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A National Survey of Training Needs Reported by Public Health Professionals in Chronic Disease Programs in State, Territorial, and Local Governments

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Abstract

Context—In 2009 the National Association of Chronic Disease Directors (NACDD) published desirable competencies for professionals in public health chronic disease programs. Assessing the training needs of these professionals is an important step toward providing appropriate training programs in chronic disease prevention and control competencies.

Objectives—Conduct a survey of the chronic disease workforce in state and local health departments to identify professional training needs.

Design—We conducted a cross sectional survey of state, territorial and local public health professionals who work in chronic disease programs, to identify their self-reported training needs, using the membership lists of three professional organizations that included practitioners in chronic disease public health programs.

Setting—The survey was national, used a convenience sample and was conducted in 2011.

Participants—The survey was developed using an algorithm to select anonymous participants from the membership lists of the NACDD, the Directors for Health Promotion and Education (DHPE), and the National Association of County and City Health Officials (NACCHO).

Outcome measures—The survey included questions about professional background, chronic disease activities, confidence about skills, and needs for training.

Results—The survey had 567 responses (38% response ratio). The majority of the respondents were female, non-Hispanic white, and aged 40 years or older. Respondents were not confident of

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their skills in health economics (38%) and technology and data management (23%). The most requested training topics were assessing the effects of policies, laws, and regulations (70%); and health economics (66%).

Conclusions—This survey included local, territorial, and state public health professionals who work in chronic disease programs. These reported training needs in quantitative measurement methods and policy-related topics suggest key subjects for future training and education curricula.

Keywords

health manpower; cross sectional surveys; chronic disease; public health professional education

Introduction

Each year, chronic diseases such as heart disease and stroke, cancer, diabetes, arthritis, and respiratory diseases are responsible for 70% of deaths among the population of the United States (U.S.).¹ In 2005, approximately half of the U.S. adult population (133 million) had at least one chronic condition, and more than 70% of our health care dollars were spent for people with chronic diseases.¹ Within 30 years, increasing numbers of older adults with chronic diseases are expected to raise health care costs another 25%.¹

Many of these diseases can be prevented or controlled through population-based programs. Unfortunately, during the past 20 years, multiple assessments and workforce analyses have identified that the U.S. public health system is understaffed, and its workforce is insufficiently trained. During 1980–2006, the Institute of Medicine (IOM);² a partnership of the Council of State Governments, the Association of State and Territorial Health Officials, and the National Association of State Personnel Executives;³ and the Association of Schools of Public Health⁴ all published reports describing the lack of resources for training public health workers and the impending workforce losses caused by retirement, reduced hiring, and other challenges.

In 2009, the IOM published *HHS in the 21st Century: Charting a New Course for a Healthier America*.⁵ The report reiterated that the federal, state, and local public health workforces are decreasing because of the retirement of baby boomers and serious challenges to recruiting new professionals, such as low salaries and bureaucratic barriers. In addition, those who are recruited often lack sufficient public health and science backgrounds. To establish national standards for professional capacity, several organizations, in particular the Council on Linkages between Academia and Public Health Practice,⁶ have recommended competencies required in the public health workforce. All these reports address the overall public health system, but in 2009 the National Association of Chronic Disease Directors (NACDD) published competencies specifically for professionals in public health chronic disease programs.⁷ The domains for these competencies include 1) lead strategically, 2) manage people, 3) manage programs and resources, 4) design and evaluate programs, 5) use public health science, 6) influence policies and systems change, and 7) build support.

In 2010, Georgia State University (GSU) received funding from NACDD to 1) develop and implement a competency-based assessment to determine training needs of state, territorial

and public health professionals who work in chronic disease programs; and 2) create a competency-based online professional development program that addresses the educational needs of the workforce, taking into account each worker's expertise, experience and working environment. Use of a competency approach such as the one described here can provide guidance to ensuring a public health workforce that possesses the capacity to support health department goals.

