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Characterization of the Federal Workforce at the Centers for Disease Control and Prevention

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Abstract

Context: Studies characterizing the public health workforce are needed for providing the evidence on which to base planning and policy decision making both for workforce staffing and for addressing uncertainties regarding organizing, financing, and delivering effective public health strategies. The Centers for Disease Control and Prevention (CDC) is leading the enumeration of the US public health workforce with an initial focus on CDC as the leading federal public health agency.

Objective: To characterize CDC's workforce, assess retirement eligibility and potential staff losses, and contribute these data as the federal component of national enumeration efforts.

Methods: Two sources containing data related to CDC employees were analyzed. CDC's workforce was characterized by using data elements recommended for public health workforce enumeration and categorized the occupations of CDC staff into 15 standard occupational classifications by using position titles. Retirement eligibility and potential staffing losses were analyzed by using 1-, 3-, and 5-year increments and compared these data across occupational classifications to determine the future impact of potential loss of workforce.

Results: As of the first quarter of calendar year 2012, a total 11 223 persons were working at CDC; 10 316 were civil servants, and 907 were Commissioned Corps officers. Women accounted for 61%. Public health managers, laboratory workers, and administrative-clerical staff comprised the top 3 most common occupational classifications among CDC staff. Sixteen percent of the workforce was eligible to retire by December 2012, and more than 30% will be eligible to retire by December 2017.

Conclusions: This study represents the first characterization of CDC's workforce and provides an evidence base upon which to develop policies for ensuring an ongoing ability to fulfill the CDC mission of maintaining and strengthening the public's health. Establishing a system for continually monitoring the public health workforce will support future efforts in understanding workforce shortages, capacity, and effectiveness; projecting trends; and initiating policies.

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Keywords

health manpower; public health workforce

Public health measures have contributed remarkably to the overall health improvement of US residents during the last century.¹ However, the public health practice landscape is rapidly changing and is being influenced by advances in technology and science, emerging and reemerging public health threats that know no geographic boundaries, and reductions in staff because of limited budgets, funding cuts, and personnel retirements.²⁻⁴ Understanding how the existing public health workforce can meet the challenges posed by this changing landscape requires concrete data about the size, composition, and skill set of this workforce, yet neither these data nor accurate models to produce useful estimates are available.² Consequently, there are no answers to questions regarding the size of the workforce, much less how many personnel are needed, in what jobs and functions, and whether the necessary skills are present to provide adequate public health services. Studies characterizing the public health workforce are required both for providing foundational evidence on which to base planning and policy decision making related to workforce needs and for identifying and addressing critical uncertainties about how best to organize, finance, and deliver effective public health strategies for all Americans.^{1,5,6} Enumerating the US public health workforce is a necessary prerequisite for improving our ability to identify gaps, forecast future workforce trends and needs, guide public health workforce development and related policy, and ultimately to strengthen the US health workforce infrastructure.

The imperative to plan for present and future public health workforce needs underscores the importance of performing an enumeration on an ongoing basis; however, implicit challenges exist in characterizing this workforce. The public health workforce encompasses diverse occupational groups often working across disciplines. Occupational groups or position titles might not be related to or require specific training, education, or certification, unlike other health professions. For example, a person working as an epidemiologist might hold a medical or veterinary degree with training in the Centers for Disease Control and Prevention (CDC) Epidemic Intelligence Service. This is one factor that makes characterizing the public health workforce challenging. A myriad of nongovernmental partners, community-based workers, and contractors add to the diversity to be considered when counting public health workers.^{1,7} Finally, no comprehensively applied taxonomy and standards exist for occupational definitions, worker classifications, or data collection methods used by the different organizations attempting to characterize the public health workforce.

To address these challenges, CDC is leading the implementation of a systematic ongoing approach for enumerating the US governmental public health workforce. To advance this effort, CDC supported the work of the Centers of Excellence in Public Health Workforce at the University of Michigan and the University of Kentucky in developing consensus-based strategies to enumerate this workforce, specifically to reach consensus on a working definition of “governmental public health workforce” and a standard classification of public health occupations. The governmental public health workforce is defined for this initiative as “all persons responsible for providing any of the 10 Essential Public Health Services who

are employed in federal, state, or local governmental public health agencies and those providing environmental health and public health laboratory services.” This definition has been limited so that occupations and functions can be accurately tracked as *public health* across time by using existing data sources, while recognizing that this definition likely underestimates the overall public health workforce.⁸

