5-2008

Public Health Nutrition: A Workforce in Transition

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To the Graduate Council:

I am submitting herewith a dissertation written by Alexa M. George entitled "Public Health Nutrition: A Workforce in Transition." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in .

Betsy Haughton, Major Professor

We have read this dissertation and recommend its acceptance:

Eugene Fitzhugh, Charles Hamilton, Lisa Jahns

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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PUBLIC HEALTH NUTRITION:
A WORKFORCE IN TRANSITION

A Dissertation
Presented for the
Doctor of Philosophy Degree
The University of Tennessee, Knoxville

Alexa Marie George
May 2008

Dedication

This dissertation is dedicated to Brian.

Thank you.

Acknowledgments

I am deeply grateful for the guidance, support, encouragement and patience of Dr. Betsy Haughton. This dissertation never would have been possible without her. In addition, I would like to sincerely thank my committee members, Dr. Eugene Fitzhugh, Dr. Charles Hamilton, and Dr. Lisa Jahns, for their time, effort and valuable input. I would also like to extend my thanks to Cary Springer for her willingness to share her statistical expertise.

This project would not have occurred without the financial support of the Association of State and Territorial Public Health Nutrition Directors; the US Department of Agriculture, Food and Nutrition Service; and the Department of Nutrition, The University of Tennessee.

I would also like to acknowledge Dr. Janice Dodds, Dr. Terry Beehr, and Blackwell Publishing for the permission to reprint several figures.

Finally and importantly, I am forever grateful to my friends and family (especially my parents Jim and Tanya Broadbent). Without their love, support and (lots of) patience, I could not have written this dissertation.

Abstract

Objective Because the public health nutrition workforce may be in a state of transition, this study had three purposes: 1) describe the US public health nutrition workforce; 2) examine a new position class, breastfeeding peer counselor; and 3) determine if retirement intention of public health nutrition personnel can be predicted based on personal and workplace factors.

Methods Secondary data analysis of the national research dataset of the 2006-07 Public Health Nutrition Workforce Survey was conducted (n=10,683, response rate 80.0% for overall survey; research dataset n=9,923). Subjects were personnel in nutrition professional/paraprofessional positions working in nutrition programs under the purview of the official health agency and who agreed to release their data for research purposes.

Results Over one-quarter (28.0%) of respondents were in positions with a population/systems focus, while 67.5% were in client-focused, direct care positions. Two-thirds (67.0%) practiced primarily in the core public health function of assurance. Approximately 10% (11.3%) of personnel were breastfeeding peer counselors. The majority (52.6%) of breastfeeding peer counselor positions were part-time and 20.3% were contracted. Nearly half (42.0%) did not receive employee benefits. Close to one-quarter (23.9%) of the overall workforce intended to retire within 10 years. There were significant differences in both personal and workplace factors for intention to retire for personnel 45 years and older. Age category, years of experience in nutrition/dietetics and public health nutrition, agency of employment, vacation and retirement employee benefits, percent of work time spent in direct client services, full-time/part-time status, and US DHHS Region correctly predicted retirement intention 75.0% of the time.

Conclusions The majority of respondents worked in client-focused positions which could indicate a potentially inadequate proportion of personnel available for assuring population health. Breastfeeding peer counselors constitute a noteworthy proportion of the overall workforce. That many positions are part-time or contracted and do not receive employee benefits could indicate inadequate funding for this position class. 'Graying' of the public health nutrition workforce appears to be an important concern. Results can be used to evaluate organizational characteristics for workforce succession planning and forecasting.

Preface

An explanation of this dissertation's organization is provided here to orient the reader. Part I consists of a brief introduction and an extensive literature review. Parts II-IV contain the study written in journal format for three publications. Finally, extended methods are located in Appendix A.

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Part I:

Introduction,
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Introduction

To fulfill its mission of assuring the health of populations (IOM, 1988), public health requires a competent, adequate workforce (US DHHS, 2000; Cioffi, Lichtveld, and Tilson, n.d.). Data on public health workforce composition is necessary for proper forecasting, planning and to prevent service interruption for populations (Atchison, Gebbie, Thielen, and Woltring, 2001). Previous attempts to enumerate the overall public health workforce have been problematic, in part because of classification difficulties (Tilson and Gebbie, 2004). One segment of public health is public health nutrition, which has been consistently enumerated by the Association of State and Territorial Public Health Nutrition Directors (ASTPHND) using the Public Health Nutrition Workforce Survey (PHNWS) since 1985 (Kaufman, Heimendinger, Foerster and Carroll, 1986; Kaufman and Lee, 1988; Haughton, Story and Keir, 1998; McCall and Keir, 2003). Results from the 1999-2000 PHNWS indicated that the majority of public health nutrition personnel were government employees involved in providing direct client care (McCall and Keir, 2003). Results also suggested the emergence of a new position class, breastfeeding peer counselor, that was not specifically included in the survey, but was identified via *post hoc* analyses. The survey also indicated that public health nutrition personnel were very experienced and over half had at least 10 years of experience in nutrition/dietetics (McCall and Keir, 2003). This could suggest that an important portion of the workforce may be nearing retirement. High rates of expected retirement have been noted in public health, both at the state (Association of State and Territorial Health Officials, 2008) and local (National Association of County and City Health Officials, 2006) levels. There is an indication, then, that the public health nutrition workforce may be in a state of transition.

The public health nutrition workforce was enumerated most recently in 2006-07. The purpose of this study was to use research data from the 2006-07 PHNWS to explore the transition this workforce appears to be undergoing. The following section contains a review of the current literature.

Literature Review

> *The committee has concluded that effective public health activities are essential to the health and well-being of the American people, now and in the future. But public health is currently in disarray.*
>
> Institute of Medicine, 1988, p. 6

> *The committee is seriously concerned that despite subsequent efforts for improvement, governmental public health agencies, the* ***backbone*** *of any public health system, still suffer from grave underfunding, political neglect, and continued exclusion from the very forums in which their expertise and leadership are most needed to assure an effective public health system.*
>
> Institute of Medicine, 2002, p. 26

Introduction: The Public Health Workforce

In 1988 the Institute of Medicine identified the mission of public health as fulfilling "society's interest in assuring conditions in which persons can be healthy" (IOM, p7). The public health infrastructure, defined in *Healthy People 2010* as "the resources needed to deliver the essential public health services to every community," is in place to meet this mission (US Department of Health and Human Services, 2000, p. 23-3). A vital component of public health infrastructure is the public health workforce. Because public health pertains to the health of populations rather than individuals, professionals who comprise the public health workforce concentrate on "population-level health" (Gebbie, Rosenstock, and Hernandez, 2003, p. 1). The Committee on Educating Public Health Professionals for the 21st Century defined a public health professional as "a person educated in public health or a related discipline who is employed to improve health through a population focus" (Gebbie, Rosenstock, and Hernandez, 2003, p. 1). The public health workforce encompasses a variety of these professionals, including physicians, nurses, dentists, social workers, nutritionists, pharmacists, lawyers, public administrators, veterinarians, engineers, environmental scientists, biologists, microbiologists, and journalists (Gebbie, 2000; Institute of Medicine, 2003). These professionals may or may not have received formal public health training, a characteristic that has made it difficult to identify members of the public health workforce specifically. This lack of formal training may have contributed to the characterization of the public health infrastructure as "structurally weak," with gaps in workforce capacity and competency, as stated in the 1999 *Public Health's Infrastructure Status Report* (Centers for Disease Control and Prevention, p. iii).

Gebbie emphasized the danger of a weak public health workforce, because these professionals are at the core of any successful public health action (1999). The public health workforce protects the health of the population by providing essential services in three core functions: assessment, policy development and assurance (Public Health Functions Steering Committee, 1999). When the workforce is not trained adequately or appropriately, or is not present in sufficient numbers, the mission of public health is compromised, contributing to the disarray referenced in the opening quotations of this literature review (IOM, 1988).

Significance of a Competent Workforce

To fulfill the mission of public health, it is vital that a competently staffed, well-trained workforce is available. Tilson and Gebbie believe that attention should be given to development of a competent public health workforce, because a well-trained workforce is required if public health goals are to be met (2004). The significance of the public health workforce is highlighted in the 23rd objective of *Healthy People 2010*. Through its 467 objectives in 28 focus areas, *Healthy People 2010* provides a national framework for health. It provides benchmarks that allow states, agencies, and organizations to measure progress toward health goals. In addition to objectives related to health status, *Healthy People 2010* specifies objectives related to the training and staffing of the public health workforce. Goal 23 is: "Ensure that Federal, Tribal, State and local health agencies have the infrastructure to provide essential public health services effectively" (US DHHS, 2000, p. 23-3). The infrastructure goal includes 17 objectives to ensure an adequately trained and prepared public health system. Areas of focus include: data and information systems, workforce, public health organizations, resources, and prevention research. The foundation of the Nation's Pyramid of Preparedness' foundation is basic infrastructure, with workforce capacity as one of its three elements (Figure 1.1) (CDC, 2001).

Objective 23-8 of *Healthy People 2010* is to "Increase the proportion of Federal, Tribal, State and local agencies that incorporate specific competencies in the essential public health services into personnel systems" (US DHHS, 2000, p. 23-14). This encompasses a variety of areas in which public health personnel should be proficient, including public health core competencies, current information technology, cultural competence, and technical understanding of related social and behavioral sciences. In addition to these areas, competent members of the workforce require sufficient training and experience to manage and lead health agencies effectively. Effective employees require competent leadership; therefore, leaders and managers of health agencies have need of sufficient training and experience to administer and direct public health policies and programs successfully. The Public Health Functions Steering Committee recognized that knowledge about the composition of the public health workforce is necessary for appropriate training and education (US DHHS, 1999). In the past, collecting data on workforce composition has been met with challenges, including difficulties in defining and classifying existing and needed members of the workforce (Tilson and Gebbie, 2004). The Public Health Functions Steering Committee identified three recurring problems in initiatives to assess the composition of the public health workforce: absence of a clear public health profession classification scheme, lack of uniform public health professional credentialing requirements, and a diverse professional workforce without formal public health training (US DHHS, 1999). Collecting public health workforce composition data has been further complicated by a history of inadequate formal public health systems research (Lenaway, Sotnikov, Corso, Millington, Halverson and Tilson, 2006). This has precluded the evidence base required for public health workforce policy. Tilson and Gebbie stressed that "the lack of a credible scientific forum for debate, rigorous peer review, and ultimately publication of work in the area has been a recognized impediment to raising the field of public health practice (including workforce) research to a level of academic credibility" (2004, p. 351).

The Centers for Disease Control and Prevention (CDC) also recognized this lack of public health workforce research, and subsequently developed a strategic plan for workforce development for public health personnel. The initial phase of its 6-step plan called for monitoring workforce composition. The objective of the strategic plan was to "build a research agenda for public health workforce development to complement emerging national interest in public health systems research" (Cioffi, Lichtveld, and Tilson, n.d.). To meet this objective and recommend research

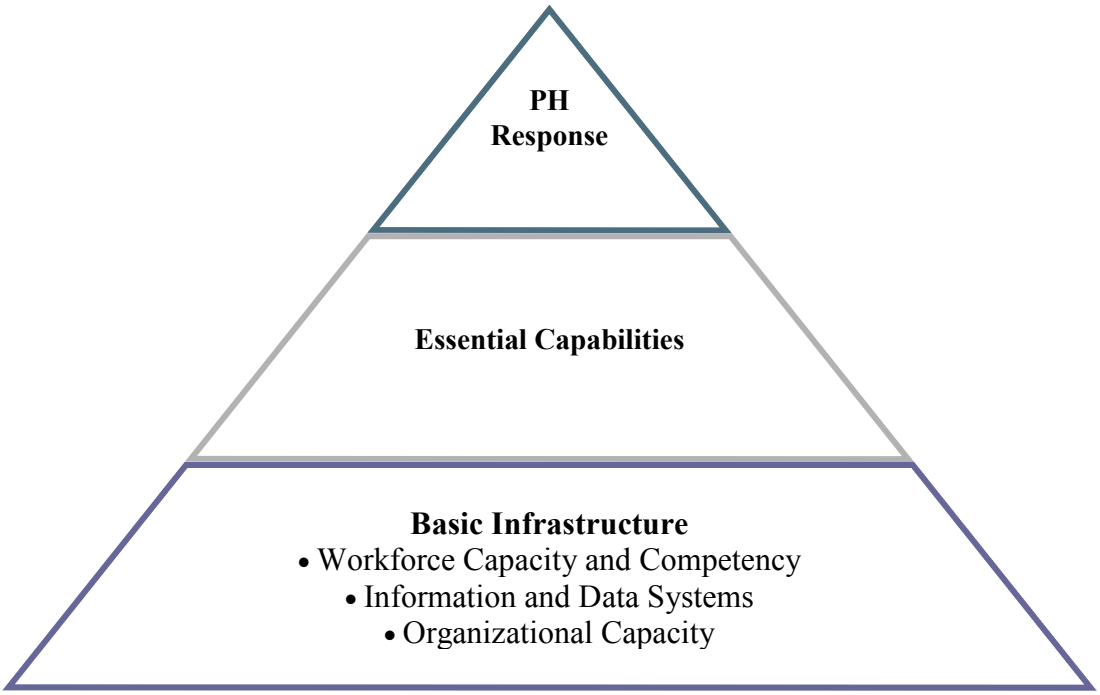

Figure 1.1. Pyramid of preparedness
Source. Adapted from Centers for Disease Control and Prevention. Department of Health and Human Services. *Public Health's Infrastructure: A Status Report.* March 2001. Available at http://www.uic.edu/sph/prepare/courses/ph410/resources/ phinfrastructure.pdf. Accessed February 23, 2008.

direction, CDC convened four expert panel workgroups between 2000-2003, which resulted in a logic model and research questions for public health workforce development. In the workgroup's framework, workforce development is reliant upon the initial input of workforce size and composition. Effects extend beyond workforce development into overall program and system improvements, to improvements in individual and population health outcomes. One of the key gaps in public health science identified by the workgroups was the monitoring of workforce size, distribution, qualifications, and tenure (Cioffi, et al., n.d.). As a result of the CDC's workgroups, previous calls for improved enumeration of the public health workforce were intensified. The American Public Health Association (APHA) also recognized the importance of enumeration by calling on Congress to provide funds for a national database of public health workers (2005).

History of Public Health Enumeration

In *The Future of the Public's Health in the 21st Century*, The Committee on Assuring the Health of the Public in the 21st Century highlighted the neglect of governmental public health infrastructure. Specifically, the Committee recommended that "federal, state, and local government public health agencies should prioritize leadership training, support, and development within government public health agencies and the academic institutions that prepare the workforce" (IOM, 2002, p. 4). This underscores the importance of training nascent members of the public health workforce. In addition, this recommendation implies that leaders within the workforce must be appropriately trained and experienced, as well. From the Committee's report, it may be inferred that within the workforce division of responsibility, upper-level positions require appropriately high levels of training. Both the number of public health personnel and their preparation for practice were found to be inadequate (Lichtveld, et al., 2001; IOM, 2003; ASTHO, CSG, and NASPE, 2004). After a number of events that required an immediate response from the public health infrastructure, such as the attacks of September 11, 2001 and the West Nile Virus, the lack of appropriate training in the public health workforce became a focus area of health and governmental agencies (CDC, 2001). For the public health infrastructure to handle the diverse challenges it will face, the public health workforce must be adequately and appropriately staffed. A number of organizations and agencies have recognized the importance of determining the capacity of the public health workforce to meet these challenges, including the Appropriations Committee of the US Senate, the CDC, and the Bureau of Health Professions.

As a first step to ensure adequate staffing and necessary competencies, multiple organizations and agencies have attempted to enumerate the public health workforce (ASTHO, CSG, and NASPE, 2004; Bureau of Health Professionals, 2005; Gebbie, 2000). An absence of workforce composition data can inhibit appropriate workforce and infrastructure development (Atchison, et al., 2001). Enumeration is necessary for effectively planning and evaluating workforce development activities, as well as for forecasting future personnel needs (Gebbie, Merrill, Hwang, Gebbie, and Gupta, 2003). Because of the significance of the information collected in enumerations, multiple surveys of the public health workforce have occurred. The following is a brief history of these enumerations, which concludes with a summary of the current public health workforce, as described by the most recent enumerations.

In 1920 the Metropolitan Life Insurance Company funded the first comprehensive census of municipal health departments. The APHA and the United States Public Health Service (USPHS) collected information on both full and part time health department workers. This census identified a ratio of 30 public health workers per 100,000 population (Merrill, Btoush, Gupta, and Gebbie, 2003; US Treasury Department, 1923). In 1923 the USPHS enumerated the public

health workforce of municipal health departments of the 100 largest cities in the country. This enumeration utilized field surveys that USPHS officers administered; consequently, the agency had data on staffing, educational preparation, expenditures and staffing recommendations. At that time, the ratio of public health personnel to the population was 27 per 100,000 (Merrill, et al., 2003; US Treasury Department, 1926). As a result of the Great Depression and reductions in funding, the USPHS again surveyed 68 health departments in 1933. This enumeration reported a ratio of 34 public health personnel per 100,000 population (Merrill, et al., 2003; Mountin, 1935). Enumerations of the public health workforce also were performed by the US Department of Health Education and Welfare when it commissioned annual reports of local public health resources from 1946-1952 to determine staffing shortages, expenditures, and minimum staffing standards for the workforce. These reports were updated annually until 1960 by receiving information from state health officers (Merrill, et al., 2003; US Department of Health, Education, and Welfare, 1953, 1954, 1955, 1957, 1958, 1959, 1961, and 1967; US Federal Security Agency, 1952; US Public Health Service, 1949).

A lag in enumerations occurred until 1972 when the University of North Carolina's School of Public Health reported on the impact of funding cuts to public health schools on public health staffing (Merrill, et al., 2003; University of North Carolina, 1973). From 1975-1991, the Association of State and Territorial Health Officials (ASTHO) collected public health services data at the state and local levels with the National Public Health Program Reporting System. The purpose of data collection was to collect information on health agency expenditures rather than for workforce enumeration (Merrill, et al., 2003; US Public Law 94-484, 1976). The initial reports estimated the size of the public health workforce as 150,000, a ratio of approximately 49 per 100,000 population (Merrill, et al., 2003; US Department of Health, Education, and Welfare, 1980). This figure was modified in 1980 in an attempt to include public health personnel who practiced in settings other than just state and local health departments. As a result, the estimated size of the workforce was increased to 500,000, the figure utilized in future public health workforce reports (Merrill, et al., 2003; US Department of Health, Education, and Welfare, 1982 and 1988).

In 1976 the Health Professions Educational Assistance Act required the US Department of Health Education and Welfare to submit biennial reports to Congress. These reports utilize workforce estimates based on information from government agencies, schools of public health and professional associations to describe types of public health personnel, staff levels and geographic location, as well as types of activities performed (Merrill, et al., 2003; US Public Law 95-623, 1978). The reports to Congress were based on the 1980 estimate of 500,000 individuals. In the 1980s, APHA was contracted by the Health Resources and Services Administration (HRSA) of the US Department of Health and Human Services (US DHHS) to survey and enumerate public health employees. Though the APHA researchers developed a methodology to determine occupational definitions and characterize the workforce using title, function, education and work setting, the enumeration was never performed because of the anticipated expense (De la Puente, 1983; Gebbie, 2000; Merrill, et al., 2003). In 1996, the University of Texas in Houston's Center for Health Policy Studies utilized the APHA's methodology to survey the Texas public health workforce (Kennedy, Spears, Loe, and Moore, 1999; Merrill, et al., 2003). The enumeration was completed in two stages. First, public health employers were surveyed for information regarding their current public health workforce. Respondents also provided employee rosters which researchers used to survey a sample of the reported agency staff, rather than perform a direct count (Kennedy, et al., 1999).

In addition to enumerations which surveyed all or a sample of public health workers, local health departments have been profiled by the National Association of County and City Health Officials (NACCHO) and the CDC utilizing a direct survey methodology. Until the 1999-2000 survey, the profiles did not collect occupational category or title information (Gebbie, 2000). A sample of local health agency profiles was used to identify size and composition of the public health workforce, but did not include total workforce numbers (Hagat, Brown and Fraser, 2001; Merrill, et al., 2003; NACCHO and CDC, 1997). ASTHO, the Council of State Governments (CSG), and the National Association of State Personnel Executives (NASPE) partnered in response to potential future shortages in the state public health workforce identified by the *State Employee Worker Shortage* report (Carroll and Moss, 2002). To determine more specific information than was collected in the state employee report, ASTHO, CSG, and NASPE surveyed human resource directors in state public health offices. The directors were asked to identify potential workforce shortages within their respective state offices (ASTHO, CSG, and NASPE, 2004). While this method did not employ secondary data analysis, neither did it use primary data collection from the workforce. It instead relied upon human resource directors' speculation rather than direct counting of personnel. Further public health workforce data were collected in a five-state public health agency enumeration completed during the mid-1990s by the Center for Health Policy Research at George Washington University for HRSA. The study provided information on the workforce's training and educational needs (Solloway, Haack, and Evans, 1997). In contrast to previous efforts, the most comprehensive recent effort in enumerating the public health workforce released in 2000 relied upon secondary rather than primary data. HRSA analyzed existing surveys and reports to assess the size and composition of the public health workforce, the results of which were reported in T*he Public Health Work Force: Enumeration 2000* (Gebbie, 2000).

In an effort to consolidate parallel efforts, in 2000 the CDC announced a strategic plan for public health workforce development and created the Office of Workforce Policy and Planning within the Public Health Practice Program Office (PHPPO) to oversee its implementation (CDC). Similarly, to identify the systems required to assure the health of all people, the Public Health Systems Research Leadership Forum was initiated. In 2001, the first Forum was convened by the Council on Linkages between Academia and Public Health Practice as a means to link academic and practice communities to identify priority research areas for public health systems research. As a result of the annual Forums, public health workforce research was identified as a priority research agenda (Council on Linkages between Academia and Public Health Practice, 2004). In an effort to specify the future strategy for workforce research, the Division of Public Health Systems Development and Research within PHPPO led a study to develop a research agenda to build the evidence base to guide public health practice policymaking. In 2003 it identified high-priority gaps in public health science, which included monitoring the public health workforce's size, distribution, qualifications and tenure (Cioffi, et al., n.d.). Next, the Public Health Systems Research Agenda was further refined by the identification of research themes. The primary theme specified was to describe the public health system which refers to "all public, private and voluntary entities that contribute to public health in a given area" (Halverson, Lenaway, Sotnikov, Corso, and Millington, n.d., p. 1). A second theme was to assess the resources and capacity of the public health system. A Research Seminar held in June 2003 led to more specific themes for research. These included quantifying dimensions of public health systems, exploring public health infrastructure's relationship to its performance, and developing health outcome measures that are sensitive to the capacity and performance of public health systems (Halverson, et al., n.d.).

Though not national in scope, the most recent enumeration of the public health workforce was initiated in 2002 when the New York Center for Health Workforce Studies at the SUNY School

of Public Health was commissioned by the National Center for Health Workforce Analysis of the Bureau of Health Professionals to assess the public health workforce in a six-state case study (2005). The results of the study were released in January 2005 in the *Public Health Workforce Study*. By analyzing secondary data and interviewing staff and local public health stakeholders, researchers assessed the public health workforce composition of the six states to ascertain the most urgent public health workforce concerns (Bureau of Health Professionals, 2005). Within the six states surveyed, administrators cited recruiting difficulties in a number of occupations, including public health nurses, public health physicians, health educators, and nutritionists. Five of the six states reported shortages in public health nutritionists due to difficulty in recruiting and retaining these personnel. Many reported concerns about members of senior staff retiring within the next five years. In addition, they called for a need for improved succession planning. In this study, retirement intention was based on predictions by administrators, rather than directly surveying the members of the workforce. As a result of the information gathered in the case study, the Bureau of Health Professions recommended that states should "monitor the size and composition of the public health workforce on a regular basis, with a focus on 'functional' enumeration, i.e., understanding the public health workforce within a State based on the roles and responsibilities of the public health system within the State" (2005, p.5).

As described, in spite of numerous barriers, enumerations of public health personnel have been performed, focusing on assessing the overall size of the workforce. Enumerations that began at the turn of the 20th Century described slow growth in the public health workforce with an eventual rise in the ratio of public health workers to the general population that peaked in 1979 (Tilson and Gebbie, 2004). In the year 2000, there were 448,254 salaried public health professionals, a ratio of 1 public health professional for every 635 persons. In the 1970s, this ratio was 1 public health professional per 457 members of the population (Gebbie, 2000). This figure reflects a 10% decrease in salaried public health workers since 1980, while the general US population increased by 25% (Gebbie, et al., 2003). The "best estimate" for 2000 was based on secondary data analysis of existing government reports. Therefore, the data collected were inherently limited because they were collected for a variety of purposes, used various definitions, and covered different time periods with varied specificity (Tilson and Gebbie, 2004). Further analysis was performed on the 1980 and 2000 enumerations using only comparable professional categories and data on government public employment and payroll (Gebbie and Turnock, 2006). This research found an increase in the number of public health professionals from 1980 (140,000 professionals) through 2000 (260,000 professionals) that extended through 2003 when full-time equivalents (FTEs) were compared per year. Approximately 486,986 FTE health workers were employed by government health agencies in 1994; the number of FTEs peaked in 2003 at 555,584, and dropped to 552,061 in 2004 (Gebbie and Turnock, 2006). The researchers attributed this change to: funding and positions shifting to bioterrorism, increasing productivity of fewer workers due to improvements in information technology, and administrative obstacles such as hiring freezes, non-competitive salaries, and no room for advancement in professional positions (Gebbie and Turnock, 2006).

The 2000 enumeration provided information on the occupational category, geographic location, and type of agency where members of the public health workforce were employed. Data collected demonstrated that public health workers were not evenly distributed across the country. Ratios of public health personnel varied from 76 public health workers per 100,000 population in Region V, to 200 public health workers per 100,000 population in Region X. The national average was 156 public health workers per 100,000 population. Approximately 34% of the public health workforce was located in local public health agencies, 33% was in state agencies and 19% was located at the federal level. No information was collected that specified the roles

that the workers performed, their education, gender, age, ethnicity or career path (Gebbie, 2000). According to Tilson and Gebbie, this type of demographic data is crucial to develop and strengthen recruitment and retention programs (2004). Because of the gaps in data collected, the Bureau of Health Professions stated in its *Public Health Workforce Enumeration 2000* that both the size and the composition of the workforce should be identified and tracked over time to develop plans for workforce development, recruitment, and retention (Gebbie, 2000).

As evidenced by the 2000 Bureau of Health Professionals enumeration, the majority of previous enumerations were limited to assessing overall size and geographic distribution of the public health workforce. According to Merrill, et al. (2003), the last federal agency enumeration of the public health workforce that employed the use of a direct count was in 1963. Since that time, proxy measures have been utilized to estimate the size of the workforce through agency sampling or questioning state agency officials (Merrill, at. al., 2003). While size and geographic location are important components of workforce data, more detailed information regarding workforce composition would assist long-term planning. Workforce composition refers to information such as title, agency type, demographic data, education, training and years of experience. The Public Health Leadership Society's 2001 *Enumerating the Public Health Workforce* specifically identified the importance of gathering workforce composition information to forecast needs and potential shortages, develop appropriate plans, and ultimately assure public health service access for the population (Atchison, et al., 2001). Accurate descriptions of the public health workforce require enumeration. In addition, enumeration is a crucial first step in the appropriate preparation of future members of the workforce. *Enumerating the Public Health Workforce* described a variety of organizing principles that may guide an enumeration, including work setting, job title, job function and professional or occupational training.

When developing an enumeration, it is important to consider the intended use of the findings, because this dictates the degree of individual detail that should be collected. For example, if the enumeration is collecting data to develop workforce policy, demographic, educational and training data would be beneficial (Atchison, et al., 2001). ASTHO released *Strategies for Enumerating the Public Health Workforce* as a first step to expanding enumeration of this workforce. This document recognized the importance of enumeration to "describe current demographics, identify shortages and surpluses, track trends over time, forecast future needs, and advocate for resources" (ASTHO, 2005, p. 5). The organization researched enumeration efforts in ten professions to learn strategies from prior efforts that could be applied to prospective public health enumerations (ASTHO, 2005). ASTHO recognized the need to monitor the public health workforce regularly, and conducted the 2007 Public Health Workforce Survey. Results indicated a graying workforce, a continued shortage in public health workers and barriers impacting the shortage, including budget limitations and lack of competitive salaries (ASTHO, 2008).

As explained in the *Public Health Workforce Study*, it has been difficult to determine the specific composition and adequacy of the public health workforce because of its diversity and lack of specific defining characteristics (Bureau of Health Professionals, 2005). In spite of these difficulties, though, it is important to be able to describe the public health workforce for such purposes as appropriate forecasting of training and staffing needs. Tracking health workforce policy is reliant upon accurate personnel numbers, location, and current and needed training (Kennedy, et al., 1999). Enumerating the public health workforce has proven difficult because of occupational classifications that do not adequately describe duties, occupational categories that are not mutually exclusive, lack of consistent personnel classification systems, and no requirement of licensure or certification (Gebbie, 2000). Public health nutrition is one component of the public health workforce, and therefore a narrower segment of the workforce from which to

collect information. Enumerating public health nutrition personnel has been comparatively easier because of a more narrowly defined workforce. It is also more reasonable to gather more detailed individual data for more specific workforce planning.

The Public Health Nutrition Workforce

Public health professionals make up 45% of the overall public health workforce (ASTHO, CSG, and NASPE, 2004); public health nutritionists are part of this professional workforce. The public health workforce is broad and encompasses a variety of occupational categories. To collect information that is specific to public health nutrition, ASTPHND has collected data periodically since 1985 in the PHNWS. This survey is an enumeration of the workforce and gathers individual and position-related information from those "public health nutrition personnel employed in official state and local health agencies and nonprofit and for-profit agencies funded by official health agencies" (Haughton, Story, and Keir, 1998, p. 665). The Bureau of Health Professions collected all available enumeration data for its *Public Health Workforce Enumeration 2000* to supplement data collected from state chief health officials. The researchers stated that the data available for public health nutritionists were among the most comprehensive and correct for all the public health professions due to the effort undertaken by ASTPHND (Gebbie, *et al.*, 2003).

A persistent barrier to enumerating public health personnel has been identifying members of the workforce. The PHNWS has the advantage of a comparatively narrowed population to study. A member of the workforce for the purpose of the PHNWS is defined as a "person classified or functioning as a nutritionist or paraprofessional in a public health nutrition program…in US state and territorial health agencies, all local health agencies, and any other agency on contract to provide WIC or other public health services that have a nutrition component. Participants…also include public health nutrition personnel who work for the Indian Tribal Organizations" (McCall and Keir, 2003, p.13).

A related obstacle in public health enumeration efforts is the variety of occupational categories that are to be included. The PHNWS utilizes position classes described in *Personnel in Public Health Nutrition for the 1990s.* This document divides the public health nutrition workforce into three series of position classes according to each position's major responsibilities. Each of the series are subdivided into position classes which exist on a continuum from a population/systems focus to a client focus, as shown in Figure 1.2. The focus of practice dictates educational preparation, professional credentials, experience and training requirements unique for each position class. The management series is composed of the public health nutrition director class, assistant public health nutrition director class, and the public health nutrition supervisor class. The professional series contains the public health nutrition consultant class, public health nutritionist class, clinical nutritionist class, and nutritionist class. Finally, the technical/support series contains the nutrition technician class and the nutrition assistant class (Dodds and Kaufman, 1991).

The focus of practice for these positions ranges from a population/systems focus to direct services. *Personnel in Public Health Nutrition for the 1990s* classifies the professional series and some of the management series (public health nutrition consultant and public health nutritionist position classes) as having a population/systems focus (Dodds and Kaufman, 1991). The rest of the professional series (clinical nutritionist and nutritionist position classes) and all of the technical/support series, alternatively, have a direct client focus Although not included as a position class in *Personnel in Public Health Nutrition for the 1990s*, a novel position class,

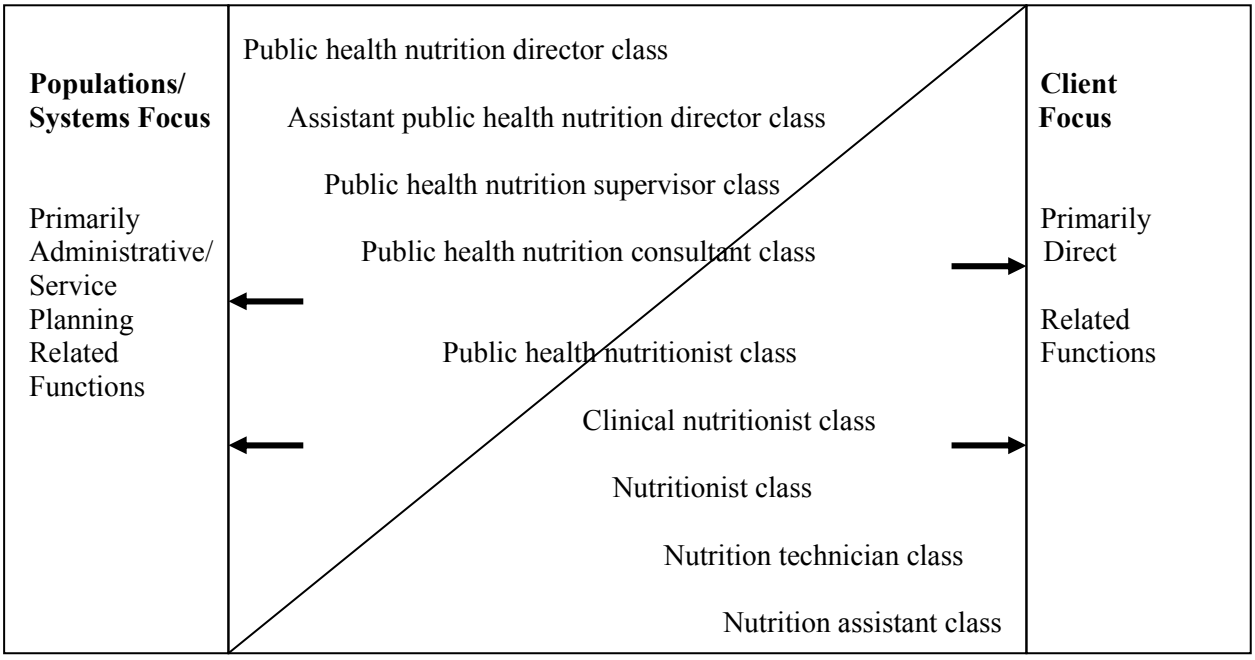

Figure 1.2. Major focus of public health nutrition team positions.
Source. Dodds, J.M. and Kaufman, M., *Personnel in Public Health Nutrition for the 1990s*, The Public Health Foundation, Washington, DC. (Used by permission.)

breastfeeding peer counselor, was added to the survey that was administered in 2006-07. The following section explains the importance of including this new position class.

