

HOD Backgrounder

House of Delegates

Fall 2012

Introduction

Sylvia Escott-Stump appointed a Public Health Task Force in November 2011 to provide direction for the Academy of Nutrition and Dietetics (Academy) related to public health nutrition and community nutrition. Six Academy members were appointed to serve on this task force. The task force met in person and by teleconference calls to address its charge from January-March 2012.

The purpose of the task force was to address a strategic priority in the 2011-2012 Board of Director's Strategic Plan, which calls for enhancing the relevance of public health nutrition and community nutrition within the Academy and increasing the Academy's visibility in the broader public health community.

The charge given to the task force included the following:

- Develop an action plan focusing on enhancing the Academy's role in public health nutrition and community nutrition;
- Create a communications plan to raise the Academy's visibility in and the support for the public health community;
- Prepare recommendations for consideration by the Board of Directors;
- Propose a budget for review by the Finance and Audit Committee for inclusion in the FY 2013 budget.

The following themes from the task force discussions provided direction for development of the action plan that includes target dates for implementation, partners (e.g., Academy organizational units and staff, organizations), and budgetary implications.

1. Establish definitions for public health nutrition and community nutrition.
2. Increase understanding and appreciation for public health nutrition and community nutrition as a vital area of dietetics practice.
3. Promote awareness of the importance of RDs working in public health nutrition and in community nutrition at the federal, regional, state, and local level and their respective specialized skills and knowledge.
4. Identify and advocate for employment opportunities for RDs in public health nutrition and in community nutrition positions at the federal, regional, state, and local level.
5. Promote Academy members' participation in coalitions at the national, state, and local level to address public health nutrition community nutrition issues.
6. Increase public health organizations' awareness of the Academy's and its members' involvement in public health nutrition and community nutrition (Appendix A).
7. Integrate public health nutrition and community nutrition philosophies, especially serving communities at large, including vulnerable and underserved populations, and activities throughout all organizational units in the Academy.

One of the action items noted in the plan was to submit a mega issue related to public health nutrition and community nutrition for a future HOD Meeting dialogue session. This backgrounder will prepare delegates and members for the dialogue session occurring at the HOD Fall Meeting on October 6, 2012.

Meeting Goal: Obtain input to help members recognize and seize opportunities to work in public health nutrition and community nutrition.

Mega Issue Question:

In an evolving health services environment, how can our members seize opportunities and provide leadership in public health nutrition and community nutrition?

Expected Outcome:

Academy members will:

1. Recognize, prepare for, and seize opportunities.
2. Be leaders in public health nutrition and community nutrition by actively working in policy development, assessment, assurance, advocacy, environmental change, education, and programs and services.
3. Provide input on how to prepare members to meet the needs in public health nutrition and community nutrition.

Knowledge-based Strategic Governance is a mechanism for consultative leadership. It recognizes that “strategy” is the necessary and appropriate link in the Board's role to govern the organization, the House's role to govern the profession and the staff's role to manage implementation. To assist you in thinking about the issue to be addressed, four key background areas are presented as standard questions used for each Mega Issue. These questions create an environment of awareness of what we know and what is unknown. A wide range of resources has been used to provide you with what is known.

Question #1: What do we know about the current realities and evolving dynamics of our members, marketplace, industry, profession that is relevant to this decision?

The 2003 *Guidelines for Community Nutrition Supervised Experiences* help explain the core functions of public health, which are assessment, policy development, and assurance (1). The guidelines put an emphasis on the core functions, along with a need for community and public health nutrition professionals to shift from a client-focus to a population/systems focus. In relation to the socio-ecological model, this means that while some will continue to work in individual and interpersonal- level interventions, others move to environmental and policy interventions to change practices in organizations, social norms in communities, and systems-level policies, regulations, and practices (2,3). This shift will accomplish the mission set out by the Institute of Medicine established in *The Future of Public Health* which states “to assure conditions in which people can be healthy”(4).

Public health nutritionists must be policy and advocacy experts, as they develop and promote policies and programs to address nutrition concerns for the population. They also must be experts in environmental change and how to collaborate with others to change the environments to promote access to healthy and affordable food and safe and convenient places to be physically active. The shift from a client to a population/systems focus is ongoing and continues to occur at different rates.

Core Public Health Functions

These responsibilities require an understanding of the core public health functions and how they relate to nutrition practice. These functions can be described as:

- 1) assessing the nutrition problems and needs of the population, monitoring the nutritional status of populations and related systems of care, and processing information back into the assessment functions;

- 2) developing policies, programs, and activities that address highest priority nutritional problems and needs; and,
- 3) assuring the implementation of effective nutrition strategies.

The core functions are interrelated and accomplished through essential services, as reflected in Figure 1.

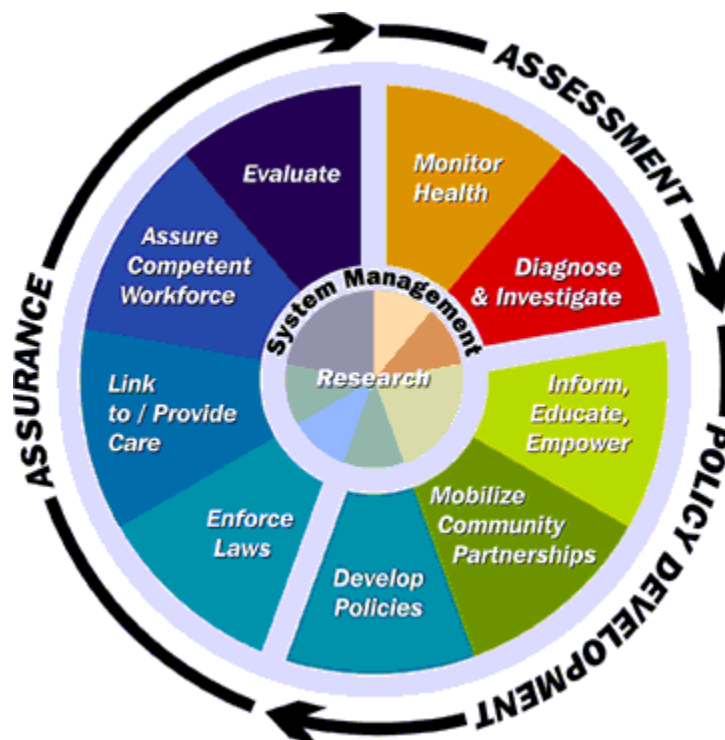


Figure 1: Core Functions and Essential Services of Public Health (5)

Assessment

- Assessment activities include surveillance, needs and resource identification, collection and interpretation of data, identification of population needs, monitoring using diverse and multiple data sets, forecasting trends, estimation of threats to the food supply, and evaluation of outcomes.
- Geographic Information Systems will facilitate a better understanding of how resources, assets, environmental factors, and health concerns are related within neighborhoods and communities.
- Assessment also includes evaluation of how interrelated systems, such as health, education, human service, food supply, and financial or insurance, impact communities' health status.
- Assessment also includes fostering community-based strategies, such as working with community stakeholders to determine needs, priorities, and resources.

