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Rising to Meet the Moment: What Does the Public Health Workforce Need to Modernize?

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ABSTRACT

Objective: This study uses findings from the most recent iterations of the Public Health Workforce Interest and Needs Survey (PH WINS) to describe importance, skill level, and gaps of key public health competencies as well as characteristics associated with gaps.

Design: Repeated cross-sectional analysis of the 2017 and 2021 PH WINS data.

Setting: State and local health departments.

Participants: Nationally representative population of state and local governmental public health workers.

Main Outcome Measures: Gaps of key public health competencies related to data, evidence-based approaches, health equity and social justice, factors that affect public health, cross-sectoral partnerships, and community health assessments and improvement plans. Gaps reflect areas of high importance and low skill level. Differences in gaps among the traditional public health workforce and those hired specifically for COVID-19 response.

Results: For most competency areas, more than 20% of the public health workforce perceived a gap. Gaps related to environmental factors that affect public health, social determinants of health and cross-sector partnerships, and community health assessments and improvement plans were the largest. Tenure in public health practice, highest level of education, and having formal public health training were associated with lower odds of gaps in most areas. In a secondary analysis of traditional public health workforce compared with those hired specifically for COVID-19 response, those hired for COVID-19 response reported significantly fewer gaps for all but one competency considered.

Conclusions: A substantial proportion of the public health workforce perceives gaps in competency areas that are of high importance to the evolving role of public health. As public health continues to adjust and modernize in response to the COVID-19 pandemic and other historic changes, understanding and addressing training needs of the workforce will be instrumental to public health's ability to respond to the needs of the public.

KEY WORDS: COVID-19, PH WINS, public health practice, training, workforce, workforce development

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Public health needs in the United States are wide ranging and so too is the potential for positive impact through tailoring public health services to meet changing needs of the population. Recent efforts including Public Health 3.0, Healthy People, and others present new goals and an updated role for public health.[1-4] These efforts focus on modernizing public health to include roles focused on social determinants of health and collaborating with other sectors to improve population health, for example. These goals represent a shift toward a more integrated approach that requires public health to establish cross-sector partnerships, utilize timely data, and effectively communicate in order to improve the health of the public. Furthermore, the COVID-19 pandemic has highlighted the need for the field of public health to adapt quickly to meet demands for timely,

culturally competent services, information, and relevant data.[5] For public health to be adaptable and achieve the goal of improved well-being of the public, the workforce must have extensive skill sets, diverse backgrounds, and ample training.[6] Because of the changing landscape and needs of public health both before and during the COVID-19 pandemic, it is important to describe competencies and training gaps of the workforce to meet the current and future needs of the public.

The Public Health Workforce Interests and Needs Survey (PH WINS), a national survey of the public health workforce beginning in 2014, provides the ability to monitor and assess the current skills as well as training needs of the state and local public health workforce.[7,8] The 2014 administration of PH WINS provided the first national perspective of state-level workforce attitudes and needs, including a focus on training.[9] Since then, PH WINS has regularly assessed skill level and the importance of various skills in the ever-changing workforce. Studies utilizing previous PH WINS data found that some of the largest training needs in the public health workforce are budgeting and fiscal management, systems and strategic thinking, and data and informatics.[10-12] Additional studies emphasized the importance of motivations, such as funding, and designated time for travel to training, as well as regionally focused training.[12,13] Findings from previous studies of PH WINS data, such as these, are important in understanding the workforce at its current state, measuring changes over time, and focusing on emerging areas of focus for public health such as social determinants of health, cross-sectoral collaborations, use of data, and delivering culturally competent services. With the addition of the third fielding of PH WINS in 2021 during the COVID-19 pandemic, it is important to provide an update on the changing and emerging needs of the workforce.

The purpose of the current study was to describe the governmental public health workforce perceptions of their skills and gaps to meet the changing needs of the public. To characterize workforce skills and gaps, we use a repeated cross-sectional analysis of the most recent 2 iterations of national PH WINS data from 2017 and 2021. We present perceptions of importance of various competencies, current skill level, and gaps between high importance but low skill level by year, supervisory status, demographic characteristics, and experience of the workforce. Findings from this study will be of interest to training organizations, such as regional training centers and colleges of public health. Furthermore, state and local public health departments can benefit from assessing the training needs of their workforce now and in the future. Similarly, policy makers can benefit from information described in this study, as federal, state, and local governments continue to assess public health budgets and funding needs to create a diverse and well-trained workforce.

