Federal Public Health Workforce Development: An Evidence-Based Approach for Defining Competencies

Karen Mumford, PhD, MEd, **Andrea C. Young, PhD, MS**, and **Saira Nawaz, PhD, MPH**

Division of Public Health Performance and Improvement, Centers for Disease Control and Prevention, Atlanta, Georgia

Abstract

Objective—This study reports the use of exploratory factor analysis to describe essential skills and knowledge for an important segment of the domestic public health workforce—Centers for Disease Control and Prevention (CDC) project officers—using an evidence-based approach to competency development and validation.

Design—A multicomponent survey was conducted. Exploratory factor analysis was used to examine the underlying domains and relationships between competency domains and key behaviors. The Cronbach α coefficient determined the reliability of the overall scale and identified factors.

Setting and Participants—All domestic (US state, tribe, local, and territorial) grantees who received funding from the CDC during fiscal year 2011 to implement nonresearch prevention or intervention programs were invited to participate in a Web-based questionnaire.

Main Outcome Measure(s)—A total of 34 key behaviors representing knowledge, skills, and abilities, grouped in 7 domains—communication, grant administration and management, public health applied science and knowledge, program planning and development, program management, program monitoring and improvement, and organizational consultation—were examined.

Results—There were 795 responses (58% response rate). A total of 6 factors were identified with loadings of 0.40 or more for all 34 behavioral items. The Cronbach α coefficient was 0.95 overall and ranged between 0.73 and 0.91 for the factors.

Conclusions—This study provides empirical evidence for the construct validity of 6 competencies and 34 key behaviors important for CDC project officers and serves as an important first step to evidence-driven workforce development efforts in public health.

Correspondence: Karen Mumford, PhD, MEd, Division of Public Health Performance and Improvement, Centers for Disease Control and Prevention, 1600 Clifton Rd, Mail Stop: E-70, Atlanta, GA 300345 (EQH1@cdc.gov).

Supplemental digital content is available for this article. Direct URL citation appears in the printed text and is provided in the HTML and PDF versions of this article on the journal's Web site (http://www.JPHMP.com).

The public health infrastructure has been defined as the nerve center of the public health system[1] and provides the capacity to effectively deliver the 10 essential public health services.[2] The backbone of this infrastructure is the public health workforce. As such, workforce competency is a fundamental component of the public health system and critical to optimal system performance.[3] Defined as a measureable human capability that is required for effective performance,[4] competencies are used by organizations to recruit the right people for specific positions and jobs, clarify performance expectations, appraise performance, inform training programs, and align workforce behavior with organizational strategies and values.[5]

A common theme throughout the public health literature is a call to action to better prepare the public health workforce.[6–8] The development and application of public health competencies are recognized as essential components of a sound workforce development strategy.[5,9] While the topic of workforce competencies has a long history in the public health literature,[8,10,11] a majority of the available literature is descriptive and suppositional in approach.[11] The methods used to define and validate competencies for the public health workforce rely heavily on the Delphi method, a consensus building technique that uses a series of structured questionnaires (commonly referred to as rounds) to gather information from experts, resulting in a group opinion or consensus decision.[12] While the Delphi method has clearly advanced public health and health care competency development, significant concerns about its methodological rigor and deficiencies in its application are well documented in the literature.[12–14]

Relatedly, reviews of public health workforce research have identified limitations in the evidence base for the development and application of public health workforce competency and recommend that empirical research methods from the social sciences be adopted for use in public health workforce research.[3,11,15,16]

In response to the dearth of evidence and lack of empirical research methods used to guide public health workforce development efforts, the field of Public Health Systems and Services Research (PHSSR) has focused attention on the following public health work-force research questions:

- What standardized assessment methods are most effective in producing valid and reliable measures of the skills and competencies attained by practicing professionals?