Policy Development

- Policy development includes setting priorities, developing and implementing community nutrition plans, assuming leadership in developing policies that relate to nutrition goals and objectives, and advocating, convening, negotiating, and brokering for nutrition components in new and existing programs and services.
- Policy development also focuses on supporting environments that assure access to healthy and affordable food and safe and convenient places to be physically active. Examples include working with planning commissions to consider housing developments in relation to access to food and transportation policies that impact both food access and physical activity.

- Administrative roles, such as fiscal management, supervision, and program administration, are important parts of policy development.

Assurance

- Assurance involves access and quality in the implementation of public health and community nutrition plans. It implies the development and maintenance of services and activities needed to maintain safety, access, and adequacy of the food supply for optimal nutrition and health of populations.
- It includes maintaining the capacity to respond to food and nutrition crises, as well as supporting crucial services such as nutrition monitoring and surveillance; population-based, culturally and linguistically competent nutrition education; individual and group nutrition services to populations at high risk for nutrition-related diseases and conditions, under-served, and culturally diverse; nutrition counseling for individuals with nutrition-related conditions and disease; mobilizing nutrition resources; emergency preparedness; marketing; provision of public information about nutrition issues; and encouragement of private and public sector action concerning nutrition issues through incentives and persuasion.
- Assurance includes setting standards and maintaining quality assurance for services and activities that are provided in both private and public sectors. It also includes setting standards for nutrition personnel in recognition that different levels of education and credentialing are necessary for different position responsibilities. Finally, assurance includes maintaining accountability to the community by setting objectives and reporting progress.

Science-based research provides the foundation for these core functions and essential services of public health. New insights and innovative solutions to health problems are critical to success in public health and result from rigorous investigative processes. Collaboration with community members and other stakeholders, researchers, and public health nutrition practitioners can lead to applied research to benefit communities and the population served. Therefore, study design, implementation, and data analysis are integral in the training of public health personnel (1).

Defining Public Health Nutrition and Community Nutrition

One of the first action steps prioritized by the Academy’s Public Health Task Force is to develop a consensus on definitions of public health nutrition and community nutrition. These terms are often used interchangeably, yet are different. In 2003, Roger Hughes wrote that “during the last decade there have been various attempts in the international literature to define public health nutrition as a field of nutrition practice distinct from the well established professional practice of clinical nutrition and dietetics (6).” While another decade later, there still is not a formal consensus definition of public health nutrition, more recently Hughes and Margetts argued that “a public health approach is traditionally defined by its focus on prevention rather than treatment, populations rather than individuals and interventions that address the determinants of health rather than the treatment of disease (7).”

The Academy’s Public Health Task Force has developed definitions for the following terms: Public Health Nutrition, Community Nutrition, Public Health Nutritionists, and Community Nutritionists. It is the goal of the Task Force to share the definitions with several public health organizations to begin developing that consensus definition once-and-for-all. The task force is currently sharing the definitions developed this summer with other public health organizations in hopes of working towards a consensus and plan to bring the final definitions to the House in early Fall, 2012.

Public health nutrition is the application of nutrition and public health principles to improve or maintain optimal health of populations and targeted groups through enhancements in programs, systems, policies, and environments.

Public health nutritionists are professionals trained in both nutrition and the core competency areas of public health. These individuals have advanced level didactic and experiential training in public health and nutrition practice and are registered dietitians or licensed dietitians/nutritionists.

The main functions of public health nutritionists include:

- taking a leadership role in identifying nutrition-related needs of a community;
- planning, directing, and evaluating health promotion and disease prevention efforts;
- administering and managing programs, including supervising personnel;
- developing and/or assisting in the preparation of a budget;
- identifying and seeking resources (e.g., grants, contracts) to support programs and services;
- providing therapeutic and rehabilitation nutrition services, when these needs are not adequately met by other parts of the health care system;
- providing technical assistance/consultation to policy makers, administrators, and other health agency personnel;
- collaborating with others to promote environmental and systems changes;
- assuring access to healthful and affordable food and nutrition-related care;
- advocating for and participating in policy development and evaluation of the impacts and outcomes; and,
- participating in research, demonstration and evaluation projects.

Examples:

1. Collaborating with city planners to change environments to increase access, availability, affordability of healthful food options, such as, providing tax incentives to full service grocery stores to locate in rural areas.
2. Developing and utilizing surveillance systems to monitor the nutritional state of a population group.
3. Developing policies to impact healthy eating and physical activity, such as, working with transportation departments to promote safe and reliable access to healthy and affordable food venues.
4. Developing and implementing policies and procedures to promote and support breastfeeding in the workplace.

Community nutrition encompasses individual and interpersonal-level interventions focused on creating changes in knowledge, attitudes, behavior and health outcomes either individually or in small groups within a community setting.

Community nutritionists are professionals trained in the delivery of preventive and therapeutic nutrition services within community settings. These individuals have training in nutrition throughout the life-span, nutrition education and counseling, and program development, and are registered dietitians or licensed dietitians/nutritionists.

The main functions of community nutritionists include:

- conducting and evaluating nutrition education and counseling for small groups and individuals;
- planning, implementing, and evaluating primary and secondary prevention interventions;
- providing therapeutic and rehabilitation nutrition services;
- administering programs; and,

- participating in care coordination or providing case management.

Examples:

1. Conducting food demonstrations/classes for individuals enrolled in the Supplemental Nutrition Assistance Program (SNAP).
2. Training peer counselors and promotoras to promote breastfeeding.
3. Conducting in-service education for school foodservice personnel.
4. Developing nutrition education activities for the school classroom.
5. Providing technical assistance/consultation to health providers on case management for nutrition and dietetics-related issues ;
6. Participating in an interdisciplinary team conducting home visits.

Current Roles of the RD in Public Health

Public health nutrition is a well-defined and recognized specialty for about 100 years. Public health nutritionists work in various settings, within and outside of health care to reach the public throughout the lifespan. For example, some public health nutritionists may work in county extension, child care centers, schools, etc., but they are probably doing community nutrition work. On the other hand, at many non-governmental organizations (NGO) and non-profit organizations, public health nutritionists do perform public health nutrition roles as described in *Personnel in Public Health Nutrition for the 2000s* (8).