The Centers of Excellence recommended using 15 standard occupational classifications for enumerating the public health workforce to allow comparisons across different government agencies.⁸ These occupational classifications match those developed by the Association of State and Territorial Health Officials (ASTHO) and the National Association of County and City Health Officials (NACCHO) for use in their periodic profile studies.^{9,10} The ASTHO and NACCHO profile studies are considered the core data sources for information regarding the structure and function of their respective health constituencies. These 15 occupational classifications, hereafter referred to as the “recommended occupational classifications,” support categorization of the public health workers at state and local public health agencies and link to the occupational series set used by the US Office of Personnel Management (OPM), the primary personnel data source for all federal civil service employees (civil servants) at the US Department of Health and Human Services (HHS). Consequently, these standard occupational classifications can be used to provide a comprehensive description of the combined federal, state, and local governmental public health workforce. However, accessible information regarding public health workers is primarily about those in state and local public health agencies, with only limited information available about the federal workforce.¹¹ Although the standard occupational classifications provide a mechanism for linking federal, state, and local public health workforce data, no enumeration of the federal component of the public health workforce is ongoing.⁸

CDC initiated an enumeration of the federal component of the public health workforce, with an initial focus on CDC as the leading public health agency in the United States. Determining the size and composition of CDC’s workforce is a critical step in understanding its capacity and serves as an evidence base upon which to develop policies that ensure an ongoing ability to fulfill CDC’s mission of maintaining and strengthening the public’s health. This study characterizes the CDC federal workforce by using the 15 recommended occupational classifications, assesses retirement eligibility and potential staff losses, and contributes CDC information to the federal component of national enumeration efforts.

Methods

The CDC workforce comprises civil servants, US Public Health Service Commissioned Corps (CC) officers, and contractors. Contractors are not included in the OPM workforce count, and data regarding contractors using the official HHS system of record are incomplete; therefore, contractors cannot be included in the federal public health workforce enumeration. CDC federal employees support the agency’s mission and provide essential public health services; consequently, all civil servants and CC officers meet the definition of a public health worker and are therefore included in this study. To enumerate CDC’s workforce, we used 2 data sources with maximum validity, reliability, completeness, inclusiveness, and accessibility to data elements of interest. The primary data source was the

HHS system of record, Capital Human Resources, in which individual-level data regarding civil servants and CC officers are maintained. The HHS system of record, however, does not include complete demographic and occupational information regarding CC officers, necessitating use of a second data source, the CC database, which provides demographic and occupational information for active CC officers and information about the occupational categories used by the CC system. Because these data sources are official personnel records, data are captured on an ongoing basis and are essentially complete. To integrate data, both data sources were merged and sorted by CC officers' birth date, and duplicate records were removed.

The CDC workforce was characterized by using Centers of Excellence–recommended data elements for the public health workforce (eg, demographic information, educational background, and job characteristic)⁸; we also assessed location (domestic vs international) and supervisory responsibility status. Race/ethnicity was reported as a single, combined variable within the databases used and thus was recorded as such for this analysis rather than by using the White House Office of Management and Budget format of separate fields for race and ethnicity.

To categorize the occupations of CDC staff into the 15 recommended occupational classifications, we applied 2 methods. In the first method, the OPM occupational series was mapped to the recommended occupational classifications. None of the OPM series mapped to 3 of the recommended occupational classifications (ie, emergency preparedness staff, epidemiologists, and public health informatics specialists); therefore, we applied a second method, mapping CDC-assigned position title to the recommended occupational classifications. Because position titles are usually entered in free text in the HHS reporting system, and therefore not in a standard format, this mapping required manually collapsing and grouping position titles into a comparable single position title. For example, if part of a position title included “epid” (eg, epidemiology, epidemiolo-gist, or nurse epidemiologist), the position was classified as Epidemiologist. As an additional example, positions listed as “ADMIN ASST,” “Administrative Assistant,” or “Admint Asst.” were classified as Administrative/Clerical Personnel. Mapping of CDC occupations by using the second method, position titles, proved more useful. Using the more granular description of position titles more accurately reflected job functions of the workforce and captured positions of employees working in the 3 occupational classifications not captured by the OPM. Classifications used to further characterize the CDC workforce, therefore, are based on position titles and their mappings to the recommended occupational classifications.

Retirement eligibility and potential staffing losses were analyzed by using 1-, 3-, and 5-year increments and were based on workers' retirement designations. Retirement designations differ for civil servants and CC officers; moreover, within the civil service, 2 retirement systems exist for permanent civilians: the Federal Employee Retirement System and the Civil Service Retirement System. Calculations for retirement eligibility were based on the parameters of the applicable retirement system. Retirement eligibility was compared within occupational classifications to determine the future impact of potential loss of workforce within different occupations.

First quarter of calendar year 2012 CDC workforce data were analyzed using SAS v9.3 (SAS Institute Inc, Cary, North Carolina). Descriptive statistics were calculated for all variables. The authors had access to deidentified information only. This project was reviewed by CDC for human subjects protection and deemed to be nonresearch.

