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Strengthening Human Capacity to Scale Up Nutrition

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Todd Post/Bread for the World

"Much more investment is needed in human and institutional capacity for nutrition in low-income and middle-income countries."

– *The* Lancet *Series on Maternal and Child Undernutrition*[1]

"Strategic capacities that are needed urgently include the knowledge, skills, leadership, and human resources for envisioning, shaping, and guiding the national and sub-national nutrition agendas, and especially the capacity to broaden, deepen, and sustain the commitment to nutrition."

– *The* Lancet *Series on Maternal and Child Undernutrition*[2]

Introduction

The Scaling up Nutrition movement, or SUN, launched in 2010, is a global push for investment and action to improve maternal and child nutrition across sectors. Through this movement, 35 developing and middle income countries around the world have committed to "scale up nutrition."[3] However, most high-burden stunting countries[4]* have a critical shortage of human resources to deliver basic health, nutrition, and community services. This limits the capacity to implement life-saving direct nutrition services and longer-term solutions to malnutrition. The global shortage of skilled, motivated, and well-supported frontline health workers is universally acknowledged as a significant barrier to reaching the Millennium Development Goals (MDGs)[5]and continues to be one of the major barriers to scaling up nutrition interventions and services.[6] Urgent, accelerated action and investment in strengthening the capacity of frontline workers to deliver and rapidly scale up nutrition interventions is needed to achieve the MDGs, improve nutrition and health outcomes, improve child survival and reduce maternal and child mortality.

"Increasing the numbers and quality of human resources for nutrition at all levels and in all relevant sectors is critical for improving the quality of nutrition services."

– The United Republic of Tanzania Ministry of Health and Social Welfare National Nutrition Strategy (July 2009 – June 2015)

A number of simple, cost-effective, evidence-based nutrition specific interventions are available to reduce malnutrition, especially in the critical period from pregnancy to age 2. *The Lancet*'s 2008 Series on Maternal and Child Undernutrition[7] re-emphasizes this evidence base and recognizes the

* For definitions of this and other key terms, see pages 10-11.

devastating and largely irreversible impact of malnutrition on the youngest children. In addition, nutrition-sensitive interventions in other sectors, especially agriculture and social protection, are also important to address the longer term, underlying causes of malnutrition. The *Lancet* Series also identifies and emphasizes strengthening human resources for nutrition as a key area to make faster progress on reducing undernutrition. It is one of the four functional areas of scaling up nutrition through a systems approach: (1) human and institutional resource strengthening, 2) stewardship, 3) mobilization of financial resources, and 4) direct provision of nutrition services).[8,9] In both 2008[10] and 2012,[11] the Global Copenhagen Consensus—a project that seeks to establish priorities for advancing global welfare using methodologies based on the theory of welfare economics, rated investment in malnutrition as a "best buy" in development through a group of world-renowned economists. The 1,000 Days partnership promotes targeted action and investment to improve nutrition for mothers and children in the 1,000 days "window of opportunity" between a woman's pregnancy and children 2 years of age for a high-priority package of health and nutrition (both nutrition-specific[12] and nutrition-sensitive[13]) interventions to reduce death and disease. Many countries have begun expanding delivery of these priority nutrition interventions and services to more individuals, and, in so doing, are committing to increase and strengthen their human capacity in nutrition.

This paper reflects on what donor support and investments are needed to strengthen human capacity for scaling up nutrition across sectors and highlights key components of a nutrition workforce strategy (ideally as part of the national nutrition strategy). Focusing largely on the sub-Saharan Africa experience, this brief is based on both a number of assumptions arising from past program experience and on the changing context for nutrition training and education in many countries. It is an opportune time to discuss both who should provide priority nutrition interventions? and what will it take to strengthen human capacity to deliver priority nutrition interventions at scale? It is our intention for the paper to promote dialogue about the current situation most countries are facing and how donors and implementing partners cansupport these countries. This includes such questions as: What cadres of workers and service providers are currently delivering and coordinating nutrition interventions and services?; Who should be involved in the future?; What is the level and extent of training and support needed?; and What are the components of a successful, functional nutrition workforce system?