In local, state and federal public health agencies, community-based health agencies, non-profit organizations, and other community organizations, public health nutritionists are responsible for nutrition services that emphasize community-wide health promotion and disease prevention in addition to addressing the needs of individuals. These programs include a variety of nutrition personnel, each of whom has different functions that can be described along a continuum of emphasis from population/systems focus to the client or individual focus. This continuum is described in *Personnel in Public Health Nutrition for the 2000's* (8). Public health nutritionists establish linkages with personnel involved in a broad range of human services, including child care agencies, services to the elderly, educational institutions, and community-based research. They focus on promoting health and preventing disease in the community, using a population/systems focus and a client-focused or personal nutrition service, approach (9).

Figure II-2. Major Focus of Public Health Nutrition Team Positions

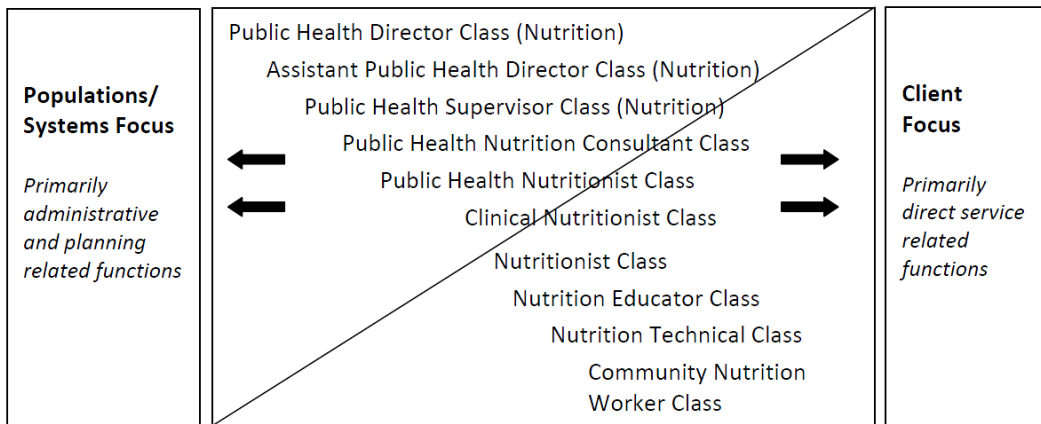


Figure used courtesy of Association of State and Territorial Public Health Nutrition Directors, available at: http://www.astphnd.org/resource_files/105/105_resource_file1.pdf

Community Nutrition Practice

As explained in *Guidelines for Community Nutrition Supervised Experiences*, very few community nutrition practices focus exclusively on public health services; most provide a combination of public health and personal nutrition services.

Prevention plays a prominent role in community nutrition practice. In this document, prevention is defined comprehensively to include a wide array of interventions, which can be categorized as three essential components:

- individually-based,
- community-based, and
- systems-based.

Each component has a distinct role, importance, and focus. Individually-based efforts deal with prevention issues at the personal level. Community-based prevention messages are targeted at groups. Prevention at the systems level focuses on changing environments, policies and law so that the goals of prevention practices are achieved. Community nutrition practice involves making appropriate and coordinated use of each.

For each of the three components of prevention, there are three levels.

- Primary prevention involves health promotion to maintain a state of wellness and focuses on changing or enhancing the environment, community, family, and individual life styles and behaviors.
- Secondary prevention consists of risk appraisal and reduction along with interventions that include screening, detection, early diagnosis, treatment, and follow-up.
- Tertiary prevention is directed at managing and rehabilitating persons with diagnosed health conditions to extend their years of productivity (1).

Table 1 presents the three essential components of prevention and provides examples for the three levels of prevention in community nutrition practice.

Table 1: Essential Components and Levels of Prevention in Public Health and Community Nutrition Practices

Levels of Prevention:	Components of Prevention:		
	Personal	Community	System
Primary Prevention	'My Plate' education at health fair	Local "Fruits and Veggies Matter" campaign in association with the farmers 'market, schools and grocery stores Use of local produce in school lunch program	School lunches required by law to be consistent with the Dietary Guidelines for Americans Folic acid fortification of foods
Secondary Prevention	Work site nutrition education for high-risk employees Nutrition education for high-risk WIC clients	Health fairs with screening and referrals to primary care providers	Food labels required to include information on particular nutrients, including calories
Tertiary Prevention	Medical nutrition therapy	Diabetes education classes offered by local health departments	Legislation requiring medical nutrition therapy for identified diseases

Adapted from AL Owen, PL Splett, GM Owen. *Nutrition in the Community: The Art and Sciences of Delivering Services*. Boston: WCB/McGraw-Hill; 1999.

Academy's Public Health Nutrition and Community Nutrition Members

According to the 2008 Needs Assessment, 7% of RDs reported their primary employment setting was a community or public health program. Eleven percent of RDs reported that their primary practice area was community nutrition (10).

Advanced Degrees in Public Health

There are many different degree programs for those that are interested in studying public health. Some of the program degrees include:

- MPH = Master of Public Health
- MHA = Master of Health Administration
- MHSA/MS = Master of Health Services Administration
- MSPH = Master of Science in Public Health
- DrPH = Doctor of Public Health
- PhD = Doctor of Philosophy

In general, the MPH degree will include competencies in the core public health disciplines of biostatistics, epidemiology, environmental health science, health policy and management, and social and behavioral sciences. Specialized degrees such as a Master of Health Administration will be more focused on a specific topic.

Another distinction between degrees is the professional degree versus the academic degree. Professional degrees generally have a greater orientation towards practice in public health settings. The MPH, DrPH, and MHA are example of degrees which are geared towards those who want careers as practitioners of public health in traditional health departments, managed care organizations, community-based organizations, hospitals, consulting firms, international agencies, state and federal agencies, among others.

Academic degrees particularly at the doctoral level are more oriented toward students wishing to seek a career in academics and research rather than public health practice. Examples of academic degrees are the MS, PhD, and ScD.

However, each accredited public health program or school of public health can tailor its degree programs significantly. Students interested in getting a degree in public health should check with individual schools for more information on specific degree programs (11).

Question #2: What do we know about the needs, wants and expectations of members, customers and other stakeholders related to this issue?

It is All About Prevention: Shift in Healthcare

In the March 2012 *Journal of Academy of Nutrition and Dietetics* supplement on Workforce Demand, the Academy's Director of Regulatory Affairs, Pepin Tuma, JD explains how health care reform under the Obama administration will potentially shift the areas of demand in nutrition and dietetics, specifying prevention and public health. "The Patient Protection and Affordable Care Act that passed in 2010 (12) consists of two separate but closely related pieces of legislation (henceforth referred to as Acts). On March 21, 2010, the US House of Representatives agreed to the version of health care reform that the US Senate passed on Christmas Eve 2009; President Barack Obama signed this jointly approved bill into law on March 22, 2010. Then, on March 23, 2010,

the House and Senate approved a second measure (13) amending certain portions of the jointly passed bill, which President Obama signed that same day. These Acts are intended to achieve three main goals (14):

- provide coverage for 32 million uninsured Americans;
- improve affordability and stability of insurance for those who already have it; and
- slow the growth of health care costs to reduce the federal budget deficit.”

