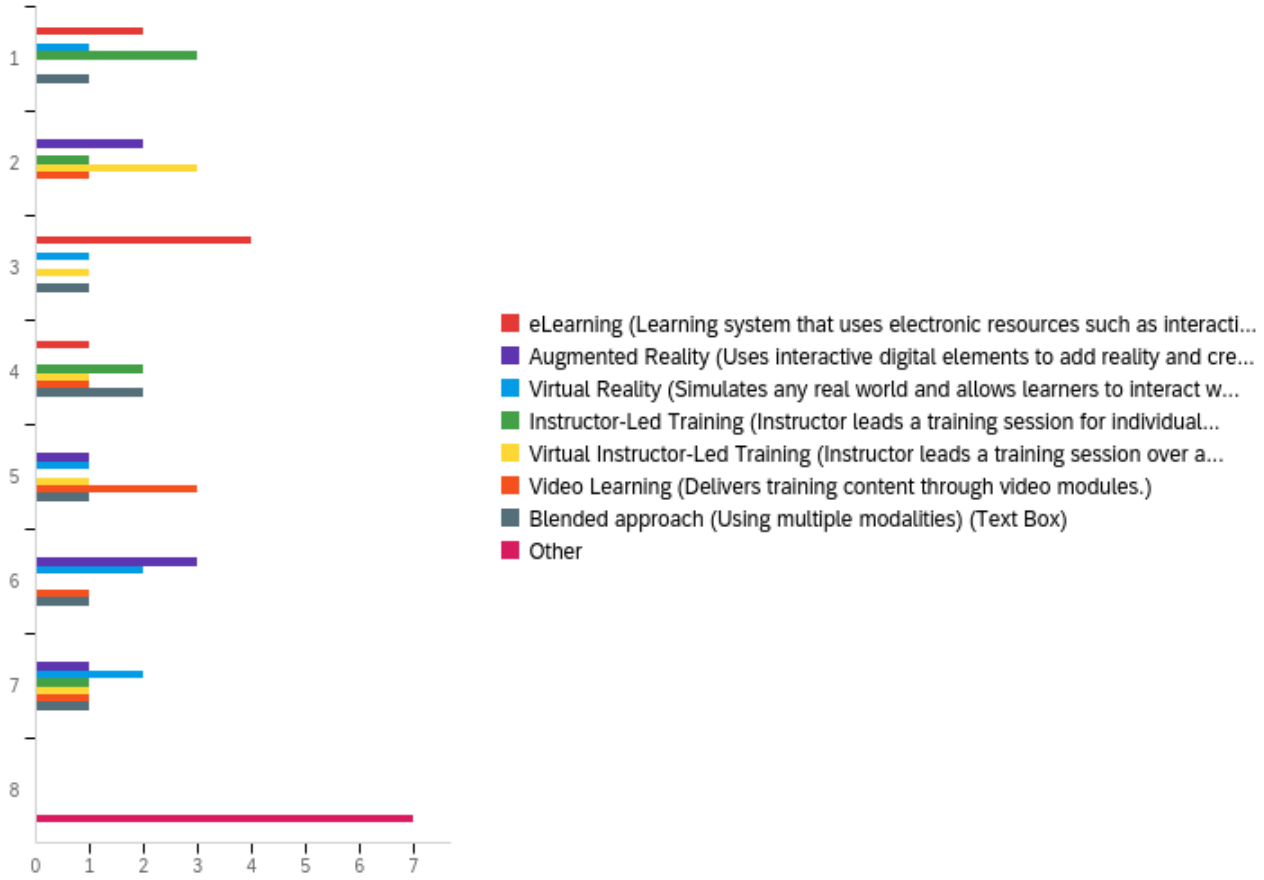


Figure 10: Bar Chart of Ranked Training Modalities Recruitment Survey N=8

Figure 11: Pie Charts of Ranked Training Modalities Recruitment Survey N=8

Q8. Additional Thoughts

Q8. Do you have any additional thoughts or comments to share?									
Row Labels	**LS1**	**LS1/LS2**	**LS2**	**LS3**	**LS4**	**LS5**	**LS6**	**(blank)**	**Grand Total**
	2		9	5	3	6	9	23	57
I appreciate the opportunity to participate. Thank you for reaching out.				1					1
I currently work for a private consulting company providing HAI/AR support to nursing homes		1							1
I'm not available during the focus group times provided or during the working hours of 8-5:30. I am open to answering focus group questions if the organizers are available for discussion after 5:30 pm on weekdays. I have thoughts I'd love to share based on my experience working locally, federally, and in different states. I'd like to be kept in the loop on updates regarding this effort. Thank you!								1	1
Interested in discussing use of genomic sequencing to respond to HAI's.						1			1
I've been the HAI Epidemiologist/Program Manager since August 2017. In December 2021, I became the section supervisor for the HAI/ICP Section (a new section as of December 2021). I have trained other state employees, local public health agencies, and healthcare facilities in HAI/IC/AR.							1		1
No				1					1
None at this time, thank you	1								1
Not at this time				1					1

Degrees Held by All Respondents N=65		
BS & MPH (N=1)	DL (N=1)	MS, RN (N=1)
BS & RN (N=1)	MA (N=1)	MSCJA (N=1)
BSN (N=4)	MBA, BSN, RN (N=1)	MSPH (N=2)
BSN & MPH (N=1)	MD (N=1)	PharmD (N=1)
BSN & RN (N=2)	MD, MPH (N=2)	PhD, MPH (N=2)
BS, BSN, MPH, RN (N=1)	MPH (N=23)	PhD, MPH, MS (N=1)
BSEd, MSN, Nursing (N=1)	MPA (N=1)	RN (N=3)
BSN, MPH, RN (N=1)	MPH, MSN, RN (N=1)	RN, BSN, MSA (N=1)
BSPH (N=1)	MPH, RN (N=1)	RN, MS (N=1)
DNP (N=1)	MRes (N=1)	Blank (N=5)

Table 7: Degrees Held by All Respondents N=65

Certifications for All Respondents N=65	
ABIM (N=1)	CNE (N=1)
APRN BC Informatics, CSM (N=1)	CPH (N=1)
Board Certified in Infection Prevention and Control (N=1)	CPH CHES (N=1)
Certified Nurse Educator (N=1)	CPH CIC CCMA (N=1)
CIC (N=16)	CPHQ CPHRM CIC FAPIC (N=1)
CIC CHES (N=1)	FACP FSHEA IM ID Board Certified (N=1)
CIC CPHQ CPH (N=1)	Infection Prevention (N=1)
CIC FAPIC (N=2)	Limited (N=1)
CIC LTC CIP (N=2)	Blank (N=27)
CLSM (N=1)	None (N=3)

Table 8: Certifications for All Respondents N=65

"I am willing to participate in a virtual focus group to provide information on the essential skills and training needs for the public health workforce involved in infection prevention and control (IPC), healthcare associated infections (HAI) and antimicrobial resistance (AR) activities?"		
Response	**Count**	**Percentage %**
Yes, I am willing to participate in a virtual focus group.	54	83.07
No, I am not willing to participate in a virtual focus group.	8	12.31
No Response	3	4.62
Total	**65**	**100**

Table 9: Recruitment Survey Q7. Participation

State	Count	Governance
Alaska	1	Mixed
California	1	Decentralized
Colorado	2	Decentralized
Hawaii	1	Centralized
Tennessee	1	Mixed
Michigan	1	Decentralized
New York	1	Decentralized
Total	**8**	

Table 10: Recruitment Survey Non-LS Participant Governance

Outcome: The data presented from the recruitment survey satisfies the objective of identifying and recruiting participants from the 5 pre-identified

Listening Sessions Data

Listening Session Participants State and Governance

State	Governance	Count	Total Count	Percentage
Hawaii	Centralized	6	7	17%
South Carolina		1		
Arizona	Decentralized	1	12	29%
California		1		
Colorado		1		
Connecticut		1		
Michigan		2		
Montana		1		
Nebraska		1		
Oregon		2		
Utah		1		
Washington		1		
Louisiana	Largely Centralized	1	4	10%
New Hampshire		1		
South Dakota		1		
Virginia		1		
Texas	Largely Decentralized	1	1	2%
Maryland	Largely Shared	2	2	5%
Maine	Mixed	1	5	12%
Pennsylvania		2		
Tennessee		2		
Florida	Shared	10	10	24%
Totals		**41**	**41**	**100%**

Table 11: Listening Session Participants by State and Governance

Participant demographics by Listening Session

Forty-one (41) total participants in the six listening sessions, with one person participating in two listening sessions (1 and 2) but whose demographics were analyzed in listening session 1.

Listening sessions were conducted on the following dates are referred in numerical order.

1. Wednesday, January 4, 2023, 2:00PM-4:00PM EST (11:00AM-1:00PM PST)
2. Friday, January 20, 2023, 12:00PM-2:00PM EST (9:00AM-11:00AM PST)
3. Monday, January 23, 2023, 1:00PM-3:00PM EST (10:00AM-12:00PM PST)
4. Wednesday, January 25, 2023, 12:00PM-2:00PM EST (9:00AM-11:00AM PST)
5. Monday, January 30, 2023, 1:00PM-3:00PM EST (10:00AM-12:00PM PST)
6. Tuesday, February 7, 2023, 12:00PM-2:00PM EST (9:00AM-11:00AM PST)

Listening Session 1

There were four (4) participants in listening session 1.

LS1 Experience

- 3 have experience in all 3 areas of IPC, HAI, and AR
- 1 has experience in HAI and AR but not IPC

LS1 Time Worked

- 1 2 years to 5 years
- 1 6 years to 10 years
- 1 11 years to 15 years
- 1 Greater than 15 years

LS1 Supervise/Manage

- 3 No
- 1 Yes
    - 2-5 years of experience supervising/managing

LS1 Work Setting

- 2 State health agency
- 1 Personal health service industry
- 1 Other private industry

LS 1 Employer

- 1 State government
- 2 Other: Private GI Specialty Practice, Consulting Company

LS 1 Occupation

- 1 Management and leadership (e.g., director, manager, supervisor, health officer)
- 3 Professional and scientific (Clinical) (e.g., nurse, physician, dentist, nutritionist, dietitian, oral health professional, behavioral health professional, medical examiner, etc.)

Listening Session 2

There were nine (9) participants in listening session 2.

LS2 Experience

- 4 have experience in all 3 areas of IPC, HAI and AR
- 1 has experience in AR only.
- 4 have experience in IPC and HAI but not AR.

LS2 Time Worked

- 2 6 months to 1 year
- 5 2 years to 5 years
- 1 6 years to 10 years
- 1 Greater than 15 years

LS2 Supervise/Manage

- 4 No
- 5 Yes
    - 2 6 months-1 year of experience supervising/managing.
    - 2 with 2-5 years of experience supervising/managing.
    - 1 6-10 years of experience supervising/managing.

LS2 Work Setting

- 1 Local health agency
- 6 State health agency
- 2 Other private industry (Hospital)

LS2 Employer

- 1 Local government
- 7 State government
- 1 Nongovernment

LS2 Occupation

- 5 Professional and scientific (non-Clinical) (e.g., epidemiologist, laboratory worker, information specialist, emergency preparedness, environmentalist, health educator, occupational health)
- 2 Professional and scientific (Clinical) (e.g., nurse, physician, dentist, nutritionist, dietitian, oral health professional, behavioral health professional, medical examiner, etc.)
- 2 Technical and outreach (e.g., animal control worker, community health worker, home health worker, other technical and outreach)

Listening Session 3

There were eight (8) participants in listening session 3.

LS3 Experience

- 4 have experience in all 3 areas of IPC, HAI, and AR
- 1 has experience in HAI only.
- 2 have experience in IPC and HAI but not AR.
- 1 has experience in IPC only.

LS3 Time Worked

- 3 2 years to 5 years
- 1 6 years to 10 years
- 1 11 years to 15 years
- 3 Greater than 15 years

LS3 Supervise/Manage

- 2 No
- 6 Yes
    - 2 6 months-1 year of experience supervising/managing.
    - 1 2-5 years of experience supervising/managing.
    - 2 6-10 years of experience supervising/managing.
    - 1 Greater than 15 years of supervising/managing.

LS3 Work Setting

- 2 Local health agency

- 3 State health agency
- 1 Educational/academic institution
- 1 Private nonprofit organization
- 1 Private foundation

LS3 Employer

- 2 Local government
- 2 State government
- 1 Nongovernment
- 2 Other: Partly state government and nongovernment; Private, non-profit

LS3 Occupation

- 1 Management and leadership (e.g., director, manager, supervisor, health officer)
- 5 Professional and scientific (non-Clinical) (e.g., epidemiologist, laboratory worker, information specialist, emergency preparedness, environmentalist, health educator, occupational health)
- 2 Professional and scientific (Clinical) (e.g., nurse, physician, dentist, nutritionist, dietitian, oral health professional, behavioral health professional, medical examiner, etc.)

Listening Session 4

There were three (3) participants in listening session 4.

LS4 Experience

- 2 have experience in all 3 areas of IPC, HAI, and AR
- 1 have experience in IPC and HAI but not AR.

LS4 Time Worked

- 1 2 years to 5 years
- 1 6 years to 10 years
- 1 Greater than 15 years

LS4 Supervise/Manage

- 1 No
- 2 Yes
    - 1 2-5 years of experience supervising/managing.
    - 1 Greater than 15 years of supervising/managing.

LS4 Work Setting

- 3 Private nonprofit organization

LS4 Employer

- 3 Nongovernment

LS4 Occupation

- 1 Management and leadership (e.g., director, manager, supervisor, health officer)
- 2 Professional and scientific (non-Clinical) (e.g., epidemiologist, laboratory worker, information specialist, emergency preparedness, environmentalist, health educator, occupational health)

Listening Session 5

There were seven (7) participants in listening session 5.

LS5 Experience

- 4 have experience in all 3 areas of IPC, HAI, and AR
- 2 has experience in HAI and AR but not IPC.
- 1 has experience in IPC and HAI but not AR.

LS5 Time Worked

- 1 6 months to 1 year

- 2 2 years to 5 years
- 1 6 years to 10 years
- 2 11 years to 15 years
- 1 Greater than 15 years

LS5 Supervise/Manage

- 3 No
- 4 Yes
    - 1 6 months-1 year of experience supervising/managing.
    - 1 2-5 years of experience supervising/managing.
    - 1 6-10 years of experience supervising/managing.
    - 1 Greater than 15 years of supervising/managing.

LS5 Work Setting

- 1 Local health agency
- 3 State health agency
- 3 Private nonprofit organization

LS5 Employer

- 4 State government
- 3 Nongovernment

LS5 Occupation

- 5 Professional and scientific (non-Clinical) (e.g., epidemiologist, laboratory worker, information specialist, emergency preparedness, environmentalist, health educator, occupational health)
- 2 Professional and scientific (Clinical) (e.g., nurse, physician, dentist, nutritionist, dietitian, oral health professional, behavioral health professional, medical examiner, etc.)

Listening Session 6

There were ten (10) participants in listening session 6.

LS6 Experience

- 8 have experience in all 3 areas of IPC, HAI, and AR
- 2 have experience in HAI only.

LS6 Time Worked

- 1 Less than 6 months
- 4 2 years to 5 years
- 5 6 years to 10 years

LS6 Supervise/Manage

- 3 No
- 7 Yes
    - 1 less than 6 months
    - 3 6 months-1 year of experience supervising/managing.
    - 3 2-5 years of experience supervising/managing.

LS6 Work Setting

- 2 Local health agency
- 7 State health agency
- 1 Private nonprofit organization

LS 6 Employer

- 1 Local government
- 7 State government
- 2 Nongovernment

LS 6 Occupation

- 1 Management and leadership (e.g., director, manager, supervisor, health officer)
- 7 Professional and scientific (non-Clinical) (e.g., epidemiologist, laboratory worker, information specialist, emergency preparedness, environmentalist, health educator, occupational health)
- 2 Professional and scientific (Clinical) (e.g., nurse, physician, dentist, nutritionist, dietitian, oral health professional, behavioral health professional, medical examiner, etc.)

Listening Session Topical Outcomes

Validating the methodological process is an essential step to assure that the tools and techniques used to understand a given phenomenon (in this case, public health and infection control worker's "essential" or transferable/non-technical skills) are working. To validate the phenomenological interview method, we first frequency counted the presence of initial essential skills categories in each listening session. The charts were created from a frequency count from the categorical coding.

Outcome: The phenomenological method provided a way for each listening session to address the targeted conversation topics.

Bubble Charts (by Essential Skill)

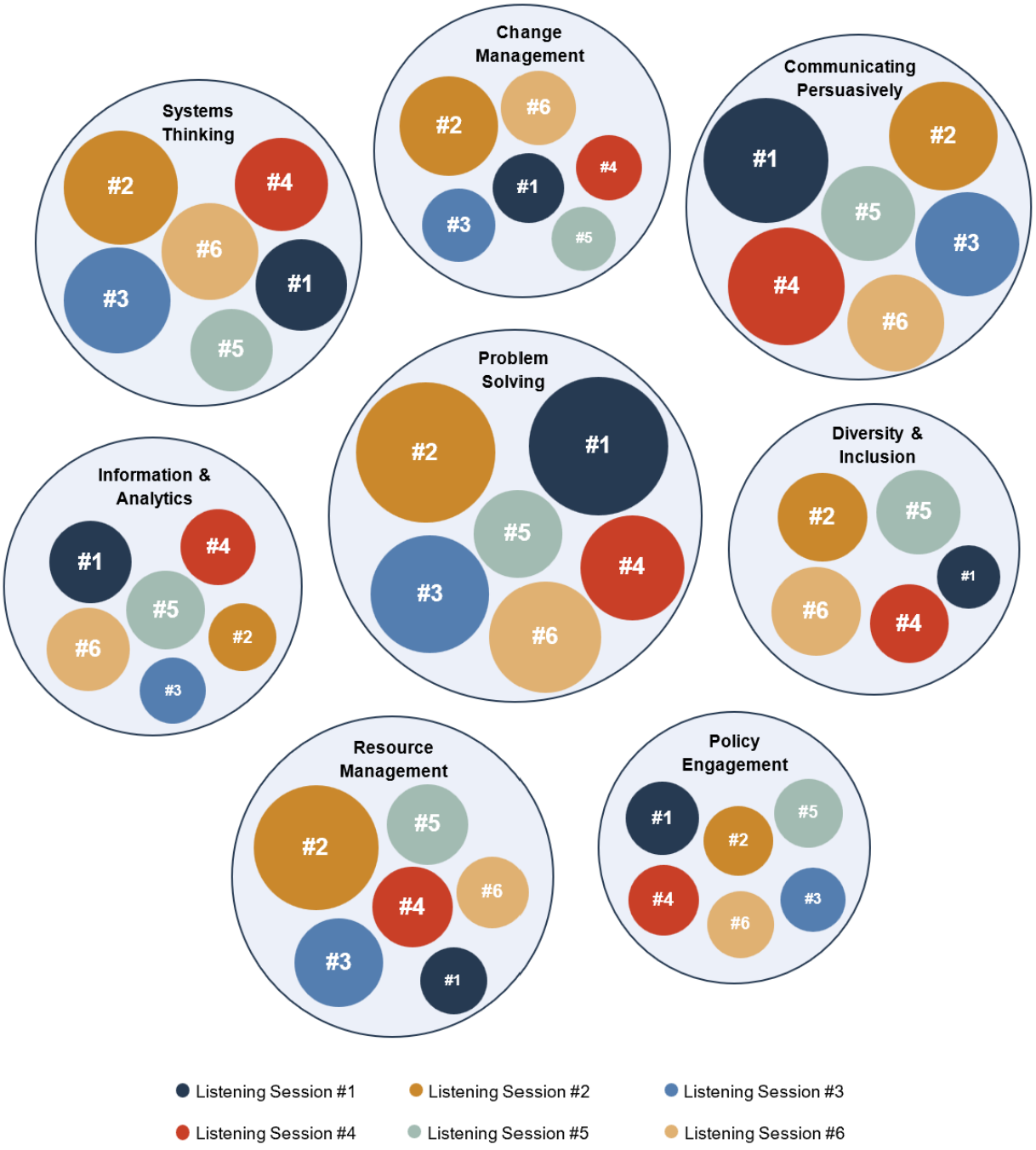


Figure 12 represents the codes by essential skills and Figure 13 by listening sessions.

Bubble Charts (by Essential Skill)

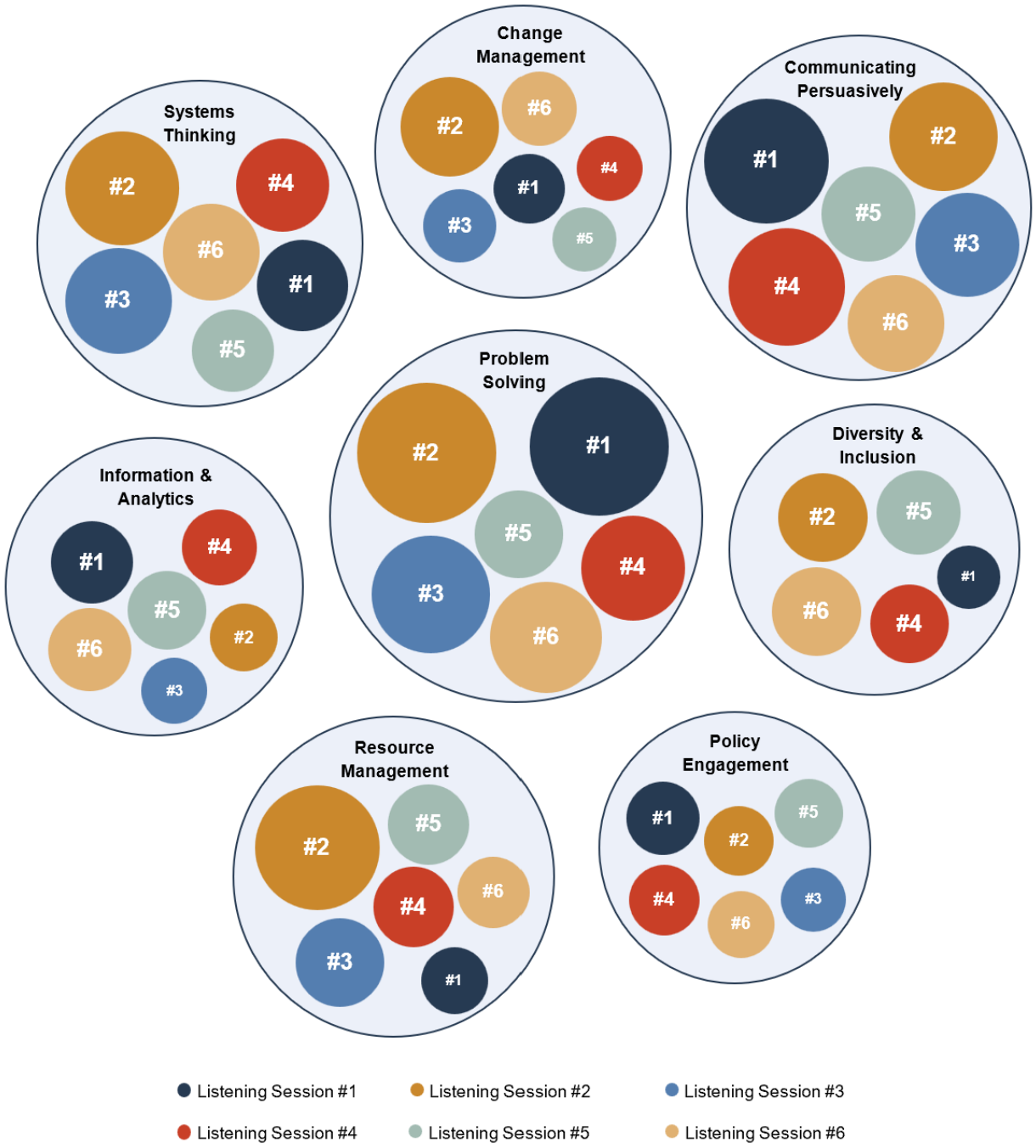


Figure 12: Frequency of Essential Skills in each listening session

Next, the researchers examined the extent to which each of these topics appeared in the listening sessions to better understand how the sample conversations may have been dominated by specific topics. As each session was limited in time (1.5 hours), it is assumed that topics could not be given equal attention while following a naturalistic conversation flow as this method requires.

Bubble Charts (by Listening Session)

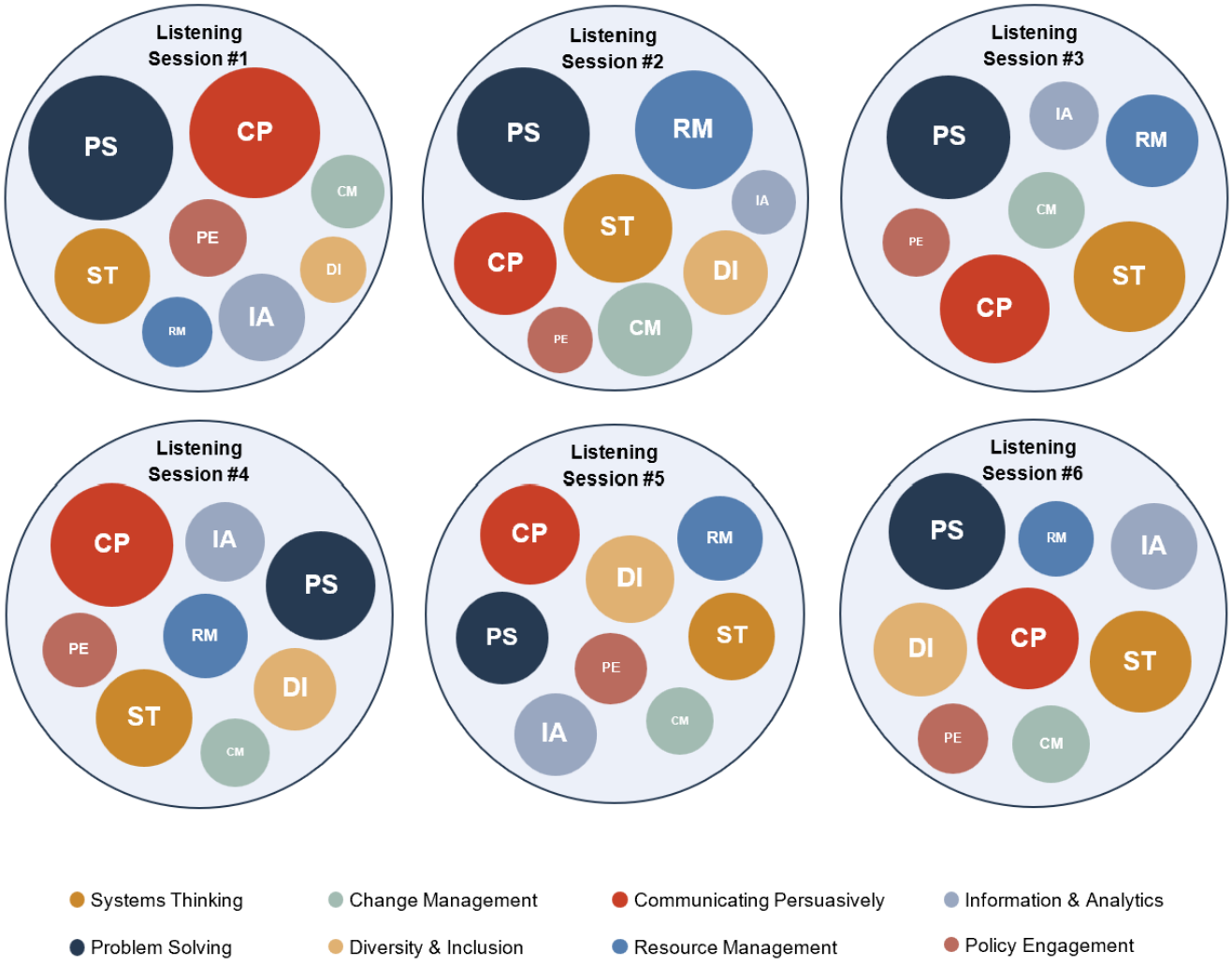


Figure 13: Frequency of Essential Skills stratified by listening sessions

This visualization, also built from frequency counts, reflects topical balances. The same data was used to represent the conversational weights, but is presented in word cloud format, below, which allows each topic to be readily identified, while size shows the prevalence.

Word Clouds (by Listening Session)

Outcome: Listening session participants' narratives prioritized some topics, but the regular appearance of the other topics suggests high interconnectedness.

With the validation of the method, and the verification that the information being sought was the kind of information that will help explain "essential skills", HCC, Inc. examined these constructs, the contexts in which they were discussed, and their relationships to each other. The logic flow used to categorize the results is described in the Methods section of this report.

The result is "The Essentials." This is a framework that includes essential (needed) skills (learned behaviors) but goes beyond, offering a taxonomy which may be used to inform future PH/IC instructional design, job placement, and performance assessment.

Appendix F: Taxonomy of Essentials

The listening sessions affirmed that the topics referred to as *essential skills* are important in PH/IC work. However, that basic framework risks conflating skills, objectives, and values. Further, there are other taxonomic concerns, particularly regarding the dependence of some constructs on others.

For example, the original category of "Change Management" more aptly describes an *objective*, or something that must be accomplished, than a skill per se. While such a distinction may appear pedantic at first, it is valuable to make because these categories impact instructional design, job descriptions, and work evaluations. Change Management, like other objectives, can only be accomplished by applying other skills, like Strategic Thinking, Leadership, Professionalism, and Emotional Intelligence. Further, it is made more successful when values like those associated with Diversity & Inclusion (D&I) are practiced. Change management is executed within systems of systems to use resources, modify business processes, allocate budgets, and otherwise cause and/or manage change in an organization. Consequently, change management will always involve explicit knowledge of an organization, policies, and practices as well as knowledge of the appropriate tools and techniques for resource allocation and management. Although the explicit technical knowledge involved in change management is necessary, it is not sufficient. Change requires emotional intelligence to assure and maintain stakeholder buy-in, strategic thinking, leadership, communication, and diversity & inclusion. In sum, because Change Management is an objective accomplished by applying these combinations, it must be taught and assessed very differently than a specific skill would be.