- How do the skills and competencies of the public health workforce impact the effectiveness, efficiency, and outcomes of public health strategies delivered by this workforce?[17]

In the area of PHSSR, there is growing interest in evidence-based practices for public health administration. According to Brownson et al, "The National Public Health Performance Standards Program, Public Health Accreditation Board standards and measures, and local quality improvement and accreditation processes are drawing increasing attention to administrative practices."[18] One area of administrative practice particularly important to the Centers for Disease Control and Prevention (CDC) and its state, local, tribal, and territorial

grantees is the role and competency of the CDC project officers in providing technical, scientific, and programmatic guidance and support to CDC-funded public health programs (from this point forward referred to as *grantees*) for a particular grant, cooperative agreement, or contract to ensure programmatic success. They serve as CDC's counterpart to the principal investigator or program director within the grantee organization implementing the funded prevention or control program. In 2012, the CDC conducted an assessment of the technical assistance and customer support provided to grantees implementing public health programs. One of the purposes of the assessment was to define and validate a set of competencies that were essential to the successful administration and implementation of domestic prevention and control programs and central to effective CDC project officer performance.

This article advances the dialogue around the aforementioned research questions by presenting the results of a competency development study that uses an evidence-based approach to define and validate the requisite knowledge and skills of the federal workforce whose functional role and responsibilities include the administration of public health prevention and control cooperative agreements and grants.

Methods

Design

A survey of domestic public health programs receiving CDC funding was undertaken in fall 2012. All principal investigators or program managers for domestic public health programs funded during fiscal year (FY) 2011 through a cooperative agreement or grant to implement nonresearch public health prevention or intervention programs were invited to participate in a Web-based survey. In those instances where 1 person was the primary point of contact for 2 or more cooperative agreements or grants, one was randomly selected for inclusion. This process ensured that each response represented a single cooperative agreement or grant and reflected a single project officer, allowing for comparisons across programs. Each invitation to participate included the questionnaire and a cover letter explaining the survey. The Office of Management and Budget granted approval for the survey (OMB no. 0920-0879; expiration date: March 31, 2014).

Data collection tools

Because this survey represents the first attempt to define a set of competencies for federal public health workers serving in the role of project officer, a process to identify all potential competencies and associated behaviors, knowledge, and skills began in fall 2011. The first step in identifying behaviors, commonly viewed as important, was to conduct focus group interviews with CDC project officers and key informant interviews with their supervisors based at CDC headquarters in Atlanta, Georgia. The staff interviewed represented a cross section of 9 CDC program areas (HIV/AIDS prevention, TB elimination, immunization services, cancer prevention and control, smoking and health services, injury response, health assessment and consultation [Agency for Toxic Substances and Disease Registry], public health preparedness and response, and public health infrastructure). A total of 9 focus groups with 35 project officers were conducted. In addition, 9 key informant interviews with a total

of 26 supervisors were completed. Topical areas of discussion included the roles and responsibilities of project officers and essential skills, knowledge, and characteristics required of project officers to demonstrate in providing technical assistance and guidance to public health programs. These interviews identified a broad scope of concepts and constructs important for inclusion in the survey, including items measuring (1) aspects of technical assistance provided through all phases of a federally funded program, (2) expectations and support provided by project officers for continuous improvement, and (3) the skills and characteristics necessary to provide quality technical assistance and capacity-building guidance to grantees. Once key behaviors were fully described and categorized into themes, the underlying constructs were defined through an examination of existing and familiar public health competency sets and training resources for public health and CDC staff. The materials reviewed and used to inform the development of the behavioral constructs are listed as follows:

1. Core Competencies for Public Health Professionals, the Council on Linkages Between Academia and Public Health Practice[19]

2. Health and Human Services Core Competencies, US Department of Health and Human Services[20]

3. Occupational Competencies for Public Health Advisors, CDC Human Capital and Resources Management Office[21]

4. Occupational Competencies for Leadership, CDC Human Capital and Resources Management Office[22]

5. Project Officer of the Future training program, CDC[23]

6. School of Public Health Education & Communication curriculum, CDC Human Capital and Resources Management Office[24]

7. School of Public Health Administration curriculum, CDC Human Capital and Resources Management Office[25]

8. School of Business Management curriculum, CDC Human Capital and Resource Management Office[26]

This process resulted in a questionnaire ready for a survey of nationwide principal investigators/program managers of domestic public health prevention and control programs. The survey tool contained a total of 34 key behaviors representing knowledge, skills, and abilities, grouped into 7 domains representing distinct constructs for competencies: communication, grant administration and management, public health applied sciences and knowledge, program planning and development, program management, program monitoring and improvement, and organizational consultation. Participants rated the importance of each behavior on a 4-point option Likert scale from 0 to 3, where 3 = very important, 2 = important, 1 = somewhat important, and 0 = not important or not applicable (see Table, Supplemental Digital Content 1, available at: http://links.lww.com/JPHMP/A117, which provides the items presented to survey participants).