Tuma continues his analysis, stating, “Passage of the Acts put the United States on the path of a new health care paradigm that may have substantial implications for the supply and demand of dietetics practitioners. Under the new framework, health care will begin to shift away from the current fee-for-service payment model to one focused on preventive care and wellness; a patient-centered approach to treating multiple chronic diseases; and a reformed delivery system that includes more primary care providers, medical homes, and community-based health centers. As the Academy and policymakers understand, these changes are vitally necessary to achieving the Acts' related goals of improving affordability and stability of insurance for those who already have it and slowing the growth of health care costs and reducing the federal budget deficit.

The Patient Protection and Affordable Care Act that passed in 2010* promises to change health care delivery systems in the United States, partly by shifting focus from disease treatment to disease prevention. Registered dietitians (RDs) have already taken an active role in health care areas that stand to be directly affected by provisions in the health care reform bill. However, nutrition's vital role in preventing diseases and conditions potentially could translate to additional opportunities for RDs as a result of this reform” (15).

*During development of this backgrounder, the U.S. Supreme Court's ruled on June 28, 2012 to uphold the constitutionality of the Patient Protection and Affordable Care Act.

National Prevention Council Action Plan

On June 16, 2011, the National Prevention, Health Promotion, and Public Health Council (National Prevention Council) (16) released the National Prevention Strategy: America's Plan for Better Health and Wellness. Authorized by the Affordable Care Act, the National Prevention Strategy (17) represents the leadership of 17 federal departments, agencies, and offices (departments) and identifies Strategic Directions and Priorities that promote good health for all Americans. Led by the U.S. Surgeon General, the National Prevention Council is committed to prevention and wellness for individuals, families, and communities.

Using its collective leadership and taking specific actions that align to the Strategic Directions and Priorities of the National Prevention Strategy, the National Prevention Council intends to accelerate high-impact areas to move America from a system of sick care to one based on wellness and prevention. The National Prevention Council provides federal leadership to promote the best health outcomes where people live, learn, work, and play. The work of the National Prevention Council departments affects communities across the country. Thus, the implementation efforts summarized in this National Prevention Council Action Plan strive to ensure everyone has the opportunity to live a long, healthy, and productive life (18).

Shifts Influencing Future Roles of RDs and DTRs

In the Workforce Demand Study, an article written by Betsy Haughton and Jamie Stang gives a thorough indication of how healthcare is shifting from traditional medicine to public health (19).

Comprehensive health care reform stipulated in the *Patient Protection and Affordable Care Act* and projections about the future health care workforce have implications for the dietetics profession over the long-term. Implementation will shift from a fee-for-service payment model to preventive, patient-centered approaches, including the patient-centered medical home and accountable care organization models, and a reformed

delivery system with more primary care providers, medical homes, and community-based health centers (20, 21).

In the Haughton and Stang article, there are four major shifts that can potentially be a result of the health care reform: healthcare costs, diversity, attrition and growth, and skill set requirements.

The Four Major Shifts

Healthcare Costs

- RDs need to position themselves to other team members and to health insurers as recognized providers of nutrition and dietetics services.
- There are many challenges and opportunities for the dietetics workforce to address the changing population risk factors and trends in health care and public policy by working toward intervention targets across the social-ecological model to promote health, prevent disease, and eliminate health disparities. Addressing nutrition-related health needs, including controlling costs and improving health outcomes, and the demands of a changing population will require careful research and deliberation about new practice roles, integration in health care teams, workforce supply and demand, and best practices to recruit and retain a diverse workforce.

Diversity

- Dietetics practitioners will work with an increasingly diverse population, which will require the ability to adapt existing programs and services to culturally diverse individuals and communities. Economic factors will affect not only the type, quantity, and quality of food available in homes, but also how health care is delivered, influencing future roles of RDs and DTRs. As health care services consume a larger percentage of federal and corporate expenditures, health care agencies will continue to look for ways to reduce costs.
- Health promotion and disease prevention efforts will likely play a larger role in health care services, thus creating many opportunities for RDs and DTRs in preventive care and wellness. Increasingly, nutrition and dietetics services will be provided in more diverse settings, such as worksites, community health centers, and home-care agencies. To address population-based health care and nutrition priorities effectively, dietetics practice will need to focus on appropriate evidence-based intervention approaches and targets.
- Because there is an assumption that the dietetics profession will experience rates of attrition of 2% to 5% based on historical workforce data, an important consideration is that the current dietetics workforce is limited in terms of diversity. An increasingly diverse population will demand a more diverse dietetic workforce, which will only be achieved through a more focused effort to recruit, train, and retain practitioners from a variety of racial, ethnic, social, and cultural backgrounds.

Attrition and Growth

- Nutrition will continue to have a role in tertiary prevention (chronic disease management) along with expanded roles in primary and secondary prevention.
- Health care workforce projections from the Bureau of Labor Statistics for 2008 to 2018 project substantial growth in the “frontline workforce” of health care personnel with a bachelor's degree or less and who will have extensive direct patient contact [(22,23,24) (and American Dietetic Association. *Report to the House of Delegates: Final Report of the Phase 2 Future Practice and Education Task Force*. July 15, 2008, unpublished; Gilbride J, Parks S, Dowling R. Framework for analyzing supply and demand for the dietetics profession, 2011, unpublished)].

- Whereas the Bureau of Labor Statistics projects that RD and DTR positions will grow at rates of 9.2% and 13.9%, respectively, from 2008 to 2018, these increases are less than that projected for other sectors of the health care workforce.
- These projections suggest an important role for dietetics practitioners, who will remain providers of patient-care services, but also might assume increased responsibilities as consultants and managers of those in the frontline workforce, who will have more extensive and expanded direct-care contact.

Skill Requirements

- The workforce needs to be skilled in the delivery of culturally competent interventions across the lifespan, for all population groups, and across all levels of the socio-ecological model for primary, secondary, and tertiary prevention.
- Related to growth of the frontline workforce is bifurcation of the health care workforce (22), as the proportions of personnel with lower levels of education (associate's degree or less) and those with higher levels of education (graduate degree) increase, but the proportion of staff with bachelor's degrees decreases. The tension of employers trying to control personnel costs and professional associations trying to advance their professions will only continue. It will be important for the Academy of Nutrition and Dietetics and CDR to consider what level of education and training is appropriate in relation to how much employers are willing to pay (22, 25, 26). What qualifications are required for future dietetics positions and what will the market bear for quality, nutrition-related health outcomes? Currently, survey findings range from 34% of RDs having an advanced degree in dietetics, food, nutrition, or a related field (10, 27) to up to half of all RDs having any advanced degree (28), whereas only 1% of DTRs having an advanced degree (10, 27). What level of education and credential is required to address individual and population needs (29)? Training a qualified and marketable workforce will require educational institutions and programs to have goals and curricula aligned with workforce and population needs (25).
- Established by the Affordable Care Act, the Center for Medicare & Medicaid (CMS) Innovation Center is a new engine for revitalizing and sustaining Medicare, Medicaid, and the Children's Health Insurance Program (CHIP) and ultimately for improving the health care system for all Americans. Within the CMS Innovation Center are Accountable Care Organizations (ACOs), which are groups of doctors, hospitals, and other health care providers, who come together voluntarily to give coordinated high quality care to the Medicare patients they serve (30). RDs and DTRs need to know and understand the types of programs and services that have been or are being developed as a result of health care reform.

