Preliminary Hawai‘i Public Health Workforce Supply and Demand Assessment

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Abstract

Ensuring the adequacy of the public health workforce requires an understanding of its size and composition, as well as the population's demand for services. The current article describes research undertaken as a first step toward developing an estimate of the supply of and demand for Hawai'i's public health workforce. Using an organizational-level survey, data was obtained from a subset of 34 organizations considered to be major providers of population-based public health services in Hawai'i. The results indicate that estimates of the existing public health workforce range from 3,429 to 3,846 workers. Calculations of functional demand reveal that an additional 317 to 502 employees will be required to compensate for vacancies and projected retirements over the next five years; though, the discussion points to the fact that this number may be closer to 1,005 to 1,664. While, an additional 594 to 848 employees would be needed to meet the current missions of organizations in this sample and to best meet community need. While these findings are neither exhaustive nor definitive, they raise issues concerning the state's supply of public health workers in terms of their ability to adequately meet demand for services. More research is needed to confirm these findings and track Hawai'i's public health workforce to assure a strong local public health system.

Keywords

Public health workforce, assessment, supply, demand, capacity, health workforce

Introduction

The public health workforce is a key component of the nation's public health infrastructure. Ensuring the adequacy of the public health workforce requires knowledge of (a) its size and composition; and, (b) the population's demand for the essential services of public health.[2,3] While this type of information has been available for medicine, dentistry, and nursing for decades, efforts to develop this information about the public health workforce have encountered major barriers.[3,4] Such barriers include: the uncertain boundaries of the field; its multidisciplinary nature; its diverse settings for employment; and, its absence of credentialing requirements.[4] While progress has been made, what is known is largely limited to the governmental workforce, despite high levels of interest in the nongovernmental component.[5] On the demand side, there have been no systematic efforts to assess national need.[6]

Estimates indicate that the national public health workforce has declined by approximately 50,000 people over recent decades, with the ratio of the public health workforce to the US population reported at just 158 per 100,000 in 2000 compared to 220 per 100,000 in 1980.[5,7] While a 2012 estimate suggests that the governmental public health workforce could be as high as 520,000 workers (or as low as 300,000), a minimum of 220,000 additional workers would be needed by 2020 to achieve the same public health workforce-to-population ratio that existed in 1980.[6,8] However, this estimate fails to account for the rapidly aging workforce and existing shortages, with most state or territorial health agencies reporting shortages in public health nurses, epidemiologists, environmental health workers, and laboratorians.[9] Additionally, the 1980 workforce-to-population ratio (220 per 100,000), though often referenced as a benchmark, likely underestimates the ideal number of public health workers.[6,7]

Information about the local public health workforce is needed to support public health workforce planning and policy development most relevant to states and localities.[4] Hawai'i's State Department of Health (DOH), which is based on O'ahu and includes four district offices distributed across the neighbor islands, is the state's main public health organization.[10] Nationally, Hawai'i's state health agency structure is considered centralized (one regional health department and no local health departments) and small, with the number of full-time employees estimated by the Association of State and Territorial Health Officials (ASTHO) to be 2,593 and the population served smaller than 1,500,000.[11,12] In addition to the DOH, Hawai'i has one graduate public health program, University of Hawai'i at Manoa's Office of Public Health Studies (UH-OPHS), 29 hospitals, 16 Federally Qualified Health Centers and Rural Health Clinics, five Native Hawaiian Health Care Systems, and over 700 nonprofit organizations within the fields of health care/mental health and human services, not to mention the unknown number of for-profit organizations that support public health through the provision of evaluation, data collection, social marketing, and leadership services.[13-15] To varying degrees, these diverse organizations comprise the landscape of public health services delivery in Hawai'i.