Another example would be the clarifications we have made to shift from "Persuasive Communication" to use "Communication". The listening sessions affirmed that persuasion is critical. However, it is one of many possible goals that the Listening session participants emphasized. Others included: Building rapport, negotiating, and informing (e.g., resource access, status updates). The sessions suggest that persuasive communication is an outcome, and that other "essentials", like Decision Making and Problem Solving, must lead the professional to persuade (as opposed to other communication goals). It then combines technical communication skills (including use of various modalities such as voice or email) as well as cultural awareness (D&I), emotional intelligence, and strategic thinking. Teaching persuasion without teaching these other related items will result in less effective training & readiness.

The "essentials" listed in the present report are those identified from the listening sessions, but there is no assertion that this is an exclusive nor static list. Further, the definitions of each term vary across disciplinary literature. Therefore, the following definitions offer guidance to better understand how they contribute to the present "essentials" framework.

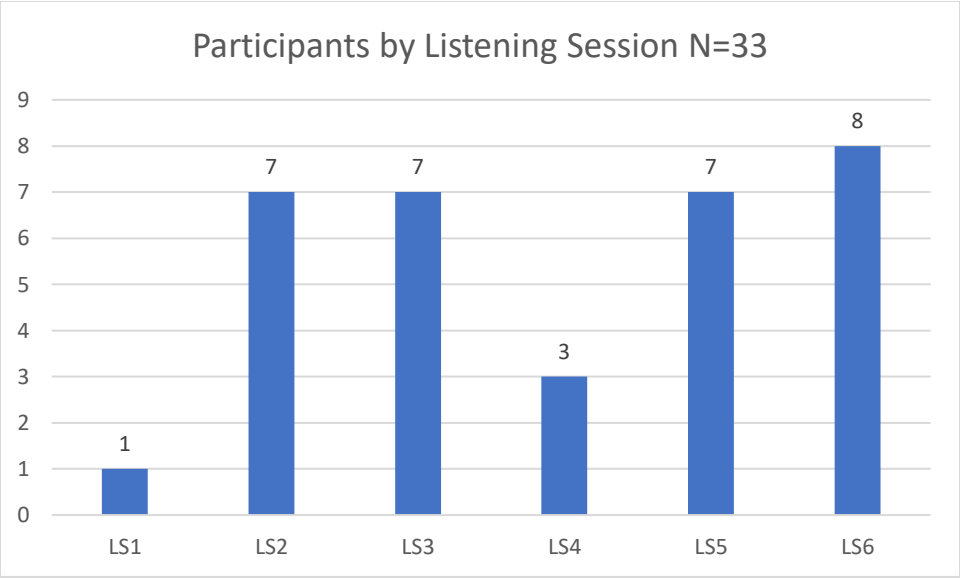
Post-Listening Session Results

Post Listening Survey Analysis

Qualtrics identified 58 responses within the platform for the post listening session survey from January 4, 2023, through February 16, 2023. Seventeen (17) responses did not have any contact information and were removed from the analysis. Seven (7) participants had duplicate entries of which 1 had 2 duplicates. Three (3) of the duplicates were not complete entries and were removed from the analysis. The remaining 4 were compared for additional information and were provided cumulatively.

Of the 41 participants who attended a listening session 33 completed a post listening session survey. There were 33 participants with 38 responses.

The average duration for completion was 12 minutes with a range of 3 minutes-49 minutes and median of 7.6 minutes. There was one outlier that took 65 hours. This data point was not included in the analysis.



Listening Session	LS1	LS2	LS3	LS4	LS5	LS6	Total
Total	1	7	6	4	7	8	33

Figure 14: Participants by Listening Session N=33

Q3 - Reflecting on your listening session conversation, do you have any additional information or clarifications to share?
Not at this time, I appreciated the open conversation and being able to hear what similarities and differences others were experiencing in the field.
I think making trainings for different levels of education would be more engaging.

The session was helpful. There were a lot of topics brought up we could have spent more time on, but time ran out. 2006 brought up the challenges of navigating the political climate and lack of training provided on this. I had a similar experience, but also understand that we were all in "fire-fighting" mode and I don't know that we had agency resources to plan/train staff on this.
It was a very good session. Resource management, KSA assessment, onboarding, coaching, and mentoring are key components to training new IPs.
I appreciate the meeting and sharing. It helps validate some of the experiences I have had. I came in hitting the ground running and no onboarding or orientation was in place. I plan to put together an onboarding program for ne IPs so they have some foundation when they start
I do not have any additional information to share.
Emotional based interviewing are techniques used to elicit key information while also engaging the person you are having the conversation with.
None
I referenced the importance that observing others has had on my development. Perhaps there is some level of that which can be useful in thinking about how to approach training. 1.) Is the value if teaching people to utilize observations in their own learning. (How do you identify a good "mentor" or "model" to observe? How do you learn from your observations and apply that?). 2.) Are there ways that the tendency to observe in itself can be used to build training activities (have participants observe a roll play or conversation and break it down/discuss the soft skills.
none that I can think of
I wish we had heard some scenarios and a chance to discuss them as a group.
None
None
No
No
Na
Training can sometimes be viewed as just another task to do. I would like to focus on the why behind the training and outcomes.
I enjoyed this opportunity, and it was good to hear others
Working in government, I always feel that a lot of responsibility is pushed off- it takes a lot to get not only communication clear and looped back, but to have someone take responsibility for certain tasks. This is a big hurdle I find in relationship, communication, effectiveness in our work, etc.

There is so much information to share regarding Infection Prevention and the different care settings. I now know that, as an Epi, I was very limited in the knowledge I had regarding what my healthcare partners did day to day. I think it will be very important to build relationships across the continuum of care.
Relationship and approach are key to success; constantly evolve and improve approach/education/training materials; find out what approach for education works best for facility - in person, recorded, train the trainers, etc.
COVID has also highlighted the need for difficult conversations about who is responsible for supporting facilities with PPE, staff trainings, and infection control education. In the past, this burden has fallen to public health. HHS was much more involved in COVID, and many facilities reported and looked to them before contacting public health. I think it is essential for us to continue conversations about who, how and where all organizations who touch these facilities should be held accountable and what ideal support looks like long-term.
None
It is important for public health professionals to have the ability to think and not just follow a playbook
None
No
None at this time
not at this time
No

Q4 was further themed and contained in the

Combined Training Modalities by Count	1	2	3	4	5	6	7	8	Total
a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)	7	6	9	9	9	1	2	0	43
b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accessed through a tablet, phone, or headset)	2	10	3	4	7	9	6	2	43
c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)	4	3	9	4	5	9	6	3	43
d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)	11	10	9	10	2	0	1	0	43
e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)	0	10	8	10	9	3	3	0	43
f. Video Learning (Delivers training content through video modules.)	0	1	1	3	10	17	10	1	43
g. Blended approach (Using multiple modalities) (Text Box)	16	2	3	3	1	4	12	2	43
h. Other (Text Box)	3	1	1	0	0	0	3	35	43

Table 13: Training modalities ranked by most efficacious in IPC, HAI, & AR

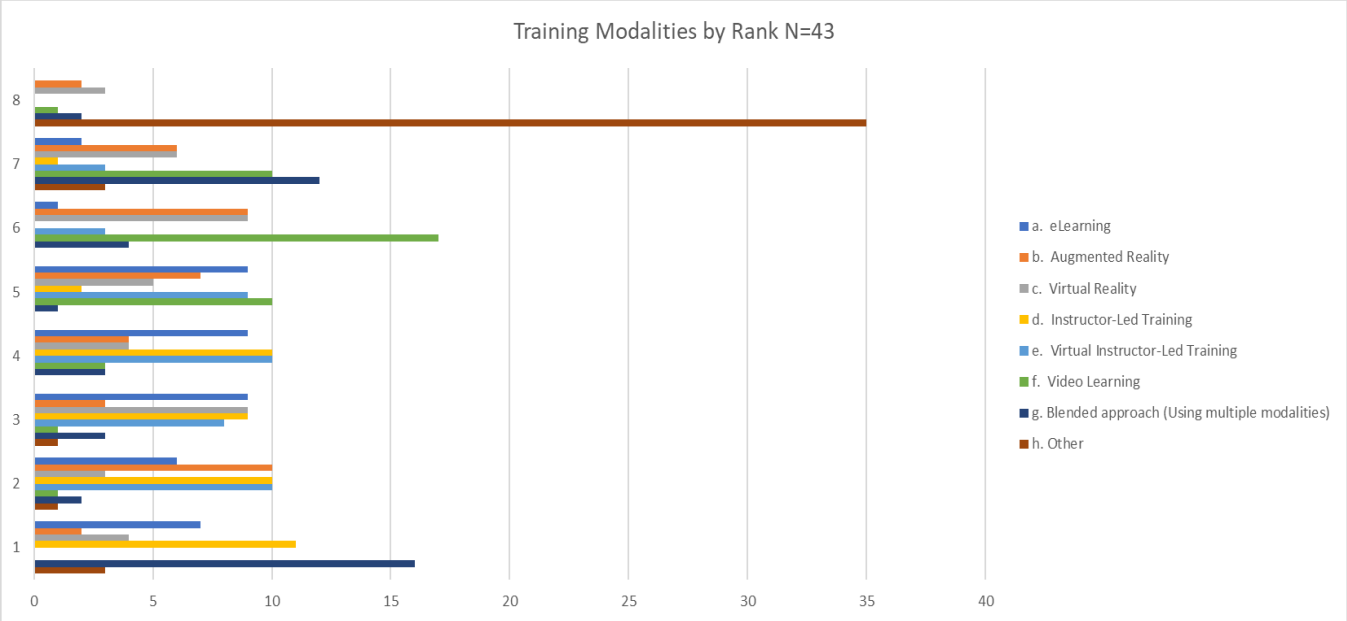


Figure 17: Ranked Training Modalities from All Respondents N=43

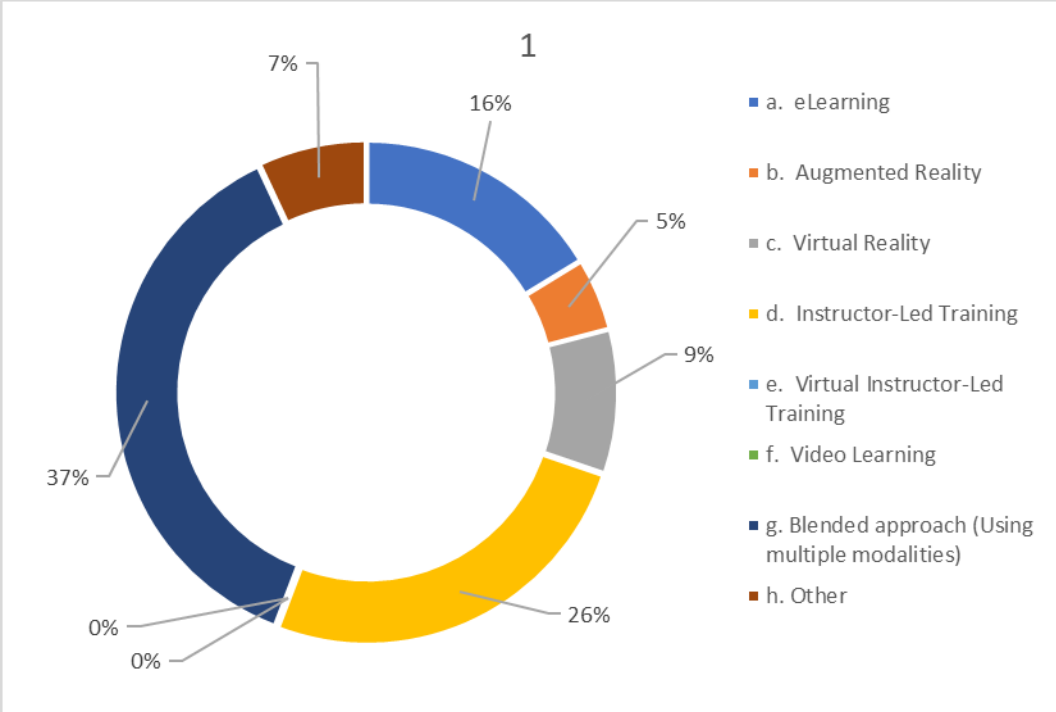


Figure 18: Rank 1 training modalities all respondents

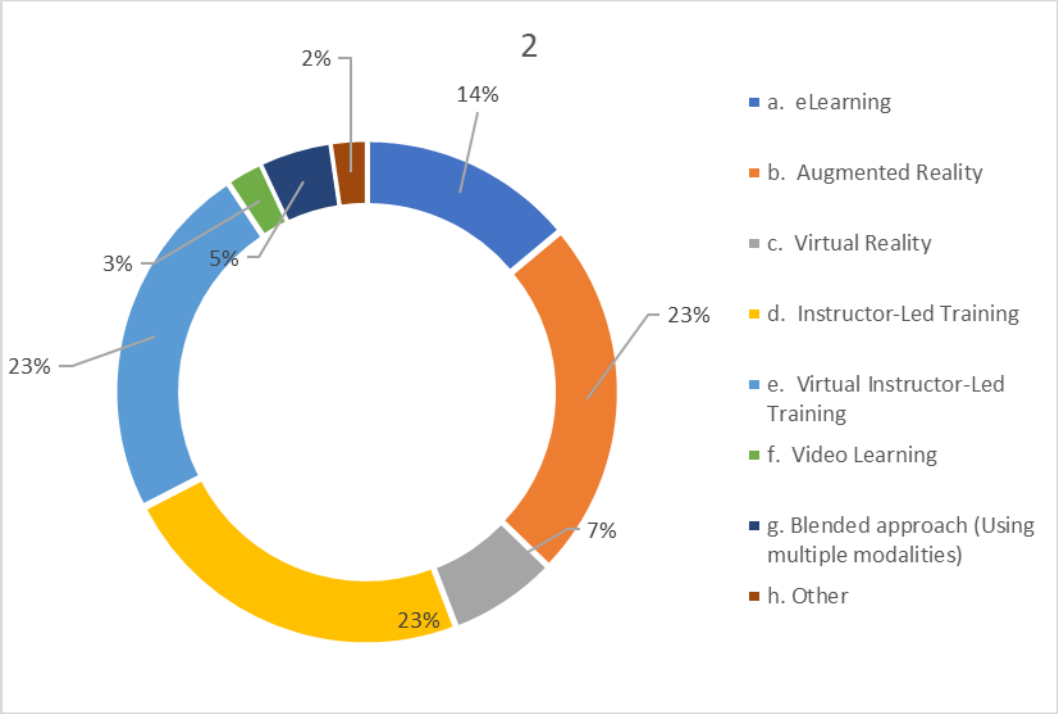


Figure 19: Rank 2 training modalities all respondents

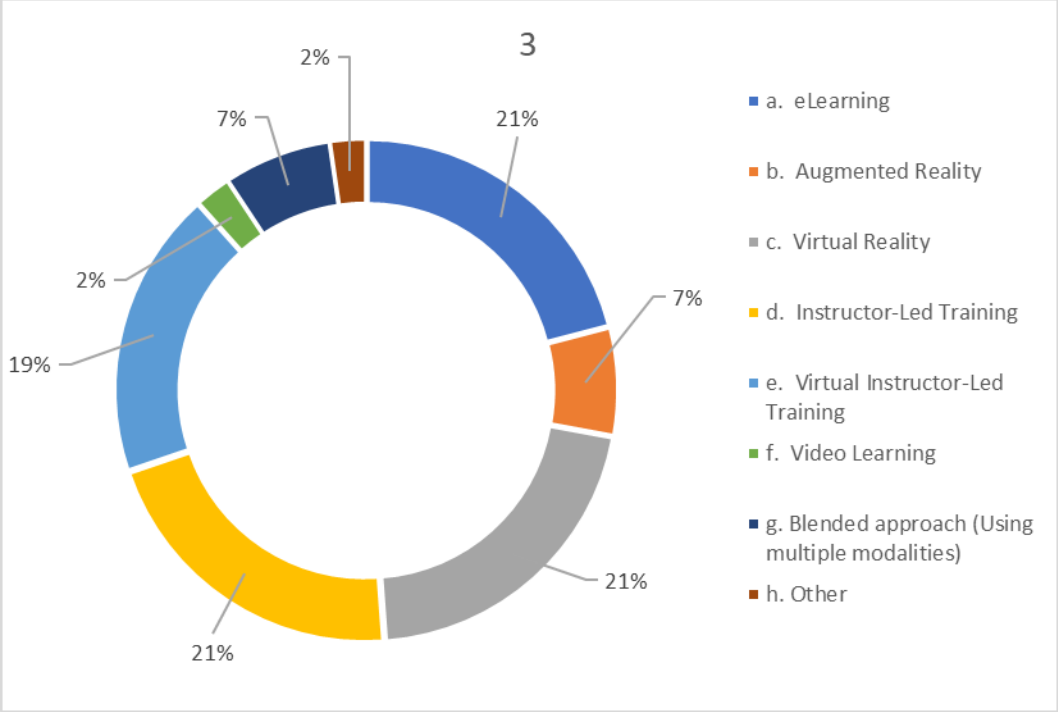


Figure 20: Rank 3 training modalities all respondents

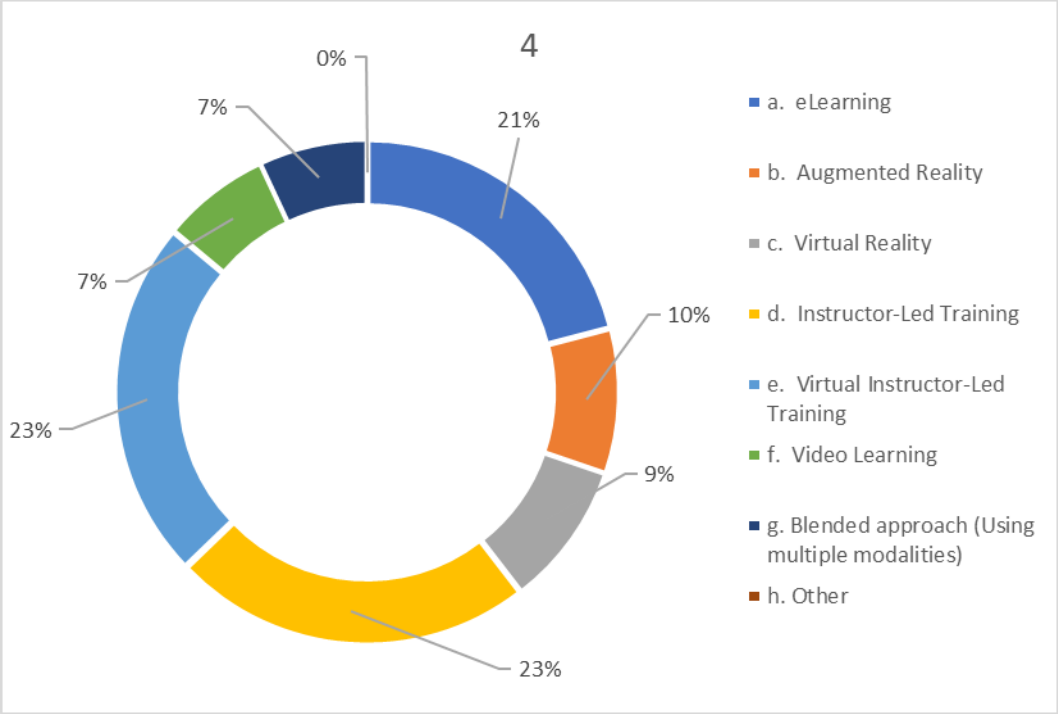


Figure 21: Rank 4 training modalities all respondents

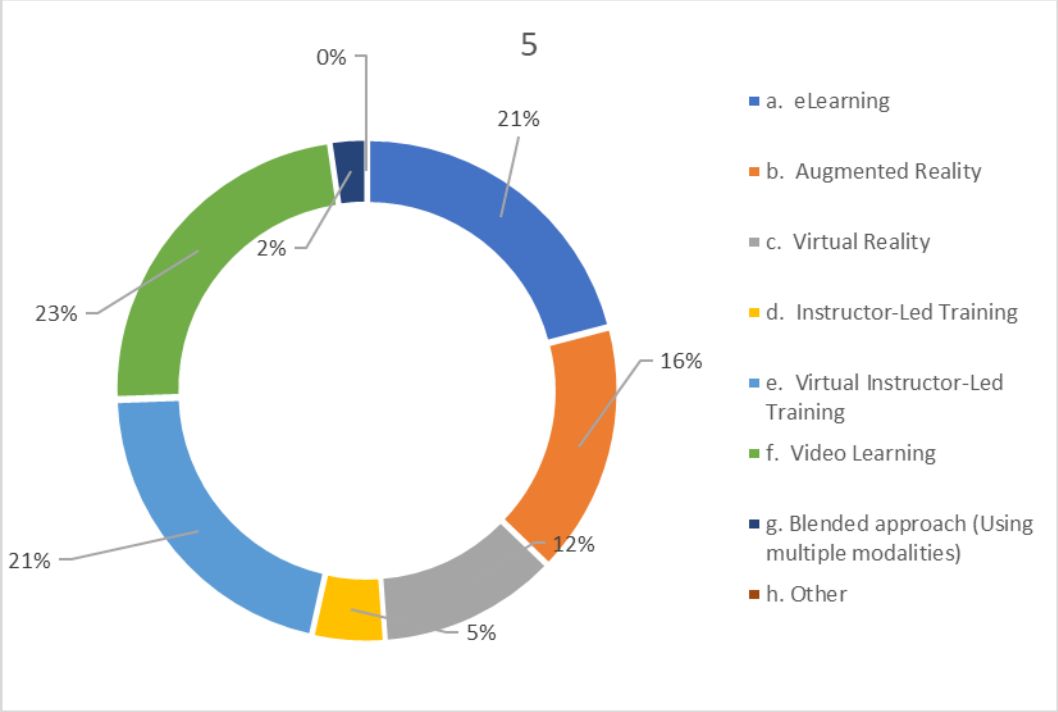


Figure 22: Rank 5 training modalities all respondents

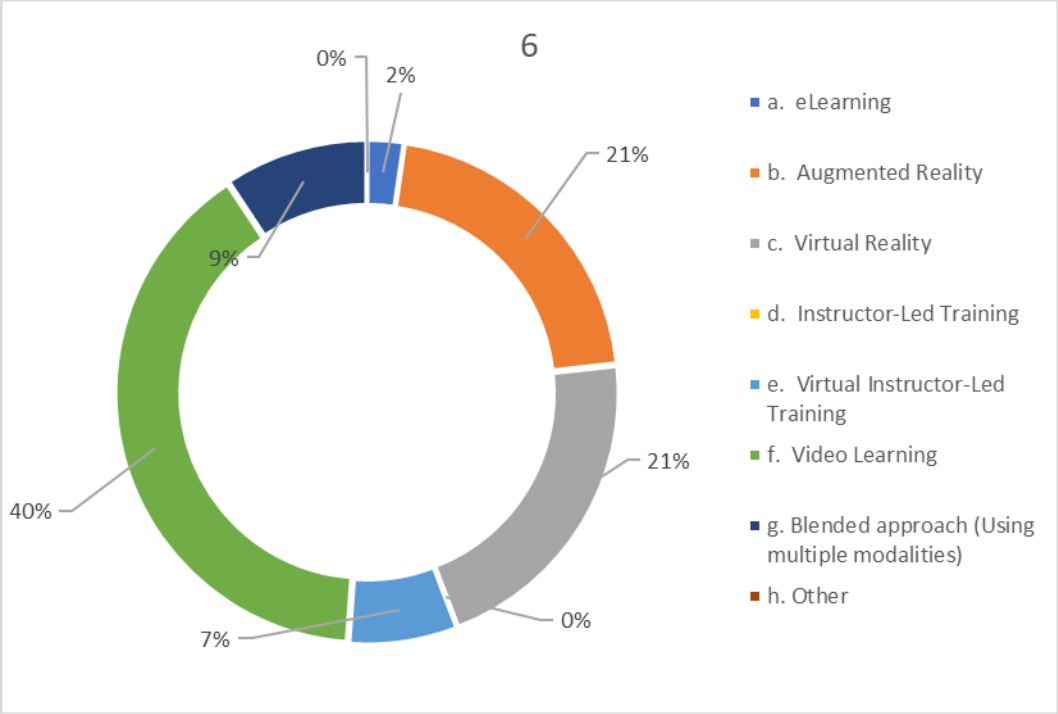


Figure 23: Rank 6 training modalities all respondents

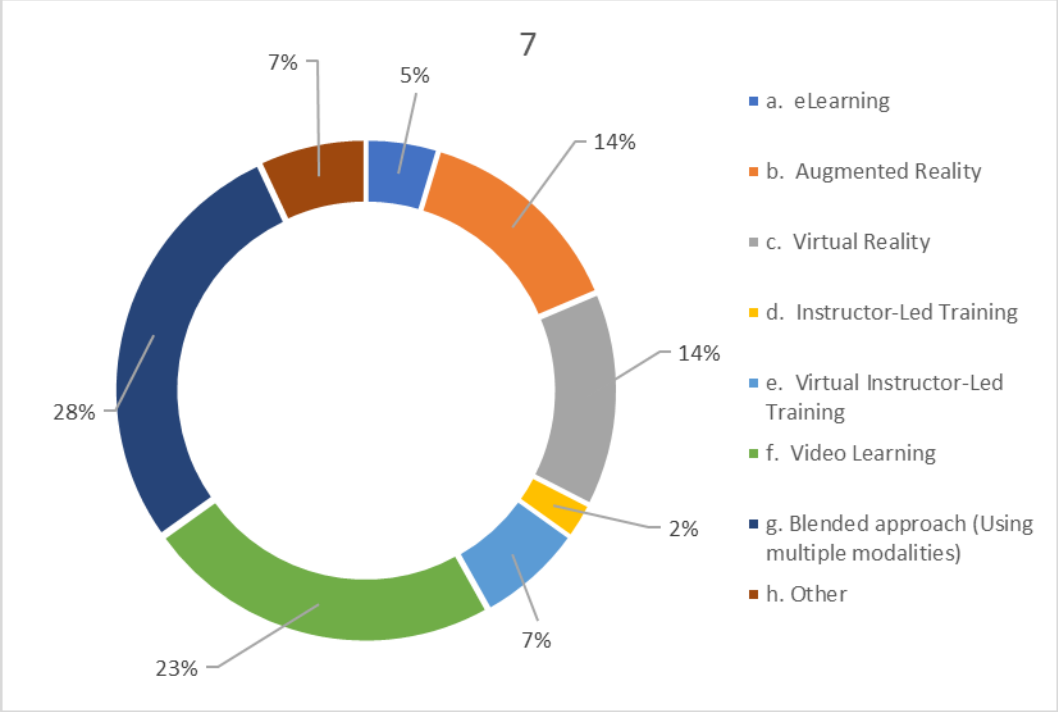


Figure 24: Rank 7 Training Modalities all respondents

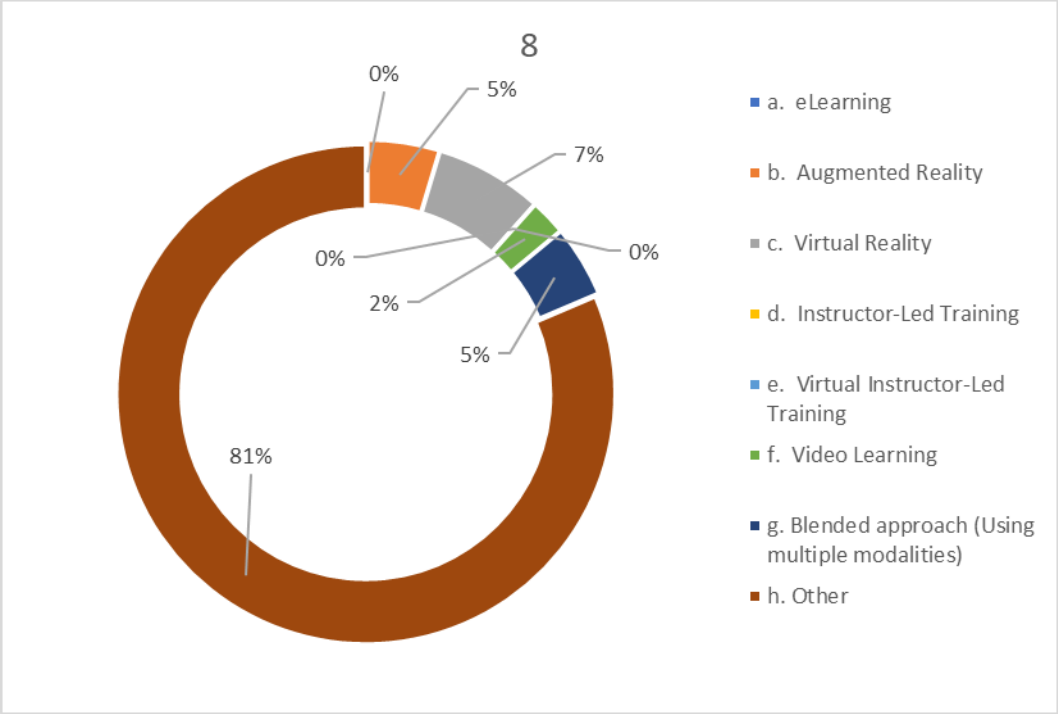


Figure 25: Rank 8 training modalities all respondents

Themed data Q4, Q5, Q6 section.

