Employee Perceptions About Public Health Agencies' Desired Involvement in Impacting Health Equity and Other Social Determinants of Health

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ABSTRACT

Context: Despite a growing consensus in public health to address health inequities and leverage social determinants of health (SDoH), the level of public health practitioners' readiness to become the agents of change in promoting health equity and shaping SDoH is not well researched.

Objectives: To examine (1) the level of public health agency employees' perceived desirability for impacting health equity and SDoH, and (2) the impact of employee characteristics such as a (PH WINS) public health degree and awareness of health in all policies on such desirability.

Methods: Data from the 2017 Public Health Workforce Interests and Needs Survey were used in examining the sense of desirability among agency employees for affecting health equity and SDoH in the agency jurisdictions.

Results: Fifty-seven percent of health agency employees believed that their agencies should be very involved in affecting health equity in their jurisdictions. Fairly smaller proportions of employees believed in the desirability of affecting SDoH, and the proportions who believed that the agency should be *very involved* in affecting specific SDoH were 17.8% for affecting the quality of transportation, 18.5% for affecting the economy, 22.2% for quality of housing, 22.4% for quality of the built environment, 25.4% for K-12 education system, and 34.5% for impacting the quality of social support systems. Agency employees without a public health degree had significantly lower odds ($P < .05$) of believing that the agency should be very involved in affecting health equity.

Conclusions: With increasing efforts to reduce health inequities and leverage SDoH for improved population health, gaps exist in the public health workforce's perceived desirability for their agencies to be involved in such efforts. These gaps exist among employees regardless of their demographic characteristics, length of tenure, or agency setting. Policy and practice initiatives aimed to improve health equity might benefit from our findings positing a need for education regarding SDoH and health equity. Our study findings imply the need for interventions for improving alignment between employee beliefs and organizational priorities for an effective transformation to Public Health 3.0. Fostering cross-sector partnerships with a focus on Health in All Policies (HiAP), SDoH, and health equity must be a high priority for public health agencies, which can be formalized through organizational strategic plans.

KEY WORDS: health equity, Health in All Policies, local health departments, public health agencies, social determinants of health, social support network, state health departments

The focus of public health practice in the pre-1990s era had traditionally been on public health program administration, which emphasized the provision of personal health services to the underserved.[1,2] In that era, public health program success was measured using overall community health indices, with relatively little attention to subgroup differences.[1,2] Consensus grew concerning the need for assessing and addressing health status gaps among racial, ethnic, and other subgroups with the adoption of the 10 essential public health services framework in the mid-1990s.[2]

With the paradigm shift away from treating communities as homogenous groups,[2] public health practice is increasingly recognizing the persistent difference in health outcomes based on subgroups. These differences referred to as health disparities, focused on the worse health outcomes of the socially and economically disadvantaged within any racial/ethnic

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group. While early research on determinants of these subgroup differences emphasized health care and medical factors, contemporary research emphasizes the role of a multitude of social and environmental factors as bases for population health. These factors, such as education, employment, income, housing, and transportation, known as the social determinants of health (SDoH), are not evenly distributed among subgroups. This unequal distribution of the SDoH is predominantly the result of policy and other social decisions.[3,4]

Health disparities that result from unjust exposure or access to SDoH across population subgroups are referred to as "health inequities." This term captures the unjust nature of the distribution of the factors that shape health outcomes, incorporating the ethical concept of "equity," which implies fairness grounded in the principles of distributive justice. Thus, health inequities are those differences in health risks and determinants that are "unnecessary, avoidable, unfair, and unjust."[5] If health inequities are defined as observed differences in health and determinants of health that are unjust, then health equity is the elimination of the injustices in the factors that determine health.[6] The ultimate goal of health equity is not to eliminate all health differences among society but rather to eliminate injustices (eg, those based on race and ethnicity) in the distribution of socioeconomic, physical, and legal conditions, which in turn shape individual health behaviors and outcomes.[7,8]

It is suggested that "the most promising strategies for advancing health equity are those that target the SDoH."[9] Public health initiatives are increasingly incorporating the SDoH into practice as SDoH research has matured.[10] For 4 decades, health equity has been an implicit priority for the World Health Organization's global health strategy. In 2005, the World Health Organization called for multisectoral action among health systems to broaden their advocacy role in addressing the SDoH.[11] Health equity has also been incorporated at the federal level in the United States through *Healthy People 2020*, which envisions achieving health equity through achieving the best health status for all people.