Methods

Our methods description follows the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) recommended by the *Journal of Internet Medical Research*.⁸ The survey was developed from several sources: literature on public health workforce training, recommended competences from several professional organizations, key informant interviews at 7 state and local health departments, and the recipient activities in CDC's National Center for Chronic Prevention and Health Promotion program announcements. Drafts of the survey were reviewed by professionals at GSU, NACDD, the national organizations of the Directors of Health Promotion and Education (DHPE) and the National Association of County and City Health Officials (NACCHO), and other specialists in chronic disease training. It was then tested online with 10 representatives of professional organizations and academic training programs.

There is no listing of all chronic disease professionals employed by state, territorial, and local health departments. We developed a convenience sample by combining the membership e-mail addresses of NACDD, DHPE, and NACCHO. The combined membership lists included some individuals who were not government employees. In addition, many addresses were no longer active. After development of the survey instrument was completed, to assess the response ratio of the population of interest, all addresses from the original list that did not have a government address extension (.gov; .us; .pr; or .vi) were removed. All federal government addresses (CDC.gov; HRSA.gov; FDA.gov; SAMSHA.gov; CSAP.gov; NCI.gov; or HHS.gov) were removed. Finally, all inactive addresses were removed. The remaining number was used as the denominator of the response ratio (Figure 1).

To avoid receiving duplicate surveys from the same e-mail address, each potential respondent received a unique link to the survey that allowed only one completed response to the survey per address. To maintain anonymity, survey responses were delinked from the originating e-mail addresses. However, the survey included a question that asked the respondents their place of employment. The number of respondents who replied that they were part-time or full-time, state, territorial or local public health employees or contractors was considered the numerator of the survey (Figure 1). The numerator was not an actual subset of the denominator because government employees who registered as members of one of the participating organizations by using a nongovernment address (e.g., personal email address) would be included in the numerator but not in the denominator. Therefore, the percentage response estimate is a ratio rather than a rate.

The survey questioned respondents about their demographics, characteristics of the health departments that employed them, professional backgrounds, chronic disease activities, perceived needs for public health and chronic disease training, computer skills, and Internet access. The final survey included up to 42 questions, depending on question skip patterns.

To assess respondent perceptions of their individual training needs, the survey grouped questions about training needs into 8 major competency categories: population, policy, program, communication, research and analysis, partnership and coalition, leadership and management, and knowledge of chronic diseases. These categories were derived from the recommendations of the NACDD and the Association of Schools of Public Health. However, the survey categories were not always the same as these recommendations: they were adapted depending on the results of the literature review, consultant recommendation, and anticipated curriculum design. Each category included 3 to 7 questions. For example, the policy category included 3 questions about (1) identifying government strategies, (2) monitoring the implementation of policies, and (3) assessing the effects of policies. Each question required respondents to rank their current confidence in their competencies in that topic and their self-assessed needs for additional training in the topic.

The survey was delivered through SurveyMonkey as a web-based survey. An introductory letter, which was signed by representatives of GSU, NACDD, DHPE, and NACCHO, described the purpose of the survey and encouraged recipients to respond. If recipients of the letter went to the web site, the informed consent document appeared, which described the purpose of the survey; how long the survey would take; the risks of participation (which did not exceed those of daily living); the likelihood of personal benefit (unlikely); anonymity protections (no names, identifying information or IP addresses retained); and data protections (password and firewall protected). Readers were informed that by clicking "Next" at the bottom of the page, they indicated their willingness to participate in the survey. No incentives were offered for participation. The survey was distributed to all addresses on the combined list; it was opened on March 3, 2011, and closed on March 28, 2011. Two reminders were sent to the addresses during the course of the survey (March 9, March 24). On March 20, the website was closed for 24 hours because of technical difficulties.

Competencies and need for training were assessed by using 2 independent questions: (1) how confident are you in your skills and knowledge related to each of the following competencies? (not confident, somewhat confident, very confident); and (2) do you need training in this competency? (yes, no, uncertain). For each respondent, these 2 questions were used to construct a composite variable that assigned one of 3 mutually exclusive values to every respondent: (1) respondents who reported they were not confident in their skills and knowledge *and* needed training were coded as "not confident, need training;" (2) respondents who reported they were somewhat *or* very confident *and* needed training were coded as "somewhat or very confident and need training;" and (3) respondents who said that they did not or were uncertain if they needed training, *regardless* of their indication of competency, were coded as "don't need training or uncertain if need training."