Q4 - Please share your motivation for participating in today's listening session.
Being new to public health and my role, I am always looking for ways to grow and develop this skillset.
Curiosity, want to help
I wanted to be a part of the ongoing move to further education on HAI/AR
Very interested in workforce development and share my feedback and experience to help others.
To hear from others and learn about their experiences. Also, wanted to share mine.
Would like to see the field of IP continue to develop and to recruit IPs
Training of our own regional/local IPC teams.
Learning new techniques, hearing about others' experiences.
I believe the more information organizations such as NACCHO have on our experience and struggles the more opportunities and resources will be available to help us and upcoming generations move forward.
Share experiences and learn from others' experiences. We can all learn from each other.
Wanting to provide insight and information regarding my profession.
Used to work in soft skills training development so this is an interest area and passion for me

the email was inviting and encouraging that our opinion/feedback mattered
To share my experience and hear from others in a similar role.
Try to make future job trainings better for future employees.
I wanted to share my experience working with HAI epidemiologists, infection control/prevention officers, and healthcare facilities in the genomic space.
When I connect with others I find that we are experiencing the same types of challenges and it is helpful to see how others are addressing those challenges
An opportunity to share experiences with the hope that others will find the information useful
Passionate about IPC :)
I started in PH in 2020, and communication and training felt nonexistent. I felt like it was trial by fire. Now, I am the director of the health department and I want to make sure everyone on my team has the tools they need to be successful.
The pandemic shifted the role of my program as public health. I've realized the importance of working together as a network.
Other perspectives
Want to make HAI and public health better!
I believe it's a very important topic that impacts health and lives every day. I'm happy that I was able to join the session!
Help identify and mitigate gaps in public health training
This is a really important topic that does not receive enough attention in my state at the local level. We are also grappling with how to best build up the skills and expertise of our team to best address HAI, while coordinating with state partners and HHS. I think this is a timely and very important topic.
Improving the skills and resources for the infection prevention profession.
to offer advice on our profession
I was asked to participate by someone I respect and appreciate her work in the field of public health
Gain better understanding of challenges that other facilities face... pre-, post- pandemic
Contribute to the improvement of our profession.
To provide feedback from a local perspective
Hear the experiences of others and learn any best practices
to share experience and help inform future activity
Keeping myself updated on latest issues, concerns, and satisfactory responses in other institutions

To offer reflections that inform improvements for infection prevention and public health capacity
To better serve my community

Q5 was further themed and contained in the

Combined Training Modalities by Count	1	2	3	4	5	6	7	8	Total
a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)	7	6	9	9	9	1	2	0	43
b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accessed through a tablet, phone, or headset)	2	10	3	4	7	9	6	2	43
c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)	4	3	9	4	5	9	6	3	43
d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)	11	10	9	10	2	0	1	0	43
e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)	0	10	8	10	9	3	3	0	43
f. Video Learning (Delivers training content through video modules.)	0	1	1	3	10	17	10	1	43
g. Blended approach (Using multiple modalities) (Text Box)	16	2	3	3	1	4	12	2	43
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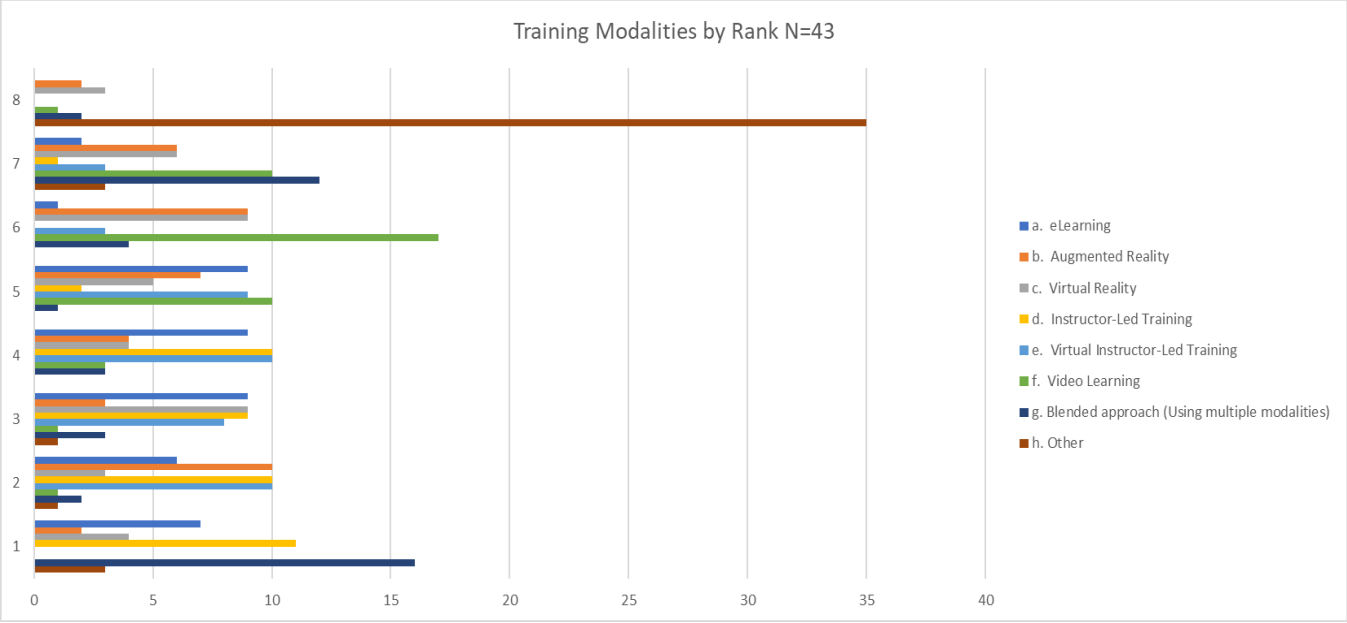

Figure 17: Ranked Training Modalities from All Respondents N=43

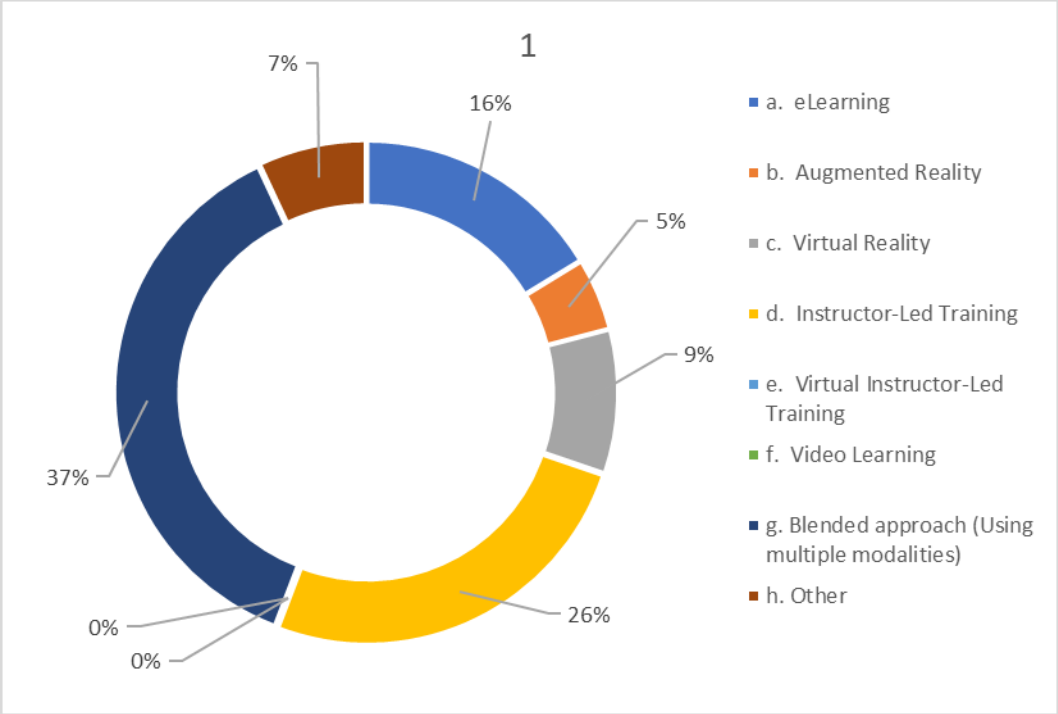

Figure 18: Rank 1 training modalities all respondents

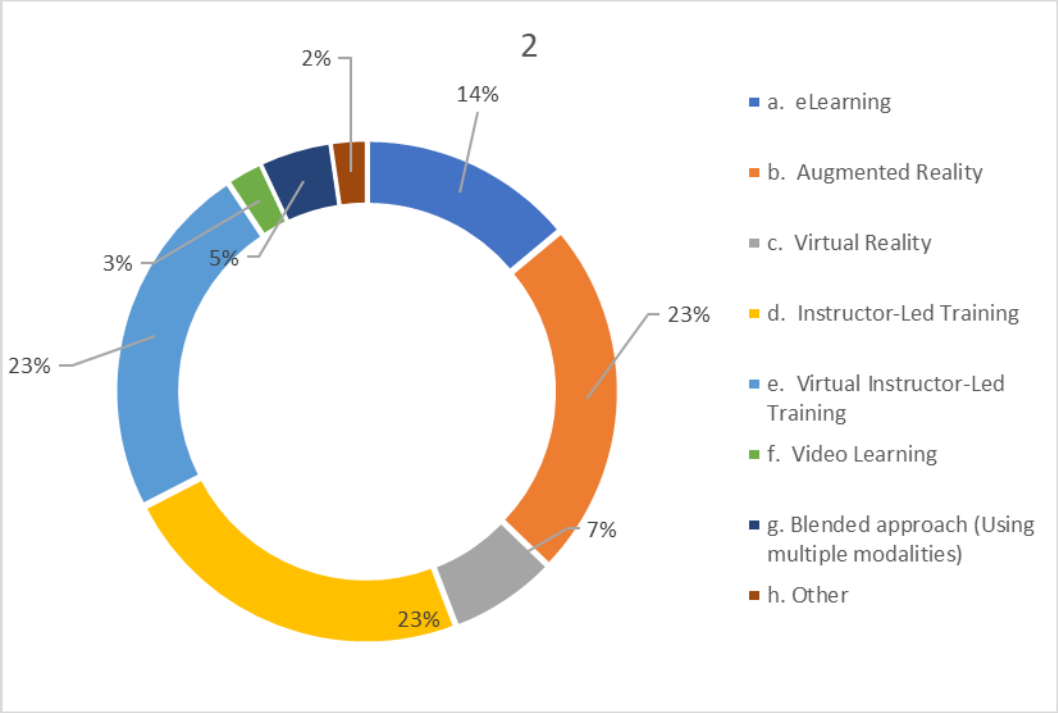

Figure 19: Rank 2 training modalities all respondents

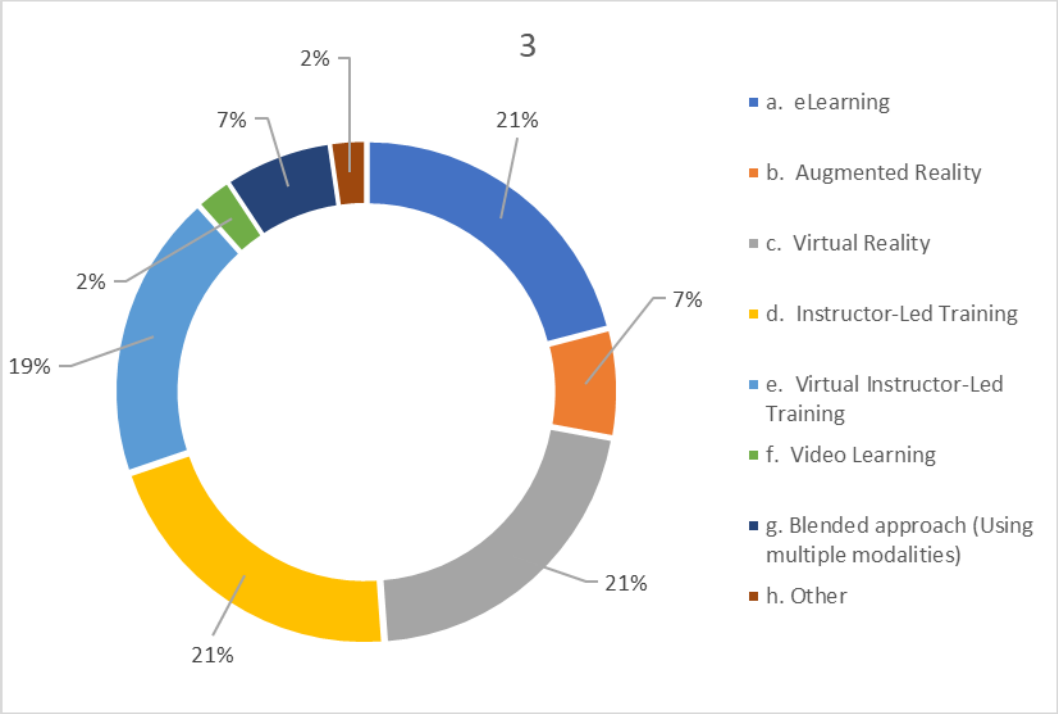

Figure 20: Rank 3 training modalities all respondents

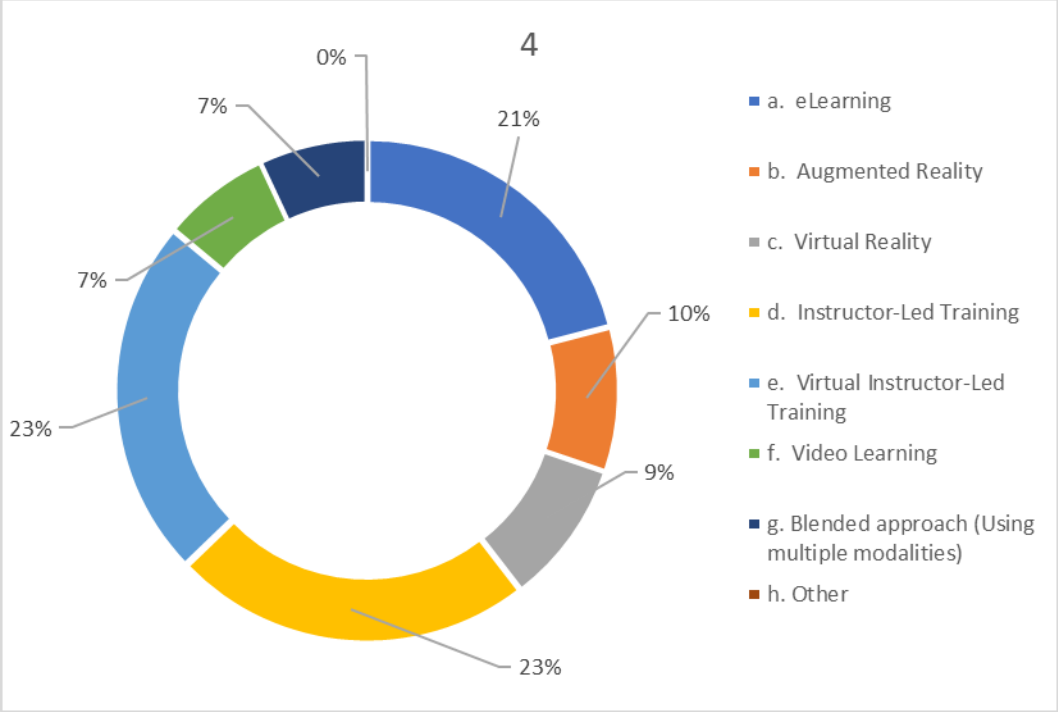

Figure 21: Rank 4 training modalities all respondents

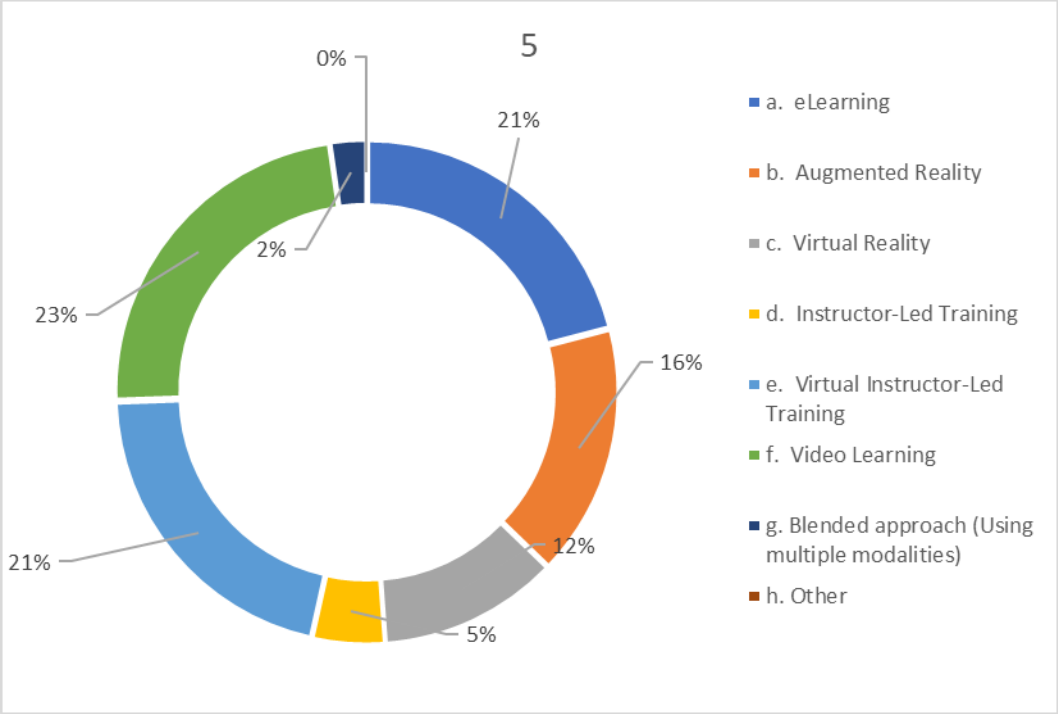

Figure 22: Rank 5 training modalities all respondents

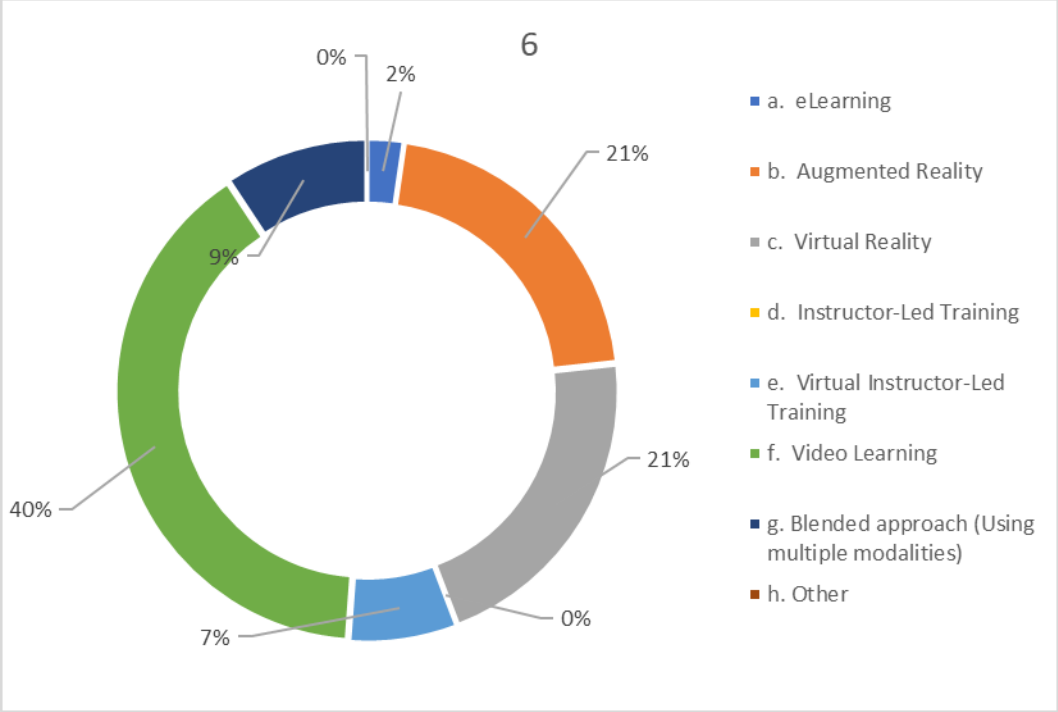

Figure 23: Rank 6 training modalities all respondents

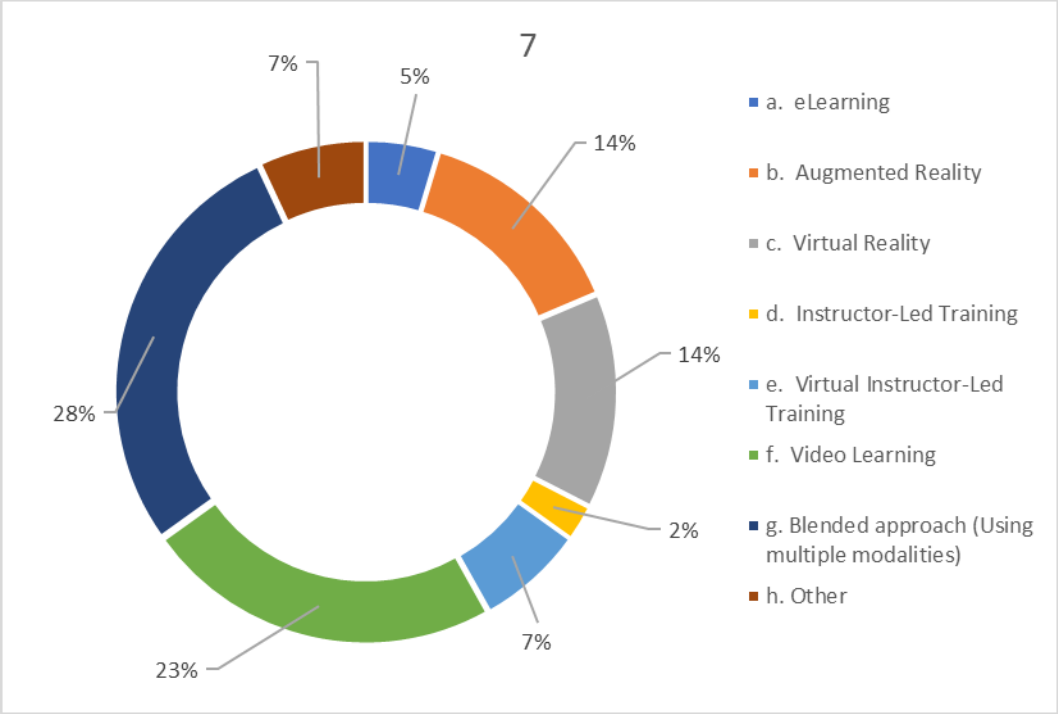

Figure 24: Rank 7 Training Modalities all respondents

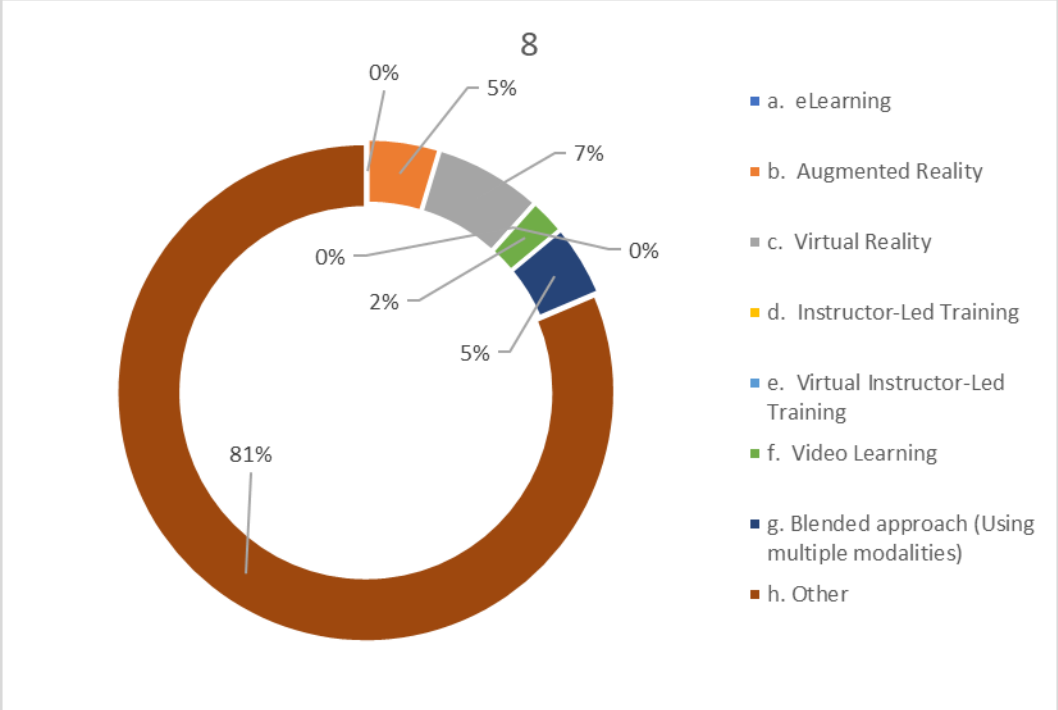

Figure 25: Rank 8 training modalities all respondents

Themed data Q4, Q5, Q6 section.

Q5 - Thinking about essential skills, sometimes referred to as “soft skills” or those skills most necessary for you to complete more technical and applied skills, what do you think are the essential skills needed for working in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?
Base understanding of the topics listed above, knowing how to adapt the knowledge into different settings (bag of tools you have gathered and developed in professional experiences), being able to think outside the box as situations, locations, and resources vary with every experience, and not being afraid to ask for help.
Communication Relationship building Emotional intelligence Critical thinking
Communication
Mentioned many in the chat, but the big one that stands out is relationship building.
2006 provided an excellent list in the chat, that I agree with -- things like team player. I've been in IP/HAI since 2005 and have found that genuine passion/care for patient and healthcare worker safety is essential. Folks also need to be driven and value partnerships.
Leadership, communication, making a business case, emotional intelligence.
Building rapport
Communication, leadership, innovation, diplomacy, integrity, timeliness, etc.
Essential skills to me is having the epi foundation and ability to reach out and seek resources as needed. Be willing to learn from others and be a team player, have good communication skills and be a people person.
Empathy, effective communication, self-motivation, adaptability
Ability to listen, understand and respond in a manner that effects change.
Communication, persuasion, listening, assessing readiness to learn.
communication and emotional intelligence (reading others and regulating self); as well as critical thinking and problem solving. And that means less that you can come up with all solutions yourself but that you know how to approach, understand, and identify a problem and then leverage the collective wisdom of your team and partners to come up with solutions
time management, communication skills
Ability to research and think for yourself. Making decisions based on CDC recommendations.
Flexibility, knowing local resources or where to find resources, being willing to ask questions/seek help, organization
It is important to be able to utilize excel and google, as well as understand surveillance systems

Being able to share information on observed deficiencies without being judgmental. Emphasizing the importance of fostering a relationship that's viewed as a partnership, and not adversarial.
Compassion, willingness to listen, continuous learning, adaptability, critical thinking.
Critical thinking, communication, being approachable.
Communication, networking, public speaking, competent writer
Flexibility
Communication, relationships, trust, bias, quality improvement, listening, health equity.
the ability to take the initiative and be proactive is essential. I can teach IPC, but I cannot teach the passion behind it. Emotional intelligence is very important and the ability to "not be the smartest person in the room" is vital.
Ability to build trust and relationships; willingness to learn on the job; adaptability and flexibility
#1 - You need the knowledge base and trained/experienced staff. #2 - You need the people skills. You need to be able to assess a situation and where/how you can best support knowing that “one glove does not fit all.” You need strong communication and relational skills and need to be able to build relationships and partnerships. Ideally, you also take your learnings and use them to advocate for improvements in your organization and in the larger structure.
Listening, problem solving, persuading, leading, negotiating
Depends on the job role -- Manger or front-line field investigator? Those are different skill sets. Ability to think, ability to say no nicely and professionally, ability to write, ability to make decisions, ability to plan ahead
collaboration/networking/relationship building emotional intelligence listening to understand understanding the 'why'
The ability to engage your audience
Active listening
obtaining CIC, experience with disease investigations, utilization of resources, Ability to conduct literature reviews, product assessments, ability to observe practices to ensure patient safety, etc.
building trust/rapport with stakeholders
Ability to connect all disciplines of healthcare and environmental services in a One Health approach.
Communication, time management, how to deal with difficult people

Q6 was further themed and contained in the

Combined Training Modalities by Count	1	2	3	4	5	6	7	8	Total
a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)	7	6	9	9	9	1	2	0	43
b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accessed through a tablet, phone, or headset)	2	10	3	4	7	9	6	2	43
c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)	4	3	9	4	5	9	6	3	43
d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)	11	10	9	10	2	0	1	0	43
e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)	0	10	8	10	9	3	3	0	43
f. Video Learning (Delivers training content through video modules.)	0	1	1	3	10	17	10	1	43
g. Blended approach (Using multiple modalities) (Text Box)	16	2	3	3	1	4	12	2	43
h. Other (Text Box)	3	1	1	0	0	0	3	35	43

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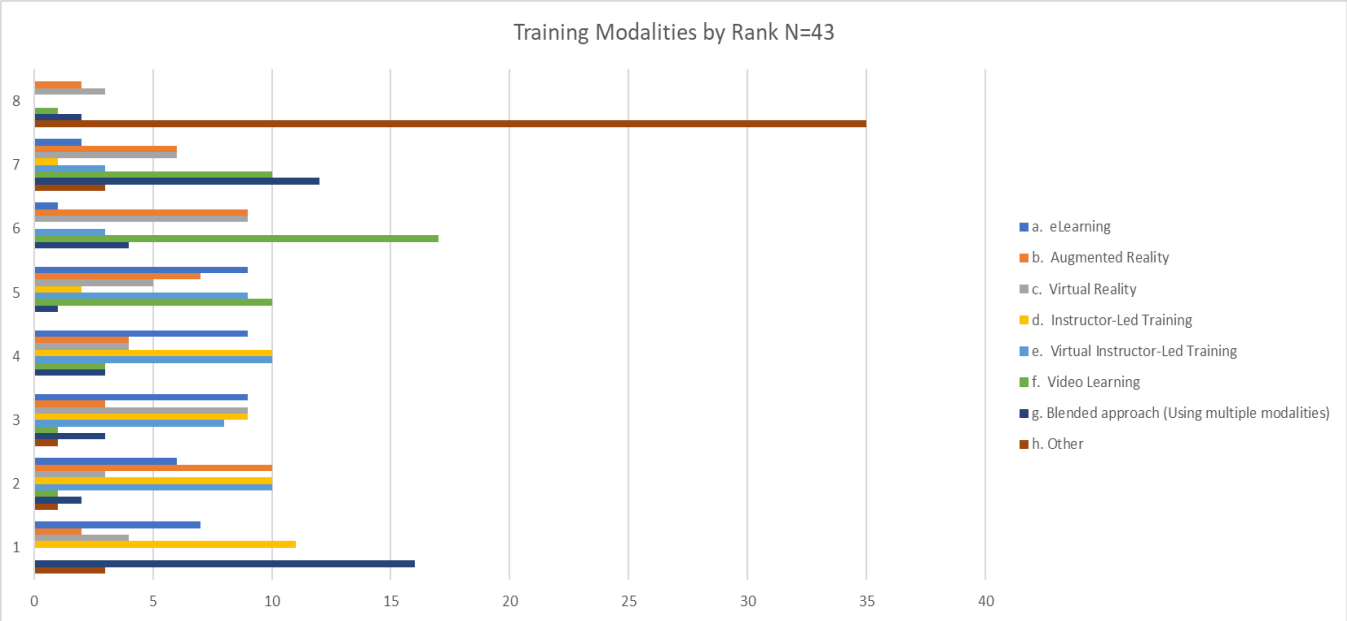