The unjust nature of health inequities is a strong reason for eliminating health inequities, but that is not the only argument for achieving health equity. Health inequities affect the US population economically and socially in that they pose tremendous economic burden in the United States ranging within the billions of dollars excluding the costs of illness and premature death.[12] Cost also includes hardships placed on companies that experience high absenteeism and lower productivity due to inadequate care.[13] As the US population ages and becomes more culturally diverse,[14] health inequities will remain one of the biggest challenges faced by public health practitioners. Public health fits as the natural leader in addressing SDoH, due to its moral foundations of health equity and social justice.[15,16]

Ensuring equitable social conditions through relevant partnerships is central to ensuring effective, sustainable population health improvements. The focus on SDoH in the effort to achieve health equity is part of this broader paradigm shift called Public Health 3.0, which calls for health departments in the United States to serve as the chief health strategists, both in developing and sustaining cross-sectoral partnerships, implementing Health in All Policies (HiAP), and in the cocreation of strategies for population health.[1,17,18] However, the extent to which Public Health 3.0 and HiAP are currently adopted nationally by public health agencies is unknown. State and local health departments are considered the backbone of public health in the United States, with health department employees serving as "boots on the ground."[19] Given that these public health employees will have to serve as the agents of change in this paradigm shift,[20] it is logical to examine the perceptions of state and local health department employees concerning the desirability of their involvement in impacting health equity and SDoH, which is the central aim of the current research study. Our research questions include the following: (1) To what level is the public health workforce sensitive to the need for public health agencies to address health inequity and favorably affect SDoH in their jurisdictions? (2) Is there variation in perceived desirability for favorably affecting health inequity and SDoH by an employee's having a degree in public health discipline and by other employee characteristics? Based on the previous literature on public health employees' awareness of emerging public health trends,[21] we hypothesize that considerable gaps do exist in public health employees' sensitivity to health equity and SDoH. We also propose that, after controlling for demographic characteristics, a favorable work environment, having a public health degree, longer tenure in public health, and awareness of HiAP, which is an approach to addressing health through all social policies, are associated with improved desirability for favorably affecting health inequity and SDoH.

Data and Methods

This cross-sectional observational study uses self-reported secondary data from the 2017 Public Health Workforce Interests and Needs Survey (PH WINS), the largest-ever public health workforce survey. The PH WINS survey participants included a nationally representative sample of state health agency central

office (SHA-CO) staff, as well as local health department (LHD) staff from 47 SHAs, 26 large (LHDs), and 71 mid-sized (LHDs). All permanent central office employees of the SHAs in the sample were included, using a census approach. A total of 47 604 public health employees participated in the PH WINS 2017, representing a response rate of 48%. We used balanced repeated replication weights for the estimates of means, frequencies, and regression coefficients. Additional details about the sampling design and size are discussed in this issue by Leider et al.[22]

Measures

Dependent variables

Two dependent variables were used. The first, measuring public health workforce perception regarding the desirability of their agency to impact *health equity*, was operationalized using the question, "To what extent do you believe your agency should be involved in affecting *health equity* in your jurisdiction?," for which the original 4-category Likert scale was recoded as (*a*) Not at all involved = 0, (*b*) Not very involved or somewhat involved = 1, and (*c*) very involved = 2.