This composite variable was designed to create proxies of need and interest for training as a guide to curriculum design that is tailored to meet the educational needs of the workforce. Respondents in category (1) were considered to represent the highest priority for training at an introductory level. Category (2) represented individuals who might be able to start training at an intermediate level. Category (3) respondents were considered to have no or low interest in training and thus were low priority.

This study was approved by the Institutional Review Board of Georgia State University.

Results

The survey was distributed to 4315 unique e-mail addresses (Figure 1). Of these, 1477 were identified as current, valid addresses for state, territorial, or local employees (response ratio denominator). There were 860 responses; the addresses of the returned responses were not linked to the individual survey reports. In the analysis, 567 respondents self-identified as state, territorial, or local part-time or full-time employees, or as contractors to a state, territorial, or local health department. This number represents the numerator of the response ratio. Thus, the response ratio was 567/1477, or 38.4. There was at least one response from every state; the District of Columbia; the U.S. territories of Puerto Rico and the Virgin Islands; and the Federated States of Guam, Micronesia and Palau.

Eighty-four percent of the respondents were female (Table 1). Forty-nine percent were age 50 years or older; and 16% were age 60 years or older. Seventy-six percent were non-Hispanic white, 9% were non-Hispanic black, and 3% were Hispanic. Seventy-five percent had master's degrees or higher educational levels. When they were asked to indicate their primary job function, 42% indicated program manager, administrator, or coordinator; 15% health educator; 10% health service manager, or health director; 7% epidemiologist; 5% nurse; and 4% program planner. Contract managers, administrative or clerical personnel, evaluators, physicians, public health advisors, dietitians, and nutritionists each represented approximately 2% of the respondents; public information specialists and surveillance analysts were each 1%. The remaining job categories had fewer than 5 respondents each: policy analyst, statistician, environmental health specialist, or other. Fifty-nine percent worked in multiple chronic disease areas, and 58% were supervisors at any level. Sixty-six percent of the respondents worked in state health departments; 33% in local, city, county, or regional departments; and 1% in territory, tribe or associated state departments (data not shown).

Across competencies, the respondents were most likely to report that they were not confident and needed training in health economics (38%); technology and data management (23%); assessing the health, fiscal, administrative, legal, social, and political effects of current and proposed policies, laws, and regulations (18%); and integrity of data (18%) (Table 2). They were least likely to report a need for training in identifying the demographics of a population (73% did not report a need), overseeing daily agency and program operations (70%), developing an action plan and implementing interventions to address a health problem (65%), and reviewing the literature to identify best practices for partnership and coalition activities (62%). For people who reported that they needed

training, regardless of confidence level, the most common competencies selected were assessing the health, fiscal, administrative, legal, social, and political effects of current and proposed policies, laws, and regulations (70%); health economics (66%); designing communication and health marketing strategies for specific audiences (59%), and monitoring and evaluation communication activities (59%).

For all but the chronic disease topics, we assessed the mean percentage of people who reported they needed training, regardless of confidence level, for each category. Among these, the categories of policy (62%), program (62%), communication (54%), and research and analysis (53%) had the highest means (data not shown). “Identify demographics of a population” and its accompanying topics in the population category had the lowest mean, but even for this topic the percentage of respondents needing training was 41%.

There was a strong interest in subject matter knowledge across all the chronic disease topics (Table 3). Chronic obstructive pulmonary disease (50%), asthma (47%), and arthritis (47%) had the highest numbers of respondents reporting they needed training in the topic. Breast and cervical cancer (38%) and tobacco use (36%) had the lowest numbers, but they were still of training interest to more than a third of the respondents.

Discussion

This survey has several strengths. First, unlike most previous assessments of competency, the survey asked for individual self-reports rather than supervisor opinions of staff training needs. Questions about competency or training needs may have different meanings from the individual perspective compared with a supervisor’s evaluation. Second, the survey collected data specific to the chronic disease workforce’s needs. Third, the survey was designed to translate training needs in competencies directly into educational curriculum design. With repeated surveys and feedback from participants, course content can be adapted to emerging issues, as needed by the field. Finally, with revisions in the survey methodology, periodic evaluation of training participants after they return to their workplaces can permit comparison with pre-training survey data.