Results

As of the first quarter of calendar year 2012, a total of 18 346 persons were working at CDC; 10 316 were civil servants and 907 were CC officers (Table 1). An additional 7123 contractors were identified, but they are not included in this analysis because of previously noted limitations of these data. Women accounted for 6821 of 11 223 employees (61%) included in our analyses. Among 11 061 employees (99%) with known race/ethnicity, 6795 (61%) were white, 2912 (26%) black, and 955 (8.6%) Asian/Pacific Islanders. The race/ethnicity distribution of civil servants and CC officers were similar among whites, Asians, and Hispanics. Proportionally, 2.4 times more black civil servants than black CC officers and 2.5 times more American Indian CC officers than American Indian civil servants worked at CDC. Sixty percent of the entire CDC workforce was 45 years or older (median age, 48 years; range, 18–91 years); 53% of the CC officers were 44 years or younger. Fifty-nine percent of the CDC workforce had a graduate-level degree.

Approximately 90% of the workforce was located at CDC offices throughout the United States (ie, Atlanta [CDC headquarters], Anchorage, Cincinnati, Fort Collins, Hyattsville, Morgantown, Pittsburgh, and Puerto Rico). A total of 145 CC officers (16%) and 757 civil servants (7%) were assigned to domestic locations outside of CDC offices (ie, state and local health departments). In addition, 48 CC officers (5%) and 232 civil servants (2%) were assigned to international locations. Thirty-one percent of the CDC workforce (n = 3489) was located in operational units focusing on noninfectious diseases, 27% on infectious diseases (n = 3062), and the remainder on crosscutting offices, including 24% on crosscutting science (eg, the Office of Surveillance, Epidemiology, and Laboratory Services or the Center for Global Health) and 18% on crosscutting support (eg, the Office of State, Tribal, Local, and Territorial Support or the Office of the Director) (Table 1).

Among CDC staff, persons in 159 individual OPM occupational series were identified and grouped into the recommended occupational classifications; however, OPM occupational series codes did not capture the roles of emergency preparedness staff, epidemiologists, or public health informatics specialists (Table 2). By using the single-position title approach as described in the “Methods” section, we identified 928 individual position titles, collapsed them into 230 comparable single-position titles, and then grouped them into one of the standard occupational classifications, successfully capturing the 3 missing occupations. The balance of the results presented is based on classifications that used this second approach.

Public health managers, laboratory workers, and administrative-clerical staff comprised the top 3 most common occupational classifications among CDC staff (Table 2). Persons placed in the Other Public Health Professional category accounted for 28% of the 11 223 person workforce, representing 124 of the 230 comparable single-position titles (54%). Characteristics of the most common scientific occupational classifications (ie, environmental

health workers, epidemiologists, laboratory workers, and public health managers) are displayed in Table 3. Among these 4 occupational classifications, women represented 54% or more, with the exception of environmental health workers (34%); more than 50% were white. Epidemiologists accounted for 9% of the overall CDC federal workforce, 5% of whom were civil servants and 50% CC officers. Among the established occupational classifications, the proportion of workers 55 years or older was larger than the proportion of workers aged 34 years or younger. Graduate-level degrees were held by 95% of epidemiologists, 70% of laboratory workers, 63% of environmental health workers, and 44% of public health managers. The supervisor-to-nonsupervisor ratio for epidemiologists, public health managers, and environmental health workers was 1:5, whereas the ratio for laboratory workers was 1:14.

Sixteen percent of the CDC workforce was eligible to retire by December 2012, and more than 30% will be eligible to retire by December 2017 (Table 4). Among CC officers, more than 40% were eligible to retire within 5 years, and an additional 8% faced mandatory retirement within the next 5 years (data not shown). Approximately 19% of the workforce in operational units focusing on noninfectious diseases was eligible to retire in 2012, and 15% of the workforce in crosscutting scientific areas was eligible to retire within 5 years (Figure). Positions critical for fulfilling the CDC mission, including 23% of public health physicians, 25% of environmental health workers, and 16% of epidemiologists, were eligible to retire by December 2012. Public health nurses, public health physicians, environmental health workers, health educators, and administrative-clerical staff are among the occupational classifications that might lose 30% or more of their workforce within the next 5 years (Figure).

Discussion

Although research is being conducted on staffing patterns of health departments and workforce competencies, these efforts have been hampered considerably by a lack of data regarding the public health workforce overall.^{12,13} Describing and counting the public health workforce acknowledges the vital role of public health as part of the entire US health system, especially as public health and clinical health care evolve in complementary ways to address and improve population health. However, challenges to enumerating the public health workforce are mirrored by similar obstacles to enumerating the larger health workforce. This study is the first to characterize the CDC workforce and represents a substantial contribution to understanding the size and composition of the governmental federal public health enterprise; furthermore, our findings reveal implications for the broader national public health enumeration efforts. Monitoring the size and composition of the public health workforce is an essential first step in determining how to develop and maintain workforce competency and effectiveness and in ensuring that health agencies have a capable and qualified workforce necessary for providing essential public health services, a priority outlined by the *Healthy People* initiative.¹⁴

