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The Public Health Workforce Interests and Needs Survey: The First National Survey of State Health Agency Employees

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Context: Public health practitioners, policy makers, and researchers alike have called for more data on individual worker's perceptions about workplace environment, job satisfaction, and training needs for a quarter of a century. The Public Health Workforce Interests and Needs Survey (PH WINS) was created to answer that call. **Objective:** Characterize key components of the public health workforce, including demographics, workplace environment, perceptions about national trends, and perceived training needs. **Design:** A nationally representative survey of central office employees at state health agencies (SHAs) was conducted in 2014. Approximately 25 000 e-mail invitations to a Web-based survey were sent out to public health staff in 37 states, based on a stratified sampling approach. Balanced repeated replication weights were used to account for the complex sampling design. **Setting and Participants:** A total of 10 246 permanently employed SHA central office employees participated in PH WINS (46% response rate). **Main Outcome Measures:** Perceptions about training needs; workplace environment and job satisfaction; national initiatives and trends; and demographics. **Results:** Although the majority of staff said they were somewhat or very satisfied with their job (79%; 95% confidence interval [CI], 78-80), as well as their organization (65%; 95% CI, 64-66), more than 42% (95% CI, 41-43) were considering leaving their organization in the next year or retiring before 2020; 4% of those were considering leaving for another job elsewhere in governmental public health. The majority of public health staff at SHA central offices are female (72%; 95% CI, 71-73), non-Hispanic white (70%; 95% CI, 69-71), and older than 40 years (73%; 95% CI, 72-74). The greatest training needs include influencing policy development, preparing a budget, and training related to the social determinants of health. **Conclusions:** PH WINS represents the first nationally representative survey of SHA employees. It holds significant potential to help answer previously unaddressed questions in public health workforce research and provides actionable findings for SHA leaders.

KEY WORDS: public health workforce, Public Health Workforce Interests and Needs Survey (PH WINS), state health agencies, workforce development

The majority of the public health literature focuses on describing disease; identifying physical, social, and environmental correlates of disease; evaluating programmatic interventions; and reporting study results. Significantly less effort has focused on understanding the dynamics of the public health workforce—those who influence the entire public health system by

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cultivating and curating the necessary inputs and processes through which population outcomes are achieved.[1] Woltring and Novick commented that "the workforce is the most essential element in our collective efforts in assuring the public health."[2(p438)] To ensure that the public health workforce has the necessary capacities and skills to meet current and future population health challenges, public health practitioners and leaders in the field of public health workforce research have been calling for better data on the public health workforce for decades.[3-10]

Previous literature focuses on describing the size and composition of the workforce,[3,5,10,11] identifying competencies and training needs,[4,6,12-16] and supporting the need for improved recruitment and retention.[1,2,11,17] Gebbie and Merrill's[5] seminal workforce enumeration study provided more information on the size and composition of the workforce than the field had seen before. However, this study did not include any information on gender, age, education, ethnicity, or functional roles.[9] Subsequent enumeration updates[12] lacked information on these topics. A characterization of the Centers for Disease Control and Prevention's workforce was recently completed alongside the annually administered Federal Employee Viewpoint Survey. While comparable workforce characteristic estimates among state health agencies (SHAs) nationwide do exist,[13] national data on perceptions around job satisfaction and staff perceptions do not. A 25-year systematic review of the public health workforce literature lamented that "the literature on public health workforce diversity was meager"[14] despite the prioritization of workforce development by federal agencies and major policy initiatives, such as *Healthy People*.[18] This is in contrast to more robust literature in other fields, public and private,[11,15,16,19-25] where workforce development has been consistently recognized as a core need.[26-33]

The literature on the training needs of the public health workforce is more expansive and identifies certain topics repeatedly. Multiple authors contend that the managerial, leadership, and policy development skills of the public health workforce are all in need of improvement.[8,34] The Institute of Medicine (now National Academy of Medicine, [NAM]) identified 8 emerging areas in need of competency development: informatics, communications, community-based participatory research, global health, ethics, genomics, cultural competency, and policy and law.[35] Multiple other efforts have defined competencies for public health generally[36] and for specific disciplines (eg, epidemiology, public health nursing, or preparedness) or specific degree types (eg, master of public health).[37-42] While the list of competencies and training needs is robust, it is without clear prioritization. This remains a critical gap in workforce development.

Public health membership organizations have made significant contributions to workforce development through the development and implementation of various surveys. The National Association of County & City Health Officials and the Association of State and Territorial Health Officials each conduct profile surveys of their member health departments. These surveys have provided valuable insights into staffing levels, budget changes, and other important topics. These data have helped identify trends and inform policy. However, these data are collected at the agency level and cannot capture the beliefs, attitudes, opinions, and experiences of individual public health workers. Efforts to capture such data have been undertaken by the various membership groups including the Council on State and Territorial Epidemiologists and the Association of Maternal and Child Health Programs. However, different methods, time frames, and content have limited the ability to combine or compare data, and few have been published. For example, in Hilliard and Boulton's[14] 25-year systematic review of the public health workforce literature, the authors found only 1 article on job satisfaction, which was limited to public health nurses.[43]

The Public Health Workforce Interests and Needs Survey (PH WINS) fills many of the research gaps enumerated earlier. It is the first nationally representative survey to collect data from SHA workers about critical issues in today's transforming health system such as the diversity of the public health workforce, workers' ability to meet difficult challenges ahead, worker perspectives on current national trends, and aspects of the workplace environment that are likely to impact worker recruitment, retention, development, and performance. A more detailed discussion of the genesis and background of PH WINS is published concurrently in this supplement.[44] Broadly, PH WINS had 3 main goals: inform future workforce development investments, establish a baseline to evaluate future workforce development efforts, and explore workforce attitudes, morale, and climate. This article provides highlights of PH WINS, including the identification of greatest training needs, examination of staff perceptions and job satisfaction, and how well SHAs promote a culture of learning.[45] Our discussion focuses on implications of this first ever individual-level survey for workforce development and training priorities.