The total number of chronic disease workers and their skills, education, and years of experience in this field are unknown for state, territorial, or local levels. However, there have been efforts to capture what chronic disease workers consider their most critical training and competency needs. Kreitner and colleagues used focus groups and interviews with public health leaders in chronic disease programs to develop recommended competencies.⁹ Brownson and colleagues worked with cancer program leaders to design a list of competencies for practitioners in cancer control.¹⁰ After extensive review and stakeholder input, the NACDD published a list of competencies for chronic disease practice in 2010.⁷ Jacobs et al., conducted state and local level surveys of practitioners and partners in chronic disease control and prevention in Kansas and Mississippi.¹¹ Respondents were asked to identify the importance and the availability of necessary competencies for their practice of evidence-based (EB) public health. In both states, the largest gaps between importance and availability were in communicating EB research to policy makers, making

decisions based on economic evaluation, and translating evidence based research to real world settings. The highest rated skill was the ability to find to find data.

Other researchers have examined the training needs of public health workers in general. Maylahn and colleagues developed a course on EB public health for local health professionals in New York State.¹² Surveys of the course participants were conducted in initial assessments and at 6 month follow up after completing the course. Among eight course topics, epidemiology was the highest ranked skill both in terms of perceived usefulness (initial survey) and actual use (followup survey).

In our survey, there was especially strong interest in training for more quantitative topics such as health economics, data integrity, and technology and data management; as well as policy-related competencies such as assessing health, fiscal, administrative, legal, social, and political effects of current and proposed policies, laws, and regulations. The policy category and the research and analysis category again appeared as strong interests, as well as the program category and the communication category. These findings suggest both promise and challenge for workforce training. Quantitative skills are difficult to learn by experience alone, and professionals with backgrounds in program management and administration, or health education, the most common job functions reported in the survey, may have less exposure to quantitative analysis in their formal education. On the other hand, recognition of policy concerns tends to increase with experience, and the senior managers in this survey may have recognized a need for more training for their current roles.

Public health educators will need a deep understanding of their specialty topics and an appreciation of public health practice to create the best adult learning environments for these professionals. Koo and Miner have recommended a framework for workforce education in public health that includes elements of adult learning theory, competency-based education, and the Dreyfus model of skills acquisition.¹³ Their integrated framework emphasizes creating learning environments that are matched to the experience level of the participants to identify educational activities appropriate to participants' skills, select optimal competencies and learning objectives for the training program, and enable participants to match their education needs to suitable training opportunities.

Many of the competencies identified by the NACDD are reflected in the survey questions, but it is important to keep in mind that the survey was specifically focused on gathering information for curriculum design. It was not our intent to address the entire NACDD competency list—some skills are likely best developed by internships and field experiences rather than in formal pedagogy.

There are limitations to the interpretation of these results. There is no comprehensive list of chronic disease professionals in state and local health departments available. Thus, the potential pool of respondents for this survey did not represent all professionals in this field. Further, it was not possible to oversample by demographic or other characteristics. For example, approximately half of the respondents were aged 50 years or older, and most were supervisors, suggesting a skew toward more senior professionals. Although the results are useful, this survey did not meet the assumption of random sampling necessary for statistical

tests and confidence intervals (i.e., sampling error could not be determined). Nevertheless, the general demographics are similar to the findings of other recent surveys of the entire public health workforce.^{14–16}

The response ratio for this survey was 38%. Although online surveys are generally less resource-intensive than other survey formats, they often have lower response rates and less information about nonrespondents, making it more difficult to account for nonresponse bias. An extensive review of online survey response rates among different populations is beyond the scope of this report, but a few citations may offer benchmarks. Zusevics and colleagues conducted an online survey of 627 Wisconsin local and state health department professionals from e-mail addresses provided by the state health department; their response rate was 23%.¹⁷ Dobrow and others, using a survey design and analysis similar to ours, had a response rate of 38% among 5000 cancer care providers and administrators in Canada.¹⁸ The previously cited New York survey had a rate of 48%.¹² The Kansas survey rate was 49% and the Mississippi rate was 75%.¹¹ Jacobs and colleagues had approximately a 65% response rate among state-level chronic disease practitioners, using the membership list of the NACDD; however, in this survey, each prospective respondent also was contacted by phone by a research staff member.¹⁹ Our response rate was near the low end of this spectrum, and the results should be assessed in light of this higher potential for response bias. We recommend that future survey plans include sufficient resources for aggressive follow up of potential respondents.