CDC has a large, highly educated, and diverse workforce that seeks to accomplish the agency's mission through collaboration with nationwide and global partners to improve the public's health. Our profile of the CDC workforce used data from existing personnel

systems capturing information about the workforce on an ongoing basis and was based on data elements recommended for workforce surveillance (eg, demographic and education and training background).⁸ Combining these data with those of enumeration efforts from state and local public health departments collected through the ASTHO and NACCHO profile studies can provide a more complete and arguably representative picture of the public health workforce. The 2 profile studies do not collect demographic information or education and professional training characteristics of their workforce, and including the minimum elements recommended for monitoring the workforce in these studies and related occupational surveys should facilitate substantial progress in national efforts to characterize the public health workforce. Integrating these elements into their respective surveys or into a structured and systematic data collection method will permit (1) profiling the local, state, and federal public health population in quantitative terms; (2) presenting trends that allow reflecting on the diversity of the workforce trends and understanding the degree to which this workforce reflects the characteristics of the continually changing US population; (3) identifying disparities in worker qualifications; and (4) using these data to raise policy concerns in preparation, continuing education, recruitment, and retention.¹¹

An accurate description of the job functions of persons working in public health is crucial to determining whether adequate numbers and types of staff are employed in positions that enable public health agencies to meet the needs of protecting the public health over time. Although the OPM provides extensive data regarding the federal civilian workforce, including demographic information, employment trends, and retirement statistics, the majority of occupational series do not reflect public health workers' job functions as accurately as position titles.^{8,12,15} Position titles provide more granularity for classification into the corresponding occupational classification, but they do not consistently provide an accurate reflection of the educational preparation or the work performed by a person¹¹; furthermore, at CDC, not all position titles correspond to workers' job functions or education and training background (eg, a physician who trained as an epidemiologist but serves in a management position). Additional variations among how public health worker job titles are listed in state, local, and federal governments limit our ability to compare our findings with those of other public health agencies. Implementing a standardized system for classifying public health workers among the different public health groups collecting workforce data or mapping current position titles to a standardized classification system is key to developing a profile of the national public health workforce derived from data from multiple sources.

The public health workforce is a complex mixture of health care professionals.¹¹ In our study, all CDC staff were grouped into one of the recommended occupational classifications by using position titles, from which we observe that more than 40% were classified as public health managers, laboratory workers, and epidemiologists. Workers classified in the Other Public Health Professional category, however, accounted for approximately 30% of the CDC workforce. This finding is consistent with the 29% of local public health workers enumerated but not categorized by the most recent NACCHO profile survey,¹⁰ although it is somewhat lower than the 46% of ASTHO public health workers not categorized during their last survey.⁹ At any level of government, the Other Public Health Professional category includes public health workers who are either in occupational classifications other than those

recommended for data collection or otherwise uncategorized because of missing data; at CDC, 124 different comparable position titles (eg, health scientists, veterinarians, or economists) were classified into this category. To provide a more refined characterization of a greater proportion of the public health workforce, assessing the Other Public Health Professional category is essential for determining whether we are systematically not capturing a discipline or occupation and thus the need to add additional occupational classifications to better characterize the public health workforce.

As one mechanism of responding to this challenge, CDC and public health partners, including ASTHO and NACCHO, are developing a taxonomy for occupational classifications to provide a detailed, more comprehensive, and accurate representation of the public health workforce. This taxonomy will help future studies determine whether the public health system has adequate numbers of staff working in the right job functions and assist the public health sector in efforts to hire and train a workforce that can deliver and measure the essential public health services.

Current and projected personnel shortages in the public health workforce are well documented, and reports indicate that 25% of the public health professionals are eligible to retire.² Our study indicates that more than 30% of the CDC workforce will be eligible to retire by 2017, and with their retirement, staff experience necessary for effectively delivering public health services also will be lost. Furthermore, our study indicates that CDC workers are an average age of 48 years, essentially the same as other public health workers outside the federal system and 8 years older than the rest of the US workforce.¹⁶ These findings are consistent with other reports and reveal that the public health workforce is aging at a higher rate than the general workforce or that fewer workers at the younger end are being recruited; as older, more experienced workers retire, a substantial gap in leadership is anticipated. Although CDC has educational and training programs implemented to encourage careers in public health,¹⁷ hiring limitations at federal, state, and local health agencies might constrain the number of trained workers entering the field of public health. That a field as important as public health might be left without sufficient workforce in the next 5 years is a wake-up call at all levels.¹⁶ Addressing the looming workforce shortage should be approached strategically by developing workforce planning models for public health agencies that include monitoring and evaluation of the workforce,¹⁸ along with succession planning, as critical steps in ensuring key public health positions are maintained. Workforce models can help to identify and implement strategies for maintaining and increasing competency in these positions beginning with the Institute of Medicine recommendation for all students to have access to public health education.⁷ These and other targeted efforts should emphasize reevaluation of retention practices, preparing talent within the organization, and planning recruitment activities for external candidates.¹³