The second, measuring public health workforce perception regarding the desirability of their health department to affect or shape *SDoH*, was operationalized using the question: "To what extent do you believe your agency should be involved in" (1) Affecting the K-12 education system in your jurisdiction? (2) Affecting the economy in your jurisdiction? (3) Affecting the built environment (roads, parks, greenways, walking and biking trails, etc) in your jurisdiction? (4) Affecting the quality of housing in your jurisdiction? (5) Affecting access to affordable, reliable, and clean transportation in your jurisdiction? (6) Affecting the quality of social support systems for individuals in your jurisdiction? The responses to the aforementioned question and 6 statements were measured using a 4-point Likert Scale, "Not at all involved," "Not very involved," "Somewhat involved," and "Very involved." The individual scores on these items were combined into a factor loading score, which was subsequently categorized on the basis of the first and the third quartiles into 3 groups for the final variable, SDoH involvement, labeled as "very involved," "not very or somewhat involved," and "not at all involved."

Independent variables

The independent variables for this study included *awareness about HiAP* (had heard about HiAP, nothing at all, not much, a little, a lot), *gender* of the study participant (male, female, nonbinary/other), *ethnicity* (Hispanic or Latino—yes, no), *race* (nonwhite, white), *health agency setting* (see Table 1 for detailed attributes), *employer* (local government, state government, federal government, nongovernmental), *length of tenure in public health practice* in years (0-5, 6-10, 11-15, 16-20, 21+), *type of degree* (public health, non–public health), and *work environment*. The variable public health degree was measured on the basis of numeric responses to the question "Please indicate which degrees you have attained." Responses indicating selection of BSPH, MPH, or public health doctorate (DrPH/PhD/ScD/other public health doctorate) were coded as "1" and other degrees were coded as "0." Work environment was operationalized by combining 16 variables (see detailed list in Gould et al[23]) into a single factor loading score through factor analysis, in order to avoid multicollinearity issues. These 16 variables were originally measured on a 5-point Likert Scale of "strongly disagree, disagree, neither agree nor disagree, agree, strongly agree" using 16 statements such as "I know how my work relates to the agency's goals and priorities"; "the work I do is important"; "creativity and innovation are rewarded"; "supervisors in my work unit support employee development," and so forth. The larger values of the work environment variable, a single continuous factor loading score, indicated stronger agreement for each of the individual items.

Analytical methods

Descriptive statistics such as percentages and confidence intervals were computed to assess the survey participants' perceived level of desirability for their agencies to be involved in affecting SDoH and health equity in their jurisdictions. We conducted multivariable analysis to assess the association of perceived desirability of involvement in affecting SDoH and health equity. To model the ordinal categorical dependent variables with 3 categories, we initially performed ordered logistic regression (also known as a proportional odds model).[24] However, upon noting that our data did not meet the proportional odds assumption, we applied multinomial logistic regression[25] with "not at all involved" as the reference level for both response variables.

Results

A large proportion of the study participants from state and local health departments and other agencies had heard nothing (40.4%) or not much (25.0%) about HiAP (Table 1). The largest percentage of employees (30.4%) had a tenure of 5 years or less, followed by those with tenure of 21+ years (21.3%). Thirty-four

TABLE 1
Descriptive Statistics for Characteristics of the Health Agency Employees, 2017 Public Health Workforce Interests and Needs Survey (PH WINS)

	N (Unweighted)	Percent (Weighted)	95% CI for Percent	
			Lower	Upper
How much have you heard about Health in All Policies				
Nothing at all	17 496	40.4	32.6	48.1
Not much	10 196	25.0	7.7	42.2
A little	9386	21.7	9.1	34.2
A lot	5823	13.0	5.7	20.3
Gender				
Male	9270	21.1	8.6	33.5
Female	33 547	78.4	66.1	90.7
Nonbinary/Other	301	0.6	−0.1	1.3
Hispanic or Latino				
No	36 616	87.1	73.4	100.8
Yes	6345	12.9	−0.8	26.6
Race				
Nonwhite	12 664	30.6	13.2	47.9
White	29 446	69.4	52.1	86.8
Health agency setting				
County health agency	13 036	34.1	0.1	68.1
City/town health agency	3805	10.2	−6.3	26.7
Multicity health agency	179	0.4	−0.4	1.2
Multicounty health agency	805	2.3	−1.8	6.3
Hospital or primary care clinic	247	0.4	−0.3	1.1
Other public health local agency	1469	3.8	−1.1	8.6
State health agency—central office	13 814	24.4	5.4	43.4
State health agency—local or regional office	8543	19.8	−10.5	50.1
Inpatient or outpatient clinical setting	362	0.7	−0.9	2.4
Other state agency, not health agency	384	1.6	−5.2	8.4
Other	939	2.4	−1.3	6.1
Employer				
Local government	10 886	33.7	−8.2	75.7
State government	31 388	62.1	24.4	99.7
Federal government	515	2.1	−4.9	9.0
Nongovernmental	490	2.1	−3.2	7.4
Tenure in public health practice, y				
0-5	13 315	30.4	15.2	45.7
6-10	7458	18.4	11.0	25.8
11-15	6217	15.6	8.1	23.1
16-20	5258	14.2	−0.3	28.8
≥21	9341	21.3	7.5	35.2
Educational status				
Nonpublic health degree	38 962	91.2	85.4	97.0
Public health degree[a]	4053	8.8	3.0	14.6