Breastfeeding Peer Counselors

Though the 1999-2000 survey instrument did not include 'breastfeeding peer counselor' as a position class, just less than one-half percent of the workforce classified themselves as such using write-in responses (McCall and Keir, 2003). Therefore, the responses were reclassified and a new position class was created. Because it was unknown how many respondents were not appropriately reclassified into this position, the 2006-07 survey included 'breastfeeding peer counselor' as a position classification option to circumvent the need for reclassification. In addition, one of the financial supporters of the survey, the United States Department of Agriculture, Food and Nutrition Service (USDA, FNS), specifically requested that breastfeeding peer counselors be included in the survey. As will be explained, this was in response to a recent effort to increase the number of breastfeeding peer counselors in the USDA's Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). The WIC Program provides nourishing food and nutrition education for pregnant or breastfeeding women and their infants and children up to age five who are both low-income and at nutritional-risk.

Peer counseling can be defined as the provision of support, "assistance or encouragement given by someone considered an equal" (Noel-Weiss and Hebert, 2006, p. 30), who comes from the target population group (Best Start, 2004). Peer counselors ideally come from the indigenous population; therefore, the counselor and client speak in the same dialect and have the same socioeconomic status, ethnicity and "understanding of a community's health beliefs and barriers to health care services" (Bronner, Barber and Miele, 2001, p. 136). Peer counselors act as identifiable models for behavior and provide encouragement and support to direct the client to self-efficacy (Bronner, Barber and Miele, 2001).

Peer counseling is a technique with roots in the Alcoholic's Anonymous program in the 1950s, which was later applied to smoking cessation programs, HIV/AIDS education and academic settings (Best Start, 2004; Bronner, Barber and Miele, 2001). The breastfeeding support group La Leche League was founded on the peer counseling concept in 1957 (La Leche League, Int., 1997). To provide support for low-income women not involved in La Leche League, the concept spread in the 1970s to Augusta, GA (Lawrence, 2002). The first formal breastfeeding program utilizing the peer counselor technique was in 1987 in Chicago, and significantly improved breastfeeding initiation, duration and exclusivity (Arlotti, Cottrell, Lee and Curtin, 1998; Kistin, Abramson and Dublin, 1994).

Results from breastfeeding peer counseling programs appear to impact breastfeeding initiation, duration and exclusivity positively in a variety of populations, including low-income, minority, rural and urban (Anderson, *et al.*, 2005, Arlotti, Cottrell, Lee and Curtin, 1998, Bronner, Barber and Miele, 2001, Dennis, Hodnett, Gallop and Chalmers, 2002, Long, *et al.*, 1995, Martens 2002, Pugh, *et al.*, 2002, Schafer, Vogel, Viegas, and Hausafus, 1998, Shaw and Kaczorowski, 1999). Some research also supports that participants in breastfeeding peer counseling programs have infants with fewer medical sick visits and who require fewer medications (Pugh, *et al.*, 2002). However, there is some debate as to the scientific rigor under which these studies were undertaken (McLaughlin, Burstein, Tao and Fox, 2004). Many of the studies included women with intent to breastfeed, thus potentially impacting breastfeeding rates reported. Therefore, to more accurately determine the impact of peer counselors on breastfeeding USDA, FNS

contracted researchers to develop a breastfeeding intervention design (McLaughlin, Burstein, Tao and Fox, 2004), though it is not clear when and if this intervention design will be used.

The WIC program has developed a national breastfeeding promotional campaign executed at the state level, *Loving Support Makes Breastfeeding Work* (USDA, FNS, 2005). Because of the promising existing research, WIC developed a training program, "Using *Loving Support* to Implement Best Practices in Peer Counseling," to provide states with a framework to use peer counselors in their breastfeeding programs. The long-range vision of FNS "is to institutionalize peer counseling as a core service in WIC" (WIC Learning Center, 2007b). The model for a successful breastfeeding peer counseling program defines a peer counselor as a paraprofessional who is recruited from the target population and is available to WIC clients outside the regular clinic hours and environment (WIC Learning Center, 2007a). According to training materials for breastfeeding peer counselor managers, breastfeeding peer counselors are to meet monthly with pregnant WIC clients and frequently with new breastfeeding WIC clients (WIC Learning Center, 2007b).

Results from the Public Health Nutrition Workforce Survey

Results from the enumeration of the public health nutrition workforce conducted in 1999-2000 identified 10,904 public health nutrition positions (McCall and Keir, 2003). This was an increase from the 6,680 positions identified in the 1994 survey (Haughton, et al., 1998). The approximately 40% increase in positions reflected both an increase in the workforce and the inclusion of data for California. The state of California did not participate in the 1994 survey, but accounted for nearly one-quarter of the 1999-2000 workforce population (McCall and Keir, 2003). In 1994, approximately 49% of those surveyed worked in local health agencies (Haughton, et al., 1998), as did 48% in 1999-2000 (McCall and Keir, 2003). Approximately 94% of all the positions were budgeted, rather than contracted positions (Haughton, et al., 1998), without expectation for long-term employment (Bureau of Labor Statistics, 2008). This figure did not change dramatically in 1999-2000 and was 95% (McCall and Keir, 2003). Another important finding in 1994 was that two-thirds of the personnel were involved in direct care services. Likewise, in 1999-2000 78% of those surveyed reported their primary practice area as assurance and the majority was involved in direct client care. Three-quarters of the workforce spent more than 50% of their time in direct client services (McCall and Keir, 2003). This is significant because the defining characteristic of public health is that it is focused on population rather than individual health (Gebbie, Rosenstock, and Hernandez, 2003).

An additional concern arising from previous PHNWS's is that the overall number of public health nutrition personnel in 1994 was below recommendations. *Public Health Nutrition Personnel for the 1990s* recommends a ratio of 1 public health nutritionist for every 50,000 members of the population (Dodds and Kaufman, 1991). According to 1990 Census data, 4,379 public health nutritionists were required to fill population/system-focused responsibilities. This was 83% more than the 1994 amount of 2,393 (Haughton, et al., 1998), indicating that levels of public health nutrition personnel with a population focus were not adequate. Therefore, based on the 1994 survey, researchers reported that "those in leadership positions need to emphasize the importance of population-focused competencies and to advocate for related funding to support public health core functions" (Haughton, et al., 1998, p. 669). According to 2000 Census data, approximately 5,629 public health nutritionists would be needed to meet the recommended ratio (Dodds and Kaufman, 1991; US Census Bureau, n.d.), while only 3,311 positions in the 1999-2000 survey had a populations/systems focus (McCall and Keir, 2003). In addition to inadequate numbers, the

1999-2000 survey also found that over two-thirds of public health nutrition personnel had more than 10 years of experience in nutrition. ASTPHND speculated that this may be because individuals do not enter public health nutrition until later in their careers (McCall and Keir, 2003). It is also possible that this indicates an aging workforce. While it has not been researched, a potential issue in public health nutrition is the "graying" of the workforce. Aging of personnel and subsequent retirement from the workforce have been cited by other public health researchers as a concern (Gebbie, 2000, Tilson and Gebbie, 2004). The following section discusses the impact of the retirement of public health and other healthcare professionals.

Retirement in Public Health Professions

Though *The Future of the Public's Health in the 21st Century* cited the aging of the general population as one of the three concerns facing the public health system (IOM, 2003), it did not extrapolate that concern to the "graying" of the public health workforce itself. It is possible to infer, though, that the workforce charged with assuring the nation's health will age at a rate similar to that of the population it cares for. Therefore, while preparations are made in anticipation of an older population, parallel preparations must be made to prepare for members of the public health workforce to age and retire. In the Board of Health Science Policy Disasters Roundtable, Goldman stated that "the public health workforce is dominated by professionals reaching retirement age. Therefore, in addition to responding to public health disasters, public health professionals should also invest resources in training new leaders to ensure that they will be ready to work on the front lines of public health as the current workforce retires" (IOM, 2005, p11).

One sector of the healthcare field that has been concerned about the effects of retiring personnel is the registered nursing workforce. The National Sample Survey of Registered Nurses has been performed since 1977, which has allowed researchers to track trends in the nursing workforce (Spretley, Johnson, Sochalski, Fritz, and Spencer, 2000). According to the US Census Current Population Survey, the average age of registered nurses has been steadily increasing. In 2000, approximately 49% of registered nurses were considered "baby boomers," born between 1947 and 1962 (Minnick, 2000). In addition to the aging of the workforce, nursing has been impacted by the fact that it has been a predominantly female profession and fewer females have been choosing to enter the field. This is due to numerous factors, including an increasing number of alternative career choices and increasing wages in other fields. Similar trends have been noted in other female-dominated careers (Buerhaus, Staiger, and Auerbach, 2000).

Because of a history of tracking nursing workforce trends, Buerhaus, Staiger, and Auerbach (2000) predicted that the number of nurses entering the field would not be sufficient to replace those expected to retire. Nursing administrators responded by creating incentives to attract individuals into the nursing field and bonuses to entice current workers to remain in the field. In addition, they also utilized workers from other countries to fill the gaps in the nursing field. Because the lack of workers was forecasted and, to a degree, anticipated, it allowed managers and those in upper-level positions to attempt to correct the gaps before they occurred (Buerhaus, Donelan, Ulrich, Norman, and Dittus, 2005). HRSA's *Public Health Advisory Panel for the 10th Report on the Status of Health Personnel* (2001) included a logic model that demonstrated the link between workforce monitoring and supply. Continual monitoring and evaluation, through workforce studies, can be used by: employers to improve recruitment and retention; educators to enhance training; professional associations to advocate for better salaries and working conditions; and legislators to set staffing ratios and direct money to workforce training. The outcome of

these activities is an increased worker supply, which is in turn identified by the continual workforce monitoring (Biviano, 2001).

Workforce monitoring allowed policymakers to forecast and anticipate the current nursing shortage that began in 1998. There are signs that this shortage may be abetting, because of diligent and focused attention (Bureau of Health Professionals, 2004). The impending lack of registered nurses received public attention because research demonstrated an association between patient outcomes and the number of registered nurses. It also received focus because of troublesome supply and demand projections as well as Institute of Medicine reports on quality and patient safety (Ulrich. 2005). As a result, hospitals increased registered nurses' wages and increased the number of nurses employed (Buerhaus, Staiger, and Auerbach, 2003; Buerhaus, et al.,2005). In addition, greater public awareness of opportunities for nursing careers led to an increased enrollment in nursing education programs (Buerhaus, et al., 2005).

Retirement of the overall healthcare workforce has not been monitored as consistently as the nursing workforce. There are indications, though, that retirement will soon present problems for the healthcare workforce. For example, in 2003 the Partnership for Public Service found that nearly 45% of CDC's physicians and biologists will be eligible to retire by 2008, as will 47% of its biological scientists. Almost 55% of the National Institutes of Health's medical field members will be retirement-eligible, as well as 52% of FDA medical personnel and 53% of all Food Safety and Inspection Service employees (Partnership for Public Service, 2003). Similarly, in 2002 the *State Employee Workforce Shortage: The Impending Crisis* reported that a state employee worker shortage was due to the rate of employee retirement and the overall composition of the workforce. In its assessment of all state workers, the Council determined that of all state agencies, the health care and medical sector of the workforce would be hardest hit by the impending shortage (Carroll and Moss, 2002). In response, ASTHO conducted its own analysis of the state public health workforce (ASTHO, CSG, and NASPE, 2004), which was repeated in 2007 (ASTHO, 2008).

Among ASTHO's significant findings was a rapidly aging state public health workforce with an average age of 47 years, as well as a state public health workforce retirement rate of 20% within 3 years, and 29% within 5 years. Compared to the state public health workforce, the overall state workforce averaged 54 years of age, while the overall American workforce averaged 41 years (ASTHO, 2008). The trend of a "graying" workforce presents significant challenges in filling vacant public health positions. The public health workforce mimics the trends seen in the overall American population with a "bulge in eligibility for retirement" as the first members of the baby boomer generation near retirement age (ASTHO, CSG, and NASPE, 2004, p7). The younger generations left to fill in the employment gaps are comparatively smaller in size (ASTHO, CSG, and NASPE, 2004,). In addition to age, it is possible to examine retirement eligibility. According to the *State Employee Workforce Shortage* document, approximately 30% of state workers could be lost by 2006 due in large part to retirement, compared to 45% of state public health workers (Carroll and Moss, 2002). The retirement of experienced workers "may require professional training of existing staff to meet levels of those retiring" (ASTHO, CSG, and NASPE, 2004, p7). Similarly, a January 2001 meeting of public health practice leaders in the Northwest United States led to recognition that public health department workers at the state and local levels were retiring faster than new workers could be trained adequately (Bekemeir, 2001). A profile of local health departments in 2005 found that nearly 20% of local health department employees were estimated to be retirement eligible within five years, with higher rates for those health departments serving smaller populations (NACCHO, 2006).

As individuals reach age 55, their participation in the workforce markedly decreases because of early retirement and pension options, among other factors (Toossi, 2005; Dohm, 2000). Women have been shown to exit the workforce after age 55 at rates higher than men (Dohm, 2000). In studying the registered nursing workforce, Buerhaus noted that the number of nurses tended to increase with age until individuals reached age 55 years. After age 55, a rapid decline occurred as individuals neared the official retirement age of 65 years (Buerhaus, et al., 2000). Likewise, Minnick found that individuals, including nurses, tended to decrease their labor participation at age 55 years (2000). This reciprocal decrease in labor participation with increased chronological age may suggest the potential to anticipate or predict workforce shortages and therefore, to do a better job at succession planning. Historically, industrial/occupational psychologists have focused their research on individuals' reactions to retirement, rather than determining predictors of retirement itself (Beehr, 1986). The following section describes researchers' responses to the lack of these types of data.

Beehr's Model of Retirement Behavior

In the 1980s as members of the baby boomer generation began to near retirement, some industrial/occupational psychologists recognized the value of predicting individuals' intention to retire. These researchers believed that if an organization could predict which individuals would retire, more appropriate planning measures could occur in anticipation of the vacancies left by retirees. Beehr believed that organizations are impacted by retirement in a number of ways, notably because those individuals retiring are generally more experienced and have reached higher levels within the organization. When these individuals retire, organizational uncertainty and a loss of organizational knowledge can result (Beehr, 1986). The limited research performed on intent to retire prior to Beehr's work suggested that the strongest predictor of retirement is finances (McCune and Schmitt, 1981). Building on this, Beehr hypothesized that an individual's intention to retire is influenced by personal and environmental factors. Personal factors include Type A behavior, skill obsolescence, health and economic well-being. Environmental factors include both job and non-job factors. Job factors include attaining occupational goals and job characteristics, while non-job factors are marital and family life and leisure activities. In his Model of Retirement Behavior, Beehr hypothesized that the interaction of these factors leads to the preference to retire or thinking about retirement. With the passage of time, this preference leads to the decision or intention to retire, followed by the act of retiring (Beehr, 1986) (Figure 1.3).

According to Azjen and Fishbein (1975), plans can be viewed as behavioral precursors to action. Therefore, it should be reasonable to believe that intention to retire precedes the behavior of retirement. As stated by Lezin (2005), "intention is a plan or a likelihood that someone will behave in a particular way in specific situations." A number of researchers have applied Beehr's model to test its ability to predict retirement (Beehr, Glazer, Nielson, and Farmer, 2000; Ekerdt, DeViney, Kosloski, 1996; Talaga and Beehr, 1995; Taylor and Shore, 1995). While financial and health variables are the strongest predictors of retirement, researchers confirmed that other factors play a role. In one study, finances explained 17% of the variance toward expected retirement age of state government employees, while work and non-work characteristics contributed to 20% (Beehr, et al., 2000). In addition, Talaga and Beehr found that in the generation nearing retirement age, traditional gender roles may explain some retirement decisions (1995). While financial and physical health were the strongest predictors of retirement for both genders, women were more likely than men to retire when their spouse's health was good, and when dependents were in the home (Talaga and Beehr, 1995).

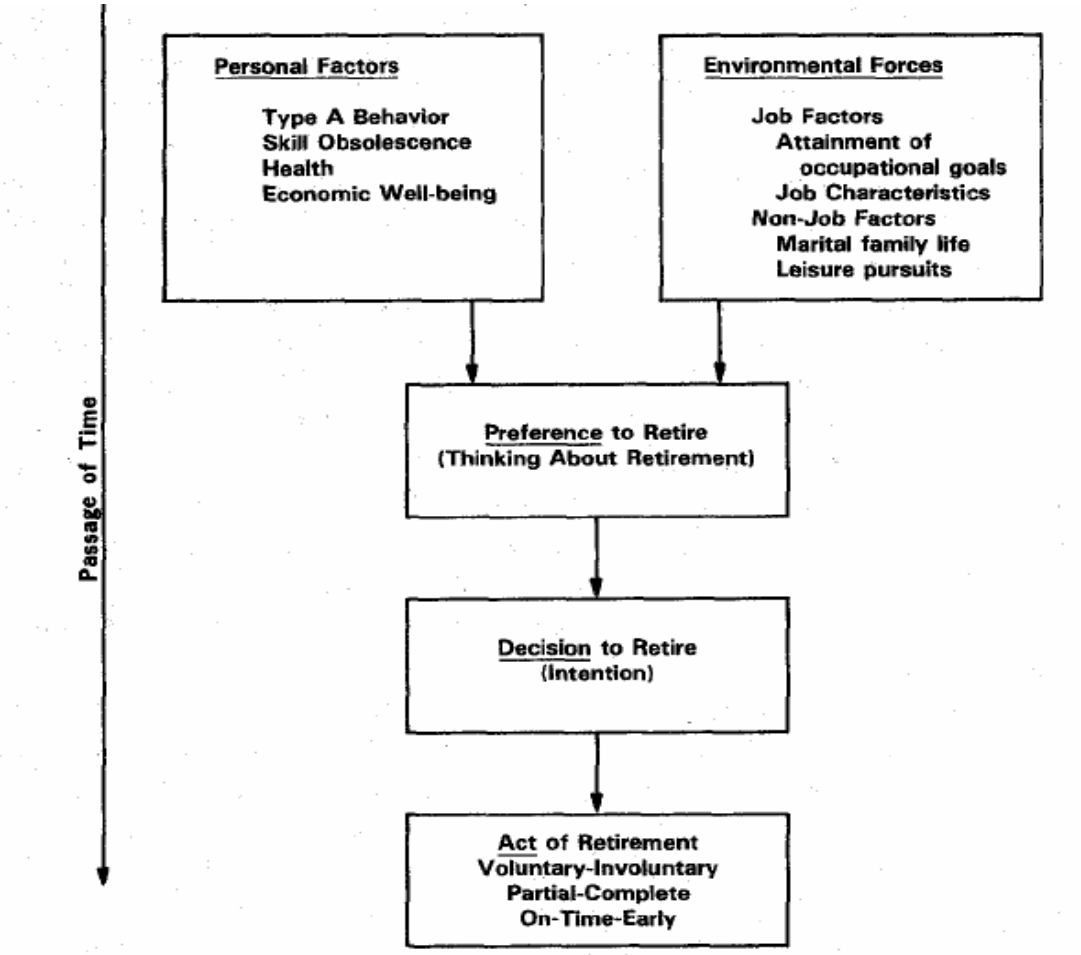

Figure 1.3. Beehr's Model of Retirement Behavior.
Source. Beehr T. The process of retirement: A review and recommendations for future investigations. *Personnel Psychology*. 1986; 39: 31-55. (Used by permission.)

In its 1999-2000 survey of public health nutrition personnel, ASTPHND stated that "data on age of the workforce were not collected, but the proportion of respondents that have been working in the field for 20 years and longer suggests that the eventual replacement of workers as they retire is an issue requiring consideration by public health officials" (McCall and Keir, 2003, p. 61). Members of the public health nutrition workforce hold positions in a variety of agencies and locations, making it difficult to plan for the future state of the workforce without more specific information about which members of the workforce will be retiring. Approximately 90% of the public health nutrition personnel surveyed by ASTPHND were funded by the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) that began in 1972. Almost half of all those working for WIC in 1999-2000 had at least 10 years of nutrition experience (McCall and Keir, 2003). Because data on age were not collected in previous versions of the survey, it is not possible to know the age of WIC employees. It is possible, though, that some WIC employees have been members of the workforce since the inception of the 36-year-old program and subsequently promoted to professional or management positions. If some of these individuals were in their twenties when they entered the workforce, they will soon be nearing age 55, the age at which other healthcare workers begin to reduce their labor participation (Minnick, 2000). The retirement of these individuals could lead to a significant loss of experience and leadership in the field.

Because *Healthy People 2010* is built on ten-year increments (US DHHS, 2000), it is helpful to use this timeframe in planning and forecasting. If an individual will retire within the next ten years, it is likely that he/she has begun to make plans in anticipation of this action (Beehr, 1986). Therefore, he/she should be able to identify this intent (Fishbein and Ajzen, 1975). Public health nutrition personnel in upper-level, population-focused positions were likely promoted because of experience, leadership, and public health training. If these individuals entered the field at age 25 years with the inception of the WIC program (Cohen and Bianchi, 1999), they would be approximately 61 years old. Therefore, if public health nutritionists follow the average retirement age of 62 years, (Gendell, 2008), these individuals would be ready to retire within the next year. If those individuals who will be retiring are members of the upper-level positions, this raises the question of who will be in place to fill these positions. If the lower-level positions are more transient in nature or filled by new members of the public health nutrition field, it is possible that these individuals may not be adequately prepared to replace the empty upper-level positions that may be vacated. "Many current public health workers were originally hired for entry level positions for which a specific skill was essential and which did not require a general perspective. As programs and funding shift, and as employees seek advancement, they move from these narrowly defined positions into ones in which their lack of broad public health perspectives and skills is more limiting" (Gebbie, 1999, p. 660). Therefore, there is a potential lack of adequately trained and prepared individuals in the public health nutrition workforce to fill vacant positions left by those who will retire within the next ten years. If a larger percentage of the public health workforce retires without an equivalent number of appropriately prepared individuals to fill the gaps, it is likely that shortages may occur. As was found in the shortage of physiotherapists in the United Kingdom, the small size of the workforce makes shortages felt more severely (Buchan, 2000).

In an effort to determine the extent to which retirement will be an issue for the public health nutrition workforce, three items were added to the 2006-07 PHNWS that was administered in 2006-07. These items were:

- "In what year were you born?"
- "Do you intend to retire in the next 10 years?" (No/Yes)

- (If yes, then) "In how many years do you intend to retire?"

Determining an individual's intention to retire may be phrased in a number of ways. For example, in his study of current Registered Nurses, Buerhaus asked RNs if they had plans to leave their nursing position with the response options of "No plans to leave" and "Yes, within the next 3 years" (2005). The phrase "intend to retire" was selected for the 2006-07 PHNWS as opposed to "will you retire" because intentions precede specific behavior (Azjen and Fishbein, 1975; Beehr, 1986). Therefore, it is likely that more individuals would be able to identify future behavioral intentions than behavioral plans. Retirement intention was divided into two items. Individuals were first asked if they had intention to retire in the next 10 years. If an individual responded positively, s/he then was asked in how many years s/he intended to retire. This format was selected because retirement is an ongoing, multi-year process (Beehr, 1986; Talaga and Beehr, 1995). Therefore, it is likely that those individuals nearing their retirement ages would be able to identify this intention. Ten years is the timeframe used for much of health-planning, such as *Healthy People 2010* (US DHHS, 2000); therefore, retirement data collected in this enumeration is more likely to fit an existing health-planning framework.

Rationale and Significance for Research, by Area

Description of the workforce

As has been discussed, accurate enumeration data is invaluable to workforce planning, management and forecasting (Gebbie, Merrill, Hwang, Gebbie, and Gupta, 2003). *Enumerating the Public Health Workforce* (Atchinson, Gebbie, Thielsen and Woltring, 2001) specifies core data elements that should ideally be collected in a comprehensive enumeration. With the new inclusion of age data, the 2006-07 PHNWS contained survey items that correspond to each of the core data elements. Therefore, the 2006-07 PHNWS can be used to describe the public health nutrition workforce overall.

Key concerns about this workforce exist in emerging areas of interest, including employment practices and diversity. Contracted workers made up 4% (3.7%) of positions in the 1999-2000 PHNWS (McCall and Keir, 2003). It appears that employment practices in general may be moving to an increased use of contracted workers (Department for Professional Employees, 2003; Goldsmith, 2007), in part because they do not receive employee benefits (US Government Accountability Office, 2007), and are less costly for employers. The 2006-07 PHNWS contained a new survey item about which employee benefits respondents received, making it possible to explore the relationship between employment status, position, and employee benefits received. An additional concern for the public health workforce is its diversity. It is recommended that diversity exist in all levels of a healthcare organization reflect the diversity of its service area (US DHHS, 2001). This is important because service providers who are good cultural matches to their target population helps limit negative health behaviors (Smedley, Stith and Nelson, 2003). In addition, increasing underrepresented racial and ethnic groups in the healthcare workforce is an important step toward eliminating health disparities (Smedley, Stith and Nelson, 2003; Sullivan Commission, 2004).

Breastfeeding Peer Counselors

Anecdotal evidence suggests that the public health nutrition workforce is currently in transition (Haughton, Story and Keir, 1998; McCall and Keir, 2003; USDA, FNS, 2005). In addition to individuals retiring from the workforce, there is also a burgeoning sector of the field. Breastfeeding peer counselors are a group of paraprofessionals hired from the indigenous community to aid new mothers by providing social and emotional support for breastfeeding. It would be valuable to know more about this segment of the workforce that may be increasing in presence, especially in the WIC program. Learning about how breastfeeding peer counselors describe their practice would provide an indication of how they are fulfilling their job descriptions. Being able to describe breastfeeding peer counselors demographically would yield a more complete picture of who breastfeeding counselors are. It would be helpful for workforce planning to know whether breastfeeding peer counselors practice differently from the other position classes in the technical/support series (nutrition technicians and nutrition assistants), and where differences or similarities lie. This is a relevant concern for workforce planners because position requirements and salaries differ for each position class. Of particular interest is whether breastfeeding peer counselors contribute to the overall diversity of the workforce. Finally, one of the defining characteristics of breastfeeding peer counselors is that they are to be members of the indigenous community. A convenience sample of WIC breastfeeding peer counselors indicated that they were less racially diverse, were more educated, earned higher incomes and were more likely to be married than their clients (Bronner, Barber, Vogelhut and Resnik, 2001). It would be useful to compare a census population of breastfeeding peer counselors to their client population, especially using the key characteristics for which they ought to be similar: age, ethnicity and race (Best Start, 2004). The biennial report of WIC participants, *WIC Participant and Program Characteristics 2004,* describes breastfeeding women according to their age, ethnicity, and race (Bartlett, Bobronnikov and Pacheco, 2006). According to this report, the proportion of breastfeeding women has increased since 1992 (from 3.6% to 6.0%), and these women tend to be older, Hispanic, and have higher household incomes compared to pregnant and postpartum WIC clients (Bartlett, Bobronnikov and Pacheco, 2006).

Retirement of the workforce

"Graying" of the workforce has become a concern in many fields (Carroll and Moss, 2002), and especially in healthcare (ASTHO, 2008; Buerhaus, et al., 2000; Gebbie 2000). Historically, public health has not tracked retirement trends of the workforce because of difficulty in enumerating public health personnel (Gebbie, 2000). Monitoring workforce composition is the first step in meeting workforce needs (Office of Workforce Policy and Planning, n.d.), which has led to a call to enumerate the public health workforce. Once the workforce is identified and enumerated, it is possible to forecast future shortages, as has been done in the nursing field (Buerhaus, et al., 2000). Because of the PHNWS, public health nutrition personnel are one of the public health fields about which the most information is known (Gebbie, 2000). The previous versions of the survey have benefited workforce monitoring and assisted in forecasting and planning. Three items to determine age and retirement intentions were added to the 1999-2000 survey, which will further enhance workforce forecasting. There is a possibility that individuals who intend to retire are not evenly distributed across the workforce. For example, previous enumerations of the public health workforce and the public health nutrition workforce have identified differences in personnel ratios by geographic location (Gebbie, 2000). Therefore, age and retirement intentions are important characteristics to identify differences according to selected data that are collected in the survey. As previously explained, intention is considered an

appropriate predictor of future behavior (Ajzen and Fishbein, 1975). In addition, retirement has been found to occur as a process rather than an isolated decision, and individuals nearing retirement make anticipatory decisions to facilitate future retirement (Beehr, 1986; Talaga and Beehr, 1995). Therefore, it is expected that those individuals who intend to retire within 10 years will be able to identify this expectation, even if they have not yet begun the process of retiring or associated behavior changes.

According to Beehr (1986), both personal and environmental factors can influence an individual's intention to retire. Though chronological age is not the only predictor of retirement, it is a valuable characteristic to determine individuals who may be nearing their full retirement age (Beurhaus, 2000; Minnick, 2000; Social Security Administration, n.d.). These data could be used for planning both within and outside the organizations in which personnel are employed. For example, the Bureau of Health Professionals stated that if the retirement age of public health personnel was known, schools of public health could plan educational programs accordingly (Gebbie, 2000*)*.

Another characteristic related to retirement is the years of experience individuals have spent in the workforce. Previous researchers have identified that individuals nearing retirement are often those with the most experience in an organization (Beehr, 1986; Talaga and Beehr, 1995). Therefore, years of experience in nutrition/dietetics and public health nutrition may be an important variable to consider when differentiating between personnel who do and do not intend to retire within the next 10 years. Finances, which include both income level and employee benefits received, have been consistently identified as the most significant predictors of retirement (McCune and Schmitt, 1981). Therefore, economic well-being can be assessed by employee benefits received as proxy measurements of income (Cowan, 2000; Schwabish, 2004). Cost-of-living varies nationally, so years of experience and position class can be used to explain income level because these characteristics correspond to income level. In addition, though the 2006-07 PHNWS collects salary data, it does not collect household income. Therefore, it is not possible to know respondents' overall financial status from this survey.

Beehr's Model of Retirement Behavior also includes a factor referred to as skill obsolescence (1986). Retirement research has found that the more obsolete an individual's skills and amount of training s/he would require to continue to work, the more likely s/he is to retire (Beehr, et al., 2000). The 2006-07 PHNWS assesses both an individual's level of education and amount of training required for his/her current work. For the population-focused work performed by personnel in the management series and the public health nutrition consultant and public health nutritionist classes, individuals require master's level education in public health (Dodds and Kaufman, 1991). In addition, public health nutrition encompasses a variety of skills and competencies (Council on Linkages Between Academia and Public Health Practice, 2007), and an individual may require updated or continual training. Therefore, if an individual nearing retirement does not have the educational degree or level of training required for his/her work, he/she may be more apt to retire than to update his/her proficiencies.

In Beehr's model, environmental factors include both job and non-job characteristics. The 2006-07 PHNWS did not gather data on marital/family life or leisure pursuits. The survey did collect data on a number of job characteristics that fit Beehr's Model of Retirement Behavior, such as full-time/part-time status, employed/contracted status and time spent in direct client services The survey's data also provided information on an individual's position class, supervision and budget responsibility, and type of agency where employed/contracted. Because the data set resulting

from the 2006-07 PHNWS supplied multiple variables included in Beehr's model, it may be possible to predict future retirement behavior.

Research Questions

Description of the Workforce

As explained, the 2006-07 PHNWS collected information in each of the areas described as core data elements of an enumeration (Atchinson, Gebbie, Thielsen and Woltring, 2001). To enumerate the public health nutrition workforce, the following question was asked in this research:

Research question 1A: Describe the public health nutrition workforce according to the following parameters:

- total number of staff (filled positions, vacant positions, and persons);
- FTEs by funding source;
- job classification;
- job function (primary area of practice, percent of work time spent in direct client services, primary client population, budget responsibilities, supervision responsibilities);
- location (geographical, agency of employment, location of practice);
- age category;
- maximum education level attained/working toward;
- credentials;
- experience (years in nutrition and public health nutrition);
- salary (salary range, employee benefits received);
- ethnicity;
- race;
- gender; and
- language.

Research question 1B: Determine whether those in population/system focused and client focused positions are different, according to the following parameters:

- ethnicity;
- race;
- gender;
- primary language;
- employed/contracted status; and
- employee benefits received.

Breastfeeding Peer Counselors

The 2006-07 public health nutrition enumeration provided data on the new job classification: breastfeeding peer counselor. To better understand those functioning in this position and to partially determine how the position's stated purposes are being met, the following three questions were asked:

Research question 2A: Describe breastfeeding peer counselors by person and position characteristics according to the following parameters:

- *Person*:
    - years of experience in nutrition/dietetics, public health nutrition, and WIC;
    - maximum education level attained/working toward;
    - credentials;
    - attendance at any nutrition courses;
    - perceived training needs;
    - gender;
    - age category;
    - intention to retire within 10 years;
    - ethnicity;
    - race; and
    - primary and secondary languages spoken.

- *Position*:
    - geographical region;
    - agency of employment;
    - location of practice;
    - whether the position is in the WIC program;
    - percent of work time spent in direct client services;
    - full-time/part-time status;
    - employed/contracted status;
    - salary;
    - employee benefits received;
    - funding source;
    - primary area of practice; and
    - primary client caseload.

Research question 2B: Determine whether breastfeeding peer counselors practice differently compared to other positions in than the rest of the technical/support series (nutrition technician and nutrition assistant) using the following position parameters:

- agency of employment;
- whether the position is in the WIC program;
- percent of work time spent in direct client services;
- full-time/part-time status;
- employed/contracted status;
- primary area of practice; and
- primary client population.

Research question 2C: Determine whether WIC breastfeeding peer counselors are filling the position qualification of being from the same population group as the clients served according to the following characteristics:

- age category;
- ethnicity; and
- race.