In its 2003 report, *The Future of the Public's Health in the 21st Century*, the Institute of Medicine recommended periodic assessments of the preparedness of the public health workforce to document the training necessary for meeting basic competency expectations and to advise on the funding necessary to provide such training.⁷ Implementing a systematic process for characterizing the size and composition of the public health workforce is essential both for maintaining and strengthening the US public health infrastructure and for

understanding the capacity, projecting trends, and developing policies regarding the future workforce. CDC is facilitating the implementation of strategies for enumerating the US governmental public health workforce by using a systematic, ongoing, surveillance-like approach. This ongoing enumeration will monitor and leverage existing data sources and resources to provide a comprehensive picture of the numbers and variety of disciplines and functions that, combined, form the public health workforce. A single data source capturing workforce data across public health agencies does not exist, and existing data streams are neither compatible nor necessarily comparable⁸; however, standardizing job titles and consistently collecting data elements recommended for workforce surveillance can support combining the 3 most representative systems (the NACCHO and ASTHO periodic profile surveys and CDC's ongoing collection of personnel data) and analyzing them as a single data source system on an ongoing basis to provide an adequate, if not a complete, picture of the public health workforce. Accurate and timely enumeration data can lay the groundwork for workforce development efforts that include understanding gaps and future needs in the public health system, competency measurement, certification and credentialing, compliance with performance standards, and tracking progress toward *Healthy People* objectives.¹⁹

Our findings provide an understanding of the complex and diverse CDC workforce, and the methods used in our study can be applied to continually monitor US governmental agencies contributing to public health, especially those within the HHS system. This contribution represents a critical baseline measure that will help support studies to identify the needs of different public health professions. Nevertheless, enumeration efforts are only one part of a larger initiative to strengthen the public health and health workforce to improve the public's health. Under this initiative, CDC has adopted shared leadership with such key partners as ASTHO, NACCHO, and the University of Michigan, among others, to advance systems for measurement, evaluation, and continuous improvement by enhancing the education system at multiple levels, improving pathways to public health careers, and increasing the capacity and capability of the existing workforce.

Limitations

One limitation of our study was that our assessment did not include contract employees, considered a substantial contribution to the federal workforce and almost 30% of CDC's workforce. Contractors are counted through their home organization, not captured in the OPM data system, and therefore not classified as federal workers (ie, company A contractor working at CDC in a public health capacity is reported and counted as a company A employee). Second, because position titles lack standardization when entered into the personnel systems, our effort to manually collapse and group them into position titles similar in roles might have resulted in potential misclassification with under- or overcounting for certain disciplines. However, because of the specificity of job titles when compared with the use of OPM occupational series, our findings still provide useful insight into the CDC workforce. Third, our study measured retirement eligibility and potential staff losses but did not assess personnel influx. Evidence exists, however, that the growth of the general public health workforce might be slowing or even reversing.²⁰ In addition, categorization of certain CDC operational divisions into crosscutting, infectious disease, or noninfectious disease areas might not completely represent the activities within those units; for example, we

classified the Center for Global Health as a crosscutting science organization, yet it also includes disease-specific components (eg, the global HIV/AIDS and malaria programs). Consequently, we might have underestimated the proportion of CDC staff working in the infectious diseases area. Fourth, CDC workforce data were only available in real time; therefore, it did not allow for retrospective analyses and trends over time. Finally, CDC does not comprise the entirety of the public health workforce at the federal level. Because it is the leading public health agency in the US government, however, examining the composition of CDC workforce serves as a useful proxy for the federal component in the national public health workforce enumeration effort.

Conclusions

This study represents the first characterization of the CDC workforce and provides a valuable contribution to the national public health workforce enumeration. The methods used in our study can be applied to other HHS agencies and serve as the beginning of a systematic approach for enumerating the federal public health system. Establishing a system for continually monitoring the public health workforce is the method by which the characterization of this workforce will be possible, which, in turn, can help efforts regarding understanding workforce shortages, capacity, and effectiveness, projecting trends, and implementing policies.

