

Regional Training Needs Assessment: A First Look at High-Priority Training Needs Across the United States by Region

Jennifer McKeever, MSW, MPH; Jonathon P. Leider, PhD; Aaron A. Alford, PhD, MPH, PMP; Dorothy Evans, MPH, MD

ABSTRACT

Context: Although core scientific skills remain a priority to public health, preventing and responding to today's leading causes of death require the workforce to build additional *strategic skills* to impact the social, community-based, and economic determinants of health. The 2017 Public Health Workforce Interests and Needs Survey allows novel regional analysis of training needs, both individually and across 8 strategic skill domains.

Objective: The purpose of this article is to describe the training needs of public health staff nationally, across the 10 Department of Health and Human Services Regions.

Design: The Public Health Workforce Interests and Needs Survey was a Web-based survey fielded to 100 000 staff nationwide across 2 major frames: state health agency-central office and local health department. State-based respondents were fielded on a census approach, with locals participating in a more complex sampling design. Balanced repeated replication weights were used to address nonresponse and sampling.

Setting: State and local health departments.

Participants: Respondents from state and local health departments.

Main Outcome Measures: This article draws from the training needs portion of Public Health Workforce Interests and Needs Survey. Descriptive statistics are generated, showing training needs gaps. Inferential analyses pertain to gaps across Region and supervisory status, using Pearson χ^2 test and Rao-Scott design-adjusted χ^2 test.

Results: Training needs varied across regions and work setting. Certain strategic skills tended to see larger, consistent gaps regardless of Region or setting, including Budgeting & Finance, Change Management, Systems Thinking, and Developing a Vision for a Healthy Community.

Conclusions: Overall, the data suggest substantial interregional variation in training needs. Until now, this picture has been incomplete; disparate assessments across health departments, Regions, and disciplines could not be combined into a national picture. Regionally focused training centers are well situated to address Region-specific needs while supporting the broader building of capacity in strategic skills nationwide.

KEY WORDS: governmental public health, public health practice, public health workforce interests and needs survey, training needs assessment, workforce development

Author Affiliations: National Network of Public Health Institutes, Washington, DC, New Orleans, Louisiana (Ms McKeever and Evans, and Dr Alford). Division of Health Policy and Management, School of Public Health, University of Minnesota, Minneapolis, Minnesota (Dr Leider).

PH WINS was funded by the de Beaumont Foundation and conducted in collaboration with ASTHO. Ms McKeever, Dr Alford, and Ms Evans did not receive financial support for this work. Dr Leider was a paid consultant to the de Beaumont Foundation.

The authors declare no conflicts of interest.

Supplemental digital content is available for this article. Direct URL citation appears in the printed text and is provided in the HTML and PDF versions of this article on the journal's Web site (<http://www.JPHMP.com>).

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

In the first part of the 20th century, health departments focused on fighting infectious diseases.¹ Today, the leading causes of death—heart disease, cancer, chronic lower respiratory diseases, unintentional injury and overdose, stroke, Alzheimer disease, and diabetes^{2,3}—challenge our public health system's capacity to protect the nation's health.⁴ While the current public health workforce includes specialized experts in distinct scientific disciplines (eg, epidemiology,

Correspondence: Jennifer McKeever, MSW, MPH, Public Health Practice and Training, National Network of Public Health Institutes, 1300 Connecticut Ave., NW, Suite 510, Washington, DC 20036 (jmckeever@nnphi.org).

Copyright © 2019 The Authors. Published by Wolters Kluwer Health, Inc.

DOI: 10.1097/PHH.0000000000000946

laboratory sciences, chronic disease prevention), the workforce of the future must think strategically, act from a systems perspective, be skilled at building partnerships, and harness the power of new data types to meet these population health challenges.⁵ In short, the field must expand its scope and reach to address all the factors that impact health and well-being.⁶ Although core scientific skills remain a priority, modernizing the public health workforce requires building additional “strategic skills” to meaningfully impact the social, community-based, and economic determinants of health.⁵ Only recently has the field gained a national sense of where the training needs for these strategic skills lay.⁷⁻¹⁴

Training needs in public health have been studied, but primarily with a discipline-specific or agency-specific focus.^{7,8,11,15-19} The Public Health Workforce Interests and Needs Survey (PH WINS) was first launched in 2014 with state health agencies and a pilot of local health agencies and explored demographics, trends, workplace environment, and training needs.¹⁰ PH WINS was fielded again in 2017 to a nationally representative sample of state health department and local health department (LHD) staff²⁰ for the first time allowing study of training needs at the Regional level for both state and local staff.

The Health Resources and Services Administration has long supported training centers, which were recently reorganized into Regional Public Health Training Centers (RPHTCs). Ten RPHTCs based at accredited schools of public health—one in each Department of Health & Human Services (HHS) Region (“Region”)—provide training and capacity-building support to the current and future public health workforce. In concert with the National Network of Public Health Institutes, the RPHTCs form the Public Health Learning Network and are required to assess the needs of the public health workforce within their Region.²¹ However, Regional preferences and approaches to assessing needs vary dramatically. Some RPHTC prefer a qualitative approach; others adapt their tools to meet the various needs of local partners or disciplines.^{11,12} These differences have long been discussed in workforce research and were part of the genesis of PH WINS.²² The purpose of this article is to systematize training needs comparisons across the Regions, using secondary data collected in a nationally representative fashion.

Methods

This article catalogues the training needs of public health staff nationally, across the HHS Regions. It draws exclusively upon the PH WINS 2017 fielding. PH WINS was designed to be Regionally and

nationally representative of state health agency staff, as well as across LHD staff in departments with 25+ staff that serve populations 25 000+.²⁰ The state health agency central office (SHA-CO) frame included staff who worked in their state health agency’s central office, while the Local frame includes staff who work in the Regional or local health departments in their states. One caveat of note is that in decentralized states,²³ regional employees were included as part of the SHA-CO frame, since regional health departments are generally run by the state agency in a decentralized structure.