Methods

The Association of State and Territorial Health Officials and the de Beaumont Foundation convened a panel of survey and workforce experts to provide guidance on the development of the survey instrument and fielding

approach. The panel consisted of representatives from the Centers for Disease Control and Prevention, the Health Resources and Services Administration, the National Network of Public Health Institutes, the Public Health Foundation, the National Association of County & City Health Officials, and the Public Health Accreditation Board, as well as other experts in survey design and public health workforce development. The group agreed that the instrument should cover 4 key areas: training needs, individual worker perspectives on key national initiatives (such as quality improvement, health information exchange, and the Affordable Care Act), workplace environment (eg, morale, worker engagement, culture of learning), and demographic characteristics.

When developing the instrument, the research team sought to incorporate existing and/or validated measures when possible; the instrument drew heavily from previously used surveys, including the Centers for Disease Control and Prevention's Project Officer Survey, the 2009 Epidemiology Capacity Assessment, the Federal Employee Viewpoint Survey, the Public Health Foundation Worker Survey, and the Job in General Scale.[44] The research team drafted new questions when appropriate existing items could not be identified. The instrument adapted and used several items from Boulton and Beck's public health workforce taxonomy to ask respondents about occupational classification (see the Appendix), program area (see the Appendix), degrees and certifications, work setting, and demographics. Cognitive interviews were conducted, and the instrument was pretested with 3 groups of public health practitioners at the state and local levels. The finalized survey was administered online in fall 2014.

The complex sampling methodology for PH WINS has been outlined elsewhere.[44] Briefly, the national sampling frame of state public health employees was stratified on the basis of 5 geographic (paired HHS) regions using employee lists provided by each participating state and stratified with the state as the lowest stratum variable before selection of a random sample within each state. Participating states and paired regions are shown in Appendix Figures 3 and 4. The national sample was designed to ensure that estimates for each geographic region, each governance size, and each population-served size would have a maximum margin of error of 2.5% for a survey item estimate of 50% for SHA central office employees, as separate from those staff who work in local or regional health departments. States were given options to increase their sample size for state-level estimation or for conducting a census of their employees, allowing even more granular reporting. Because of multiple factors such as a state's workforce size and wishes of participating SHA officials for differing analytical needs, the sample for some states in the national sample was selected using a probability-based selection of the workforce whereas the sample for other states included all state public health employees as a census. This was accounted for in the complex sampling design and weighting.[44] Potential respondents were contacted directly by e-mail in line with the identified sampling approach. The survey was confidential; contact information was retained only to ascertain whether a potential respondent had indeed responded. No contact information is associated with responses in final PH WINS data sets. SHAs received aggregate reports; no identifiable information was shared.[44]

The data were weighted to account for nonresponse, and balanced repeated replication was used to adjust the variance estimates to account for complex sampling in PH WINS. More information regarding weighting methodology appears elsewhere in this supplement.[44] The research team used Stata 13 to calculate descriptive statistics and cross-tabulations for this study. The study was designated as "exempt" by the Chesapeake institutional review board (Pro00009674).

Results

Who is the public health workforce?

Across all 3 sample frames, approximately 54 000 state and local public health employees were selected for participation in PH WINS. Of these, 23 229 responded (a 44% response rate). Among central office employees (estimated at 42 000 nationally),[44] after accounting for undeliverable e-mails and individuals who confirmed they had left their position, the response rate was 46% (n = 10 246). After applying balanced repeated replication weights, descriptive statistics for the workforce were generated.

As shown in Table 1, a large majority of the workforce was female (72%; 95% confidence interval [CI], 71-73), most reported being non-Hispanic white (70%; 95% CI, 69-71), and most were older than 40 years (73%; 95% CI, 72-74). The mean age was 48.2 years and the median age was 50 years.

As shown in Table 2, just more than half (52%; 95% CI, 50-53) of SHA workers did not have supervisory or management responsibilities (see definitions in Appendix Table 2). The largest proportion of workers held public health science jobs, such as public health program managers, epidemiologists, and health educators (41%; 95% CI, 40-43), followed by administrative jobs (28%; 95% CI, 27-30). The vast majority (94%; 95% CI, 95-96) of respondents worked full-time.

Most state public health agency workers had been serving in their current position for 5 or fewer years (59%; 95% CI, 58-60). Workers had spent more time in

TABLE 1 ● Demographic Characteristics

Gender	Percent	(95% Confidence Interval)
Female	72%	(71%-73%)
Male	28%	(27%-29%)
Race/Ethnicity		
American Indian or Alaska Native	1%	(0%-1%)
Asian	5%	(4%-5%)
Black or African American	13%	(12%-14%)
Hispanic or Latino	7%	(6%-7%)
Native Hawaiian or other Pacific	0%	(0%-0%)
White	70%	(69%-71%)
Two or more races	5%	(4%-5%)
Age		
20 or below	0%	(0%-0%)
21 to 25	2%	(1%-2%)
26 to 30	6%	(6%-7%)
31 to 35	9%	(8%-10%)
36 to 40	10%	(9%-11%)
41 to 45	12%	(11%-13%)
46 to 50	14%	(12%-15%)
51 to 55	16%	(15%-17%)
56 to 60	17%	(16%-18%)
61 to 65	11%	(10%-11%)
66 to 70	3%	(2%-3%)
71 to 75	1%	(0%-1%)
76 or above	0%	(0%-0%)

the health department generally than in their current positions; 65% (95% CI, 64-66) had worked in the same health department for 6 or more years. Most workers had substantial experience in public health; 54% (95% CI, 53-55) had 11 or more years of experience in the field. Three-fourths (75%; 95% CI, 74-77) of the workforce reported a 4-year college degree, whereas 38% (95% CI, 36-40) held a master's and 9% (95% CI, 8-10) reported a doctoral degree. One-third (33%; 95% CI, 32-34) reported obtaining some sort of professional certification.