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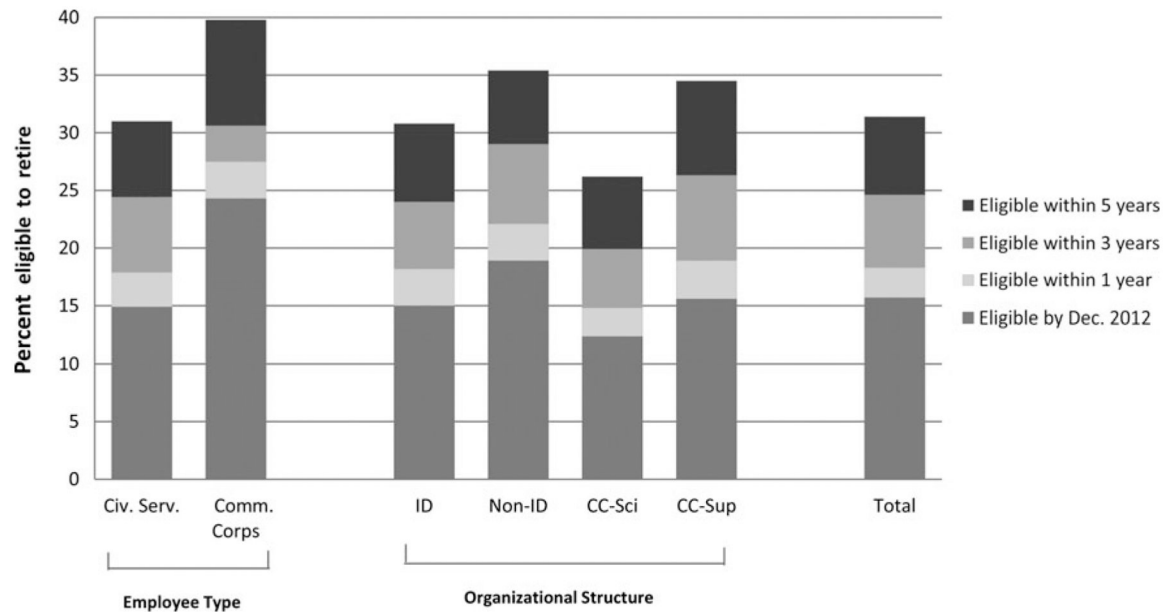


FIGURE. Retirement Status of the Centers for Disease Control and Prevention Federal Workforce, by Employee Type and Organizational Structure,^a First Quarter Calendar Year 2012

Abbreviations: Employee Type—Civ. Serv., Civil Service employees; Comm. Corps., Commissioned Corps officers. Organizational structure—CC-Sci, crosscutting science; CC-Sup, crosscutting support; ID, infectious disease; NID, noninfectious disease.

^aCDC Organizational Structure—Infectious disease: Office of Infectious Disease.

Noninfectious Disease: Office of Noncommunicable Diseases, Injury, and Environmental Health; National Institute of Occupational Safety and Health; and Coordinating Center for Environmental Health and Injury Prevention. Crosscutting science: Center for Global Health; Coordinating Office for Terrorism Preparedness and Emergency Response; Office of Public Health Preparedness and Response; and Office of Surveillance, Epidemiology, and Laboratory Services. Crosscutting support: Office of the Chief Operating Officer; Office of the Director; and Office of State, Tribal, Local, and Territorial Support.

Characteristic of the Centers for Disease Control and Prevention Federal Workforce, First Quarter Calendar Year 2012^a

TABLE 1

| Characteristic | Civil Service Employees, n (%) | Commissioned Corps Officers, n (%) | Total, n (%) |
|-----------------------------|--------------------------------|------------------------------------|---------------|
| Sex | | | |
| Women | 6 316 (61.2) | 505 (55.7) | 6 821 (60.8) |
| Men | 4 000 (38.8) | 402 (44.3) | 4 402 (39.2) |
| Race/ethnicity | | | |
| Black | 2 810 (27.2) | 102 (11.2) | 2 912 (25.9) |
| American Indian | 37 (0.4) | 9 (1.0) | 46 (0.4) |
| Asian/Pacific Islander | 871 (8.4) | 84 (9.3) | 955 (8.5) |
| White | 6 274 (60.8) | 521 (57.4) | 6 795 (60.5) |
| Hispanic | 324 (3.1) | 29 (3.2) | 353 (3.1) |
| Unknown | 0 (0) | 162 (17.9) | 162 (1.4) |
| Age group, y | | | |
| 24 | 139 (1.3) | 0 (0) | 139 (1.2) |
| 25–34 | 1 316 (12.8) | 164 (18.1) | 1 480 (13.2) |
| 35–44 | 2 525 (24.5) | 324 (35.7) | 2 849 (25.4) |
| 45–54 | 3 404 (33.0) | 295 (32.5) | 3 699 (33.0) |
| 55–64 | 2 529 (24.5) | 119 (13.1) | 2 648 (23.6) |
| 65 | 403 (3.9) | 5 (0.6) | 408 (3.6) |
| Education level | | | |
| Less than bachelor's degree | 1 938 (18.8) | 0 (0) | 1 938 (17.3) |
| Bachelor's degree | 2 591 (25.1) | 97 (10.7) | 2 688 (24.0) |
| Master's degree | 3 373 (32.7) | 178 (19.6) | 3 551 (31.6) |
| Doctoral degree | 2 410 (23.4) | 626 (69.0) | 3 036 (27.1) |
| Unknown | 4 (<0.1) | 6 (0.7) | 10 (<0.1) |
| Location | | | |
| Headquarters | 9 327 (90.4) | 709 (78.2) | 10 036 (89.4) |
| Other domestic locations | 757 (7.3) | 145 (16.0) | 902 (8.0) |
| International | 232 (2.3) | 48 (5.3) | 280 (2.5) |
| Unknown | 0 (0) | 5 (0.5) | 5 (<0.1) |

