UNIVERSITY OF CALIFORNIA

Healthforce Center at UCSF

Public Health Workforce and Education in California

INTRODUCTION

This report presents an overview of current and future supply and demand for California's public health workforce. Public health professionals perform a wide range of services aimed at creating the conditions in which people can be healthy. Some public health professionals provide services to individuals, such as vaccination and education about healthy behaviors (e.g., education about the risks associated with consuming tobacco or alcohol). Others address community needs, such as investigating and treating outbreaks of communicable disease, providing access to nutritious foods and safe places to exercise, and enforcing safety standards in workplaces and sanitary standards in restaurants.[1] Epidemiologists conduct research at a population level to identify risk factors and trends in the incidence and prevalence of disease. Still other public health professionals develop, implement and evaluate programs, systems and policies to improve health.

The COVID-19 pandemic has highlighted the importance of the public health workforce and revealed a critical need for reinvestment in it. For example, California needs to substantially increase the number of contact tracers working with people who test positive for COVID-19 and those with whom they have had close contact to ensure that they have access to testing, medical care and other services that can reduce the spread of the virus.

The public health workforce is usually defined in one of two ways. One definition encompasses all people who work for local, state or federal agencies that provide public health services, regardless of whether they have degrees in public health. The other definition includes all those who have bachelor's, master's or doctoral degrees in public health, regardless of whether they work for public health agencies. Neither definition is optimal. Many jobs for public health agencies do not require public health degrees, and many people with public health degrees do not work for organizations that provide public health services. For example, people with master's degrees in public health who work for health systems or health plans.

SUMMARY

- No single source of data exists that encompasses all workers in the public health workforce.
- The majority of employees of state and local health departments in the United States were female (79%) and non-Hispanic white (59%) in 2017.
- Over one-fourth (27.78%) of employees of state and local public health departments in 2017 were older than 55 years.
- Only 14% of state and local public health department employees in the United States had any public health degree in 2017,
- Nationwide, the number of graduate degrees awarded in public health grew by 300% between 1992 and 2016.
- Twenty-eight colleges and universities in California award bachelor's, master's or doctoral degrees in public health, including 4 schools of public health and 16 public health programs accredited by the Council on Education for Public Health (CEPH).
- A survey of 36 local health departments and 41 state health agencies across the United States found that state health agencies most frequently reported high need for epidemiologists and laboratory workers, while local health departments reported high need for disease intervention specialists, nurses, and administrative support.
- The COVID-19 pandemic is increasing demand for the public health workforce.

CURRENT SUPPLY

While there is no single estimate of the number of individuals in the workforce with degrees in public health, the Public Health Workforce Interests and Needs Survey (PH WINS), conducted in 2014 and 2017, offers useful data on state and local health department workers nationwide.

The total number of people in California's public health workforce is unknown. The California Department of Public Health (CDPH) employed approximately 3,600 people in 2017. At that time, 61% of the CDPH's permanent managers and supervisors were eligible for retirement, as were 44% of permanent non-supervisory employees.[2]

Demographic Characteristics

The 2017 survey, which had 47,756 respondents, found that the majority of the workforce in state and local health departments was female (79%) and non-Hispanic white (59%) (**Table 1**).[3] Black and Asian workers constituted similar proportions of the workforce in these departments as in the U.S. population overall. Latinos were underrepresented relative to their proportion of the U.S. population. Non-Hispanic white employees were more likely to be in supervisory, managerial or executive positions.[4]

Table 1. State and Local Public Health Workforce in the United States by Race/Ethnicity, 2017

Racial/Ethnic Group	Percentage
White	59%
Black/African American	15%
Hispanic/Latino	13%
Asian	6%
Other	1%
Two or More Races	6%

Source: de Beaumont Foundation. PH WINS Survey, 2017

The 2017 PH WINS survey found that 20.2% of state or local health department employees were age 35 years or younger, 52% were age 36 to 55 years, 25% were age 56 to 65 years, and 2.8% were age 66 years or older. [5] Twenty-two percent of respondents indicated that they had worked in public health for over 20 years.

Sixty-seven percent of respondents to the 2017 PH WINS survey reported that they had at least a bachelor's degree in any field. Twenty-five percent had a master's degree in addition to a bachelor's degree. Five percent had a doctorate (and possibly a master's degree) in addition to a bachelor's degree. Only 14% had any type of public health degree.[6]

EDUCATION

Educational Programs in the United States

Colleges and universities in the United States offer public health degrees at undergraduate, master's and doctoral levels. There are two types of doctoral degrees in public health. PhD programs prepare students for careers as advanced researchers and academicians, while DrPH programs are designed to prepare "leaders with expertise in evidence-based public health practice and research".[7]

The Council on Education for Public Health (CEPH), the accrediting body for public health schools and programs, was formed in 1974 to promote consistent training, learning objectives and national standards. The first programs accredited by CEPH were master's degrees in public health, followed in 2003 by undergraduate public health programs at universities that offered master's degrees in public health, and in 2013, by stand-alone undergraduate public health programs (i.e., undergraduate public health programs at universities that do not offer graduate programs in public health).