Figure 17: Ranked Training Modalities from All Respondents N=43

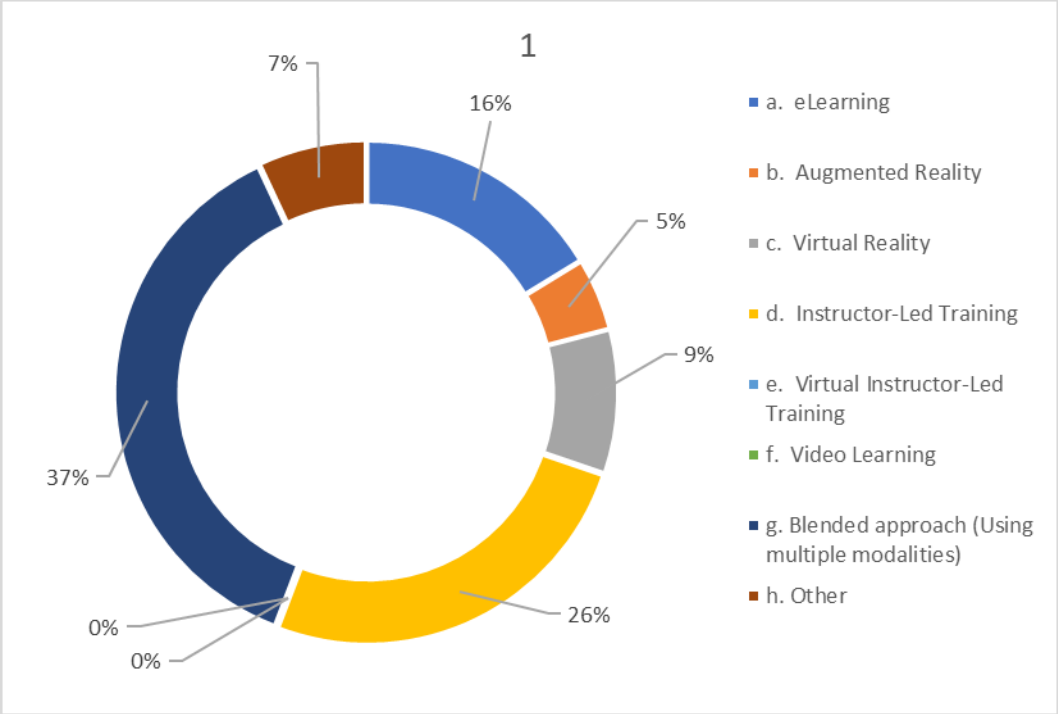

Figure 18: Rank 1 training modalities all respondents

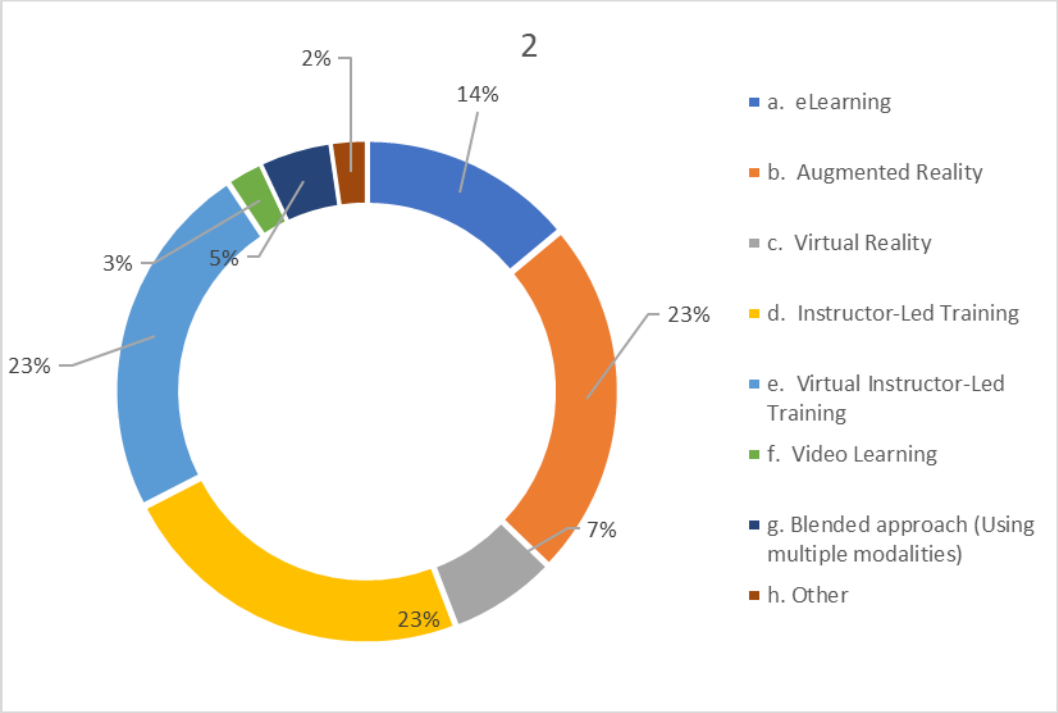

Figure 19: Rank 2 training modalities all respondents

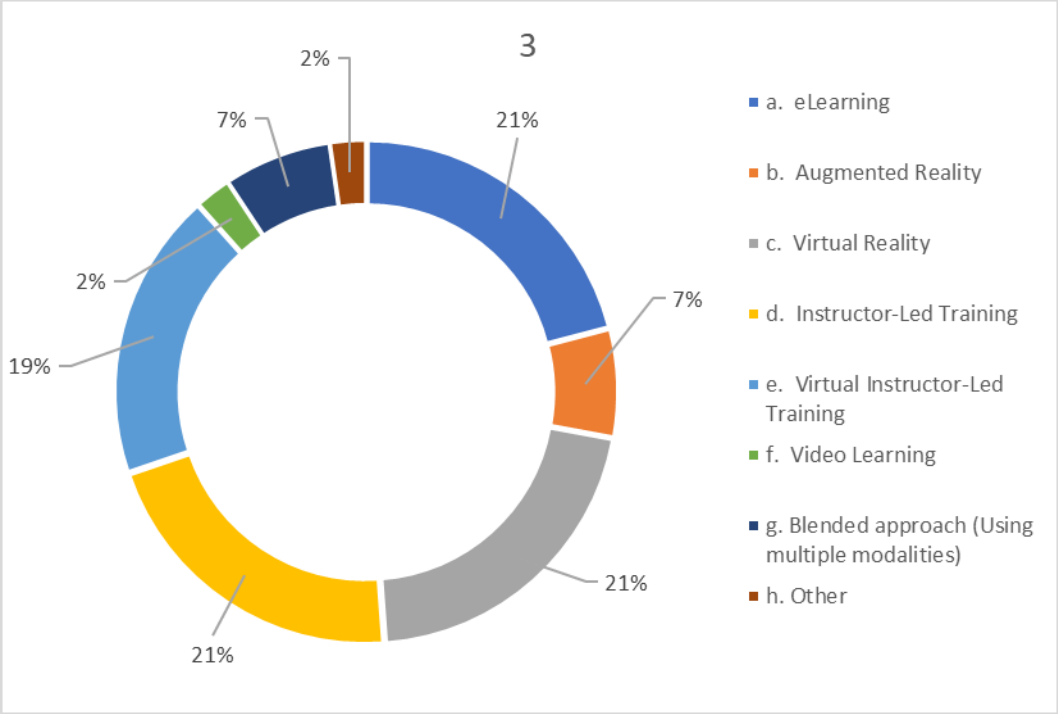

Figure 20: Rank 3 training modalities all respondents

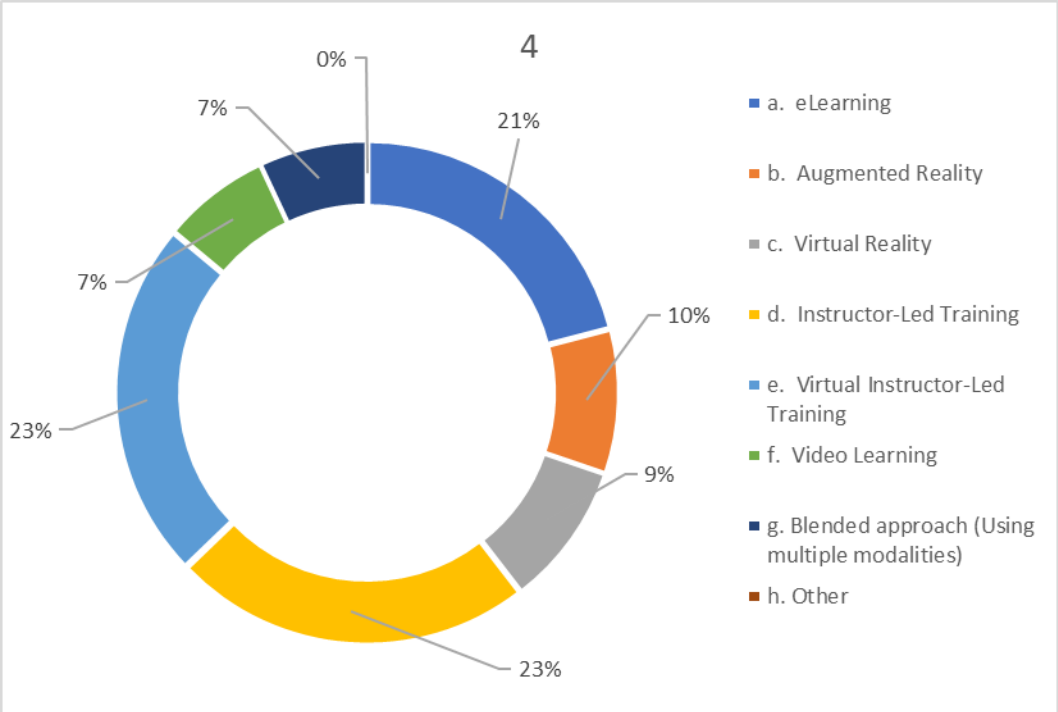

Figure 21: Rank 4 training modalities all respondents

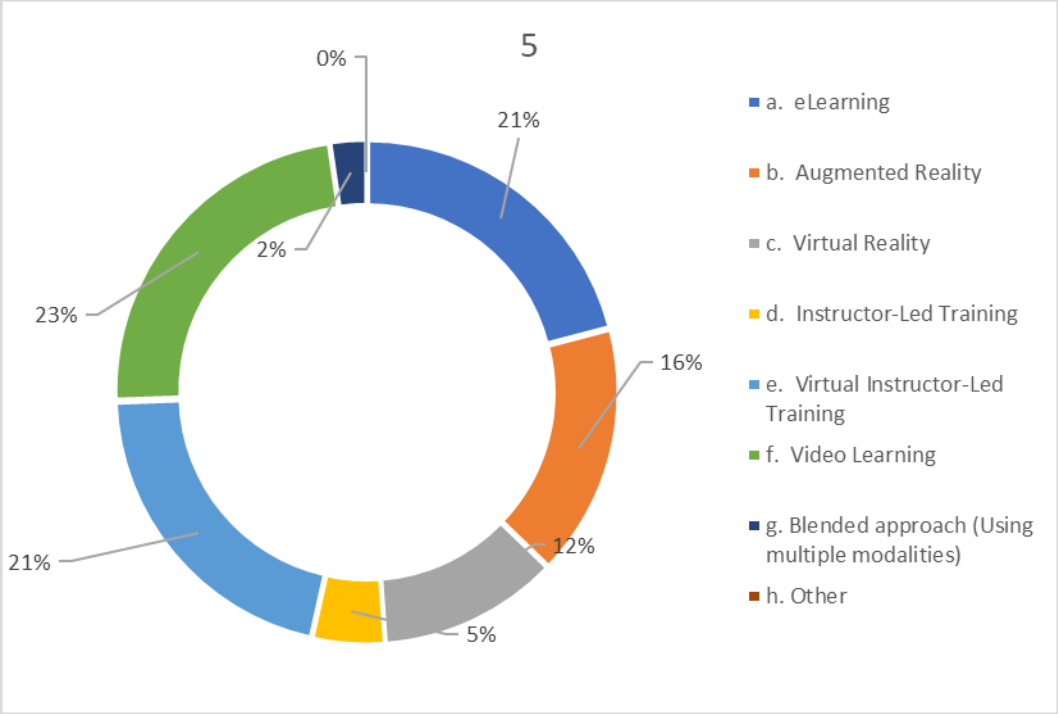

Figure 22: Rank 5 training modalities all respondents

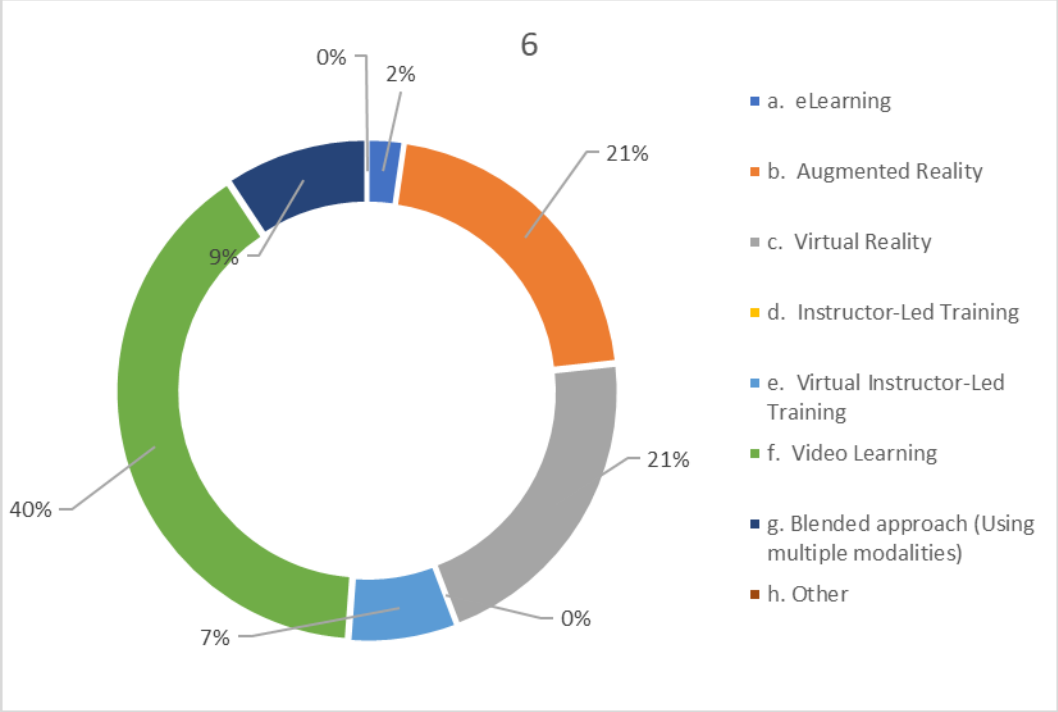

Figure 23: Rank 6 training modalities all respondents

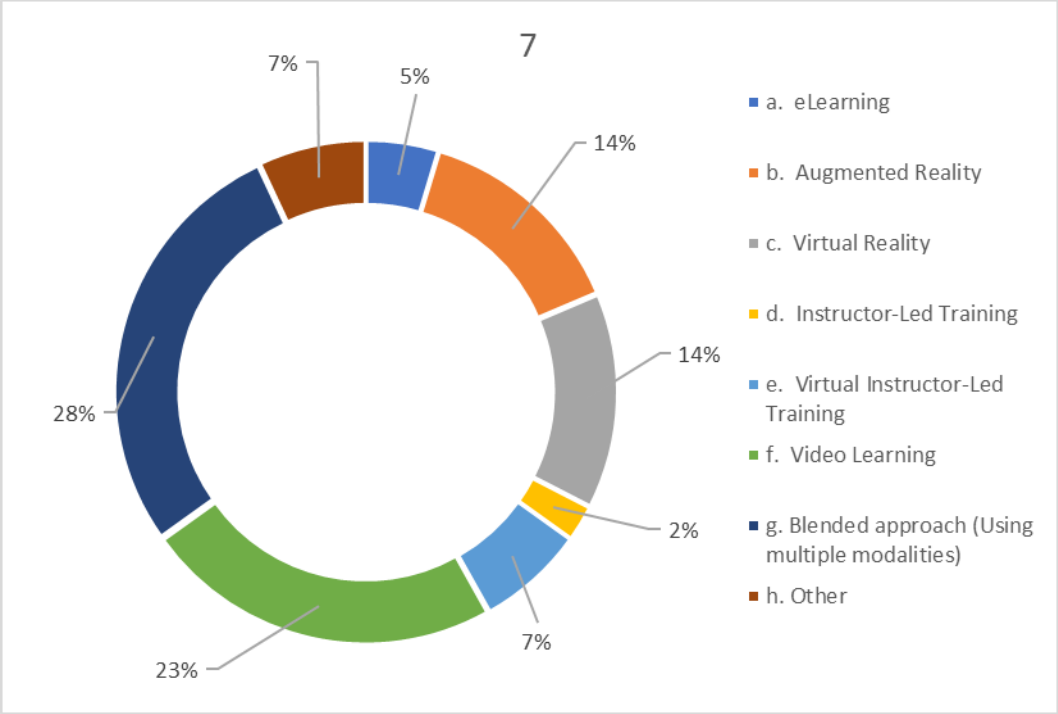

Figure 24: Rank 7 Training Modalities all respondents

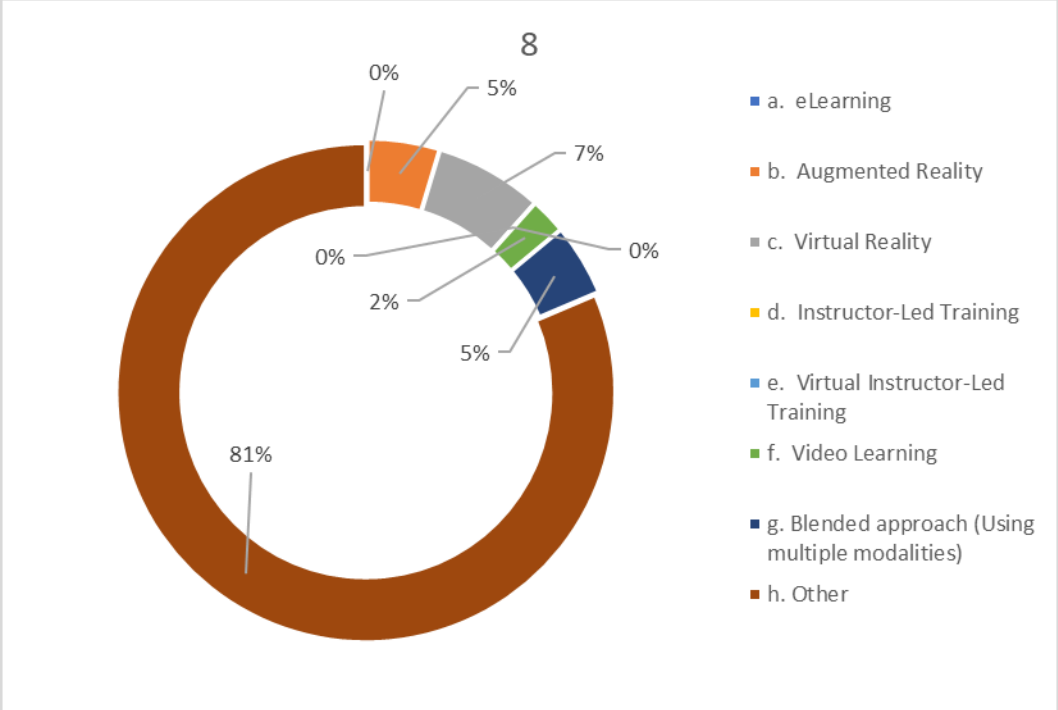

Figure 25: Rank 8 training modalities all respondents

Themed data Q4, Q5, Q6 section.

Q6 - Please list any specific trainings, coursework, or training topics you think are most useful for your work in: Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR). (Note: Please use website links, names of documents, etc. Put NA if training or resources are not used for the specified area).
I am looking to become certified in IPC which I think will help increase my base knowledge and connect some of the experiences I have had to grow my understanding of the topics. The more I know, the more I can share with others on these topics.
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How to recognize when an HAI OB response is needed, when does normal epi work cross over into IP response, how to respond to IC breaches when there are no cases, how to handle call for cases associated with extrinsic contamination of medical products and devices, etc.
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APIC trainings, CDC HAI workshops, CSTE workshops
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APIC Trainings CDC COCA Calls CDC HAI Calls
Strive IP training and APIC training modules
N/A
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Any that I can access in off hours, lol. I look for trainings that align with APIC's professional model and CBIC topics. I also tend to look for things that help support what I may currently be experiencing in my facilities.
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CDC, APIC, FDOH,
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CIC certification, NHSN trainings, trainings and conferences held throughout the year by CSTE, SHEA, and APIC. My MPH underpins my work in IPC/HAI/AR and is necessary for anyone who is trained as an epidemiologist. This is all just a drop in the bucket, opportunities for learning are endless and should be pursued regularly
NA

Q7 - Which training modalities have you used in the areas of Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)? (Select all that apply)	**Count**	**Percent**
a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)	35	24.14
b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accessed through a tablet, phone, or headset)	5	3.45
c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)	3	2.07
d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)	25	17.24
e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)	28	19.31
f. Video Learning (Delivers training content through video modules.)	26	17.93
g. Blended approach (Using multiple modalities) (Text Box) * video + instructor lead * Hybrid of virtual and in person	16	11.03
h. Other (Text Box) *tabletop *Attending APIC chapter meetings, keeping up with the literature in general *Tabletop exercise *Hands on training *Mentorship *tabletop exercises *Reading text and guidance as well as field work	7	4.83
Total	**145**	**100**

Q8. (Ordered selection) Rank the training modalities from the "**most (1)" to "least (8)**" effective in the areas of Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?

Training Modalities	1	2	3	4	5	6	7	8	Total
a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)	5	6	5	8	9	1	2	0	36
b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accessed through a tablet, phone, or headset)	2	8	3	4	6	6	5	2	36
c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)	3	3	8	4	4	7	4	3	36
d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)	8	9	9	8	2	0	0	0	36
e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)	0	7	7	9	8	3	2	0	36
f. Video Learning (Delivers training content through video modules.)	0	0	1	2	7	16	9	1	36
g. Blended approach (Using multiple modalities) (Text Box)	15	2	2	1	0	3	11	2	36
h. Other (Text Box)	3	1	1	0	0	0	3	28	36

Training Modalities	Minimum	Maximum	Mean	Std. Deviation	Variance	Count
a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)	1.00	7.00	3.58	1.66	2.74	36
b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accessed through a tablet, phone, or headset)	1.00	8.00	4.44	2.06	4.25	36
c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)	1.00	8.00	4.53	2.06	4.25	36
d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)	1.00	5.00	2.64	1.21	1.45	36
e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)	2.00	7.00	3.97	1.42	2.03	36
f. Video Learning (Delivers training content through video modules.)	3.00	8.00	5.92	1.01	1.02	36
g. Blended approach (Using multiple modalities) (Text Box)	1.00	8.00	3.89	2.83	7.99	36
h. Other (Text Box)	1.00	8.00	7.03	2.22	4.92	36

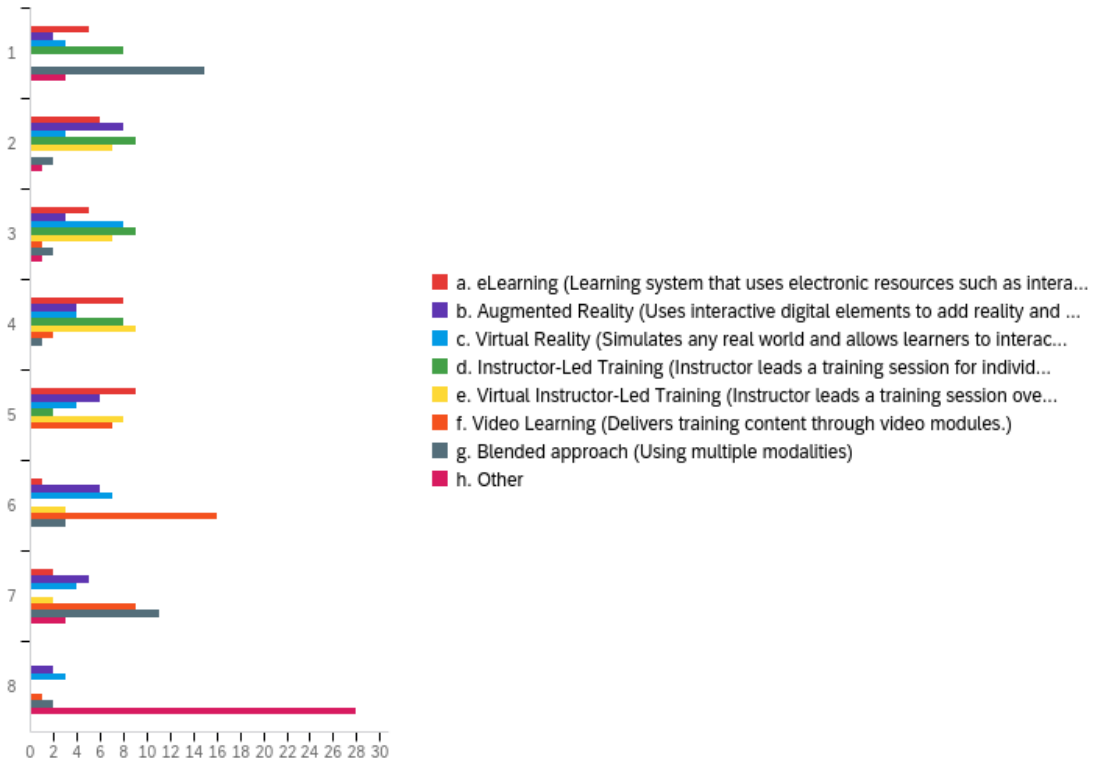

Figure 15: Bar Chart of ranked training modalities Post Listening Session Survey

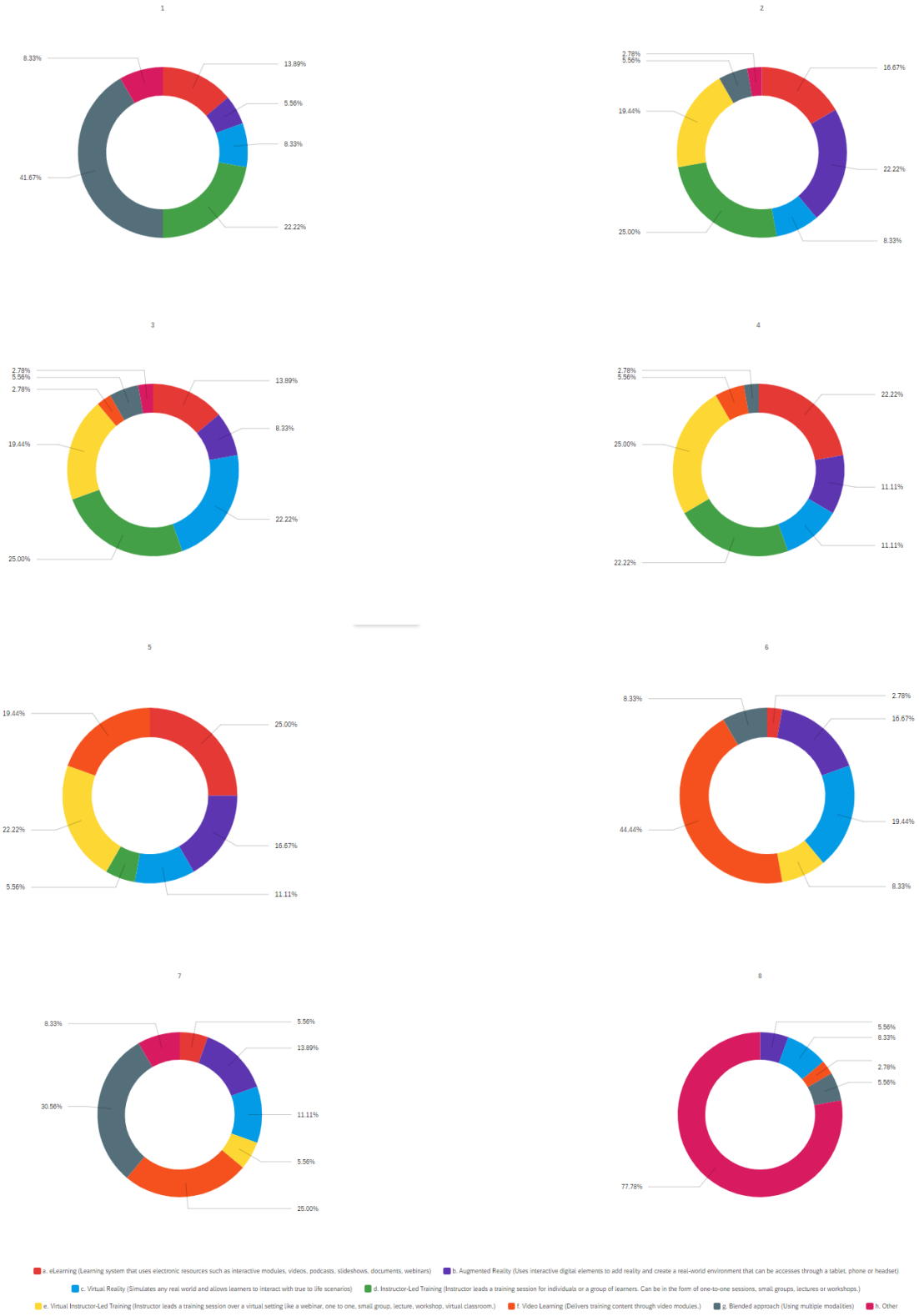

Figure 16: Pie Chart of ranked training modalities Post Listening Survey

Q9 - Do you have any additional thoughts or comments to share?
Not at this time, thank you
Not at this time
None
It is critical that the powers to be understand and respect the value of the Infection Prevention area no matter what role the individuals are in. There needs to be more funding allocated to support the programs and positions.
Thank you for the opportunity of sharing my experience with you.
None
none
No thank you
None
I would have preferred to have the questions shared before the session. I may have misunderstood the objectives and thought this was going to be more about how we work with agencies on HAI, IP, AMR topics.
Infection prevention, HAI, and AR cover broad-ranging areas, so it's very difficult to narrow down specific challenges and effective trainings related to each one. Areas of infection prevention and HAI dealing directly with patient care are generally far less relevant at the local health department level, such as CAUTIs and SSIs, but which doesn't make them less important.
Thank you
I do believe that the type of education and its effectiveness will depend on the topic of the training and its risk level.
Thank you!
None
no
NA
not at this time
No

Q10 - Select one of the following statements.	Count	Percent
a. I want to be entered for a chance to be randomly selected to receive 1 of 19 APIC Annual Memberships as an incentive for participating in this Listening Session.	24	73%
b. I do not want to be entered for a chance to receive the participation incentive.	9	27%
Total	33	100%

Combined Data from the Recruitment Survey and Post LS Survey

The Recruitment Survey and Post Listening Survey contained shared questions. Survey logic allowed respondents who elected not to participate in a listening session to complete additional questions. Those additional questions were shared in the Post Listening Survey. The responses are combined in this section with the grey highlighted representing those from the recruitment survey responses.