Information about the composition of Hawai'i's public health workforce has been generated by the Hawai'i Public Health Training Hui (HPHTH). Through its unique position as the provider of statewide public health workforce training, continuing education, coordination, and collaboration, the HPHTH has developed a network of those who identify or affiliate with the local public health workforce.[16] This network exists in the form of a 1,700-subscriber "Community Partnership" listserv, whose training needs and competency are assessed every three years by the HPHTH.[16] A secondary outcome of these needs assessments has been the collection of compositional data. Regular collection of information on the competency and composition of the local workforce is an important first step. However, only 509 of the 1,693 HPHTH listserv subscribers completed the 2015 needs assessment, so the size of the local public health workforce is still unclear.[16] More precise knowledge of the size

of Hawai'i's public health workforce, as well as the demand for services is needed. This study was undertaken as a first step in developing further information about Hawai'i's public health workforce, with special attention paid to the non-governmental segment.

Methods

Using data obtained from a sample of organizations in Hawai'i through the HPHTH, this research explores the size of the local public health workforce and the demand for services. Human subjects' research exemption was obtained for this study from the University of Hawai'i Institutional Review Board (#23308).

Participants

Because a statewide list of public health organizations does not exist, researchers were granted access to the HPHTH's aforementioned "Community Partnership" listserv in July 2015. This listserv includes subscribers from over 120 different organizations, including various departments/divisions of the University of Hawai'i and the DOH, who have participated in the HPHTH's trainings and created the existing network platform.[15] A total of 46 organizations considered to be major providers of population-based public health services in Hawai'i were selected. Efforts were made to attain a diverse sample with regard to organizational type and size.

A primary contact for each organization was selected, with emphasis placed on selecting individuals who would know the most about the organization's employees and plans for expansion. For the most part, this was someone in an executive or senior leadership position, such as the Executive Director or CEO, a Deputy Director, or a Director of Quality Assurance. However, for organizations in which the researchers lacked a preexisting connection to a member of the executive leadership, contacts in less senior positions were selected (eg, Quality/Compliance Manager, Department Director, Program Manager, or a health center Provider).

Provider Supply Measure

An online survey was developed by the research team to obtain information from employers about their current workforce. The survey was adapted from an organizational-level survey instrument developed by the University of Michigan's Center of Excellence in Public Health Workforce Studies to assess the public health nursing workforce in state and local health departments.[17] Survey items were reduced to prevent participant burden and adapted to reflect the broader scope of participants. Survey items were multiple choice and fill in the blank. Due to survey logic, the number of items ranged from 10-16, with six questions being dependent on respondents' previous answers. The instrument was piloted with the UH-OPHS Director and revised prior to dissemination.

Size was operationalized as the number of public health workers employed by a given agency, with a public health worker defined as "anyone who works with groups and/or communities to protect, promote, or advance health/wellness." In essence, any worker who engages in population-based public health practices and services was deemed a public health worker. Demand was operationalized in two ways: (1) functional demand — the number of vacancies and projected retirements; and, (2) plans for expansion (if applicable) — the number of additional employees needed to meet the organization's current mission and to best meet community need. Questions about funding were also asked, as researchers believed funding to be a barrier faced by public health organizations in their ability to meet demand.

To assess demand, the questions solicited information about all employees, rather than public health workers specifically. This decision was made on the assumption that (1) all employees in an organization engaging in population health services can be considered public health workers; and (2) that requesting information about public health workers specifically would be too burdensome for participants, given the broad definition of a public health worker. Plans for expansion were used as a proxy for demand under the assumption that an organization would expand in order to meet a demand that differed or exceeded those served by current levels of services. All answers were solicited as ranges (eg, 5-10 or 11-20) and best estimates.

The survey was administered through Qualtrics, an online survey software, and required less than five minutes to complete. All participants provided their consent to participate in this research study. The survey was administered in August 2015 and remained open for approximately 3 weeks. Periodic reminder emails were employed to improve response rates.

Upon closing the survey in September 2015, a Qualtrics-generated report including frequencies and basic descriptive statistics were downloaded. Raw data was exported into Excel and additional frequencies and basic descriptive statistics were calculated.