Methods

Study design and population studied

This study utilizes a repeated cross-sectional analysis of data from the 2017 and 2021 administrations of PH WINS to assess importance, skills, and gaps related to various competencies. Administered by the de Beaumont Foundation, PH WINS collects nationally representative data on the public health workforce. The current study includes focuses on the subset of individuals who responded to PH WINS in either 2017 or 2021 from state and local public health agencies and who are permanent staff and were not hired specifically for COVID-19 response. In secondary analyses focused on training gaps during the COVID-19 pandemic, we focus only on 2021 respondents who are permanent staff in state or local agencies not hired specifically for COVID-19 response (referred to as "traditional workforce") as compared with those who were hired specifically for COVID-19 response.

Outcomes

Primary outcomes focus on core competencies for public health professions that are adjusted to the supervisory tier of the individual responding to the survey. In total, there were 21 competencies that were assessed in both the 2017 and 2021 administrations of the survey (competencies by tier with their abbreviation can be found in Supplemental Digital Content Table A1, available at http://links.lww.com/JPHMP/B48). Seven priority competencies of high relevance to the modern public health workforce were specifically identified and are of primary focus. These were selected on the basis of emerging focus areas for public health prioritized in Healthy People, Public Health 3.0, public health modernization efforts, and the COVID-19 pandemic. These include competencies related to data collection and use, evidence-based approaches, health equity and social justice principles, drivers of health, social determinants of health, and community health assessments and health improvement plans. While the results and analyses focus on these 7 competency areas, findings related to the remaining competencies can be found in the Digital Appendix (see Supplemental Digital Content Tables A2-A4, available at http://links.lww.com/JPHMP/B49 and Table A6, available at http://links.lww.com/JPHMP/B51).

The language of the competencies is tailored to be relevant to the respondent based on their supervisory tier. For example, nonsupervisors (tier 1) are asked to reflect on "Collect[ing] valid data for use in decision making," while supervisors and managers (tier 2) as well as executives (tier 3) are asked to reflect on "us[ing] data to drive decision making." Full competency language for each of the tiers can be found in the Supplemental Materials (see Supplemental Digital Content Table 1, available at http://links.lww.com/JPHMP/B48).

For each competency, we consider self-rated importance, skill level, and gaps. Importance is assessed on a 4-point Likert scale of how important the item is in their day-to-day work from "not important" to "very important." Skill level is assessed on a 4-point Likert scale from "unable to perform" to "expert" or "not applicable." Gaps are identified when an individual rates the importance of a competency as high importance (somewhat or very important) and low skill (unable to perform or beginner).

Independent variables

Independent variables include demographic characteristics, training and experience, and characteristics of the individual's current position.

Demographic characteristics include gender (identify as a man, woman, some other way) and race and ethnicity (American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or other Pacific Islander, 2 or more races, White). As the providers of foundational public health services for diverse communities, understanding the racial and ethnic demographics of the public health workforce is critical. This information can help government agencies and partner organizations understand the many identities and experiences that governmental public health employees bring to their work. It can also help federal, state, and local agencies support and train the public health workforce to meet the needs of the diverse communities they serve.

Training and experience include tenure in public health (0-5 years, 6-10 years, 11-15 years, 16-20 years, ≥21 years), highest degree attained (no college, associate degree, bachelor's degree, master's degree, doctoral degree), and an indicator for having a formal degree in public health at any level.

Characteristics of the current position include supervisory tier (nonsupervisor, supervisor or manager, executive), employment status (contractor, permanent staff), an indicator for being in a union or bargaining unit position, setting (state or local), job classification category (public health sciences, administrative, clinical and laboratory, social services, and all other), and year of the survey (2017 or 2021).

Analyses

First, we present trends and changes in competency gaps by supervisory tier for each of the 7 competencies. Next, we present logistic regressions for the presence of a gap in each of competencies as a function of demographic, background, and current position characteristics. Regression analyses combined all supervisory tiers into models for each competency area.

We then focus on the 2021 respondents to compare the "traditional" public health workforce with those hired specifically for COVID-19 response. First, we present bivariate comparisons of 2021 competency gaps for "traditional" public health workforce as compared with those hired specifically for COVID-19 response. Because of the theoretical differences in those hired for COVID-19 response, we also decompose gaps into perceived importance and skill and present bivariate comparisons, which are presented in the Digital Appendix. Finally, we present similar logistic regression models as described previously but with the primary indicator of hired for COVID-19 response or not. All findings and analyses were conducted and are presented with nationally representative survey weights.