Retirement of the workforce

An enumeration of public health nutritionists will contribute important information about this workforce that may be used in a number of ways, including infrastructure planning, personnel forecasting, and policy development. The 2006-07 public health nutrition enumeration provided data to answer the following four questions:

Research question 3A: Describe those members of the public health nutrition workforce 45 years and older according to the following parameters:

- retirement intention;
- age category;
- years of experience in nutrition/dietetics and public health nutrition;
- employee benefits received;
- position class;
- graduate degree in public health or public health nutrition;
- level of training required for current work;
- full-time/part-time status;
- employed/contracted status;
- percent of work time spent in direct client services;
- supervision responsibilities;
- budget responsibilities;
- type of agency; and
- geographic region.

Research question 3B: For those 45 years and older, determine if there are significant differences for the intention to retire within the next 10 years based on:

- age category;
- years of experience in nutrition/dietetics and public health nutrition;
- employee benefits received;
- position series;
- graduate degree in public health or public health nutrition;
- level of training required for current work;
- full-time/part-time status;
- employed/contracted status;
- percent of work time spent in direct client services;
- supervision responsibilities;
- budget responsibilities;
- type of agency; and
- geographic region.

Research question 3C: Determine whether an individual's intention to retire within the next 10 years for those 45 years and older is predicted by the following variables (characteristics):

- age category;
- years of experience in nutrition/dietetics and public health nutrition;
- employee benefits received;
- position series;

- graduate degree in public health or public health nutrition;
- level of training required for current work;
- full-time/part-time status;
- employed/contracted status;
- percent of work time spent in direct client services;
- supervision responsibilities;
- budget responsibilities;
- type of agency; and
- geographic region.

Research question 3D: For those 45 years and older, determine if there are significant differences in the number of years until intended retirement based on:

- age category;
- years of experience in nutrition/dietetics and public health nutrition;
- employee benefits received;
- position series;
- graduate degree in public health or public health nutrition;
- level of training required for current work;
- full-time/part-time status;
- employed/contracted status;
- percent of work time spent in direct client services;
- supervision responsibilities;
- budget responsibilities;
- type of agency; and
- geographic region.

Research question 3E: Among those 45 years and older who intend to retire within the next 10 years, determine if the years until intended retirement can be predicted by:

- age category;
- years of experience in nutrition/dietetics and public health nutrition;
- employee benefits received;
- position series;
- graduate degree in public health or public health nutrition;
- level of training required for current work;
- full-time/part-time status;
- employed/contracted status;
- percent of work time spent in direct client services;
- supervision responsibilities;
- budget responsibilities;
- type of agency; and
- geographic region.

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Part II:

Public Health Nutrition:
A Workforce in Transition

Abstract

Objective: To enumerate the US public health nutrition workforce, defined as professional and paraprofessional positions funded by programs under the purview of official health agencies, and describe people in these positions demographically.

Methods: Secondary data analysis using descriptive statistics and $_X^2$ analysis of a research data set generated from a 2006-07 enumeration survey of filled and vacant positions.

Results: Almost 9,500 (n=9,442) persons were employed/contracted in 9,558 filled positions; 365 positions were vacant. Most positions were primarily employed/contracted by official health agencies and funded by the Special Supplemental Nutrition Program for Women, Infants, and Children. Most were client-focused and supported the core function of assurance to the maternal and child population. Nearly 70% (69.4%) of contracted positions (6.7% of positions) received no employee benefits. One-quarter (23.9%) of personnel intended to retire within ten years.

Conclusions: Personnel are involved primarily in direct care services to a limited population, which may not adequately address the public health goals of disease prevention and health promotion across the lifecycle. Employment practices may be changing in light of budget constraints. High rates of retirement are expected within the next 10 years.

Introduction

The mission of public health in the United States is "assuring the conditions in which people can be healthy" (Institute of Medicine, 1988, p.7). *Healthy People 2010's* 23rd Goal focuses on the public health infrastructure required to support this mission (US DHHS, 2000). One key component of this infrastructure is the public health workforce, which should be monitored through regular, periodic enumerations for composition and adequacy (Cioffi, Lichtveld, and Tilson, n.d.) to assure it is competent, well-trained, and sufficiently staffed. While appropriate enumeration has been problematic for the public health workforce as a whole (US DHHS, 1999; Tilson and Gebbie, 2004), one segment, public health nutrition, has been enumerated periodically since 1985 by the Association of State and Territorial Public Health Nutrition Directors (ASTPHND) using the Public Health Nutrition Workforce Survey (PHNWS) (Kaufman, Heimendinger, Foerster and Carroll, 1986; Kaufman, Heimendinger, Foerster and Carroll, 1987; Kaufman and Lee, 1988; Thompson, Bellamy, Kaufman and Jarka, 1990; Haughton, Story and Keir, 1998; McCall and Keir, 2003; Haughton and George, *in press*). The survey has evolved since its inception, but has consistently included many of the essential core data elements for public health workforce enumeration recommended by the Public Health Leadership Society and the Center for Health Leadership and Practice to the U.S. Department of Health and Human Services (US DHHS), Health Resources and Services Administration. These core data elements, both at the position-level and person-level, include: total number of staff, number of full-time equivalents (FTEs), job classification, job functions, location, education level, credentials, experience, salary range, demographics (age, ethnicity, race, gender), and languages spoken (Atchinson, Gebbie, Thielen, and Woltring, 2001). With the inclusion of age in 2006-07, the most recent PHNWS contained all of these essential items.

The PHNWS is the only complete source of workforce and personnel data for nutritionists employed or contracted by state and local official public health agencies. Results from the 1999-2000 PHNWS indicated a large national workforce (10,904 positions) employed primarily by state or local government health agencies (67.8%) and funded primarily by the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (81.0%) (McCall and Keir, 2003). The majority of the workforce was experienced, with over half (57.5%) having worked in nutrition/dietetics for at least 10 years (McCall and Keir, 2003). The more recent 2006-07 PHNWS provided the opportunity to determine how the workforce had changed, if at all, and to collect data on emerging areas of interest, including employment practices, diversity, and retirement. In the previous PHNWS, less than 4% (3.7%) of positions were contracted, which were positions of consultants or others contracted to the agency and reimbursed based on differential pay rates. This figure was similar to the proportion in the 1994 PHNWS (McCall and Keir, 2003). Because they do not receive employee benefits (US Government Accountability Office, 2007) and are thus less costly for employers, it appears that employment practices may be shifting toward the increased use of contracted workers (Department for Professional Employees, 2003; Goldsmith, 2007). Also of concern is workforce diversity because one step to eliminate health disparities is to increase underrepresented racial and ethnic groups in the healthcare workforce (Smedley, Stith and Nelson, 2003; Sullivan Commission, 2004).

The primary aim of the present study was to use research data from the 2006-07 PHNWS to describe the US public health nutrition workforce based on the recommended core data elements of an enumeration (Atchinson *et. al*., 2001). In addition, we wanted to determine if there are differences in employment practices and diversity by job classification. Finally, we wished to discuss the implications of these findings and suggest areas of future research.

Methods

Primary data collection

Survey development and administration. This study employed secondary data analysis of the 2006-07 PHNWS for respondents who agreed to release their data for research purposes; detailed methods are available in the technical report (Haughton and George, *in press*). In brief, all full- and part-time nutrition professionals and paraprofessionals employed by or contracted with official health agencies to work in nutrition programs or services were asked to complete the PHNWS in partial fulfillment of their job requirements. The PHNWS was modified from the 1999-2000 survey in a collaboration between ASTPHND, the United States Department of Agriculture, Food and Nutrition Service (USDA, FNS), and University researchers. The survey instrument was similar to the 1999-2000 instrument, but included additional items on employee benefits received (health insurance, retirement, sick leave, and vacation) and retirement (age categories, intention to retire, and years until intend to retire). Job classification of respondents used the same position descriptions as previous administrations, which place job classifications on a continuum from those most involved with population/systems (Public Health Nutrition Director, Public Health Nutrition Assistant Director, Public Health Nutrition Supervisor, Public Health Nutrition Consultant, Public Health Nutritionist), to those most involved in direct client care (Clinical Nutritionist, Nutritionist, Nutrition Technician, Nutrition Assistant) (Dodds and Kaufman, 1991). A new position description, Breastfeeding Peer Counselor (located at the most direct client care-focused end of the continuum) was added as a response option to assess the extent of implementation of new programs within the WIC Program (WIC Learning Center, 2007).

After pilot testing, three versions of the fixed-response survey instrument were developed: 1) a 42-item instrument for completion by personnel in filled positions; 2) a 28-item instrument including only position-related items for personnel who worked in multiple positions and had completed the 42-item instrument; and 3) an 11-item instrument completed by local directors or state personnel regarding positions vacant at the time of survey administration. The survey was administered primarily online (mrInterview ver. 4.0, 2002-2006, SPSS Ltd., Chicago, IL), with a print option for respondents unable to utilize the on-line version.

Designated state-level nutrition contacts identified personnel to complete the survey and assigned personnel unique identifiers to access the password-protected website. State contacts also cleaned selected survey items found to be problematic in past survey administrations, and followed-up with non-respondents. The survey was administered from September 2006 through March 2007. The final dataset was exported as three SPSS files (SPSS 15.0 for Windows, ver. 15.0.1, November 22, 2006, SPSS Inc., Chicago, IL) for data management and analysis: 1) basic position characteristics (filled and vacant positions); 2) detailed position characteristics (filled positions only); and 3) demographic characteristics of personnel.

Secondary data analysis

Subjects. Subjects for this study were personnel in public health nutrition positions funded by official health agencies who agreed to release their data for research purposes (n=9,923 filled and vacant positions, 92.9%). The overall response rate for the survey was 80.0%; the research subset used here was 74.2% of the total population.

Measures. Public health nutrition positions and persons were measured by the characteristics found in Table 2.1. Complete response options to items in the 2006-07 PHNWS can be found in the technical report (Haughton and George, *in press*).

Statistical methods. Results of descriptive univariate and bivariate analyses on the complete set of respondents (n=10,683 filled and vacant positions) have been reported (Haughton and George, *in press*). We used univariate and bivariate statistics on the research dataset to describe public health nutrition positions and the people in these positions, according to the core data elements of an enumeration (Atchison et. al, 2001). χ^2 analyses were performed to determine if significant differences ($P \leq 0.05$) existed between population/systems focused and client focused positions for employed/contracted status, employee benefits, gender, ethnicity, race, and primary language other than English. For these analyses, personnel who selected "other" responses for position classification were excluded (n=435). In addition, 58 individuals who worked in multiple positions and completed more than one survey could be linked to job classifications identified in each survey and also were excluded as multi-completers. An additional 58 persons who worked in multiple positions could not be linked to job classifications identified in each survey; therefore, they were assigned to the job classification identified in the first position survey completed and were included in the χ^2 analyses.

To clarify that personnel described their job classification based on duties performed and not job title, respondents were asked to describe their job classification in two survey items. The first item was asked only as position descriptions. At the end of the survey, the same question was asked, including both job titles *and* position descriptions, consistent with how the item was asked in previous survey administrations. The *a priori* decision was made to use McNemar's test to select which item to use for job classification. Specifically, if it showed no agreement between responses to the two items, then responses to the item using only job descriptions would be used. Results revealed no agreement (P=0.000); therefore, results are reported for response to the survey item with only position description.

Results

Position characteristics

There were almost 10,000 positions (n=9,923) of which 9,558 (96.3%) were filled at the time of survey administration. All 50 states, the District of Columbia, and Guam participated; Indian Tribal Organizations were captured within the states where they are located. Proportions of personnel in each of the US DHHS Regions ranged from 4.5% in Region X to 22.6 % in Region IX. About one-quarter of filled and vacant positions had a population/systems focus (28.0%), while two-thirds (67.5%) had a direct care focus (responses that indicated "other" were not included in this categorization) (Table 2.2). The novel position class, Breastfeeding Peer Counselor, comprised over one-tenth of positions (11.3%).

The majority of filled and vacant positions were in official health agencies (71.0%). Nearly one-third (29.0%) were employed by or contracted with other agencies, such as non- or for-profit agencies. Almost 30% of positions (29.4%) were located in the central office of a local government health agency, while just over 25% (26.5%) were in community or rural migrant health centers or clinics, and 13.8% were located in the field office or clinic of a government health agency.

Table 2.1. Core data elements and survey measures in the 2006-07 Public Health Nutrition Workforce Survey

Core Data Element	Survey Item	Response Options
Number of staff	Filled positions, vacant positions, and persons	Number
Full-time equivalents (FTEs)	FTEs by funding source for position	State/tribal government, US Department of Agriculture, US Department of Health and Human Services (US DHHS), US Department of Education, Local government, and Other revenue sources
Job classification	Job classification [a]	9 options consistent with previous survey administration, plus breastfeeding peer counselor.
Job function	Primary area of practice	12 options categorized into the 3 core public health functions (assessment, policy development, assurance)
	Primary client population	10 response options. Only those reporting direct client services as a primary area of practice responded to this item.
	Time spent in direct client services	0-100% of work time
	Budget responsibilities	None
		Responsible for specific budget
		Responsible for agency's nutrition program budget
	Supervision responsibilities [b]	Number of FTEs directly and indirectly supervise
Location	Geographic	States categorized into US DHHS Regions I-X
	Agency of employment	6 options categorized into 'official health agency' and 'other agency'
	Location of employment	10 options ranging from central office of state health agency to community health center

Table 2.1. Continued.

Core Data Element	Survey Item	Response Options
Salary range	Minimum salary [c]	Reported as median
	Annual salary	Reported as median
	Employee benefits	Health insurance
		Retirement
		Sick leave
		Vacation time
		No benefits
Education	Degrees earned or working toward	20 options categorized into: high school diploma/ equivalent; bachelor's degree; master's degree; doctoral degree
Credentials	Certification and credentials	13 options. Reported here: registered dietitian; licensed/certified dietitian; dietetic technician, registered
Experience	Nutrition/dietetics experience	Years
	Public health nutrition experience	Years
Age	Year born	Categorized into <44 45-54, and ≥55 years old
Gender	Gender	Female
		Male
Race	Race	5 options, categorized into 'White' and 'Non-white'
Ethnicity	Ethnicity	Hispanic/Latino
		Not Hispanic/Latino
Languages spoken	Primary and secondary languages	19 options categorized into 'English,' 'Spanish,' and 'Other' language

[a] Job classifications can be categorized into those with a population/systems focus (Public health nutrition director, public health nutrition assistant director, public health nutrition supervisor, public health nutrition consultant, and public health nutritionist) and those with a client focus (clinical nutritionist, nutritionist, nutrition technician, nutrition assistant, and breastfeeding peer counselor). 'Other' responses are not included in this categorization.
[b] 323 personnel (3.3%) recorded the number of direct and indirect FTEs supervised as less than *only* the direct FTEs supervised. These unreasonable responses were excluded in the data analysis for supervision responsibility.
[c] The response to the survey item 'percent of time worked' was used to calculate the FTE annual salary for part-time workers. Responses from the 24 part-time personnel (0.2%) who did not report the percent time worked were excluded from the annual salary calculation.

Table 2.2. Job classification of filled and vacant public health nutrition positions.

Job Classification	No. (%)
Population/systems focused	2782 (28.0)
Public health nutrition director	396 (4.0)
Public health nutrition assistant director	280 (2.8)
Public health nutrition supervisor	1106 (11.1)
Public health nutrition consultant	585 (5.9)
Public health nutritionist	415 (4.2)
Client focused	6706 (67.5)
Clinical nutritionist	312 (3.1)
Nutritionist	4035 (40.7)
Nutrition technician	904 (9.1)
Nutrition assistant	330 (3.3)
Breastfeeding peer counselor	1125 (11.3)
Other	435 (4.4)
Total	9923 (100.0)

Over 75% of positions (77.4%) were full-time; the average percent time that part-time positions worked was just less than 50% (48.4%) (SD ±24.0). The majority of filled positions were employed (93.3%) rather than contracted (6.7%) positions. Nearly 70% (69.4%) of contracted positions did not receive employee benefits compared to 6.7% of employed positions (Table 2.3). The median minimum salary for filled and vacant positions was $29,392.00; the median annual salary was $36,857.00.

USDA was the major source of funding for filled and vacant positions (83.2% of FTEs), primarily through the WIC Program. Nearly 90% of positions (88.5%) were in WIC; accordingly, WIC accounted for 95.0% of all FTEs funded by USDA. State sources of revenue and the US DHHS were the second and third largest funding sources of FTEs, respectively (4.8% and 4.7%). The primary area of practice for more than two-thirds of filled positions was the core public health function of assurance (67.0%). Approximately 15% (16.3%) and 10% (10.3%) were involved primarily in policy development and assessment, respectively. The primary client population for filled positions providing direct client services was general women, infants, and children (86.3%), followed by children with special health care needs and developmental disabilities (4.4%). On average 67.3% (SD ±35.1) of work time for filled positions was spent providing direct client services.

The majority of filled positions had no budget responsibility (83.1%). A smaller proportion, nearly 12% (11.8%), had responsibility for a specific budget, while only 5.1% had responsibility for the entire agency's nutrition program budget. The mean number of FTEs supervised was 3.9 (SD ±15.2).

Demographic characteristics of personnel

Approximately 1% (n=116; 1.2%) of personnel worked in multiple positions: 9,442 persons worked in the 9,558 filled positions. The highest degree earned (or working toward) was a high school diploma or equivalent for 19.1% of personnel, an associate's degree for 7.0% of personnel and a bachelor's degree for 44.6%. Approximately one-quarter (27.3%) had earned/were working toward a master's degree, and 1.3% had earned/were working toward a doctorate. Nearly 40% (38.7%) of personnel reported having earned a degree in public health nutrition or public health. Almost 40% (37.7%) were registered dietitians, 1.5% were dietetic technicians, registered, and almost 30% (29.9%) were licensed/certified dietitians. Personnel had an average of 12.1 years of experience in nutrition (SD ±10.5 years) and 9.3 years in public health nutrition, specifically (SD ±8.1 years). Over half (52.8%) of personnel were 44 years old or younger, 28.6% were between the ages of 45 and 54, and 18.6% were 55 years or older. Nearly one-quarter (23.9%) intended to retire within the next ten years; of those individuals, the average years until retirement was 6.6 (SD ±3.0 years).

X^2 analyses indicated significant differences in demographic characteristics, employed/contracted status, and employee benefits received for personnel in population/systems focused positions and those in client focused positions (Table 2.4). A greater proportion of personnel in population/systems focused positions than client focused positions were male. A greater proportion of those in client focused positions than population/systems focused positions, on the other hand, were Hispanic/Latino, non-white, and spoke a primary language other than English. In addition, there were also greater proportions in contracted positions and in positions that did

Table 2.3. Employee benefits received by employed and contracted status of filled positions.

Employee benefits	Employed and Contracted		
	Total	**Employed**	**Contracted**
	No. (%)	**No. (%)**	**No. (%)**
Health insurance	7467 (78.1)	7329 (82.2)	138 (21.6)
Retirement	7095 (74.2)	6965 (78.1)	130 (20.4)
Sick leave	8159 (85.4)	7986 (89.5)	173 (27.1)
Vacation time	8327 (87.1)	8149 (91.4)	178 (27.9)
No benefits	1037 (10.8)	594 (6.7)	443 (69.4)

Table 2.4. Demographic characteristics, employed/contracted status and employee benefits by job classification.

Characteristic		**Job Classification**			**P value**
		Total n=8973 No.(%)	*Population/ systems focused* n=2615 No.(%)	*Client focused* n=6358 No.(%)	
Gender	*Female*	8658 (96.5)	2502 (95.7)	6156 (96.8)	0.007*
	Male	315 (3.5)	113 (4.3)	202 (3.2)	
Ethnicity	*Not Hispanic/ Latino*	6378 (78.5)	2108 (89.1)	4270 (74.2)	0.000*
	Hispanic/ Latino	1742 (21.5)	258 (10.9)	1484 (25.8)	
Race	*White*	6404 (76.2)	1993 (78.5)	4411 (75.2)	0.001*
	Non-white	2002 (23.8)	547 (21.5)	1455 (24.8)	
Primary language	*English*	8085 (90.1)	2469 (94.4)	5616 (88.3)	0.000*
	Other	888 (9.9)	146 (5.6)	742 (11.7)	
Employed/ contracted status	*Employed*	8425 (93.9)	2527 (96.6)	5898 (92.8)	0.000*
	Contracted	548 (6.1)	88 (3.4)	460 (7.2)	
Employee benefits received	*Yes*	8034 (89.5)	2537 (97.0)	5497 (86.5)	0.000*
	No	939 (10.5)	78 (3.0)	861 (13.5)	
* $P \leq 0.05$					

not offer employee benefits. There was an association between job classification and each of the demographic characteristics, employed/contracted status, and having employee benefits.

Discussion

These results reveal important considerations, especially for planners and administrators in official health agencies, and members of academia concerned with workforce training and preparation. Monitoring the composition of the public health nutrition workforce, a component of the public health infrastructure, fits the agenda of public health systems research (Lenaway, Sotnikov, Corso, Millington, Halverson and Tilson, 2006). Though direct comparisons are inappropriate because data from the 1999-2000 PHNWS survey were not available, it appears that in many ways, the current workforce (9,923 positions) is similar to that described in 1999-2000 (10,904 positions) (McCall and Keir, 2003). When investigating the workforce, one concern is how personnel practice (Gebbie, 1999). Because survey respondents were nutrition personnel in public health nutrition programs under the purview of an official health agency, the majority of respondents were employed by these agencies, consistent with the previous survey administration (69.2%) (McCall and Keir, 2003). This limited definition excludes a portion of the overall public health system not funded by official health agencies, such as those in academia, the media, health care delivery, communities, and private businesses (IOM, 2003). Moreover, while the definition used was consistent with previous survey administrations, other countries do not limit the definition of 'public health nutrition' to only those funded by tax dollars (Hughes and Somerset, 1997).

Because WIC funded most of the workforce and provides direct nutrition services to a select population group (USDA, FNS, 2003), it was not surprising that the majority of positions continued to practice in assurance and provide direct care services (McCall and Keir, 2003). As members of the public health workforce, though, public health nutrition personnel are by definition concerned with the health of populations (Gebbie, Rosenstock, and Hernandez, 2003), rather than providing direct care predominately. While public health personnel are called on to provide direct services when necessary, assurance also refers to regulating and encouraging other entities to provide needed services (IOM, 1988). The majority of respondents (75.0%) whose primary area of practice was assurance, however, specifically provided direct client services.

Of concern is whether the one-quarter of positions (26.6%) functioning in policy development and assessment is adequate. Population/systems focused positions (28.0%) are responsible for providing the essential services for these core functions (Dodds and Kaufman, 1991), but it is unclear whether there are appropriate numbers of these positions. Research suggests that a greater number of staff FTEs per capita is associated with better performance of local public health systems (Kennedy, et al., 2003). One recommendation is 1 public health nutritionist (population/systems focused positions that have "public health" in the title) per 50,000 people for population/system focused work (Dodds and Kaufman, 1991). Previous research applied this ratio to the 1994 PHNWS and found 83% more public health nutritionists were needed (Haughton, Story and Keir, 1998). Applying the ratio to the 2005 population (296,410,000 according to the US Census) reveals the need for 5,928 public health nutritionists, rather than the 2,782 identified, or an increase of 113% more personnel. There is concern, then, whether an appropriate number of personnel are available to fulfill their purpose of assuring the nutrition-related health of populations.

The overwhelming majority of respondents also continued to provide direct services to a select portion of the population (McCall and Keir, 2003). While women, infants, and children are an important group of interest because of their unique health issues (Maternal and Child Health Bureau, 2003), only a small minority of public health nutrition personnel are left to provide services to other groups, such as the elderly, adults, and individuals with special health care needs. Public health's role is to assure services for all members of the population (IOM, 1988), including, but not limited to, particular sub-groups. Most position funding came from agencies devoted to women, infants and children; therefore, to assure services for the remainder of the population, additional funding sources may be necessary and appropriate. Alternately, while unknown, these needs may be met by a workforce beyond those employed or contracted by official health agencies.

Workforce training and preparation are key considerations for public health nutrition (Hess and Haughton, 1996; Hughes, 2003, 2004; Olmstead-Schafer, Story and Haughton, 1996), and public health overall (Clark and Weist, 2000; Potter, Pistella, Feertman and Dato, 2000). Of particular concern is formal public health training (Gebbie, Rosenstock, and Hernandez, 2003; Sommer, 2000). Population/systems focused job classifications require masters level public health training (Dodds and Kaufman, 1991). Therefore, one would expect 28% of respondents, those in population/systems focused positions in this research, to have earned at least a masters level degree in public health or public health nutrition. However, only 15% of personnel in these positions (16.4%) had earned or were working toward this degree. Personnel may now be working toward the new voluntary public health certification, which requires a graduate degree from accredited programs and schools of public health (The National Board of Public Health Examiners, 2006). Personnel without formal public health training have alternate training options, such as on-the-job training (Mixon, Dodds and Haughton, 2003), public health certificates (Council on Education for Public Health, 2005), public health training centers (Association of Schools of Public Health, n.d.), and continuing education in public health (Gebbie, Rosenstock, and Hernandez, 2003). In contrast to those with a population/systems focus, training adequacy for personnel with a direct service responsibility may be indicated by dietetic credentialing status.

Results provided valuable information about how positions are funded. Though direct comparisons to previous surveys are inappropriate, it appears that USDA, through WIC, remained the largest funding source of FTEs (Kaufman, Heimendinger, Foerster and Carroll, 1986; Kaufman, Heimendinger, Foerster and Carroll, 1987; Kaufman and Lee, 1988; Thompson, Bellamy, Kaufman and Jarka, 1990; Haughton, Story and Keir, 1998; McCall and Keir, 2003). WIC funded 79.0% of the FTEs in the current enumeration, 81.0% of the 1999-2000 survey (McCall and Keir, 2003), 78.0% of the 1994 survey (Haughton, Story and Keir, 1998), and 55% of the 1987 survey (Kaufman and Lee, 1988). As discussed, this program targets only a limited segment of the population, leaving many other populations untargeted or potentially underserved by official health agencies.

A small but important component of the workforce was contracted and worked part-time. This finding is consistent with other career fields that have increased the use of contracted and part-time workers, because they are less costly to employ than full-time workers, particularly if employee benefits are reduced (Lettau, 1999). The proportion of part-time public health nutrition personnel (22.6%) was greater than the national average of approximately 17% of all workers (Bureau of Labor Statistics, n.d.). It appears that the use of contracted workers has increased since the 1999-2000 survey (3.7% of respondents in 1999-2000) (McCall and Keir, 2003), consistent with the increase found in other fields, including the health sector (Chapman, Lindler

and Ward-Cook, 2005; Gochfeld and Mohr, 2007; Goldsmith, 2007). Contracted workers are those who work without expectation for long-term employment (Bureau of Labor Statistics, 2008). The combined impact of contracted and part-time personnel was demonstrated by the 11% of respondents who did not receive any employee benefits, raising concern about whether employment practices within public health nutrition are changing to reduce employee costs. Those in client focused positions were more likely than those in population/systems focused positions to be contracted and to be in positions that did not provide employee benefits. This is an important consideration because some evidence suggests that reduced spending on FTEs could reduce local public health agencies' performance and ability to provide essential services (Scutchfield, Knight, Kelly, Bhandari and Vasilescu, 2004).

It appears that those in population/systems focused positions were less diverse than those in client focused positions. This is notable because the US DHHS recommends that all levels of the organization, not just those in direct contact with clients, should utilize a diverse staff that reflects the diversity of the service area (US DHHS, 2001). The diversity of client focused positions, including race, ethnicity and language spoken, does suggest that these providers may be good cultural matches to their clients, helping prevent negative health behaviors (Smedley, Stity and Nelson, 2003). It would seem, though, that there is room for improved diversity for both types of positions, but especially within population/systems focused positions. Also notable was the significant difference in gender, with a greater proportion of males in population/systems focused positions than in client focused positions. While males were a very small proportion overall, this tendency for men to be in upper-level positions even within female-dominated professions has been noted overall (Britton and Stoller, 1998; Williams, 1995) and within dietetics (Whaley and Hosig, 2000).

The public health nutrition workforce appears to be in a state of transition. The novel paraprofessional position class, Breastfeeding Peer Counselor, was more than 10% of filled and vacant positions, compared to less than 1% (0.4%) identified *post-hoc* in 1999-2000 (McCall and Keir, 2003). Further research is needed to describe the new position class, how they function, and whether they practice or are employed differently than similar position classes. It also appears that nearly one-quarter of the workforce intends to retire within the next ten years, consistent with rates anticipated in state public health positions (ASTHO, 2008). This has important implications for those involved in workforce planning to ensure that an adequately trained pipeline of workers is available to fill these positions, especially those with leadership responsibilities, when vacated. Further research should explore whether retirement intention can be predicted to allow for more accurate workforce planning.

Limitations

Caution must be used when comparing results from the current and 1999-2000 survey administrations, because raw data were not available for the 1999-2000 PHNWS to test for statistical differences in trends. In addition, comparing results using job classification data must be done cautiously if respondents in previous survey administrations incorrectly identified their job classification according to title, rather than function, as results from the 2006-07 PHNWS suggest. On-line administration was a new aspect of the 2006-07 PHNWS, but a comparable response rate to the 1999-2000 administration (88.0% in 1999-2000, 80.0% in 2006-07) was maintained. As in the more recent enumerations, results are inherently limited because the responses were self-reported. To validate some items, responses to key survey items were cleaned by states to confirm their accuracy and make necessary changes. Though respondents

were asked to complete the survey in partial fulfillment of their job responsibilities, a small percentage for a survey of this size did not participate, despite rigorous steps to follow-up with non-respondents. Little is known about these individuals, but it is possible to describe the whole workforce in general because of the high response rate. Finally, only personnel employed/contracted by public health nutrition programs funded by official health agencies were included in this survey, consistent with previous survey administrations. Little is known about the broader public health nutrition workforce not included in this survey, such as those in academia, the media, communities, the health care delivery system and private businesses (IOM, 2003).

Conclusions

Results from the 2006-07 PHNWS indicate a workforce primarily involved in providing direct client services, rather than population-based services. Of note is the high proportion involved in supporting the core public health function of assurance with a relatively narrow target client group. In addition, it appears that the current staffing ratio of public health nutritionists falls short of recommendations. Results suggest that public health training and preparation are areas to be strengthened. Finally, it appears that the public health nutrition workforce may be in a state of transition. Increasing use of contracted workers, especially those not receiving employee benefits, a novel position class, and an experienced workforce nearing retirement are notable.

Human Participant Protection

This study received approval from The University of Tennessee, Knoxville's Institutional Review Board and the Office of Management and Budget.

Acknowledgements

Funding for the primary data collection used in this study was provided by the US Department of Agriculture, Food and Nutrition Service and the Association of State and Territorial Public Health Nutrition Directors, with additional funding provided by The University of Tennessee. Special thanks are given to ASTPHND designees and state contacts. Additional gratitude is extended to Dr. Eugene Fitzhugh, Dr. Charles Hamilton and Dr. Lisa Jahns, faculty at The University of Tennessee, Knoxville.

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Part III:

Breastfeeding Peer Counselors Constitute 10% of the Public Health Nutrition Workforce, Most in Part-Time Positions.

Abstract

Background: Breastfeeding peer counselors are an increasing proportion of the public health nutrition workforce. In contrast to other personnel, peer counselors are hired as positive role models for breastfeeding, who share characteristics of the target population.

*Objective:*Describe breastfeeding peer counselor positions and personnel in these positions. Compare how they practice to those in comparable position classifications.

Design: Secondary data analysis of the 2006-07 Public Health Nutrition Workforce Survey, a census enumeration of nutrition personnel employed or contracted by official health agencies.

Subjects/setting: Nutrition technicians, nutrition assistants and breastfeeding peer counselors who worked under the purview of official health agencies, completed the survey, and agreed to release their data for research (n=2,359).

*Statistical analyses performed***:** Frequencies and means with standard deviations to describe breastfeeding peer counselors. $_{X}^{2}$ analyses to determine if breastfeeding peer counselor position characteristics differed from comparable position classifications (P<0.05). Adjusted standardized residuals to determine where observed events differed from expected.

Results: Breastfeeding peer counselors were employed by official health agencies (69.5%) in part-time (52.6%) and contracted (20.3%) positions. Many (42.0%) did not receive employee benefits. They functioned primarily in assurance (87.6%) providing direct client services to maternal and child clients, and were diverse (30.1% Hispanic/Latino, 24.3% non-white). The three positions were employed and practiced differently (P=0.000 to 0.028). Nutrition technicians were more likely to practice in an area other than assurance, and nutrition assistants were more likely to be employed in non-official health agencies, working with non-maternal and child groups. Breastfeeding peer counselors were more likely to be part-time and in contracted positions.

Conclusion: Breastfeeding peer counselor positions may lack sufficient funding to provide competitive wages and employee benefits. Securing appropriate funding may improve these programs through reduced employee turnover and increased retention. Because of the assistance they provide, especially for young mothers, supervisors should properly match breastfeeding peer counselors with program participants.

Introduction

Peer counseling refers to an individual providing support to another viewed as an equal (Noel-Weiss and Hebert, 2006). Breastfeeding peer counselors act as positive role models, have successfully breastfed, and ideally come from the indigenous population (Best Start, 2004). Preferably, breastfeeding peer counselors in The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) share the ethnicity, age, and cultural background of their clients (Best Start, 2004). Breastfeeding peer counselor programs appear to positively impact breastfeeding initiation, duration and exclusivity in various population groups (Anderson, *et al.*, 2005; Arlotti, Cottrell, Lee and Curtin, 1998; Bronner, Barber and Miele, 2001; Dennis, Hodnett, Gallop and Chalmers, 2002; Long, *et al.*, 1995; Martens 2002; Pugh, *et al.*, 2002; Schafer, Vogel, Viegas, and Hausafus, 1998; Shaw and Kaczorowski, 1999). Because of this impact, a new initiative in WIC is to increase the number of breastfeeding peer counselors and develop their contributions into a component of the Program's core services (WIC Works Learning Center, 2007).

To date, the emphasis of breastfeeding peer counselor research has been on the impact on breastfeeding and breastfeeding peer counselor programs (Best Start, 2004), rather than on the peer counselors as a workforce. Breastfeeding peer counselors are a component of the workforce infrastructure needed to provide essential public health services (US DHHS, 2000). As a result, descriptive information about this position class as a whole is limited to the 1993 National WIC Breastfeeding Peer Counselor Survey (Bronner, Barber and Miele, 2001). Results suggested a workforce demographically dissimilar to WIC participants; one lacking sufficient funding sources and one that is competent, but with retention problems (Bronner, Barber, Vogelhut and Resnik, 2001).