Are SHA workers satisfied with their jobs?

Figure 1 shows that SHA workers have a fairly high level of satisfaction with their jobs. A total of 79% of workers (78%-80%) report being somewhat satisfied or very satisfied with their jobs. Satisfaction with the organization for which they work is somewhat more muted; 65% (95% CI, 64-66) are somewhat satisfied or very satisfied with their organization. Satisfaction with pay is substantially lower, with only 48% being somewhat or very satisfied with pay. Almost a quarter (24%; 95%

TABLE 2 ● Workforce Characteristics

Supervisory status	Percent	(95% Confidence Interval)
Non-supervisor	52%	(50%-53%)
Team leader	15%	(14%-16%)
Supervisor	16%	(15%-17%)
Manager	13%	(12%-14%)
Executive	4%	(3%-4%)
Employed full-time	95%	(95%-96%)
Years in current position		
0-5 years	59%	(58%-60%)
6-10 years	22%	(21%-23%)
11-15 years	10%	(9%-10%)
16-20 years	5%	(4%-5%)
21 or above	5%	(4%-5%)
Years in current health department		
0-5 years	35%	(34%-36%)
6-10 years	22%	(21%-23%)
11-15 years	15%	(14%-16%)
16-20 years	10%	(9%-11%)
21 or above	18%	(17%-19%)
Years in public health		
0-5 years	25%	(24%-26%)
6-10 years	21%	(20%-22%)
11-15 years	17%	(16%-17%)
16-20 years	12%	(11%-13%)
21 or above	25%	(24%-27%)
Years in management (17% of total)		
0-5 years	32%	(28%-35%)
6-10 years	25%	(23%-28%)
11-15 years	17%	(15%-19%)
16-20 years	11%	(9%-13%)
21 or above	15%	(12%-17%)
Educational attainment		
Associates	18%	(17%-18%)
Bachelors	75%	(74%-77%)
Masters	38%	(36%-40%)
Doctoral	9%	(8%-10%)
Any formal professional certification	33%	(32%-34%)
Any degree in Public Health (any level)	17%	(16%-18%)
Job classification*		
Administrative	28%	(27%-30%)
Clinical and Lab	14%	(14%-15%)
Public Health Science	41%	(40%-43%)
Social Services and All Other	16%	(15%-17%)
Program area**		
Access	1%	(1%-1%)
Chronic Disease and Injury	3%	(2%-3%)
Communicable Disease	10%	(9%-11%)
Environmental Health	12%	(11%-12%)
Maternal and Child Health	11%	(10%-11%)
All Hazards	4%	(4%-5%)

(*continues*)

TABLE 2 ● Workforce Characteristics (*Continued*)

Supervisory status	Percent	(95% Confidence Interval)
Assessment	9%	(8%-10%)
Communications	4%	(4%-5%)
Organizational Competencies	16%	(14%-18%)
Other Health Care	3%	(2%-3%)
All Other	28%	(27%-29%)

Note: Data are shown as Point estimates of proportions as percent and (95% Confidence interval).
*Job classification was condensed from the Boulton and Beck taxonomy of job types. See Appendix for more information.
**Programmatic areas were condensed into the Foundational Areas and Foundational Capabilities from the Public Health Services model. See the Appendix for more information.

CI, 23-25) report being somewhat dissatisfied with pay, and 15% (95% CI, 14-16) are very dissatisfied.

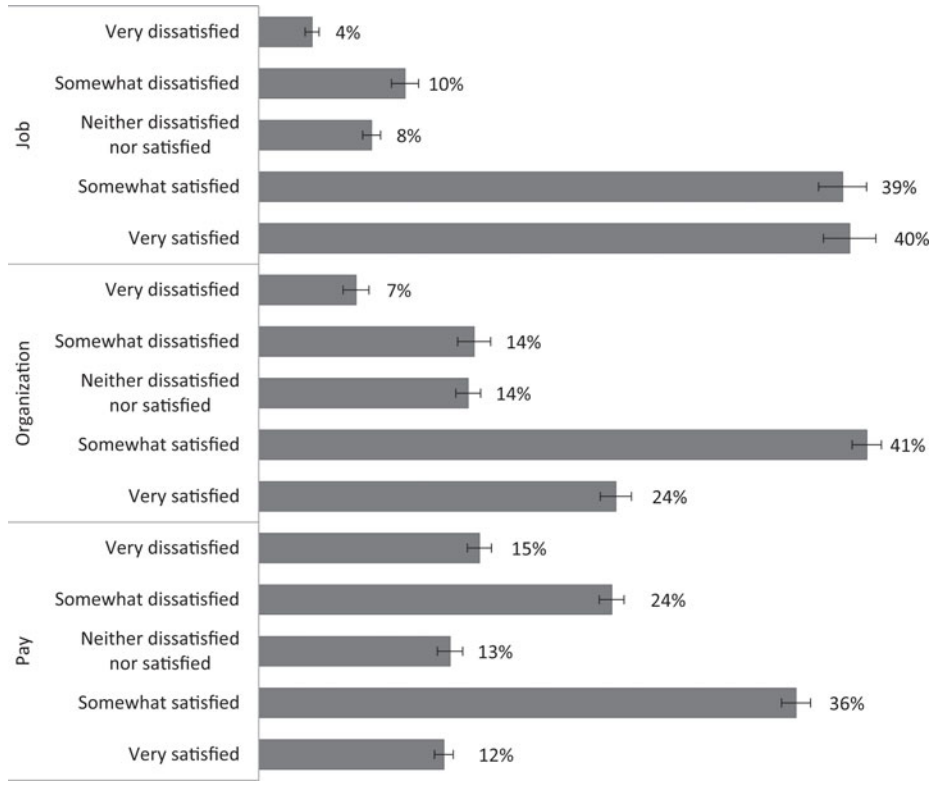
Despite this level of job satisfaction, more than a quarter (27%; 95% CI, 26-28) of the workforce plans to leave its current position in the coming year. Included in this number is the 5% (95% CI, 5-6) who intend to retire in 2015. Approximately 15% (95% CI, 14-16) plan to retire by 2020. About 5% (95% CI, 4-6) are considering leaving their job for another job in governmental public health in a different agency. If workers carry out their current plans, at least 38% will have left governmental public health by 2020.