Results

Our primary analyses included 79 065 individuals eligible for our sample who responded to either the 2017 or 2021 survey, representing a weighted sample size of 341 459 public health workers. Descriptive characteristics of respondents for each of the iterations of PH WINS have been described elsewhere.[14,15]

Between 6.9% and 41.7% of individuals reported gaps in competencies, and there was little consistency in changes over time where gaps for some competencies and supervisory tiers increased while others decreased (Table 1). In general, gaps were more frequently reported among lower supervisory tiers. Among nonsupervisors, the most common gap was related to community health assessment and improvement plans (39.1% in 2021). For supervisors and managers, environmental drivers that affect public health was the most commonly reported gap area (37.0% in 2021). For executives, social determinants of health, cross-sector partnerships, and related policies were the most commonly reported gaps (37.5% in 2021). Among all supervisory tiers, the least commonly reported gap was related to valid data for decision making (14.7% for nonsupervisors, 12.5% for supervisors/managers, and 6.8% for executives in 2021). The changes for each competency and supervisory tier represent the percent change from 2017 to 2021. For example, gaps related to valid data for

TABLE 1								
Percentage of Respondents With Gaps by Competency, Tier, and Year[a]								
	Nonsupervisor			Supervisor/Manager			Executive		
Competency	**2017**	**2021**	**% Change**	**2017**	**2021**	**% Change**	**2017**	**2021**	**% Change**
Appropriate sources of data for assessing health	21.3%	21.4%	0.5%	21.4%	20.8%	− 2.8%	15.4%	12.9%	− 16.2%
Valid data for decision making	13.8%	14.7%	6.5%	13.0%	12.5%	− 3.8%	6.9%	6.8%	− 1.4%
Evidence-based approaches	21.7%	20.1%	− 7.4%	17.5%	15.2%	− 13.1%	14.2%	13.1%	− 7.7%
Health equity and social justice principles	25.3%	26.2%	3.6%	28.4%	31.8%	12.0%	25.4%	30.7%	20.9%
Environmental drivers that affect public health	33.9%	35.4%	4.4%	38.0%	37.0%	− 2.6%	25.1%	25.7%	2.4%
Social determinants of health, cross-sector partnerships, and related policies	29.1%	26.5%	− 8.9%	31.6%	32.5%	2.8%	32.9%	37.5%	14.0%
Community health assessment and improvement plans	41.7%	39.1%	− 6.2%	35.7%	33.8%	− 5.3%	19.8%	22.4%	13.1%

[a] Percent change reported is the percent change from 2017 to 2021 and is not a percentage point change. For example, gaps for valid data for decision making among nonsupervisors increased from 13.8% in 2017 to 14.7% in 2021. The 2021 rate is a 6.5% increase from the 2017 rate.

decision making among nonsupervisors increased 6.5% from 13.8% in 2017 to 14.7% in 2021. Additional detail on the frequency of importance, skill ratings, and gaps by supervisory tier, year, and competency area can be found in the Digital Appendix (see Supplemental Digital Content Tables A2-A4, available at http://links.lww.com/JPHMP/B49).

Results from regression models estimated characteristics associated with gaps in each competency area and were similar across competency areas (Table 2). After controlling for demographic, training, and position characteristics, greater odds in presence of a gap were found among those who identified as women as compared with men, individuals who are Asian as compared with White, supervisors and managers as compared with nonsupervisors, and those in clinical and laboratory positions as compared with public health sciences. For example, women were 1.27 times as likely to have a gap related to data for assessing health as compared with men ($P < .001$). Odds of gaps were generally inversely related to tenure in public health practice and higher levels of education. For most competencies, supervisors/managers were more likely to report a gap than nonsupervisors. Gaps reported by executives as compared with nonsupervisors were mixed in terms of direction and significance. For example, executives were significantly more likely to report a gap related to social determinants of health, cross-sector partnerships, and related policies than nonsupervisors but significantly less likely to report a gap related to valid data for decision making.