PH WINS was fielded as a census to all state health agencies. Local staff who were employed by their state health agency (eg, in centralized or shared governance structures²³) were contributed with certainty to the Local frame. All 30 members of the Big Cities Health Coalition—a membership organization of the nation’s largest LHDs—were invited to participate; 26 agencies accepted. Twenty-five Big Cities Health Coalition agencies were fielded as a census, with 1 receiving a 70% simple random sample to reduce survey burden. In addition, LHDs from decentralized states were sampled on a probability basis for inclusion in the Local frame; staff from 71 LHDs participated in this way. Balanced repeated replication weights were used to adjust for nonresponse and design across all frames.

Respondents were grouped by HHS Region and supervisory status. The data for HHS Regions 1 and 2 are paired because there were not enough LHDs in each Region to support the sampling frame.²⁰ The national workforce comprises approximately 200 000 staff at the state and local levels.²⁴ PH WINS was designed to include SHA-CO staff, as well as staff from large LHDs and medium LHDs. It was designed to exclude staff from small LHDs. A large LHD is defined as serving more than 250 000 people, a medium LHD is defined as serving 25 000 to 250 000 people, and a small LHD is defined as serving fewer than 25 000 people. From estimations based on the Association of State and Territorial Health Officials and the National Association of County & City Health Officials 2016 Profiles,^{25,26} SHA-CO staff constitute about 53 000 of the total workforce, compared with 84 000 from large LHDs and 43 000 from medium LHDs. As illustrated in the Figure, a modest number of staff—about 19 000—come from agencies that were excluded from PH WINS because of small size.²⁰ The survey was administered to 102 305 workers between September and December 2017, with an overall response rate of 48%.

While the first fielding of PH WINS in 2014 included items related to training needs, a reimagining of the section was deemed necessary for 2017.¹⁵ In partnership with the de Beaumont Foundation,

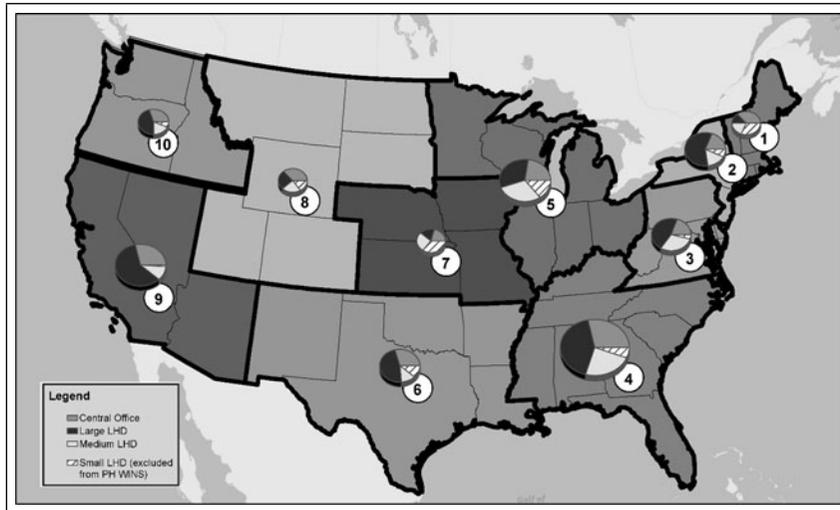


FIGURE Staff Distribution Across HHS Regions^a

Abbreviations: LHD, local health department; PH WINS, Public Health Workforce Interest and Needs Survey.

^aNot pictured are Hawaii (Region 9), Alaska (Region 10), and the US territories, whose staff are not included in these calculations. Central Office indicates the staff that work in a state health agency's central office (and regional offices in decentralized states). A large LHD is defined as an LHD serving <250 000 people, a medium LHD is defined as an LHD serving 25 000 to 250 000 people, and a small LHD is defined as one serving fewer than 25 000 people. Small LHDs were not eligible for inclusion in PH WINS.

the Association of State and Territorial Health Officials convened the PH WINS Standardized Training Needs Assessment Workgroup—cochaired by representatives from the National Association of County & City Health Officials and the National Network of Public Health Institutes—to revise the training needs section for the 2017 survey launch.²⁰ The resulting section included 8 “strategic skill” domains and 21 to 22 questions (individual skills) across 3 supervisory tiers: nonsupervisors (tier 1), supervisors/managers (tier 2), and executives (tier 3).^{15,20} The strategic skill domains build on those identified in the de Beaumont Foundation report, *Building Skills for a More Strategic Public Health Workforce: A Call to Action*,⁵ and include Effective Communication, Data for Decision-Making, Cultural Competency, Budget and Financial Management, Change Management, Cross-Sectoral Partnerships, Systems and Strategic Thinking, and Developing a Vision for a Healthy Community. With the expansion of these questions, the training needs assessment became the largest section of the PH WINS survey²⁰ and is the focus of our data analysis.

The training needs assessment focused on discrete strategic skill domains.⁵ For each individual skill, the respondent was asked to separately rate the importance of the skill in his or her day-to-day work and his or her own level of proficiency in that skill. Importance was measured on a 4-point Likert scale ranging from Not Important to Very Important. A rating of somewhat important or very important constituted a “High Importance” rating. Level of proficiency in the skill was measured on a 4-point Likert scale, with a

not applicable option: Unable to Perform, Beginner, Proficient, and Expert. Unable to perform and beginner constituted “Low Skill” ratings. The survey team has conceived of *training gaps* as the combination of the dichotomized importance and skill variables, with a gap being “High Importance” and “Low Skill,”¹⁵ and that convention is retained in this analysis. Certain analyses examine gap existence by each of the 8 strategic skill domains. A gap was identified in a domain if 1 or more of the questions in that domain had a respondent report they viewed the individual skill as High Importance + Low Skill.