Abbreviations: CI, confidence interval; N, number of observations.

[a] *Public health degree reflected BSPH, MPH, or public health doctorate (DrPH/PhD/ScD/other public health doctorate), selected directly by the survey participants. Qualitative answers in the other categories were not included.*

percent of the study participants were located within the county health agency setting, while 24% were located within the SHA—CO setting.

Table 2 shows the distribution of health agency employees by the perceived desirability of their agency to be involved in their jurisdictions in affecting factors that constitute SDoH and health equity. Concerning the desirability of their public health agency for *affecting the K-12 education system* in agency jurisdiction, a large proportion of employees believed that their agency should be not at all involved (19.5%), not very involved (16.9%), and somewhat involved (38.1%); only 1 in 4 (25.4%) believed that the agency should be very involved. The proportion of health agency employees who believe that their agency should be very involved in *affecting the economy in the jurisdiction* was a low of 18.5%, with the remaining believing that their agency should

TABLE 2

Percent Distribution of Employees by the Extent They Believe Their Agency Should Be Involved in Affecting Social Determinants of Health and Health Equity in Their Jurisdictions

	N (Unweighted)	Percent (Weighted)	95% CI for Percent	
			Lower	Upper
Affecting the K-12 education system in your jurisdiction?				
Not at all involved	8769	19.5	11.3	27.7
Not very involved	7677	16.9	7.3	26.6
Somewhat involved	15 138	38.1	12.0	64.2
Very involved	11 018	25.4	10.7	40.1
Affecting the economy in your jurisdiction?				
Not at all involved	8845	19.9	10.3	29.5
Not very involved	10 069	23.5	17.7	29.2
Somewhat involved	15 492	38.1	26.4	49.8
Very involved	8079	18.5	12.1	24.8
Affecting the built environment (roads, parks, greenways, walking and biking trails, etc) in your jurisdiction?				
Not at all involved	11 118	24.8	14.9	34.7
Not very involved	8755	20.3	15.3	25.3
Somewhat involved	13 268	32.5	23.0	42.0
Very involved	9441	22.4	15.3	29.5
Affecting the quality of housing in your jurisdiction?				
Not at all involved	9694	21.6	12.0	31.2
Not very involved	8619	19.5	14.4	24.7
Somewhat involved	14 922	36.7	22.5	50.9
Very involved	9357	22.2	10.3	34.0
Affecting the quality of transportation in your jurisdiction?				
Not at all involved	10 748	23.9	13.0	34.8
Not very involved	9732	22.5	17.0	28.0
Somewhat involved	14 226	35.8	15.9	55.8
Very involved	7833	17.8	5.8	29.8
Affecting the quality of social support systems for individuals in your jurisdiction?				
Not at all involved	5687	12.9	6.8	19.0
Not very involved	5104	11.9	6.9	17.0
Somewhat involved	16 387	40.6	22.8	58.5
Very involved	15 365	34.5	14.5	54.5
Affecting health equity in your jurisdiction?				
Not at all involved	3699	8.8	3.0	14.6
Not very involved	2660	5.9	0.6	11.2
Somewhat involved	11 592	27.8	22.1	33.5
Very involved	24 659	57.5	49.0	66.0