The number of institutions offering undergraduate public health degrees increased between 2003 and 2016, from 83 institutions in 2003 (with a mean of 17 degrees per institution and a maximum of 120 degrees per institution) to 271 in 2016 (with a mean of 48 degrees per institution and a maximum of 536 degrees per institution).[8] The number of undergraduate public health degrees awarded per year

increased dramatically during this period, from 1,448 in 2003 to 12,895 in 2016. More than half of all degrees awarded between 2003 and 2016 were awarded between 2011 and 2016. In 2016, degrees from accredited undergraduate programs accounted for 6,834 (53%) of the 12,895 undergraduate public health degrees conferred.[9]

According to a survey conducted by the Association of Schools and Programs of Public Health (ASPPH), 75% of recipients of bachelor's degrees in public health in 2014-2015 were employed following graduation and 12% were pursuing further education (13% did not respond to the survey). Among those who were employed, 34% were employed by for-profit institutions, 20% by health care organizations, and 11% by governmental organizations (35% worked elsewhere or did not respond).[10]

The number of graduate degrees awarded in public health quadrupled between 1992 and 2016, from 4,481 graduate degrees awarded in 1992 to 19,124 in 2016. During this time, the number of institutions granting at least one graduate degree in public health increased from 74 to 310. Master's degrees accounted for between 90% and 92% of these degrees awarded each year, while doctorate degrees accounted for 8% to 10%. In 2016, 83% of public health graduate degrees were awarded by CEPH-accredited institutions.[11]

The proportion of graduate public health degrees by program area remained consistent from 1992 to 2016, with 40% to 50% of graduate degree recipients having a concentration in general public health or health policy and management. A smaller percentage obtained degrees in the basic public health sciences. In 2016, 11% of degrees were awarded in epidemiology, 10% in health education/behavioral science, 6% in environmental health sciences and 5% in biostatistics. Other specializations in which degrees were awarded include global health, maternal child health and program management.[12]

According to ASPPH data, the number of accredited schools and programs of public health with students in DrPH programs increased from 18 in 2000 to 38 in 2015. Since 2002, the number of students in DrPH programs has more than doubled, growing from 605 to 1,526 students in 2015. During the 2014-2015 academic year, 204 graduates received a DrPH degree.[13]

Geographic Distribution of Educational Programs

Of the 12,895 undergraduate public health degrees conferred by U.S. schools in 2016, institutions in the Southeast and Western United States accounted for the largest share of degrees. Institutions in New England and the Plains states conferred the fewest degrees.[14]

An assessment of 85 institutions offering CEPH-accredited public health programs at the certificate, master's, and doctoral level in 2014 found that 22% (19) were located in Northeastern states, followed by 16% (14) in Eastern states, 14% (12) in Southern states, 14% (12) in Central states, and 12% (10) in Western states.[15] These estimates do not include colleges and universities that have public health degree programs not accredited by CEPH.

Demographic Characteristics of Public Health Students

The percentage of undergraduate degrees in public health awarded to women increased between 2003 and 2016, from 73% to 78% of degrees awarded. The percentage of graduate degrees in public health awarded to women also increased, rising from 63% in 1992 to 73% in 2016.[16]

The proportion of Asian/Pacific Islander and Hispanic students in undergraduate public health programs increased between 2003 and 2016 from 5% to 13% and from 6% to 14%, respectively. At the same time, the proportions of non-Hispanic white students and non-Hispanic Black students decreased, from 62% to 50% and from 23% to 16%, respectively.[17] Asian/Pacific Islander, Hispanic and non-Hispanic Black students accounted for a higher

share of undergraduate degrees received in public health than across all other disciplines.

The racial/ethnic composition of individuals awarded graduate degrees in public health also changed in the last several decades. The ASPPH reports that the percentage of graduate degrees awarded to white students decreased from 75% in 1992 to 53% in 2016, while the percentage of graduate degrees awarded to Asian/Pacific Islander students increased from 6% to 14%, to Black/African American students from 6% to 11%, and to Hispanic/Latino students from 8% to 10%.[18]

Educational Programs in California

As of 2016, California had the most colleges and universities conferring undergraduate public health degrees in the United States (20 institutions, 1,699 degrees).[19] Of these, 15 were public (California State University or University of California) and five were private, not-for-profit.[20]

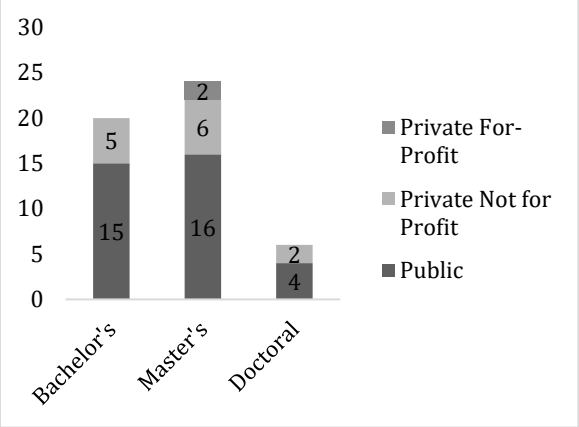
California has 24 universities that offer master's degree programs in public health. Sixteen of these universities are public (California State University or University of California), six are private, not-for-profit, and two are private, for-profit.