Question #3: What do we know about the capacity and strategic position of the Academy in terms of its ability to address this issue?

Personnel Availability and Expertise

Guidelines for Community Nutrition Supervised Experiences 2nd Edition, describes the field of public health nutrition and community nutrition as currently suffering from both a shortfall in the number of personnel and a lack of training in public health and community-based nutrition (1). In 2005 there were approximately 2,979 public health nutritionists working in the US with a population/systems focus (31). The recommended staffing ratio is 1 public health nutritionist per 50,000 people (32). Application of this ratio to the 2,782 that participated in this census survey and released their data for research purposes to the 2005 population residing in the states and territories, suggests that 5,928 public health nutritionists with population/systems-focused responsibilities are needed for the US, a 113% increase from the current level (33).

Guidelines for Community Nutrition Supervised Experiences

The purpose of *Guidelines for Community Nutrition Supervised Experiences 2nd Edition* (1) is to update the guidelines in consideration of the changes in public health nutrition over the past decade. This purpose maintains the original intent, which was to provide guidelines for supervised experiences in community nutrition programs that promote the health and well being of individuals, families, and communities. These guidelines are the essential starting point for personnel working in community nutrition programs who seek to enhance their level of practice, whether they are Nutritionists, Community Nutrition Educators, or Clinical Nutritionists and whether or not they are a RDs or DTRs. Enhanced education and training are considered critical to recruiting and retaining qualified community nutrition professionals.

Guidelines for Community Nutrition Supervised Experiences is intended to help community nutrition personnel enhance their current practice for client-focused personal nutrition services, but also transition to a practice that will be more population/systems focused. Although the rate at which this transition occurs will vary across the country, it is imperative that public health and community nutrition personnel clearly understand and assume their responsibilities consistent with public health's mission, to assure conditions in which people can be healthy.

Partnerships with other Public Health Organizations

In the future, the implementation of the Public Health Plan of Action will focus on development of partnerships with public health organizations to identify public health nutrition and community nutrition related opportunities for working together collaboratively. Some partnerships are already established; the members of the task force and other Academy leaders will need to meet with leadership regarding these opportunities.

Through these partnerships, the task force hopes to develop a consensus on definitions of community nutrition and public health nutrition; terms which are often interchanged yet are different. A list of existing or potential partners is provided below:

AGPPHN – Association of Graduate Programs in Public Health Nutrition, Inc.

APHA – American Public Health Association; Food and Nutrition Section and Maternal and Child Health Section

ASPH – Association of Schools of Public Health

ASTPHND – Association of State and Territorial Public Health Nutrition Directors

BHP – Bureau of Health Professionals

BPHC – Bureau of Primary Care Health

CDC – Centers for Disease Control and Prevention

DNPAO – (CDC) Division of Nutrition, Physical Activity, and Obesity

FNS – (USDA) Food and Nutrition Service

HRSA – Health Resources and Services Administration

MCHB – Maternal and Child Health Bureau

NWA – National WIC Association

PFCD – Partnership to Fight Chronic Disease

SNEB – Society for Nutrition Education and Behavior

TFAH – Trust for America's Health

USDA – U.S. Department of Agriculture

Partnership for Prevention

Question #4: What ethical/legal implications, if any, surround the issue?

In reviewing the Code of Ethics for the Profession of Dietetics (34), it should be noted that Ethics Principles #3, #8, #9, #11, #13, #14, #15, #16, #17, #18 and #19 all relate to the Academy’s value ‘Social Responsibility’. The Academy defines social responsibility as: the practitioner makes decisions with consideration for inclusivity as well as environmental, economic and social implications. It is important for RDs and DTRs to be mindful of our value of social responsibility as it relates to the issue of public health nutrition and community nutrition.

The Principles noted under this value are provided in detail.

- Principle #3:** The dietetics practitioner considers the health, safety, and welfare of the public at all times.
- Principle #8:** The dietetics practitioner recognizes and exercises professional judgment within the limits of his or her qualifications and collaborates with others, seeks counsel, or makes referrals as appropriate.
- Principle #9:** The dietetics practitioner treats clients and patients with respect and consideration.
- Principle #11:** The dietetics practitioner, in dealing with and providing services to clients and others, complies with the same principles set forth above in “Responsibilities to the Public” (Principles #3-7).
- Principle #13:** The dietetics practitioner presents reliable and substantiated information and interprets controversial information without personal bias, recognizing that legitimate differences of opinion exist.
- Principle #14:** The dietetics practitioner assumes a life-long responsibility and accountability for personal competence in practice, consistent with accepted professional standards, continually striving to increase professional knowledge and skills and to apply them in practice.
- Principle #15:** The dietetics practitioner is alert to the occurrence of a real or potential conflict of interest and takes appropriate action whenever a conflict arises.
- Principle #16:** The dietetics practitioner permits the use of his or her name for the purpose of certifying that dietetics services have been rendered only if he or she has provided or supervised the provision of those services.
- Principle #17:** The dietetics practitioner accurately presents professional qualifications and credentials.
- Principle #18:** The dietetics practitioner does not invite, accept, or offer gifts, monetary incentives, or other considerations that affect or reasonably give an appearance of affecting his/her professional judgment.
- Principle #19:** The dietetics practitioner demonstrates respect for the values, rights, knowledge, and skills of colleagues and other professionals.

As health care environment changes, the need to provide the best care in any environment is imperative. It is the RDs’ and DTRs’ responsibility to develop skills to provide this care and relate it back to the Academy value of ‘social responsibility’.

Conclusion

As the health care environment and service delivery continues to change, it is important that Academy members recognize the long history of public health nutrition and community nutrition and look forward to public health nutrition and community nutrition playing a vital role in the future of the profession.

Over the next few years, the Academy Public Health Plan of Action will be implemented in order to help members build their knowledge and interest in this area of practice. The Academy will work to integrate public health nutrition and community nutrition philosophies, especially serving communities at large, including vulnerable and underserved populations, and activities throughout all organizational units in the Academy.