Abbreviations: CI, confidence interval; N, number of observations.

be not at all involved (19.9%), not very involved (23.5%), or somewhat involved (38.1%). Health agency employees believing their agency should be very involved in *shaping the built environment* (*roads, parks, greenways, walking and biking trails, etc*) *in their jurisdiction* were outnumbered (22.4%) compared with employees who believed otherwise with, respectively, 24.8%, 20.3%, and 32.5%, who believed that the agency should be not at all involved, not very involved, or somewhat involved. The proportions of health agency employees who believe that their agency should be *very involved* in affecting the other SDoH were also fairly small, 22.2% believed in desirability *of affecting the quality of housing*, 17.8% believed in desirability of *affecting access to affordable, reliable, and clean transportation*, and 34.6% believed in *impacting social connectedness, or the quality and quantity of social support systems for individuals*. Respectively, 8.8% and 5.9% believed that their agencies should be "not at all" be involved or should be "not very involved" in *affecting health equity* in their jurisdictions. However, 57.5% believed that their agencies should be very involved.

Table 3 shows that public health employees with no public health degree had significantly lower odds (adjusted odds ratio, 0.2; $P < .05$) of believing that their agency should be very involved (vs not at all involved) in *affecting health equity* in their jurisdictions. All other independent variables in Table 3 had no significant association with the dependent variable belief of public health employees that their agency should be involved in *affecting health equity* in their jurisdictions. These independent variables include public health practitioner characteristics such as work environment, individual knowledge of HiAP, gender, ethnicity, race, current health agency setting, current employer, and tenure within public health practice. Table 4 also shows that all of the independent variables (for which descriptive statistics are presented in Table 1) had no significant association with the extent to which public health agencies' employees believed that their agency should be involved in affecting SDoH.

Discussion

This study used PH WINS to examine the perceived importance of health equity and SDoH among local, state, and other public health agency employees. Our primary research questions steered our focus on assessing public health employees' perceptions of desirability for their public health agencies to address health inequity and favorably shape SDoH for improved population health in their jurisdictions. Consistent with the previous literature on public health employees' awareness of emerging public health trends, we hypothesized that considerable gaps do exist in public health employees' sensitivity to health equity and SDoH. The study findings point out considerable gaps and indicate the need for awareness-raising interventions. For instance, although education is considered an integral component of SDoH,[26] only 25% of public health employees believed that the agency should be very involved in affecting the quality of K-12 education in their jurisdiction. Moreover, given the impact of economic resources on health, the proportion of the public health workforce believing that it was desirable for their agency to be very involved in affecting the economy was only 18.5%, with the remaining believing that their agency should not be at all involved, not very involved, or somewhat involved. A slightly higher but still a relatively low proportion of the workforce believed in the desirability of their public health agency's being very involved in affecting other SDoH, such as built environment (22.4%); quality of housing (22.2%); access to affordable, reliable, and clean transportation (17.8%); and impacting social connectedness or the quality and quantity of social support systems (34.5%).

Given that our findings show major gaps in public health employees' perceived desirability of favorably affecting these SDoH including economy, education, housing, transportation, social support systems, and built environment, these gaps may impede the paradigm shift to Public Health 3.0.[1,10,17] This study's findings suggest that low levels of desirability could limit this paradigm shift because Public Health 3.0 places heavy emphasis on cross-sector collaborations to shape policies affecting SDoH. Our findings also point to the need for further research, focusing on why the diffusion of Public Health 3.0 does not seem to be gaining traction. The finding showing that although a much larger proportion (57.5%) of public health employees believed that their agency should be very involved in affecting health equity, a much smaller proportion was convinced about the need for affecting SDoH such as the quality of transportation, jurisdiction economy, quality of housing, the built environment, K-12 education system, and quality of social support systems. Future research may also consider exploring the reason for such a disconnect between beliefs about addressing health equity and the SDoH, which are a significant component of achieving health equity.