Q5 - Thinking about essential skills, sometimes referred to as "soft skills" or those skills most necessary for you to complete more technical and applied skills, what do you think are the essential skills needed for working in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?
Base understanding of the topics listed above, knowing how to adapt the knowledge into different settings (bag of tools you have gathered and developed in professional experiences), being able to think outside the box as situations, locations, and resources vary with every experience, and not being afraid to ask for help.
Communication Relationship building Emotional intelligence Critical thinking
Communication
Mentioned many in the chat, but the big one that stands out is relationship building.
2006 provided an excellent list in the chat, that I agree with -- things like team player. I've been in IP/HAI since 2005 and have found that genuine passion/care for patient and healthcare worker safety is essential. Folks also need to be driven and value partnerships.
Leadership, communication, making a business case, emotional intelligence.
Building rapport
Communication, leadership, innovation, diplomacy, integrity, timeliness, etc.

Essential skills to me are having the epi foundation and ability to reach out and seek resources as needed. Be willing to learn from others and be a team player, have good communication skills and be a people person.
Empathy, effective communication, self-motivation, adaptability
Ability to listen, understand and respond in a manner that effects change.
Communication, persuasion, listening, assessing readiness to learn.
communication and emotional intelligence (reading others and regulating self); as well as critical thinking and problem solving. And that means less that you can come up with all solutions yourself but that you know how to approach, understand, and identify a problem and then leverage the collective wisdom of your team and partners to come up with solutions
time management, communication skills
Ability to research and think for yourself. Making decisions based on CDC recommendations.
Flexibility, knowing local resources or where to find resources, being willing to ask questions/seek help, organization
It is important to be able to utilize excel and google, as well as understand surveillance systems
Being able to share information on observed deficiencies without being judgmental. Emphasizing the importance of fostering a relationship that's viewed as a partnership, and not adversarial.
Compassion, willingness to listen, continuous learning, adaptability, critical thinking.
Critical thinking, communication, being approachable.
Communication, networking, public speaking, competent writer
Flexibility
Communication, relationships, trust, bias, quality improvement, listening, health equity.
the ability to take the initiative and be proactive is essential. I can teach IPC, but I cannot teach the passion behind it. Emotional intelligence is very important and the ability to "not be the smartest person in the room" is vital.
Ability to build trust and relationships; willingness to learn on the job; adaptability and flexibility
#1 - You need the knowledge base and trained/experienced staff. #2 - You need the people skills. You need to be able to assess a situation and where/how you can best support knowing that “one glove does not fit all.” You need strong communication and relational skills and need to be able to build relationships and

partnerships. Ideally, you also take your learnings and use them to advocate for improvements in your organization and in the larger structure.
Listening, problem solving, persuading, leading, negotiating
Depends on the job role -- Manger or front-line field investigator? Those are different skill sets. Ability to think, ability to say no nicely and professionally, ability to write, ability to make decisions, ability to plan ahead
collaboration/networking/relationship building emotional intelligence listening to understand understanding the 'why'
The ability to engage your audience
Active listening
obtaining CIC, experience with disease investigations, utilization of resources, Ability to conduct literature reviews, product assessments, ability to observe practices to ensure patient safety, etc.
building trust/rapport with stakeholders
Ability to connect all disciplines of healthcare and environmental services in a One Health approach.
Communication, time management, how to deal with difficult people
knowledge of HAIs and infection prevention, PPE donning and doffing protocol
Public speaking, google/tracking things down on the internet, being organized in thoughts and communications
organization, time management, organizing large/multiple data sets
Relationship and partnership building and maintenance. Resilience/ability to monitor and address burnout in a challenging landscape. Effective communication, including meeting and training facilitation. Magical powers to translate dry and sometimes conflicting guidance documents from regulatory authorities into practical guidance that facilities can actually operationalize with the resources and staffing that they have.
communication, listening skills, flexibility in presentation of materials to best suit person receiving information, resources, knowledge of disease, mitigation
Clinical experience whether this is in a clinical setting or working with clinical settings in a consultative role

Q6 - Please list any specific trainings, coursework, or training topics you think are most useful for your work in: Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR). (Note: Please use website links, names of documents, etc. Put NA if training or resources are not used for the specified area).
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NA
APIC CIC/ CBIC training
The West Region ARLN has done some great trainings on MDRO response.
Discussions with local infectious disease doctors, hospital IPs, and LTCF partners are the most useful in understanding what we're up against and what we might be able to have an impact on. I did not find APIC trainings for CIC certification very helpful.
CDC guidelines - Hawaii state guidelines, DOH meetings re : IPC and HAI . https://www.cdc.gov/hai/pdfs/stateplans/hi.pdf https://hawaiicovid19.com https://www.cms.gov/files/document/covid-toolkit-states-mitigate-covid-19-nursing-homes.pdf https://www.coursera.org/?utm_source=recommendations&utm_medium=email&utm_campaign=19484&sfmc_id=90512066&sfmc_key=0031U00001sTZJoQAO UH Manoa - Covid 19 certification 6 credit course
APIC study materials and courses, state health department trainings, and CDC trainings

Training Modalities

Combined Q7 - Which training modalities have you used in the areas of Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)? (Select all that apply)	Count	Percent
a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)	40	24%
b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accessed through a tablet, phone, or headset)	5	3%
c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)	3	2%
d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)	29	18%
e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)	33	20%
f. Video Learning (Delivers training content through video modules.)	29	18%
g. Blended approach (Using multiple modalities) (Text Box) * video + instructor lead * Hybrid of virtual and in person	18	11%
h. Other (Text Box) *tabletop *Attending APIC chapter meetings, keeping up with the literature in general *Tabletop exercise *Hands on training *Mentorship *tabletop exercises *Reading text and guidance as well as field work	7	4%
Total	**164**	**100**

Table 12: Training Modalities used in IPC, HAI and AR

Combined Training Modalities by Count	1	2	3	4	5	6	7	8	Total
a. eLearning (Learning system that uses electronic resources such as interactive modules, videos, podcasts, slideshows, documents, webinars)	7	6	9	9	9	1	2	0	43
b. Augmented Reality (Uses interactive digital elements to add reality and create a real-world environment that can be accessed through a tablet, phone, or headset)	2	10	3	4	7	9	6	2	43
c. Virtual Reality (Simulates any real world and allows learners to interact with true to life scenarios)	4	3	9	4	5	9	6	3	43
d. Instructor-Led Training (Instructor leads a training session for individuals or a group of learners. Can be in the form of one-to-one sessions, small groups, lectures, or workshops.)	11	10	9	10	2	0	1	0	43
e. Virtual Instructor-Led Training (Instructor leads a training session over a virtual setting like a webinar, one to one, small group, lecture, workshop, virtual classroom.)	0	10	8	10	9	3	3	0	43
f. Video Learning (Delivers training content through video modules.)	0	1	1	3	10	17	10	1	43
g. Blended approach (Using multiple modalities) (Text Box)	16	2	3	3	1	4	12	2	43
h. Other (Text Box)	3	1	1	0	0	0	3	35	43

Table 13: Training modalities ranked by most efficacious in IPC, HAI, & AR

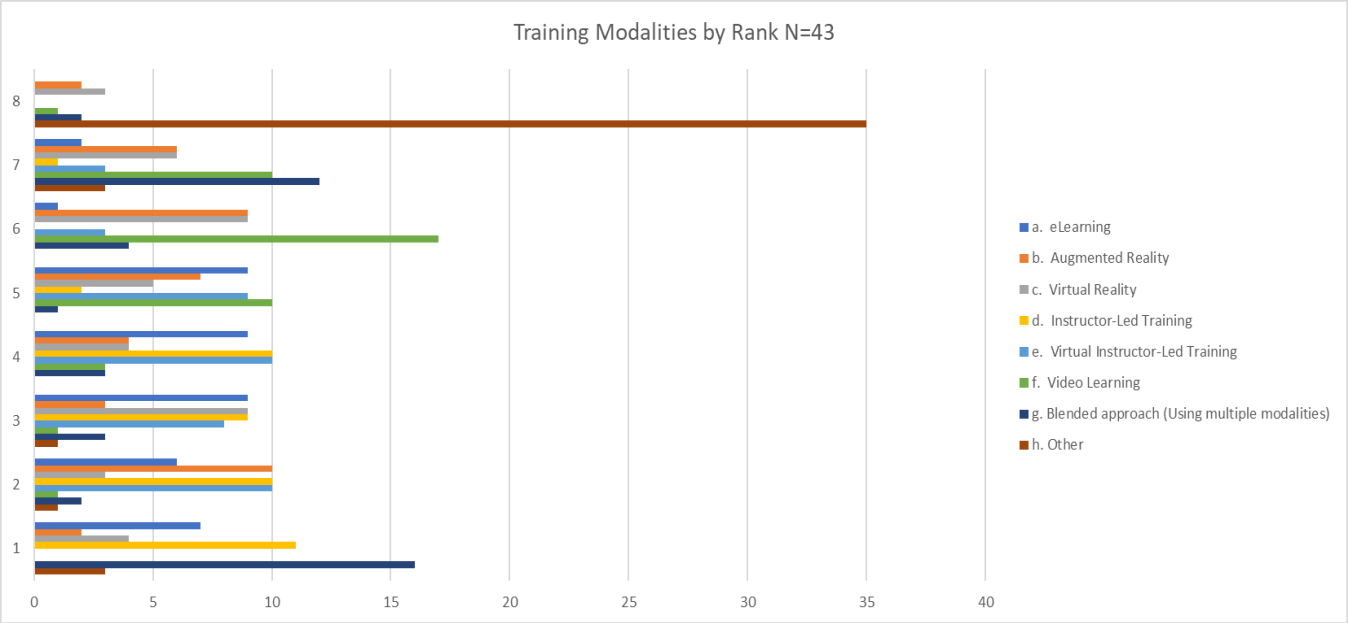


Figure 17: Ranked Training Modalities from All Respondents N=43

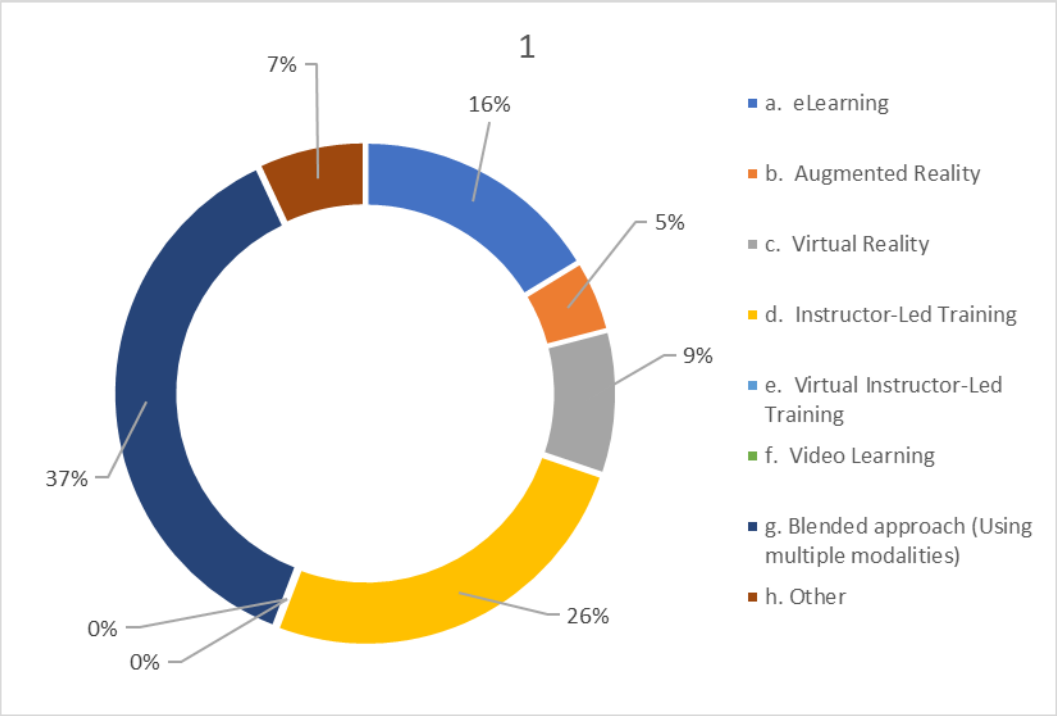


Figure 18: Rank 1 training modalities all respondents

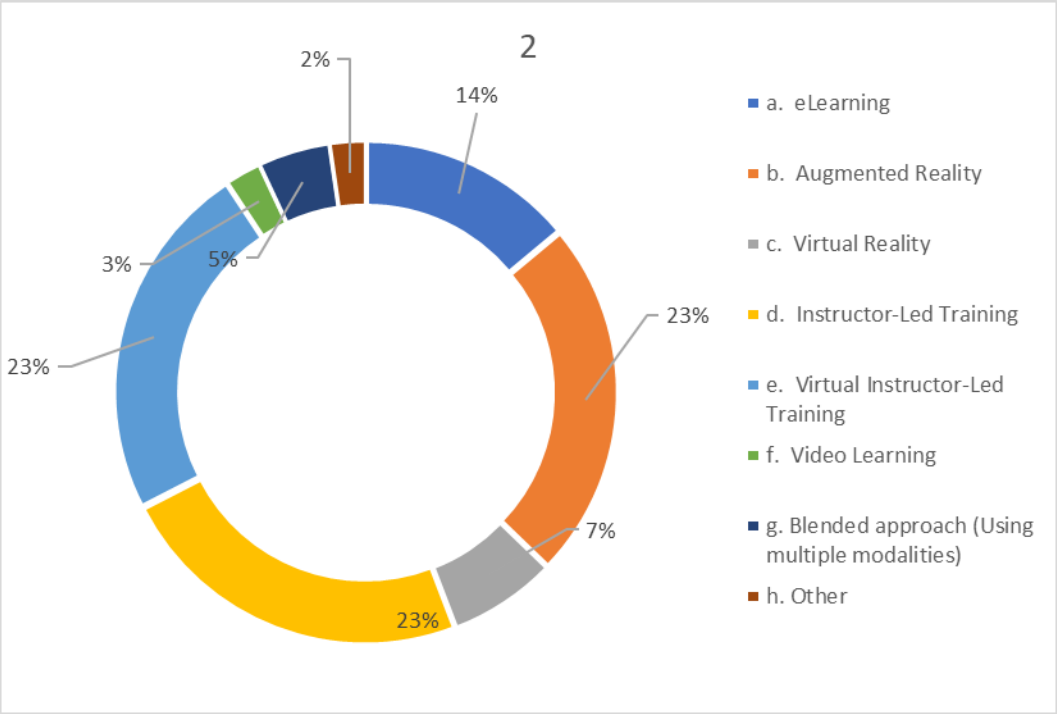


Figure 19: Rank 2 training modalities all respondents

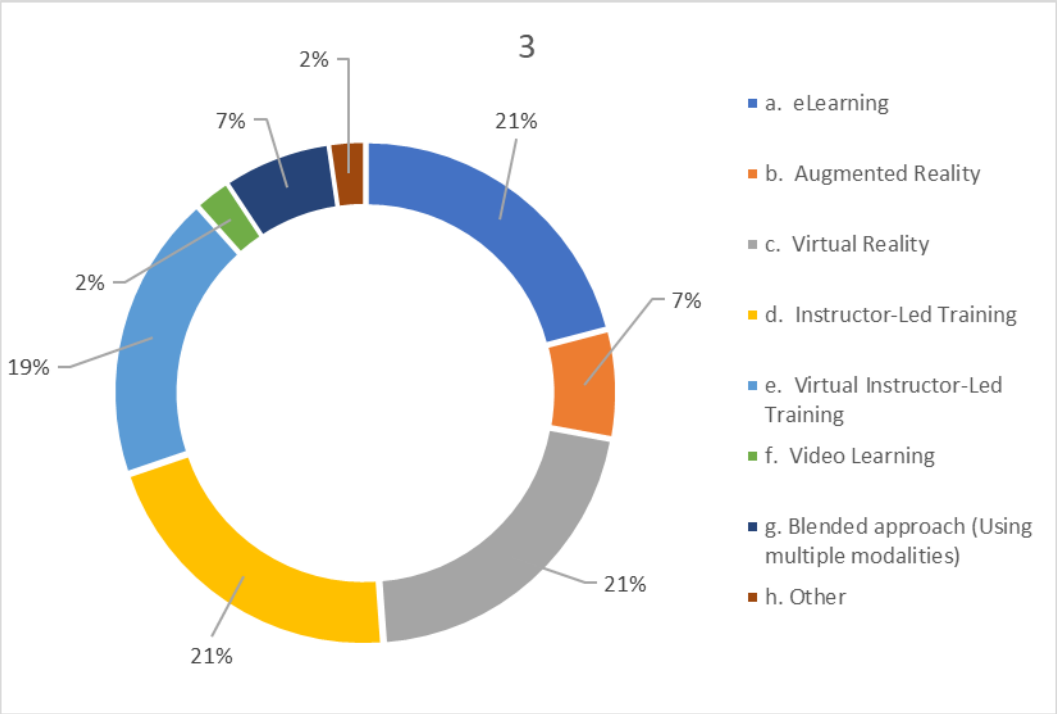


Figure 20: Rank 3 training modalities all respondents

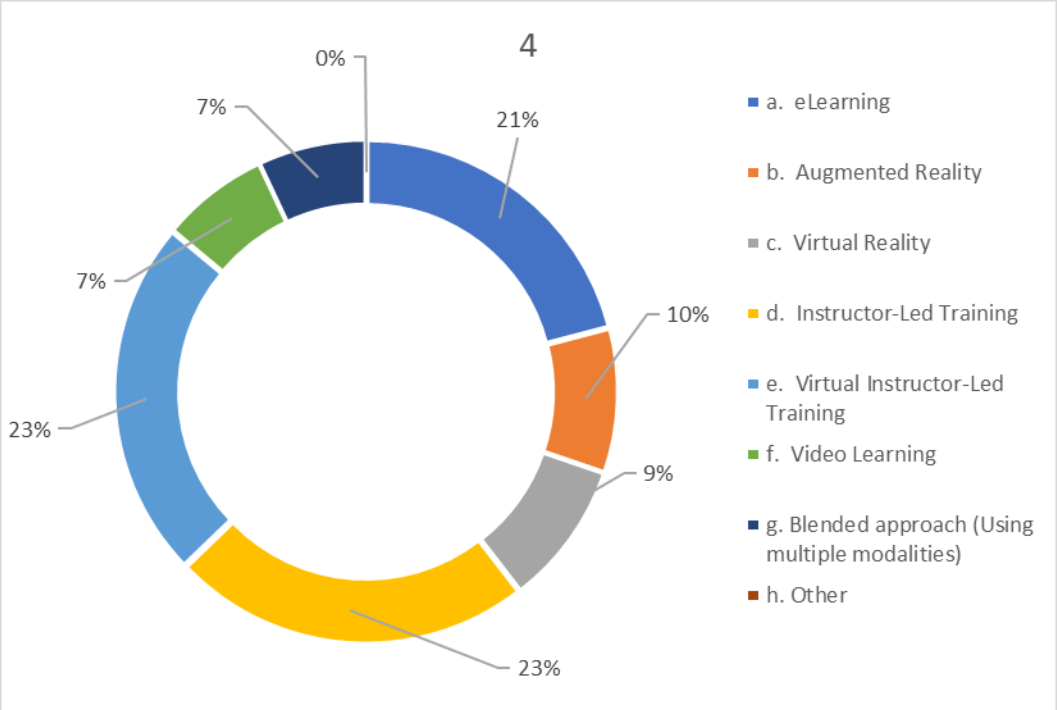


Figure 21: Rank 4 training modalities all respondents

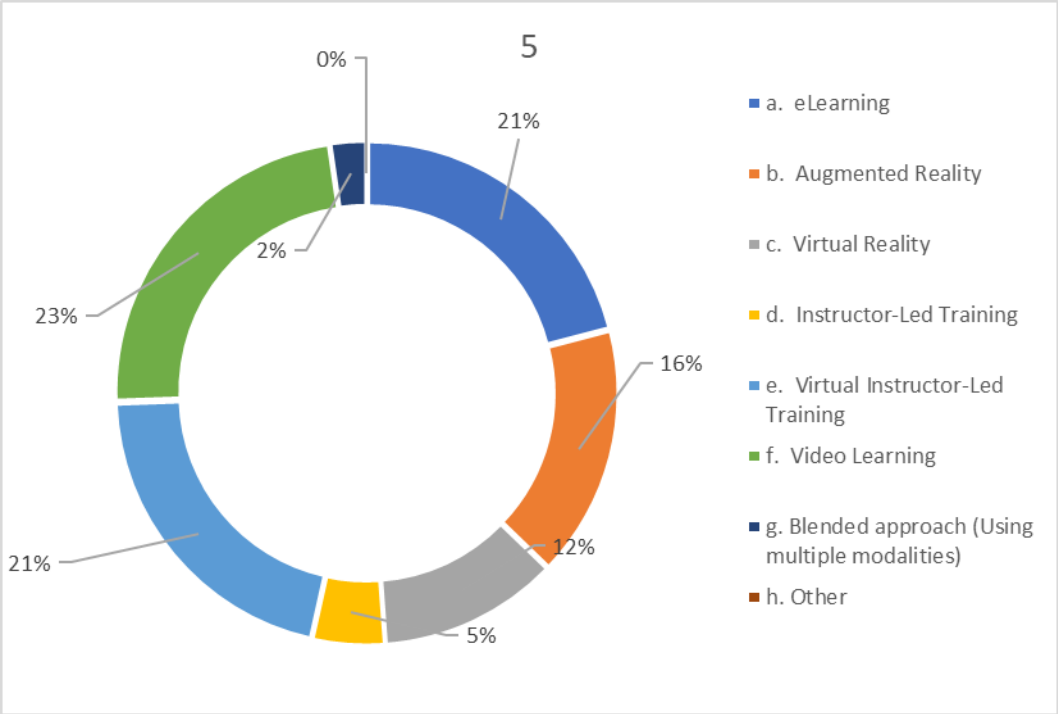


Figure 22: Rank 5 training modalities all respondents

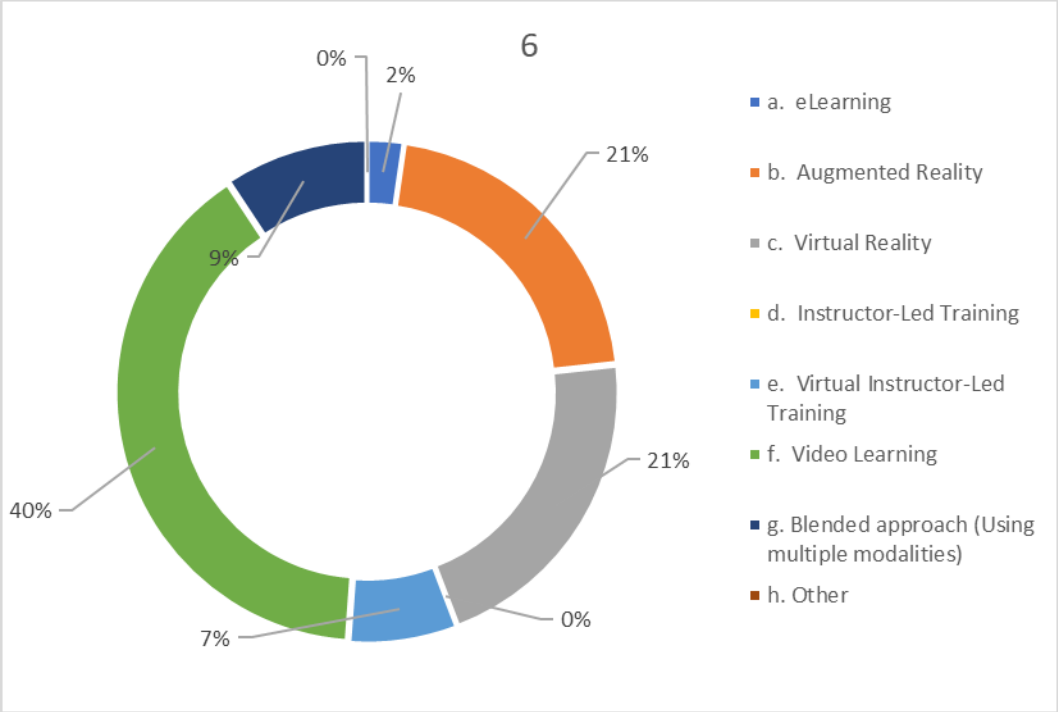


Figure 23: Rank 6 training modalities all respondents

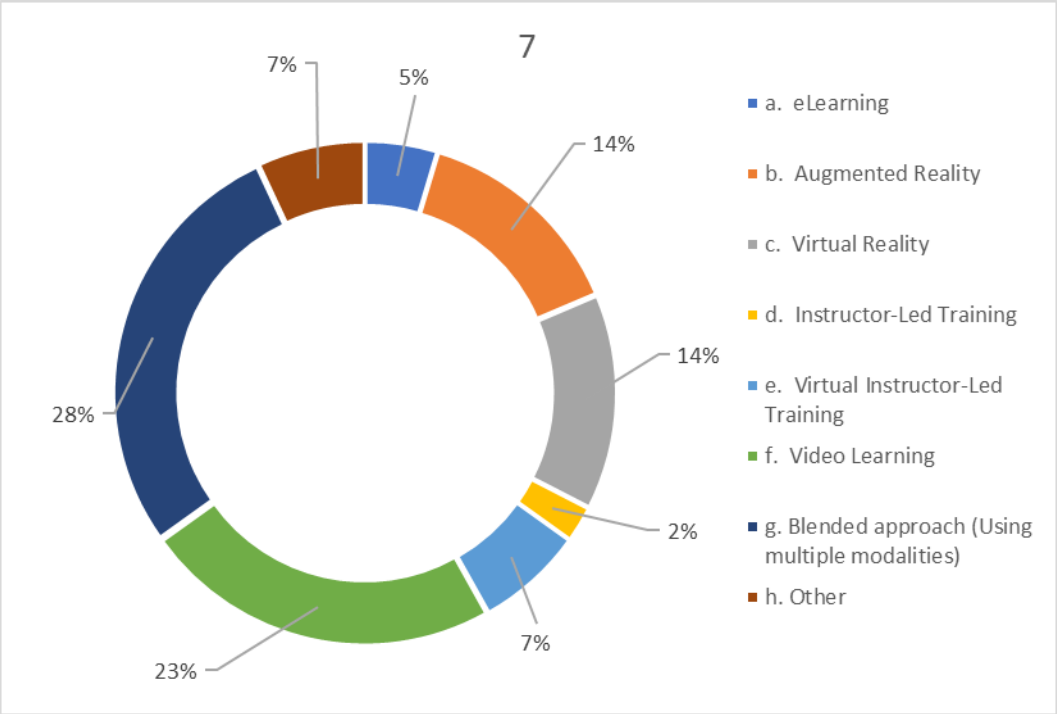


Figure 24: Rank 7 Training Modalities all respondents

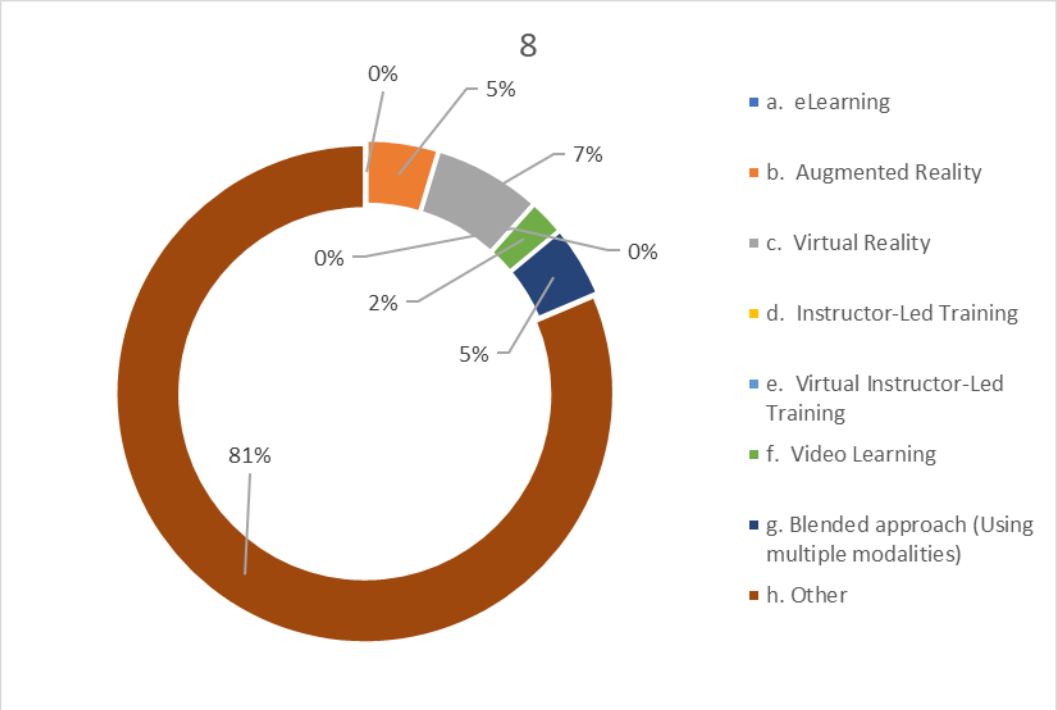


Figure 25: Rank 8 training modalities all respondents

Themed data Q4, Q5, Q6

Q4 Please share your motivation for participating in today's listening session.