Conclusion

Despite several challenges, this initial effort to gather information about the training needs of public health workers among state and local chronic disease programs will be useful in developing a chronic disease education curriculum. The results suggest a strong emphasis on public health basics, such as biology, biostatistics, epidemiology, and health economics. Policy-related topics, such as health planning and program development are also important. In addition, we must recognize that professionals may not always “know what they don’t know,” and it is incumbent upon academic public health centers to identify additional necessary topics for education. After implementation of the curriculum, the results can be incorporated into a future survey to assess ongoing workforce training needs. With the continued rise in the incidence and prevalence of chronic diseases and the well-documented shortages in the public health workforce, academics and practitioners can do no less to protect the health of our citizens.

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Figure 1.

Response ratio, workforce training needs survey of state, territorial, and local government public health professionals in chronic disease programs, 2011.

Table 1

Characteristics of respondents in national, workforce training needs survey of state, territorial, and local government public health professionals in chronic disease programs, 2011. (N=567)

Number (%) [*]	
Sex (N=566)	
Male	89 (15.7)
Female	477 (84.3)
Age (years) (N=567)	
19–29	39 (6.9)
30–39	101 (17.8)
40–49	151 (26.6)
50–59	185 (32.6)
60+	91 (16.0)
Race and Hispanic origin (N=566)	
Hispanic, or Hispanic and more than one race	16 (2.8)
Non-Hispanic White	432 (76.3)
Non-Hispanic Black	53 (9.4)
Non-Hispanic Asian or Pacific Islander	26 (4.6)
Non-Hispanic American Indian or Alaskan Native	5 (0.9)
Non-Hispanic, more than one race	9 (1.6)
Declined to state ethnicity and/or race	25 (4.4)
Highest level of Education (N=566)	
Doctorate	65 (11.5)
Master's	358 (63.3)
Bachelor's	121 (21.4)
Less than bachelor's	22 (3.9)
Job function (N=567)	
Program manager / administrator / coordinator	238 (42.0)
Health educator	86 (15.2)
Health service manager, administrator, health director	59 (10.4)
Epidemiologist	39 (6.9)
Nurse	30 (5.3)
Program planner	21 (3.7)
Evaluator	13 (2.3)
Contract manager	11 (1.9)
Administrative or clerical personnel	10 (1.8)
Physician	10 (1.8)
Public health advisor	10 (1.8)
Dietician	9 (1.6)

Number (%) *	
Nutritionist	9 (1.6)
Public information specialist	6 (1.1)
Surveillance analyst	6 (1.1)
Less than 5 respondents in job category (Policy analyst, Statistician, Environmental health specialist, Other)	10 (1.8)
Program specialization (N=567)	
Work in multiple chronic disease areas	333 (58.7)
Specialize in single program	205 (36.1)
Doesn't work in chronic disease program	29 (5.1)
Supervisor (N=567)	
Yes	326 (57.5)
No	241 (42.5)

* Percentages may not sum to 100% due to rounding.

Table 2

Chronic disease and health promotion competencies reported in survey of training needs reported by state, territorial, and local government public health professionals for chronic disease, 2011.