The most recent administration of the periodically-conducted Public Health Nutrition Workforce Survey (PHNWS), conducted in 2006-07, included 'breastfeeding peer counselor' as a response option to the position classification item for the first time (Haughton and George, *in press*). This addition in part reflected the large number of write-in responses for this position in the 1999-2000 PHNWS (McCall and Keir, 2003). Considering educational attainment and credentialing, breastfeeding peer counselors can be categorized in the technical/support position series delineated for public health nutrition personnel, which also includes nutrition technicians and nutrition assistants (Dodds and Kaufman, 1991). These personnel work in local health agencies, have an associate's degree or on-the-job training, and assist professionals in providing direct care to low nutrition risk individuals (Dodds and Kaufman, 1991). Because breastfeeding peer counselor is a new position classification, how this position compares to the others in the technical/support series is unknown. Information about how similarly or differently the three positions practice would be beneficial in determining appropriate staffing of local health agencies, particularly in support of assurance-related essential public health services.

The purpose of this study was twofold: (a) describe position characteristics and demographics of breastfeeding peer counselors; and (b) compare practice of breastfeeding peer counselors, nutrition technicians and nutrition assistants. The null hypothesis of no difference in practice would be supported if breastfeeding peer counselors were not employed significantly differently or did not practice significantly differently ($P<0.05$) than nutrition technicians and nutrition assistants.

Methods

Data source and subjects

This study employed secondary data analysis of the 2006-07 PHNWS. The census survey enumerated all nutrition professionals and paraprofessionals funded by official health agencies and working in nutrition programs and services. Detailed methods are described elsewhere (Haughton and George, *in press*; George, *et al.*, 2008, unpublished data). Briefly, a 42-item survey was administered on-line for self-administration by respondents (mrInterview ver. 4.0, October 16, 2006, SPSS Ltd., Chicago, IL) that required responses to key items and limited improbable responses. A print survey option was available for respondents without access to the on-line version. To limit the impact of potential language barriers, the print survey could be administered orally in the native language. Data for positions unfilled at the time of survey administration were collected from local directors or state personnel. The 2006-07 PHNWS received human subjects' approval from the University's Institutional Review Board and from the US Office of Management and Budget in compliance with the Paperwork Reduction Act of 1995.

Data were collected from September 2006 through March 2007. All 50 states, the District of Columbia, and Guam participated; Indian Tribal Organizations were captured within the states where they are located. The overall survey response rate was 80.0%; a subset of respondents (92.9% of total respondents) agreed to release their data for research purposes.
Subjects for the present study were those who agreed to release their data for research and who selected position descriptions in the survey from the technical/support series: breastfeeding peer counselors, nutrition assistants and nutrition technicians (n=2,359).

Measures

Breastfeeding peer counselors first were described according to position characteristics and demographics. Next, they were compared to their client base and two other positions in the technical/support series. Position characteristics used in analyses are shown in Table 3.1. Demographic measures included both education and training and personal characteristics:

- education and training:
    - highest level of education attained/working toward (high school diploma or equivalency, associate's degree, bachelor's degree, master's degree, doctoral degree);
    - certifications (registered dietitian; licensed/certified dietitian; dietetic technician, registered; International Board Certified Lactation Consultant; other certification in lactation or breastfeeding);
    - attendance at any nutrition course (since January, 2000 from a list of 25 national course options);
    - top training needs required (from a list of 43 options in four areas);
    - years of experience (in nutrition, public health nutrition, and WIC);
- and personal traits:
    - gender;
    - ethnicity;
    - race;
    - primary and secondary languages spoken;

Table 3.1. Measures used to describe breastfeeding peer counselor [a] practice settings, employment characteristics, and position characteristics and compare positions in the technical/support series.

Category	Characteristic	Survey response options
Practice settings	US Department of Health and Human Services (US DHHS) Region where the position was located	Regions I-X
	Agency of employment [b]	Official health agency
		Other agency
	Location of work	Central office of state/district/regional government health agency; central office of local government health agency; community, rural or migrant health center/clinic; field office/clinic of a government health agency; hospital or other private entity; Indian Health Service; and other
Employment characteristics	Full-time/part-time status [b]	Full-time
		Part-time
	Employed/contracted status [b]	Employed
		Contracted [c]
	Salary	Annual full-time equivalent median salary
		Minimum median salary
	Employee benefits	Health insurance
		Retirement
		Sick leave
		Vacation
		None
	WIC/Non-WIC status [b]	WIC
		Non-WIC
	Funding source for position	Department of Education
		Local
		State
		US Department of Agriculture
		US DHHS Regions
		Other

Table 3.1. Continued.

Category	Characteristic	Survey response options
Position characteristics	Primary area of practice [b]	Assessment
		Assurance
		Policy development
		Other
	Primary client caseload [b]	General/comprehensive nutrition
		General women, infants and children
		General women's nutrition and health
		General infant nutrition
		General child health or pediatric nutrition
		School and adolescent health
		Children with special health care needs
		Breastfeeding
		Adult health promotion/chronic disease prevention
		Seniors, geriatrics, and adult disabilities
	Direct client services [b]	Reported as a percent of work-time spent providing direct client services

[a] Breastfeeding peer counselor position description: "This position is a paraprofessional support person who provides basic breastfeeding information, encouragement, and counseling to WIC pregnant and breastfeeding mothers in WIC clinics, by telephone, home visits, and/or hospital visits at scheduled intervals, and is available outside usual 8 to 5 working hours. This position informs new mothers about breastfeeding benefits and how to prevent and handle common breastfeeding problems" (Haughton and George, *in press*).

[b] Characteristics used to compare positions in the technical/support series. For data analysis, 12 areas of practice were collapsed into assurance or other core function (assessment, policy development and other); primary client caseload was collapsed into maternal and child (general women, infants and children; general women's nutrition and health; general infant nutrition; general child health or pediatric nutrition; children with special health care needs; and breastfeeding) and other (general/comprehensive nutrition; school and adolescent health; adult health; and seniors). Percent of work time spent providing direct client services was categorized into <60% and $\geq$60% (Kaufman and Lee, 1988).

[c] Contracted positions are those of consultants or others contracted to the agency and reimbursed based on differential pay rates.

- age (<44, 45-54, and ≥55 years old); and
- intention to retire within the next 10 years.

Statistical methods

Breastfeeding peer counselors were described with univariate analyses. Frequencies were determined for categorical data, while means and standard deviations were reported for continuous data. Additional person-level analysis consistent with WIC's definition of breastfeeding peer counselors (age, ethnicity and race) (Best Start, 2004) was performed for those who worked in WIC. This was to enable non-statistical comparisons to their client base of pregnant (44.7%), postpartum (30.7%), and breastfeeding (24.6%) WIC participants (n=2,056,622) (Bartlett, Bobronnikov and Pacheco, 2006).

Finally, practice characteristics in the technical/support series (nutrition technicians, nutrition assistants and breastfeeding peer counselors) were compared using $_X^2$ analyses for categorical data (P<0.05). For each characteristic, adjusted standardized residuals were used to determine which positions deviated from what would be expected. Values greater than 2 and less than -2 indicated that the characteristic was more or less likely to occur, respectively, than would be expected from the proportion of positions. All statistical analyses were performed using SPSS (SPSS 15.0 for Windows, ver. 15.0.1, November 22, 2006, SPSS Inc., Chicago, IL).

Results

Breastfeeding peer counselors

There were 1,125 filled and vacant breastfeeding peer counselor positions, of which 1,069 (95.0%) were filled. The distribution of filled and vacant positions, WIC positions, and WIC women participants in the US DHHS Regions is shown in Table 3.2.

The majority (69.5%) of filled and vacant breastfeeding peer counselor positions were in official health agencies (Table 3.3). Most (57.5%) were located in central offices of local government health agencies or in community, rural or migrant health centers/clinics. The majority of these positions were part-time (52.6%), and worked an average of 67.0% time (SD±35.7). One-fifth (20.3%) of filled positions were contracted. Over 40% of breastfeeding peer counselors (42.0%) did not receive any employee benefits. The overwhelming majority (97.8%) of filled and vacant breastfeeding peer counselor positions were in the WIC Program. Accordingly, USDA, which funds WIC, was found to fund most of the full-time equivalent positions (87.0%). The primary area of practice for nearly all positions was in the public health core function of assurance (87.6%), which includes the provision of direct client care. Filled positions spent over three-quarters (77.4%, SD±27.6) of their work time providing direct care services.

Demographics. Eight individuals held multiple positions; thus, 1,061 persons are demographically described in Table 3.4. The primary language for 84.8% of breastfeeding peer counselors was English, for 11.0% was Spanish and for 4.1% was some other language. English was a second language for 13.9% of breastfeeding peer counselors, while Spanish was a second language for 20.3%. For most breastfeeding peer counselors, the highest level of education attained/working toward was a high school diploma or equivalency (48.8%); 15.6% reported

Table 3.2. Distribution of filled and vacant breastfeeding peer counselor positions and, for WIC peer counselors and women participants by US DHHS Region.

Region	Breastfeeding Peer Counselors No. (%)	WIC		
		Breastfeeding Peer Counselors No. (%)	WIC Women Participants No. (%)[a]	Ratio WIC Breastfeeding Peer Counselors: Participants
I *CT, ME, MA, NH, RI, VT*	117 (10.4)	112 (10.7)	59750 (2.9)	1:533.5
II *NJ, NY*	69 (6.1)	58 (5.6)	171413 (8.3)	1:2955.4
III *DE, DC, MD, PA, VA,WV*	146 (13.0)	144 (13.8)	140753 (6.8)	1:977.5
IV *AL, FL, GA, KY, MS, NC, SC, TN*	274 (24.4)	240 (23.0)	410019 (19.9)	1:1708.4
V *IL, IN, MI, MN, OH, WI*	61 (5.4)	59 (5.7)	284881 (13.9)	1:4828.5
VI *AR, LA, NM, OK, TX*	127 (11.3)	119 (11.4)	342456 (16.7)	1:2877.8
VII *IA, KS, MO, NE*	58 (5.2)	54 (5.2)	84987 (4.1)	1:1573.8
VIII *CO, MT, ND, SD, WY*	42 (3.7)	40 (3.8)	58136 (2.8)	1:1453.4
IX *AZ, CA, HI, NV, GU*	179 (15.9)	167 (16.0)	420127 (20.4)	1:2515.7
X *AK, ID, OR, WA*	52 (4.6)	49 (4.7)	84100 (4.1)	1:1716.3
Total	1125 (100.0)	1042 (100)	2056622 (100)	1:1973.7

[a] Data from Bartlett S, Bobronnikov E, and Pacheco N. US Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation, WIC Participant and Program Characteristics 2004, WIC-04-PC. Alexandria, VA: March 2006.

Table 3.3. Breastfeeding peer counselor position characteristics.

	No. (%)
Position settings	
Agency of employment	
Official health agency	782 (69.5)
Other agency	323 (30.5)
Location of work	
Central office of state/district/regional government health agency	73 (6.5)
Central office of local government health agency	336 (29.9)
Community/rural/migrant health center/clinic	310 (27.6)
Field office/clinic of a government health agency	161 (14.3)
Hospital or other private entity	103 (9.2)
Indian Health Services, tribal agency or tribal health center	14 (1.2)
Other	128 (11.4)
Employment characteristics	
Full-time/part-time status	
Full-time	533 (47.4)
Part-time	592 (52.6)
Employed/contracted status [a]	
Employed	852 (79.7)
Contracted	217 (20.3)
Salary	
Median salary [b]	$24,500.00
Median minimum salary	$18,026.00
Employee benefits	
Vacation time	622 (55.3)
Sick leave	603 (53.6)
Health insurance	507 (45.1)
Retirement	476 (42.3)
None	473 (42.0)
WIC/Non-WIC status	
WIC	1100 (97.8)
Non-WIC	25 (2.2)
Funding sources of FTEs	
USDA	651.8 (87.0)
State	36.1 (4.8)
Other	25.5 (3.4)
Local	18.9 (2.5)
US DHHS	15.6 (2.1)
Department of Education	1.7 (0.2)

Table 3.3. Continued.

	No. (%)
Practice characteristics	
Primary area of practice (Core public health function)	
Assurance	985 (87.6)
Assessment	47 (4.2)
Other	35 (3.1)
Policy development	31 (2.8)
No response	27 (2.4)
Primary client caseload	
General women, infants and children	274 (24.4)
Breastfeeding	115 (10.2)
General women's nutrition and health	6 (0.5)
General/comprehensive nutrition	3 (0.3)
General child health or pediatric nutrition	3 (0.3)
Adult health promotion/chronic disease prevention	1 (0.1)
No response/missing	723 (64.2)
Percent of work time spent providing direct client services [a]	77.4 (SD±27.6)

[a] Filled positions only (n=1,069)
[b] Six respondents were not included in this calculation because of non-response to 'percent of part time' worked, which was used in a calculation of the full-time equivalent salary for part-time workers.

Table 3.4. Demographic characteristics of breastfeeding peer counselors, WIC breastfeeding peer counselors and WIC women participants.

Characteristic	Breastfeeding Peer counselors N (%) n=1,061	WIC Breastfeeding Peer Counselors (%) n=1,042	WIC Women Participants[a] (%) n=2,056,622
Gender			
Female	1044 (98.4)	98.4	100.0
Male	17 (1.6)	1.6	--
Ethnicity[b]			
Hispanic/Latino	319 (30.1)	30.0	38.2
Not Hispanic/Latino[c]	590 (55.6)	55.4	--[c]
No response[c]	152 (14.3)	14.6	1.0[c]
Race[b]			
American Indian/Alaskan Native	36 (3.4)	3.5	1.4
Asian[c]	34 (3.2)	3.3	3.4[c]
Black or African American	149 (14.0)	14.2	19.0 (non-Hispanic)
Native Hawaiian/Other Pacific Islander[c]	8 (0.8)	0.8	--[c]
White	684 (64.5)	64.1	37.0 (non-Hispanic)
Two or more races reported[c]	31 (2.9)	2.9	--[c]
No response[c]	119 (11.2)	11.3	1.0[c]

[a] Data from Bartlett S, Bobronnikov E, and Pacheco N US Department of Agriculture, Food and Nutrition Service, Office of Analysis, Nutrition and Evaluation, WIC Participant and Program Characteristics 2004, WIC-04-PC. Alexandria, VA: March 2006. Defined as all pregnant, breastfeeding and postpartum WIC participants included in the report.

[b] In compliance with Office of Management and Budget standards, for the 2006-07PHNWS, race and ethnicity were asked in two separate, optional survey items; for race, respondents could choose multiple options from five categories.

[c] Race and ethnicity were combined in the WIC *Participant and Program Characteristics* report. Categories included: American Indian or Alaskan Native, Asian or Pacific Islander, Black (non-Hispanic), Hispanic, White (non-Hispanic), and Race or ethnicity not reported.

having earned/were working toward an associate's degree, 26.2% reported a bachelor's, 5.1% a master's, and 1.3% a doctorate (no response, 2.9%). Very few breastfeeding peer counselors were International Board Certified Lactation Consultants (IBCLC) (4.9%), registered dietitians (3.1%), licensed/certified dietitians (3.1%) or dietetic technicians, registered (1.1%). A greater proportion held certifications in lactation or breastfeeding (37.1%). More than 40% (43.3%) had attended a nutrition course since January, 2000. The top three identified training needs were breastfeeding (87.9%), prenatal nutrition (59.5%) and infant and preschool age nutrition (54.8%). Breastfeeding peer counselors had an average of 5.2 years of experience in nutrition (SD±7.1) and 4.8 years of experience in public health nutrition, specifically (SD±6.4). Those in WIC had an average of 5.3 years of experience in the Program (SD±5.7). The majority (71.9%) were 44 years old or younger, 18.9% were between 45 and 54 years old, and 9.1% were 55 years or older. Just over 10% (10.9%) intended to retire within the next ten years.

WIC breastfeeding peer counselors and participants

There were 1,042 persons employed as WIC breastfeeding peer counselors. The majority of WIC peer counselors (72.1%) were 44 years or younger and 27.9% were 45 years or older. Comparatively, 6.3% of WIC women participants were 17 years or younger, 85.3% were 18-34 years old, and 7.9% were 35 years or older (Bartlett, Bobronnikov and Pacheco, 2006). Nearly one-third (30.0%) of WIC breastfeeding peer counselors and 38.2% of women participants were Hispanic/Latino (Table 3.4).

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Breastfeeding peer counselors and the technical/support series

There were statistically significant differences in how positions within the technical/support series were employed and practiced (Table 3.5). Adjusted standardized residuals indicated that breastfeeding peer counselors were slightly more likely than expected to be employed by official health agencies (adjusted standardized residual=2.3), while nutrition assistants were less likely (-7.7). While most of the positions in the technical/support series worked in WIC, breastfeeding peer counselors were slightly more likely to work in the Program (2.6) than nutrition assistants (-2.1). Breastfeeding peer counselors were much more likely than expected to work part-time (21.6) or be contracted (13.6) positions; nutrition technicians and nutrition assistants were more likely to be full-time (15.9 and 8.8, respectively) or in employed positions (9.9 and 5.6). While breastfeeding peer counselor positions were more likely than expected to practice primarily in the core function of assurance (7.0), nutrition technicians were more likely than expected to practice in areas within the other core functions of assessment and policy development (6.1). Finally, breastfeeding peer counselors were slightly more likely than expected to spend less than 60% of their time providing direct client services (2.6).

Discussion

Breastfeeding peer counselors

Previous studies on breastfeeding peer counselors as a workforce were of limited scope (n=254 peer counselors) and called for further research (Bronner, Barber, Vogelhut and Resnik, 2001). The current study addresses this need and found that breastfeeding peer counselors appear to make up an increasing proportion of the public health nutrition workforce. In the 1999-2000

Table 3.5. Differences in position characteristics by job classification.

Position characteristics		Nutrition Technicians (n=904)		Nutrition Assistants (n=330)		Breastfeeding Peer Counselors (n=1125)		Total (n=2359)		*P* value
		n	%	n	%	n	%	n	%	
*Agency of employment**	Official health agency	641	70.9	161	48.8	782	69.5	1584	67.1	0.000
	Other agency	263	29.1	169	51.2	343	30.5	775	32.9	
	Total	904	100	330	100	1125	100	2359	100	
*WIC Employment Status**	WIC	870	96.2	313	94.8	1100	97.8	2283	96.8	0.015
	Non-WIC	34	3.8	17	5.2	25	2.2	76	3.2	
	Total	904	100	330	100	1125	100	2359	100	
*Full-time/part-time status**	Full-time	797	88.2	296	89.7	533	47.4	1626	68.9	0.000
	Part-time	107	11.8	34	10.3	592	52.6	733	31.1	
	Total	904	100	330	100	1125	100	2359	100	
*Employed/ contracted status** [a]	Employed	857	97.3	319	98.2	852	79.7	2028	89.1	0.000
	Contracted	24	2.7	6	1.8	217	20.3	247	10.9	
	Total	881	100	325	100	1069	100	2275	100	
*Primary area of practice** [b]	Assurance	679	78.2	264	82.5	985	89.7	1928	84.3	0.000
	Other core function	189	21.8	56	17.5	113	10.3	358	15.7	
	Total	868	100	320	100	1098	100	2286	100	
*Primary client caseload** [c]	Maternal and child	693	96.7	254	94.1	398	99.0	1345	96.8	0.002
	Other client group	24	3.3	16	5.9	4	1.0	44	3.2	
	Total	717	100	270	100	402	100	1389	100	
*Direct care services** [a]	<60% time in direct services	135	15.3	47	14.5	206	19.3	388	17.1	0.028
	≥60% time in direct services	746	84.7	278	85.5	863	80.7	1887	82.9	
	Total	881	100	325	100	1069	100	2275	100	

* $P<0.05$.
[a] Includes only filled positions (n=2,275)
[b] 73 did not respond to this item (3.1%)
[c] 970 did not respond to this item (58.9%).

PHNWS, write-in responses for breastfeeding peer counselors were 0.4% of the total workforce and 1.9% of the WIC workforce (McCall and Keir, 2003); in 2006-07, they made up 11.3% of all positions for personnel who released their data for research (Haughton and George, *in press*; George, et al., 2008, unpublished data). These positions were employed by official health agencies, and located in central offices of local government health agencies or in community, rural or migrant health centers/clinics. This may be explained by the function and practice of peer counselors. Specifically, these agencies and clinics, unlike state agencies, are more likely to provide direct client services, such as WIC (National Association of County and City Health Officials, 2006). Similarly, breastfeeding peer counselors were active in the core public health function of assurance (87.6%), primarily as direct care services to clients (IOM, 1988). This is consistent with their job function of counseling pregnant or breastfeeding mothers to promote breastfeeding, and similar to the primary practice area reported by the overall public health nutrition workforce (Haughton and George, *in press*; George, et al., 2008, unpublished data). As expected, maternal and child groups were the primary population for most breastfeeding peer counselors (99.0% of those who responded to the item) (Table 3.2), but results must be interpreted cautiously because item non-response was high (64.2% of breastfeeding peer counselors). Similarly, the identified training needs of breastfeeding and infant nutrition were appropriate for their positions, and suggested that breastfeeding peer counselors may discuss more than just breastfeeding with their clients. Other studies have indicated that breastfeeding peer counselors have more specific training needs in the areas of breastfeeding benefits, resolving common breastfeeding problems, counseling skills, and making appropriate referrals to other WIC staff or community programs (Bronner, Barber, Vogelhut and Resnik, 2001; Best Start, 2004). The majority of positions were in the WIC program, most likely a direct result of WIC's focus on implementing breastfeeding peer counselor programs throughout local agencies and its position as a major funding source.

Some results, though unexpected, were not unreasonable, such as the small percentage of breastfeeding peer counselors who reported being male (1.6%). To be employed in this position, personnel should be females with breastfeeding experience (Best Start, 2004). In the PHNWS, the response option to classify position only included job descriptions; it did not include position qualifications or titles (Haughton and George, *in press*; George, et al., 2008, unpublished data) (Table 3.1). Therefore, the position description used for breastfeeding peer counselor, provided by USDA, did not include the position qualification of being female or having breastfeeding experience. Thus, it is conceivable that males could have classified themselves in this position. Likewise, the small percentage of those who earned or were working toward graduate degrees (6.4%) is similar to results from the previous PHNWS survey (2% of WIC paraprofessionals), and potentially could be attributed to personnel who are passionate about breastfeeding (Best Start, 2004), are highly-trained, and desire part-time employment.

How breastfeeding peer counselors were employed was striking. Nationally, approximately 17% of all workers are part-time (Bureau of Labor Statistics, n.d.), compared to 22.6% of public health nutrition positions (Haughton and George, *in press*; George, et al., 2008, unpublished data) and 52.6% of breastfeeding peer counselor positions. Similarly, while only 8.0% of all US workers are in contracted positions (Bureau of Labor Statistics, 2005) and 6.7% of public health nutrition positions were contracted (Haughton and George, *in press*; George, et al., 2008, unpublished data), 20.3% of breastfeeding peer counselor positions were contracted. The comparatively high proportion of part-time and contracted breastfeeding peer counselor positions may have influenced the very high proportion of positions that did not receive employee benefits (42.0%). This is in contrast to the 10.8% of the overall public health nutrition workforce who did not receive any benefits (Haughton and George, *in press*; George, et al., 2008, unpublished data).

Discontinuous and limited funding have plagued breastfeeding peer counselor programs (Giblin, 1989; Bronner, Barber, Vogelhut and Resnik, 2001; Best Start, 2004); previous research found that approximately one-quarter of breastfeeding peer counselors surveyed received no compensation at all (Bronner, Barber, Vogelhut and Resnik, 2001). Currently, special funding is available through September 2008 for WIC agencies to implement breastfeeding peer counselor programs. Because the funds are appropriated, their availability and total amount may be changed annually. Despite this, WIC strongly encourages state agencies to adopt breastfeeding peer counselor programs and redistribute program funds if necessary (WIC Works Learning Center, 2007). This lack of continuous or adequate funding could negatively impact salaries, employee benefits, and retention of personnel, and may help to explain the high proportion of breastfeeding peer counselors without employee benefits identified here. Retention could also be an issue for contracted workers, who work without implicit or explicit expectation for long-term employment (Bureau of Labor Statistics, 2008).

Already a problem with WIC positions overall (US GAO, 2001), failure to retain breastfeeding peer counselors has been attributed to funding problems and personnel leaving to pursue better jobs (Best Start, 2004). Part of breastfeeding peer counselors' success can be credited to their previous breastfeeding experience. However, their own childcare needs have been cited as reasons for retention problems (Best Start 2004). Current WIC funds cannot be used to provide childcare for personnel (WIC Works Learning Center, 2007). Therefore, peer counselors who are hired to serve as role models are at retention risk, because as found in this study, they typically work part-time and without employee benefits, and may have childcare demands.

Breastfeeding peer counselors appear to be among the most diverse personnel within the public health nutrition workforce (Haughton and George, *in press*; George, et al., 2008, unpublished data), raising the question of how the field's diversity would be impacted by losing personnel in this position. Further research focusing on breastfeeding peer counselors would be useful to document factors that impact their decision to remain in or leave their positions. In addition, data are needed for administrators to determine how to incorporate successful breastfeeding peer counselor programs in light of budget constraints. Previous research suggested certification of breastfeeding peer counselors as a means to raise wages (Bronner, Barber, Vogelhut and Resnik, 2001). This study found that 37% of breastfeeding peer counselors had a certification in lactation or breastfeeding, but only 5% were IBCLCs. The degree to which these certifications translated into salary differentials is unknown. The need for adequate and continuous funding would again be important for such merit recognition.

Conclusions about WIC breastfeeding peer counselors and WIC women participants must be drawn with caution because raw data were unavailable, prohibiting statistical comparisons, and the data came from two different data sets (Bartlett, Bobronnikov and Pacheco, 2006). It appears, however, that the distribution of WIC breastfeeding peer counselors and WIC women participants was similar. The ratio of WIC breastfeeding peer counselors to adult female participants was smaller than the national ratio of 1 peer counselor to 1,972 participants in US DHHS Regions II, V, VI and IX. It is unknown whether this is because fewer participants required the services of peer counselors or because of fewer available positions, due to funding or staffing priorities. Also unknown is the adequacy of the proportion of WIC breastfeeding peer counselors to WIC women participants. Currently, recommended staffing ratios do not exist for WIC (Bach and Carroll, 2006), but their development has been recommended (US GAO, 2001). One pilot study identified ratios ranging from no peer counselors to 1 full-time equivalent peer counselor for every 1,718 participants (Bach and Carroll, 2006). This study suggests that nationally this ratio is not met.

It appears that WIC breastfeeding peer counselors were somewhat similar to the clients they served. WIC breastfeeding peer counselors tended to be older than their clients; this could be in part due to women with older children (Best Start, 2004) able to work on a part-time basis. However, being of a similar age has been shown to be particularly important for counseling adolescent mothers (Best Start, 2004). Response options in the two surveys were different for race and ethnicity. However, it appears that WIC breastfeeding peer counselors were approaching the ethnic diversity of WIC women participants (30.0% and 38.2%, respectively), especially when compared to the overall public health nutrition workforce (19.0%) (Haughton and George, *in press*; George, et al., 2008, unpublished data). The majority of WIC breastfeeding peer counselors were white, which appears to be in contrast to WIC women participants; however, interpretation is difficult because the proportion of WIC women participants who were white/Hispanic is unknown (Bartlett, Bobronnikov and Pacheco, 2006). Given the generally recognized benefits of peer influence, these findings suggest that WIC breastfeeding peer counselors could be better matched to their target population to impact their effectiveness positively. Further research is needed to more accurately compare breastfeeding peer counselors to their clients.

Breastfeeding peer counselors and the technical/support series

Though classified within the same series, positions within the technical/support series reflected different patterns of employment and practice settings. Nutrition technician positions should function mostly in patient screening and education (Dodds and Kaufman, 1991; Jan Dodds, personal communication, February 13, 2008). Nutrition assistants' responsibilities should lie in record keeping and outreach, benefited by the assistants being members of the indigenous community. Nutrition technicians supply technical support to nutritionists, while nutrition assistants supply assistance in routine duties (Dodds and Kaufman, 1991). Breastfeeding peer counselors were not included in this document, but the emphasis of this position is on client education, limited in scope to breastfeeding. Clients are generally referred to peer counselors by WIC or clinic staff (Best Start, 2004), rather than by peer counselors engaging in outreach efforts to identify clients, which is more typical for nutrition assistants. Positions in the technical/support series are grouped together in part because of similar education and training requirements. Unlike the other position classes, graduation from a four-year university and status as a registered or licensed dietitian are not required. Rather, the highest level of education is an associate's degree and status as a dietitian technician, registered for the nutrition technician class (Dodds and Kaufman, 1991). Qualifications for nutrition assistants and breastfeeding peer counselors are a high school diploma or equivalency, with completion of planned on-the-job training (Dodds and Kaufman, 1991; Best Start, 2004). Demographically, personnel functioning as nutrition assistants and breastfeeding peer counselors ideally come from the local community (Dodds and Kaufman, 1991; Best Start, 2004).

Results demonstrated that employment settings and practice characteristics for the three positions are similar, but distinct. The majority were employed by official health agencies in the WIC program and practiced in the core function of assurance, through direct care service provision to the maternal and child population. Key differences between breastfeeding peer counselors and the other positions became evident. Breastfeeding peer counselors also were slightly more likely than expected to be employed by official health agencies and to work in the WIC program, which could be a result of special funds for breastfeeding program development in WIC (WIC Works Learning Center, 2007). Breastfeeding peer counselors were slightly less likely than expected to spend at least 60% of their time providing direct client services, though the difference was less

than 10 percentage points from the total, thus not practically significant (Know net, 2008). This may be explained, however, by time spent doing paperwork (Best Start, 2004) or telephoning clients, one of their major job duties (Best Start, 2004), not considered as time spent in "direct care." Finally, employment characteristics of breastfeeding peer counselors appeared to differ most from others in the technical/support series. Peer counselors were more likely than expected to be part-time or contracted, in contrast to nutrition technicians or nutrition assistants. This may be a function of their job responsibilities, which are quite narrow in scope, or because breastfeeding peer counselor positions lack funding to be full-time, employed positions.

These results provide evidence that nutrition technicians, nutrition assistants, and breastfeeding peer counselors practice differently from each other. Comparing results from the 1999-2000 and 2006-07 PHNWS must be done cautiously, but it appears that the proportion of nutrition assistants (16.2% to 3.3%) dramatically decreased (McCall and Keir, 2003; Haughton and George, *in press*; George, et al., 2008, unpublished data). This could be partially attributed to "breastfeeding peer counselor" being included as a new job classification response option in the 2006-07 PHNWS, but still represents a striking change. Because of differences in employment characteristics, breastfeeding peer counselors may be less expensive to hire than full-time or employed positions (Lettau, 1999), but their scope of practice limits how they are able to function, compared to other positions in the technical/support series. Because of the rapid increase seen in the number of breastfeeding peer counselor positions, further research should elucidate whether new breastfeeding peer counselors are replacing other positions in the technical/support series, especially nutrition assistant positions, or whether their presence was masked in previous surveys. It also would be useful to know if breastfeeding peer counselors could be trained in nutrition assistant duties, potentially opening avenues of employment which are more likely to be full-time. This is even more important in light of the upcoming revision of *Personnel in Public Health Nutrition for the 1990s*. The current working revised definition for the technical/support series includes nutrition technicians, with a recommended education requirement of an associate's degree, and community nutrition workers, with a high school education recommended. The community nutrition worker classification will include both the current nutrition assistant and breastfeeding peer counselor positions (Jan Dodds, personal communication, February 13, 2008). Therefore, future research using this document will have to carefully distinguish these positions by their employment characteristics and practice settings.

Limitations

Because the 2006-07 PHNWS surveyed all public health nutrition positions, it did not target breastfeeding peer counselors specifically. Secondary analysis of results, however, still gives a more complete picture of breastfeeding peer counselors as a workforce than was previously available. The survey was self-administered and data were self-reported. Therefore, some unreasonable or unexpected responses were reported, and non-response was high to some non-required survey items. However, this was kept to a minimum by attributes of the on-line survey format, and key items problematic in previous survey administrations were reviewed by state personnel for accuracy. Finally, true comparisons between WIC breastfeeding peer counselors and WIC participants could not be made. This remains an area that requires further research.

Conclusions

Breastfeeding peer counselors are recognized as an increasingly large segment of the public health nutrition workforce. Positions appear to be under-funded, as evidenced by the high proportion of part-time and contracted positions. Further research should determine effective strategies for discovering revenue sources to increase the proportion of breastfeeding peer counselors who are adequately compensated and receive employee benefits. Those involved in the development of breastfeeding peer counselor programs should ensure that appropriate, adequate funding sources exist. It also appears that WIC breastfeeding peer counselors may be relatively similar to their client base, which may improve their effectiveness. Additional research should determine how closely breastfeeding peer counselors are matched to their clients, and whether more attention is needed in this area. Clinic staff responsible for hiring personnel to fill breastfeeding peer counselor positions should select qualified individuals closely matched to their target client population.

Personnel holding positions within the technical/support series were employed and practiced differently. Further research should continue to monitor differences and similarities between breastfeeding peer counselors and other positions within the technical/support series. This would aid in determining if nutrition technician or nutrition assistant positions are impacted by the increasing number of breastfeeding peer counselor positions. Managers and administrators responsible for determining staffing needs of local health agencies are encouraged to identify appropriate staffing requirements as outlined by position descriptions (Dodds and Kaufman, 1991).

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Part IV:

Retirement Intentions of the Public Health Nutrition Workforce

Abstract

Background: High retirement rates are anticipated throughout public health as baby boomers near retirement. Predicting retirement intention would aid workforce planning.

Subjects and methods: Secondary data analysis from a census enumeration of nutrition professionals/ paraprofessionals ≥45 years old in nutrition programs under official health agencies' authority who released their data for research. Selected factors from Beehr's Model of Retirement Behavior were used to determine if significant ($P \leq 0.05$) differences exist for and can be used to predict retirement intention within 10 years and years until intended retirement.