COVID-19 workforce comparisons

Supplemental analyses compared 2021 responses from the traditional workforce and those hired specifically for COVID-19 response. This sample included 37 960 responses representing a weighted sample size of 172 650. These analyses identified significantly fewer gaps among those hired for COVID-19 response for all of the competency areas of interest, aside from use of evidence-based approaches (Table 3). The largest magnitude difference in reported gaps was related to social determinants of health, cross-sector partnerships, and related policies (28.6% of the traditional workforce, 20.5% of the COVID-19 response workforce, $P < .001$). Differences in importance and skill level for each of these competencies between the traditional workforce and the COVID-19 response workforce can be found in the Digital Appendix (see Supplemental Digital Content Table A5, available at http://links.lww.com/JPHMP/B50).

Logistic regression analyses estimated that COVID-19 response workers were at significantly lower odds of having gaps in 4 of the 7 competency areas than the traditional public health workforce, even after controlling for demographic, background, and current position characteristics. These included evidence-based approaches; environmental drivers that affect public health; social determinants of health, cross-sector partnerships, and related policies; and community health assessment and improvement plans. Full regression results for each of these models can be found in the Digital Appendix (see Supplemental

TABLE 2
Multivariate Regression Results: 2017-2021 Gap Regression Models[a]

	Appropriate Sources of Data for Assessing Health	Valid Data for Decision Making	Evidence-Based Approaches	Health Equity and Social Justice Principles	Environmental Drivers That Affect Public Health	Social Determinants of Health, Cross-sector Partnerships, and Related Policies	Community Health Assessment and Improvement Plans
Gender							
Male	ref	ref	ref	ref	ref	ref	ref
Female	1.27***	1.60***	1.12	1.25***	1.49***	1.15**	1.17**
Other	1.09	1.45*	1.03	1.11	1.13	1.07	0.96
Race and ethnicity							
American Indian or Alaska Native	0.87	0.98	1.11	0.91	0.84	0.74	1.07
Asian	1.14	1.18*	1.20***	1.07	1.36***	1.51***	1.38***
Black or African American	0.85*	0.94	1.13	0.68***	0.86**	0.86**	1.05
Hispanic or Latino	0.96	1.10	1.07	0.81***	1.03	1.00	1.01
Native Hawaiian or other Pacific Islander	1.04	1.23	1.12	1.16	0.84	0.89	0.92
White	ref	ref	ref	ref	ref	ref	ref
≥2 races	0.74*	0.92	0.83	0.64**	1.14	0.86	1.28
Tenure in public health							
0-5 y	ref	ref	ref	ref	ref	ref	ref
6-10 y	0.68***	0.74***	0.64***	0.81***	0.78***	0.82***	0.78***
11-15 y	0.64***	0.73***	0.67***	0.83*	0.87	0.73***	0.88
16-20 y	0.52***	0.60***	0.65**	0.74***	0.69***	0.72***	0.79**
≥21 y	0.59***	0.64***	0.54***	0.73***	0.71***	0.72***	0.71***
Highest level of education							
No college degree	ref	ref	ref	ref	ref	ref	ref
Associate degree	0.90*	0.76***	0.84**	0.82***	0.88	0.87*	0.83**
Bachelor's degree	0.98	0.97	0.84***	0.96	0.98	0.75***	0.92
Master's degree	0.70***	0.77**	0.54***	0.74**	0.73***	0.49***	0.60***
Doctoral degree	0.46***	0.47***	0.31***	0.60***	0.62***	0.45***	0.55***
Formal PH training	0.60***	0.73***	0.61***	1.05	1.01	0.77***	0.77***

(*continues*)

TABLE 2
Multivariate Regression Results: 2017-2021 Gap Regression Models[a] (*Continued*)

	Appropriate Sources of Data for Assessing Health	Valid Data for Decision Making	Evidence-Based Approaches	Health Equity and Social Justice Principles	Environmental Drivers That Affect Public Health	Social Determinants of Health, Cross-sector Partnerships, and Related Policies	Community Health Assessment and Improvement Plans
Position type							
Permanent staff employed directly by the health department	ref	ref	ref	ref	ref	ref	ref
Contractor providing third party services to the health department	0.52	0.56	0.93	0.65**	0.93	0.72	0.81*
Bargaining unit/union	1.03	1.07	1.12	0.96	1.04	1.01	1.02
Supervisory tier							
Nonsupervisors	ref	ref	ref	ref	ref	ref	ref
Supervisors and managers	1.30***	1.14*	1.02	1.41***	1.35***	1.64***	0.97
Executives	1.00	0.73*	1.08	1.37***	0.95	2.25***	0.59***
Setting							
SHA-CO	ref	ref	ref	ref	ref	ref	ref
Local	1.13*	1.16**	1.06	0.89*	1.18***	0.98	1.11**
Position category							
Public health sciences	ref	ref	ref	ref	ref	ref	ref
Administrative	1.09	0.99	1.25**	1.06	1.10	1.24***	1.14*
Clinical and laboratory	1.19*	1.21***	1.01	0.97	1.40***	1.28***	1.36***
Social services and all other	1.41**	1.44**	1.24**	0.67***	1.09	1.03	1.30***
Year							
2017	ref	ref	ref	ref	ref	ref	ref
2021	0.99	1.01	0.92	1.11	1.06	0.96	0.94