Participants and sample size

The study population included all domestic grantees who received CDC funding (FY2011) through a cooperative agreement or grant to implement nonresearch prevention or intervention programs. The total population of potential respondents was surveyed (1) to address possible bias posed by a stratified sampling strategy due to significant variability in the size and organization of CDC centers, institutes, and offices and (2) to achieve the desired level of accuracy using the rule of 20 subjects per item[27] for conducting exploratory factor analysis.

A total of 1365 principal investigators or program managers for 61 unique cooperative agreements and grants funded by the CDC during FY2011 were identified. However, no single database or source of information providing contact information was available. Therefore, several sources of information were used to develop the distribution list, including CDC's FY2011 grant funding files and the Information for Management, Planning, Analysis, and Coordination (IMPAC II) system. In addition, any missing contact information was solicited from the CDC programs included in the survey.

Statistical analysis

The analyses were conducted using STATA (version 11.2) software. Demographic data were analyzed using means and standard deviations and other descriptive analysis. These demographic variables were further examined for possible nonresponse bias using the χ^2 test of independence with a significance level of .001. Since this study represents the first attempt to explore the construct validity of the defined behaviors and competencies for the federal project officer, exploratory factor analysis was deemed appropriate to uncover the underlying domains and relationships between the selected key behaviors.[28] Using the Kaiser criterion, all factors with eigenvalues exceeding 1 were extracted.[28,29] An orthogonal rotation (Varimax) was used to explore the degree of correlation between the factors and variables.[28,30] A cutoff point for factor loading of 0.40 was used. Reliability was tested by means of the Cronbach α coefficient, where a value of 0.70 is considered acceptable.[31]

Limitations

As with any study, there are limitations inherent to this study. Although CDC project officers and their supervisors provided input to the competencies and behaviors examined in this study, the participants of this survey include only grantees. While this perspective is critically important, it should be noted that this population provides the perspective of 1 of 3 key constituent groups. Therefore, these findings relate to the essential knowledge and skills necessary for project officers to demonstrate in providing technical and scientific guidance to grantees and does not necessarily reflect the knowledge and skills required to successfully meet the expectations or requirements of other duties or responsibilities of their position within the CDC.

Results

Participant characteristics

A total of 875 responses were received. Of these, 80 were incomplete and excluded from the analysis, giving an adjusted response rate of 58.07%. Respondent characteristics are outlined in Table 1. Approximately one-third of the respondents worked in infectious disease programs and 28.68% worked in chronic disease prevention and control programs. The mean length of experience within the program was 6.92 years (SD = 6.78 years). The majority of respondents were from state public health departments (84.91%). Responses that made up "other" STLT (state, tribe, local, and territorial)-type settings included nonprofit, private, non-governmental organizations (n = 4) and private for- profit organizations (n = 1). A comparison of responders with nonresponders on these characteristics revealed that respondents (n = 795) and nonrespondents (n = 570) were from similar program areas, χ^2 (4, N = 795) = 22.545, $P>.001$, and STLT type, χ^2 (4, N = 795) = 15.125, $P>.001$.

Factor analysis

Given the total number of respondents of 795, the sample-to-item ratio exceeded the rule of 20:1 sample to variables. The data were considered appropriate for factor analysis, with 0.95 Kaiser-Meyer-Olkin measure of sampling adequacy.[32] Results yielded a 6-factor solution, accounting for 63% of the total variance.