Results

Of the 46 organizational contacts that the survey was sent to, 34 completed the survey (a 74% response rate). Only surveys with a response to every question were included in the results. A variety of organizations were represented; non-profit or community-based agencies comprised the majority (53%), followed by federally qualified community health centers (FQHCs) (21%) and educational institutions (15%) (this category included departments or programs affiliated with larger educational institutions) (Table 1). The majority of organizations were located on O'ahu (91%); however, a small number of organizations were located on Lana'i and Hawai'i Island. Most participants reported their position to be Executive Director (31%) or Director (19%) (Table 1).

Current Supply

Total estimates of public health workers ranged from a low of 3,429 to a high of 3,846, with an average of 3,638. The DOH was the largest employer of public health workers (Table 2). FQHCs and educational institutions were the second largest employers of public health workers, despite having a smaller representation in the sample than non-profit or community-

based agencies. However, the estimates may be significantly undercounted, as five participants selected the response option of "more than 100 public health workers? Please list," but did not provide an actual estimate of the number of employees. In which case, both minimum and maximum estimates were counted as 101. For example, one of the organizations that did not originally provide an actual estimate is the largest employer of public health workers in Hawai'i. However, follow up communication uncovered that there are 2,631 employees at this organization, which was included in the total counts of supply. Another example is a federal agency in the sample, which estimated having "over 10,000" public health workers, but was counted as 101 in this study, as the researchers believed this figure encompassed those employed nationwide rather than just those working in Hawai'i.

Current and Future Demand

Most organizations (62%) reported existing job vacancies. Total estimates of existing vacancies ranged from 245 to 327 (Table 3). Additionally, the majority of organizations (65%) submitted an estimate of employees eligible for retirement within the next five years. Total estimates of eligible retirees ranged from 72 to 175 (Table 3). Therefore, an additional 317 to 502 public health workers would be needed to fill these vacant positions and offset projected retirements.

An overwhelming majority of organizations (88%) indicated that they would like to add more employees to their organization. When asked how many more employees would be needed to meet their organization's current mission, total estimates ranged from 344 to 477 (Table 4). The majority of organizations (76%) reported having plans to expand in the future. When asked how many more employees would be needed to expand services/programs to best meet community need, the total estimates ranged from 254 to 371 employees. In combining these two measures of additional employees, either to meet organizations' current missions or expand to best meet community need, an additional 598 to 848 employees would be needed to adequately meet demand.

Funding

In terms of funding, 50% of the organizations indicated they did not have enough funding for their basic personnel infrastructure. The remaining 32% felt they had sufficient funding and 12% replied that they did not know. Among the organizations that reported lacking sufficient funding, 100% wrote grants, 88% sought donations, and 69% pooled resources in order to acquire extra funding. A smaller number of organizations (31%) used endowments as a funding source.

Table 1. Public Health Workforce Survey Sample Description, Hawai'i, 2015

Organizational type	Frequency
Non-profit or Community-Based Agency	18
Federally Qualified Health Center	7
Educational Institution	5
State Health Department	1
Native Hawaiian Health System or Organization	1
Federal Agency	1
Health System or Clinic	1
Total	34
Title	**Frequency**
Executive Director	10
Director	8
Program Manager	4
Professor	4
Vice President	3
CEO	2
Other	5
Total	36

Note: Individuals who reported having more than one title were double counted across applicable categories; Director = of an organization or department within an organization (eg, workforce development); Manager = of operations, a program, or quality control; Other = board member, attorney, grant writer, medical officer, or staff physician.

Table 2. Estimated Number of Public Health Workers Employed by Setting, Hawai'i, 2015

Work setting	Minimum	Maximum
Non-profit or Community-Based Agency (18)	133	295
Federally Qualified Health Center (7)	277	432
Educational Institution (5)	255	337
State Health Department (1)	2631	2631
Native Hawaiian Health System or Organization (1)	21	30
Federal Agency (1)	101	101
Health System or Clinic (1)	11	20
Total (34)	3429	3846

Note: Organizations that did not provide an estimate of the number of public health workers, if >100, were counted as 101.