Appendix A: Public Health Action Plan April 2012 FINAL

BACKGROUND

Sylvia Escott-Stump appointed a Public Health Task Force in November 2011 to provide direction for the Academy of Nutrition and Dietetics (Academy) related to public health nutrition. The Academy members appointed to serve on this task force were: Margaret J. Tate, MS, RD, chair; Claire A. Heiser, MS, RD, Katrina Holt, MPH, MS, RD, Helene M. Kent, MPH, RD, Marsha Spence, PhD, MS-MPH, RD, LDN and Jamie S. Stang, PhD, MPH, RD, LN. Staff support provided for this effort included Harold Holler, RD, LND, Vice President, Governance and Practice, Diane Juskelis, MS, RD, LDN, Director, DPG/MIG/Affiliate Relations Team and Patricia Babjak, CEO. The task force met on January 29-30, 2012 in Chicago, IL and on February 9, 2012 and March 2, 2012 by conference call to address its charge.

The purpose of the task force was to address a strategic priority in the 2011-2012 Board of Director's Program of Work which calls for enhancing the relevance of public health nutrition within the Academy and increasing the Academy's visibility in the broader public health community.

The charge given to the task force included the following:

- Develop an action plan focusing on enhancing the Academy's role in public health nutrition;
- Create a communications plan to raise the Academy's visibility in and the support for the public health community;
- Prepare recommendations for consideration by the Board of Directors;
- Propose a budget for review by the Finance and Audit Committee for inclusion in the FY 2013 budget.

The following themes from the task force discussions provided direction for development of the action plan that includes target dates for implementation, partners (e.g., Academy organizational units and staff, organizations), and budgetary implications.

1. Establish definitions for community nutrition and public health nutrition.
2. Increase understanding and appreciation for community nutrition and public health nutrition as a vital area of dietetics practice.
3. Promote awareness of the importance of RDs working in community nutrition and in public health nutrition at the federal, regional, state, and local level and their respective specialized skills and knowledge.
4. Identify and advocate for employment opportunities for RDs in community nutrition and in public health nutrition positions at the federal, regional, state, and local level.
5. Promote Academy member's participation in coalitions at the national, state, and local level to address community nutrition and public health nutrition issues.
6. Increase public health organizations' awareness of the Academy's and its members' involvement in community nutrition and public health nutrition.
7. Integrate community nutrition and public health nutrition philosophies, especially serving vulnerable and underserved populations, and activities throughout all organizational units in the Academy.

The following three categories were identified for the action plan:

1. Consensus on Definitions
2. Education, Training, and Credentialing
3. Policy.

The Board of Directors approved the following action plan on March 9, 2012 for implementation.

Academy Public Health Plan of Action

CONSENSUS ON DEFINITIONS				
	The work must begin by coming to consensus on definitions of community nutrition and public health nutrition, terms which are often interchanged, yet are different. This work should be done in collaboration with other relevant organizations, e.g., AGPPHN, APHA's Food and Nutrition Section and the Maternal and Child Health section, ASPH, ASTPHND, NWA, and SNEB. In addition, it was agreed that prevention is a core element and should be emphasized in all categories of the action plan.	Fall 2012	Alliances Task Force	Budget needed; potential meetings, conf. calls
EDUCATION/TRAINING/CREDENTIALING				
	<ol style="list-style-type: none"> Develop articles/stories with a consumer focus for the new <i>Food & Nutrition Magazine</i>; Interviews might focus on: <ul style="list-style-type: none"> Are RD's needed in community nutrition and in public health nutrition settings? Why get an MPH or MS concentration in public health nutrition as a RD? How does the socio-ecological model relate to clinical dietetics? Why are the training, recruitment and retention of a diverse and culturally and linguistically competent community nutrition and public health nutrition workforce important for decreasing health disparities in underserved and vulnerable populations? How can we use technology to promote public health nutrition and community nutrition to make services more effective (e.g., informatics/electronic health records, social media, telemedicine, see http://www.hitsp.org)? 	Fall 2012 or Winter Issue	Strategic Communications Team	No budget needed
	<ol style="list-style-type: none"> Develop FNCE session: Social Determinants of Health/Life Course (could be a potential 'hot topic). 	2013 FNCE Sessions (Oct. 2012 proposal)	J Stang, M Tate, M Spence Professional Development Team	No budget needed.
	<ol style="list-style-type: none"> Develop partnerships with public health organizations to identify community nutrition and public health nutrition related opportunities, and work in collaboration. Meet with leadership regarding alliance opportunities. 	Summer 2012	Alliance Program	Budget needed (attendance at other organization meetings)
	<ol style="list-style-type: none"> Enhance understanding and promote intersection of the public health nutrition competencies and the Accreditation Council for Education in Nutrition and Dietetics (ACEND) competencies <ul style="list-style-type: none"> Require that ACEND reviewers reviewing public health nutrition programs have a public health background. Conduct a crosswalk (intersection) between the public health nutrition competencies and ACEND competencies and promote awareness and use of them in public health graduate programs. Develop and promote a toolkit for program reviewers. Public health nutrition representatives on ACEND develop accreditation standards (didactic programs and experiential practices) specific to public health. Use community nutritionists and public health nutritionists in development of ACEND toolkits for education. Establish alliance with APHA's Food and Nutrition section and the Maternal and Child Health section; ASPH; ASTPHND; and NWWA to develop competencies required of community nutrition and of public health nutrition and 	2013-14 DEP Area Meetings	ACEND Other accreditation organizations	Budget needed

	<p>position requirements.</p> <ul style="list-style-type: none"> ▪ Raise awareness of research related to issues in community nutrition and public health nutrition, such as access to food and population based interventions. 			
	5. Incorporate community nutrition and public health nutrition representation on Academy committees (such as QMC, LPPC, NIC, APC, PD&EC) and incorporate into committee charges.	Spring 2013	H. Holler	No budget needed.
	6. Understand credentialing of local and state public health agencies and how it relates to the RD.	2014	CDR <i>EatRightWeekly</i> Professional Development Team	Budget needed to develop certificate programs.
	7. Conduct a gap analysis related to the Academy's Compensation & Benefits survey to better reflect the definitions of community nutrition and public health nutrition. <ul style="list-style-type: none"> ▪ Pull data from the Academy's Compensation & Benefits survey. ▪ Encourage Public Health/Community Nutrition Dietetic Practice Group (PHCNPG), Pediatric Nutrition Dietetic Practice Group (PNPG) – Hunger and Environmental Nutrition Dietetic Practice Group (HEN DPG) and Healthy Aging (HA DPG) to survey members to gather data related to community nutrition and public health nutrition. ▪ Obtain data from CDR Workforce Demand Study. 	2014	CDR Member Services PHCN, PNPG, HEN, HA DPGs All Academy Members	Budget needed for analysis.
	8. Submit a mega issue (succession, sustainability, survival of public health nutrition and community and nutrition) for HOD meeting.	Fall 2012	Task Force HOD Leadership Team; HOD Governance	No budget needed.
	9. Engage in meetings with HRSA's Bureau of Health Professionals to explore scholarship opportunities in the National Health Services Corp and the Loan Repayment programs.	Fall 2012	ACEND Education Committee	Budget needed (potential meetings, conf. calls)
	10. Develop strategies to increase the diversity of the public health nutrition and community nutrition workforce including methods for improving recruitment, training and retention for individuals from and underserved and vulnerable populations.	Spring 2013	ACEND Diversity Committee MIGs DPGs	Budget needed (potential meetings, conf. calls)
	11. Promote awareness of the importance of RDs with expertise in community nutrition and public health nutrition and advocate for community nutrition and public health nutrition positions at the federal, regional, state, and local levels.	Fall 2012	All organizational units	Budget needed (potential meetings, conf. calls)