Is there a "culture of learning" in health departments?

The vast majority of SHA workers report that they are allowed to use working hours to participate in training (92%; 95% CI, 91-92) (Table 3). Most (80%; 95% CI, 79-81) also report that the health agency provides on-site training. More than three-fourths (77%; 95% CI, 77-78) report that their employer pays for travel to and/or registration fees for trainings. Fewer (59%; 95% CI, 58-60), however, report having education and training objectives included in performance reviews. Less than a third (30%; 95% CI, 29-31) report their employer requires continuing education.

Most (82%; 95% CI, 81-83) report that employees learn from one another as they do their work, and most (71%; 95% CI, 70-72) report that supervisors support employee development. Recognition of achievement was reported to be less common (57%; 95% CI, 56-58), and only 45% (95% CI, 44-46) report having their training needs assessed. Half (50%; 95% CI, 48-51)

FIGURE 1 ● Employee Level of Satisfaction With Job, Organization, and Pay



Note: Capped bars represent 95% confidence intervals on the respective point estimates. Bars may not sum to 100% due to rounding errors.

TABLE 3 ● Employee Perceptions of Organizational Support for Workforce Development

Does Your Health Department Do Any of the Following?	Yes	(95% CI)	Please Rate Your Level of Agreement With the Following Items	Agree/Strongly Agree	(95% CI)
Require continuing education	30%	(29%-31%)	Provide recognition of achievement	57%	(56%-58%)
Include education and training objectives in performance reviews	59%	(58%-60%)	Supervisors/team leaders in my work unit support employee development	71%	(70%-72%)
Allow use of working hours to participate in training	92%	(91%-92%)	My training needs are assessed	45%	(44%-46%)
Pay travel/registration fees for trainings	77%	(77%-78%)	Employees have sufficient training to fully utilize technology needed	50%	(48%-51%)
Provide on-site training	80%	(79%-81%)	Employees learn from one another as they do their work	82%	(81%-83%)
Have staff position(s) responsible for internal training	62%	(61%-64%)			

Note: Data are shown as point estimates for response options for (Yes; Agree/Strongly Agree) as well as 95% confidence intervals.

report that employees have sufficient training to use the technology needed to do their work.

What are the important skills and training gaps in the workforce?

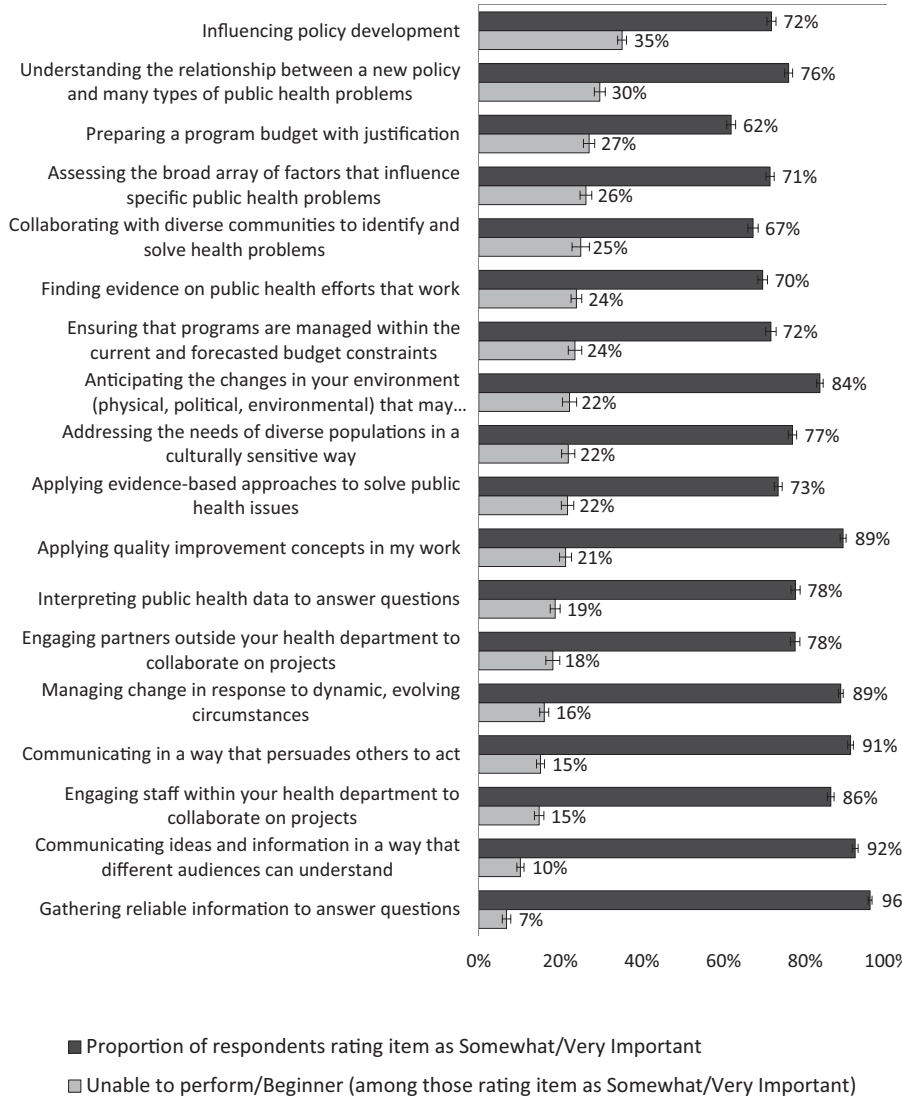
Respondents were given a list of skills and asked to rate them in terms of their importance for their current position. They were also asked to rate their level of proficiency for each skill. Figure 2 shows the list of skills, what proportion of the workforce rated the skills as "somewhat important" or "very important" in their day-to-day work, and what proportion of those workers rating the skill as "somewhat important" or "very important" also rated themselves as "unable to perform" or at a "beginner" level (termed a "competency gap"). "Influencing policy development" was reported to be somewhat or very important by 72% (95% CI, 71-73) of respondents, but 35% (95% CI, 34-36) indicate being either unable to perform this skill or having only a beginner's level of proficiency. Similarly, 62% (95% CI, 61-63) of workers consider "preparing a program budget with justification" to be important, but 27% (95% CI, 26-28%) report having a low level of skill in that area. "Understanding the relationship between a new policy and many types of health problems" was rated as important by 76% (95% CI, 75-77), but 30% (95% CI, 29-31) rate themselves as being a beginner or being unable to do this.