This study also focused on assessing whether better work environments, having a public health degree, awareness of HiAP, length of tenure in public health practice, health agency setting (local, state, hospital, etc), and type of employer (federal, state, local, nongovernment) were associated with public

TABLE 3

Multinomial Logistic Regression of the Extent Public Health Agency Employees Believe Their Agency Should Be Involved in Affecting *Health Equity* in Their Jurisdictions[a]

	Very Involved Versus Not at All Involved			Not Very or Somewhat Involved Versus Not at All Involved		
		95% CI for AOR			95% CI for AOR	
Public Health Practitioner Characteristics	**AOR**	**Lower**	**Upper**	**AOR**	**Lower**	**Upper**
Work environment	1.3	0.8	2.2	1.1	0.8	1.7
How much have you heard about Health in All Policies?						
A little	2.7	1.0	7.3	3.3	0.7	14.6
A lot	3.9	1.1	14.5	2.5	0.3	22.9
Not much	2.3	0.2	28.3	3.0	0.1	118.1
Nothing at all	…	…	…	…	…	…
Gender						
Female	2.1	0.0	90.6	1.4	0.0	86.1
Male	1.1	0.0	47.5	0.8	0.0	111.6
Nonbinary/Other	…	…	…	…	…	…
Hispanic or Latino						
No	1.4	0.5	3.8	1.3	0.4	4.3
Yes	…	…	…	…	…	…
Race						
Nonwhite	1.1	0.1	11.4	0.8	0.3	2.0
White	…	…	…	…	…	…
Health agency setting						
City/town health agency	1.9	0.0	249.0	1.3	0.1	31.0
County health agency	1.8	0.1	30.8	1.6	0.1	20.4
Hospital/primary care clinic	1.3	0.0	43.2	1.1	0.0	28.6
Inpatient/outpatient clinical setting	1.0	0.0	42.3	1.3	0.1	21.8
Multicity health agency	1.4	0.0	[b]	1.0	[b]	[b]
Multicounty health agency	3.4	0.0	998.0	2.6	0.0	370.6
Other	0.3	0.0	33.1	0.4	0.0	11.1
Other public health local agency	0.8	0.0	14.0	1.0	0.0	30.5
Other state agency, not health agency	0.8	[b]	[b]	0.5	0.0	62.9
State health agency—central office	1.3	0.1	15.0	1.0	0.1	16.9
State health agency—local or regional office	…	…	…	…	…	…
Employer						
Federal government	0.9	0.0	27.8	1.9	[b]	[b]
Local government	1.5	0.2	14.4	1.1	0.1	17.9
Nongovernmental	5.0	[b]	[b]	2.8	[b]	[b]
State government	…	…	…	…	…	…
Tenure in public health practice, y						
0-5	0.9	0.2	5.7	0.9	0.2	4.2
11-15	0.8	0.1	5.8	0.8	0.1	5.1
16-20	0.6	0.0	177.8	0.7	0.0	149.5
≥21	0.9	0.1	5.8	0.9	0.1	6.5
6-10	…	…	…	…	…	…
Educational status						
Nonpublic health degree	0.2[c]	0.0	1.0	0.4	0.1	2.6
Public health degree	…	…	…	…	…	…

Abbreviations: AOR, adjusted odds ratios; CI, confidence interval.

[a] *All reference categories are notated with "…."*

[b] *Statistics unstable due to zero/small cell entries.*

[c] *Statistically significant at* $P < .05$.