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| Characteristic | Civil Service Employees, n (%) | Commissioned Corps Officers, n (%) | Total, n (%) |
|---------------------------------------|--------------------------------|------------------------------------|----------------|
| Organizational structure ^b | | | |
| Infectious disease | 2 733 (26.5) | 329 (36.3) | 3 062 (27.2) |
| Noninfectious disease | 3 228 (31.3) | 261 (28.8) | 3 489 (31.1) |
| Crosscutting science | 2 371 (23.0) | 278 (30.7) | 2 649 (23.6) |
| Crosscutting support | 1 984 (19.2) | 39 (3.4) | 2 023 (18.0) |
| Total | 10 316 (100.0) | 907 (100.0) | 11 223 (100.0) |

^aPercentages might not sum to 100% because of rounding.

^bOrganizational Structure—Infectious disease: Office of Infectious Disease, Noninfectious disease: Office of Non-Communicable Diseases, Injury, and Environmental Health; National Institute of Occupational Safety and Health; and Coordinating Center for Environmental Health and Injury Prevention. Crosscutting science: Center for Global Health; Coordinating Office for Terrorism Preparedness and Emergency Response; Office of Public Health Preparedness and Response; and Office of Surveillance, Epidemiology, and Laboratory Services. Crosscutting support: Office of the Chief Operating Officer; Office of the Director; and Office of State, Tribal, Local, and Territorial Support.

TABLE 2

Recommended Occupational Classifications, by OPM Occupational Series and Position Title, Centers for Disease Control and Prevention, First Quarter Calendar Year 2012^a

| Recommended Occupational Classifications for Public Health Workforce ^b | Total | |
|---|--|---------------------------------------|
| | By OPM Occupational Series, ^c n (%) | By Position Title, ^d n (%) |
| Administrative/Clerical Personnel | 1 596 (14.2) | 1 147 (10.2) |
| Behavioral Health Professional | 233 (2.1) | 233 (2.1) |
| Emergency Preparedness Staff | 0 (0) | 115(1.0) |
| Environmental Health Worker | 266 (2.4) | 354 (3.2) |
| Epidemiologist | 0 (0) | 961 (8.6) |
| Health Educator | 176 (1.6) | 176 (1.6) |
| Laboratory Worker | 1 110 (10.0) | 1 118 (10.0) |
| Nutritionist | 1 (<0.1) | 1 (<0.1) |
| Public Health Dentist | 9 (<0.1) | 5 (<0.1) |
| Public Health Informatics Specialist | 0 (0) | 67 (0.6) |
| Public Health Manager | 2 416 (21.5) | 2 867 (25.5) |
| Public Health Nurse | 55 (0.5) | 31 (0.3) |
| Public Health Physician | 787 (7.0) | 418(3.7) |
| Public Information Specialist | 556 (5.0) | 553 (4.9) |
| Other Public Health Professional | 4 018 (35.8) | 3 177 (28.3) |
| Total | 11 223 (100.0) | 11 223 (100.0) |

Abbreviation: OPM, US Office of Personnel Management.

^aPercentages might not sum to 100% because of rounding.

^bFrom University of Michigan/Center of Excellence in Public Health Workforce Studies, University of Kentucky/Center of Excellence in Public Health Workforce Research and Policy.⁸

^cOPM occupational series refers to the designations set forth by the OPM that fall into the corresponding recommended occupational classifications.

^dPosition title refers to the use of individual position titles that correspond to the recommended occupational classifications.

Characteristics of the Most Common Scientific Occupational Classifications, Centers for Disease Control and Prevention, First Quarter Calendar Year 2012^a