Workers across the United States were largely consistent in how they assessed competency gaps, with only marginal variation across the 5 paired HHS regions. Differences in these self-assessed competency gaps were observed between at least 2 paired HHS regions for 11 of the 18 training needs assessed in PH WINS (Table 4). These differences were statistically significant at $P < .05$ but rarely different by more than 2 to 3 percentage points across the paired regions. Analysis of unweighted responses within the 10 HHS regions also showed marginal differences within the 5 pairs of regions (data not shown). Within each of the 5 pairs of HHS regions (eg, comparing HHS regions 3 and 5), differences in competency gaps were 3 percentage points on average (median, 3 percentage points difference; minimum, 0 percentage points difference; maximum, 9 percentage points difference).

Is there recognition of national trends and initiatives?

Respondents were given a list of national trends, which included concise definitions, and asked to report how much they had heard about the trend, how important they thought it was, how much they thought it would impact their day-to-day work, and how much more or less emphasis they thought should be put on the trend in the future. Respondents were counted as having heard of a trend if they indicated they had heard about it "not much," "a little," or "a lot" (as opposed to "nothing at all"). The national trends results are displayed in Table 5. Respondents were most likely to have heard about "implementation of the Affordable Care Act" (92%; 95% CI, 91-93). While 85% (95% CI, 84-86) of staff who had heard of the Patient Protection and Affordable Care Act (ACA) considered it to be important to public health, this was among the least important of the trends listed. Implementation of the ACA was rated lower than most other trends in terms of impact on day-to-day work and needing more emphasis in the future. "Fostering a culture of quality improvement" was the next most common trend for workers

FIGURE 2 ● Gaps in Training Among Central Office Employees at State Health Agencies



Note: Capped bars represent margins of error on the respective point estimates.

to have heard of (83%; 95% CI, 83-84), and it was most almost universally rated as important (96%; 95% CI 95-96). Quality improvement was considered the trend to be most likely to impact day-to-day work and was second only to "leveraging electronic health information" in terms of trends needing more emphasis in the future.

"Evidence-based public health practice" and "public health and primary care integration" were recognized by approximately three-fourths of respondents and were among the most highly rated trends in terms of importance. Roughly half of respondents reported that more emphasis should be placed on these 2 trends in the future.

● Discussion

PH WINS is the first nationally representative survey of central office employees in SHAs. This survey provides a unique opportunity to learn about what workers from the front lines to the leadership teams know, think, and believe about their own training needs, the environment in which they work, and the national trends that are, to some extent, driving health system transformation. A number of the insights gained from this survey are immediately actionable for leaders wishing to develop a more robust workforce prepared to protect and promote population health in a transformed health system.

TABLE 4 ● Proportion of Staff With Self-reported Competency Gaps, by Paired HHS Region