The 6 factors were defined using the 7 domains in the survey tool, where 2 domains merged into a single factor. Using a cutoff level of 0.4, all 34 items loaded on a factor. Items 19–20, 22–27, and 34 loaded on factor 1 (program management and improvement); items 15–18, 28, and 32–33 loaded on factor 2 (program planning and development); items 9–14 loaded on factor 3 (public health applied sciences and knowledge); items 21 and 29–31 loaded on factor 4 (organizational consultation); items 5–8 loaded on factor 5 (grant administration and management); and items 1–4 loaded on factor 6 (communication). Six of the 34 items loaded on 2 different factors. Each of these items was examined and deemed appropriately categorized for the factor with the stronger loading value. Table 2 displays the 6 factors defined with each item's factor loading score.

Internal consistency using the Cronbach a coefficient was observed to be high (a = 0.95) overall as well as for each of the factors: program management and improvement (a = 0.91), program planning and development (a = 0.90), public health applied sciences and knowledge (a = 0.86), organizational consultation (a = 0.75), grant administration and management (a = 0.78), and communication (a = 0.73), indicating good internal consistency.

Further analysis was conducted to determine whether certain domains were of greater importance to certain programs that to others. While all 6 domains were found to be important to all programs, the χ^2 and Fischer exact tests (when n of respondents <5 in any cell) indicated that certain domains are of slightly greater importance for certain types of programs:

- Factor 1: Program management and improvement— Environmental health and public health infrastructure programs indicated slightly greater importance, $\chi^2(4, N = 762) = 11.24$, $P < .05$.

- Factor 2: Program planning and development— Environmental health and public health infrastructure programs indicated slightly greater importance, $\chi^2(4, N = 762) = 33.01$, $P < .05$.

- Factor 3: Public health applied sciences and knowledge—Environmental health and infectious disease programs indicated slightly greater importance, $\chi^2(4, N = 762) = 30.55$, $P < .05$.

- Factor 4: Organizational consultation—Infectious disease, public health preparedness and response, and the public health infrastructure programs indicated slightly greater importance, $\chi^2(4, N = 762) = 18.51$, $P < .05$.

No association by program type was observed for factor 5 (grant administration and management) or factor 6 (communication).

Discussion

The results of this study have implications both for public health practitioners responsible for the provision of technical assistance and guidance to awardees and for public health services and systems researchers. For practitioners, this study provides empirical evidence for the construct validity of 6 competencies and 34 key behaviors important for federal public health workers to demonstrate when supporting a federally funded public health program implemented by an STLT health department. While the competencies in question target a very specific segment of the public health workforce—CDC project officers—their role in the public health system cannot be overlooked. These CDC project officers serve as a prominent resource for public health agencies implementing federally funded programs aimed at preventing health problems and improving and protecting community public health. Therefore, the identification of a valid set of competencies for federal employees serving in the role of project officers is essential to evidence-driven workforce development efforts, including, but not limited to, recruitment and selection, training and curricula development, and employee performance appraisals.

For researchers, this study contributes to the PHSSR agenda by advancing the evidence base and dialogue related to workforce competencies in 2 key ways. First, the establishment of the Public Health Accreditation Board has focused national attention on administrative and management capacity and public health operations, organization, and governance. Relatedly, the national research agenda for PHSSR poses the question, "What forms of decision support, guidance, and technical assistance for governmental public health agencies are most effective in improving the effectiveness, efficiency, and outcomes of public health strategies delivered at local, state, and national levels?"[17] While the answer to this research question goes beyond the scope of this study, the findings presented in this article begin to lay the measurement foundation and evidence required for future inquiry on the impact of specific forms of technical assistance on governmental public health agency effectiveness, efficiency, and outcomes. That is, this study confirms the importance of specific types of technical and

management skills to governmental public health practice and provides evidence-based measures of human capability related to the delivery of technical assistance to STLT governmental public health agencies for purposes of improving public health programs and services. While the direct application of these competencies is limited to the federal public health workforce, the results of this study bolster the evidence in an underdeveloped area of public health research[18] and provide a framework for further study in the area of technical assistance.

Finally, this study demonstrates how empirical research methods from the social sciences can be adapted for use in public health workforce research, thus responding to concerns about the lack of rigor and quantifiable evidence used in public health workforce development research.[15,33] Factor analysis, as used in this study, offers those engaged in the development of public health competencies a methodological alternative to consensus-based approaches such as the Delphi technique.