Data analysis was completed using Stata, version 15.1. For all items, national, state, and local estimates of skill gaps were calculated by the supervisory tier. This was done generally by strategic skill domain, as well as specifically by individual skill. All skill gaps were also cross-tabulated by HHS Region, within supervisory tier. While this article largely contains descriptive statistics, we do make some inferential comparisons across Regions and compare Regional with national estimates. Comparisons are made within SHA-CO and Local setting, between the HHS Regions with the most and fewest gaps. In these cases, Pearson χ^2 test and design-adjusted Rao-Scott χ^2 test are employed.

Results

Staffing varies widely across the Regions (Table 1). About 71% of staff were nonsupervisors nationally (95% confidence interval [CI], 70%-74%), with the

TABLE 1
Public Health Staff Characteristics, by HHS Region^a

Setting	Region										Total
	1 and 2	3	4	5	6	7	8	9	10		
SHA-CO staff	29% (17%-45%)	20% (17%-24%)	30% (28%-33%)	26% (14%-43%)	33% (24%-44%)	32% (21%-46%)	44% (29%-60%)	29% (16%-47%)	33% (18%-52%)	29% (26%-33%)	
Local staff	71% (55%-83%)	80% (76%-83%)	70% (67%-72%)	74% (57%-86%)	67% (56%-76%)	68% (54%-79%)	56% (40%-71%)	71% (53%-84%)	67% (48%-82%)	71% (67%-74%)	
Supervisory status											
Tier 1 (nonsupervisor)	62% (56%-67%)	72% (70%-74%)	71% (71%-72%)	76% (75%-77%)	73% (72%-74%)	81% (77%-85%)	73% (70%-75%)	74% (74%-75%)	79% (76%-81%)	72% (71%-74%)	
Tier 2 (supervisor/Manager)	36% (30%-43%)	26% (25%-27%)	25% (25%-26%)	21% (20%-22%)	25% (24%-26%)	17% (13%-21%)	25% (22%-27%)	24% (23%-25%)	19% (18%-21%)	25% (24%-27%)	
Tier 3 (executive)	2% (1%-4%)	2% (2%-3%)	3% (3%-3%)	2% (2%-3%)	2% (2%-3%)	2% (1%-4%)	3% (2%-4%)	2% (2%-3%)	2% (1%-4%)	2% (2%-3%)	
Occupation type											
Administrative/clerical	34% (26%-43%)	36% (35%-38%)	46% (44%-48%)	36% (31%-40%)	42% (41%-43%)	36% (30%-42%)	35% (33%-37%)	42% (39%-44%)	40% (37%-43%)	40% (38%-42%)	
Clinical and Laboratory	17% (14%-21%)	27% (25%-30%)	25% (23%-27%)	28% (25%-33%)	24% (23%-26%)	28% (26%-30%)	24% (21%-28%)	26% (24%-28%)	22% (19%-25%)	25% (23%-26%)	
Public health sciences	47% (34%-60%)	34% (30%-38%)	26% (25%-28%)	33% (29%-37%)	30% (28%-31%)	34% (28%-40%)	39% (36%-42%)	31% (29%-33%)	37% (34%-40%)	33% (30%-36%)	
Social services	1% (0%-6%)	2% (1%-5%)	3% (3%-4%)	3% (1%-7%)	3% (3%-4%)	3% (1%-7%)	2% (1%-5%)	2% (1%-3%)	1% (0%-1%)	2% (2%-3%)	
Highest degree attained											
No college	10% (4%-26%)	20% (18%-22%)	22% (21%-23%)	16% (12%-21%)	24% (21%-26%)	17% (13%-22%)	14% (13%-15%)	17% (16%-18%)	17% (15%-20%)	18% (16%-20%)	
Associates	8% (3%-21%)	14% (12%-16%)	19% (17%-21%)	15% (9%-23%)	16% (14%-18%)	15% (12%-18%)	13% (10%-16%)	13% (12%-14%)	13% (12%-15%)	15% (13%-17%)	
Bachelors	37% (32%-43%)	35% (32%-38%)	33% (31%-34%)	40% (36%-44%)	34% (31%-36%)	40% (34%-46%)	45% (41%-49%)	38% (38%-39%)	38% (34%-42%)	36% (35%-38%)	
Masters	39% (22%-58%)	26% (22%-30%)	22% (21%-24%)	25% (21%-29%)	23% (22%-24%)	26% (23%-29%)	24% (23%-26%)	26% (25%-27%)	26% (24%-29%)	26% (23%-29%)	
Doctoral	5% (2%-13%)	5% (4%-8%)	4% (4%-5%)	4% (4%-5%)	4% (3%-5%)	3% (2%-7%)	4% (3%-5%)	6% (5%-7%)	5% (3%-8%)	5% (4%-6%)	

Abbreviation: SHA-CO, state health agency central office.

^aCells should be interpreted as, for example, 29% of governmental public health staff in HHS Regions 1 and 2 indicate that they work in their state health agency's central office, with a 95% confidence interval of 17% to 45%.

smallest relative amount of nonsupervisors being in Regions 1 and 2 (62%), compared with the highest, in Region 7 (81%). Nationally, 33% of staff (95% CI, 30%-36%) work in the public health sciences, compared with 26% in Region 4 and 47% in Regions 1 and 2. Educational attainment was highest in Regions 1 and 2, with 44% of staff having a masters level or higher degree (95% CI, 32%-58%). The national average was 31% (95% CI, 28%-33%).