	New England & Atlantic (HHS 1 & 2)	Mid-Atlantic & Great Lakes (HHS 3 & 5)	South (HHS 4 & 6)	Mountain/ Midwest (HHS 7 & 8)	West (HHS 9 & 10)
Communicating ideas and information in a way that different audiences can understand	12% (11%-14%)	11% (10%-12%)	8% (7%-10%)	11% (8%-13%)	11% (7%-14%)
Communicating in a way that persuades others to act	17% (15%-19%)	16% (14%-18%)	13% (11%-14%)	18% (13%-23%)	14% (13%-16%)
Collaborating with diverse communities to identify and solve health problems	27% (25%-30%)	28% (25%-31%)	22% (19%-25%)	28% (24%-31%)	24% (13%-34%)
Addressing the needs of diverse populations in a culturally sensitive way	24% (22%-26%)	26% (24%-28%)	18% (16%-20%)	30% (24%-35%)	18% (11%-25%)
Assessing the broad array of factors that influence specific public health problems	26% (24%-29%)	25% (24%-27%)	24% (23%-26%)	32% (27%-37%)	27% (20%-33%)
Understanding the relationship between a new policy and many types of public health problems	30% (27%-32%)	31% (29%-33%)	27% (26%-29%)	37% (33%-40%)	28% (22%-34%)
Engaging staff within your health department to collaborate on projects	16% (14%-18%)	15% (13%-17%)	13% (12%-14%)	18% (15%-20%)	15% (10%-20%)
Engaging partners outside your health department to collaborate on projects	21% (16%-25%)	17% (16%-18%)	17% (14%-19%)	19% (15%-23%)	19% (13%-26%)
Managing change in response to dynamic, evolving circumstances	17% (16%-19%)	18% (16%-20%)	14% (13%-16%)	18% (15%-22%)	14% (10%-18%)
Anticipating the changes in your environment (physical, political, environmental) that may influence your work	27% (25%-29%)	23% (21%-25%)	19% (15%-23%)	26% (22%-30%)	21% (16%-25%)
Gathering reliable information to answer questions	8% (7%-10%)	7% (6%-7%)	6% (5%-8%)	7% (4%-9%)	6% (1%-11%)
Interpreting public health data to answer questions	19% (16%-21%)	19% (16%-21%)	17% (16%-18%)	22% (19%-26%)	20% (15%-26%)
Finding evidence on public health efforts that work	24% (21%-26%)	23% (22%-25%)	22% (20%-24%)	32% (28%-36%)	24% (18%-29%)
Applying evidence-based approaches to solve public health issues	22% (19%-26%)	20% (18%-22%)	22% (20%-23%)	24% (20%-28%)	22% (14%-29%)
Applying quality improvement concepts in my work	23% (20%-26%)	24% (22%-26%)	19% (16%-21%)	26% (21%-30%)	19% (14%-24%)
Influencing policy development	37% (35%-40%)	38% (36%-40%)	31% (29%-33%)	43% (39%-47%)	33% (31%-35%)
Preparing a program budget with justification	25% (23%-28%)	26% (24%-29%)	27% (25%-29%)	30% (25%-36%)	28% (23%-32%)
Ensuring that programs are managed within the current and forecasted budget constraints	25% (24%-27%)	25% (22%-27%)	23% (20%-25%)	23% (20%-26%)	23% (16%-30%)

As expected, the survey showed that women are strongly disproportionally represented among public health workers. The proportion of African Americans among public health workers mirrors that of the general public. Hispanic/Latino workers, on the contrary, make up 7% of the workforce compared with 17% of the population.[46] Young adults are also represented in the workforce in markedly smaller proportion to the population, with only 8% of the workforce 30 years or younger and almost half (47%) older than 50 years. These findings are consistent with demographic characteristics previously reported by the Association of State and Territorial Health Officials.[47] Addressing the health needs of Hispanics and Latinos will be a continuing priority of SHAs as their population size continues to grow, making the recruitment of Hispanic/Latino workers a priority. And to ensure a sustainable workforce, recruitment of young adults will also be a priority.

While the workforce is largely college-educated (75% hold at least a bachelor's degree, and another 10% hold an associate's degree), only 17% have any formal training in public health. Given recent growth in the undergraduate public health major and the potential to bring these recruits in at lower price points than

TABLE 5 ● Overview of Workforce Perception of National Trends in Public Health

	Have Heard of Trend	Trend Is Somewhat/Very Important to Public Health*	Trend Will Impact My Day-to-Day Work a Fair Amount/a Great Amount*	More Emphasis Should Be Placed on This Trend in the Future*
Cross-jurisdictional sharing of public health services	72% (71%-73%)	90% (89%-92%)	51% (49%-53%)	47% (45%-49%)
Fostering a culture of quality improvement	83% (82%-84%)	96% (95%-96%)	70% (69%-72%)	55% (53%-56%)
Leveraging electronic health information	81% (81%-82%)	93% (93%-94%)	58% (57%-60%)	57% (56%-58%)
Public Health Systems and Services Research	52% (51%-54%)	85% (84%-86%)	40% (38%-42%)	33% (31%-35%)
Public health and primary care integration	74% (73%-75%)	91% (90%-91%)	49% (48%-51%)	52% (50%-54%)
Evidence-Based Public Health Practice	75% (74%-76%)	93% (92%-94%)	59% (58%-60%)	48% (46%-49%)
Health in All Policies	52% (50%-53%)	86% (85%-87%)	46% (45%-48%)	41% (39%-43%)
Implementation of the Affordable Care Act	92% (91%-93%)	85% (84%-86%)	43% (42%-44%)	40% (38%-41%)

Note: The proportion of respondents for "Have heard of trend" comprises those who indicated they had heard of the item "not much," "a little," or "a lot" (i.e., respondents saying "nothing at all" are excluded). The remaining variables have been condensed as indicated in the column heading.
*Among those who had indicated they had heard of an item "not much," "a little," or "a lot".

master's educated staff, agencies might consider targeting graduates of bachelor's in public health programs when recruiting young adults and ensure that those without public health degrees participate in basic public health science training.

The finding that 79% of workers are "very satisfied" or "somewhat satisfied" with their jobs was surprising. Given the multiple rounds of cumulative budget cuts SHAs have experienced, along with the constant change induced by health reform, technological advances, and emerging health issues, it would have been reasonable to predict that morale at SHAs would be below average. The Federal Employee Viewpoint Survey found that 64% of all federal workers and 67% of federal HHS staff are "very satisfied" or "somewhat satisfied" with their jobs. Among federal workers, 55% are somewhat or very satisfied with their organization (61% in HHS) compared with 65% among SHA central office employees.[48,49] A survey of workers from a variety of fields in both the public and private sectors found that 81% of employees were "very satisfied" or "somewhat satisfied" with their jobs.[50] Two other articles in this supplement explore worker satisfaction in more depth.[51,52]

For some time, those with an interest in monitoring the public health workforce have warned that many workers will be leaving their jobs. The proportion of workers eligible for retirement has been alarmingly high for years. Possibly because of the recession of 2007-2009, however, many who were eligible did not retire, and some who retired were subsequently rehired. But those who delayed retirement during the recession are several years older now and more likely to retire. This is the first study of the governmental public health workforce to use nationally representative data on intentions to retire, augmenting retirement eligibility data. When combined with the 13% of workers intending to leave governmental public health in the next year for reasons other than retirement, the 25% leaving to retire before 2020 contribute to a bleak forecast: at least 38% of current workers may have left public health by 2020. SHAs will be under pressure to hire new employees, train them, and retain them. Much of the institutional memory, managerial experience, and leadership experience represented by the more senior segment of the workforce will soon be gone. Despite high overall job satisfaction, leaders of SHAs need to identify subgroups with higher rates of intention to leave, determine what aspects of the job or organization are driving lower satisfaction in those subgroups, and target interventions toward improving those specific aspects. This targeted approach could help prevent some of the turnover workers are contemplating, even in the context of fairly high overall job satisfaction.