In summary, this study addresses an important theme from the national research agenda for public health services and systems related to workforce competencies. More specifically, the results from this study contribute to the body of evidence related to the rigor of workforce competency development methods and effective forms of guidance and technical assistance for governmental public health agencies. Furthermore, the competencies themselves provide a valid framework for the development and evaluation of workforce training and certification programs critical to advancing and strengthening the efficacy of public health programs overall.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

References

1. Baker EL, Koplan JP Jr. Strengthening the nation's public health infrastructure: historical challenge, unprecedented opportunity. Health Aff. 2002; 21(6):15–27.

2. Public Health Functions Steering Committee. Public health in America. www.health.gov/phfunctions/public.htm. Updated May 1, 2008. Accessed May 5, 2014

3. Edgar M, Mayer JP, Scharff DP. Construct validity of the core competencies for public health professionals. J Public Health Manag Pract. 2009; 15(4):E7–E16. [PubMed: 19525770]

4. Marrelli AF, Tondora JH, Michael A. Strategies for developing competency models. Adm Policy Ment Health. 2005; 32(5/6):533–561. [PubMed: 16082796]

5. Lucia, AD., Lepsinger, R. The Art and Science of Competency Models: Pinpointing Critical Success Factors in Organizations. San Francisco, CA: Jossey-Bass/Pfeiffer; 1999.

6. Institute of Medicine. The Future of Public Health. Washington, DC: National Academies Press; 1988.

7. Maeshiro R, Johnson I, Koo D, et al. Medical education for a healthier population: reflections on the Flexner report from a public health perspective. Acad Med. 2010; 85(2):211–219. [PubMed: 20107345]

8. Tilson H, Gebbie KM. The public health workforce. Annu Rev Public Health. 2004; 25:341–356. [PubMed: 15015924]

9. Scharff DP, Rabin BA, Cook RA, Wray RJ, Brownson RC. Bridging research and practice through competency- based public health education. J Public Health Manag Pract. 2008; 14(2):131–137. [PubMed: 18287918]

10. Hilliard TM, Boulton ML. Public health research in review: a 25-year retrospective. Am J Prev Med. 2012; 42(5S1):S17–S28. [PubMed: 22502923]

11. Crawford CAG, Summerfelt WT, Roy K, Chen ZA, Meltzer DO, Thacker SB. Perspectives on public health workforce research. J Public Health Manag Pract. 2009; 15(6):S5–S15. [PubMed: 19829231]

12. Keeney S, Hasson F, McKenna H. Consulting the oracle: ten lessons from using the Delphi technique in nursing research. J Adv Nurs. 2005; 53(2):205–212.

13. Keeney S, Hasson F, McKenna H. Research guidelines for the Delphi survey technique. J Adv Nurs. 2000; 32(4):1008–1015. [PubMed: 11095242]

14. Landeta J. Current validity of the Delphi method in social sciences. Technol Forecast Soc Change. 2006; 6:467–482.

15. Beck AJ, Boutlon ML. Building an effective workforce: a systematic review of public health workforce literature. Am J Prev Med. 2012; 42(5S1):S6–S16. [PubMed: 22502927]

16. Coronado F, Polite M, Glynn MK, Massoudi MS, Sohani MM, Koo D. Characterization of the federal workforce at the Centers for Disease Control and Prevention. J Public Health Manag Pract. 2014; 20(4):432–441. [PubMed: 23963253]

17. Consortium from Altarum Institute, Centers for Disease Control and Prevention, Robert Wood Johnson Foundation, National Coordinating Center for Public Health Services and Systems Research. A national research agenda for public health services and systems. Am J Prev Med. 2012; 42(5S1):S72–S78. [PubMed: 22502928]

18. Brownson RC, Allen P, Duggan K, Stamatakis K, Erwin P. Fostering more-effective public health by identifying administrative evidence-based practices. Am J Prev Med. 2012; 43(3):309–319. [PubMed: 22898125]

19. Public Health Foundation. Core Competencies for Public Health Professionals. The Public Health Foundation web- Web site; www.phf.org/resourcestools/Pages/Core_Public_Health_Competencies.aspx. Published May 2010. Accessed May 5, 2014