Competency	Total	Not Confident/ Need Training		Somewhat or very confident/ need training		Don't need training/ uncertain if need training	
		n	%	n	%	n	%
Research and Analysis							
Health economics	490	188	38.4	136	27.8	166	33.9
Technology and data management	484	109	22.5	162	33.5	213	44.0
Integrity of data	474	87	18.4	174	36.7	213	44.9
Quantitative research	486	66	13.6	192	39.5	228	46.9
Qualitative research	485	56	11.5	203	41.9	226	46.6
Ethical principles	473	42	8.9	146	30.9	285	60.3
Data interpretation	479	23	4.8	220	45.9	236	49.3
Population							
Interpreting the interaction of biological, disability, community, ecological, social, and behavioral factors to identify populations at risk for high rates of disease morbidity and mortality	488	29	5.9	238	48.8	221	45.3
Identify demographics of a population	489	5	1.0	127	26.0	357	73.0
Recognizing the role of cultural, social, and behavioral factors in delivering public health programs and services	485	5	1.0	202	41.6	278	57.3
Policy							
Assessing the health, fiscal, administrative, legal, social, and political effects of current and proposed policies, laws, and regulations	490	89	18.2	256	52.2	145	29.6
Monitoring the implementation of public health policies, laws, and regulations.	489	57	11.7	223	45.6	209	42.7
Identifying governmental strategies to influence the health status of the public	485	38	7.8	245	50.5	202	41.6
Program							
Applying process and outcome evaluation strategies to assess the program or policy	486	32	6.6	229	47.1	225	46.3
Identifying, developing and prioritizing evidenced-based program and policy options to address a health problem	490	23	4.7	208	42.4	259	52.9
Developing an action plan and implementing interventions to address a health problem	489	16	3.3	154	31.5	319	65.2
Communication							
Designing communication and health marketing strategies for specific audiences	489	65	13.3	225	46.0	199	40.7
Monitoring and evaluating communication activities including process and outcome indicators	481	62	12.9	222	46.2	197	41.0

	Total	Not Confident/ Need Training		Somewhat or very confident/ need training		Don't need training/ uncertain if need training	
		n	%	n	%	n	%
Competency							
Implementing health communication strategies through oral presentations, print, TV and radio interviews, and Internet applications	486	39	8.0	213	43.8	234	48.1
Assessing communication objectives, target groups, key barriers and messages, and communication approaches	486	34	7.0	230	47.3	222	45.7
Disseminating to colleagues, decision makers, partners and the public health community statistics, research and program implementation outcomes	488	20	4.1	210	43.0	258	52.9
Partnership & Coalition							
Identifying models of collaboration used by governmental public health agencies	482	68	14.1	192	39.8	222	46.1
Assisting partners and coalition members in conducting a strategic planning process, and in developing and implementing an action plan	472	27	5.7	199	42.2	246	52.1
Recruiting and maintaining a diversity of partnerships across different sectors	473	19	4.0	176	37.2	278	58.8
Reviewing the literature to identify best practices for partnership and coalition activities	476	15	3.2	165	34.7	296	62.2
Leadership & Management							
Managing human resources including recruitment, retention, and training, and ensuring a diverse workforce	486	53	10.9	142	29.2	291	59.9
Securing and managing program budgets	482	51	10.6	145	30.1	286	59.3
Utilizing quality improvement strategies	477	40	8.4	223	46.8	214	44.9
Creating an organizational culture of ethical standards	482	37	7.7	171	35.5	274	56.8
Promoting team building and organizational learning	483	36	7.5	194	40.2	253	52.4
Developing, implementing, and monitoring strategic plans	473	24	5.1	174	36.8	275	58.1
Overseeing daily agency and program operations	472	18	3.8	123	26.1	331	70.1

Table 3

Subject matter knowledge in chronic disease, national workforce training needs survey of state and local government public health professionals in chronic disease programs, 2011.

Chronic Disease Subject	Total	Not Confident/Need Training	Somewhat or very confident/need training	Don't need training/uncertain if need training
		n (%)	n (%)	n (%)
Breast and cervical cancers	485	62 (12.8)	122 (25.2)	301 (62.1)
Other cancers	485	84 (17.3)	134 (27.6)	267 (55.1)
Heart disease/stroke	483	29 (6.0)	172 (35.6)	282 (58.4)
Diabetes	485	32 (6.6)	179 (36.9)	274 (56.5)
Obesity	480	14 (2.9)	196 (40.8)	270 (56.3)
COPD	483	117 (24.2)	122 (25.3)	244 (50.5)
Asthma	481	90 (18.7)	135 (28.1)	256 (53.2)
Arthritis	484	99 (20.5)	130 (26.9)	255 (52.7)
Tobacco use	473	20 (4.2)	152 (32.1)	301 (63.6)
Nutrition	480	17 (3.5)	193 (40.2)	270 (56.3)
Physical activity/built environment	479	28 (5.8)	193 (40.3)	258 (53.9)