The strategic skill domains that had the highest number of respondents with at least 1 skill gap were Budgeting and Financial Management and Systems and Strategic Thinking, with 55% and 48% of respondents identifying at least 1 skill gap in the respective domain. The highest SHA-CO needs were observed in Regions 7 and 8, with an average of 2.6 strategic skill domains with gaps per respondent (95% CI, 2.5-2.7). The highest Local frame needs were observed in Region 6 with 3.1 domains with at least 1 gap, and 3.0 in Regions 8 and 10. Training needs varied across regions and work setting (Table 2).

Select strategic skill domains tended to see large and consistent gaps regardless of Region or setting. For example, Budgeting and Financial Management had about half of respondents identifying the domain with at least 1 high importance/low skill item across Regions. However, variability between Regions and setting was more common. This variation was observed nationally, between regions with the most and fewest gaps—especially across the Budgeting and Financial Management domain (52% vs 56%, $P = .0018$), Change Management (38% vs 45%, $P < .0001$), Cross-sector Partnerships (34% vs 39%, $P = .0003$), Data for Decision Making (24% vs 30%, $P < .0001$), and Systems and Strategic Thinking domains (45% vs 49%, $P = .0095$).

Strategic skills gaps data were further analyzed by supervisory tier. Table 3 shows the domains with the largest proportion of staff reporting gaps by Region, with all domains presented in Supplementary Digital Content Appendix Table 1, available at <http://links.lww.com/JPHMP/A553>. Between the nonsupervisor and supervisor/manager tiers, the domains show similar gaps broadly across all Regions. Certain Regions are exceptions, including Region 5 in Budget and Financial Management; 59% of nonsupervisor respondents had at least 1 skill gap in this domain versus 70% of supervisors/managers, $P = .0534$. Another is Region 10 in Change Management (55% nonsupervisors vs 44% supervisors/managers, $P = .001$) and Regions 3, 6, and 9 in Systems and Strategic Thinking (48% nonsupervisors vs 61% supervisors/managers, $P = .005$; 42% nonsupervisors vs 58% supervisors/managers, $P < .0001$; and 47% nonsupervisors vs 58% supervisors/managers, $P < .0001$). Other

noteworthy differences between supervisors and managers included Regions 3 (45% vs 55%, $P = .0006$), Region 4 (41% vs 47%, $P < .0001$), Region 5 (48% vs 68%, $P = .001$), Region 6 (43% vs 56%, $P = .0002$), and Region 8 (47% vs 60%, $P = .0066$) in the Vision for Healthy Community domain. Executives generally self-reported fewer gaps across the domains and these differences did not tend to be statistically significant due to the small population size in this tier. In a few Regions, executives did report larger gaps for some items, compared with other tiers.

A further examination of interregional variation is presented in Table 4. This examination uses the individual skill items constituting the strategic skill domains. Modest Regional differences were common. For example, 5% of Regions 1 and 2 reported a gap in the skill “Communicate in a way that persuades others to act” item. Comparatively, the Region with the most gaps overall (7) had 19% of staff in the Region self-report a gap in this skill. Within the Budgeting and Financial Management domain, among SHA-CO staff, there was a 17% point difference between the Regions with the fewest and most gaps (Regions 8 and 4) for the item “Identify funding mechanisms and procedures to develop sustainable funding models for programs and services” ($P < .0001$). Among LHD staff, that difference was 36% points between the lowest and highest Regions (27% in Regions 1 and 2 vs 63% in Region 5, $P = .03$). A similar difference was observed for the item “Identify funding mechanisms and procedures to develop sustainable funding models for programs and services,” (27% gap, $P = .03$). Within the Systems and Strategic Thinking domain, several numerical (but not statistically significant) differences were observed among Locals, including 20% versus 40% gaps for “Build cross-sector partnerships to address social determinants of health” ($P = .08$) and 26% versus 55% gaps for “Implement an organizational strategic plan” ($P = .08$). One Vision for a Healthy Community item, “Assess how agency policies, programs, and services advance population health,” had a 35% point difference between the lowest and highest Regions ($P = .01$).

Discussion

This article represents a novel regional analysis of training needs across 8 strategic skill domains for state and local public health staff. We found substantial interregional differences in skill gaps. Gaps across the 10 Regions appeared to be more substantial than within Regions across supervisory tiers. However, some intraregional variation was also observed across supervisory tiers. This suggests that substantial

TABLE 2

Public Health Staff With at Least 1 Gap Within Each of the Strategic Skills Domain by Region^a