POLICY				
Document Development and Dissemination				
1.	Develop and integrate concepts of community nutrition and public health nutrition into position and practice papers to include an education, training, and policy perspective. Promote partnering relevant organizations (e.g., AGPPHN, APHA, ASPH, ASTPHNDA, and NWA).	2013	Academy Positions Committee	No budget needed.
2.	Develop and disseminate a <i>Journal</i> supplement on community nutrition and public health nutrition. Topics may include: <ul style="list-style-type: none"> ▪ Status of community nutrition and public health nutrition. ▪ Historical context of community nutrition and public health nutrition. ▪ Environmental scan to identify future opportunities associated with public health nutrition and community nutrition. ▪ Analysis of policies related to public health nutrition and community nutrition. ▪ Raise awareness of research related to public health nutrition and community nutrition. 	2014 (1 year for content development/coordination)	Journal Team DPGs/MIGs to identify potential topics/authors	Budget needed (Meeting of representatives at FNCE 2013 plus conf. calls; <i>Journal</i> supplement costs for FY14). Consider potential for funding.
3.	Create FNCE session based on <i>Journal</i> supplement. Representatives from DPGs and MIGs contributing to the planning of the supplement will develop session proposal.	2014	DPGs/MIGs Professional Development & Education Committee	Budget needed for meeting (at FNCE 2013 plus conf. calls).
4.	Collaborate with DPGs/MIGs to develop and maintain a process for identifying articles focusing on community nutrition and public health nutrition for submission to the <i>Journal</i> . Encourage DPGs/MIGs leaders to mentor those with less experience writing articles and publishing in the <i>Journal</i> .	2014	DPGs (PHNPG, HEN, WH) MIGs Journal Team	Budget needed for conference calls.
Legislative and Public Policy Committee (LPPC)				
5.	Request a designated community nutrition and public health position on LPPC to integrate more relevant content, especially related to serving vulnerable and underserved populations in PPW, FNCE, & other events.	Fall 2012	H. Holler Policy Initiatives & Advocacy Group	No budget needed.
6.	Form a group of representatives from DPGs, MIGs and LPPC to develop a strategic plan to integrate community nutrition and public health philosophies (e.g., health promotion and early interventions) and activities throughout Academy. <ul style="list-style-type: none"> ▪ Possible topics include health promotion, disease prevention, early intervention, health disparities, health care reform (e.g., exchanges), prevention, and hunger vs. obesity, policy/environmental, and systems changes. 	2013	Policy Initiatives & Advocacy Group	Budget needed for conference calls.
Health Professionals Shortage Area Designation				
7.	Engage in meetings with HRSA's Bureau of Health Professionals (BHPr) to determine feasibility of establishing a RD designated health professional shortage area (see http://bhpr.hrsa.gov/shortage). If so, consider next steps with PIA staff in DC and research division <ul style="list-style-type: none"> ▪ Investigate where RDs work and identify areas at-risk for shortage. Use information for planning proposal to BHPr and for general use by Academy. ▪ Build on current data and CDR Workforce Demand Study. ▪ Include CDC and other partners regarding data collection and gathering. 	2013-2014	Policy Initiatives & Advocacy Group	Need budget for meetings and conference calls

Think Tank				
8.	<p>Coordinate a think tank discussion to address partnership building, collaboration, and policy opportunities.</p> <ul style="list-style-type: none"> ▪ Representatives may include Academy members, as well as representatives from AGPPHN, APHA, ASTPHND, ASPH, CDC, HRSA's MCHB, and USDA whose mission is to promote the public's health and needs the expertise of both community and public health nutritionists. ▪ Develop an action plan to promote policy and environmental changes into coordinated activities. ▪ Identify potential research opportunities within public health nutrition and community nutrition. 	2012-2013	Policy Initiatives & Advocacy Group Alliances	Need budget for meetings and conference calls
9.	<p>Pursue partnerships with organizations and business community on activities of mutual interest to promote public health nutrition and community nutrition.</p> <ul style="list-style-type: none"> ▪ Academy serves as convener to facilitate ongoing conversation. ▪ Look at opportunities with Convergence Partnerships. 	2013-2014	Policy Initiatives & Advocacy Group Corporate Relations Team	Need budget for meetings and conference calls
Materials and Strategy Development				
10.	<p>Develop and strategically disseminate materials focusing on "Why community nutritionists and public health nutritionists are needed?"</p> <ul style="list-style-type: none"> ▪ Plan targeted relationship building. ▪ Identify barriers to inclusion of public health nutrition and develop common solutions. ▪ Develop tools, such as stories, standards, and job descriptions, to illustrate the community nutritionist's and public health nutritionist's specialized knowledge and skills. ▪ Review the Academy's job descriptions for RDs and "Personnel in Public Health Nutrition for the 2000's" edited by Janice M. Dodds. ▪ Share information via multiple channels (e.g., newsletter, practice paper). ▪ Partner with APHA, ASTPHND, ASPH and other organizations. Learn about target groups needs and adapt discussions to address those needs. 	2013-2014	Strategic Communications Book Publishing Professional Development Knowledge Center DPGs	Need budget for meetings and conference calls
Leadership Development				
11.	<p>Expand efforts with the Academy's Leadership Institute; demonstrate career laddering. Mentoring programs integrate into Academy's leadership efforts.</p>	2013	Professional Development	

Notes: Certification using the portfolio (75 credits) – explore certificate of training in health promotion, disease prevention, population strategies.