Abbreviation: SHA-CO, State Health Agency-Central Office.

[a] Each column represents a unique, survey-weighted logistic regression model a binary indicator of a gap in that competency area as the outcome. Odds ratios are presented in the table. *P < .05, **P < .01, ***P < .001.

TABLE 3					
Competency Gaps for 2021 Traditional and COVID-19 Response Workforce[a]					
	Percentage With Gaps			**Logistic Regression Results**	
	Traditional Workforce	**COVID Workforce**	**Unadjusted P Value**	**Odds Ratio (COVID vs Traditional Workforce)**	**Adjusted P Value**
Appropriate sources of data for assessing health	21.0%	17.7%	.02	0.80	.11
Valid data for decision making	13.8%	10.9%	.01	0.76	.11
Evidence-based approaches	18.4%	17.5%	.45	0.81	.45
Health equity and social justice principles	28.0%	22.7%	.001	0.85	.09
Environmental drivers that affect public health	35.5%	29.2%	<.001	0.71	<.001
Social determinants of health, cross-sector partnerships, and related policies	28.6%	20.5%	<.001	0.70	.02
Community health assessment and improvement plans	26.9%	31.4%	.002	0.76	.02

[a]Percent gaps are reflective of an individual reporting high importance and low skill level. All results are survey weighted to be nationally representative. The "unadjusted P value" column shows results from the bivariate comparison of gaps between the traditional and COVID-19 workforce. Results from logistic regression models are also included with individual models included for each of the competency areas. The odds ratio presented is from the indicator of COVID-19 response workforce as compared with the traditional workforce. An odds ratio less than 1 indicates lower odds of a gap in that competency area. The "adjusted P value" column shows the significance of this indicator from the logistic regression models. These models include all of the characteristics included in Table 2 aside from year. Full regression results for each of these models can be found in the Digital Appendix (see Supplemental Digital Content Table A6, available at http:// links.lww.com/ JPHMP/ B51).

Digital Content Table A6, available at http://links.lww.com/JPHMP/B51).

Discussion

In the past few decades, public health has been forced to respond to significant changes in the US health care system including implementation of the Affordable Care Act, emergencies including natural disasters and 9/11, civil unrest, and the unprecedented COVID-19 pandemic.[5,16] Collectively, these have changed the needs of the public and the role of public health. Modernizing public health will require new and different areas of expertise than those that are historically required, including the need for improved use of data, recognizing the importance of health equity and social justice, and the ability of public health to collaborate across sectors to meet the needs of their communities. This study focused on the perceived skills, importance, and gaps of the current public health workforce regarding many of these crucial areas. Understanding the current workforce perceptions of these competencies will be critical for training the current workforce and the next generation of public health workers in order to meet the current and arising public health needs.

We find areas with significant gaps in the workforce's skills in areas they identify as important, especially related to where at least 20% of the workforce reported gaps in most of the competencies assessed, with a few competencies exhibiting gaps among more than 40% of the workforce. In addition, we found differences in gaps by setting, position type, education, and experience in public health. These associations with gaps may provide a direction for targeting training to the workforce at large. In addition, previous evidence from the 2017 PH WINS results shed light on what motivates individuals in the field to seek training.[13] Specifically, most individuals are responsive to organizational pressure, compensation or incentives, and personal growth. To the extent that agencies can identify appropriate and effective training and provide necessary support for individuals to receive that training, these significant gaps in competencies may be reduced.