- Individual Professional Development
- Better Supporting the Field and the Community
- Improve Training

- Improving Advocacy Efforts from External Organizations
- Curiosity/Recruitment
- Camaraderie-Shared Experience

Individual Professional Development
Being new to public health and my role, I am always looking for ways to grow and develop this skillset.
Wanting to provide insight and information regarding my profession.
Keeping myself updated on latest issues, concerns, and satisfactory responses in other institutions

Better Supporting the Field and the Community
Passionate about IPC :)
Very interested in workforce development and share my feedback and experience to help others.
Used to work in soft skills training development so this is an interest area and passion for me
Would like to see the field of IP continue to develop and to recruit IPs
I started in PH in 2020, and communication and training felt nonexistent. I felt like it was trial by fire. Now, I am the director of the health department and I want to make sure everyone on my team has the tools they need to be successful.
The pandemic shifted the role of my program as public health. I've realized the importance of working together as a network.
Want to make HAI and public health better!
I believe it's a very important topic that impacts health and lives every day. I'm happy that I was able to join the session!
This is a really important topic that does not receive enough attention in my state at the local level. We are also grappling with how to best build up the skills and expertise of our team to best address HAI, while coordinating with state partners and HHS. I think this is a timely and very important topic.
to offer advice on our profession
Contribute to the improvement of our profession.
To provide feedback from a local perspective

to share experience and help inform future activity
To offer reflections that inform improvements for infection prevention and public health capacity
To better serve my community

Improve Training
Try to make future job trainings better for future employees.
I wanted to be a part of the ongoing move to further education on HAI/AR
Help identify and mitigate gaps in public health training
Training of our own regional/local IPC teams.
Improving the skills and resources for the infection prevention profession.

Improving Advocacy Efforts from External Organizations
I believe the more information organizations such as NACCHO have on our experience and struggles the more opportunities and resources will be available to help us and upcoming generations move forward.

Curiosity/Recruitment
Curiosity, want to help
the email was inviting and encouraging that our opinion/feedback mattered

Camaraderie-Shared Experience
To hear from others and learn about their experiences. Also, wanted to share mine.
Learning new techniques, hearing about others' experiences.
Share experiences and learn from others' experiences. We can all learn from each other.
To share my experience and hear from others in a similar role.
I wanted to share my experience working with HAI epidemiologists, infection control/prevention officers, and healthcare facilities in the genomic space.
When I connect with others, I find that we are experiencing the same types of challenges and it is helpful to see how others are addressing those challenges

An opportunity to share experiences with the hope that others will find the information useful
Other perspectives
I was asked to participate by someone I respect and appreciate her work in the field of public health
Gain better understanding of challenges that other facilities face... pre-, post- pandemic
Hear the experiences of others and learn any best practices

Q5 Essential Skills

Thinking about essential skills, sometimes referred to as "soft skills" or those skills most necessary for you to complete more technical and applied skills, what do you think are the essential skills needed for working in Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR)?

Essential (for all) Transferable Skills

Communication
Communication
Communication
Leadership, communication, making a business case, emotional intelligence.
Communication, leadership, innovation, diplomacy, integrity, timeliness, etc.
Essential skills to me is having the epi foundation and ability to reach out and seek resources as needed. Be willing to learn from others and be a team player, have good communication skills and be a people person.
Empathy, effective communication, self-motivation, adaptability
Ability to listen, understand and respond in a manner that effects change.
Communication, persuasion, listening, assessing readiness to learn.

communication and emotional intelligence (reading others and regulating self); as well as critical thinking and problem solving. And that means less that you can come up with all solutions yourself but that you know how to approach, understand, and identify a problem and then leverage the collective wisdom of your team and partners to come up with solutions
time management, communication skills
Flexibility, knowing local resources or where to find resources, being willing to ask questions/seek help, organization
Being able to share information on observed deficiencies without being judgmental. Emphasizing the importance of fostering a relationship that's viewed as a partnership, and not adversarial.
Critical thinking, communication, being approachable.
Communication, networking, public speaking, competent writer
Communication, relationships, trust, bias, quality improvement, listening, health equity.
#1 - You need the knowledge base and trained/experienced staff. #2 - You need the people skills. You need to be able to assess a situation and where/how you can best support knowing that “one glove does not fit all.” You need strong communication and relational skills and need to be able to build relationships and partnerships. Ideally, you also take your learnings and use them to advocate for improvements in your organization and in the larger structure.
Communication, time management, how to deal with difficult people
Public speaking, google/tracking things down on the internet, being organized in thoughts and communications
Relationship and partnership building and maintenance. Resilience/ability to monitor and address burnout in a challenging landscape. Effective communication, including meeting and training facilitation. Magical powers to translate dry and sometimes conflicting guidance documents from regulatory authorities into practical guidance that facilities can actually operationalize with the resources and staffing that they have.
communication, listening skills, flexibility in presentation of materials to best suit person receiving information, resources, knowledge of disease, mitigation

Emotional Intelligence

Emotional intelligence
Leadership, communication, making a business case, emotional intelligence.
Ability to listen, understand and respond in a manner that effects change.
communication and emotional intelligence (reading others and regulating self); as well as critical thinking and problem solving. And that means less that you can come up with all solutions yourself but that you know how to approach, understand, and identify a problem and then leverage the collective wisdom of your team and partners to come up with solutions
Empathy, effective communication, self-motivation, adaptability
communication and emotional intelligence (reading others and regulating self); as well as critical thinking and problem solving. And that means less that you can come up with all solutions yourself but that you know how to approach, understand, and identify a problem and then leverage the collective wisdom of your team and partners to come up with solutions
Critical thinking, communication, being approachable.
Communication, relationships, trust, bias, quality improvement, listening, health equity.
the ability to take the initiative and be proactive is essential. I can teach IPC, but I cannot teach the passion behind it. Emotional intelligence is very important and the ability to "not be the smartest person in the room" is vital.
collaboration/networking/relationship building emotional intelligence listening to understand understanding the 'why'

Listening
Communication, persuasion, listening, assessing readiness to learn.
Compassion, willingness to listen, continuous learning, adaptability, critical thinking.
Active listening
Listening, problem solving, persuading, leading, negotiating

Ability to listen, understand and respond in a manner that effects change.
Communication, relationships, trust, bias, quality improvement, listening, health equity.
collaboration/networking/relationship building emotional intelligence listening to understand understanding the 'why'
communication, listening skills, flexibility in presentation of materials to best suit person receiving information, resources, knowledge of disease, mitigation

Adaptability- Flexibility
Base understanding of the topics listed above, knowing how to adapt the knowledge into different settings (bag of tools you have gathered and developed in professional experiences), being able to think outside the box as situations, locations, and resources vary with every experience, and not being afraid to ask for help.
Empathy, effective communication, self-motivation, adaptability
Flexibility, knowing local resources or where to find resources, being willing to ask questions/seek help, organization
Compassion, willingness to listen, continuous learning, adaptability, critical thinking.
Flexibility
Ability to build trust and relationships; willingness to learn on the job; adaptability and flexibility
communication, listening skills, flexibility in presentation of materials to best suit person receiving information, resources, knowledge of disease, mitigation

Critical Thinking
Critical thinking

communication and emotional intelligence (reading others and regulating self); as well as critical thinking and problem solving. And that means less that you can come up with all solutions yourself but that you know how to approach, understand, and identify a problem and then leverage the collective wisdom of your team and partners to come up with solutions
Compassion, willingness to listen, continuous learning, adaptability, critical thinking.
Critical thinking, communication, being approachable.
Depends on the job role -- Manger or front-line field investigator. Those are different skill sets. Ability to think, ability to say no nicely and professionally, ability to write, ability to make decisions, ability to plan ahead
collaboration/networking/relationship building emotional intelligence listening to understand understanding the 'why'

Personable
Essential skills to me is having the epi foundation and ability to reach out and seek resources as needed. Be willing to learn from others and be a team player, have good communication skills and be a people person.
Empathy, effective communication, self-motivation, adaptability
Critical thinking, communication, being approachable.
#1 - You need the knowledge base and trained/experienced staff. #2 - You need the people skills. You need to be able to assess a situation and where/how you can best support knowing that "one glove does not fit all." You need strong communication and relational skills and need to be able to build relationships and partnerships. Ideally, you also take your learnings and use them to advocate for improvements in your organization and in the larger structure.
Communication, time management, how to deal with difficult people

Persuasion
Leadership, communication, making a business case, emotional intelligence.
Communication, persuasion, listening, assessing readiness to learn.

Listening, problem solving, persuading, leading, negotiating
The ability to engage your audience

Problem Solving
communication and emotional intelligence (reading others and regulating self); as well as critical thinking and problem solving. And that means less that you can come up with all solutions yourself but that you know how to approach, understand, and identify a problem and then leverage the collective wisdom of your team and partners to come up with solutions
Ability to research and think for yourself. Making decisions based on CDC recommendations.
Listening, problem solving, persuading, leading, negotiating

Compassion-Passion
2006 provided an excellent list in the chat, that I agree with -- things like team player. I've been in IP/HAI since 2005 and have found that genuine passion/care for patient and healthcare worker safety is essential. Folks also need to be driven and value partnerships.
Compassion, willingness to listen, continuous learning, adaptability, critical thinking.
the ability to take the initiative and be proactive is essential. I can teach IPC, but I cannot teach the passion behind it. Emotional intelligence is very important and the ability to "not be the smartest person in the room" is vital.

Resource Management
Base understanding of the topics listed above, knowing how to adapt the knowledge into different settings (bag of tools you have gathered and developed in professional experiences), being able to think outside the box as situations, locations, and resources vary with every experience, and not being afraid to ask for help.
Essential skills to me are having the epi foundation and ability to reach out and seek resources as needed. Be willing to learn from others and be a team player, have good communication skills and be a people person.

Flexibility, knowing local resources or where to find resources, being willing to ask questions/seek help, organization

Rapport Building
Building rapport
Communication, relationships, trust, bias, quality improvement, listening, health equity.
building trust/rapport with stakeholders

Time Management
time management, communication skills
Communication, time management, how to deal with difficult people
organization, time management, organizing large/multiple data sets

Decision Making
Ability to research and think for yourself. Making decisions based on CDC recommendations.
Depends on the job role -- Manger or front-line field investigator. Those are different skill sets. Ability to think, ability to say no nicely and professionally, ability to write, ability to make decisions, ability to plan ahead

Competent Writer
Communication, networking, public speaking, competent writer
Depends on the job role -- Manger or front line field investigator? Those are different skill sets. Ability to think, ability to say no nicely and professionally, ability to write, ability to make decisions, ability to plan ahead

As in, improving quality is a goal that is met through strategic thinking and problem solving as well as an openness to learn.

Quality Improvement
Communication, relationships, trust, bias, quality improvement, listening, health equity.

#1 - You need the knowledge base and trained/experienced staff. #2 - You need the people skills. You need to be able to assess a situation and where/how you can best support knowing that "one glove does not fit all." You need strong communication and relational skills and need to be able to build relationships and partnerships. Ideally, you also take your learnings and use them to advocate for improvements in your organization and in the larger structure.

As in, the respect given toward others (and self) is part of building and sustaining trust as well as the humility required by an openness to learn.

Professionalism
Depends on the job role -- Manger or front line field investigator? Those are different skill sets. Ability to think, ability to say no nicely and professionally, ability to write, ability to make decisions, ability to plan ahead

- Innovation is an outcome of strategic thinking and problem-solving.

Innovation/Creativity
Communication, leadership, innovation, diplomacy, integrity, timeliness, etc.

Essential (for all) Values/Attitudes

Relationship Building-Networking
Relationship building
Mentioned many in the chat, but the big one that stands out is relationship building.
Being able to share information on observed deficiencies without being judgmental. Emphasizing the importance of fostering a relationship that's viewed as a partnership, and not adversarial.
Communication, networking, public speaking, competent writer
Communication, relationships, trust, bias, quality improvement, listening, health equity.
Ability to build trust and relationships; willingness to learn on the job; adaptability and flexibility

#1 - You need the knowledge base and trained/experienced staff. #2 - You need the people skills. You need to be able to assess a situation and where/how you can best support knowing that "one glove does not fit all." You need strong communication and relational skills and need to be able to build relationships and partnerships. Ideally, you also take your learnings and use them to advocate for improvements in your organization and in the larger structure.
collaboration/networking/relationship building emotional intelligence listening to understand understanding the 'why'
Relationship and partnership building and maintenance. Resilience/ability to monitor and address burnout in a challenging landscape. Effective communication, including meeting and training facilitation. Magical powers to translate dry and sometimes conflicting guidance documents from regulatory authorities into practical guidance that facilities can actually operationalize with the resources and staffing that they have.

Integrity/Trust
Communication, leadership, innovation, diplomacy, integrity, timeliness, etc.
Communication, relationships, trust, bias, quality improvement, listening, health equity.
Ability to build trust and relationships; willingness to learn on the job; adaptability and flexibility
building trust/rapport with stakeholders

Learning
Communication, persuasion, listening, assessing readiness to learn.
Compassion, willingness to listen, continuous learning, adaptability, critical thinking.
Ability to build trust and relationships; willingness to learn on the job; adaptability and flexibility

Team Player

2006 provided an excellent list in the chat, that I agree with -- things like team player. I've been in IP/HAI since 2005 and have found that genuine passion/care for patient and healthcare worker safety is essential. Folks also need to be driven and value partnerships.
Essential skills to me is having the epi foundation and ability to reach out and seek resources as needed. Be willing to learn from others and be a team player, have good communication skills and be a people person.

Self-motivation
Empathy, effective communication, self-motivation, adaptability

Essential (for workforce/specific role) Performance Objectives

Leadership
Leadership, communication, making a business case, emotional intelligence.
Communication, leadership, innovation, diplomacy, integrity, timeliness, etc.
Listening, problem solving, persuading, leading, negotiating

Data Skills
It is important to be able to utilize excel and google, as well as understand surveillance systems
organization, time management, organizing large/multiple data sets

Other
obtaining CIC, experience with disease investigations, utilization of resources, Ability to conduct literature reviews, product assessments, ability to observe practices to ensure patient safety, etc.
Ability to connect all disciplines of healthcare and environmental services in a One Health approach.
knowledge of HAIs and infection prevention, PPE donning and doffing protocol
Public speaking, google/tracking things down on the internet, being organized in thoughts and communications

organization, time management, organizing large/multiple data sets
Relationship and partnership building and maintenance. Resilience/ability to monitor and address burnout in a challenging landscape. Effective communication, including meeting and training facilitation. Magical powers to translate dry and sometimes conflicting guidance documents from regulatory authorities into practical guidance that facilities can actually operationalize with the resources and staffing that they have.
communication, listening skills, flexibility in presentation of materials to best suit person receiving information, resources, knowledge of disease, mitigation
Clinical experience whether this is in a clinical setting or working with clinical settings in a consultative role

Q6 Training & Coursework

Please list any specific trainings, coursework, or training topics you think are most useful for your work in: Infection Prevention and Control (IPC), Healthcare-Associated Infections (HAI) or Antimicrobial Resistance (AR). (Note: Please use website links, names of documents, etc. Put NA if training or resources are not used for the specified area).

Resource	Training Title	Description	Link/Where to Find
Certification Board of Infection Control and Epidemiology (CBIC)	Certified in Infection Control (CIC)	The CIC® examination is the standardized measure of the basic knowledge, skills and abilities expected of professionals working in the field of infection prevention and control. Studying for the exam provides the individual with a foundation of knowledge. The are requirements that must be met to sit for this exam.	https://www.cbic.org/
	a-IPC	The a-IPC (Associate – Infection Prevention and Control) entry-level certification examination is a measure of basic infection prevention competency. It is intended for the novice IP and for those interested in pursuing careers in infection prevention and control. It is also intended for those who do not meet the eligibility requirements for the CIC®.	https://www.cbic.org/
	Long Term Care Certification	The LTC-CIP provides a standardized measure of the basic knowledge, skills and abilities expected of professionals working in the field. Successful long-term care infection prevention certification indicates competence in the practice of infection prevention and control within a long-term care setting.	https://www.cbic.org/
	Exam Preparation	CBIC offers a manual one can follow to prepare for the exam, content outline and sample questions.	https://www.cbic.org/CBIC/Exam-Prep-Resources.htm
Centers for Disease Control and Prevention (CDC)	COCA Calls	During COCA Calls/Webinars, subject matter experts present key emergency preparedness and response topics, followed by meaningful Q&A with participants. Each COCA Call/Webinar will offer the most up to date information and guidance for clinicians. Specifically, when the webinar goes over scenarios, individuals find that the most useful.	https://emergency.cdc.gov/coca/calls/index.asp
	Healthcare Associated Infections (HAI)	CDC's HAI homepage offers links to resources for topics such as diseases and organisms, types of HAIs, preventing HAIs, HAI data and statistics, outbreak investigations, preventing MDROs, patient safety and MDROs to name a few. There is also information on Health Department HAI/AR Programs, Emerging Infections Program and CDC Prevention Epidcenters. Individuals can subscribe to their email list to get an email when these resources are updated.	https://www.cdc.gov/hai/index.html
	Nursing Homes and Assisted Living (Long-term Care Facilities [LTCFs])	*This is a specific-setting resource within the HAI home mentioned above. It provides a very important resource for the IP, The Core Elements of Antibiotic Stewardship for Nursing Homes. This free document provides instruction practical ways to initiate or expand antibiotic stewardship activities in nursing homes and a checklist for implementation. In addition, there are addition resources for topics such as but not limited to clinical staff information, prevention tools, Infection Prevention Training and Success Stories.*	

Nursing Home Infection Preventionist Training Course	The Nursing Home Infection Preventionist Training course is designed for individuals responsible for infection prevention and control (IPC) programs in nursing homes. The course covers core activities of effective IPC programs and recommended practices to reduce pathogen transmission, healthcare-associated infections, and antibiotic resistance. In addition, this course is free.	https://www.cdc.gov/long-termcare/training.html
Outpatient Settings	*This is a specific-setting resource within the HAI home mentioned above. It provides a very important resource for individuals working in the outpatient setting, Guide to Infection Prevention in Outpatient Settings: Minimum Expectations for Safe Care. This free document focuses on the unique challenges of working in the outpatient setting, discusses how to create a Infection Prevention and Control Program and checklist that can used while creating the program and/or to use during rounds for process surveillance. In addition, there is an Outpatient Setting Policy Option document that are designed to assist state, local, and territorial health departments, and policymakers to assess current outpatient policies and consider options for improving practices.*	https://www.cdc.gov/hai/settings/outpatient/outpatient-settings.html
Dialysis Settings	*This is a specific-setting resource within the HAI home mentioned above. It provides Dialysis specific Infection Prevention information and, audit tools.*	
Laboratory Resources	*This is a specific-setting resource within the HAI home mentioned above. It provides resources on detection of antimicrobial resistance and, laboratory safety publications.*	https://www.cdc.gov/hai/settings/lab/lab_settings.html
Healthcare Workers: Information on COVID-19	*Guidance for managing patients with COVID-19, including clinical guidance, home and hospital care, care for special populations, disease severity, and more*	https://www.cdc.gov/coronavirus/2019-nCoV/hcp/index.html
Health Departments: Information on COVID-19	*Guidelines, tools, and resources for States, Tribes, Localities & Terriorities.*	https://www.cdc.gov/coronavirus/2019-ncov/php/index.html
Antibiotic Stewardship	This online training course offers individuals over 10 hours of free continuing education (CE). It is accessible in multiple modules that can be taken in any order. The course objectives are: Updating healthcare professionals on current antibiotic resistance threats, informing healthcare professionals about proper antibiotic prescribing and encouraging open discussion among physicians and patients about appropriate antibiotic prescribing.	https://www.cdc.gov/antibiotic-use/training/continuing-education.html
CDC/STRIVE	States Targeting Reduction in Infections via Engagement (STRIVE). The CDC/STRIVE curriculum was developed by national infection prevention experts led by the Health Research & Educational Trust (HRET) for CDC. The courses address both the technical and foundational elements of healthcare-associated infection (HAI) prevention.	https://www.cdc.gov/infectioncontrol/training/strive.html
Project First Line	Project Firstline offers educational resources in a variety of formats to meet the diverse learning needs and preferences of the healthcare workforce. Resources are designed to empower and enable healthcare workers to think critically about infection control, using adult learning principles, educational best practices, CDC recommendations, and the science that informs them.	https://www.cdc.gov/infectioncontrol/projectfirstline/index.html

	Interim Local Health Department (LHD) HAI/AR Strategy	*CDC's Division of Healthcare Quality Promotion (DHQP) developed a strategy for local health departments (LHDs). The strategy is being developed to highlight and support the important role that LHDs play in preventing, responding to, and controlling HAI and AR related events. This website provides a snapshot at resources that are available to local health departments and developing their HAI and AR programs.*	https://www.cdc.gov/hai/hai-ar-programs/resources/local-strategy/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhai%2Fstate-based%2Flocal-strategy%2Findex.html
	Hand Hygiene in Healthcare Settings	*Resources for all things hand hygiene related when it comes to healthcare workers, patients, the science behind hand hygiene, fire safety and alcohol-based hand rub, Clean Hands Count campaign and handwashing in non-healthcare settings.*	https://www.cdc.gov/handhygiene/
	CDC's YouTube Channel	*CDC's YouTube channel is free resource with a variety of IPC, HAI and AR topics covered in a video format.*	https://www.youtube.com/@CDC/featured
	NHSN	*CDC's National Healthcare Safety Network is the nation's most widely used healthcare-associated infection tracking system. NHSN provides facilities, states, regions, and the nation with data needed to identify problem areas, measure progress of prevention efforts, and ultimately eliminate healthcare-associated infections. NHSN provides manuals for all of their components relating to Acute Care/Critical Access Hospitals, Ambulatory Surgery Centers, Long-term Acute Care Hospitals, Long-term Care Facilities, Inpatient Rehabilitation Facilities, Inpatient Psychiatric Facilities and Dialysis. NHSN offers tree training on all of their components. Individuals can email NHSN their questions for help on scenarios they encounter for to ensure proper data mapping and entry.*	https://www.cdc.gov/nhsn/
Association for Professionals in Infection Control and Epidemiology (APIC)	Membership	The Association for Professionals in Infection Control and Epidemiology (APIC) is the leading professional association for infection preventionists (IPs) and individuals interested in Infection Prevention and Control with more than 15,000 members. Their mission is to advance the science and practice of infection prevention and control. Membership is required to access resources such as their textbook, webinars and forum.	https://apic.org/
	APIC Online Textbook	The APIC Text is the most comprehensive and up-to-date reference for infection prevention and control (IPC). Written, edited, and reviewed by more than 200 subject matter experts, it reflects the latest guidelines, regulations, and standards of practice. The APIC Text's 11 sections and 125 peer-reviewed chapters are broad ranging, covering everything from fundamental principles, microbiology, epidemiology, and surveillance to more specialized topics, including specialty care populations, special pathogens, occupational health, and supportive care. This textbook is also the foundation for the CIC exam. The APIC Text is an additional cost and APIC members do get a discount on the yearly subscription.	https://apic.org/resources/apic-text/
	Free Webinars	APIC offers paid and free webinars. APIC members get a discount on all webinars that are paid.	https://apic.org/education-and-events/online-learning/upcoming-webinars/

	APIC Connect Forum	*APIC's forum is only available to members. Members can join communities and/or use the general IP Talk to post questions, answer questions and network with other IPs. This is a great resource to IPs who are a team of one.*	https://community.apic.org/home
	Developmental Path of the Infection Preventionist	The ever-changing requirements of the profession demand that IPs and individuals working in IPC constantly update their knowledge base and expand their skill set. The updated APIC Competency Model has four career stages, defined as novice, becoming proficient, proficient, and expert. Each career level has a roadmap to guide the IP including but not limited to the Roadmap for the Novice Infection Preventionist and Proficient Practitioners Bridge.	https://apic.org/professional-practice/roadmap/
	5 Second Rule Podcast	*The APIC 5 Second Rule podcast is intended to be an entertaining conversation between hosts, colleagues, and experts in infection prevention. The podcast aims to be light-hearted and therapeutic to listeners, to celebrate the accomplishments of APIC members, to excite listeners about the profession of infection prevention, and to provide a high-level overview of key tools for aiding infection preventionists in their work. We hope the listener will find themselves invigorated in the community of infection preventionists and our colleagues, specifically those involved with APIC.*	https://apic.org/apic-podcasts/
The Society for Healthcare Epidemiology of America (SHEA)	Membership	The Society for Healthcare Epidemiology of America (SHEA) is a professional society that improves public health by establishing infection-prevention measures and supporting antibiotic stewardship among healthcare providers. Similar to APIC, the organization provide guidelines, education & training and a forum.	https://shea-online.org/
TRAIN		TRAIN is a national learning network that provides quality training opportunities for professionals who protect and improve the public's health. CDC does partner with TRAIN and have some of their courses here such as Antimicrobial Stewardship.	www.train.org
	Nursing Home Infection Prevention	TRAIN is a national learning network that provides quality training opportunities for professionals who protect and improve the public's health. CDC does partner with TRAIN and have some of their courses here such as Nursing Home Infection Preventionist Training Course	https://www.train.org/cdctrain/training_plan/3814
	Antibiotic Stewardship	TRAIN is a national learning network that provides quality training opportunities for professionals who protect and improve the public's health. CDC does partner with TRAIN and have some of their courses here such as Antibiotic Stewardship Course: Module 1: Be Antibiotics Aware: Antibiotic Resistance	https://www.train.org/cdctrain/course/1101641/
World Health Organization (WHO)	WHO EPI WIN Updates	Updates are posted every Thursday on a weekly basis and cover a variety of topics such as but are not limited to COVID-19, Influenza and, Mpox (formally known as Monkeypox).	https://www.who.int/teams/epi-win/epi-win-updates

Council of State and Territorial Epidemiologists (CSTE)	CSTE Learn	CSTE is an organization of member states and territories representing public health epidemiologists. CSTE works to establish more effective relationships among state and other health agencies. It also provides technical advice and assistance to partner organizations and to federal public health agencies such as the Centers for Disease Control and Prevention (CDC). CSTE works to advance public health policy and epidemiologic capacity. We also provide information, education, and developmental support of practicing epidemiologists in a wide range of areas as well as expertise for program and surveillance efforts. CSTE Learn is where members can take educational courses, use the resource library, and join community groups.	https://learn.cste.org/
NETEc	National Emerging Special Pathogens Training and Education Center	The National Emerging Special Pathogens Training and Education Center's mission is to set the gold standard for special pathogen preparedness and response across health systems in the U.S. with the goals of driving best practices, closing knowledge gaps, and developing innovative resources. NETEC offers education & training, consulting services and readiness assessments.	https://netec.org/
NACCHO	Workgroups		https://www.naccho.org/programs/community-health/infectious-disease/infectious-disease-prevention-and-control/healthcare-associated-infections
	Committees		
Florida Department of Health	*CIC Study Group*		https://www.floridahealth.gov/diseases-and-conditions/health-care-associated-infections/index.html
Hawaii Department of Health	State specific training		https://health.hawaii.gov/docd/for-healthcare-providers/healthcare-associated-infections/
ASTHO	Association of State and Territorial Health Officials		https://www.astho.org/

Appendix G: Analysis of *The Essentials*

Public Health workers (including those working in specialties such as Infection Prevention & Control, Healthcare Associated Infections, and Antibiotic Resistance) are tasked with a myriad of duties. While these responsibilities challenge workers to draw from their domain-specific technical knowledge, that kind of knowledge is not sufficient to meet all (quite possibly, most) public health work objectives. After all, these workers need to know biochemical and physiological factors that spread disease; they need to know how those factors apply to health-related equipment and materials. But they also need complex interpersonal abilities that transcend the moment, so that their goals to promote and preserve public health can be achieved. These are the skills, objectives, and values that, with domain-specific knowledge, make up what we will refer to in this report as "The Essentials".

As the term *essential* suggests, these are necessary to do public health work. Unfortunately, while necessary, these topics can be challenging to analyze. First, while much work in soft skills has helped to advance understanding, the constructs are often ambiguous. Also, these "skills" are sometimes conflated. For example, some examinations of soft skills include things that might arguably be better described as *values*, or guiding principles. Others will include behaviors that are more accurately described as *objectives*, that is they are tasks or goals to accomplish.

These distinctions matter, as they require different training and assessment techniques to assure readiness for the work-force.