20. US Department of Health and Human Services. HHS Competency Framework. http://hhsu.learning.hhs.gov/competencies/framework.pdf. Accessed February 12, 2012

21. Centers for Disease Control and Prevention. Human Resource Office websiteWeb site. http://intranet.cdc.gov/od/hcrmo/CDCU/competencies/occupational/phadvisor.shtml. Accessed February 12, 2012

22. Centers for Disease Control and Prevention. Human Resource Office websiteWeb site. http://intranet.cdc.gov/od/hcrmo/cdcu/schools/ileadfunctionalcomp.shtml. Accessed February 12, 2012

23. Centers for Disease Control and Prevention Office of Noncommunicable Diseases, Injury, and Environmental Health, National Center for Chronic Disease Prevention and Health Promotion. Project Officer of the Future. 2012 Published.

24. Centers for Disease Control and Prevention. Human Resource Office websiteWeb site. http://intranet.cdc.gov/od/hcrmo/CDCU/schools/sphed.shtml. Accessed February 12, 2012

25. Centers for Disease Control and Prevention. Human Resource Office website Web site. http://intranet.cdc.gov/od/hcrmo/CDCU/schools/sphadminpracticepublichealth.shtml. Accessed February 12, 2012

26. Centers for Disease Control and Prevention. Human Resource Office website Web site. http://intranet.cdc.gov/od/hcrmo/CDCU/schools/sbmbusiness.shtml. Accessed February 12, 2012

27. Hogarty KY, Hines CV, Kromrey JD, Ferron JM, Mumford KR. The quality of factor solutions in exploratory factor analysis: the influence of sample size, communality and overdetermination. Educ Psychol Meas. 2005; 65:202–226.

28. Henson RK, Roberts JK. Use of exploratory factor analysis in published research: common errors and some comment on improved practice. Educ Psychol Meas. 2006; 66(3):393–416.

29. Kaiser HF. The application of electronic computers to factor analysis. Educ Psychol Meas. 1960; 20(1):141–151.

30. Child, D. The Essentials of Factor Analysis. 2nd. London, England: Holt Rinehart & Winston; 1970.

31. Nunnally, J., Bernstein, L. Psychometric Theory. New York, NY: McGraw-Hill Higher Education; 1994.

32. Dziuban CD, Shirkey EC. When is a correlation matrix appropriate for factor analysis? Some decision rules. Psychol Bull. 1974; 81(6):358–361.

33. Koo D, Miner K. Outcome-based workforce development and education in public health. Annu Rev Public Health. 2010; 31:253–269. [PubMed: 20001820]

TABLE 1

Characteristics of Respondents

	n	%
STLT type		
Local	55	6.92
State	675	84.91
Territorial	32	4.03
Tribal	28	3.52
Other (eg, nonprofit organization)	5	0.63
Public health program area/category		
Agency for Toxic Substances and Disease Registry	17	2.14
Birth Defects and Developmental Disabilities	39	4.91
Chronic Disease Prevention and Health Promotion	228	28.68
Environmental Health	43	5.41
Infectious Diseases	266	33.46
Injury Prevention and Control	53	6.67
Multiple topics	23	2.89
Prevention and Public Health Fund/Other (ACA) funds	87	10.94
Public Health Preparedness and Emergency Response	39	4.91

Abbreviations: ACA, Affordable Care Act; STLT, state, tribe, local, and territorial.

TABLE 2

Six-Factor Solution for Competencies Important for Federal Public Health Workers[a]