TABLE 3

| Characteristic | Environmental Health Workers, n (%) | Epidemiologists, n (%) | Laboratory Workers, n (%) | Public Health Managers, n (%) |
|---------------------------------|-------------------------------------|------------------------|---------------------------|-------------------------------|
| Sex | | | | |
| Women | 122 (34.5) | 596 (62.0) | 602 (53.8) | 2089 (72.9) |
| Men | 232 (65.5) | 365 (38.0) | 516 (46.2) | 778 (27.1) |
| Race/ethnicity | | | | |
| American Indian | 3 (0.8) | 6 (0.6) | 3 (0.3) | 15 (0.5) |
| Asian/Pacific Islander | 20 (5.6) | 140 (14.6) | 197 (17.6) | 113 (3.9) |
| Black | 38 (10.7) | 75 (7.8) | 128 (11.4) | 1123 (39.1) |
| Hispanic | 9 (2.5) | 36 (3.7) | 38 (3.4) | 102 (3.6) |
| White | 268 (75.7) | 639 (66.5) | 752 (67.3) | 1469 (51.2) |
| Unknown | 15 (4.2) | 65 (6.8) | 0 (0) | 43 (1.5) |
| Age group, y | | | | |
| 24 | 0 (0) | 1 (0.1) | 6 (0.5) | 110 (3.8) |
| 25–34 | 46 (13.0) | 158 (16.4) | 186 (16.6) | 401 (14.0) |
| 35–44 | 84 (23.7) | 345 (35.9) | 321 (28.7) | 744 (26.0) |
| 45–54 | 138 (39.0) | 302 (31.4) | 332 (29.7) | 1023 (35.7) |
| 55–64 | 79 (22.3) | 142 (14.7) | 234 (20.9) | 541 (18.9) |
| 65 | 7 (2.0) | 13 (1.4) | 39 (3.5) | 48 (1.7) |
| Education level ^a | | | | |
| Less than bachelor's degree | 22 (6.2) | 2 (0.2) | 42 (3.8) | 642 (22.4) |
| Bachelor's degree | 105 (29.7) | 45 (4.7) | 295 (26.4) | 948 (33.1) |
| Master's degree | 145 (41.0) | 274 (28.5) | 253 (22.6) | 1166 (40.7) |
| Doctoral degree | 79 (22.3) | 640 (66.6) | 527 (47.1) | 107 (3.7) |
| Supervisory status ^a | | | | |
| Nonsupervisor | 304 (86.2) | 807 (84.0) | 1044 (93.4) | 2384 (83.1) |
| Supervisor | 49 (13.8) | 154 (16.0) | 74 (6.6) | 481 (16.8) |
| Total | 354 (100.0) | 961 (100.0) | 1118 (100.0) | 2867 (100.0) |

Percentages might not sum to 100% because of rounding.

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Retirement Eligibility Information, by Occupational Classification, Centers for Disease Control and Prevention, First Quarter Calendar Year 2012^a

TABLE 4

| Recommended Occupational Classifications for Public Health Workforce ^b | Dec 2012, ^c n (%) | 1–3 y, ^c n (%) | >3–5 y, ^c n (%) | Future, ^c n (%) | Total, n (%) |
|---|------------------------------|---------------------------|----------------------------|----------------------------|--------------|
| Administrative/Clerical Personnel | 208 (18) | 131 (11) | 101 (9) | 707 (62) | 1 147 (100) |
| Behavioral Health Professional | 20 (9) | 12 (5) | 14 (6) | 187 (80) | 233 (100) |
| Emergency Preparedness Staff | 3 (3) | 14 (12) | 7 (6) | 91 (79) | 115 (100) |
| Environmental Health Worker | 87 (25) | 43 (12) | 27 (8) | 197 (56) | 354 (100) |
| Epidemiologist | 149 (16) | 65 (7) | 74 (8) | 673 (70) | 961 (100) |
| Health Educator | 24 (14) | 26 (15) | 13 (7) | 113 (64) | 176 (100) |
| Laboratory Worker | 175 (16) | 81 (7) | 67 (6) | 795 (71) | 1 118 (100) |
| Nutritionist | 0 (0) | 0 (0) | 0 (0) | 1 (100) | 1 (100) |
| Public Health Dentist | 2 (40) | 2 (40) | 0 (0) | 1 (20) | 5 (100) |
| Public Health Informatics Specialist | 6 (9) | 2 (3) | 5 (7) | 54 (81) | 67 (100) |
| Public Health Manager | 431 (15) | 287 (10) | 193 (7) | 1 956 (68) | 2 867 (100) |
| Public Health Nurse | 9 (29) | 6 (19) | 3 (10) | 13 (42) | 31 (100) |
| Public Health Physician | 94 (23) | 53 (13) | 36 (9) | 223 (53) | 418 (100) |
| Public Information Specialist | 67 (12) | 64 (12) | 28 (5) | 394 (71) | 553 (100) |
| Other Public Health Professional | 475 (15) | 256 (8) | 194 (6) | 2 251 (71) | 3 176 (100) |
| Total | 1 762 (16) | 1 042 (9) | 762 (7) | 7 657 (68) | 11 222 (100) |

^aPercentages might not sum to 100% because of rounding.^bCivil Service data using the Centers of Excellence classifications are available for 10 315 employees; 1 is missing.^cDecember 2012 = On or before December 31, 2012; 1–3 years = January 1, 2013–December 31, 2015; >3–5 years = January 1, 2016–December 31, 2017; Future = Beyond January 1, 2018.