Results and conclusions: Of the 4,460 individuals, 47.2% intended to retire within 10 years. Retirement intention was predicted by age category, years of experience in nutrition/dietetics and public health nutrition, agency type, retirement and vacation benefits, time in direct services, US DHHS Region, and full-time/part-time status. Years until intended retirement was predicted by age category, years of nutrition/dietetics and public health nutrition experience, required training, and time in direct services. Results suggest retirement rates similar to the public health workforce overall. Managers/administrators can use these findings to prepare organizations for worker retirement or to influence retirement intention. Further research is needed to determine other factors impacting retirement decision.

*Key words***:** public health manpower, public health nutrition, retirement

Introduction

In the US, individuals born between 1946 and 1964 are known as "baby boomers" and number an estimated 78.2 million (US Census Bureau, 2006). Because of its size, this cohort has consistently impacted characteristics of both the US population and labor force. As it ages, it is projected to be responsible for the increased median age of the labor force from 35.4 years old in 1986 to 42.1 years old in 2016 (Toossi, 2007). Those 25-54 years old have been considered the 'prime' working age group with the strongest attachments to the workforce (Toossi, 2007). In contrast, workforce participation rapidly decreases at age 55 due in part to early retirement and pension-eligibility (Toossi, 2005; Dohm, 2000). For example, while the labor participation rate for the civilian population 25-54 years old was 82.9% in 2006, the proportion decreased to 38.0% for those 55 and older (Toossi, 2007). Though nearly 80% of baby boomers report intending to work into their retirement years, they do not necessarily plan to remain in the same position or to work full-time (AARP, 2004). It also appears that women leave the workforce after age 55 more quickly than men; therefore, female-dominated occupations may be more impacted by higher rates of retirement at earlier ages than male-dominated ones (Dohm, 2000).

'Graying' of workers, and thus retirement, has become a concern for the overall workforce (Carroll and Moss, 2002), the healthcare workforce (Buerhaus, et. al., 2000), and the public health workforce (ASTHO, 2008; National Association of County and City Health Officials, 2006). It was estimated in 2007 that 20% of the state public health workforce would be retirement-eligible in the next three years (ASTHO, 2008). The proportion of retirement-eligible workers in local health departments was 20% in 2005 (NACCHO, 2006). Research has shown that the public health nutrition workforce, a component of the overall public health workforce, is very experienced (McCall and Keir, 2003), which suggests public health nutrition also may be facing comparable rates of retirement. In 1999-2000, nearly 60% of public health nutrition personnel had at least 10 years of nutrition experience (McCall and Keir, 2003). In 2006-07, public health nutrition personnel had an average of 12.1 years of nutrition experience (Haughton and George, *in press*; George, et al., unpublished data). This combination of an experienced and female-dominated workforce may help explain the 23.9% who intended to retire within the next 10 years (Haughton and George, *in press*; George, et al., unpublished data). In addition, a 2007 survey of state health departments, several states identified either a current or projected shortage in public health nutritionists and dietitians (ASTHO, 2008).

High rates of retirement have great potential to impact organizations, particularly by the loss of workers with the most experience and at the highest levels of the organization (Beehr, 1986; Talaga and Beehr, 1989). Workforce and succession planning would be enhanced by the ability to predict retirement. Therefore, as baby boomers began approaching retirement age, industrial-organizational psychological research explored potential factors that impact individuals' decision to retire (Schmitt and McCune, 1981; Beehr, 1986; Talaga and Beehr, 1989). Beehr's Model of Retirement Behavior hypothesizes that the decision to retire is impacted by both personal and environmental factors. Personal factors include health, finances, and skill obsolescence, while environmental factors include job and non-job characteristics, such as family life (Beehr, 1986). Over time, these factors may impact an individual's preference to retire, the decision, or intention, to retire, and ultimately the act of retirement (Beehr, 1986). For example, skill obsolescence is a personal factor suggesting that the more training and education needed by a retirement-eligible individual, the more likely s/he is to retire (Beehr, 1986). Some applications of Beehr's Model have suggested that health and finances, both personal factors, may be the strongest predictors of retirement behavior (Talaga and Beehr, 1989), but other research has shown that health may only impact retirement if it impairs working ability (Feldman, 1994). In one study, finances explained

only 17% of the variance in expected retirement age, while environmental factors explained an additional 20% (Beehr, Glazer, Nielson and Farmer, 2000).

The public health nutrition workforce has been regularly enumerated since 1985 by the Association of State and Territorial Public Health Nutrition Directors (Kaufman, Heimendinger, Foerster and Carroll, 1986; Kaufman and Lee, 1988; Haughton, Story and Keir, 1998; McCall and Keir, 2003; Haughton and George, *in press*). The 1999-2000 Public Health Nutrition Workforce Survey (PHNWS) contained each of the recommended core elements of a public health enumeration except age (Atchinson, Gebbie, Thielen, and Woltring, 2001). This final core element and an item regarding retirement intention were added to the most recent 2006-07 PHNWS. With these additions, the 2006-07 PHNWS census enumeration contained factors from Beehr's Model of Retirement Intention, offering an opportunity to test selected factors as predictors of retirement intention.

Therefore, the purpose of this study was to examine retirement intention of the public health nutrition workforce, age 45 and older, using secondary data analysis. Because plans, or intention, precede behavior (Ajzen and Fishbein, 1975), those 45 and older may be beginning to consider their plans for retirement, including early retirement, defined as those who retire at the age of 55 years (Toossi, 2005; Dohm, 2000). The specific aims were to: (1) describe those in the public health nutrition workforce 45 years and older; (2) determine if there are significant differences for those who do and do not intend to retire within 10 years, using selected personal and environmental factors from Beehr's Model; and (3) determine if intention to retire and/or years until intention to retire are predicted by these factors.

Methods

Data source and subjects

Secondary data analysis was performed on data from the 2006-07 PHNWS; detailed methods are described elsewhere (Haughton and George, *in press*; George, et al, unpublished data). This survey enumerated all public health nutrition professionals and paraprofessionals in nutrition positions under the purview of official health agencies, such as state, regional or local health departments (Haughton and George, *in press*). In 2006-07, a 42-item survey was administered on-line (mrInterview ver. 4.0, October 16, 2006, SPSS Ltd., Chicago, IL) with a print option available. Data collection occurred from September 2006 until March 2007. The overall response rate was 80.0% with the 50 states, the District of Columbia and Guam participating. Nearly 93% (92.9%) of respondents agreed to release their data for research and were used in this study. To be included in this study, respondents had to be at least 45 years old.

Less than 2% (1.2%) of respondents worked in multiple positions and accessed the survey more than once. An *a priori* decision was made that this study would only use position data reported the first time a respondent completed the survey, though s/he could have worked in multiple positions.

Measures

The primary outcome variable of retirement intention was determined in a two-part question. Respondents first were asked if they intended to retire within the next 10 years; response options were 'yes' and 'no.' If respondents answered yes, then they were asked in how many years they intended to retire. Though not all factors necessary to measure Beehr's Model were included in the 2006-07 PHNWS, those personal and environmental factors available were used as independent variables to determine their impact on retirement intention:

Personal factors:

- Age (45-54, and ≥55 years old);
- Years of experience in nutrition/dietetics;
- Years of experience in public health nutrition;
- Employee benefits received (health insurance, retirement, sick leave, vacation time);
- Graduate degree in public health or public health nutrition; and
- Level of training required (43 training topics in four training areas [client and population groups, assessment, policy development, and assurance] with response options of: no training required [scored as 0]; basic training required [scored as 1]; and advanced training required [scored as 2]. A composite training score was created by summing the score for each of the 43 training options and could range from 0 to 86. For descriptive analysis, a mean training need in each of the four areas was determined to examine differences in training need areas.)

Environmental factors:

- Position classification (management, professional, or technical/support classification, or other);
- Full-time/part-time status;
- Employed/contracted status (Contracted positions were those of contracted or consultants to the agency and reimbursed based on differential pay rates);
- Percent of work time spent providing direct client services;
- Supervision responsibilities (number of full-time equivalents, directly and indirectly supervised);
- Budget responsibilities (none, responsible for specific budget, or responsible for entire agency nutrition program budget);
- Type of agency where employed/contracted (official health agency or other agency); and
- US Department of Health and Human Services (US DHHS) Region.

Though the 2006-07 PHNWS included position salary data, it did not include data on household size or total income. In addition, national cost-of-living differences would make comparisons difficult. Therefore, because employee benefits tend to be associated with wages (Schwabish, 2004), employee benefits served as a comparable part of the total compensation package (Cowan, 2000).

Statistical methods

First, a subset was created from the research dataset that included only those respondents 45 years and older (n= 4460, 47.2% of the research dataset). This subset then was described by the

personal and environmental factors using univariate analyses (means with standard deviations and frequencies). Next, to determine whether significant differences ($P \leq 0.05$) existed in intention to retire for each of the independent variables, $_X^2$ analyses for categorical variables and independent t-tests for continuous variables were conducted. Categorical variables included age, employee benefits, graduate public health degree, position classification, full-time/part-time employment status, employed/contracted status, budget responsibilities, agency type and US DHHS Region. The continuous variables were: years of experience in nutrition/dietetics; years of experience in public health nutrition; level of training required; percent of work time spent in direct client services; and supervision responsibilities. Adjusted standardized residuals were used to describe where the distribution of categorical variables differed from the expected distribution. This was indicated by values larger than 2 and less than –2. The statistically significant continuous and categorical variables then were used in a stepwise logistic regression to test their ability to predict retirement intention.

Finally, for those who intended to retire, statistical tests were used to determine if significant differences ($P \leq 0.05$) existed for the number of years until intended retirement for each of the independent variables. T-tests for independent samples for years until intended retirement were used for categorical variables with two categories, which included: age; employee benefits; graduate public health degree; contracted/employed status; full-time/part-time status; and agency type. ANOVAs were used for years until intended retirement for categorical variables with more than two categories, which were: position classification; budget responsibilities; and US DHHS Region. Pearson's correlations were used for years until intended retirement for the continuous variables of years of experience in nutrition/dietetics, years of experience in public health nutrition, level of training required, time spent in direct client services, and supervision responsibilities. The significant variables then were included in a stepwise linear regression model to determine whether they could be used to predict number of years until intend to retire. All analyses were performed using SPSS (SPSS 15.0 for Windows, ver. 15.0.1, November 22, 2006, SPSS Inc., Chicago, IL).

Results

In 2006-07, there were 4,460 individuals found to be working in public health nutrition who were 45 years or older. Nearly half (47.2%) intended to retire within the next 10 years (Table 4.1). Among those who intended to retire, the length of time until retirement intention was approximately six years (6.4). Personnel had an average of nearly 20 years of experience in nutrition/dietetics (18.6) and almost 15 years of experience in public health nutrition specifically (13.9). Only a small percentage (7.8%) did not receive employee benefits. Most were in positions that were full-time (78.8%), employed (94.7%), and in official health agencies (72.2%).

Retirement intention

Significant differences were found to exist in retirement intention for each of the personal and environmental factors (Table 4.2). Approximately two-thirds (66.3%) of those who had no employee benefits did not intend to retire, compared to 51.6% of those who had employee benefits. Nearly two-thirds (65.0%) of those in contracted position compared to 52.1% of those in employed positions did not intend to retire. Adjusted standardized residuals (ranging from 2.1-32.0) indicated that those more likely than expected to intend retirement were those 55 years and older, with employee benefits, and those with a graduate public health degree. In addition,

Table 4.1. Factors from Beehr's Model of Retirement Behavior and those 45 years and older in the public health nutrition workforce.

Factor		**Public Health Nutrition Workforce ≥45 years old No. (%) n=4,460**
Personal Factors		
Retirement intention (%)	No	2354 (52.8)
	Yes	2106 (47.2)
Years until intend to retire (years)	Mean (±SD)	6.4 (SD±2.99)
Age category (%)	45-54 years old	2700 (60.5)
	≥55 years old	1760 (39.5)
Experience in nutrition/dietetics years	Mean (±SD)	18.6 (SD±10.8)
Experience in public health nutrition years	Mean (±SD)	13.9 (SD±8.4)
Employee benefits (%)	Health insurance	3642 (81.7)
	Retirement	3579 (80.2)
	Sick leave	3960 (88.8)
	Vacation time	4037 (90.5)
	No benefits	350 (7.8)
Graduate degree in public health (%)	None	4046 (90.7)
	Earned/working toward	414 (9.3)
Mean (SD±) level of training required [a]	Client and population groups	0.83 (SD±0.5)
	Assessment	0.77 (SD±0.7)
	Policy development	0.54 (SD±0.6)
	Assurance	0.73 (SD±0.6)
Environmental factors		
Position classification (%)	Management	1061 (23.8)
	Professional	2320 (52.0)
	Technical/support	873 (19.6)
	Other	206 (4.6)
Full-time/part-time status (%)	Full-time	3514 (78.8)
	Part-time	946 (21.2)
Employed/contracted status (%)	Employed	4223 (94.7)
	Contracted	237 (5.3)
Time spent in direct client services (% time)	Mean (±SD)	2.0(SD±37.2)
Supervision responsibilities (FTEs)	Mean (±SD)	5.4 (SD±18.8)
Budget responsibilities (%)	None	3454 (77.4)
	Responsible for specific budget	676 (15.2)
	Responsible for entire agency nutrition program budget	330 (7.4)
Agency type (%)	Official health agency	3221 (72.2)
	Other agency	1239 (27.8)

Table 4.1. Continued.

Factor		Public Health Nutrition Workforce ≥45 years old No. (%) n=4,460
US DHHS Region (%)	I	287 (6.4)
	II	353 (7.9)
	III	562 (12.6)
	IV	877 (19.7)
	V	409 (9.2)
	VI	337 (7.6)
	VII	225 (5.0)
	VIII	257 (5.8)
	IX	928 (20.8)
	X	225 (5.0)

[a] Range for level of training required score: 0 (no training required) – 2 (advanced training required)

Table 4.2. Differences in intention to retire by personal and environmental factors for those 45 years and older in the public health nutrition workforce.

Factor		Do not intend to retire n (%) n=2,354	Intend to retire n (%) n=2106	Total n (%) n=4,460	X^2	Degrees of freedom	P value
Personal factors							
Age	45-54 years old	1947 (72.1)	753 (27.9)	2700 (100)	1025.9	1	0.000*
	>55 years old	407 (23.1)	1353 (76.9)	1760 (100)			
Employee benefit: Health insurance	No	488 (59.7)	330 (40.3)	818 (100)	19.0	1	0.000*
	Yes	1866 (51.2)	1776 (48.8)	3641 (100)			
Employee benefit: Retirement benefit	No	558 (63.3)	323 (36.7)	881 (100)	49.1	1	0.000*
	Yes	1796 (50.2)	1783 (49.8)	3579 (100)			
Employee benefit: Sick leave	No	319 (63.8)	181 (36.2)	500 (100)	27.4	1	0.000*
	Yes	2035 (51.4)	1925 (48.6)	3960 (100)			
Employee benefit: Vacation time	No	276 (65.2)	147 (34.8)	423 (100)	29.1	1	0.000*
	Yes	2078 (51.5)	1959 (48.5)	4037 (100)			
Employee benefit: No benefits	No	2122 (51.6)	1988 (48.4)	4110 (100)	27.8	1	0.000*
	Yes	232 (66.3)	118 (33.7)	350 (100)			
Graduate public health degree	None	2156 (53.3)	1890 (46.7)	4046 (100)	4.5	1	0.034*
	Earned/working toward	198 (47.8)	216 (52.2)	414 (100)			

Table 4.2. Continued.

Factor		Do not intend to retire n (%) n=2,354	Intend to retire n (%) n=2106	Total n (%) n=4,460	n (%)	n=4,460	P value
Environmental factors							
Position classification	Management	477 (45.0)	584 (55.0)	1061 (100)	35.4	3	0.000*
	Professional	1266 (54.6)	1054 (45.4)	2320 (100)			
	Technical/support	494 (56.6)	379 (43.4)	873 (100)			
	Other	117 (56.8)	89 (43.2)	206 (100)			
Full-time/Part-time status	Full-time	1826 (52.0)	1688 (48.0)	3514 (100)	4.4	1	0.035*
	Part-time	528 (55.8)	418 (44.2)	946 (100)			
Employed/contracted status	Employed	2200 (52.1)	2023 (47.9)	4223 (100)	14.9	1	0.000*
	Contracted	154 (65.0)	83 (35.0)	237 (100)			
Budget responsibilities	None	1901 (55.0)	1553 (45.0)	3454 (100)	31.4	2	0.000*
	Responsible for specific budget	302 (44.7)	374 (55.3)	676 (100)			
	Responsible for entire agency nutrition program budget	151 (45.8)	179 (54.2)	330 (100)			
Type of agency	Official health agency	1595 (49.5)	1626 (50.5)	3221 (100)	49.5	1	0.000*
	Other agency	759 (61.3)	480 (38.7)	1239 (100)			

Table 4.2. Continued.

Factor		Do not intend to retire n (%) n=2,354	Intend to retire n (%) n=2106	Total n (%) n=4,460	n (%)	n=4,460	P value
US DHHS Region	I	184 (64.1)	103 (35.9)	287 (100)	46.5	9	0.000*
	II	197 (55.8)	156 (44.2)	353 (100)			
	III	329 (58.5)	233 (41.5)	562 (100)			
	IV	417 (47.5)	460 (52.5)	877 (100)			
	V	234 (57.2)	175 (42.8)	409 (100)			
	VI	158 (46.9)	179 (53.1)	337 (100)			
	VII	122 (54.2)	103 (45.8)	225 (100)			
	VIII	141 (54.9)	116 (45.1)	257 (100)			
	IX	459 (49.5)	469 (50.5)	928 (100)			
	X	113 (50.2)	112 (49.8)	225 (100)			
* P<0.05							

personnel in management, full-time, and employed positions were all more likely to intend to retire, as were those in official health agencies. Personnel in US DHHS Regions IV, VI and IX were more likely to intend retirement, while personnel in Regions I and III were less likely. T-tests indicated that all of the continuous variables were significant except for level of training required (Table 4.3). Therefore, all categorical and all but this continuous variable were included in the stepwise logistic regression to predict retirement intention. Of the 16 variables, 9 remained in the resulting model (Table 4.4). The model correctly predicted retirement intention 75.0% of the time (81.4% of those who did not intend to retire and 67.9% of those who did).

Years until intended retirement

When t-tests, analyses of variance, and Pearson's correlations were run to determine whether years until intended retirement differed for each of the independent variables, the only significant factors were age (*P*=0.000, t statistic=16.4), years of experience in nutrition/dietetics (*P*=0.000, r= -0.186), years of experience in public health nutrition (*P*=0.000, r= -0.196), level of training required (*P*=0.000, r=0.076), and percent of work time spent in direct client services (*P*=0.000, r=0.058). These variables were used in the linear regression to predict years until intended retirement, and all were retained in the resulting model: age (β= -2.0 (Standard Error = 0.125), *P*=0.000); years of experience in public health nutrition (β= -0.06 (SE=0.008), *P*=0.000); training required (β=0.02 (SE=0.003), *P*=0.000); years of experience in nutrition/dietetics (β= -0.02 (SE=0.006), *P*=0.000); and work time spent in direct client services (β=0.004 (SE=0.002), *P*=0.013). The model could explain 17% of the variability in years until intend to retire (R^2 =0.170).

Discussion

Other research has found that nearly one-quarter of the public health nutrition workforce intends to retire within 10 years (Haughton and George, *in press*; George, et al., unpublished data). Because subjects in this study was specific to those who were potentially eligible for early retirement (Toossi, 2005; Dohm, 2000; NARFE, n.d.), they may provide a more accurate indicator of retirement intention than the overall workforce. Those 45 years and older were very experienced in both nutrition/dietetics and in public health nutrition, specifically. In part because of this experience, a greater proportion of subjects in this study than in the overall workforce were in management-level positions (Haughton and George, *in press*; George, et al., unpublished data). Upper-level positions are accompanied by additional job responsibilities (Dodds and Kaufman, 1991), and accordingly, respondents appeared to have both supervision and budget responsibilities. They tended to be in full-time and employed positions, and most received employee benefits. This is similar to what has been found about the overall public health nutrition workforce (Haughton and George, *in press*; George, et al., unpublished data), though the proportions of full-time positions, employed positions, and positions with employee benefits was greater in this study, which could be because of the greater proportion in upper-level positions.

Results from this study demonstrated that those in public health nutrition 45 years and older with the greatest intention to retire within the next 10 years were those in upper-level, management positions. These positions require more education and experience than do the professional and

Table 4.3. t-tests for continuous variables and intention to retire of personnel in the public health nutrition workforce 45 years and older.

Factor	Intention to Retire	Mean (±Standard Error)	P value
Years of nutrition/dietetics experience	No	15.8 (±0.2)	0.000*
	Yes	21.7 (±0.2)	
Years of public health nutrition experience	No	11.7 (±0.2)	0.000*
	Yes	16.4 (±0.2)	
Level of training required†	No	30.9 (±0.4)	0.452
	Yes	31.4 (±0.5)	
Percent of work time spent in direct services	No	65.5 (±0.7)	0.000*
	Yes	58.0 (±0.8)	
Number FTEs supervised	No	4.0 (±0.3)	0.000*
	Yes	7.0 (±0.5)	

* $P \leq 0.05$
† Summed score from 0 (no training needed in any of the 43 training area options) to 86 (advanced training needed in each of the 43 training area options).

Table 4.4. Stepwise logistic regression model of personal and environmental factors predicting intention to retire.

Factor	Odds ratio (OR)	95% Confidence interval for OR	P value
Age category	8.98	7.72-10.45	0.000
Years of experience in public health nutrition	1.06	1.05-1.07	0.000
Agency type	1.78	1.49-2.07	0.000
Retirement benefit	1.29	1.03-1.63	0.028
Years of experience in nutrition	1.02	1.01-1.03	0.001
US DHHS Region	1.04	1.02-1.07	0.002
Time in direct client services	0.99	0.99-1.00	0.005
Vacation benefit	1.60	1.16-2.22	0.005
Full/part time status	0.78	0.64-0.96	0.017

technical/support series (Dodds and Kaufman, 1991). As could be expected, then, those who were older, had more experience, and had more public health nutrition education also reported greater intention to retire. Because management positions are the most population/systems-focused of all the position series (Dodds and Kaufman, 1991), they are also least involved in providing direct client services. This may help to explain why those who spent less time in direct care services had greater retirement intention. Because upper-level positions are accompanied by higher-level job responsibilities (Dodds and Kaufman, 1991), those with more budget and supervision responsibilities may indicate individuals who were more advanced in their career, closer to retirement eligibility, and thus reported a greater intention to retire.

How and where positions were employed appeared to impact personnel's retirement intention. Those who intended to retire were more likely to receive employee benefits and to work in official health agencies. These factors could be related to the attractive employee benefit and retirement/pension packages found in the public sector (Moore, 1991). Because employee benefits appear to correlate with wages (Schwabish, 2004), this may suggest that those who received benefits also held better-paying positions. Because household income and retirement financial planning data were not collected in the 2006-07 PHNWS, it was not possible to truly assess respondents' financial security for retirement. There is evidence that females' retirement plans are more impacted than males by family characteristics, including income (Talaga and Beehr, 1995). Because public health nutrition is a female-dominated field (George, et. al., unpublished data; Haughton and George, *in press*), family income may have had a stronger impact on retirement intention than individual compensation packages. Employee benefits may also help to explain the finding that contracted positions reported less intention to retire than did employed positions, because, as demonstrated by previous research, employed positions were more likely to receive employee benefits (George, et al., unpublished data; Haughton and George, *in press*). The proportion of those who intended to retire was very similar for those in full-time and part-time positions. This could be a reflection of individuals who worked in 'bridge' jobs, which are part-time or temporary jobs taken by individuals after retiring from full-time, career positions, but before retiring from the workforce completely (Doeringer, 1990; Feldman, 1994). Therefore, those in part-time, bridge employment may have the similar retirement intentions to their full-time counterparts.

The findings in this study would be useful for managers and administrators, especially those involved in workforce and succession planning. In this study, both personal and environmental factors from Beehr's Model could be used to predict retirement intention. The personal factors signaled that those who were older, had more experience and received retirement or vacation benefits were more likely to retire. Environmental factors that predicted retirement were positions in official health agencies, located in US DHHS Regions IV, VI, and IX, that spent less time in direct client services, and were part-time. Similarly, the personal factors of age, years of public health nutrition and nutrition/dietetics experience, and level of training required, as well as the environmental factor of percent of work time spent in direct services could all be used to predict number of years until intended retirement. Thus, for succession planning and to prepare for the future retirement of their workers, managers and administrators should first determine their type of agency, its location, and the experience level of employees. To further project where future needs will be, managers and administrators should consider the types of compensation, both wages and employee benefits, which personnel receive. It was notable that the employee benefits retirement and vacation time could be used to predict retirement intention, but not the other employee benefits (health insurance or sick leave). Further research should determine the association between types of employee benefits offered and retirement behavior. Managers and administrators should also consider the types of work that positions under their authority perform.

For example, those requiring little additional training and more involved in population/systems-focused activities may intend to retire in a shorter amount of time than those requiring more training and more involved in direct client services. Finally, managers and administrators should consider the impact of those in bridge employment on their organization, because in this study, part-time positions were a predictor of greater retirement intention. This may reflect individuals who have left full-time employment in favor of part-time positions prior to complete withdrawal from the workforce. If managers and administrators are faced with high expected rates of retirement, they need to consider both training their current employees and recruiting new employees to ensure that an adequate pipeline is available to replace those in leaderships who will be retiring from the organization. It appears that at the state level, workforce planning programs exist in nearly two-thirds of health agencies (ASTHO, 2008). Results from this study can aid these agencies in analyzing the current workforce composition and assessing retirement eligibility and impact, two of the top workforce planning strategies currently being employed by state health agencies (ASTHO, 2008).

It was interesting that years of public health nutrition experience had a stronger ability to predict retirement intention than did years of experience in nutrition/dietetics. Length of tenure at the current position, in this case public health nutrition, has been associated with more accurate predictions of retirement intention (Talaga and Beehr, 1989). Also notable was that level of training required, the only factor *not* significantly different for retirement intention, was significant for years until intended retirement. This may indicate that other factors not included here, such as family characteristics, may have a greater influence for these personnel on whether to retire at all. Future research to replicate these results would benefit workforce succession planning.

There is evidence that retirement may be changing as baby boomers age (AARP, 2004; Toossi, 2007); therefore, prior retirement research may not be adequate or appropriate to fully anticipate or explain the retirement intentions and behavior of baby boomers. In addition, several factors not captured by the data source, such as health and family characteristics, may have been more influential factors for the personnel studied than the factors analyzed here (Talaga and Beehr, 1995). However, many of the factors included, such as training and employee benefits, are under the control of managers and administrators, unlike the family characteristics and health of their workers. Therefore, the impact of these factors may be more useful in application and practice.

Limitations

The data collected in the 2006-07 PHNWS could be considered highly sensitive by respondents, especially because it was administered through their position. Therefore, though confidentiality was stressed and maintained, the survey was administered on-line, and employers had no access to responses to retirement items, respondents may still have been less likely to answer honestly about their retirement plans. However, a response rate comparable to the previous administration was maintained (80.0% compared to 88.0%) (McCall and Keir, 2003). Though Beehr's Model was referenced, because this study involved secondary data analysis, many factors in the Model were not available. The factors used, though, may be more useful from an application standpoint, because they are factors more under the control of managers and administrators. Though the large *n* was a benefit to the census survey, it allowed the detection of differences that may not be practically significant. Results found here should be explored by future research. The 2006-07 PHNWS retirement survey item asked respondents whether they intended to retire, rather than whether they intended to retire from the workforce completely. Individuals could have

interpreted the item differently, and future research should explore differences between those retiring from full-time positions in favor of bridge employment and those completely withdrawing from the workforce. Further administrations of the PHNWS could also consider a revision of the retirement intention survey item to determine intention to retire from the current position and from the workforce completely.

Conclusions

The present study adds to the noted paucity of available data about the public health workforce, and can be used to forecast needs due to retirement (Lichtveld, et al., 2001). The results demonstrated that nearly half of the public health nutrition workforce is 45 years and older and of these, nearly half intend to retire within 10 years. Retirement intention appeared to be higher for those personnel in upper-level positions, with employee benefits, and in official health agencies. Individuals in management and administrative positions should consider the experience of their workforce as well as organizational characteristics that can influence intention to retire, such as employee benefits. Further research is needed to examine the different stages and types of retirement. In addition, research that includes the contribution of family factors to retirement intention would be useful. This study provides factors for managers and administrators to explore when projecting workforce needs due to retirement.

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Appendices

Appendix A:
Extended Methodology

Data Source: Public Health Nutrition Workforce Survey: 2006-07

The Association of State and Territorial Public Health Nutrition Directors (ASTPHND) has conducted a census of professional and paraprofessional public health nutrition personnel since 1985. ASTPHND has administered the Public Health Nutrition Workforce Survey (PHNWS) to identify training needs, qualifications, and practice areas of public health nutrition personnel to ensure a trained workforce (McCall and Keir, 2003). The 2006-07 enumeration was intended to gather the same information as previous versions of the survey, and included additional items to collect data on age and intention to retire. This survey was a census of "public health nutrition personnel employed in official state and local health agencies and nonprofit and for-profit agencies funded by official health agencies" (McCall and Keir, 2003, p. 103). The previous 1999-2000 survey was updated and modified utilizing the input of a national advisory committee. The 2006-07 version was developed for online administration with the option to complete in print form, if online access was unavailable. The PHNWS received Human Subjects approval through The University of Tennessee, Knoxville's Institutional Review Board. It was pilot tested by eight individuals in multiple states and agency types, and who held a variety of position classes. The pilot survey contained 42 items and was completed online in an average of 20.6 minutes, while the print version took 25.1 minutes to complete. Ease of administration and response burden, and comparability to previous versions of the survey were primary criteria in determining the final version of the survey (McCall and Keir, 2003). An abbreviated, 11-item version of the survey was developed to be completed by local public health nutrition directors for each open/vacant position under their jurisdiction. In addition, a 28-item version of the survey with only position-related items was created to be administered to personnel who worked in multiple positions and had previously completed the 42-item instrument.

Data collected in the 2006-07 PHNWS included personal and employment information. Demographic information, such as age, race/ethnicity, education level, professional certification and credentialing, and years of experience can be assessed. Employment-related information also was included, such as type of agency, job classification, source of position funding, and primary responsibilities. The previous version of the survey in 1999-2000 collected information on 10,904 positions, 595 of which were vacant. The overall response rate was 88% (McCall and Keir, 2003).

The survey has historically been administered by state and territorial public health nutrition directors (hereafter referred to as state directors). In previous survey administrations, state directors were responsible for duplicating the survey and distributing it to local directors. Local directors, in turn, identified individuals within their agencies and districts who were to complete the survey. Completed surveys were returned to the state directors who cleaned the data, entered data into a statistical program, followed-up with non-respondents, and submitted the data to ASTPHND. ASTPHND personnel then combined the state data into a national database for analysis.

Administration of the 2006-07 PHNWS was similar, but was completed online. Individuals were provided with the website address to access the survey, as well as a unique identifier and password with which to access and complete the survey. The unique identifiers were created by

each state's designated state contact and were composed of a 9-digit string that contained the 2-letter abbreviation for each state. University of Tennessee, Knoxville researchers maintained a database of completed survey data with unique identifiers stripped of all digits except state codes and with no names or contact information. Therefore, database users had no direct means to identify or contact respondents. To enhance the participant response rate, UT researchers provided state contacts with lists of unique identifiers who completed the survey on a monthly basis. The state contacts then identified individuals who had not yet completed the survey and contacted them to access the survey and submit their responses.

Quality of the dataset

Because the 2006-07 PHNWS constitutes a secondary dataset, it is necessary to evaluate its quality prior to use. The Partnership and Household Livelihood Security Unit, the grant-funded unit of CARE-USA responsible for sponsoring distance learning for CARE's staff and partners, identified some key characteristics a good secondary dataset should exhibit (McCaston, 1998). These characteristics include: an unbiased original purpose for data collection; conduct and analysis of the data by a credible source; sound methods; currency of data; an appropriate intended audience; and whether the secondary data updates or substantiates existing data.

Original purpose for data collection

When using these criteria, the 2006-07 PHNWS is a quality dataset. First, according to the stated survey goals, the data were originally collected with the intent of identifying trends in and capacity of the public health nutrition workforce. Both of these goals were consistent with the research goals posited in this proposal. ASTPHND aims to support and bolster nutrition policies and program. The workforce survey it has sponsored since 1985 has aided in understanding current trends and characteristics of the workforce. These data have assisted workforce planners and administrators in staffing and planning, as well as strengthened an enumeration of the public health workforce in general (Gebbie, 2000). Through the PHNWS, the organization hopes to add to the knowledge base regarding this workforce, rather than achieve an organization-specific goal or purpose.

Credibility of source

Next, both ASTPHND and USDA, FNS, one of the funding agencies, have exhibited strong past performances in previous data collection and reporting. Throughout its history, the survey has been funded by both the Maternal and Child Health Bureau and USDA, FNS, two agencies concerned with the health of women, infants and children (Haughton, Story and Keir, 1998, Kaufman, Heimendinger, Foerster and Carroll, 1986, Kaufman and Lee, 1988). The results from the 1999-2000 PHNWS were identified as some of the most comprehensive and correct for any of the public health professions by the Bureau of Health Professions (Gebbie, et al., 2003).

Methods

The methods outlined for the 2006-07 PHNWS were sound and consistent with previous survey administrations to the extent possible. Since the survey began in 1985, it has been improved by

methodological changes. It was originally administered to state and territorial nutrition directors who estimated the numbers and qualifications of budgeted, full-time equivalent public health nutrition professionals within their states/territories (Kaufman, et al., 1986, Kaufman and Lee, 1988). Since 1994 it has been administered directly to public health professionals and paraprofessionals in budgeted or contracted full- or part-time positions (Haughton, Story and Keir, 1998; McCall and Keir, 2003). A new component to the 2006-07 survey administration was that it was administered primarily in an online format. After respondents completed the survey, their data were automatically downloaded to The University of Tennessee, Knoxville's computer server with the program mrInterview (mrInterview ver. 4.0, 2002-2006, SPSS Ltd., Chicago, IL). Data cleaning was done using SPSS version 15.0 (SPSS 15.0 for Windows, ver. 15.0.1, November 22, 2006, SPSS Inc., Chicago, IL). This allowed for a cleaner dataset than previous administrations using print format because of computer coding rules that limited most unreasonable responses. The survey was password-protected, thus only participants provided with a password from ASTPHND could access and complete the survey. The overall response rate was 80.0%, indicating that non-response bias was most likely minimized and it has acceptable generalizability (Office of Information and Regulatory Affairs, 2006). Researchers require high response rates to have confidence that the data collected describe the population of interest. Further sampling error was minimized, because the survey was intended to be a census of the entire public health nutrition population. Rights of human subjects and confidentiality were both protected, because at no time was identifying information linked to survey responses in the dataset. Further, respondents were asked for permission to release their data for research purposes; those who declined will not be included in any analyses. Out of 10,683 total positions, 9,923 (92.9%) agreed to release their data for research purposes (74.2% of the total population).