Competency/Component Item	Factor Loadings						Communality
	1	2	3	4	5	6	
Program management and improvement—Applies administrative, monitoring, and evaluation techniques of related projects and activities to meet program goals, achieve agency objectives, and improve performance							
Develops recommendations to resolve concerns related to program operations	0.59						0.52
Applies strategies for organizing tasks, as well as the resources needed, to achieve programmatic goals and prioritizes key action steps	0.62						0.61
Identifies appropriate public health education and training to ensure that CDC–funded health agency staff possess the necessary skills and resources for program success while being sensitive to the local political and fiscal constraints (eg, travel restrictions)	0.43						0.52
Provides guidance related to methods and instruments for collecting valid and reliable quantitative and qualitative data for my program	0.59						0.56
Routinely monitors and/or evaluates work plan activities and objectives and provides meaningful guidance or technical assistance to improve program performance	0.77						0.70
Assesses program outcomes using required progress reports (eg, Interim/Mid-Year Progress Report) to provide useful feedback on program performance	0.73						0.65
Conducts monitoring and/or evaluation activities of standardized or program performance measures and uses the findings to guide program improvement activities	0.77						0.75
Applies organizational and system wide strategies, methods, or tools for continuous quality improvement	0.66	0.43					0.72
Identifies and analyzes problems and generates solutions	0.51			0.44			0.57
Program planning and development—Applies multiple planning and implementation strategies to address program requirements and public health needs							
Assists in designing programs that address the identified risks or needs of my program's target population(s)	0.40	0.65					0.69
Advises or assists with strategic program planning by integrating emerging trends of the fiscal, social, and political environments into program design		0.70					0.71
Advises on how to incorporate CDC's public health products or other national public health–related initiatives (eg, public health accreditation, CDC Winnable Battles, National Prevention Strategy) into program activities		0.63					0.63
Advises or assists in developing program activities, strategies, or interventions that are culturally competent or sensitive for my program		0.70					0.71
Informs decision makers within my organization and state about the importance of my program		0.55		0.42			0.53
Assists in the development of successful cross-agency, jurisdictional, sector relationships		0.57		0.55			0.67
Identifies non-CDC tools or resources (financial and nonfinancial) relevant to program activities		0.65					0.66
Public health applied sciences and knowledge—Applies knowledge and evidence-based approaches or strategies to improve program activities and population or individual health.							
Demonstrates basic knowledge of scientific and/or clinical terminology and relevant disease etiology that are applicable to my program			0.64				0.64
Applies basic public health sciences (including, but not limited to, biostatistics, epidemiology, and social and behavioral health sciences) to my program activities			0.66				0.74
Advises and knowledgeably discusses evidence-based strategies or interventions that may be appropriate for my program			0.64				0.66
Explains and/or discusses how CDC and public health policies impact my program			0.70				0.72

Competency/Component Item	Factor Loadings						Communality
	1	2	3	4	5	6	
Explains and/or discusses how CDC's or the division's strategic plans impact my program			0.67				0.68
Explains and/or discusses how public health laws impact my program		0.41	0.57				0.61
Organizational consultation—Applies knowledge management practices and skills to accomplish desired goals and objectives using available resources efficiently and effectively							
Coordinates with appropriate CDC subject matter experts or other national partners to provide technical assistance and capacity-building support				0.52			0.58
Represents the needs, concerns, or suggestions from my program to CDC leadership				0.72			0.64
Collaborates and coordinates with other CDC field staff assigned to my organization or agency				0.55			0.49
Creates knowledge exchange or networking opportunities with other jurisdictions or states implementing similar programs or facing similar issues or circumstances				0.61			0.59
Grant administration and management—Applies contracting and procurement guidelines for grants and cooperative agreements							
Educates and advises on the CDC grant application process in general					0.72		0.60
Educates and advises on program-specific grant goals, standards, and expectations					0.59		0.59
Advises on budget preparation and monitors the fiscal management of grant funds					0.71		0.65
Educates and supports on the use of CDC information management systems or other reporting tools and resources					0.59		0.59
Communication—Delivers information in a clear and effective manner and takes responsibility for understanding others							
Verbally expresses ideas, expectations, concerns, and recommendations in a clearly organized manner						0.56	0.53
Expresses ideas, expectations, concerns, and recommendations clearly in written business documents						0.69	0.61
Expresses ideas, expectations, concerns, and recommendations clearly in written scientific documents						0.73	0.65
Applies communication and group dynamic strategies (eg, principled negotiation, conflict resolution, active listening, risk communication) in interactions						0.57	0.53
Eigenvalues	13.53	2.08	1.74	1.45	1.27	1.21	
Percentage of total variance	39.79	6.13	5.12	4.27	3.74	3.58	
Number of behaviors/items	9	7	6	4	4	4	

Abbreviation: CDC, Centers for Disease Control and Prevention.

[a] Loadings of 0.40 or more.