Setting	Budgeting and Financial Management	Change Management	Effective Communication	Cross-Sector Partnerships	Cultural Competency	Data Decision Making	Vision for Healthy Community	Systems and Strategic Thinking
Regions 1 and 2								
SHA-CO	53% (51%-54%)	37% (36%-38%)	17% (15%-19%)	35% (31%-39%)	35% (32%-38%)	24% (23%-25%)	41% (36%-46%)	47% (45%-49%)
Local	48% (37%-58%)	37% (20%-53%)	16% (14%-18%)	39% (34%-45%)	17% (0%-42%)	22% (17%-26%)	41% (39%-44%)	43% (29%-56%)
Total	49% (42%-57%)	37% (27%-47%)	16% (15%-18%)	38% (35%-41%)	22% (2%-42%)	22% (19%-26%)	41% (41%-42%)	44% (34%-53%)
Region 3								
SHA-CO	51% (49%-54%)	38% (36%-40%)	15% (13%-18%)	34% (31%-37%)	32% (29%-34%)	22% (21%-24%)	40% (37%-42%)	46% (44%-48%)
Local	58% (55%-60%)	45% (42%-48%)	16% (15%-18%)	39% (36%-41%)	32% (28%-36%)	29% (26%-31%)	47% (45%-50%)	52% (50%-54%)
Total	56% (55%-58%)	43% (41%-46%)	16% (14%-18%)	38% (36%-40%)	32% (28%-35%)	27% (25%-29%)	46% (44%-48%)	51% (49%-53%)
Region 4								
SHA-CO	48% (43%-53%)	36% (34%-38%)	15% (13%-17%)	30% (29%-32%)	30% (28%-32%)	21% (21%-22%)	39% (37%-42%)	41% (40%-42%)
Local	53% (52%-55%)	42% (41%-43%)	16% (15%-17%)	36% (32%-39%)	28% (26%-30%)	28% (26%-29%)	42% (41%-44%)	46% (44%-47%)
Total	52% (50%-54%)	40% (39%-41%)	16% (15%-17%)	34% (32%-36%)	28% (27%-30%)	26% (25%-27%)	42% (40%-43%)	44% (43%-46%)
Region 5								
SHA-CO	55% (52%-58%)	40% (39%-42%)	18% (17%-19%)	39% (36%-42%)	36% (34%-38%)	26% (23%-28%)	43% (40%-46%)	47% (44%-50%)
Local	64% (58%-70%)	52% (44%-60%)	19% (14%-25%)	42% (35%-49%)	35% (27%-44%)	34% (25%-43%)	49% (40%-58%)	56% (45%-67%)
Total	62% (58%-65%)	49% (44%-54%)	19% (16%-23%)	41% (36%-46%)	36% (30%-41%)	32% (25%-38%)	47% (42%-53%)	54% (47%-60%)
Region 6								
SHA-CO	48% (45%-51%)	37% (34%-39%)	17% (15%-18%)	31% (29%-33%)	27% (26%-28%)	23% (21%-25%)	38% (36%-40%)	42% (40%-44%)
Local	55% (50%-60%)	45% (40%-50%)	17% (15%-18%)	38% (32%-44%)	29% (24%-33%)	28% (23%-33%)	46% (40%-51%)	46% (41%-51%)
Total	53% (51%-55%)	42% (40%-45%)	17% (16%-18%)	36% (32%-39%)	28% (26%-31%)	27% (24%-29%)	43% (40%-46%)	45% (42%-47%)
Region 7								
SHA-CO	60% (57%-63%)	45% (43%-47%)	20% (19%-21%)	35% (32%-38%)	39% (37%-40%)	30% (25%-35%)	44% (39%-49%)	54% (52%-56%)
Local	54% (35%-73%)	50% (41%-59%)	29% (21%-38%)	43% (27%-59%)	42% (26%-58%)	38% (31%-45%)	45% (26%-64%)	51% (28%-73%)
Total	56% (43%-69%)	49% (43%-54%)	26% (21%-32%)	41% (30%-52%)	41% (30%-52%)	36% (30%-42%)	45% (31%-58%)	52% (37%-66%)
Region 8								
SHA-CO	58% (57%-60%)	46% (42%-50%)	20% (18%-21%)	37% (34%-40%)	37% (33%-40%)	29% (28%-30%)	44% (43%-45%)	51% (50%-53%)
Local	61% (56%-66%)	50% (46%-53%)	22% (19%-26%)	43% (35%-50%)	41% (37%-46%)	36% (31%-41%)	50% (42%-58%)	57% (50%-63%)
Total	60% (57%-62%)	48% (46%-50%)	21% (19%-23%)	40% (37%-44%)	39% (36%-43%)	33% (30%-36%)	48% (44%-51%)	54% (51%-57%)
Region 9								
SHA-CO	51% (49%-53%)	39% (37%-41%)	20% (19%-22%)	38% (36%-41%)	30% (29%-31%)	26% (24%-27%)	43% (41%-44%)	47% (45%-48%)
Local	57% (53%-61%)	47% (45%-48%)	20% (18%-22%)	37% (34%-40%)	34% (29%-38%)	31% (28%-34%)	45% (42%-48%)	50% (45%-55%)
Total	55% (53%-57%)	45% (44%-46%)	20% (19%-22%)	37% (36%-39%)	33% (30%-35%)	29% (28%-31%)	44% (42%-46%)	49% (46%-52%)

(continues)

TABLE 2
Public Health Staff With at Least 1 Gap Within Each of the Strategic Skills Domain by Region^a (Continued)

Setting	Budgeting and Financial Management	Change Management	Effective Communication	Cross-Sector Partnerships	Cultural Competency	Data for Decision Making	Vision for Healthy Community	Systems and Strategic Thinking
Region 10								
SHA-CO	52% (51%-53%)	36% (33%-38%)	14% (13%-14%)	34% (29%-38%)	30% (28%-31%)	23% (22%-23%)	39% (33%-45%)	46% (43%-49%)
Local	61% (57%-64%)	52% (48%-56%)	22% (21%-24%)	43% (41%-45%)	39% (35%-44%)	37% (30%-44%)	52% (49%-56%)	55% (50%-59%)
Total	58% (56%-60%)	47% (44%-49%)	20% (18%-22%)	40% (38%-42%)	36% (34%-38%)	32% (27%-38%)	48% (45%-52%)	52% (50%-54%)
National								
SHA-CO	52% (50%-53%)	38% (38%-39%)	17% (16%-18%)	34% (33%-35%)	32% (31%-33%)	24% (24%-25%)	41% (40%-42%)	45% (45%-46%)
Local	56% (54%-58%)	45% (43%-48%)	18% (17%-19%)	39% (37%-40%)	31% (26%-35%)	30% (28%-32%)	45% (44%-47%)	49% (46%-52%)
Total	55% (53%-56%)	43% (42%-45%)	18% (17%-19%)	37% (36%-39%)	31% (28%-34%)	28% (27%-29%)	44% (43%-45%)	48% (46%-50%)

Abbreviation: SHA-CO, state health agency central office.