As mentioned, data cleaning occurred in a sense as respondents completed the survey online. Rules in the coding of the survey prevented most unreasonable responses and forced responses to key questions, thus minimizing item non-response. In addition, after data was input by the respondents, two levels of data cleaning then were employed on the completed dataset. The first level involved data cleaning by the state contacts. Three key survey items were particularly problematic in the previous survey administration: salary, minimum salary for position class, and funding source for position. Therefore, responses to these items were returned to state contacts for data cleaning. After receiving training regarding survey implementation and data cleaning processes, state contacts received monthly spreadsheet reports from The University containing the responses for these select survey items by respondents who had completed the survey during the previous month. After reviewing the reports and making necessary corrections within the spreadsheets, state contacts returned the corrected reports to The University where survey research staff edited the overall dataset. Despite this, some unreasonable responses remained and an additional data cleaning level was employed. The percent part-time (as a decimal) that a respondent worked was multiplied by reported annual salary to determine an equivalent part-time annual salary. Percent part-time also was used in a similar calculation to determine full-time equivalents (FTEs). Individuals not reporting the percent part-time that they worked (n=24, 0.2%) were excluded from salary and funding source analyses because these values were required in calculations. Also, 323 respondents (3.3%) recorded unreasonable responses for the total number of FTEs supervised. Those who indicated that the total number of direct *and* indirect FTEs supervised was less than the reported number of direct FTEs supervised were not included in supervision responsibility analyses. Further data cleaning was performed on a case-by-case basis for survey items requiring write-in responses.

Currency of data, intended audience and coverage

The data's currency also adds to its strength. Data collection occurred from September 2006 through March 2007, making it the most recent data on the population of interest. The intended audience of the results includes: USDA, ASTPHND, public health nutrition workforce researchers, state nutrition directors, state WIC directors, and others interested in trends, capacity, training needs, and qualifications of the population surveyed. Finally, the 2006-07 PHNWS updates data collected in 1999-2000. The Partnership and Household Livelihood Security Unit includes coverage as an indication of a secondary dataset's quality. The 2006-07 PHNWS builds on the results of previous surveys, indicating high-quality coverage. All 50 states, the District of Columbia and Guam participated with an overall response rate of 80.0%.

Final support for the methodological soundness of the survey is that the project received approval by both The University of Tennessee, Knoxville's Institutional Review Board, USDA, FNS, and USDA Office of Analysis, Nutrition and Evaluation. After notice of the survey project was posted on the Federal Register for 90 days (no comments were received), the Office of Management and Budget approved the survey. Thus, the survey was assigned a valid OMB control number and was permitted for data collection in compliance with the Paperwork Reduction Act of 1995. As shown in Table A.1, the 2006-07 PHNWS contained all items the US DHHS Health Resources and Services Administration recommends be included in a complete public health enumeration (Atchinson, Gebbie, Thielsen and Woltring, 2001).

Research Questions and Measures of Interest

Each of the research questions were answered using survey items from the 2006-07 PHNWS. To test the validity of the job classification item, respondents were asked to select their job classification in two distinct survey items in the 2006-07 PHNWS. The first item asked respondents to select the most relevant job classification description, without job titles; at the end of the survey, they were asked to answer a similar survey item with the same job classification descriptions but included job titles. Because job classification was used in the research questions, it must be determined which job classification item should be used, prior to further analysis. Therefore, an initial determination completed prior to data analysis for the research questions of interest was: (item numbers indicate the item on the print survey) (Appendix B).

> Determine the validity of the job classification survey item by comparing the results of item 4 (job classification without job title) and item 36 (job classification with job title).

To complete this determination, McNemar's test for non-parametric, nominal data was applied to determine whether the paired responses to the two survey items agree ($\alpha \leq 0.05$). If the result was statistically significant, it indicated that the responses were heterogeneous and did not agree. If responses do not agree, item 4 will be used for job classification analyses.

Research question 1

The Health Resources and Services Administration recommended core data elements to ideally be included in a public health enumeration (see Table A.1) (Atchinson, et al., 2001). The 2006-07 PHNWS collected data on each of these items. Therefore, the first research question was:

Table A.1. Recommended data elements for a public health enumeration and those contained in the 2006-07 PHNWS [a].

Recommendations from *Enumerating the Public Health Workforce*	Data Elements in the 2006-07 PHNWS
Total number of staff	By state, agency, job class and other variables
FTEs	By funding source
Occupation class	10-category scheme
Job function	14 categories of practice, percent time in direct service, type of client population, budget responsibilities, FTEs
Location	By state, agency of employment, type of work setting
Age	Year born
Education level	Degrees completed/working toward, public health degrees completed/working toward, completion of 5 core public health courses at undergraduate or graduate level
Credentials	12 credentials relevant to nutrition, steps toward RD or DTR
Experience	Years in nutrition, public health nutrition, and WIC p
Salary range	By job classification as annual earned salary and minimum position salary; some improbably low annual salaries
Ethnicity	Hispanic/Latino
Race	5 OMB approved categories
Gender	Yes
Language	Primary and secondary, with sufficient fluency for job

[a] Adapted from McCall M. Keir B. Association of State and Territorial Public Health Nutrition Directors. United States Department of Agriculture. Food and Nutrition Service. *Survey of the Public Health Nutrition Workforce: 1999-2000.* January 2003.

Research question 1A: Describe the public health nutrition workforce according to the following parameters:

- total number of staff (filled positions, vacant positions, and persons);
- FTEs by funding source (item 24);
- job classification (item 4 or 36, as determined by the analysis above);
- job function (primary area of practice, item 25; percent of work time spent in direct client services, item 16; primary client population, item 26; budget responsibilities, item 15; supervision responsibilities, item 14);
- location (geographical; agency of employment, item 1; location of practice, item 2);
- age (category, item 38);
- maximum education level attained/working toward (item 27);
- credentials (item 29);
- experience (years in nutrition/dietetics, item 5; years in public health nutrition, item 6);
- salary (salary range items 21-22; employee benefits received, item 23);
- ethnicity (item 40);
- race (item 41)'
- gender (item 37); and
- language (item 42).

To answer this question, responses to items corresponding to each of the descriptive variables were analyzed separately as means (with standard deviations) and frequencies (Table A.2). The 12 response options for primary area of practice were collapsed into the three core public health functions:

- assessment (data management, nutrition surveillance or research and community assessments, program planning, or evaluation);
- policy development (community organization, advocacy or policy development; communication, mass media or social marketing; emergency food, hunger, food security, Commodity Supplemental Foods Program; general management and administration); and
- assurance (health facilities regulation; environmental health and/or food safety; program monitoring and/or quality assurance; breastfeeding peer counselor; direct client services).

"Other" responses were not included. Responses for agency of employment also were collapsed into official health agencies (state government health agency, local government health agency, Indian Health Services) and others (non-profit organization, for-profit organization, other). Geographic location were determined by state (from respondents' unique identifiers used to access the survey) as US Department of Health and Human Services Regions.

- *Region I*: CT, MA, ME, NH, RI, VT
- *Region II:* NJ, NY, PR, Virgin Islands
- *Region III:* DC, DE, MD, PA, VA, WV
- *Region IV:* AL, FL, GA, KY, MS, NC, SC, TN
- *Region V:* IL, IN, MI, OH, WI
- *Region VI:* AR, LA, NM, OK, TX
- *Region VII:* IA, KS, MN, MO, NE
- *Region VIII:* CO, MT, ND, SD, UT, WY
- *Region IX:* AZ, CA, HI, NV, Pacific Basin, Guam
- *Region X:* AK, ID, OR, WA

Table A.2. Variables analyzed in research question 1.

Parameter	Response Options	Type of Variable	Analysis to be Performed
Total number of staff		Continuous	Report for filled positions, vacant positions and persons
FTEs by funding source	• Local • State or Tribal • USDA • US DHHS • Department of Education • Other	Continuous	Means and standard deviation
Job classification	• Public health nutrition director • Assistant public health nutrition director • Public health nutrition supervisor • Public health nutrition consultant • Public health nutritionist • Clinical nutritionist • Nutritionist • Nutrition technician • Nutrition assistant • Breastfeeding peer counselor • Other	Categorical	Frequencies and percents
Primary area of practice as core functions	• Assessment • Policy development • Assurance	Categorical	Frequencies and percents
Percent of work time spent in direct client services	0-100%	Continuous	Mean and standard deviation
Primary client population	• General/comprehensive nutrition • General women, infants and children • General women's nutrition and health • General infant nutrition • School and/or adolescent health • Children with special health care needs • Breastfeeding • Adult health promotion, chronic disease prevention or healthy aging • Seniors, geriatrics, adult disabilities or adult chronic disease control	Categorical	Frequencies and percents

Table A.2. Continued.

Parameter	Response Options	Type of Variable	Analysis to be Performed
Budget responsibilities	• None • Responsible for specific budget • Responsible for entire agency nutrition program budget	Categorical	Frequencies and percents
Supervision responsibilities	Total FTEs directly and indirectly supervised	Continuous	Mean and standard deviation
Geographic location	US DHHS Region	Categorical	Frequencies and percents
Agency of employment	• Official health agency • Other	Categorical	Frequencies and percents
Location of practice	• Central office of state government health agency • Central office of district or regional government health agency • Central office of local government health agency • Community/rural/migrant health center or clinic • Field office or clinic of a government health agency • HMO • Hospital • Indian Health Services • Other private/independent entity/office • Other	Categorical	Frequencies and percents
Age	• ≤44 years old • 45-54 years old • ≥55 years old	Categorical	Frequencies and percents
Maximum education level attained/ working toward	• High School • Associate's degree • Bachelor's degree • Master's degree • Doctoral degree	Categorical	Frequencies and percents
Credentials	• RD • Licensed/certified dietitian • DTR	Categorical	Frequencies and percents
Years of experience in nutrition/dietetics	Rounded to nearest year	Continuous	Mean and standard deviation
Years of experience in public health nutrition	Rounded to nearest year	Continuous	Mean and standard deviation
Annual salary	Reported annual salary	Continuous	Median
Minimum salary	Minimum salary for position	Continuous	Median

Table A.2. Continued.

Parameter	Response Options	Type of Variable	Analysis to be Performed
Employee benefits received	• Health insurance • Retirement • Sick leave • Vacation time • No benefits	Categorical	Frequencies and percents
Ethnicity	• Hispanic/Latino • Not Hispanic/Latino	Categorical	Frequencies and percents
Race	• American Indian or Alaskan Native • Asian • Black or African American • Native Hawaiian or Other Pacific Islander • White	Categorical	Frequencies and percents
Gender	• Female • Male	Categorical	Frequencies and percents
Language (primary and secondary)	• English • Spanish • Other	Categorical	Frequencies and percents

Respondents to the 2006-07 PHNWS were asked in what year they were born; the data were categorized in the dataset as those less than 45 years old, those 45-54 years old, and those 55 years or older. In the survey item on credentials, respondents were provided with a list of 12 credentials. The only options included in this analysis were Registered Dietitian (RD), Licensed/certified dietitian, and dietetic technician, registered (DTR) because these credentials are used in position requirements and qualifications delineated in *Personnel in Public Health Nutrition for the 1990s* (Dodds and Kaufman, 1991). Finally, primary and secondary languages were collapsed into English, Spanish and other languages.

Research question 1B: Determine whether those in population/system focused and client focused positions (item 4 or 36) are different, according to the following parameters:

- ethnicity (item 40);
- race, (item 41);
- gender (item 37);
- primary language (item 42);
- employed/contracted status (item 19); and
- employee benefits received (item 23).

For this research question, position classifications were categorized into two groups according to the focus of their responsibilities. Population/system focused positions include public health nutrition director, public health nutrition assistant director, public health nutrition supervisor, public health nutrition consultant, and public health nutritionist. Client focused positions include clinical nutritionist, nutritionist, nutrition technicians, nutrition assistant, and breastfeeding peer counselor. Respondents who selected the 'other' response were not included in this categorization. In addition, respondents who could be identified as having completed the survey for multiple positions were excluded from this designation. Those who were multi-completers but could not be identified as such were categorized according to the position for which they first completed the survey. Responses to race were categorized into 'white' and 'non-white' (American Indian or Alaskan Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, or more than 1 race). Primary language was categorized similarly into 'English' and 'language other than English,' into which each of the other 18 languages were collapsed. Finally, respondents were designated as receiving employee benefits if they indicated receiving any of the employee benefit options (health insurance, retirement, sick leave or vacation time). Respondents who did not select any of the employee benefit options were designated as receiving no employee benefits.

Chi square analyses then were performed (Table A.3). Results were considered significant at the $P \leq 0.05$ level for this and all statistical analyses.

Research question 2

Breastfeeding peer counselor was a new position class included in the 2006-07 PHNWS that was not in *Personnel in Pubic Health Nutrition for the 1990s* (Dodds and Kaufman, 1991). Members of this position class are to come from the indigenous community and thus both mirror their target population and add diversity to the workforce.

Table A.3. Variables analyzed in research question 1B.

Parameter	Response Options	Type of Variable	Analysis to be Performed
Ethnicity	• Hispanic/Latino • Not Hispanic/Latino	Categorical	Chi square
Race	• White • Non-white	Categorical	Chi square
Gender	• Female • Male	Categorical	Chi square
Primary language	• English • Language other than English	Categorical	Chi square
Employed/contracted position	• Employed • Contracted	Categorical	Chi square
Employee benefits received	• Receive employee benefits • Do not receive employee benefits	Categorical	Chi square

Research question 2A: Describe breastfeeding peer counselors by person and position characteristics according to the following parameters:

- *Person*:
    - years of experience in nutrition/dietetics (item 5), public health nutrition (item 6), and WIC (item 8);
    - maximum education level attained/working toward (item 27);
    - credentials (item 29);
    - attendance at any nutrition courses (item 33);
    - perceived training needs (item 34);
    - gender (item 37);
    - age category (item 38);
    - intention to retire within 10 years (item 39);
    - ethnicity (item 40);
    - race (item 41); and
    - primary and secondary languages spoken (item 42).

- *Position*:
    - geographical region;
    - agency of employment (item 1);
    - location of practice (item 2);
    - whether the position is in the WIC program (item 7);
    - percent of work time spent in direct client services (item 16);
    - full-time/part-time status (item 17);
    - employed/contracted status (item 19);
    - salary (items 21-22);
    - employee benefits received (item 23);
    - funding source (item 24);
    - primary area of practice (item 25); and
    - primary client population (item 26).

For this research question, the certification options of RD, licensed/certified dietitian, DTR, International Board Certified Lactation Consultant, and 'other certification in lactation or breastfeeding' were included in the analysis because they are pertinent to the position class (Table A.4). On the survey instrument, respondents were asked to indicate the level of training needed (none, basic or advanced) in 43 areas for their position. For this research question, 'basic' and 'advanced' options were collapsed into 'training required.' Geographic region and agency of employment were collapsed as in research question 1A.

Research question 2B: Determine whether breastfeeding peer counselors practice differently compared to other positions in the technical/support series (nutrition technician and nutrition assistant) using the following position parameters:

- agency of employment (item 1);
- whether the position is in the WIC program (item 7);
- percent of work time spent in direct client services (item 16);
- full-time/part-time status (item 17);
- employed/contracted status (item 19);
- primary area of practice (item 25); and
- primary client population (item 26).

Table A.4. Variables analyzed in research question 2A.

Parameter	Response Options	Type of Variable	Analysis to be Performed
Years of experience in nutrition/dietetics	Rounded to nearest year	Continuous	Mean and standard deviation
Years of experience in public health nutrition	Rounded to nearest year	Continuous	Mean and standard deviation
Years of experience in WIC	Rounded to nearest year	Continuous	Mean and standard deviation
Maximum education level attained/working toward	• High School • Associate's degree • Bachelor's degree • Master's degree • Doctoral degree	Categorical	Frequencies and percents
Credentials	• RD • Licensed or certified dietitian • DTR • International board certified lactation consultant • Other certification in lactation or breastfeeding	Categorical	Frequencies and percents
Attendance at any nutrition courses	List of 24 options	Categorical	Mean and standard deviation
Perceived training needs	List of 43 options	Categorical	Top five areas selected
Gender	• Female • Male	Categorical	Frequencies and percents
Age category	• ≤44 years old • 45-54 years old • ≥55 years old	Categorical	Frequencies and percents
Intention to retire	• Yes • No	Categorical	Frequencies and percents
Ethnicity	• Hispanic/Latino • Not Hispanic/Latino	Categorical	Frequencies and percents
Race	• American Indian or Alaskan Native • Asian • Black or African American • Native Hawaiian or Other Pacific Islander • White	Categorical	Frequencies and percents
Language (primary and secondary)	• English • Spanish • Other	Categorical	Frequencies and percents
Geographical region	Regions I-X	Categorical	Frequencies and percents
Agency of employment	• Official health agency • Other	Categorical	Frequencies and percents

Table A.4. Continued.

Parameter	Response Options	Type of Variable	Analysis to be Performed
Location of practice	• Central office of state government health agency • Central office of district or regional government health agency • Central office of local government health agency • Community/rural/migrant health center or clinic • Field office or clinic of a government health agency • HMO • Hospital • Indian Health Services • Other private/independent entity/office • Other	Categorical	Frequencies and percents
Position in WIC program	• Yes • No	Categorical	Frequencies and percents
Percent of work time spent in direct services	0-100%	Continuous	Mean and standard deviation
Full-time/Part-time status	• Full-time • Part-time	Categorical	Frequencies and percents
Employed/contracted status	• Employed • Contracted	Categorical	Frequencies and percents
Annual salary	Reported annual salary	Continuous	Median
Minimum salary	Minimum salary for position	Continuous	Median
Employee benefits received	• Health insurance • Retirement • Sick leave • Vacation time • No benefits	Categorical	Frequencies and percents
Funding source	• Local • State or Tribal • USDA • US DHHS • Department of Education • Other	Continuous	Sum for each category
Primary area of practice	• Assessment • Policy development • Assurance	Categorical	Frequencies and percents

Table A.4. Continued

Parameter	Response Options	Type of Variable	Analysis to be Performed
Primary client population	• General/comprehensive nutrition • General women, infants and children • General women's nutrition and health • General infant nutrition • School and/or adolescent health • Children with special health care needs • Breastfeeding • Adult health promotion, chronic disease prevention or healthy aging • Seniors, geriatrics, adult disabilities or adult chronic disease control	Categorical	Frequencies and percents

To facilitate chi square analysis, responses for each variable were collapsed into two categories (Table A.5). Agency of employment was collapsed into official health agency and non-official health agency consistent with previous research questions. Time in direct services was collapsed into less than 60% and at least 60% of time categories (Kaufman and Lee, 1988). Because the majority of the positions in this series practice in the area of assurance, specifically direct client services (McCall and Keir, 2003), primary area of practice was collapsed into the categories of assurance and other (assessment, policy development, and other). Similarly, because most of the clients seen by this population are in the area of maternal and child health, responses for primary client caseload were collapsed into two categories: maternal and child (general women, infants and children; general women's nutrition and health; general infant nutrition; general child health or pediatric nutrition; children with special health care needs; and breastfeeding) and other (general/comprehensive nutrition; school and/or adolescent health; adult health promotion; and seniors).

Adjusted standardized residuals also were performed to determine whether the observed distribution differs from the expected distribution. Values greater than 2 indicate that the event is more likely to occur than expected, while values less than -2 suggest that it is less likely to occur. Due to the large sample size for this and other research questions it is possible that differences were statistically significant but not practical differences. Therefore, each analysis was studied on a case-by-case basis to determine whether differences were practically important. Generally, results were considered practically significant when cell percents differ from the total by more than 10% (Know net, 2008).

Research question 2C: Determine whether WIC breastfeeding peer counselors are filling the position qualification of being from the same population group as the clients served according to the following characteristics:

- age (item 38);
- ethnicity (item 40); and
- race (item 41).

This question was answered by comparing each trait for WIC breastfeeding peer counselors to that for WIC women participants (Bartlett, Bobronnikov and Pacheco, 2006), their assumed client population. Because raw data were not available for this data source, statistical comparisons were not made.

Research question 3.

Because of evidence that the workforce is experienced (McCall and Keir, 2003), and due to concerns about impending high rates of retirement in healthcare (Buerhaus, et. al., 2000) and public health overall (ASTPHO, CSG, AND NASPE, 2004; NACCHO, 2006), the retirement intentions of the public health nutrition workforce were evaluated.

Research question 3A: Describe those members of the public health nutrition workforce 45 years and older according to the following parameters:

- retirement intention (items 39-40);
- age category (item 38);
- years of experience in nutrition/dietetics (item 5);

Table A.5. Variables analyzed in research question 2B.

Parameter	Response Options	Type of Variable	Analysis to be Performed
Agency of employment	• Official health agency • Other	Categorical	Chi square
Position in WIC program	• Yes • No	Categorical	Chi square
Percent of work time spent in direct services	• <60% of time in direct services • ≥60% of time in direct services	Categorical	Chi square
Full-time/Part-time status	• Full-time • Part-time	Categorical	Chi square
Employed/contracted position	• Employed • Contracted	Categorical	Chi square
Primary area of practice	• Assurance • Other	Categorical	Chi square
Primary client caseload	• Maternal and child • Other	Categorical	Chi square

- years of experience in public health nutrition (item 6);
- employee benefits received (item 21);
- position series (item 4 or 36);
- graduate degree in public health or public health nutrition (item 27);
- level of training required for current work (item 34);
- full-time/part-time status (item 17);
- employed/contracted status (item 19);
- percent of work time spent in direct client services (item 16);
- supervision responsibilities (item 14);
- budget responsibilities (item 15);
- type of agency (item 1); and
- geographic region.

A subset of the research dataset, those 45 years and older, was used for this research question. The survey item asked respondents about their retirement intention within the next 10 years. Because most early retirement and pension eligibility begins at age 55 (Toossi 2005; Dohm, 2000), those at least 45 years old could conceivably be within 10 years of considering retirement. As in previous research questions, prior to analysis, some variables were collapsed into categories (Table A.6). For position series, position classifications were collapsed into the management series (public health nutrition director, assistant public health nutrition director, public health nutrition supervisor), professional series (public health nutrition consultant, public health nutritionist, clinical nutritionist, nutritionist) and technical/support series (nutrition technician, nutrition assistant, breastfeeding peer counselor), consistent with *Personnel in Public Health Nutrition for the 1990s* (Dodds and Kaufman, 1991). A mean training need for each of the 4 training areas was determined by averaging the training options in each area. Type of agency again was collapsed into official health agencies and other agencies. Finally, geographic region was collapsed into US DHHS Regions.

Research question 3B: For those 45 years and older, determine if there are significant differences for the intention to retire within the next 10 years based on:

- age category (item 38);
- years of experience in nutrition/dietetics (item 5);
- years of experience in public health nutrition (item 6);
- employee benefits received (item 21);
- position series (item 4 or 36);
- graduate degree in public health or public health nutrition (item 27);
- level of training required for current work (item 34);
- full-time/part-time status (item 17);
- employed/contracted status (item 19);
- percent of work time spent in direct client services (item 16);
- supervision responsibilities (item 14);
- budget responsibilities (item 15);
- type of agency (item 1); and
- geographic region.

Variables were collapsed consistent with research question 3A (Table A.6), with one exception. To determine level of training required, each of the possible responses were scored: 'none'

Table A.6 Variables analyzed in research question 3A.

Parameter	Response Options	Type of Variable	Analysis to be Performed
Retirement intention within 10 years	• No • Yes • Number of years	(Item 39) Categorical (Item 40) Continuous	Frequencies and percents (item 39) and mean with standard deviation (item 40)
Age category	• 45-54 years old • ≥55 years old	Categorical	Mean of total and frequencies and percents
Years of experience in nutrition/dietetics	Rounded to nearest year	Continuous	Mean and standard deviation
Years of experience in public health nutrition	Rounded to nearest year	Continuous	Mean and standard deviation
Employee benefits received	• Health insurance • Retirement • Sick leave • Vacation time • No benefits	Categorical	Frequencies and percents
Position series	• Management series • Professional series • Technical/support series • Other	Categorical	Frequencies and percents
Graduate public health degree	• Master's degree in public health nutrition • Master's degree in public health • Doctoral degree in public health nutrition • Doctoral degree in public health	Categorical	Frequencies and percents
Level of training required	• Client and population groups • Assessment • Policy development • Assurance	Continuous	Mean and standard deviation
Full-time/Part-time status	• Full-time • Part-time	Categorical	Frequencies and percents
Employed/contracted status	• Employed • Contracted	Categorical	Frequencies and percents
Percent of work time spent in direct services	0-100%	Continuous	Mean and standard deviation
Supervision responsibilities	Total FTEs directly and indirectly supervised	Continuous	Mean and standard deviation
Budget responsibilities	• None • Responsible for specific budget • Responsible for entire agency nutrition program budget	Categorical	Frequencies and percents
Type of agency	• Official health agency • Other	Categorical	Frequencies and percents
Geographic region	Regions I-X	Categorical	Frequencies and percents

received a value of 0, 'basic' received a value of 1, and 'advanced' received a value of 2. A composite score indicated an average level of training need.

To determine whether significant differences existed between those who did and did not intend to retire, respondents first were separated into two categorical groups according to their response to retirement intention. Chi square analyses were conducted for each of the categorical variables: age category, employee benefits received, position series, graduate public health degree, full-time/part-time status, employed/contracted status, budget responsibilities, type of agency, and US DHHS Region. Independent t-tests were performed on the remaining continuous variables: years of experience in nutrition/dietetics; years of experience in public health nutrition; level of training required; percent of work time spent in direct services; and supervision responsibilities (Table A.7).

Research question 3C: Determine whether retirement intention within the next 10 years for those 45 years and older is predicted by the following variables (characteristics):

- age category (item 38);
- years of experience in nutrition/dietetics (item 5);
- years of experience in public health nutrition (item 6);
- employee benefits received (item 21);
- position series (item 4 or 36);
- graduate degree in public health or public health nutrition (item 27);
- level of training required for current work (item 34);
- full-time/part-time status (item 17);
- employed/contracted status (item 19);
- percent of work time spent in direct client services (item 16);
- supervision responsibilities (item 14);
- budget responsibilities (item 15);
- type of agency (item 1); and
- geographic region.

Variables found to be significantly different for intention to retire in research question 3B were used in a stepwise logistic regression to determine whether retirement intention could be predicted.

Research question 3D: For those 45 years and older, determine if there are significant differences in the number of years until intended retirement based on:

- age category (item 38);
- years of experience in nutrition/dietetics (item 5);
- years of experience in public health nutrition (item 6);
- employee benefits received (item 21);
- position series (item 4 or 36);
- graduate degree in public health or public health nutrition (item 27);
- level of training required for current work (item 34);
- full-time/part-time status (item 17);

Table A.7. Variables analyzed in research question 3B.

Parameter	Response Options	Type of Variable	Analysis to be Performed
Age category	• 45-54 years old • ≥55 years old	Categorical	Chi square
Years of experience in nutrition/dietetics	Rounded to nearest year	Continuous	Independent t-test
Years of experience in public health nutrition	Rounded to nearest year	Continuous	Independent t-test
Employee benefits received	• Health insurance • Retirement • Sick leave • Vacation time • No benefits	Categorical (yes/no)	Chi square
Position series	• Management series • Professional series • Technical/support series • Other	Categorical	Chi square
Graduate public health degree	• Master's degree in public health nutrition • Master's degree in public health • Doctoral degree in public health nutrition • Doctoral degree in public health	Categorical	Chi square
Level of training required	Mean score 0-2	Continuous	Independent t-test
Full-time/Part-time status	• Full-time • Part-time	Categorical	Chi square
Employed/contracted status	• Employed • Contracted	Categorical	Chi square
Percent of work time spent in direct services	0-100%	Continuous	Independent t-test
Supervision responsibilities	Total FTEs directly and indirectly supervised	Continuous	Independent t-test
Budget responsibilities	• None • Responsible for specific budget • Responsible for entire agency nutrition program budget	Categorical	Chi square
Type of agency	• Official health agency • Other	Categorical	Chi square
Geographic region	Regions I-X	Categorical	Chi square

- employed/contracted status (item 19);
- percent of work time spent in direct client services (item 16);
- supervision responsibilities (item 14);
- budget responsibilities (item 15);
- type of agency (item 1); and
- geographic region.

Next, to determine whether significant differences exit in the number of years until intended retirement, three sets of statistical tests were run. Independent t-tests were performed on categorical variables with two categories (age, full-time/part-time status, contracted/employed status, each employee benefit, graduate public health degree, and type of agency). Analyses of variance were run on categorical variables with more than two categories (position series, budget responsibilities, and US DHHS Region). Finally, bivariate Pearson's correlations were run on continuous variables (Table A.8)

Research question 3E: Among those who 45 years and older who intend to retire within the next 10 years, determine if the years until intended retirement can be predicted by:

- age category (item 38);
- years of experience in nutrition/dietetics (item 5);
- years of experience in public health nutrition (item 6);
- employee benefits received (item 21);
- position series (item 4 or 36);
- graduate degree in public health or public health nutrition (item 27);
- level of training required for current work (item 34);
- full-time/part-time status (item 17);
- employed/contracted status (item 19);
- percent of work time spent in direct client services (item 16);
- supervision responsibilities (item 14);
- budget responsibilities (item 15);
- type of agency (item 1); and
- geographic region.

Variables found to be significantly different for years until intended retirement in research question 3D were used in a stepwise linear regression to determine whether years until intended retirement can be predicted.

Potential Limitations or Barriers.

As with any study, this research contained several potential limitations. First, surveys are generally characterized by poor response rates. Dillman recommends a response rate of approximately 80% while cautioning that this is very difficult to achieve (1978, 2000). This has been less problematic for the PHNWS because individuals are requested to complete the survey in partial fulfillment of their job requirements. The previous administration of the PHNWS had a response rate of 88% (McCall and Keir, 2003).

Table A.8. Variables analyzed in research question 3D.

Parameter	Response Options	Type of Variable	Analysis to be Performed
Age category	• 45-54 years old • ≥55 years old	Categorical	Independent t-test
Years of experience in nutrition/dietetics	Rounded to nearest year	Continuous	Pearson's correlation
Years of experience in public health nutrition	Rounded to nearest year	Continuous	Pearson's correlation
Employee benefits received	• Health insurance • Retirement • Sick leave • Vacation time • No benefits	Categorical (yes/no)	Independent t-test
Position series	• Management series • Professional series • Technical/support series • Other	Categorical	Analysis of variance
Graduate public health degree	• Master's degree in public health nutrition • Master's degree in public health • Doctoral degree in public health nutrition • Doctoral degree in public health	Categorical	Independent t-test
Level of training required	Mean score 0-2	Continuous	Pearson's correlation
Full-time/Part-time status	• Full-time • Part-time	Categorical	Independent t-test
Employed/contracted status	• Employed • Contracted	Categorical	Independent t-test
Percent of work time spent in direct services	0-100%	Continuous	Pearson's correlation
Supervision responsibilities	Total FTEs directly and indirectly supervised	Continuous	Pearson's correlation
Budget responsibilities	• None • Responsible for specific budget • Responsible for entire agency nutrition program budget	Categorical	Analysis of variance
Type of agency	• Official health agency • Other	Categorical	Independent t-test
Geographic region	Regions I-X	Categorical	Analysis of variance

A related concern for individuals completing the survey was the sensitive nature of some of the data collected, such as retirement intention. Especially because they were requested to complete it in partial fulfillment of their job responsibilities, they may have feared repercussions resulting from their responses. As previously described, the method of survey administration and data collection was designed to prevent the linking of survey responses with identifying information.

In the survey, intention was used as a predictor of future retirement. Though intention does not guarantee that the intended action will occur, it has been found to be an acceptable proxy measurement of future behavior (Ajzen and Fishbein, 1975). Finally, the ability to predict intention to retire was based on Beehr's Model of Retirement Behavior (Beehr, 1986). Beehr and other researchers have found that finances and health are the strongest predictors of retirement (Beehr, 1975; Beehr, et al., 2000; Ekerdt, et al., 1996; Talaga and Beehr, 1995; Taylor and Shore, 1995). Because the PHNWS did not collect these data, they could not be used to predict retirement intention. The variables utilized constitute other components of Beehr's Model of Retirement Behavior (1986), and are other factors potentially impacting intention to retire.

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Appendix B:
2006-07 Public Health Nutrition Workforce Survey

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0584-0536. The time required to complete this information collection is estimated to average 0.46 hours per response, including the time to review instructions, search existing data resources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Expires 7/31/2009.

Please print your password to access the Public Health Nutrition Workforce Survey. Your password is 5-6 characters in length, beginning with a 2 letter state abbreviation.
Password _____

Please enter your unique 9-digit identifier provided by your nutrition director:

___ ___ ___ ___ ___ ___ ___ ___ ___

WELCOME TO THE PUBLIC HEALTH NUTRITION WORKFORCE SURVEY

WHY? The Association of State and Territorial Public Health Nutrition Directors with support from the United States Department of Agriculture is conducting a survey of public health nutrition personnel, including WIC staff, in all US states, territories, and Tribal organizations. The survey's purpose is to have current information on work responsibilities, areas of practice, training, and compensation and to use the information to support recruitment and retention. Several similar surveys were conducted from 1989 through 2000.

WHO SHOULD COMPLETE THE SURVEY? – Every person classified or functioning as a nutritionist or paraprofessional in a public health program, which includes WIC, should answer each question as completely as possible. Please complete the questionnaire if you work in a nutrition position, even if your job currently encompasses additional responsibilities. Persons who are nutritionists or dietitians by education or training, but who are in non-nutrition related positions should not complete the questionnaire. If you work in a support capacity or in another specialty (e.g. accountant, computer specialist, nurse, physician or receptionist), do not complete the questionnaire. Because the questions are being asked of more than 10,000 nutrition personnel throughout the US and territories, the job titles, names of programs and examples may be somewhat different from your own work experience. Nevertheless, choose the answer that is closest to your own situation.