TABLE 4

Multinomial Logistic Regression of the Extent Public Health Agency Employees Believe Their Agency Should Be Involved[a] in Affecting *Social Determinants of Health* in Their Jurisdictions[b]

	Very Involved Versus Not at All Involved			Not Very or Somewhat Involved Versus Not at All Involved		
		95% CI for AOR			95% CI for AOR	
Public Health Practitioner Characteristics	**AOR**	**Lower**	**Upper**	**AOR**	**Lower**	**Upper**
Work environment	1.2	0.7	2.2	1.1	0.9	1.5
How much have you heard about Health in All Policies?						
A little	3.2	1.4	7.4	2.0	0.8	5.0
A lot	6.1	1.7	21.4	2.2	0.8	6.1
Not much	2.1	0.3	16.2	1.9	0.3	10.2
Nothing at all	…	…	…	…	…	…
Gender						
Female	1.7	0.1	26.0	1.9	0.1	27.4
Male	0.8	0.0	14.6	1.3	0.1	17.3
Nonbinary/Other	…	…	…	…	…	…
Hispanic or Latino						
No	1.0	0.4	2.4	1.3	0.5	3.5
Yes	…	…	…	…	…	…
Race						
Nonwhite	1.5	0.2	9.9	0.9	0.3	2.5
White	…	…	…	…	…	…
Health agency setting						
City/town health agency	1.6	0.1	17.5	1.6	0.1	25.7
County health agency	1.5	0.1	20.5	1.5	0.1	15.2
Hospital/primary care clinic	1.3	0.0	317.1	0.8	0.0	20.3
Inpatient/outpatient clinical setting	0.7	0.0	107.3	0.9	0.0	19.1
Multicity health agency	1.2	0.0	103.6	1.3	0.0	176.0
Multicounty health agency	2.1	0.1	35.4	2.5	0.1	46.7
Other	0.4	0.0	3.9	0.5	0.0	10.1
Other public health local agency	0.8	0.0	15.5	0.8	0.0	25.6
Other state agency, not health agency	0.4	0.0	55.2	1.6	<0.001[b]	>999.99[c]
State health agency—central office	1.1	0.1	9.1	1.0	0.2	4.9
State health agency—local or regional office	…	…	…	…	…	…
Employer						
Federal government	1.4	0.1	30.6	2.2	0.0	>999.99[c]
Local government	1.9	0.7	5.3	1.3	0.4	3.8
Nongovernmental	2.3	<0.001[c]	>999.99[c]	3.3	<0.001[c]	>999.99[c]
State government	…	…	…	…	…	…
Tenure in public health practice, y						
0-5	0.9	0.3	2.9	0.8	0.1	4.6
11-15	1.0	0.1	12.2	0.8	0.2	3.0
16-20	0.8	0.1	7.5	0.9	0.2	3.2
≥21	1.0	0.3	2.9	0.9	0.2	4.5
6-10	…	…	…	…	…	…
Educational status						
Nonpublic health degree	0.4	0.1	2.6	0.5	0.1	3.2
Public health degree	…	…	…	…	…	…

Abbreviations: AOR, adjusted odds ratios; CI, confidence interval; N, number of observations.

[a] *The individual scores on 6 items representing SDoH involvement were combined into a factor loading score, which was subsequently categorized on the basis of the first and the third quartiles into 3 groups for the final variable. The quartile cut points were labeled as "very involved," "not very or somewhat involved," and "not at all involved."*

[b] *All reference variables are notated with "…"; none of the independent variables show significant association with the dependent variable.*

[c] *Statistics unstable due to zero cell entries.*

health employees' improved sense of desirability for favorably affecting health inequity and SDoH, after controlling for the effect of demographic characteristics. Study results highlight the value of a public health degree as it showed that agency employees without a public health degree had significantly lower odds (adjusted odds ratio, 0.2; $P < .05$) of believing that their agency should be very involved in affecting health equity rather than believing that they should not at all be involved. However, because our analysis did not show significant associations between public health degree and employees' belief that their public health agency should affect SDoH, there is a need for future research explicating the reasons for such inconsistency in the value of a public health degree relative to health equity and SDoH. Another important finding of our study is that gaps exist among employees' perception of desirability for addressing health equity and leveraging SDoH regardless of whether they had awareness about HiAP and independent of their length of tenure in public health practice, health agency setting, type of employer, gender, race, or ethnicity. The existence of these gaps across the board conveys a heightened need for intervention to change employee perceptions through proper education about their relevance to population health if Public Health 3.0 is to be successfully adopted.