^aCells should be interpreted as, for example, in Region 9, 51% of SHA-CO staff reported at least 1 skill gap in the Budgeting and Financial Management domain (95% confidence interval, 49%-53%).

investment in on-the-job public health training is warranted.

Current health department infrastructure nationwide does not have sufficient capacity or training to prevent and respond to today’s leading causes of death¹; funding and programs are “more reflective of the health concerns of the past than of the present, let alone the future.” Transforming public health infrastructure will require a strong pipeline into the public health workforce, as well as access to ongoing training and midcareer professional development resources.²⁷

With information across disciplines, across Regions, and across state and local public health, PH WINS 2017 provides a unique opportunity for the field to come together in understanding the strategic skill needs of the workforce and coordinating training and workforce development efforts in direct response to those needs. The 10 Health Resources and Services Administration–funded RPHTCs and their national consortium—the Public Health Learning Network—may utilize the Region-specific data from this article and PH WINS more broadly in their training needs assessment and planning activities.¹² Similarly, state and local health departments seeking accreditation are required to utilize training needs data for the creation and implementation of a workforce development plan²⁸ and employ myriad approaches to meeting this requirement. PH WINS may well satisfy those requirements, giving agencies insight into their staff’s gaps versus Regional or national averages.

The RPHTCs and health departments could also use PH WINS training needs data as the basis from which to build further assessments. Identifying strategic skill domains where there are high gaps and high variation across Regions provides an opportunity for RPHTCs to dig deeper into the specific gaps within their own Region and/or health department. In addition, the RPHTCs could focus training needs assessment efforts with small and rural LHDs that were excluded from the survey.

Overall, the data suggest substantial interregional differences in training needs. Until now, this picture has been incomplete; disparate assessments across health departments, Regions, and disciplines could not be rolled up into a combined national picture of training needs.²⁹ Furthermore, the literature has well documented that the majority of professionals working in public health do not have a public health degree.^{30,31} This makes the availability of relevant, applicable, on-the-job continuing education critical. With Regionally focused public health training centers—partnering with community-level partners and convened as a national consortium through the Public Health Learning Network, the United States has an unprecedented opportunity to build capacity

TABLE 3

Local Public Health Staff With at Least 1 Gap Within Select Strategic Skills Domain by Supervisory Tier^a

Tier	Budgeting and Financial Management	Change Management	Systems and Strategic Thinking
Regions 1 and 2			
Nonsupervisor	52% (48%-57%)	35% (15%-55%)	48% (42%-54%)
Supervisor/manager	37% (6%-68%)	44% (26%-63%)	31% (0%-76%)
Executive	45% (20%-70%)	26% (0%-53%)	49% (33%-65%)
Region 3			
Nonsupervisor	57% (54%-60%)	44% (41%-47%)	48% (46%-51%)
Supervisor/manager	61% (55%-68%)	48% (38%-57%)	61% (54%-69%)
Executive	41% (26%-57%)	26% (3%-49%)	58% (44%-72%)
Region 4			
Nonsupervisor	52% (51%-54%)	42% (41%-43%)	42% (39%-44%)
Supervisor/manager	56% (55%-57%)	44% (41%-47%)	56% (54%-58%)
Executive	45% (38%-51%)	35% (18%-51%)	50% (34%-67%)
Region 5			
Nonsupervisor	60% (55%-65%)	51% (42%-61%)	53% (41%-65%)
Supervisor/manager	76% (62%-91%)	58% (44%-72%)	68% (58%-78%)
Executive	52% (26%-78%)	23% (9%-38%)	38% (8%-68%)
Region 6			
Nonsupervisor	54% (48%-61%)	45% (39%-50%)	42% (38%-47%)
Supervisor/manager	60% (58%-61%)	47% (43%-51%)	58% (52%-64%)
Executive	36% (27%-45%)	27% (18%-36%)	36% (23%-49%)
Region 7			
Nonsupervisor	55% (34%-77%)	52% (43%-61%)	50% (26%-73%)
Supervisor/manager	51% (19%-84%)	47% (21%-74%)	56% (23%-88%)
Executive	35% (0%-86%)	29% (0%-67%)	55% (27%-84%)
Region 8			
Nonsupervisor	60% (55%-64%)	50% (48%-53%)	53% (47%-59%)
Supervisor/manager	64% (55%-74%)	50% (44%-57%)	66% (54%-77%)
Executive	58% (35%-81%)	33% (7%-60%)	61% (34%-89%)
Region 9			
Nonsupervisor	56% (53%-60%)	47% (46%-48%)	47% (42%-53%)
Supervisor/manager	59% (53%-65%)	47% (43%-50%)	58% (53%-63%)
Executive	45% (20%-70%)	35% (17%-53%)	46% (18%-74%)
Region 10			
Nonsupervisor	62% (59%-65%)	55% (49%-61%)	53% (48%-59%)
Supervisor/manager	59% (52%-67%)	44% (38%-49%)	61% (55%-66%)
Executive	46% (37%-54%)	33% (9%-57%)	49% (37%-62%)
National total			
Nonsupervisor	56% (54%-57%)	45% (42%-49%)	47% (45%-49%)
Supervisor/manager	58% (53%-64%)	48% (45%-50%)	55% (46%-64%)
Executive	45% (39%-52%)	30% (23%-37%)	48% (40%-56%)

^a Cells should be interpreted as, for example, in Region 9, 56% of local staff reported at least 1 skill gap in the Budgeting and Financial Management domain (95% confidence interval, 59%-65%).