HELP? It will take 15-20 minutes at most to respond to the items. If you have questions about this survey or how to answer specific questions, contact your supervisor or _____.

Please mail your completed survey to:

ASTPHND Workforce Survey
Department of Nutrition
University of Tennessee
1215 Cumberland Avenue
Knoxville, TN 37996-1920

USE OF INFORMATION? You have been assigned a unique identifier by your nutrition director, so that you can access the survey and input your responses. The purpose of the unique identifier is to ensure that the on-line database does not contain any information to identify you. It will also be used if your state nutrition director needs to contact you to follow up on any incomplete items or to clarify some answers related to salary, source of funding, and your position description. Only your responses to these questions on salary and source of funding will be reviewed by your state nutrition director to ensure that we have complete information. Your name and contact information is separate from the on-line database and will **NOT** be entered at any time into the database. Answers to the questions will be summarized, aggregated and published in a report which will be sent to your state nutrition director. No individual answers, persons or specific agencies will be identified in the report.

The Association of State and Territorial Public Health Nutrition Directors thanks you for your participation.

PUBLIC HEALTH NUTRITION WORKFORCE SURVEY
Current Public Health Nutrition Practice

1. Check the type of agency where you are **employed** (or contracted). **Blacken only one.**
   ① State government health agency
   ② Local government (city, county) health agency
   ③ Indian Health Services, tribal agency or tribal health center
   ④ Non-profit organization
   ⑤ For-profit organization
   ⑥ Other, please specify _____

2. Check the **primary location** where you work. **Blacken only one.**
   ① Central office of state government health agency
   ② Central office of district or regional (sub-state) government health agency
   ③ Central office of local (county, city or multi-county) government health agency
   ④ Community/rural/migrant health center or clinic
   ⑤ Field office or clinic of a government health agency
   ⑥ HMO or other managed care setting
   ⑦ Hospital
   ⑧ Indian Health Services, tribal agency or tribal health center
   ⑨ Other private/independent entity/office
   ⑩ Other, please specify _____

3. Write in the blank your current position or job classification title. _____

4. Read each of the following position descriptions. Blacken the **one** position description that is **most similar** to your position.
   ① No public health nutrition responsibilities. **STOP HERE**. Return the questionnaire
   ② This is the highest-level nutrition position in a state, large city, county or voluntary public health agency. Major functions of this position are policy making, planning/evaluation, budget control, management and supervision. The position is usually the head of a nutrition program unit, where this position is responsible for conducting a needs assessment, developing a comprehensive plan and budget for the nutrition services of the agency and has line authority over staff.
   ③ This is the second highest administrative and policy making public health nutrition position in a state, large city, county or voluntary public health agency. This position may participate in several delegated functions or be assigned primary responsibility for managing the nutrition component of one or more major program areas. Major functions of this position include assisting the director in policy making, planning/evaluation, budget control, management, and supervision. The person in this position serves as Acting Director in the director's absence.
   ④ This position supervises the work of an assigned number of other nutritionists, nutrition technicians, and nutrition assistants that deliver nutrition services and nutritional care in the public health agency. Supervision includes training, delegating, directing, coordinating, evaluating and reporting the work of subordinates.

Continued on next page

⑤ This position provides expert technical assistance, professional guidance, and in service education for staff in program development or case management. Consultation may be given to the administrator, other nutritionists or other health professionals. Staff in this position have both generalized and specialized knowledge and expertise and include those who work out of a central headquarters office or in the health agency's regional or district offices.

⑥ This position is employed by the state, city, county or voluntary public health agency to assess the community's nutrition needs, and to plan, direct and evaluate community nutrition intervention programs that meet these needs. Interventions promote health and prevent disease among the population at large.

⑦ This position works as a case manager and/or care coordinator, and nutrition counselor for medically high risk clients requiring physician prescribed complex dietary and nutrition regimens, including enteral and parenteral nutrition support. This position also may work as an educator in programs where more in-depth expertise in therapeutic nutrition is required, including high-risk pregnancy, neonatal and pediatric clinics; children's special services; AIDS; and home health and home hospice services.

⑧ This position is employed in a city, county or voluntary public health agency primarily to provide nutrition education to the public, and to coordinate and provide direct nutritional care to agency clients in health and disease throughout the life span. In public health agencies, this position works primarily in maternal and child health clinics, WIC programs and family health or adult health primary care clinics.

⑨ This position is paraprofessional in a city, county, or voluntary public health agency and works under the close supervision of a nutritionist to provide routine technical support services in public health agency clinics. This work includes normal nutrition education; screening using prescribed protocols; record keeping; and outreach.

⑩ This position is for auxiliary nutrition workers in a city, county, or voluntary public health agency from the local or indigenous community who are trained on-the-job to work under the close supervision of nutrition professionals to provide routine nutrition education, including interpretation for clients who do not speak English. This position also carries out assigned tasks in client outreach and screening.

⓪ This position is a paraprofessional support person who provides basic breastfeeding information, encouragement and counseling to WIC pregnant and breastfeeding mothers in WIC clinics, by telephone, home visits and/or hospital visits at scheduled intervals, and is available outside usual 8 to 5 working hours. This position informs new mothers about breastfeeding benefits and how to prevent and handle common breastfeeding problems.

⓪ Other, please specify _____

5. How many years, including part-time employment, have you practiced/been employed in the field of dietetics and/or nutrition? Write the total number of years, rounding to the nearest year. If less than 6 months, write "0."
____years

6. Of the total number of years reported in question 5, for how many years have you practiced public health nutrition, including WIC? Write the total number of years, rounding to the nearest year. If less than 6 months, write “0.”
____years

7. Are you currently working in a WIC program?
   ① No. **Skip to #9**
   ② Yes

8. If yes, how many years have you been working in the WIC program?
   ____ years

9. For how many full time equivalent employees (FTEs), positions, and/or consultants do you have **direct** responsibility for hiring, firing, promoting, and performance reviews? Include any positions that are currently vacant. Write in the number converted to full time equivalents. If you do **not** have these responsibilities, enter "0" and **skip to #14.**
   ____ FTEs

10. Of these, how many are nutrition professionals? ____ FTEs

11. How many are other health related professionals (such as biostatisticians, epidemiologists, evaluators, health educators, nurses, physical education professionals, or social workers)? ____ FTEs

12. How many are management or program support staff (such as clerical/issuance/eligibility determination staff, commodity foods/NET staff, information technology staff, budget staff, other managers or vendors)? ____ FTEs

13. How many of these FTEs are paraprofessionals (such as diet technicians, health aides, health screeners, LPNs, peer counselors, or translators)? ____ FTEs

14. For how many full time equivalent employees (FTEs), positions, and/or consultants are you responsible? This includes employees for whom you have <u>both</u> **direct** responsibility for hiring, managing, promoting, and firing, <u>and</u> **indirect** responsibility for oversight, technical assistance, or consultation. If you do **not** have these responsibilities, enter "0."
    ____ FTEs

15. How much budget and budget responsibility and control do you have in your current position? **Check only one.**
    ① None
    ② Responsible for a specific budget
    ③ Responsible for entire agency nutrition program budget

16. In a typical month, what percent of your time do you spend in direct client services, such as nutritional assessments, individual counseling, group education, or developing care plans? (Do not include working with health professionals or other organizations.) ____ %

17. Do you work full time or part time? (Full time equals the number of hours per week defined by your personnel system.)

① Full time—100%

② Part time

→ 18. If part time, write in the current percent time ____ %

19. Are you currently contracted to your agency or employed by your agency?

① Contracted

→ 20. If contracted or a consultant, at what rate are you paid?

① Hourly
② Daily
③ Annually
④ For specific services or products
⑤ Retainer

Skip to #23

② Employed

→ 21. Please record your **ANNUAL** salary. Round to the nearest dollar.
$ _____ per year

22. Please record the **ANNUAL** minimum or first step salary for your job classification as established by your agency's personnel system. Round to the nearest dollar.
$ _____ per year

23. Do you receive any of the following benefits? Mark all that apply.

① Health insurance
② Retirement
③ Sick leave
④ Vacation time
⑤ None of the above

24. Identify ALL sources of funding for your position. If your position is funded from more than one source, write in the percent of your time from each funding source. If you are not sure about sources of funds for your position, ask your program manager or the contact person. Your answers should add up to 100%.

First example: You work half time (50%) and you are funded completely by WIC. Check "WIC" and write in "100."

Second example: You work halftime. You are funded half by WIC and half by the Maternal and Child Health Block Grant. Enter "50" for both WIC and MCH Block Grant.

Third example: You work full time. Your position is paid for by a grant from a local foundation. Write "100" in Foundation or corporate grants.

State or Tribal Government Funding

____ % Non-specified funds
____ % Funds legislatively earmarked for nutrition
____ % Tobacco settlement monies
____ % Other ⟶ If other, please describe: _____

Federal Government Funding--Department of Agriculture (USDA)

____ % WIC
____ % Food Stamp Nutrition Education
____ % Child and Adult Care Food Program and/or NET
____ % Other USDA, e.g., Commodity Supplemental Food Program

Federal Government Funding--Department of Health and Human Services

____ % Bioterrorism and Public Health Preparedness (CDC)
____ % Cancer Control Program (CDC)
____ % Cardiovascular Health Grant (CDC)
____ % Diabetes Prevention and Control (CDC)
____ % Nutrition and Physical Activity Grant to Prevent Obesity and Other Chronic Diseases (CDC)
____ % Preventive Health and Health Services Block Grant (CDC)
____ % Tobacco Information and Prevention (CDC)
____ % WISEWOMAN (CDC)
____ % Steps to a Healthier US (DHHS)
____ % Older Americans Act (Title III)
____ % Maternal and Child Health Block Grant (Title V)
____ % Family Planning (Title X and Title XX)
____ % Medicaid non-EPSDT (Title XIX)
____ % Medicaid EPSDT
____ % Indian Health Services
____ % National Institutes of Health
____ % Ryan White Comprehensive AIDS Resource Emergency Act (HRSA)
____ % Other ⟶ If other, please describe: _____

Continued on next page

Federal Government Funding--Education

____ % Early Childhood Intervention, Individuals with Disabilities Education Act (IDEA)(PL105-17)

____ % Other

↳If other, please describe: _____

Local Government Funding

____ % Local funds (city/county general revenue)

Other revenue, funding sources

____ % Fees, patient charges, or third party reimbursement

____ % Foundation or corporate grants

____ % Other

↳ If other, please describe: _____

25. Put "**1**" in the area of **public health nutrition practice** listed below where you spend the **majority** of your time. If you have **2 areas of practice** place a "**1**" next to the primary area and a "**2**" next to the secondary area. If you have **3 areas** of practice, place a "**1**" next to the 1st, a "**2**" next to the 2nd, and a "**3**" next to the 3rd area. **Do not mark more than 3.**

Assessment

____ Data management, nutrition surveillance or research

____ Community assessments, program planning or evaluation

Population-based interventions

____ Community organization, advocacy or policy development

____ Communication, mass media or social marketing

____ Emergency food, hunger, food security, Commodity Supplemental Foods Program

Management and administration

____ General management and administration

Assurance

____ Health facilities regulation

____ Environmental health and/or food safety

____ Program monitoring and/or quality assurance

____ Breastfeeding peer counselor

____ **Direct client services (Please answer #26)**

Other

____ Please specify: _____

/

26. If you selected **Direct client services** as a major area of your practice, which category below best describes the **majority** of your client work? Place a "**1**" by that category. If the majority of your client caseload is mixed, put a "**1**" by those you see the most, a "**2**" for second and "**3**" for third. **Do not mark more than 3.**

____ General/comprehensive nutrition
____ General women, infants and children
____ General women's nutrition and health
____ General infant nutrition
____ General child health or pediatric nutrition
____ School and/or adolescent health
____ Children with special health care needs, developmental disabilities, chronic illnesses, or high-risk infants and children
____ Breastfeeding
____ Adult health promotion, chronic disease prevention or healthy aging
____ Seniors, geriatrics, adult disabilities, or adult chronic disease control

27. Please check **ALL** degrees and related majors and concentrations you have earned. Also check any degree(s) and related majors and concentrations you are currently working toward.

Type of Degree/Concentration	**Earned**	**Working Toward**
High School Diploma/General Education Development (GED)	①	②
Associate Degree		
Nutrition/dietetics	①	②
Other_____	①	②
Bachelor's Degree		
Nutrition/dietetics	①	②
Public health nutrition/community nutrition	①	②
Home economics/family consumer science/human ecology	①	②
Health education	①	②
Other_____	①	②
Master's Degree		
Nutrition/dietetics	①	②
Public health nutrition/community nutrition	①	②
Home economics/family consumer science/human ecology	①	②
Public health, concentration _____	①	②
Health education	①	②
Other_____	①	②
Doctoral Degree		
Nutrition/dietetics	①	②
Public health nutrition/community nutrition	①	②
Home economics/family consumer science/human ecology	①	②
Public health, concentration _____	①	②
Health education	①	②
Other_____	①	②

28. Which of these five courses have you completed? Check **all** that you have completed and whether they were at the undergraduate or graduate level. If you have a degree in public health, public health nutrition or community nutrition **skip to Question #29**.

Undergraduate

① Environmental health sciences
② Epidemiology
③ Health services administration
④ Social and behavioral sciences
⑤ Statistics

Graduate

① Environmental health sciences
② Epidemiology
③ Health services administration
④ Social and behavioral sciences
⑤ Statistics

29. Please check **ALL** certifications that apply to you.

① Registered dietitian (RD) with Commission on Dietetic Registration (CDR)
② Licensed or certified dietitian in your state
③ Dietetic technician registered (DTR) with CDR
④ Certified diabetes educator (CDE) with American Association of Diabetes Education
⑤ International board certified lactation consultant (IBCLC)
⑥ Other certification in lactation or breastfeeding
⑦ Board certification as a specialist in pediatric nutrition (CSP) with CDR
⑧ Certified health education specialist (CHES)
⑨ Registered nurse (RN)
⑩ Licensed practical nurse (LPN)
⓪ State certified teacher
⓪ Certified in Family & Consumer Sciences (CFCS) with American Association for Family & Consumer Sciences
⓪ Other, please specify: _____

30. If you are **NOT** a RD or DTR, have you taken steps towards becoming a registered dietitian or dietetic technician?

① No, neither ***skip to #33***

② Yes, RD

→ 31. If you are **NOT a RD** and have taken steps to become a registered dietitian, which of the following steps have you taken? Check **all** that apply. ***skip to #33***

① Completed at least a baccalaureate degree
② Completed a didactic program approved by the Commission on Accreditation Approval for Dietetic Education (CAADE)
③ Completed a supervised practice program accredited by CAADE
④ Received a letter from CDR verifying eligibility to take exam

② Yes, DTR

→ 32. If you are **NOT a RD OR DTR** and have taken steps to become a dietetic technician, which of the following steps have you taken? Check **all** that apply.

① Completed at least an associate degree
② Completed a didactic program approved by CAADE
③ Completed a Dietetic Technician Program approved by CAADE
④ Completed a Dietetic Technician Program supervised practice program accredited by CAADE
⑤ Received a letter from CDR verifying eligibility to take exam

33. Which of these national courses have you completed? Check all completed **after January 2000.**

Maternal, Neonatal and Infant Nutrition

① *Intensive Course in Maternal Nutrition*, University of Minnesota, Minneapolis (workshop or Web-based)
② *Neonatal Nutrition Training*, Baylor College of Medicine, Houston, Texas
③ *Neonatal Nutrition and Leadership Education in Pediatric Nutrition*, Indiana University School of Health and Rehabilitative Sciences, Indianapolis, Indiana
④ *Early Steps to Lasting Health: A Self-Study Curriculum on Infant Feeding and Assessment,* Arizona Department of Public Health and University of Tennessee, Knoxville (Web-based)
⑤ *Summer Institute in Maternal and Child Health*, Rocky Mountain Public Health Education Consortium, Salt Lake City, UT

Pediatric Nutrition

⑥ *Intensive Course in Pediatric Nutrition*, University of Iowa, Iowa City
⑦ *Intensive Course in Nutrition for Infants, Children and Adolescents*, University of Alabama, Birmingham, Alabama
⑧ *Pediatric Update Teleconferences*, University of Alabama, Birmingham

Continued on next page

Children with Special Health Care Needs' Nutrition

- ⑨ *Nutrition Update: Children with Special Health Care Needs,* Kennedy Krieger Institute and Virginia Commonwealth University, Washington, DC
- ⑩ *Interdisciplinary Leadership Training in Overweight Prevention and Intervention for Children with Special Health Care Needs,* University of Tennessee, Memphis; Knoxville, TN; Rochester, NY; Portland, OR
- ⓪ *Interdisciplinary Leadership Training in Feeding Children with Special Health Care Needs*, University of Tennessee, Memphis
- ⓪ *Nutrition Makes a Difference: The Team Approach to Feeding*, University of California, Los Angeles, CA
- ⓪ *Beyond Assessment: Series*, University of California, Los Angeles, CA
- ⓪ *Nutrition for Children with Special Health Care Needs*, University of California, Los Angeles, CA (CD-ROM and Web-based modules)

Nutrition Education and WIC

- ⓪ *Nutrition and Breastfeeding Conference,* National WIC Association
- ⓪ WIC Learning Online
- ⓪ *National Nutrition Education Conference*, USDA Food and Nutrition Service

Chronic Disease Prevention, Including Overweight and Obesity

- ⓪ ADA Certificate of Training in Childhood and Adolescent Weight Management
- ⓪ ADA Certificate of Training in Adult Weight Management Program
- ⓪ *Maximizing Resources for Results! Extending* Bright Futures *through Community Based Nutrition Planning,* University of Tennessee, Knoxville and University of North Carolina (workshop or Web-based)
- ⓪ *Moving People and Communities: Extending* Bright Futures *through Physical Activity,* University of Tennessee, Knoxville and University of North Carolina (workshop or Web-based)

Public Health and Leadership Courses

- ⓪ CDC Public Health Preparedness Conference
- ⓪ Regional or National Public Health Leadership Institute
- ⓪ Cooper Institute, Dallas, TX

Other

- ⓪ Others, please provide title and national sponsor/program of courses completed: _____

34. Indicate what level of training you need for your current work. Mark "**None**" if you do not work in that area or do not have additional training needs at this time; "**Basic**" if you need basic training, and "**Advanced**" if you have had basic training and now need advanced or more in-depth training.

Training Areas	None	Basic	Advanced
Client and Population Groups			
Infant and pre-school age nutrition	①	②	③
Childhood nutrition	①	②	③
Adolescent nutrition	①	②	③
Nutrition for children with special needs, developmental disabilities or high risk	①	②	③
Prenatal nutrition	①	②	③
Breastfeeding	①	②	③
Women's health	①	②	③
Adult health promotion, chronic disease control, or healthy aging	①	②	③
Seniors, geriatric nutrition	①	②	③
High risk clients, including HIV positive, addictions	①	②	③
Assessment of nutritional status	①	②	③
Case management/care coordination	①	②	③
Communicating with low literacy populations	①	②	③
Cultural competency	①	②	③
Eating disorders	①	②	③
Nutrition counseling, behavioral change, client education	①	②	③
Supplemental and alternative dietary therapies	①	②	③
Environmental health and/or food safety	①	②	③
Hunger and food security	①	②	③
Assessment skills			
Community nutrition assessment	①	②	③
Target population risk assessment	①	②	③
Data collection, management, surveillance and monitoring systems	①	②	③
Policy Development			
Policy development	①	②	③
Advocacy	①	②	③
Working with policy makers	①	②	③
Program planning	①	②	③
Mass media and communication	①	②	③
Social marketing	①	②	③
Environmental and policy changes to support nutrition	①	②	③
Leadership and team building	①	②	③
Coalitions and partnership-building	①	②	③
Cost effectiveness/benefit analysis	①	②	③
Financial management	①	②	③
Fund raising, proposals and grant writing	①	②	③
General management	①	②	③

Please continue to read on next page

Training Areas	None	Basic	Advanced
Assurance			
Program evaluation	①	②	③
Development of nutrition education materials	①	②	③
Development of practice guidelines	①	②	③
Using practice guidelines	①	②	③
Applied research and evaluation	①	②	③
Consultation skills	①	②	③
Staff training programs	①	②	③
Use of current information technology, including computers	①	②	③
Other, please specify_____	①	②	③

35. Blacken all of the following professional organizations to which you belong.
① American Association of Diabetes Educators
② American Association of Family and Consumer Sciences
③ American Dietetic Association
④ American Public Health Association
⑤ American Public Human Services Association
⑥ Association of State and Territorial Public Health Nutrition Directors
⑦ International Lactation Consultant Association
⑧ International Society for Behavioral Nutrition and Physical Activity
⑨ National WIC Association
⑩ National Association of Child and Adult Care Food Program Professionals
⓪ School Nutrition Association (formerly American School Food Service Association)
⓪ Society for Nutrition Education
⓪ Society of Public Health Educators
⓪ Others, please specify: _____

36. Read each of the following job classification descriptions. Blacken the job classification that is **most similar** to your position. Blacken only **one**.

Job Classification Description	Job Classification	Your choice (Choose one)
No public health nutrition responsibilities.		①
This is the highest-level nutrition position in a state, large city, county or voluntary public health agency. Major functions are policy making, planning/ evaluation, budget control, management and supervision. The position usually heads a nutrition program, with responsibility for conducting a needs assessment, developing a comprehensive plan and budget for nutrition services of the agency and having line authority over staff.	Public health nutrition director	②
This is the second highest administrative and policy making public health nutrition position in a state, large city, county or voluntary public health agency. This position may participate in delegated functions or be assigned primary responsibility for managing the component of one or more major program areas. Major functions include assisting the director in policy making, planning/ evaluation, budget control, management, and supervision. The person in this position serves as Acting Director in the director's absence.	Assistant public health nutrition director	③
This position supervises the work of an assigned number of other nutritionists, nutrition technicians, and nutrition assistants that deliver nutrition services and nutritional care in the public health agency. Supervision includes training, delegating, directing, coordinating, evaluating and reporting the work of subordinates.	Public health nutrition supervisor	④
PLEASE CONTINUE TO READ ON NEXT PAGE		

Job Classification Description	Job Classification	Your choice (Choose one)
This position provides expert technical assistance, professional guidance, and in-service education for staff in program development or case management. Consultation may be given to the administrator, other nutritionists or other health professionals. Staff in this position have both generalized and specialized knowledge and expertise and include those who work out of a central headquarters office or in the health agency's regional or district offices.	Public health nutrition consultant	⑤
This position is employed by the state, city, county or voluntary public health agency to assess the community's nutrition needs, and to plan, direct and evaluate community nutrition intervention programs that meet these needs. Interventions promote health and prevent disease among the population at large.	Public health nutritionist	⑥
This position works as a case manager and/or care coordinator, and nutrition counselor for medically high risk clients requiring physician prescribed complex dietary and nutrition regimens, including enteral and parenteral nutrition support. This position also may work as an educator in programs where more in-depth expertise in therapeutic nutrition is required, including high-risk pregnancy, neonatal pediatric clinics; children's special services; AIDS; and home health and home hospice services.	Clinical nutritionist	⑦
PLEASE CONTINUE TO READ ON NEXT PAGE		

Job Classification Description	Job Classification	Your choice (Choose one)
This position is employed in a city, county or voluntary public health agency primarily to provide nutrition education to the public, and to coordinate and provide direct nutritional care to agency clients in health and throughout the life span. In public health agencies, this position works primarily in maternal and child health clinics, WIC programs and family health or adult health primary care clinics.	Nutritionist	⑧
This position is a paraprofessional in a city, county, or voluntary public health agency and works under the close supervision of a nutritionist to provide routine technical support services in public health agency clinics. This work includes normal nutrition education; screening using prescribed protocols; record keeping; and outreach.	Nutritionist technician	⑨
This position is for auxiliary nutrition workers in a city, county, or voluntary public health agency from the local or indigenous community who are trained on-the-job to work under the close supervision of nutrition professionals to provide routine nutrition education, including interpretation for clients who do not speak English. This position also carries out assigned tasks in client outreach and screening.	Nutrition assistant/aide	⑩
This position is a paraprofessional support person who provides basic breastfeeding information, encouragement and counseling to WIC pregnant and breastfeeding mothers in WIC clinics, by telephone, home visits and/or hospital visits at scheduled intervals, and is available outside usual 8 to 5 working hours. This position informs new mothers about breastfeeding benefits and how to prevent and handle common breastfeeding problems.	Breastfeeding peer counselor	⓪
Other, please describe below.		⓪

37. Gender
    ① Female
    ② Male

38. In what year were you born? _____

39. Do you intend to retire in the next 10 years?
    ① No
    ② Yes
        ↳ If yes, in how many years do you intend to retire? _____ years

40. Ethnicity
    ① Hispanic/Latino
    ② **not** Hispanic/Latino

41. Race (choose all that apply)
    ① American Indian or Alaskan Native
    ② Asian
    ③ Black or African American
    ④ Native Hawaiian or Other Pacific Islander
    ⑤ White

42. From the list below, blacken a "**1**" for your **primary** language. In addition to your primary language, are you sufficiently fluent to use any other language(s) in your work in nutrition? Blacken **that secondary language or languages with a "2."**

Primary	Secondary	
①	②	African language, specify which: _____
①	②	Cambodian/Khmer
①	②	Chinese, specify dialect: _____
①	②	Eastern European language, specify which: _____
①	②	English
①	②	French
①	②	Haitian/Creole
①	②	Hmong
①	②	Korean
①	②	Laotian
①	②	Native American or American Indian language, specify: __
①	②	Portuguese
①	②	Russian
①	②	Sign language
①	②	Spanish
①	②	Tagalog—Filipino language
①	②	Thai
①	②	Vietnamese
①	②	Other, please specify: _____

Thank you for completing the survey, but we request that you release your data for research purposes.

RELEASE OF DATA FOR RESEARCH PURPOSES? We would appreciate if you would help us to learn about trends in the public health nutrition workforce that impact nutrition services for the public. To release your data for research purposes, please answer "yes" to the question below. If you agree to participate, your survey responses will be included in a new research database where your unique identifier will be eliminated and a new one will be assigned based only on the state, territory or Tribal organization where you work. There will be no way to link your responses to your identity. Participation is strictly voluntary and there are no risks to participants or penalty to non-participants. Your response as "yes" will constitute informed consent to release your data for research.

Do you agree to release your responses to the survey for research purposes?

① Yes
② No

The Association of State and Territorial Public Health Nutrition Directors thanks you for your participation.

Appendix C:
2006-07 Public Health Nutrition Workforce Survey for Vacant Positions

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0584-0536. The time required to complete this information collection is estimated to average 0.46 hours per response, including the time to review instructions, search existing data resources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Expires 7/31/2009.

PUBLIC HEALTH NUTRITION WORKFORCE SURVEY
FORM FOR EACH VACANT PUBLIC HEALTH NUTRITION POSITION

WHY? The Association of State and Territorial Public Health Nutrition Directors with support from the United States Department of Agriculture is conducting a survey of public health nutrition personnel, including WIC staff, in all US states, territories, and Tribal organizations. The survey's purpose is to have current information on work responsibilities, areas of practice, training, and compensation and to use the information to support recruitment and retention. Several similar surveys were conducted from 1989 through 2000.

WHO SHOULD COMPLETE THE SURVEY? – This survey is to be completed by state or regional/metropolitan/district directors or managers for any open or vacant position classified as a nutritionist or paraprofessional in a public health program, which includes WIC. The director or manager should answer each question as completely as possible and should complete the survey for each open or vacant position.

Consider a position currently vacant or open even if an offer has been made or if an individual has been hired, but that person has not yet started work. If your agency currently has one or more vacancies for a professional or paraprofessional public health nutritionist, please complete the survey one time for each open or vacant public health nutrition position.

Because the questions are being asked of more than 10,000 nutrition personnel throughout the US and territories, the job titles, names of programs and examples may be somewhat different from the work experience at your location. Nevertheless, choose the answer that is closest to your own situation.

HELP? It will take about 10 minutes at most to respond to the items. If you have questions about this survey or how to answer specific questions, contact your supervisor.

USE OF INFORMATION? A unique identifier for each open or vacant position was assigned by the state or regional/metropolitan/local nutrition director or manager. The purpose of the unique identifier is to allow your state nutrition director to follow-up with non-respondents. Your name and contact information is separate from the database and will NOT be entered at any time. Answers to the questions will be summarized and aggregated and then published in a report, which will be sent to your state nutrition director. No individual answers, persons or specific agencies will be identified in the report.

TO BEGIN THE SURVEY: Please enter your unique 9-digit identifier provided by your nutrition director:

___ ___ ___ ___ ___ ___ ___ ___ ___

The Association of State and Territorial Public Health Nutrition Directors thanks you for your participation.

Check the type of agency with the vacant position. **Blacken only one.**

① State government health agency
② Local government (city, county) health agency
③ Indian Health Services, tribal agency or tribal health center
④ Non-profit organization
⑤ For-profit organization
⑥ Other, please specify _____

Check the **primary location** of the vacant position. **Blacken only one.**

① Central office of state government health agency
② Central office of district or regional (sub-state) government health agency
③ Central office of local (county, city or multi-county) government health agency
④ Community/rural/migrant health center or clinic
⑤ Field office or clinic of a government health agency
⑥ HMO or other managed care setting
⑦ Hospital
⑧ Indian Health Services, tribal agency or tribal health center
⑨ Other private/independent entity/office
⑩ Other, please specify _____

3. Read each of the following position descriptions. Blacken the **one** position description that best describes the vacant position.

① No public health nutrition responsibilities. **STOP HERE**. Return the questionnaire
② This is the highest-level nutrition position in a state, large city, county or voluntary public health agency. Major functions of this position are policy making, planning/evaluation, fiscal control, management and supervision. The position is usually the head of a nutrition program unit, where this position is responsible for conducting a needs assessment, developing a comprehensive plan and budget for the nutrition services of the agency and has line authority over staff.
③ This is the second highest administrative and policy making public health nutrition position in a state, large city, county or voluntary public health agency. This position may participate in several delegated functions or be assigned primary responsibility for managing the nutrition component of one or more major program areas. Major functions of this position include assisting the director in policy making, planning/evaluation, fiscal control, management, and supervision. The person in this position serves as Acting Director in the director's absence.
④ This position supervises the work of an assigned number of other nutritionists, nutrition technicians, and nutrition assistants that deliver nutrition services and nutritional care in the public health agency. Supervision includes training, delegating, directing, coordinating, evaluating and reporting the work of subordinates.
⑤ This position provides expert technical assistance, professional guidance, and in service education for staff in program development or case management. Consultation may be given to the administrator, other nutritionists or other health professionals. Staff in this position have both generalized and specialized knowledge and expertise and include those who work out of a central headquarters office or in the health agency's regional or district offices.

Continued on next page

⑥ This position is employed by the state, city, county or voluntary public health agency to assess the community's nutrition needs, and to plan, direct and evaluate community nutrition intervention programs that meet these needs. Interventions promote health and prevent disease among the population at large.

⑦ This position works as a case manager and/or care coordinator, and nutrition counselor for medically high risk clients requiring physician prescribed complex dietary and nutrition regimens, including enteral and parenteral nutrition support. This position also may work as an educator in programs where more in-depth expertise in therapeutic nutrition is required, including high-risk pregnancy, neonatal and pediatric clinics; children's special services; AIDS; and home health and home hospice services.

⑧ This position is employed in a city, county or voluntary public health agency primarily to provide nutrition education to the public, and to coordinate and provide direct nutritional care to agency clients in health and disease throughout the life span. In public health agencies, this position works primarily in maternal and child health clinics, WIC programs and family health or adult health primary care clinics.

⑨ This position is paraprofessional in a city, county, or voluntary public health agency and works under the close supervision of a nutritionist to provide routine technical support services in public health agency clinics. This work includes normal nutrition education; screening using prescribed protocols; record keeping; and outreach.

⑩ This position is for auxiliary nutrition workers in a city, county, or voluntary public health agency from the local or indigenous community who are trained on-the-job to work under the close supervision of nutrition professionals to provide routine nutrition education, including interpretation for clients who do not speak English. This position also carries out assigned tasks in client outreach and screening.

⓪ This position is a paraprofessional support person who provides basic breastfeeding information, encouragement and counseling to WIC pregnant and breastfeeding mothers in WIC clinics, by telephone, home visits and/or hospital visits at scheduled intervals, and is available outside usual 8 to 5 working hours. This position informs new mothers about breastfeeding benefits and how to prevent and handle common breastfeeding problems.

⓪ Other, please specify _____

Is the vacancy in the WIC program?

① Yes

② No

Is the vacant position full time or part-time? (Full time equals the number of hours per week defined by your personnel system.)

① Full time—100%

↳ 6. Please record the **ANNUAL** salary for the job classification as established by the agency's personnel system. Round to the nearest dollar. If the employer does not have or disclose an established salary range for the position, enter "not disclosed."

Minimum or first step: $ _____ per year

Maximum or highest step: $ _____ per year

② Part-time

↳ 7. If part-time, write in the current percent time ____ %

8. Does the vacant position provide any of the following benefits? Mark all that apply.

① Health insurance
② Retirement
③ Sick leave
④ Vacation time
⑤ None of the above

9. Identify ALL sources of funding for the vacant position. If the position is funded from more than one source, write in the percent of time from each funding source. If you are not sure about sources of funds for the position, ask your program manager or the contact person. The answer should add up to 100%.

First example: The position is half time (50%) and funded completely by WIC. Check "WIC" and write in "100."

Second example: The position is halftime. It is funded half by WIC and half by the Maternal and Child Health Block Grant. Enter "50" for both WIC and MCH Block Grant.

Third example: The position is full time. It is paid for by a grant from a local foundation. Write "100" in Foundation or corporate grants.