The Essentials: The bottom line for our first line

What follows is a brief overview of findings from a series of NNPHI-sponsored work. Six listening sessions were conducted in early 2023 to hear public health workers (PHW) share their experiences. The full report, *The National Network of Public Health Institutes Infection Prevention & Control, Healthcare Associated Infections, and Antibiotic Resistance Skills and Training Needs* includes methods, full results, and supporting documentation.

So, what did the listening sessions reveal?

1. There are truly "essential" skills. Participants in every session shared that they were engaged daily in activities that require emotional intelligence, communication, situation awareness, strategic thinking, and problem solving. These are transferrable, meaning that the participants discussed learning and practicing these skills in a variety of situations, many of them unrelated to health work.
2. There are "essential" values/attitudes. Participants discussed how their values helped direct them toward success. The affective domain is well-researched (cf. Kratwohl, 2002)[13] in the learning and training sciences and can be intentionally cultivated; the participants implied that these attitudes are something one is "born with". The essential values and attitudes mentioned by the participants included: Openness to learn, diversity & inclusion (D&I), self-efficacy, networking, community building & sustainment, and fostering trust.
3. There are "essential" performance objectives needed for public health, but maybe not for every worker individually. These results are important in that they help to articulate career paths and potential routes of advancement that extend beyond straight-forward knowledge acquisition. They are coupled to expertise development and practice applying the essential skills. While this is assuredly not an exhaustive list, the participants reported the following performance objectives: Information management, information analysis, change management, leadership, policy engagement, and strategic partnership.

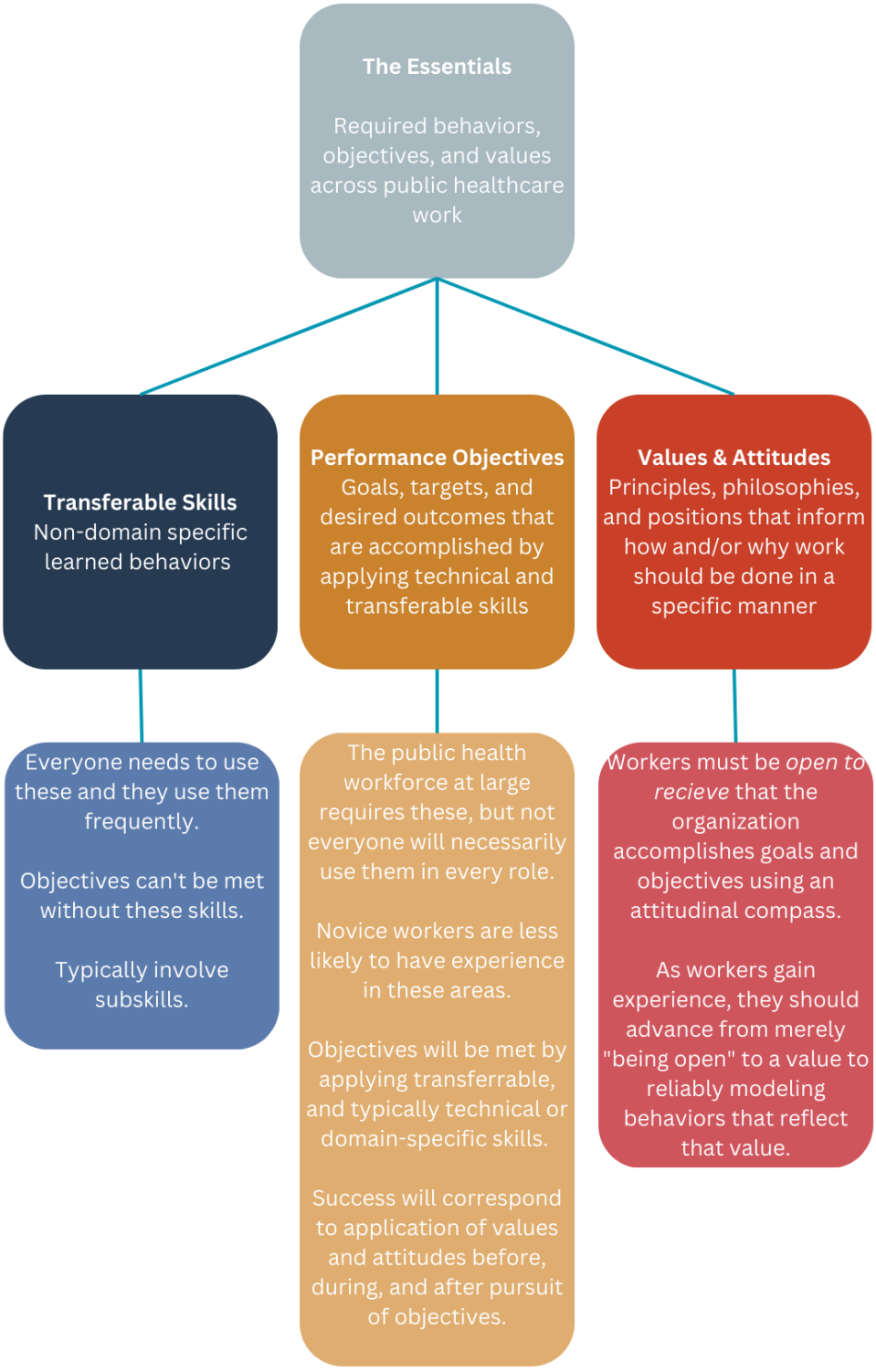


Figure 26: The Essentials: Transferable Skills, Performance Objectives and Values & Attitudes

Participants in the listening sessions emphasized the following themes, which have been organized into each taxonomic category:

The Essentials		
Essential (for all) Transferable Skills	**Essential (for workforce/specific roles) Performance Objectives**	**Essential (for all) Values/Attitudes**
Strategic Thinking **Situation Awareness** **Problem Solving** **Emotional Intelligence** **Communication**	**Information Management** **Information Analysis** **Change Management** **Leadership** **Policy Engagement**	**Openness to Learn** **Self-efficacy** **Diversity & Inclusion** **Network/Community Building & Sustainment** **Trust** **Teamwork**

This taxonomy is not intended to be an exhaustive list of non-domain specific learning topics. Rather, it is a way to *organize* such topics, so that they can then be prioritized and learning design implications can be identified. The following checklist can help professionals use this taxonomy.

- ❑ When an *Essential* is identified (that is, the public health community identifies it as something that is required to successfully "prevent, promote, and protect"), the first step is to identify whether the topic is an objective, skill, or value.
  - ★ The instructional design analysis phase (a standard part of most instructional design processes) will require further categorization to itemize specific learning objectives, typically by finding all required knowledge, skills, and attitudes attached to each *Essential* category.
- ❑ An *Essential* should have an articulated purpose. Our examples below include this.
- ❑ Any enabling factors should be identified to see how the *Essential* fits with other topics. This will inform prerequisites and/or co-requisites.
- ❑ The *Essential* will also have some outcome, in that it should enable something else to happen. This may be an objective, but it also may be other skills or values.
  - ★ Sometimes, the outcomes enable further development of *Essential* itself, creating a feedback loop. For example, Emotional Intelligence (EI) enables better communication, which in turn can improve understanding of others and thereby enable better EI. This is typically the case for EI and developing trust.

Participants speak about *The Essentials*

To demonstrate how this taxonomy can help identify what goes into an *Essential* and what can emerge from it, the following analysis was conducted. The relationships between *Essentials* help us know what prerequisites should be taught and what will be enabled by each one. Example quotes from the listening sessions have been provided to illustrate the PHW application of each *Essential.* Then, an illustration summarizes how the purpose of *The Essential* and any prerequisites go into it, and then enable other behaviors. Definitions and summative explanations of each skill are provided for additional clarity.

Look for this shield, which indicates the highest level of importance. These *Essentials* are tied to **all the other Essentials.**

Transferable Skills
Strategic Thinking

Now, what does that mean in terms of who is specifically chosen to sit on a certain policy committee? No, I had no specific road model, I had no specific roadmap. I just applied the general concept of multidisciplinary. Who are the stakeholders? Because to get buy-in, you need to have those stakeholders at the table. I just worked from that concept to figure out who needed to be in the room. (Listening Session #1)

Strategic thinking skills are integral to meeting the transformation, technology, partnership, and gap-filling demands of the rapidly changing world of health improvement and health care. These strategic skills are consistent with the consensus set of Core Competencies for Public Health Professionals and identify training priorities within these competencies where training is needed. [3]

While both are important to IPC, HAI, and AR work, Systems Thinking is subordinate to **Strategic Thinking**. Strategic thinking identifies options for action. Systems thinking is required to holistically frame these options, but it is not sufficient (see Situation Awareness, below). Other necessary skills include **reframing** (changing perspective to gain insight) and **reflecting** (integrates perceived and experienced information to build intuition and automaticity). These points are supported in literature regarding strategic thinking (cf. Pisapia et al. 2011).[14] *Reframing* requires emotional intelligence (to draw awareness to biases in self and others) as well as D&I, to contextualize perspectives across experiences of others. As a metacognitive act, *reflecting* demands an awareness of one's own knowledge vs. assumptions to identify gaps and vulnerabilities in a system and in strategies.

Transferable Skills

Situation Awareness

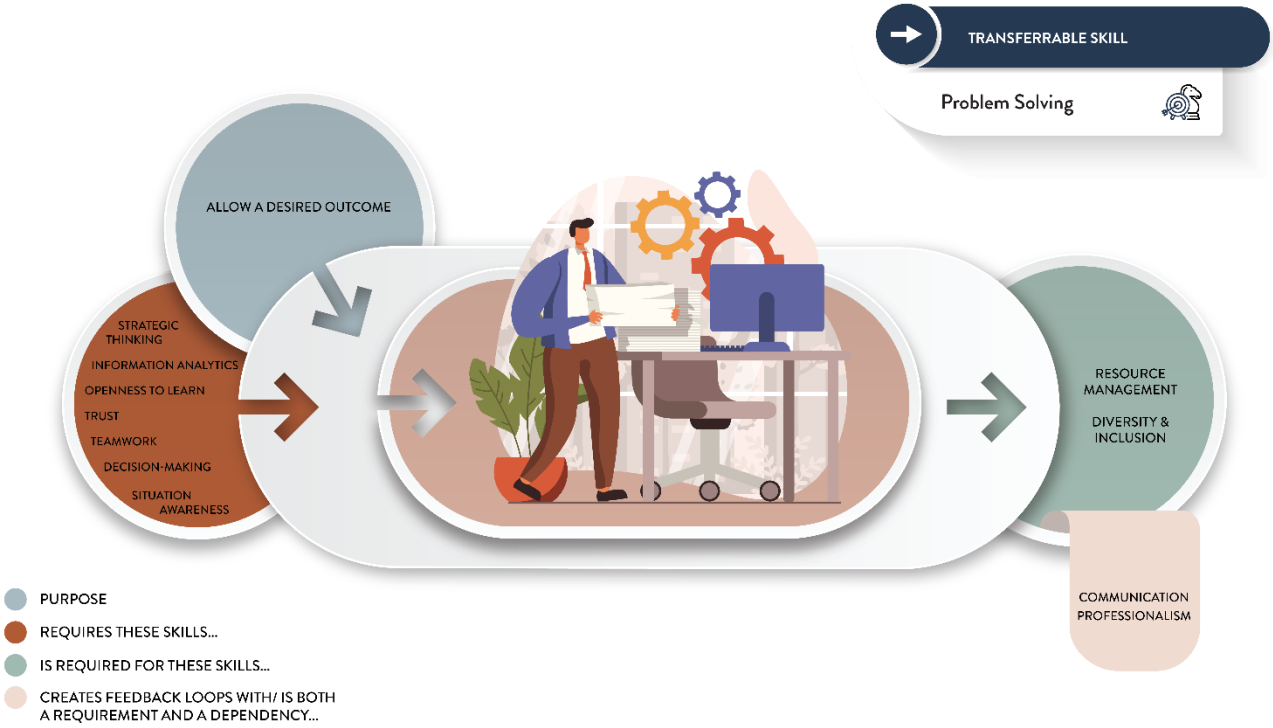
They were always at a different level, so we always had to do an assessment on where we could bridge their gap. We always put them with another team member who was more experienced. We always put them with a mentor who oversaw their work, and for a while they shadowed. They didn't just shadow us, they went to other departments, they went to micro and shadowed them. They went into the OR and shadowed those folks. They went down into dietary, EVS and how they managed their team, and how they cleaned lots of observation and the ED. That's how we set it up. They had to go to all these different departments that we worked with all the time. They went with a mentor, they observed the mentor, and then the mentor started cutting them loose and letting them do the work. (Listening Session #3)

Situation Awareness is defined as the conscious knowledge of the immediate environment and the events that are occurring in it. Situation awareness involves perception of the elements in the environment, comprehension of what they mean and how they relate to one another, and projection of their future states.[15] Situation Awareness has been well-researched in performance literature. Authors recommend applying Endsley (cf. 1995 and 2020)[16, 17] models to public health-specific scenarios.

Transferable Skills

Problem Solving

I guess you tend to integrate all of what you know and to try to solve a problem or to find out something. (Listening Session #5)



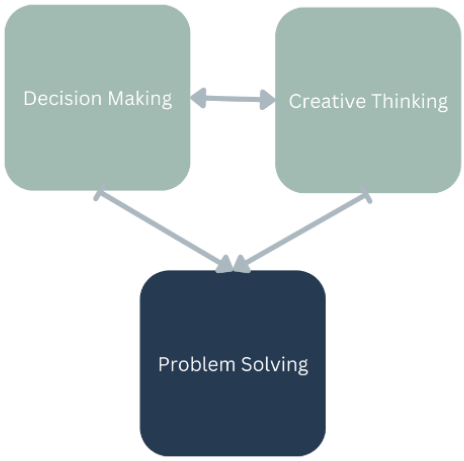
Problem Solving is defined as a key component of the 10 essential public health services, continuous quality improvement, and performance management. It includes the ability to determine the nature of a problem, identify potential solutions, implement an effective solution, and monitor and evaluate results. It is also critical to identify different intervention and prevention strategies or policies to address and set priorities. Successful problem solving includes understanding barriers to implementation and developing an effective communication strategy. Key considerations include social context and values, cultural perspectives, laws and regulations, politics of public health, and the roles of different interest groups and stakeholders.[3]

Problem Solving provides a desired outcome in an uncertain situation. The listening sessions offered opportunities for participants to walk through their experiences finding solutions to challenging situations.

Creative Thinking enables problem solving. This includes team brainstorming, which both generates ideas and organizes them into categories and priorities.

Decision Making uses the information generated in creative thinking and/or guidance from **governance, policies, and/or the organization**. As the skill name implies, it always involves choosing between options. As such, **Strategic Thinking** skills are always enabling and may even be constitutional of decision making. In this context of strategic thinking, the "creative thinking" skill includes "reframing."

This relationship has been identified in academic literature (cf. Saaty, 2009).[18]



Creative thinking and decision making work together, so that options can be identified, prioritized, and outcomes can be considered.
The actions that allow for **solving a problem** will come from applying the visions generated by creative thinking and decision making.

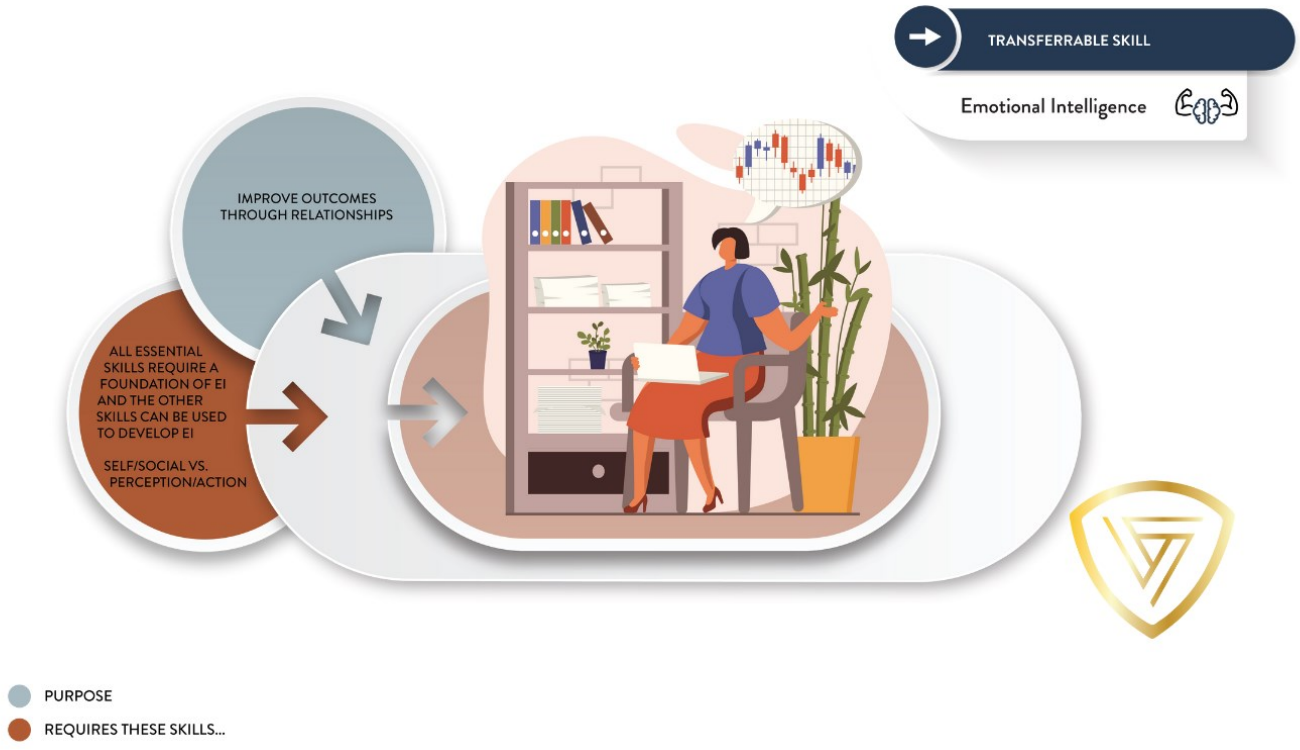
Figure 27:Problem Solving as a outcome to decision making and creative thinking

PRIORITY SKILL: Emotional Intelligence informs *all PHW activities*.

Transferable Skills

Emotional Intelligence

I've been in situations where I'm conveying some information to maybe a group of people, staff members. It's probably not what they want to hear, or they're not exactly accepting of that. I don't want to say that I shift in-- then I'll get the hostility, there'll be some hostility that's set back your way. I will probably stiffen up a little bit.... You're going to need to do this, that, and the other to fix whatever problem it is. There's not going to be room for negotiation. They are going to have to do this, they're going to follow my direction either to keep the patient safe or keep themselves safe. My tone might get a little more firm. Let's just say I will come back to them still professional, whereas before, I might have sounded, I usually start out somewhat collegial and just giving him the background again and saying, "Well, this is the situation. Here's what we know about this type of situation or condition. This is what you're going to have to do. If they don't like it. My tone will shift a little bit and say, "Well, I'm sorry that you feel that way, but this is what you're going to have to do" …instead of them getting hostile maybe they become a bit more fearful, so my tone will shift the other way. (Listening Session #4)



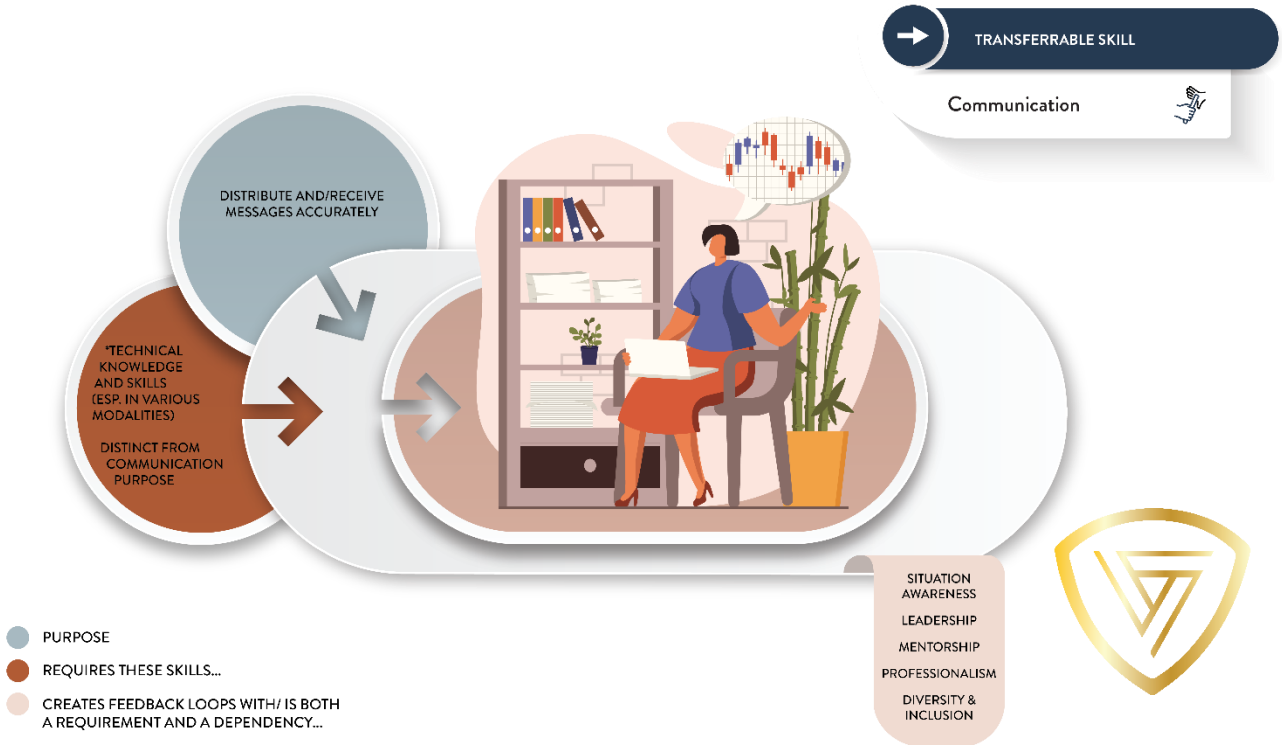
Emotional Intelligence (EI) is defined as a set of skills hypothesized to contribute to the accurate appraisal and expression of emotion in oneself and in others, the effective regulation of emotion in self and others, and the use of feelings to motivate, plan, and achieve in one's life.[19] EI became one of the most consistent themes, with participants expressing how important it is to every aspect of their public health work. The authors expand on how EI can be used to anchor instructional design in the Recommendations section of this report.

PRIORITY SKILL: Communication is part of *all PHW activities*.

Transferable Skills

Communication

It was like this color system and different characteristics of personalities and how that translates into management styles and communication. It just proved to be very beneficial, not only in actually getting a better understanding of myself, but also looking at other people and when communicating with other people, trying to get a sense of where they are. Then you learn how to communicate to them based on who they are using certain terms and things like that, so that you can be a more effective communicator with them. You learn about you so you know how to adapt to the other person and communicate on according to their style. (Listening Session #2)



Public health communication is the development, dissemination, and evaluation of relevant, accurate, accessible, and understandable information shared with and received from intended audiences to protect and advance the health of the public.[19] Like EI, and frankly inseparable from it, communication is also a priority skillset. It's important to consider the technical aspects of communication by modality (e.g., email, text, academic writing) as well as *the purpose of the communication* (e.g., as trust-building, informing, persuading).

Performance Objectives

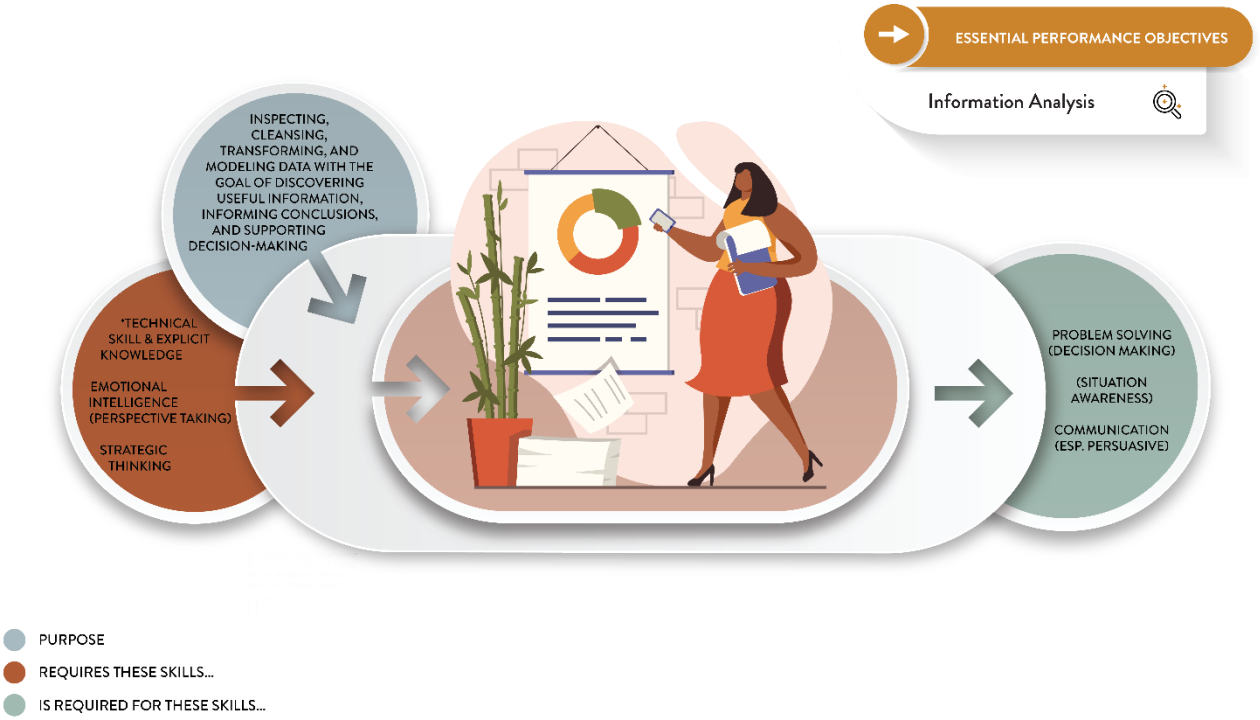
Information Management

A lot of times it's having an honest conversation and being able to read the person you're speaking with. You're speaking with them, not at them or above them. It's just having and back to what 07 had said, it's the why. This is why we're asking you to do it. This is what can become of it if you do it or if you don't do it and just laying all the cards out. Then they have all the information in front of them and not being regulatory, it does fall on them to then put some of our recommendations in place. I like to try and be a resource, so they can call and ask questions anytime and be on their side to help them in any way we can. Sometimes when they know that it's a little easier.

(Listening Session #1)

Information Management is defined as the planning, budgeting, manipulating, and controlling of information throughout its life cycle. [20] Information & Analytics skills are described in the PPH literature as "Leverage, synthesize, and analyze multiple sources of electronic data, and use informatics to identify and act on health priorities, population impacts, evidence-based approaches, and health and cost-related outcomes." The emphasis on electronic data implies that this is broadly a technical (and even technological) skill enabled by Strategic Thinking, communication (especially in trust building and maintenance). Consequently, the authors of the present study separated these constructs into "Information Management and Information Analysis", as these are two distinct objectives, enabled by multiple skills.

I'm from a state health department, so we've done a lot of training and creating training materials and educational materials lately for our health care facilities. We will put a tool together or something like that, or we'll pick a topic that we want to train on. We will go out in the field, we'll do it. Then we're like, you know what could make this better, is if we do this. Then the next time we do that, and then we add a new thing on top of that and say, you know what? This could make this better is by adding this new aspect. Continuously improving our educational materials and our tools that we've created. Instead of just saying one and done, this is just what the training material is going to look like and be like forever. I think for me, personally going out to facilities teaches me just as much as I'm there teaching them. I really do think it's a two-way street. That's been really nice when we've been going out on-site to our health care facilities and providing our infection control assessments, is getting the feedback from them as well. Instead of us just being the ones talking, making it a conversation, versus just us being there to give our expertise. We've been doing a lot of our training more aimed at getting feedback from staff while we're on-site. (Listening Session #6)



Information analysis is the process of systematically applying statistical and/or logical techniques to describe and illustrate, condense, and recap, and evaluate data and information.[21] Strategic thinking enables the Information Analytics skill by enabling prediction. It answers the questions, “what do these data mean?” (a systems thinking question) and “how might people use this information?” (a strategic thinking question, enabled by emotional intelligence and D&I in order to reflect and reframe/perspective taking). As the purpose of information analysis is to support decision-making (“identify and act on...”), it is both contextual and constitutive of health communication.

Performance Objectives

Change Management

Getting into my role in infection prevention, I feel like building relationships and trust in, well, say like within my facilities, I've drawn a lot from my public health training.