While most SHA employees have some access to training (92% are allowed to use working hours for training, 80% have on-site training available, and 77% report that the agency pays travel or registration fees for training), there is more that can be done, even without

substantial new funding for workforce development. Only 45% of workers report that their training needs are assessed, and only 59% report that the agency provides recognition of achievement. Another opportunity for improvement is in providing the training workers need to use technology and information systems needed to perform their jobs; only half of workers report having adequate training to use their technology.

SHA workers clearly communicated that they need to increase their skills, especially in the areas of policy analysis and development as well as business and financial management, echoing the National Academy of Medicine's 1998 and 2002 reports.[3,4,35] Systems thinking and working with diverse populations have also been highlighted as a potential need by other studies in recent years.[53] Likewise, workers seem eager to learn what they need to know to find "evidence on public health efforts that work" and apply "evidence-based approaches to solve public health issues." This study also found receptivity to the idea of training on "collaborating with diverse communities to identify and solve health problems" and "addressing the needs of diverse populations in a culturally sensitive way." All of these findings reinforce previous calls for crosscutting training that transcends the traditional, categorically funded silos of public health practice.[37,54]

Interestingly, workers rated the items related to persuasive communications as very important, but something they felt they already performed fairly well. Kaufman et al[54] found that public health leaders from across the entire breadth of public health practice believe that public health workers do not have well-developed skills in communicating persuasively. This may be an example of an individual worker's assessment of his or her own skills differing from that of a colleague or supervisor.

In addition to showing an interest in training in policy development, management, systems thinking, and other topics, the workforce also indicated receptivity to stronger emphasis on quality improvement, leveraging health information, and public health/health care integration. The fact that awareness of these trends was high, combined with a pervasive belief that these trends are important, means that the workforce is mentally ready to do what is needed to advance these initiatives. Public health leaders can seize this opportunity to ensure that the workforce knows what to do continuously improve quality, make the most of electronic health information, and collaborate effectively with the health care sector. On the contrary, only 52% had heard of Health in All Policies. Particularly given the strong interest in policy, public health leaders should make sure the whole public health workforce hears about the use of a Health in All Policies approach to improving both health and health equity.

Limitations

The generalizability of these findings is limited by the fact that 13 of the 50 states did not agree to participate. We used a large sample, a regional approach, and statistical weights to minimize the impact of nonparticipating states (and individuals), but this remains a limitation. We also acknowledge that many workers were concerned about the confidentiality of their responses and recognize that some may have tempered their responses (particularly in the workplace environment questions) for fear that their employers would read the concerns they expressed. Others with low levels of job or organizational satisfaction may have declined to participate because of confidentiality concerns or lack of interest. We limited this potential bias by keeping the survey anonymous and assuring all respondents that raw data would not be shared with their employers. An important consideration is that these data are a cross section of SHA central office employees during fall 2014. The results should not necessarily be generalized to local or regional health department staff. See articles by Shah and Madamala[55] and Ye et al[56] in this supplement for analyses of data from staff working in local and regional health departments. Finally, we used workers' self-assessments to measure their training needs, which likely yield different information from what an objective test of their skills or observation of their performance might yield. The workers' self-assessments, however, provide important insight into the workers' receptivity to training.

Conclusions

PH WINS fills a critical gap in the literature by asking public health workers for their own perspectives on national initiatives. Public health leaders at the national level have been working tirelessly to ensure that quality improvement becomes infused in the culture of health departments or that public health departments can harness the power of electronic health data in a meaningful way, but no one else has asked the nation's public health workers what they think of these important developments. Public health leaders have been building a vision of a transformed health system but have not asked frontline workers how such transformation will impact them. PH WINS gives public health leaders a unique opportunity to better understand the workforce they rely on to follow their lead.

These findings support a number of concrete recommendations. First, governmental public health must make a high priority of succession planning. Preserving institutional knowledge, preparing mid-level managers to lead, and retaining high-performing individuals must be key objectives of the workforce

and succession planning. SHAs also need to devise a strategy to recruit young and mid-career professionals into the field, with a particular emphasis on Hispanic/Latino staff given their underrepresentation in the workforce and the needs of the population they serve. The demographic composition of the workforce will need to be continually monitored as the demographics of the population evolve in order to ensure that the workforce is well suited to serve the diverse population of the United States.

Second, the results recommend investments in training for the existing public health workforce in policy analysis and development, business and financial management, systems thinking and social determinants of health, evidence-based public health practice, and collaborating with and engaging diverse communities. These topics are covered in the Core Competencies, which should be used to develop the curricula and evaluate the training.

Third, the workforce has heard about quality improvement, harnessing the influx of electronic health information from electronic health records and elsewhere, and integrating public health with health care, and believe these are important initiatives. Almost half of the workforce has yet to hear about using a Health in All Policies[57,58] approach to improving health and health equity. More education and training on this topic will be important.

The PH WINS data set contains a large amount of rich data on understudied topics in public health services and systems research. With repeated rounds of the survey in the future, particularly with more robust local health department participation, these data could serve to answer many of the previously unaddressed questions in public health workforce research.