TABLE 4
Regional Differences in Skills Gaps for Supervisors/Managers, by Setting^a

Item	SHA-CO National Mean	SHA-CO Regional Difference (Low vs High)	Local National Mean	Local Regional Difference (Low vs High)
Effective communication				
Communicate in a way that different audiences can understand	8%	6% (6% vs 12%) ^b	9%	5% (7% vs 12%)
Communicate in a way that persuades others to act	11%	5% (9% vs 14%)	12%	15% (4% vs 19%) ^b
Data for decision making				
Identify appropriate sources of data and information to assess the health of a community	17%	8% (15% vs 23%) ^b	23%	19% (12% vs 31%)
Use valid data to drive decision making	10%	4% (8% vs 12%)	15%	11% (8% vs 19%) ^b
Apply evidence-based approaches to address public health issues	14%	6% (13% vs 20%) ^b	19%	12% (15% vs 27%)
Cultural competency				
Support development of a diverse public health workforce	18%	10% (13% vs 23%) ^b	19%	18% (14% vs 32%)
Incorporate health equity and social justice principles into planning for programs and services	29%	17% (24% vs 41%) ^b	28%	24% (17% vs 41%) ^b
Implement socially, culturally, and linguistically appropriate policies, programs, and services that reflect the diversity of individuals and populations in a community	23%	10% (20% vs 30%) ^b	23%	18% (16% vs 34%) ^b
Budgeting and financial management				
Use financial analysis methods in managing programs and services	36%	15% (31% vs 46%)	46%	9% (41% vs 50%)
Identify funding mechanisms and procedures to develop sustainable funding models for programs and services	34%	6% (31% vs 37%)	46%	35% (27% vs 62%) ^b
Implement a business plan for agency programs and services	34%	17% (28% vs 44%) ^b	45%	36% (27% vs 63%) ^b
Change management				
Modify programmatic practices in consideration of internal and external changes	24%	7% (21% vs 29%) ^b	34%	11% (26% vs 37%) ^b
Assess the drivers in your environment that may influence public health programs and services	31%	9% (28% vs 37%) ^b	42%	19% (34% vs 53%) ^b
Systems and strategic thinking				
Integrate current and projected trends into strategic planning for programs and services	29%	9% (26% vs 34%) ^b	42%	11% (36% vs 48%)
Build cross-sector partnerships to address social determinants of health	29%	10% (23% vs 33%) ^b	33%	21% (20% vs 40%)
Apply quality improvement processes to improve agency programs and services	25%	3% (23% vs 27%)	31%	15% (22% vs 37%)
Implement an organizational strategic plan	32%	8% (28% vs 36%)	40%	28% (26% vs 55%)
Vision for healthy community				
Apply findings from a community health assessment or community health improvement plan to agency programs and services	30%	8% (27% vs 35%) ^b	38%	14% (32% vs 46%)
Engage community members in the design and implementation of programs to improve health in a community	30%	9% (28% vs 36%) ^b	38%	14% (32% vs 46%)
Assess how agency policies, programs, and services advance population health	32%	9% (30% vs 38%)	39%	35% (20% vs 55%) ^b
Cross-sector partnerships				
Identify and engage assets and resources that can be used to improve health in a community	30%	10% (26% vs 36%) ^b	35%	31% (18% vs 49%) ^b
Engage in collaborations within the public health system, including traditional and nontraditional partners, to improve the health of a community	25%	11% (20% vs 31%) ^b	31%	27% (15% vs 42%)

Abbreviation: SHA-CO, state health agency central office.

^a Cells should be interpreted as, for example, for communicate in a way that different audiences can understand, 9% of Local respondents nationally identified a skill gap. At the local level, there is a 5% point difference between the Region with the lowest gap compared with the highest (7% vs 12%).

^b Differences between lowest and highest Regions are statistically significant at $P < .05$

Implications for Policy & Practice

- The PH WINS data can now be used to provide Regional training needs estimates for public health workforce development, usable by state and local workforce planners alike.
- Regional organizations and practice partners may use national and Regional PH WINS training needs data to customize other assessments. Health departments can do the same when assessing training needs to create a workforce development plan.
- Use PH WINS training needs data to inspire coordination in the development of training that builds capacity in strategic skills in response to the needs identified.

in strategic skills nationwide, to connect with multiple federally funded training initiatives, and to coordinate the development and dissemination of effective continuing education opportunities that are directly applicable to the evolving needs of the public health workforce.

Limitations

This article has several limitations. First, training needs gaps are defined on the basis of self-reported data, wherein respondents indicate an importance rating and a skill rating. While self-report is the norm for this type of analysis,⁷ it nonetheless is susceptible to challenges to internal validity. Comparisons against management perspectives may be a useful triangulation point in future research, as previous research on locals suggests some discordance between staff and supervisor perception.³² Complex balanced repeated replication survey weights were used to adjust for nonresponse. However, the purposeful lack of staff from small LHDs means that these findings may not be generalizable to the nation's many smaller LHDs.²⁰