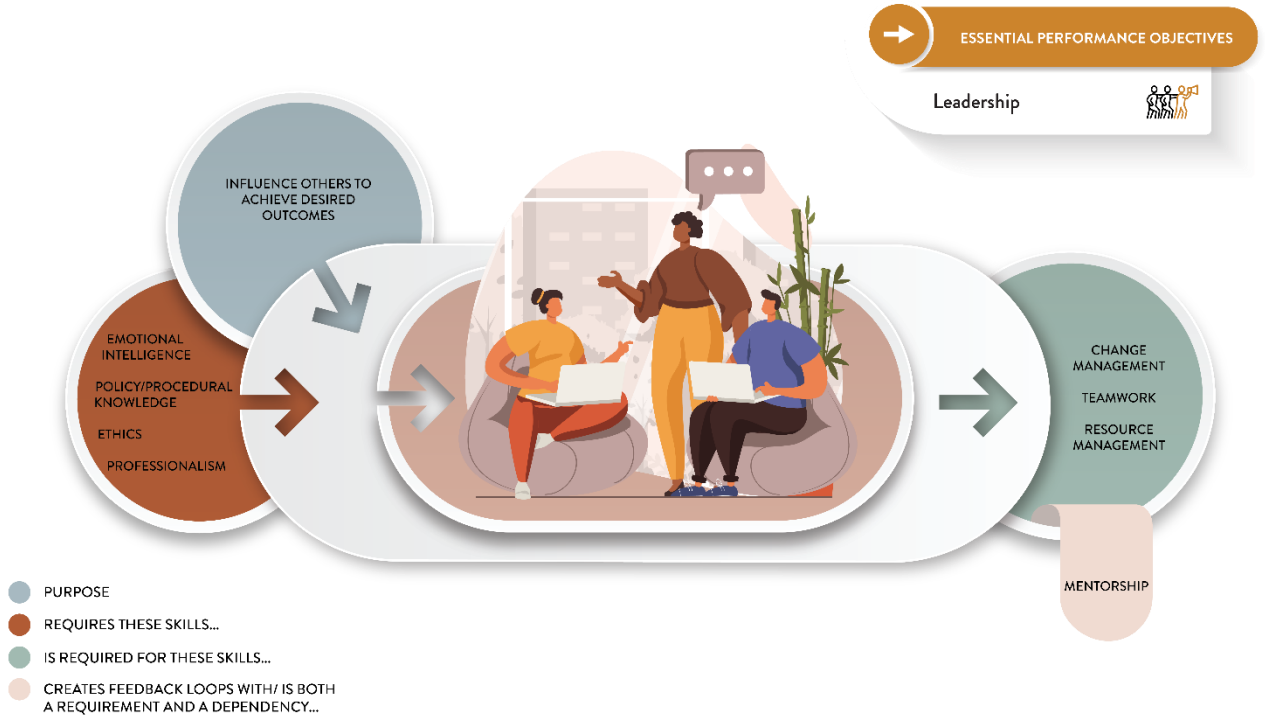
Like in going out and doing assessments and things like that and not just starting to change things, but to go out in my "community" [laughs] and just making observations and, "Hey, show me what you do. Why do you do it like that?" Because even though there are times when we have to make a big process change, I can't go to a unit and say, "Oh my goodness, what are you doing? This is all wrong. Let me change it." I have to say like, "Oh, can you show me this process?" There are times when we have to make quick changes, but there's still a way to do it with compassion and empathy as well as tact. I think sometimes that's missing because people will come in as, "I'm the expert, you need to do what I tell you to do," or do what I say, or it's implied. If anything, actually for me in acute care, I feel like that's the quickest way to make sure that nothing gets done. (Listening Session #6)

Change Management is defined as the scaling programs up and down or changing them entirely in response to the environment and identifying core elements to help sustain programs in challenging times. [3] Change management is a goal, enabled by essential/soft skills such as Strategic Thinking, Leadership, Emotional Intelligence, and Diversity & Inclusion. As a process, it uses experimentation and trial and error to "fine tune" solutions and responses. Change management is executed within systems of systems to use resources, modify business processes, allocate budgets, and otherwise cause and/or manage change in an organization. Consequently, change management will always involve explicit knowledge of an organization, policies, and practices as well as knowledge of the appropriate tools and techniques for resource allocation and management. Although the explicit technical knowledge involved in change management is necessary, it is not sufficient. Change requires emotional intelligence to assure and maintain stakeholder buy-in, strategic thinking, leadership, communication, and diversity & inclusion.

Performance Objectives

Leadership

You go into a facility, and you maybe see something that's just like, "What is going on here?" Or "Wow, I can't believe this is happening." Not having your eyes super big and you're just shutting down and crossing your hands and looking actively looking uncomfortable when you walk into their facility. I think you have to put on a game face and have that compassion for that facility and meeting them where they're at instead of where you think they should be at. Then assisting them and helping them to get there and see what their vision is. Then they also have a part to play in it. (Listening Session #6)



Leadership in public health involves those who act in service of a *vision* that differs from the status quo, using their *influence* to drive change. This change is grounded in their *values*.[22]

Leadership has been classified as an objective, which is still essential to PH work, but not as a skill unto itself for the purpose of clarifying its role in workforce development. All of the Transferrable Skills will be required by everyone, on a regular basis, however, an objective like leadership may not. However, there is no question that the field requires strong leaders. This distinction helps focus resources for both individual career development as well as for the development of more targeted instructional resources (i.e., just-in-time learning, job aids, and milestone-based career progression).

Performance Objectives

Policy Engagement

I want to approach you; I want to have a dialogue with you. I want to make sure that we're on the same page. If I was to train my earlier stuff, I would just make sure that I always check in I'm say, "Hey, let's go over this real quick. Let's make sure that we're up to speed on whatever scenario." Policy is a big thing in what we do in healthcare. Obviously, you live and die by policy and just making sure that someone is comfortable with those things and how to apply policy to real-life situations, et cetera. (Listening Session #4)

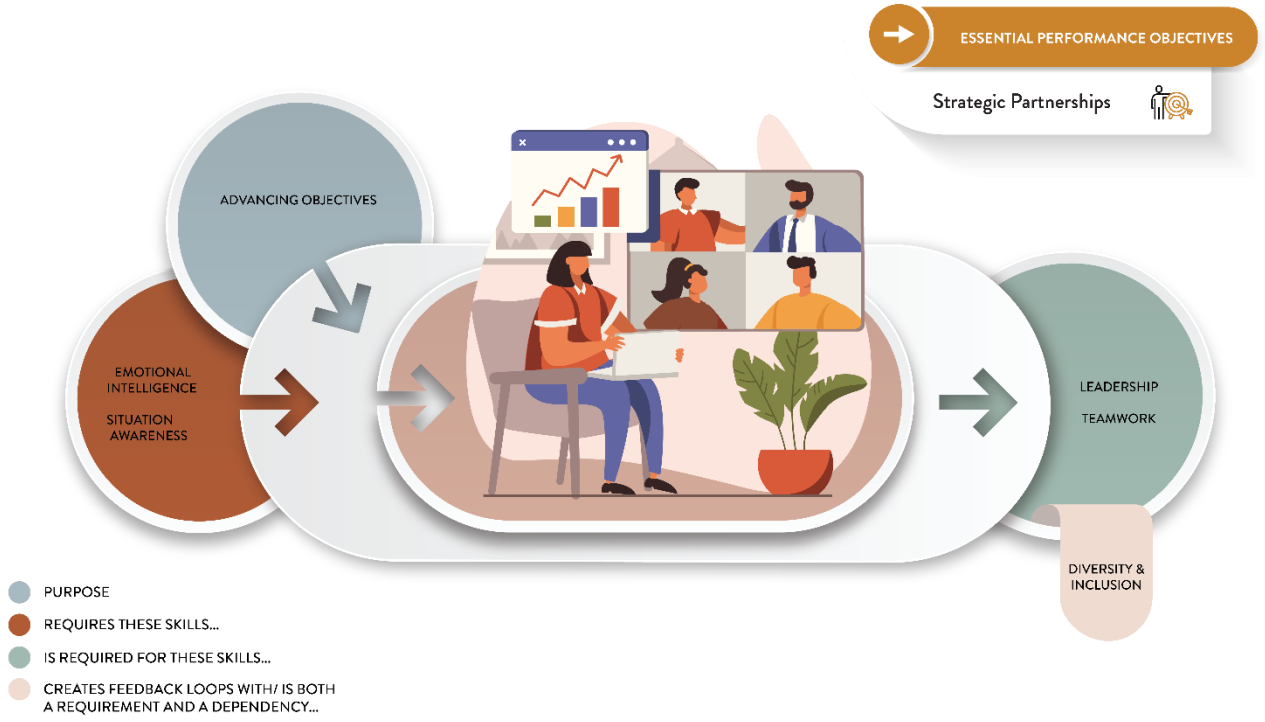
Like Leadership, not every IPC, HAI, and AR professional must directly engage with policy, while all personnel are affected by policy engagement. Again, this distinction helps direct career paths and curricular development.

Policy engagement is also a *technical skill*. It is the spectrum of skills needed to address public health concerns and needs of local, state, and federal policymakers and partners.[3] Understanding distinctions in legal, ethical, and organizational practices is a knowledge-based endeavor. It will always require developing new technical/systems knowledge when the policy engager is placed in a new context, particularly changing roles in different jurisdictions.

Performance Objectives

Strategic Partnerships

I think trust is 100% vital in us being able to do our jobs. Being from a State Health Department, if we don't have the trust of our facilities or the trust of our Infection Preventionist, that really limits the amount of work that we're able to do and the effectiveness of our work. I know, for us, relationship building has been very important. Creating cohorts or creating these little groups within our state itself of peer-to-peer groups, but then also I think partnering with the correct stakeholders and then having those stakeholders, we almost say endorse us. State survey will often endorse our program and say, "Hey, these individuals can help you. We would really recommend you reach out to them and speak to them." (Listening Session #6)



Strategic partnerships is defined as negotiating, building, and maintaining partnerships with other organizations that are key organizations in the community that can assist you in achieving your goals.[23] It is an objective to develop strategic partnerships, particularly across resource-diverse organizations, that may lead to positive public health outcomes. It's important to remember that, while these partnerships are objectives, they are enabled by transferrable skills, and they enable other objectives and skills.

Listening session participants emphasized the role that D&I plays in making partnerships possible. However, strategic partnerships also help achieve better representation, allowing the value of D&I to be embodied in their work.

Values & Attitudes

Openness to Learn

My learning experience that I often enjoy is a conference-type setting, where there are many things going on at one time, and you can pick what's interesting to you, meet people from other spaces or similar spaces that you work in, and network, with a little fun added in. (Listening Session #5)

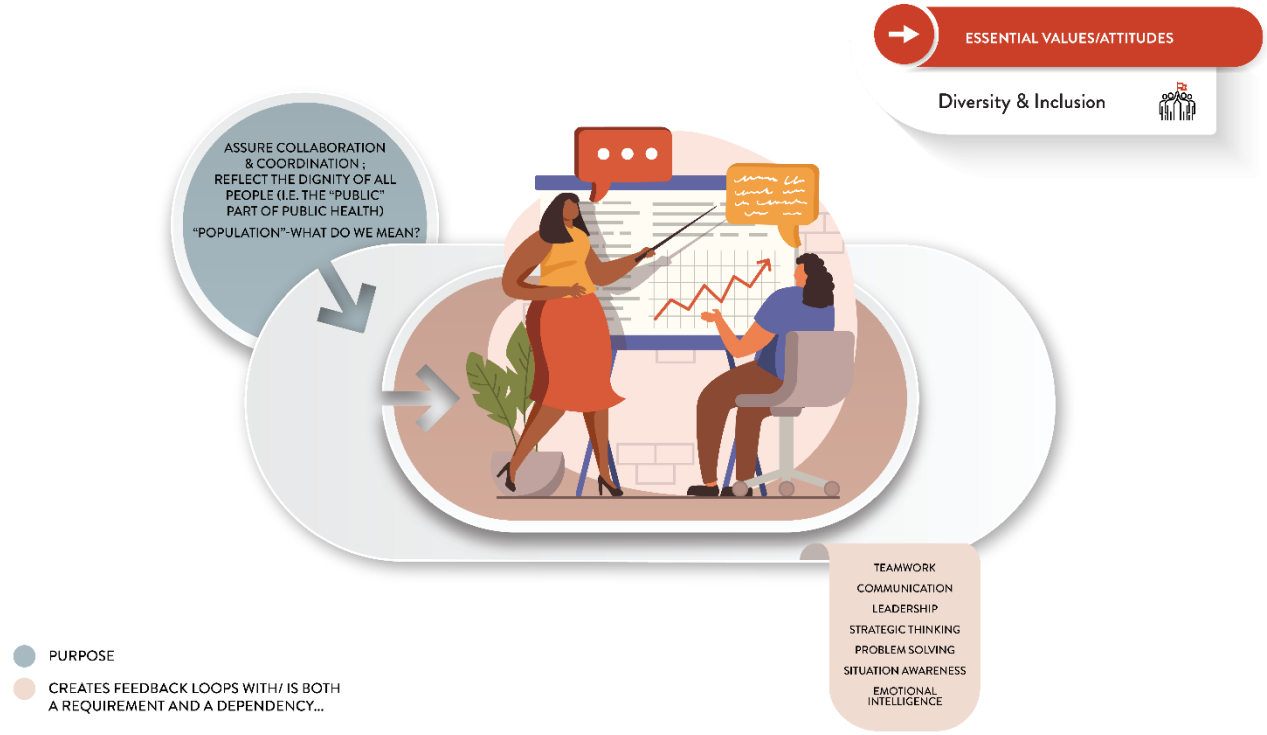
To define openness to learn, we used by proxy the definition of open-mindedness which is an individual's ability and willingness to consider ideas and opinions that are new or different from their own, enabling change or growth. [15] From expanding one's domain-specific knowledge, to hearing a different point-of-view, the participants shared numerous stories in which their openness to learn was evident. This openness not only facilitates more competent work, but it also allows for quicker "pivots," changing directions or tactics as information updates.

Values & Attitudes

Diversity & Inclusion

We are the melting pot a lot of people will call us. We have many different cultures, and the barriers and frustrations I think would come from ESL many of the times, however, we did have access to translators, of all languages. That really helped. At any given time, we could call a certain number and have a third-party interpreter on the phone with us. That was good to get through some of those barriers, and every culture is different. You'll have some cultures where they love to talk story, they'll talk all day, and then you'll have other cultures who you get a mm-hmm, a yes, mm-mmm, very conservative and reserved and cautious, and your main point of all of these calls is to collect data, that's the bottom line, our data is so important at the end of the day.

(Listening Session #2)

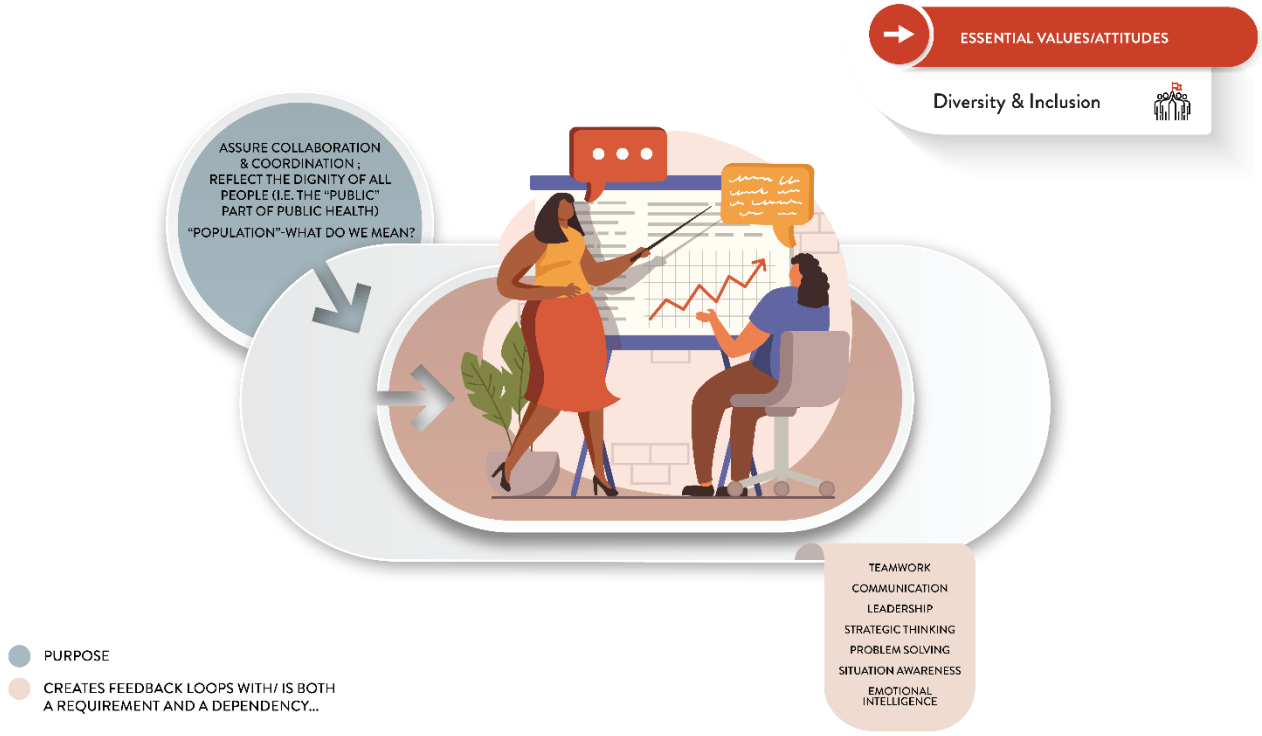


Diversity reflects the changing demographics of the US population and the public health workforce itself. Inclusion is the effort to fully incorporate workers representing diverse populations into health solutions. Together, they enable agencies to better relate to the populations they serve (including ones at higher risk of adverse health outcomes), provide a larger recruitment pool, and improve employee retention.[3] The participants shared experiences of how incorporation of D&I principles supported their work. These experiences align with empirical work in cognitive science. For a review of opportunities and challenges across the applications of D&I (e.g., team composition criteria, operationalization) see Mello & Rentsch, 2015.[24]

Values & Attitudes

Self-efficacy

It's one of those things is you sink, or you swim. I chose to swim. I can't speak for others. I have a feeling, though, that if you don't have that mentality if you choose to swim, you might get left behind, unfortunately, especially in a time of constant change. If you aren't given the education or even some of the resources or aren't being mentored by somebody as strong to show you the way, I feel like you can get left behind. (Listening Session #2)



Self-efficacy refers to an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments.[25] Briefly, self-efficacy is believing that you *can* do something. Where it becomes complicated is that, like many belief structures, part of the puzzle lies in one's perception of one's own skills. The other part is in the perception of the system in which one finds oneself.

This means that developing a keen sense of accurate self-efficacy requires elevated levels of emotional intelligence in multiple parties.

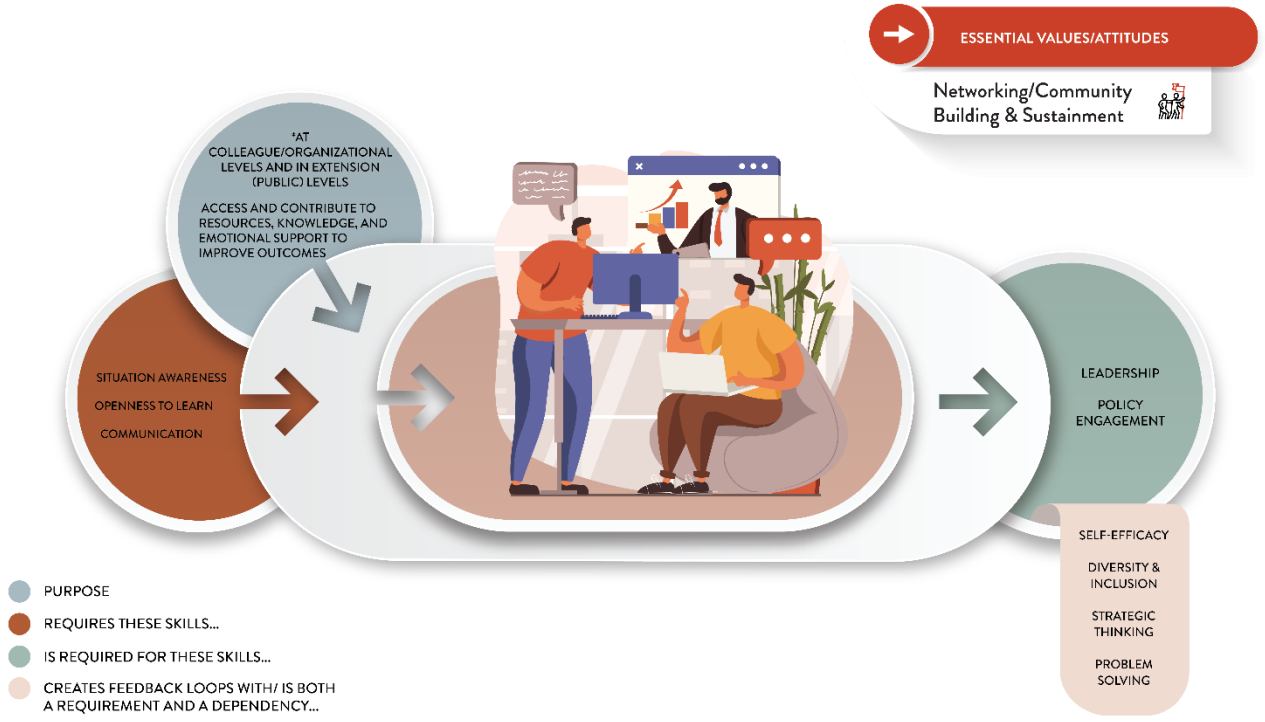
It also is useful to value self-efficacy in the public (to avoid the "it won't make a difference" mentality that keeps individuals from acting in their best interest).

Values & Attitudes

Networking

I think having those relationships with stakeholders and entities within your state, but additionally having those relationships with your facilities and your local health jurisdictions. One way I think we've done that is just building that network of infection preventionist throughout our state. We have a Listserv that we use that all emails go out on and communication. Any infection preventionist can type a question on that and then they can get resources and things like that. I think doing kind of the like, "Hey, we're all on the same team here. We all want to improve infection control." We can bounce ideas off of one another. Making that network has been really important for us. I think without trust or without facilities trusting us, we really would not be able to do our jobs at all.

(Listening Session #6)



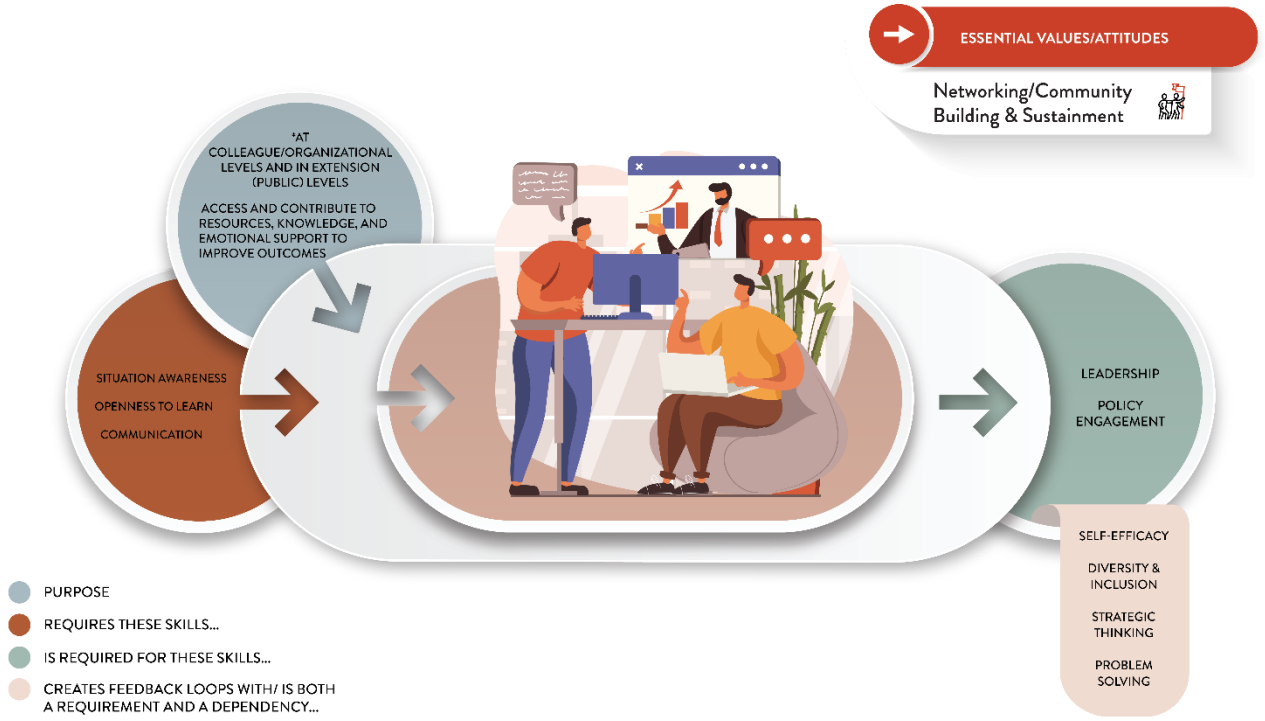
Networking involves making contacts and building relationships with people who work in the field of public health.[26] Networking among other IPC, HAI, & AR professionals is so integrated into the PHW fabric, that Listening Session participants spontaneously took the opportunity to do so during sessions. That is, rather than simply conversing in response to the questions, participants would post resource links in the Zoom chat and some exchanged contact information to stay in touch after discovering shared experiences.

Networking provides academic, social, and professional support to the PHW which allows that workforce to be sustained and continue developing (avoiding stagnation or resignation). Personnel can and should be supported in networking efforts because networking helps meet PH objectives.

Values & Attitudes

Community Building & Sustainment

Relationship building is key. I feel like the soft skills, and how we talk with each other at work, how we are held accountable, hold ourselves accountable for work, just a lot of the soft skills are just, I found so important because during COVID we hired a lot of folks that, I mean, to be frank, we wouldn't have hired before COVID because they didn't have a lot of the extensive experience in public health that we used to look for when we hired folks. (Listening Session #2)



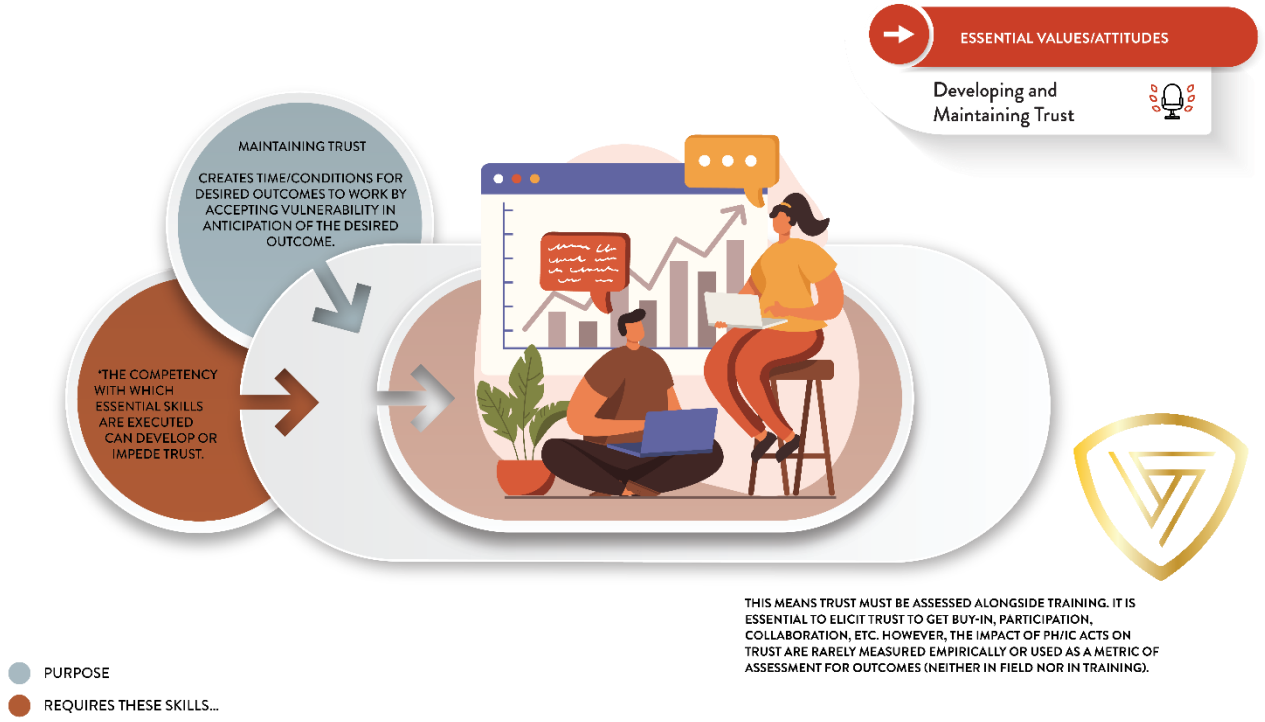
Community building is a process aimed at strengthening the capacity of individuals and organizations to develop and sustain conditions that support all aspects of community life.[27] It is too obvious to point out that Community Building is *Essential*—public health work is always going to involve communities. However, what is important to note is that it has been placed in the present taxonomy as a *value.* This is because it is a driving priority, and when personnel value community building, they have a *why*—they have a reason to do things a certain way. That attitudinal position applies to communities within their organizational and team structures as well as the communities they serve.

PRIORITY VALUE: Trust will impact the effectiveness of every objective

Values & Attitudes

Developing & Maintaining Trust

I had a similar situation to 2002 running the COVID response in our county health department. The staff all know their temporary position, so I'd constantly get questions about the status of the funding, "How much longer is this going to be?" I told them, "I can't really answer that because I don't know and our leadership doesn't know." If elected officials would come out and say the pandemic is over, or it's not a priority anymore, this would cause immense stress and anxiety to the staff. We didn't really have any really training to navigate that, we just had to build relations with our teams and say, "Look, I'm in the trenches here with you, I'm sharing with you what the best information that I have with me, at this moment. I promise you that as soon as I hear anything about that, I will try my best to give you ample notice If there is something going on with the funding so you have time to prepare to look for other positions. (Listening Session #2)



A conceptually useful definition of trust is "a particular level of subjective probability with which an agent [the public] assesses that another agent or group of agents will perform a particular action and in a context which affects his own action."[28]

Another "gold seal" priority *Essential*, developing and maintaining trust is required to accomplish any IPC, HAI, and AR work according to the listening sessions. From the trust placed in data to the reliability of teams to complete tasks, it is everywhere. Instructional efforts should pull from research in the field of trust (c.f., Feitosa et al., 2020 for a meta-analysis of trust and team performance)[29] and apply practice developing and maintaining trust in training scenarios.

Values & Attitudes

Teamwork

We had always taken a team approach to onboarding and onboarding matters. Can you teach anybody infection prevention control? Heck yes, you can, but they have to come with certain skills. (Listening Session #3)

Listening session participants shared experiences that reflected a challenge to balance individual responsibility and contributions with constant needs for team collaboration and coordination.

The authors recommend applying work conducted in the interdisciplinary research field, the Science of Team Science (SciTS). While an emergent area of research, it has identified methods for translating research in teamwork broadly to those who work in fields of science, such as public health.

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