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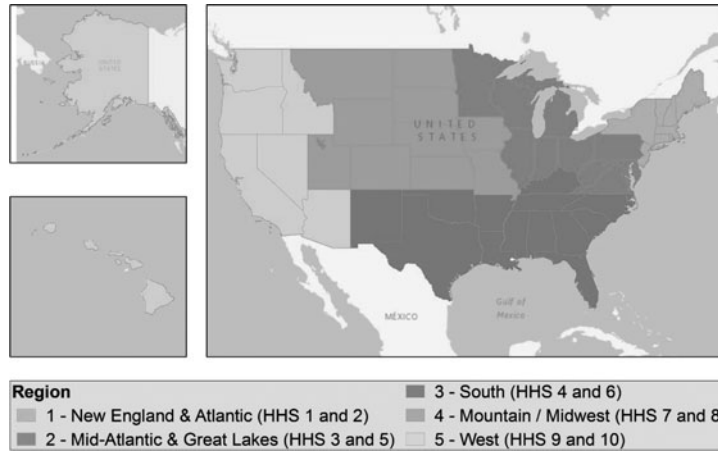
APPENDIX: Job Classification Categories

These items were collapsed from a list of job classifications respondents were asked to select as best representing their position. This includes Administration & Business Support—Accountant/Fiscal, Clerical Personnel (Administrative Assistant, Secretary), Custodian, Grant and Contracts Specialist, Health Officer, Human Resources Personnel, Information Technology Specialist, Other Facilities/Operations worker, Public Health Agency Director, Public Information Specialist; Clinical and Lab & Behavioral Health Professional, Community Health Worker, Home Health Worker, Laboratory Aide/Assistant, Laboratory Developmental Scientist, Laboratory Scientist (Manager, Supervisor), Laboratory Scientist/Medical Technologist, Laboratory Technician, Licensed Practical/Vocational Nurse, Medical Examiner, Nutritionist, Other Oral Health Professional, Other Physician, Other Registered Nurse—Clinical Services, Other Veterinarian, Physician Assistant, Public Health Dentist, Public Health/Preventative Medicine Physician, Registered Nurse—Community Health Nurse, Registered Nurse—Unspecified; Public Health Science & Animal Control Worker, Behavioral Health Professional, Department/Bureau Director, Deputy Director, Engineer, Environmentalist, Epidemiologist, Health Educator, Other Management and Leadership, Other Professional and Scientific, Program Director, Public Health Manager/Program Manager, Public Health Veterinarian, Public Health Informatics Specialist, Sanitarian/Inspector, Technician, Statistician, Student—Professional and Scientific; Social Services and All Other & Social Services Counselor, Social Worker, Other.

APPENDIX FIGURE 1 ● State Health Agency Participation in PH WINS

This map indicates the participation status of 50 state health agencies (SHAs) in the 2014 Public Health Workforce Interests and Needs Survey. Staff from 37 states constituted the national sample. In addition, 3 SHAs increased their sample size to attain agency-level estimates, and 24 had all their employees surveyed. Twelve states declined participation in PH WINS. Alaska and Hawaii are not pictured to scale.

APPENDIX FIGURE 2 ● Paired HHS Regions in the Public Health Workforce Interests and Needs Survey 2014



APPENDIX TABLE 1[a]

Program Area (PH WINS Instrument)	Designated FA or FC From Foundational Public Health Services Model
Communicable Disease—HIV	FA—Communicable Disease
Communicable Disease—STD	FA—Communicable Disease
Communicable Disease—TB	FA—Communicable Disease
Other Communicable Disease	FA—Communicable Disease
Noncommunicable Disease	FA—Chronic Disease and Injury
Injury	FA—Chronic Disease and Injury
Environmental Health	FA—Environmental Health
Maternal and Child Health	FA—Maternal and Child Health
Maternal and Child Health—WIC	FA—Maternal and Child Health
Clinical Services (excluding TB, STD, family planning)	Other Health Care
Clinical Services—Immunizations	Other Health Care
Oral Health/Clinical Dental Services	Other Health Care
Administration/Administrative Support	FC—Organizational Competencies
Mental Health	Other Health Care
Substance Abuse, including tobacco control programs	Other Health Care
Public Health Genetics	FC—Assessment
Vital Records	FC—Assessment
Medical Examiner	FC—Assessment
Animal Control	FA—Environmental Health
Emergency Preparedness	FC—All Hazards
Epidemiology Surveillance	FC—Assessment
Program Evaluation	FC—Organizational Competencies
Health Education	FC—Communications
Health Promotion/Wellness	FA—Chronic Disease and Injury
Community Health Assessment/Planning	FC—Assessment
Training/Workforce Development	FC—Organizational Competencies
Global Health	Other
Other Program Area (specify)	Other
I work equally in multiple programs	Other

Abbreviations: FA, Foundational Area; FC, Foundational Capability; PH WINS, Public Health Workforce Interests and Needs Survey; STD, sexually transmitted disease; TB, tuberculosis; WIC, Special Supplemental Nutrition for Women, Infants, and Children.
[a]This table represents a crosswalk between the PH WINS instrument's question on job classification and the appropriate area or capability from the Foundational Public Health Services model.

APPENDIX TABLE 2[a]

Question: What is your supervisory status? Please note, supervisory levels are defined as follows:

Nonsupervisor: You do not supervise other employees.

Team leader: You provide employees with day-to-day guidance in work projects but do not have official supervisory responsibility or conduct performance appraisals.

Supervisor: You are responsible for employees' performance appraisals and approval of their leave but you do not supervise other supervisors.

Manager: You are in a management position and supervise 1 or more supervisors.*Executive*: Member of Senior Executive Service or equivalent.

[a]The text from this table was used in the PH WINS instrument to allow respondents to classify themselves into a type of supervisory status.