References

1. Public Health Leadership Forum. *The High Achieving Governmental Health Department in 2020 as the Community Chief Health Strategist*. Washington, DC: RESOLVE; 2014.
2. Xu J, Murphy SL, Kochanek KD, Arias E. Mortality in the United States, 2015. *NCHS Data Brief*. 2016;(267):1-8.
3. Roehrig C. Mental disorders top the list of the most costly conditions in the United States: \$201 billion. *Health Aff (Millwood)*. 2016;35(6):1130-1135.
4. Erwin PC, Brownson RC. Macro trends and the future of public health practice. *Annu Rev Public Health*. 2017;38:393-412.
5. National Consortium for Public Health Workforce Development. *Building Skills for a More Strategic Public Health Workforce: A Call to Action*. Washington, DC: Beaumont Foundation; 2017.
6. Health UDo, Services H. *Public Health 3.0: A Call to Action to Create a 21st Century Public Health Infrastructure*. Washington, DC: US Department of Health & Human Services Office of the Assistant Secretary for Health; 2016.
7. Hilliard TM, Boulton ML. Public health workforce research in review: a 25-year retrospective. *Am J Prev Med*. 2012;42(5 suppl 1):S17-S28.
8. Beck AJ, Boulton ML. Building an effective workforce: a systematic review of public health workforce literature. *Am J Prev Med*. 2012;42(5 suppl 1):S6-S16.
9. Beck AJ, Boulton ML. Trends and characteristics of the state and local public health workforce, 2010-2013. *Am J Public Health*. 2015;105(suppl 2):S303-S310.
10. Sellers K, Leider JP, Harper E, et al. The public health workforce interests and needs survey: the first national survey of state health agency employees. *J Public Health Manag Pract*. 2015;21(suppl 6):S13-S27.
11. Joly BM, Coronado F, Bickford BC, et al. A review of public health training needs assessment approaches: opportunities to move forward. *J Public Health Manag Pract*. 2018;24(6):571-577.
12. National Network of Public Health Institutes. Three public health training needs rise to the top. <https://nnphi.org/three-core-competencies-rise-to-the-top-of-the-list-of-public-health-training-needs/>. Published 2017. Accessed August 1, 2018.
13. Bigley MB. HRSA's transformation of public health training. *Public Health Rep*. 2016;131(1):4.
14. Miner K, Allan S, McKenzie JF. *Public Health Training Centers: Strategies for Preparing the Public Health Workforce*. Los Angeles, CA: SAGE Publications Sage CA; 2014.
15. Bogaert K, Castrucci B, Gould E, Rider N, Whang C, Corcoran. Top training needs of governmental public health departments. *J Public Health Manag Pract*. 2019;25(suppl 2):S134-S144.
16. Yeager VA, Wisniewski JM, Chapple-McGruder T, Castrucci B, Gould E. Public health workforce self-identified training needs by jurisdiction and job type [published online ahead of print June 21, 2018]. *J Public Health Manag Pract*. doi: 10.1097/PHH.0000000000000830.
17. Chapple-McGruder T, Leider JP, Beck AJ, et al. Examining state health agency epidemiologists and their training needs. *Ann Epidemiol*. 2017;27(2):83-88.
18. Brownson RC, Samet JM, Chavez GF, et al. Charting a future for epidemiologic training. *Ann Epidemiol*. 2015;25(6):458-465.
19. Wilcox LS, Majestic EA, Ayele M, Strasser S, Weaver SR. National survey of training needs reported by public health professionals in chronic disease programs in state, territorial, and local governments. *J Public Health Manag Pract*. 2014;20(5):481-489.
20. Leider JP, Pineau V, Bogaert K, Ma Q. The methods of PH WINS 2017: approaches to refreshing nationally-representative state-level estimates and creating nationally-representative local-level estimates of public health workforce interests and needs. *J Public Health Manag Pract*. 2019;25(suppl 2):S49-S57.
21. Health Resources & Services Administration. Regional public health training centers (PHTC) program funding opportunity number: HRSA-18-017. <https://bhvw.hrsa.gov/fundingopportunities/?id=7253f7ad-0e92-4827-aa33-fa1e36b3ba48>. Published 2017. Accessed August 1, 2018.
22. Leider JP, Bharthapudi K, Pineau V, Liu L, Harper E. The methods behind PH WINS. *J Public Health Manag Pract*. 2015;21(suppl 6):S28-S35.
23. Meit M, Sellers K, Kronstadt J, et al. Governance typology: a consensus classification of state-local health department relationships. *J Public Health Manag Pract*. 2012;18(6):520-528.
24. Leider JP, Coronado F, Beck AJ, Harper E. Reconciling supply and demand for state and local public health staff in an era of retiring baby boomers. *Am J Prev Med*. 2018;54(3):334-340.
25. National Association of County & City Health Officials. *National Profile of Local Health Departments*. Washington, DC: National Association of County & City Health Officials; 2017.
26. Association of State and Territorial Health Officials. *ASTHO Profile of Health*. Vol 4. Arlington, VA: Association of State and Territorial Health Officials; 2017.
27. DeSalvo KB, O'Carroll PW, Koo D, Auerbach JM, Monroe JA. Public health 3.0: time for an upgrade. *Am J Public Health*. 2016;106(4):621.
28. Board PHA. *Standards & Measures, Version 1.5*. Alexandria, VA: Public Health Accreditation Board; 2013.

29. Kaufman NJ, Castrucci BC, Pearsol J, et al. Thinking beyond the silos: emerging priorities in workforce development for state and local government public health agencies. *J Public Health Manag Pract.* 2014;20(6):557-565.
30. Leider JP, Harper E, Bharthapudi K, Castrucci BC. Educational attainment of the public health workforce and its implications for workforce development. *J Public Health Manag Pract.* 2015;21(suppl 6):S56-S68.
31. Gebbie KM, Rosenstock L, Hernandez LM. *Who Will Keep the Public Healthy?: Educating Public Health Professionals for the 21st Century.* Washington, DC: The National Academies Press; 2002.
32. Ye J, Leep C, Robin N, Newman S. Perception of workforce skills needed among public health professionals in local health departments: staff versus top executives. *J Public Health Manag Pract.* 2015;21(suppl 6):S151-S158.