Table 3. Estimated Number of Job Vacancies and Employees Eligible to Retire in the Next Five Years by Setting, Hawai'i, 2015

Work setting (# of organizations)	Vacancies Minimum	Vacancies Maximum
Non-profit or Community-Based Agency (10)	20	65
Federally Qualified Health Center (4)	4	20
Educational Institution (4)	19	40
State Health Department (1)	101	101
Native Hawaiian Health System or Organization (-)	-	-
Federal Agency (1)	101	101
Health System or Clinic (1)	0	0
Total (21)	245	327
Work setting (# of organizations)	**Eligible Retirees Minimum**	**Eligible Retirees Maximum**
Non-profit or Community-Based Agency (14)	39	100
Federally Qualified Health Center (3)	13	30
Educational Institution (4)	19	40
State Health Department (-)	-	-
Native Hawaiian Health System or Organization (1)	1	5
Federal Agency (-)	-	-
Health System or Clinic (-)	-	-
Total (25)	72	175

Note: - indicates that the participant was not able to provide an estimate.

Table 4. Estimated Number of Additional Employees Needed to Meet the Organization's Current Mission and Community Need by Ssetting, Hawai'i, 2015

Work setting (# of organizations)	Employees needed to meet current:	
	Minimum	Maximum
Non-profit or Community-Based Agency (17)	77	160
Federally Qualified Community Health Center (6)	56	90
Educational Institution (3)	108	116
State Health Department (-)	-	-
Native Hawaiian Health System or Organization (1)	1	5
Federal Agency (1)	101	101
Health System or Clinic (1)	1	5
Total (29)	344	477
Work setting (# of organizations)	**Employees needed to meet current:**	
	Minimum	**Maximum**
Non-profit or Community-Based Agency (15)	85	155
Federally Qualified Community Health Center (5)	40	70
Educational Institution (3)	127	136
State Health Department (-)	-	-
Native Hawaiian Health System or Organization (1)	1	5
Federal Agency (-)	-	-
Health System or Clinic (1)	1	5
Total	254	371

Note: - indicates that the participant was not able to provide an estimate.

Discussion

Results from 34 key organizational players in Hawai'i's public health landscape estimate its workforce to be comprised of 3,429 to 3,846 individuals. This exceeds what can be inferred about the size of Hawai'i's public health workforce from the HPHTH's 2015 needs assessment response rate and listserv network (509 and 1,693 individuals, respectively).[16] This translates to a workforce-to-population ratio to be within the range of 242 to 271 per 100,000, which is markedly better than the 1980 national benchmark (220 per 100,000).[7] While this may not be surprising given Hawai'i's strong investment in public health ($154.99 per capita versus the national median of $27.40), it is evident that more comprehensive research efforts are needed to confirm and track the size of Hawai'i's public health workforce.[18]

This study estimates that 317 to 502 public health workers will be needed by these organizations over the next five years to compensate for existing job vacancies and projected retirements. However, these estimations are undercounted, as the participant representing the largest employer of public health workers was not able to provide corresponding estimates. ASTHO reports that 10% to 19% of this employer's positions are vacant and that 20% to 29% of its workforce are eligible for retirement in federal year 2016.[18] In applying these percentages to the aforementioned workforce of 2,631 full-time employees, an additional 789 to 1,263 public health workers would be needed just to maintain the largest employer's current capacity over the next five years.[19] If one were to replace these figures with those provided in Table 3, estimates of functional demand increase to 1,005 to 1,664.

Since 2012, the UH-OPHS has produced between 28 to 37 masters- and doctoral-level graduates per year.[20-23] The number of UH-OPHS graduates has steadily increased and was supplemented by the first class of bachelors-level public health graduates in December 2015. While schools or programs in other disciplines (e.g. public health nursing, medicine, and social work) contribute to the local supply of public health workers, it is evident that the number of graduates from the state's main public health program (UH-OPHS) may be inadequate to meet this study's estimated projected functional demand. Therefore, workforce planning, recruitment, and retention strategies may be needed to overcome this discrepancy.