Our study findings have important implications for contemporary public health policy and practice, given a number of emerging trends in the increasingly complex public health landscape. There is an increasing consensus that population health is determined by a complex interplay of a whole host of system and environmental influences referred to as SDoH, rather than direct provision of health care and public health service alone. National accreditation standards through the Public Health Accreditation Board emphasize the importance of assessing and leveraging health equity and SDoH, rather than simply providing mandated public health services. Consequently, the evidence is accumulating to illustrate the impact of accreditation on improved health equity.[27] Since HiAPs are considered instrumental in reducing health inequities,[28] it was logical to find an association between awareness of public health agency employees concerning HiAP and their perceived desirability for addressing health equity issues; however, study findings did not provide evidence for such an association. This finding further underscores the notion that across-the-board interventions are needed to raise public health employee's sensitivity to the importance of affecting health equity and the SDoH. Our study findings also support the notion that public health practice agencies might still be stuck in the "old-school" notion of focusing on health disparities, the downstream aftermath of upstream health inequities that shape SDoH unfavorably for socially, economically, and politically disadvantaged populations.[29] Public health agencies must shift their focus on health equity and SDoH to effectively and equitably improve population health, and changing employees' perceptions might be the first critical step to that end.

This study uses the largest number of responses from public health employees ever gathered on the subject and therefore makes our findings highly generalizable. However, our results should be interpreted within limitations inherent in the study design. The sample selection biases may have implications for the representativeness of the employees' perceived desirability of addressing health equity and SDoH relative to the actual prioritization of their agency reflected in formal strategic plans and priorities. Thus, the data may have typical self-reporting biases.

Conclusions

The current level of perceived desirability to affect health equity and SDoH in the public health workforce, based on a recent large-scale quantitative survey, paints a suboptimal picture. The centrality of health equity and SDoH is clear in public health practice, given that national initiatives encourage accountable public health practice characterized by Public Health 3.0 principles that delineate the importance of leveraging HiAP and SDoH and pursuing health equity. Consequently, it is highly desirable for public health employees to be sensitive about the relevance of these principles to the modern public health enterprise. Although earning a public health degree seemed to favorably impact public health employees' perceived importance of health equity, having a public health degree did not show any impact on desirability for leveraging SDoH, suggesting a need for additional research to explicate this relationship.

We found the lack of an association between all employee characteristics and the dependent variables reflecting employees' perceived desirability for their agencies to affect health equity and SDoH, thus indicating the need for relevant educational interventions among all public health agency employees, regardless of tenure, work environment, education status, and so forth. Low-perceived levels of desirability for addressing health equity and SDoH were dominant within the public health workforce regardless of whether the work setting was a local, state, or federal agency; hospital; or nonprofit setting. The gaps in perceived desirability also seemed to prevail regardless of employment characteristics such as length of tenure in public health practice and demographic characteristics of employees such as gender, race,

Implications for Policy & Practice

- Organizational learning theories emphasize that thoughts, attitudes, behaviors, motivations, and skills to handle change among individuals and groups can either inhibit or promote organizational learning.[30] Our study finding that public health workforce beliefs do not provide sufficient support for advancing Public Health 3.0 goals, such as SDoH, may imply the need for interventions for improving alignment between employee beliefs and organizational priorities for an effective transformation to Public Health 3.0. However, the extent to which Public Health 3.0 has been adopted nationally is still unclear.
- To support this transition, public health agencies must foster cross-sector partnerships and collaborations to increase a focus on HiAP, SDoH, and health equity as high priorities in agency and community formal strategic plans.
- Public health leaders should secure employee buy-in and shared understanding about priorities through communications and operational plans that include health equity and SDoH in its mission, vision, values statements, employee orientation, and continuing education and active feedback about individual and organizational performance.

or ethnicity. These findings underscore the need for proactive strategies and policies for mobilizing the public health workforce concerning the health equity principles of Public Health 3.0. Future studies regarding the extent to which Public Health 3.0 has been adopted nationally by public health organizations, as well as the need for the implementation of a transition plan and communication strategy, are needed.

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