Glossary of Acronyms

AGPPHN – Association of Graduate Programs in Public Health Nutrition

APHA – American Public Health Association

ASPH – Association of Schools of Public Health

ASTPHND – Association of State and Territorial Public Health Nutrition Directors

BHPr – Bureau of Health Professionals

CDC – Centers for Disease Control and Prevention

HRSA –Health Resources and Services Administration

MCHB – Maternal and Child Health Bureau

NWA – National WIC Association

SNEB – Society for Nutrition Education and Behavior

USDA – U.S. Department of Agriculture

References:

1. Mixon H, Dodds J, Haughton B. *Guidelines for Community Nutrition Supervised Experiences*. 2nd Ed. Public Health/Community Nutrition Practice Group, American Dietetic Association; 2003. Available at: www.phcnpg.org. Accessed on May 15, 2012.
2. Story M, Kaphingst KM, Robinson-O'Brien R, Glanz K. Creating healthy food and eating environments: Policy and environmental approaches. *Ann Rev Public Health*. 2008; 29:253-272.
3. Gregson J, Foerster S, Orr R, Jones L, Benedict J, Clarke B, Hersey J, Lewis J, Zotz K. System, environmental, and policy changes: Using the social-ecological model as a framework for evaluating nutrition education and social marketing programs with low-income audiences. *J Nutr Ed*. 2001; 33: S4-S15.
4. *The Future of the Public's Health in the 21st Century*. Committee for the Study of the Future of Public Health; Division of Health Care Services, Institute of Medicine. National Academy Press. Washington, D.C.; 1988. Available at: <http://iom.edu/Reports/2002/The-Future-of-the-Publics-Health-in-the-21st-Century.aspx>. Accessed on May 15, 2012.
5. US Department of Health and Human Services. *Public Health in America*. Available at: <http://www.health.gov/phfunctions/public.htm>. Accessed on 6/11/2012.
6. Hughes R. Definitions for Public Health Nutrition: A Developing Consensus. *Public Health Nutrition*. 2003; 6(6), 615-620.
7. Hughes R, Margetts BM. *Practical Public Health Nutrition*. United Kingdom: Wiley Blackwell; 2011.
8. Dodds, JM. *Personnel in Public Health Nutrition For the 2000's*. The Association of State and Territorial Public Health Nutrition Directors; 2009. Available at: http://www.astphnd.org/resource_files/105/105_resource_file1.pdf. September 2010. Accessed on May 15, 2012.
9. Dodds, JM, Kaufman, M. *Personnel in Public Health Nutrition for the 1990's*. Washington, DC: The Public Health Foundation; 1991.
10. Readex Research. American Dietetic Association/Commission on Dietetic Registration 2008 Needs Assessment. Stillwater, MN: Readex Research; 2009.
11. What is Public Health? Frequently Asked Questions. Available at: <http://www.whatispublichealth.org/faqs/index.html>. Accessed on 6/26/2012.
12. Patient Protection and Affordable Care Act of 2010. Pub L No. 111-148, 124 Stat 1029.
13. Health Care Education and Reconciliation Act of 2010. Pub L No. 111-152, 124 Stat 119.
14. Stolberg SG, Pear R. Obama signs health care overhaul bill, with a flourish. *New York Times* March 24, 2010; A19.

15. P Tuma. An Overview of the Intentions of Health Care Reform. *J Acad Nutr Diet.* 2012; 112 (suppl 1): S56-S63.
16. National Prevention, Health Promotion, and Public Health Council. Available at: <http://www.healthcare.gov/prevention/nphpphc>. Accessed May 29, 2012.
17. National Prevention Council, National Prevention Strategy. Washington, DC: US Department of Health and Human Services, Office of the Surgeon General, 2011. <http://www.healthcare.gov/prevention/nphpphc/strategy/report.html>. Accessed May 29, 2012.
18. National Prevention Council. *National Prevention Council Action Plan, Implementing the National Prevention Strategy*. Washington, DC: US Department of Health and Human Services, Office of the Surgeon General, 2012. Available at: <http://www.healthcare.gov/prevention/nphpphc/> Accessed June 26, 2012.
19. Stang, J and Haughton B. Population Risk Factors and Trends in Health Care and Public Policy. *J Acad Nutr Diet.* 2012; 112 (suppl 1):S35-S55.
20. US Senate. HR 3590- Patient Protection and Affordable Care Act, with amendments from House HR 4872- Reconciliation Act of 2010. Available at: <http://dpc.senate.gov/docs/lb-111-2-42.html>. Accessed June 2, 2011.
21. American Dietetic Association House of Delegates. HOD backgrounder. *Health Reform-Next Steps*. Chicago, IL: American Dietetic Association; 2010.
22. Collier SN. Changes in the health work-force: Trends, issues, and credentialing. In: Homes DE, ed. *From Education to Regulation: Dynamic Challenges for the Health Workforce*. Washington, DC: Association of Academic Health Centers; 2008: 1-19.
23. Lacey TA, Wright B. Occupational employment projections to 2018. *Monthly Labor Rev.* November 2009; 132 (11): 82-123.
24. Schindel J, Cherner D, O'Neil E, Solomon K, Iammartino B, Santimauro J. *Workers Who Care: A Graphical Profile of the Frontline of Health and Health Care Workforce*. Princeton, NJ: Robert Wood Johnson Foundation; 2006.
25. Executive Officer of the President, Council of Economic Advisers. Preparing the workers of today for the jobs of tomorrow. July 2009. Available at: <http://www.whitehouse.gov/administration/eop/cea/Jobs-of-the-Future/>. Accessed November 5, 2010.
26. Collier SN. The cost-quality conundrum and its effect on the allied health workforce. *Trends.* 2007; November: 4-5.
27. Rogers D. Report on the American Dietetic Association/Commission on Dietetic Registration 2008 needs assessment. *J Am Diet Assoc.* 2009; 109 (7): 1283-1293.
28. Ward B. Compensation & benefits survey 2009: Despite overall downturn in economy, RD and DTR salaries rise. *J Am Diet Assoc.* 2010; 110(1):25-36.

29. Collier SN. How would health system reform affect the allied health workforce? Trends. 2007-2008; December 2007-January 2008:4-6.
30. Center for Medicare & Medicaid Services. Center for Medicare & Medicaid Services (CMS) Innovation. Available at: <http://www.innovations.cms.gov/>. Accessed July 24, 2012.
31. Haughton B, George A. Survey of the Public Health Nutrition Workforce: 2006-07. For the Association of State and Territorial Public Health Nutrition Directors. Available at: <http://www.fns.usda.gov/.../SurveyofthePublicHealthNutritionWorkforce2006-07.pdf>. Accessed July 5, 2012.
32. Dodds JM, Kaufman M. Personnel in Public Health Nutrition for the 1990's. Washington, DC: The Public Health Foundation; 1991.
33. George A. Public Health Nutrition: A Workforce in Transition. Doctoral Dissertation, The University of Tennessee, Knoxville, 2008.
34. American Dietetic Association/Commission on Dietetic Registration Code of Ethics for the Profession of Dietetics and Process for Consideration of Ethics Issues. J Amer Diet Assoc. 2009; 109: 1461-1467.