There are six California universities with doctoral programs in public health. Four are public (University of California) and two are private, not-for-profit. All six universities award PhD degrees. One offers a general PhD in public health, whereas the others offer PhDs in public health specialties, including biostatistics, environmental science, epidemiology, global health, health policy, health promotion, infectious disease and nutrition. Three of these universities (Claremont Graduate University, Loma Linda University, and University of California, Berkeley) award DrPH degrees.

There are currently four CEPH-accredited schools of public health in California: Loma Linda University, San Diego State University, University of California, Berkeley, and University of California, Los Angeles.[21] The Regents of the University of California have approved the establishment of a School of Public Health at the University of California, San Diego that is not yet accredited by CEPH. In addition, there are 16 CEPH-accredited public health programs in the state, nine at public universities and seven at private, not-for-profit universities. There are also seven California universities that have unaccredited public health degree programs.

Public health degree programs are located across California, but are concentrated in Southern California and in the Bay Area. There are no doctoral programs in the San Joaquin Valley or in the Central Coast region, and no institutions north of Sacramento that have graduate degree programs in public health.

Figure 1. Public Health Degree Programs by Degree Type, California, 2018



Source: National Center for Education Statistics, College Navigator. Some institutions award more than one type of degree in public health.

There are also nine programs in California that are exclusively online or offer an online/in-person hybrid format. These include three programs at public universities: CSU Northridge (MPH), San Jose State University (MPH), and UC Berkeley (MPH). There are five programs at private, not-for-profit universities: Loma Linda University (MPH), National University (bachelor's and MPH), University of San Francisco (MPH), University of Southern California (MPH), and Touro University (MPH). There is one program at a private, for-profit university, Ashford University (MPH).[22]

FUTURE SUPPLY AND DEMAND

A survey of 41 state health agencies and 36 local health departments found that state health agencies most frequently reported high-priority workforce needs for epidemiologists and laboratory workers.[23] Local health departments reported high need for disease intervention specialists, nurses, and for administrative support, management and leadership personnel. Both state and local health departments indicated that their ability to recruit and retain qualified employees was constrained by an inability to offer competitive salaries.

Several recent trends will increase demand for public health professionals. First, California's aging population will require public health professionals with expertise in the challenges faced by senior citizens, including chronic disease, disability and impaired mobility. Successfully addressing these challenges will require a public health approach that goes beyond treatment of specific medical or cognitive conditions to encompass social determinants of health, including access to food, housing and transportation.

Second, there is increasing recognition that social determinants of health affect mental health. This recognition will increase demand for public health professionals who can work alongside mental health professionals to address the needs of those with mental health conditions. The movement to shift resources away from law enforcement may increase the resources available to implement such approaches to improving mental health.

Third, climate change will increase demand for public health professionals. In particular, California will need public health professionals with expertise in emergency response and disaster management to respond to wildfires.

Finally, the COVID-19 pandemic has increased demand for public health personnel. Large numbers of contact tracers are needed to connect with individuals who test positive for COVID-19 and to ensure that they and their close contacts have access to testing, medical care, and other services to reduce the spread of the virus. Public health professionals also need skills to persuade skeptical members of the public that preventive measures such as wearing masks and immunization (when a vaccine is available) are effective and safe. In addition, the disproportionate impact of COVID-19 on Black and Latino Californians will increase demand for Black and Latino public health professionals, and those with the skills, knowledge and cultural and linguistic competency to improve health equity.

Regardless of the needs that public health professionals address, they will need expertise in analysis and interpretation of quantitative data from multiple streams, including environmental monitoring, electronic medical records and mobile and wearable devices.

No quantitative estimates of future supply and demand for public health professionals in California have been published. The large growth in the number of recipients of bachelor's and graduate degrees in public health in California and the U.S. overall suggests that the future supply of public health professionals may be adequate to replace those who retire. However, little is known about the extent to which persons with public health degrees are working for government agencies or not-for-profit organizations that provide public health services. Better information about graduates' career paths is needed to estimate the fraction who go on to complete degrees in clinical fields (e.g., medicine, dentistry) or to work for for-profit health care organizations. Public health education programs also need to assess the extent to which their curricula prepare graduates to address aging, social determinants of health, climate change, and COVID-19.

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