State or Tribal Government Funding

____ % Non-specified funds
____ % Funds legislatively earmarked for nutrition
____ % Tobacco settlement monies
____ % Other ⟶ If other, please describe: _____

Continued on next page

Federal Government Funding--Department of Agriculture (USDA)

____ % WIC
____ % Food Stamp Nutrition Education
____ % Child and Adult Care Food Program and/or NET
____ % Other USDA, e.g., Commodity Supplemental Food Program

Federal Government Funding--Department of Health and Human Services (US DHHS)

____ % Bioterrorism and Public Health Preparedness (CDC)
____ % Cancer Control Program (CDC)
____ % Cardiovascular Health Grant (CDC)
____ % Diabetes Prevention and Control (CDC)
____ % Nutrition and Physical Activity Grant to Prevent Obesity and Other Chronic Diseases (CDC)
____ % Preventive Health and Health Services Block Grant (CDC)
____ % Tobacco Information and Prevention (CDC)
____ % WISEWOMAN (CDC)
____ % Steps to a Healthier US (DHHS)
____ % Older Americans Act (Title III)
____ % Maternal and Child Health Block Grant (Title V)
____ % Family Planning (Title X and Title XX)
____ % Medicaid non-EPSDT (Title XIX)
____ % Medicaid EPSDT
____ % Indian Health Services
____ % National Institutes of Health
____ % Ryan White Comprehensive AIDS Resource Emergency Act (HRSA)
____ % Other → If other, please describe: _____

Federal Government Funding--Education

____ % Early Childhood Intervention, Individuals with Disabilities Education Act (IDEA)(PL105-17)
____ % Other
↳ If other, please describe: _____

Local Government Funding

____ % Local funds (city/county general revenue)

Other revenue, funding sources

____ % Fees, patient charges, or third party reimbursement
____ % Foundation or corporate grants
____ % Other
↳ If other, please describe: _____

10. Put "**1**" in the area of **public health nutrition practice** listed below in which the person in the position will spend the **majority** of his/her time. If the person in the position will have **2 areas of practice** place a "**1**" next to the primary area and a "**2**" next to the secondary area. If the person will have **3 areas** of practice, place a "**1**" next to the 1st, a "**2**" next to the 2nd, and a "**3**" next to the 3rd area. **Do not mark more than 3.**

Assessment
____ Data management, nutrition surveillance or research
____ Community assessments, program planning or evaluation
Population-based interventions
____ Community organization, advocacy or policy development
____ Communication, mass media or social marketing
____ Emergency food, hunger, food security, Commodity Supplemental Foods Program
Management and administration
____ General management and administration
Assurance
____ Health facilities regulation
____ Environmental health and/or food safety
____ Program monitoring and/or quality assurance
____ Breastfeeding peer counselor
____ **Direct client services (Please answer #11)**
Other
____ Please specify: _____

11. If you selected **Direct client services** as a major area of the vacant position's practice, which category below best describes the **majority** of the position's client work? Place a "**1**" by that category. If the majority of the position's client caseload is mixed, put a "**1**" by those you see the most, a "**2**" for second and "**3**" for third. **Do not mark more than 3.**
____ General/comprehensive nutrition
____ General women, infants and children
____ General women's nutrition and health
____ General infant nutrition
____ General child health or pediatric nutrition
____ School and/or adolescent health
____ Children with special health care needs, developmental disabilities, chronic illnesses, or high-risk infants and children
____ Breastfeeding
____ Adult health promotion, chronic disease prevention or healthy aging
____ Seniors, geriatrics, adult disabilities, or adult chronic disease control

RELEASE OF DATA FOR RESEARCH PURPOSES? We would appreciate if you would help us to learn about trends in the public health nutrition workforce that impact nutrition services for the public. To release your data for research purposes, please answer "yes" to the question below. If you agree to participate, your survey responses will be included in a new research database where your unique identifier will be eliminated and a new one will be assigned based only on the state, territory or Tribal organization where you work. There will be no way to link your responses to your identity. Participation is strictly voluntary and there are no risks to participants or penalty to non-participants. Your response as "yes" will constitute informed consent to release your data for research.

Do you agree to release your responses to the survey for research purposes?

① Yes

② No

The Association of State and Territorial Public Health Nutrition Directors thanks you for your participation.

Appendix D:

Filled Position Survey Items and Variable Names

Table D.1. Filled position survey items and variable names.

Question	Variable name	Variable label
Used to enter survey website	Password	ID
Entered on first page	PositionID	Please enter the 9 digit unique identifier you were assigned.
Created by SPSS from PositionID	State	State
Created by SPSS	completed	Completed successfully
Created by SPSS	in_progress	Active / In progress
Created by SPSS	timedout	Timed out
Created by SPSS	stopped_by_script	Stopped by script
Created by SPSS	stopped_by_respondent	Stopped by respondent
Created by SPSS	interview_system_shutdown	Interview system shutdown
Created by SPSS	start_time	Interview start time
Created by SPSS	end_time	Interview finish time
Have you successfully completed this survey for another position?	CompletedSurvey	Have you successfully completed this survey for another position?
(If yes) Enter the Unique ID that you used to previously complete the survey.	PreviousID	Enter the Unique ID that you used to previously complete the survey.
Select the type of agency where you are employed (or contracted). • State government health agency • Local government (city, county) health agency • Indian Health Services, tribal agency or tribal health center • Non-profit organization • For-profit organization • Other	agency	Agency type
Other agency string	agency1	Other agency

Table D.1. Continued.

Question	Variable name	Variable label
Select the primary location where you work. • Central office of state government health agency. • Central office of district or regional (sub-state) government health agency • Central office of local (county, city or multi-county) government health agency • Community/rural/migrant health center or clinic • Field office or clinic of a government health agency • HMO or other managed care setting • Hospital • Indian Health Services, tribal agency or tribal health center • Other private/independent entity/office • Other	loc	Primary location
Other location string	loc1	Other location
Enter your current position or job classification title in the blank.	title	Enter your current position or job classification title in the blank.
Read each of the following position descriptions. Select the one position description that is most similar to your position.	Position	Job Classification
How many years, including part-time employment, have you practiced/been employed in the field of dietetics and/or nutrition? Enter the total number of years, rounding to the nearest year. If less than 6 months, enter "0."	YrsEmp	Years in dietetics
Of the total number of years reported above, for how many years have you practiced public health nutrition, including WIC? Enter the total number of years, rounding to the nearest year. If less than 6 months, enter "0."	YrsPHN	Years in public health nutrition
Are you currently working in a WIC program?	TRASH_WIC	WIC/Non-WIC
If yes, how many years have you been working in the WIC program?	YrsWIC	Years in WIC

Table D.1. Continued.

Question	Variable name	Variable label
For how many full time equivalent employees (FTEs), positions, and/or consultants do you have **direct** responsibility for hiring, firing, promoting, and performance reviews? Include any positions that are currently vacant. Enter the number converted to full time equivalents (please round up or down). If you do not have these responsibilities, enter "0."	DirectFTE	Direct responsibility for FTEs
How many FTEs are nutrition professionals?	ntr_fte	Nutrition FTEs
How many FTEs are other health related professionals (such as biostatisticians, epidemiologists, evaluators, health educators, nurses, physical education professionals, or social workers)?	ProfFTE	Health related professional FTEs
How many FTEs are management or program support staff (such as clerical/issuance/eligibility determination staff, commodity foods/NET staff, information technology staff, fiscal staff, other managers or vendors)?	support_fte	Management or program support staff FTEs
How many FTEs are paraprofessionals (such as diet technicians, health aides, health screeners, LPNs, peer counselors, or translators)?	ParaFTE	Paraprofessional FTEs
For how many full time equivalent employees (FTEs), positions, and/or consultants are you responsible? This includes employees for whom you have both **direct** responsibility for hiring, managing, promoting, and firing, and **indirect** responsibility for oversight, technical assistance, or consultation. If you do not have these responsibilities, enter "0."	totalFTE	Direct and indirect responsibility for FTEs
How much fiscal and budgetary responsibility and control do you have in your current position? • None • Responsible for a specific budget • Responsible for entire agency nutrition program budget	budget	Fiscal and budgetary responsibility
In a typical month, what percent of your time do you spend in direct client services, such as nutritional assessments, individual counseling, group education, or developing care plans? (Do not include working with health professionals or other organizations.) *Enter your percent time as a whole number and do not use %.*	TimeDirect	Percent time in direct client services

Table D.1. Continued.

Question	Variable name	Variable label
Do you work full time or part time? (Full time equals the number of hours per week defined by your personnel system.)	FullPart	Full Time or Part Time
If Part time, indicate the current percent time	PartTime	Part Time
Are you currently contracted to your agency or employed by your agency?	ContEmp	Contracted or Employed
At what rate are you paid? • Hourly • Daily • Annually • For specific services or products • Retainer	PayRate	Pay rate
Please enter your ANNUAL salary. Round to the nearest dollar. (Please enter numbers only. Do not include commas, dollar signs or periods.)	Salary	Annual salary
Please enter the ANNUAL minimum or first step salary for your job classification as established by your agency's personnel system. Round to the nearest dollar. (Please enter numbers only. Do not include commas, dollar signs or periods.)	MinSal	Annual minimum salary
Do you receive any of the following benefits?		
• Health insurance	HINS23	Health insurance
• Retirement	Retirement23	Retirement
• Sick leave	SickLeave23	Sick leave
• Vacation time	Vacation23	Vacation time
• None of the above	None23	No benefits
On the next page, check ALL sources of funding for your position. If your position is funded from more than one source, write in the percent of your time from each funding source. If you are not sure about sources of funds for your position, ask your program manager or the contact person. Your answers should add up to 100%		

Table D.1. Continued.

Question	Variable name	Variable label
• State/Tribal--Non-specified funds	NonState24	State/Tribal--Non-specified funds
• State/Tribal--Funds earmarked for nutrition	LegState24	State/Tribal--Funds earmarked for nutrition
• State/Tribal--Tobacco settlement monies	TobState24	State/Tribal--Tobacco settlement monies
• State/Tribal--Other state/tribal government funding	OtherState24	State/Tribal--Other state/tribal government funding
• Please describe the "other" State/Tribal funding source for your position:	StateOther124	Please describe the "other" State/Tribal funding source for your position:
• USDA--WIC	WicUSDA24	USDA--WIC
• USDA--Food Stamp Nutrition Education	FoodStampUSDA24	USDA--Food Stamp Nutrition Education
• USDA--Child and Adult Care Food Program and/or NET	CACFPUSDA24	USDA--Child and Adult Care Food Program and/or NET
• USDA--Other	OtherUSDA24	USDA--Other
• US DHHS--Bioterrorism and Public Health Preparedness (CDC)	BioDHHS24	US DHHS--Bioterrorism and Public Health Preparedness (CDC)
• US DHHS-- Cancer Control Program (CDC)	CancerDHHS24	US DHHS-- Cancer Control Program (CDC)
• US DHHS--Cardiovascular Health Grant (CDC)	CvDHHS24	US DHHS--Cardiovascular Health Grant (CDC)
• US DHHS--Diabetes Prevention and Control (CDC)	DmDHHS24	US DHHS--Diabetes Prevention and Control (CDC)
• US DHHS-- Nutrition and Physical Activity Grant to Prevent Obesity and Other Chronic Diseases (CDC))	NtrDHHS24	US DHHS-- Nutrition and Physical Activity Grant to Prevent Obesity and Other Chronic Diseases (CDC))
• US DHHS-- Preventive Health and Health Services Block Grant (CDC)	PrevDHHS24	US DHHS-- Preventive Health and Health Services Block Grant (CDC)
• US DHHS--Tobacco Information and Prevention (CDC)	TobDHHS24	US DHHS--Tobacco Information and Prevention (CDC)
• US DHHS--WISEWOMAN (CDC)	WiseDHHS24	US DHHS--WISEWOMAN (CDC)
• US DHHS--Steps to a Healthier US (DHHS)	StepsDHHS24	US DHHS-Steps to a Healthier US-DHHS
• US DHHS--Older Americans Act (Title III)	OlderDHHS24	US DHHS--Older Americans Act (Title III)

Table D.1. Continued.

Question	Variable name	Variable label
• US DHHS--Maternal and Child Health Block Grant (Title V)	MchbDHHS24	US DHHS--Maternal and Child Health Block Grant (Title V)
• US DHHS--Family Planning (Title X and Title XX)	FamDHHS24	US DHHS--Family Planning (Title X and Title XX)
• US DHHS--Medicaid non-EPSDT (Title XIX)	MedNonDHHS24	US DHHS--Medicaid non-EPSDT (Title XIX)
• US DHHS--Medicaid EPSDT	MedDHHS24	US DHHS--Medicaid EPSDT
• US DHHS--Indian Health Services	IhsDHHS24	US DHHS--Indian Health Services
• US DHHS--National Institutes of Health	NihDHHS24	US DHHS--National Institutes of Health
• US DHHS--Ryan White Comprehensive AIDS Resource Emergency Act (HRSA)	AidsDHHS24	US DHHS--Ryan White Comprehensive AIDS Resource Emergency Act (HRSA)
• US DHHS—Other	OtherDHHS24	US DHHS--Other
• Please describe the "other" DHHS funding source for your position:	DHHSOther124	Please describe the "other" DHHS funding source for your position:
• Federal Education--Early Childhood Intervention, Individuals with Disabilities Education Act (IDEA)(PL105-17)'	IdeaFed24	Federal Education--Early Childhood Intervention, Individuals with Disabilities Education Act (IDEA)(PL105-17)'
• Federal Education--Other federal government education funding	OtherFed24	Federal Education--Other federal government education funding
• Please describe the other federal funding source for your position:	FederalOther124	Please decribe the other federal funding source for your position:
• Local--Local funds (city/county general revenue)	LocLOC24	Local--Local funds (city/county general revenue)
• Other--Fees, patient charges or third-party reimbursement'	FeesOther24	Other--Fees, patient charges or third-party reimbursement'
• Other--Foundation or corporate grants	GrantOther24	Other--Foundation or corporate grants
• Other	OtherOther24	Other
• Please describe the "other" funding source for your position:	OtherOther124	Please describe the "other" funding source for your position:

Table D.1. Continued.

Question	Variable name	Variable label
Primary area of public health nutrition practice • Data management, nutrition surveillance or research • Community assessments, program planning or evaluation • Community organization, advocacy or policy development • Communication, mass media or social marketing • Emergency food, hunger, food security, Commodity Supplemental Foods Program • General management and administration • Health facilities regulation • Environmental health and/or food safety • Program monitoring and/or quality assurance • Breastfeeding counseling/coordination • Direct client services • Other, please describe below	PHNPracPrim	Primary public health nutrition practice area
Secondary area of public health nutrition practice (choices same as primary)	PHNPracSec	Secondary public health nutrition practice area
Tertiary area of public health nutrition practice (choices same as primary)	PHNPracTert	Tertiary public health nutrition practice area
If your area of practice was not listed, please describe:	PHNPracOther	If other, please describe:
If your area of practice was not listed, please describe:	PHNPracOther1	If your area of practice was not listed, please describe:

Table D.1. Continued.

Question	Variable name	Variable label
Identify which category best describes the majority of your direct client work by choosing it from the first box below. If the majority of your client caseload is mixed, choose the group you see most in the first box, the second in the second box and the third in the third box. • General/comprehensive nutrition • General women, infants and children • General women's nutrition and health • General infant nutrition • General child health or pediatric nutrition • School and/or adolescent health • Children with special health care needs, developmental disabilities, chronic illnesses, or high-risk infants and children • Breastfeeding • Adult health promotion, chronic disease prevention or healthy aging • Seniors, geriatrics, adult disabilities, or adult chronic disease control	DirSvcPrim	Primary Client Caseload
See above	DirSvcSec	Secondary Client Caseload
See above	DirSvcTer	Tertiary Client Caseload
Please check all degrees and related majors and concentrations you have earned. Also select any degree(s) and related majors and concentrations you are currently working toward. Please specify degree type and concentration if necessary in the box below.		
• High School Diploma/General Education Development (GED)	HS27	High School Diploma/General Education Development (GED)
• Associate's Degree in Nutrition/dietetics	NtrA27	Associate's degree in nutrition/dietetics
• Other Associate's Degree (specify below)	OtherA27	Other Associate's degree
• Bachelor's Degree in Nutrition/dietetics	NtrB27	Bachelor's degree in nutrition/dietetics
• Bachelor's Degree in Public health nutrition/community nutrition	PhnB27	Bachelor's degree in public health nutrition/community nutrition

Table D.1. Continued.

Question	Variable name	Variable label
• Bachelor's Degree in Home economics/family consumer science/human ecology	HomeEcB27	Bachelor's degree in home economics/family consumer science/human ecology
• Bachelor's degree in Health education	HEduB27	Bachelor's degree in health education
• Other Bachelor's Degree (specify below)	OtherB27	Other Bachelor's degree
• Master's Degree in Nutrition/dietetics	NtrM27	Master's degree in nutrition/dietetics
• Master's Degree in Public health nutrition/community nutrition	PhnM27	Master's degree in public health nutrition/community nutrition
• Master's Degree in Home economics/family consumer science/human ecology	HomeEcM27	Master's degree in home economics/family consumer science/human ecology
• Master's Degree in Public health (specify concentration below)	PHM27	Master's degree in public health
• Master's Degree in Health education	HEduM27	Master's degree in health education
• Other Master's Degree (specify below)	OtherM27	Other Master's degree
• Doctoral Degree in Nutrition/dietetics	NtrD27	Doctoral degree in nutrition/dietetics
• Doctoral Degree in Public health nutrition/community nutrition	PhnD27	Doctoral degree in public health nutrition/community nutrition
• Doctoral Degree in Home economics/family consumer science/human ecology	HomeEcD27	Doctoral degree in home economics/family consumer science/human ecology
• Doctoral Degree in Public health (specify concentration below)	PHD27	Doctoral degree in public health
• Doctoral Degree in Health education	HEduD27	Doctoral degree in health education
• Other Doctoral Degree (specify below)	OtherD27	Other Doctoral degree
Please specify other degree type not listed and/or Public Health concentration:	OtherDegreeConcentration27	Please specify other degree type not listed and/or Public Health concentration:
Have you earned a degree in Public Health, Public Health Nutrition or Community Nutrition?	Earned27	Degree in public health

Table D.1. Continued.

Question	Variable name	Variable label
Please indicate which of the following degrees you have earned (check all that apply): • Bachelor's Degree in Public health nutrition/community nutrition • Master's Degree in Public health nutrition/community nutrition • Master's Degree in Public health • Doctoral Degree in Public health nutrition/community nutrition • Doctoral Degree in Public health	PHDegrees27	Public health degrees you have earned
Indicate which of the following courses you have completed and whether they were at the undergraduate or graduate level.		
• Environmental health sciences	EnvUClass	Undergraduate
• Environmental health sciences	EnvGClass	Graduate
• Epidemiology	EpiUClass	Undergraduate
• Epidemiology	EpiGClass	Graduate
• Health services administration	HsvUClass	Undergraduate
• Health services administration	HsvGClass	Graduate
• Social and behavioral sciences	SocUClass	Undergraduate
• Social and behavioral sciences	SocGClass	Graduate
• Statistics	StatUClass	Undergraduate
• Statistics	StatGClass	Graduate
Are you currently a Registered Dietitian (RD) with the Commission on Dietetic Registration (CDR)?	RD	RD
Are you currently a Dietetic Technician Registered (DTR) with CDR?	DTR	DTR
Please check ALL certifications that apply to you.		
• Licensed or certified dietitian in your state	LiscCert	Licensed/certified dietitian
• Certified diabetes educator (CDE) with American Association of Diabetes Education	CDECert	Certified diabetes educator (CDE) with American Association of Diabetes Education
• International board certified lactation consultant (IBCLC)	IBCLCCert	International board certified lactation consultant (IBCLC)

Table D.1. Continued.

Question	Variable name	Variable label
• Other certification in lactation or breastfeeding	LactCert	Other certification in lactation or breastfeeding
• Board certification as a specialist in pediatric nutrition (CSP) with CDR	CSPCert	Board certification as a specialist in pediatric nutrition (CSP) with CDR
• Certified health education specialist (CHES)	CHESCert	Certified health education specialist (CHES)
• Registered nurse (RN)	RNCert	Registered nurse (RN)
• Licensed practical nurse (LPN)	LPNCert	Licensed practical nurse (LPN)
• State certified teacher	TeachCert	State certified teacher
• Certified in Family & Consumer Sciences (CFCS) with American Association for Family & Consumer Sciences	CFCSCert	Certified in Family & Consumer Sciences (CFCS) with American Association for Family & Consumer Sciences
• Other, please specify:	OtherCertYN	Other certification
If you are NOT a RD and have taken steps to become a registered dietitian, which of the following steps have you taken? Check all that apply.		
• Completed at least a baccalaureate degree	BacRD	Completed at least a baccalaureate degree
• Completed a didactic program approved by the Commission on Accreditation Approval for Dietetic Education (CAADE)	DidacticRD	Completed a didactic program approved by the Commission on Accreditation Approval for Dietetic Education (CAADE)
• Completed a supervised practice program accredited by CAADE	SupPracRD	Completed a supervised practice program accredited by CAADE
• Received a letter from CDR verifying eligibility to take exam	CDRRD	Received a letter from CDR verifying eligibility to take exam
• None of the above	NoneRD	None of the above

Table D.1. Continued.

Question	Variable name	Variable label
If you are NOT a RD OR DTR and have taken steps to become a dietetic technician, which of the following steps have you taken? Check all that apply.		
• Completed at least an associate degree	AssocDTR	Completed at least an associate degree
• Completed a didactic program approved by CAADE	DidacticDTR	Completed a didactic program approved by CAADE
• Completed a Dietetic Technician Program approved by CAADE	ProgramDTR	Completed a Dietetic Technician Program approved by CAADE
• Completed a Dietetic Technician Program supervised practice program accredited by CAADE	SupPracDTR	Completed a Dietetic Technician Program supervised practice program accredited by CAADE
• Received a letter from CDR verifying eligibility to take exam	CDRDTR	Received a letter from CDR verifying eligibility to take exam
• None of the above	NoneDTR	None of the above
Indicate which of the following courses you have completed (if after January 2000).		
• Intensive Course in Maternal Nutrition, University of Minnesota, Minneapolis (workshop or Web-based)	IntM32	Intensive Course in Maternal Nutrition, University of Minnesota, Minneapolis (workshop or Web-based)
• Neonatal Nutrition Training, Baylor College of Medicine, Houston, Texas	NNtrM32	Neonatal Nutrition Training, Baylor College of Medicine, Houston, Texas
• Neonatal Nutrition and Leadership Education in Pediatric Nutrition, Indiana University School of Health and Rehabilitative Sciences, Indianapolis, Indiana	NNlM32	Neonatal Nutrition and Leadership Education in Pediatric Nutrition, Indiana University School of Health and Rehabilitative Sciences, Indianapolis, Indiana
• Early Steps to Lasting Health: A Self-Study Curriculum on Infant Feeding and Assessment, Arizona Department of Public Health and University of Tennessee, Knoxville (Web-based)	StepM32	Early Steps to Lasting Health: A Self-Study Curriculum on Infant Feeding and Assessment, Arizona Department of Public Health and University of Tennessee, Knoxville (Web-based)

Table D.1. Continued.

Question	Variable name	Variable label
• Summer Institute in Maternal and Child Health, Rocky Mountain Public Health Education Consortium, Salt Lake City, UT	Summ32	Summer Institute in Maternal and Child Health, Rocky Mountain Public Health Education Consortium, Salt Lake City, UT
• Intensive Course in Pediatric Nutrition, University of Iowa, Iowa City	InPedP32	Intensive Course in Pediatric Nutrition, University of Iowa, Iowa City
• Intensive Course in Nutrition for Infants, Children and Adolescents, University of Alabama, Birmingham, Alabama	ChildP32	Intensive Course in Nutrition for Infants, Children and Adolescents, University of Alabama, Birmingham, Alabama
• Pediatric Update Teleconferences, University of Alabama, Birmingham	PedUpdP32	Pediatric Update Teleconferences, University of Alabama, Birmingham
• Nutrition Update: Children with Special Health Care Needs, Kennedy Krieger Institute and Virginia Commonwealth University, Washington, DC	NtrUpdC32	Nutrition Update: Children with Special Health Care Needs, Kennedy Krieger Institute and Virginia Commonwealth University, Washington, DC
• Interdisciplinary Leadership Training in Overweight Prevention and Intervention for Children with Special Health Care Needs, University of Tennessee, Memphis; Knoxville, TN; Rochester, NY; Portland, OR	OWC32	Interdisciplinary Leadership Training in Overweight Prevention and Intervention for Children with Special Health Care Needs, University of Tennessee, Memphis; Knoxville, TN; Rochester, NY; Portland, OR
• Interdisciplinary Leadership Training in Feeding Children with Special Health Care Needs, University of Tennessee, Memphis	SHCNC32	Interdisciplinary Leadership Training in Feeding Children with Special Health Care Needs, University of Tennessee, Memphis
• Nutrition Makes a Difference: The Team Approach to Feeding, University of California, Los Angeles, CA	DiffC32	Nutrition Makes a Difference: The Team Approach to Feeding, University of California, Los Angeles, CA
• Beyond Assessment: Series, University of California, Los Angeles, CA	BeyondC32	Beyond Assessment: Series, University of California, Los Angeles, CA
• Nutrition for Children with Special Health Care Needs, University of California, Los Angeles, CA (CD-ROM and Web-based modules)	CSHCNC32	Nutrition for Children with Special Health Care Needs, University of California, Los Angeles, CA (CD-ROM and Web-based modules)

Table D.1. Continued.

Question	Variable name	Variable label
• Nutrition and Breastfeeding Conference, National WIC Association	BFN32	Nutrition and Breastfeeding Conference, National WIC Association
• WIC Learning Online	WicLOlN32	WIC Learning Online
• National Nutrition Education Conference, USDA Food and Nutrition Service	NtlN32	National Nutrition Education Conference, USDA Food and Nutrition Service
• ADA Certificate of Training in Childhood and Adolescent Weight Management	ChildDz32	ADA Certificate of Training in Childhood and Adolescent Weight Management
• ADA Certificate of Training in Adult Weight Management Program	AdultDz32	ADA Certificate of Training in Adult Weight Management Program
• Maximizing Resources for Results! Extending Bright Futures through Community Based Nutrition Planning, University of Tennessee, Knoxville and University of North Carolina (workshop or Web-based)	MaxDz32	Maximizing Resources for Results! Extending Bright Futures through Community Based Nutrition Planning, University of Tennessee, Knoxville and University of North Carolina (workshop or Web-based)
• Moving People and Communities: Extending Bright Futures through Physical Activity, University of Tennessee, Knoxville and University of North Carolina (workshop or Web-based)	MoveDz32	Moving People and Communities: Extending Bright Futures through Physical Activity, University of Tennessee, Knoxville and University of North Carolina (workshop or Web-based)
• CDC Public Health Preparedness Conference	CdcPH32	CDC Public Health Preparedness Conference
• Regional or National Public Health Leadership Institute	PhliPH32	Regional or National Public Health Leadership Institute
• Cooper Institute, Dallas, TX	CoopPH32	Cooper Institute, Dallas, TX
• Others, please provide title and national sponsor/program of courses completed:	Other32	Others, please provide title and national sponsor/program of courses completed:

Table D.1. Continued.

Question	Variable name	Variable label
Indicate what level of training you need for your current work. Mark "None" if you do not work in that area or do not have additional training needs at this time; "Basic" if you need basic training, and "Advanced" if you have had basic training and now need advanced or more in-depth training.		
• Infant and pre-school age nutrition	Inf33	Infant and pre-school age nutrition
• Childhood nutrition	Child33	Childhood nutrition
• Adolescent nutrition	Adol33	Adolescent nutrition
• Nutrition for children with special needs, developmental disabilities or high risk	CSN33	Nutrition for children with special needs, developmental disabilities or high risk
• Prenatal nutrition	Pre33	Prenatal nutrition
• Breastfeeding	BF33	Breastfeeding
• Women's health	Womens33	Women's health
• Adult health promotion, chronic disease control, or healthy aging	Adult33	Adult health promotion, chronic disease control, or healthy aging
• Seniors, geriatric nutrition	Senior33	Seniors, geriatric nutrition
• High risk clients	HighRisk33	High risk clients
• Assessment of nutritional status	Asst33	Assessment of nutritional status
• Case management/care coordination	Case33	Case management/care coordination
• Communicating with low literacy populations	Comm33	Communicating with low literacy populations
• Cultural competency	CultComp33	Cultural competency
• Eating disorders	ED33	Eating disorders
• Nutrition counseling, behavioral change, client education	NtrCounsel33	Nutrition counseling, behavioral change, client education
• Supplemental and alternative dietary therapies	Suppl33	Supplemental and alternative dietary therapies
• Environmental health and/or food safety	Envrt33	Environmental health and/or food safety
• Hunger and food security	Hunger33	Hunger and food security
• Community nutrition assessment	NtrAsst33	Community nutrition assessment

Table D.1. Continued.

Question	Variable name	Variable label
• Target population risk assessment	Target33	Target population risk assessment
• Data collection, management; surveillance and monitoring systems	Data33	Data collection, management; surveillance and monitoring systems
• Policy development	PolicyDev33	Policy development
• Advocacy	Advocacy33	Advocacy
• Working with policy makers	PolicyMkrs33	Working with policy makers
• Program planning	PgmPlan33	Program planning
• Mass media and communication	Media33	Mass media and communication
• Social marketing	SocMktg33	Social marketing
• Environmental and policy changes to support nutrition	PolicyChg33	Environmental and policy changes to support nutrition
• Leadership and team building	Leadership33	Leadership and team building
• Coalitions and partnership-building	Coalitions33	Coalitions and partnership-building
• Cost effectiveness/benefit analysis	CostEffect33	Cost effectiveness/benefit analysis
• Financial management	FinancMgmt33	Financial management
• Fund raising, proposals and grant writing	Fundraising33	Fund raising, proposals and grant writing
• General management	Mgmt33	General management
• Program evaluation	PgmEval33	Program evaluation
• Development of nutrition education materials	DevNtrEd33	Development of nutrition education materials
• Development of practice guidelines	DevPg33	Development of practice guidelines
• Using practice guidelines	UsePG33	Using practice guidelines
• Applied research and evaluation	AppResearch33	Applied research and evaluation
• Consultation skills	Consultat33	Consultation skills
• Staff training programs	StaffTrain33	Staff training programs
• Use of current information technology, including computers	InfoTech33	Use of current information technology, including computers

Table D.1. Continued.

Question	Variable name	Variable label
• If you need other training for your current work that was not specified above, please describe it here, including the level of training that is needed.	OtherTrain33	If you need other training for your current work that was not specified above, please describe it here, including the level of training that is needed.
Check all of the following professional organizations to which you belong.		
• American Association of Diabetes Educators	AADE34	American Association of Diabetes Educators
• American Association of Family and Consumer Sciences	AAFCS34	American Association of Family and Consumer Sciences
• American Dietetic Association	ADA34	American Dietetic Association
• American Public Health Association	APHA34	American Public Health Association
• American Public Human Services Association	APHSA34	American Public Human Services Association
• Association of State and Territorial Public Health Nutrition Directors	ASTPHND34	Association of State and Territorial Public Health Nutrition Directors
• International Lactation Consultant Association	ILCA34	International Lactation Consultant Association
• International Society for Behavioral Nutrition and Physical Activity	ISBNPA34	International Society for Behavioral Nutrition and Physical Activity
• National WIC Association	NWICA34	National WIC Association
• National Association of Child and Adult Care Food Program Professionals	NACACFPP34	National Association of Child and Adult Care Food Program Professionals
• School Nutrition Association (formerly American School Food Service Association)	SNA34	School Nutrition Association (formerly American School Food Service Association)
• Society for Nutrition Education	SNE34	Society for Nutrition Education
• Society of Public Health Educators	SPHE34	Society of Public Health Educators
• Other organization	Other34	Other organization
Read the description of job classifications and check the one that is most similar to your position.	Classification	Read the description of job classifications and check the one that is most similar to your position.
Other job classification	OtherClassifi	

Table D.1. Continued.

Question	Variable name	Variable label
Gender	Gender	Gender
In what year were you born?	Born	Year born. In categories: • ≤44 years old • 45-54 years old • ≥55 years old
Do you intend to retire in the next 10 years?	Retire	Intend to retire within 10 years
(If yes) In how many years do you intend to retire?	RetireYrs	Years until intended retirement
Ethnicity • Hispanic/Latino • NOT Hispanic/Latino • No Answer	Ethnicity	Ethnicity
Race (choose all that apply)		
• American Indian or Alaskan Native	Indian40	American Indian or Alaskan Native
• Asian	Asian40	Asian
• Black or African American	Black40	Black or African American
• Native Hawaiian or Other Pacific Islander	Hawaiian40	Native Hawaiian or Other Pacific Islander
• White	White40	White
• No Answer	No_answer40	No Answer

Table D.1. Continued.

Question	Variable name	Variable label
Select your primary language from the first drop-down box below. In addition to your primary language, if you are sufficiently fluent to use any other language(s) in your work in nutrition, select it from the second drop-down box; otherwise, choose Not Applicable. If you speak either an African language, Chinese dialect, Eastern European language, Native American or American Indian language, or other language not specified, please enter it in the text box at the bottom.		
• English • African language, please specify below • Cambodian/Khmer • Chinese, please specify dialect below • Eastern European language, please specify below • French • Haitian/Creole • Hmong • Korean • Laotian • Native American or American Indian language, please specify below • Portuguese • Russian • Sign language • Spanish • Tagalog—Filipino language • Thai • Vietnamese • Other, please specify below • No Answer	PLang41	Primary Language
See above	SLang41	Secondary Language

Table D.1. Continued.

Question	Variable name	Variable label
Please specify the African language, Chinese dialect, Eastern European, Native American or American Indian language or other language not listed above:	OtherLang41	Please specify the African language, Chinese dialect, Eastern European, Native American or American Indian language or other language not listed above:
To release your data for research purposes, please answer "yes" to the question below. If you agree to participate, your survey responses will be included in a new research database where your unique identifier will be eliminated and a new one will be assigned based only on the state, territory or Tribal organization where you work. There will be no way to link your responses to your identity. Participation is strictly voluntary and there are no risks to participants or penalty to non-participants. Your response as "yes" will constitute informed consent to release your data for research. • Yes • No	Release	Release responses

Vita

Alexa George graduated summa cum laude from the University of Memphis with a Bachelor of Science in Education with a concentration in dietetics in 2004. In 2007 she received the Master of Public Health Degree with a Community Health Education concentration from The University of Tennessee, Knoxville. She also received her PhD in Health and Human Sciences from The University of Tennessee, Knoxville in 2008.