We also find that there are several important characteristics associated with lower odds of perceived gaps, including tenure of public health, higher levels of education, and having formal training in public health. In addition, tenure and level of education specifically exhibit a stead dose-response type of relationship where with each increase in tenure in public health and level of education there is a decrease in odds of perceiving a gap. Previous iterations of PH WINS have identified significant proportions of the workforce with intentions to leave the field.[14,17] The COVID-19 pandemic has also led to novel stressors, harassment, and increased burnout of the workforce,

which may exacerbate this phenomenon.[18,19] Given the role of experience in competency level, significant turnover in the field may result in substantial losses in institutional knowledge and public health expertise. This also underscores the importance of training the incoming public health workforce in these areas of importance.

The COVID-19 pandemic has brought widespread changes to the health care and public health landscape. Importantly, we find that individuals hired specifically to respond to the COVID-19 emergency reported fewer gaps in many of the key competency areas than those hired either prior to the pandemic or during but not primarily for COVID-19 response. There may be several possible explanations for this, although we are unable to assess which of these may be driving these differences. It is possible that those hired to respond are more recently trained and more likely to have formal public health training and therefore may be more prepared in the key competency areas. Another possibility is that public health in general has been more effective in recruiting the right people to the right positions. Historically, there have been barriers to hiring and recruiting into governmental public health, which has resulted in many public health graduates not entering governmental public health.[20,21] Another possibility is that those hired for COVID-19 response workers may be more likely to report high skill level or less likely to report various competencies of high importance to their jobs, therefore resulting in a lower prevalence of gaps. However, unadjusted comparisons of skill level and importance for these competencies have mixed results. Preliminary analyses of these data do show that those who were hired in COVID-19 response roles were more likely both to have more recently entered the field and to have formal public health training; however, logistic regression analyses controlled for these factors and lower gaps among the COVID-19 response workers remained significantly lower in many competency areas. Separately, the combination of the economic changes, especially those early on in the pandemic, and possible changes in hiring practices in order to staff public health during the pandemic may have made the pipeline into public health more seamless. Further research is warranted to better understand this important workforce, if they plan to stay, and what drove them to join the field.

This study presents findings that are relevant to the public health workforce in response to the changing demands on public health; however, it is not without limitations. First, gaps are defined by a combination of perceived high importance and low skill level. These are subjective perceptions of survey participants and do not reflect objectively assessed gaps in competencies. There may be unobserved factors we do not control for in regression models that are correlated with rating of skill level, importance, and resulting gaps that we cannot adjust for. Objective assessments of importance, skill level, and gaps may also be warranted to inform more targeted training efforts within agencies, states, or programs that train public health workers, but this study may provide direction in terms of focus areas. Second, the survey is a nationally representative sample of the public health workforce in both 2017 and 2021 working in health departments with a staff of at least 25 or serving a population of at least 25 000. Because of this, the training needs of individuals from small health departments are not reflected in this study and may be different from those of the workforce serving larger jurisdictions. Third, there may be variations in training needs across jurisdictions, regions, and agency type. We are unable to control for those characteristics in this analysis. Finally, survey results are from before and during the COVID-19 pandemic; however, because of the study design, we are unable to derive causality of the pandemic on training needs.

The COVID-19 pandemic has brought attention to the importance of public health and has also shed light on gaps in infrastructure, training, capacity, and funding.[5,22] The recognition of the role public health plays in ensuring the health, safety, and well-being of the population, several funding and legislative efforts have been suggested to improve public health infrastructure, including building capacity and skills of the workforce.[23-25] Findings from this study may inform targeted areas for training the current workforce and the next generation of public health workers. In addition to previous analyses of PH WINS data, this

Implications for Policy & Practice

■ Much of the public health workforce perceives gaps in competencies in key areas including using data, the role of health equity and social justice, factors that affect public health, cross-sectoral partnerships to affect social determinants of health, and community health assessments and improvement plans.

■ Having formal public health training, higher levels of education, and tenure in public health practice are associated with lower odds of gaps.

■ Findings from this study may inform areas to develop trainings and capacity of the workforce to address the changing needs of the public and to meet the evolving role of public health.

study may help the field to understand whether gaps are increasing or decreasing over time as the needs of public health and backgrounds of the workforce evolve. Finally, input from the workforce in this round of PH WINS reflects an unprecedented time in public health when the field is facing an ongoing global pandemic, a great deal of public attention and scrutiny, and an influx of new workers. These pressures may have affected what the workforce looks like, needs, and wants in order to continue moving public health forward to protect the public's health. Building capacity of the workforce to be able to address emergencies, collect and utilize reliable data, understand the role of public health in health equity and social justice, and work across sectors may help public health to meet the evolving needs of the public.

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