Up to this point, the discussion has centered on maintaining existing workforce levels. However, the ideal number of workers is yet to be seen. While no methodology currently exists to quantify a population's demand for public health services, this study found that the vast majority of organizations (88%) indicated a desire to add additional employees to their organizations, with an additional 344 to 441 employees needed just to meet their current missions. Therefore, Hawai'i's demand for public health services may exceed the capacity of organizations seeking to meet that demand.

A mismatch between supply and demand would not be surprising, given that 50% of organizations surveyed felt they lacked sufficient funding for basic personnel infrastructure. While results from this study highlight the resourcefulness of public health organizations in their ability to secure additional funding, the systemic underfunding of public health is widely acknowledged. Additionally, these findings point to the fact that, even in a state considered to possess a strong investment in public health, funding may be insufficient. For every dollar spent on healthcare in the United States, only four cents goes toward public health and prevention.[24] While prevention is the most cost-effective and common sense way to improve health, until a paradigm shift occurs prioritizing a culture of health and commitment to prevention, the public health system may continue to be compromised in its ability to optimally meet the population's demand for services.[24]

Study Limitations

This study is limited by its use of a convenience sample, in that most organizations in the sample originated from the HPHTH's "Community Partnership" listserv. Thus, it is possible that organizations important to the delivery of population-based public health services, but not members of the HPHTH's network, may have been overlooked. For example, only one health system or clinic participated in this survey and the majority of organizations were located on O'ahu. Despite having achieved consensus among the researchers in the selection of organizations considered to be key players in the delivery of population-based public health services, it is possible that bias may have been introduced into the sample, as anecdotal evidence regarding organizational reach rather than set criteria was used to guide this selection. Bias may have also been introduced through the inclusion of organizational contacts

that did not hold executive or senior leadership positions (eg, professor or staff physician), since the extent to which their knowledge differed from those in more senior positions is not known. It has been repeatedly noted that estimates generated by this study may be undercounted due to five participants failure to provide actual estimates when prompted to do so for public health workforce sizes greater than 100. While follow-up with the state's largest public health employer generated a figure for supply, follow-up was inconsistent as, it was only conducted with said participant and equivalent figures for functional demand were not provided during this follow-up. Conversely, estimates generated for functional demand and plans for expansion may have been overestimated, as participants were asked to estimate the number of employees generally, rather than public health workers specifically. While this study signifies an important first step toward developing baseline data about Hawai'i's public health workforce, there were several major study limitations, the results are not exhaustive, and the conclusions that can be drawn at this point are preliminary.

Future Research

The challenges encountered in developing this research largely centered on the absence of commonly held definitions of a public health worker and organization. While efforts to develop a standardized methodology for classifying public health workers are ongoing, improving and standardizing data collection will rely on the adoption and use of such classifications among the diverse organizations that engage in the delivery of public health services.[25] In Hawai'i, efforts to create a public list of organizations that identify or affiliate with the public health community should be initiated. This would allow for easier identification of public health organizations and may promote increased communication and collaboration. A dedicated group should be tasked with encouraging and assisting organizations with the implementation of a standard classification scheme for their public health workers. Those who are involved in the delivery of public health services, but do not perceive themselves as belonging to the public health workforce or field (eg, physicians who perform activities that bridge both personal health and population-focused public health), should be further explored. A data collection system should be developed to conduct regular assessments of the public health workforce in a more comprehensive manner. Developing a system for the regular collection of data on the supply of and demand for the public health workforce will allow for more effective advocacy efforts, workforce policy and planning, and the ability to finely tune delivery of public health services for optimal impact.

Conflict of Interest

None of the authors identify a conflict of interest.

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