UN Photo/Martine Perret

Key Recommendations

- A comprehensive ***National Nutrition Workforce Strategy and Implementation Plan*** (as part of a National Nutrition Strategy) is necessary to increase and strengthen human resource capacity for nutrition.
- A successful ***National Nutrition Workforce Strategy*** will (according to a country's need):
  1. Clearly define and document the cadres of workers that need nutrition competencies, knowledge and skills.
  2. Clearly define and document job descriptions/ schemes of service including detailed roles and responsibilities and accountability structures of these cadres.
  3. Clearly define and document the priority nutrition-specific and nutrition-sensitive intervention areas and related nutrition competency standards, the requisite knowledge, skills and workplace functions for each cadre.
  4. Include a plan to strengthen the capacity of multisectoral[14] frontline workers (including frontline health workers, community health workers and agriculture extension officers), trained public health allied positions such as Nutritionists and/or Dieticians (if these exist within the country) with the knowledge and skills necessary to implement priority nutrition interventions;
  5. Include a plan to establish and/or strengthen the capacity of a cadre of mid-level Nutrition Focal persons and/or Nutrition Officers whom have the capacity to manage, coordinate and oversee decentralized nutrition activities.
  6. Include a plan to harmonize and standardize a national nutrition training strategy and curricula including:
     - Pre-Service Training: Establish a comprehensive curriculum for pre-service training that

focuses on all determinants of nutrition including nutrition-specific and nutrition-sensitive interventions and stresses active participation through 'hands-on' experience
    - In-Service Training: Establish and/or strengthen in-service training using a nationally standardized set of training materials including social behavior change communication materials and job aides.
    - Lifelong Learning including continuing education, on the job and refresher training, short courses and other innovative methods to keep cadres up to date in the latest nutrition competencies.
- In addition it is important to ensure that the workforce strategy is well articulated in the national nutrition policy and implementation plan, if feasible. If not it could be added as an addendum.
- A **national human capacity needs assessment for nutrition** is essential to collect baseline information on the skills, competencies, and abilities of frontline workers, other targeted sector cadres as well as mid-level staff who manage and supervise these cadres at the national and sub-national levels. This needs assessment can be used to analyze human capacity barriers to integrate nutrition into the workforce across sectors, recommend areas of investment for workforce development and inform the way forward.
- An ***Advocacy Nutrition in the Workforce Policy Brief*** can highlight the size, composition, educational attributes and the training of the nutrition workforce in countries.

Growing Political Commitment for Nutrition on the Development Agenda

The U.S. government's Feed the Future (FTF) (2010) and Global Health Initiative (GHI) (2009) set a joint goal to reduce child undernutrition by 30 percent in food-insecure countries receiving U.S. assistance.[15] During the U.N. summit on the Millennium Development Goals (MDGs) in September 2010, Secretary of State Hillary Clinton and her Irish counterpart launched the 1,000 Days: Change a Life, Change the Future[16] Partnership. The 1,000 Days partnership is intended to catalyze action on SUN in countries that express a commitment to scale up maternal and child nutrition—with the goal of achieving measurable results during the 1,000-day period September 2010 to June 2013.

Global momentum continues to grow and two international meetings in June 2013 will place nutrition high on the agenda before international leaders and other stakeholders.

Rebecca Guatafson

A Bolivian health worker in a clinic fills out a patient intake form before examining a patient. The clinic was set up by USAID partner CIES to serve families in temporary shelters constructed after the floods in Bolivia.

An event called "Nutrition for Growth" in London will focus on donor government commits in nutrition, seeking specific pledge amounts and commitments. Following this, an international gathering of SUN representatives in Washington, DC will take place called "Sustaining Political Commitments to Scaling Up Nutrition". This civil society-led meeting will mark the culmination of the 1,000 days "Call to Action", assessing challenges and opportunities for the next 1,000 days while developing a global advocacy agenda.

Both meetings present a perfect opportunity to discuss human capacity development.

At the 2012 G-8 summit hosted by the United States, President Obama recommitted the U.S. government to supporting food security and nutrition as well as the SUN movement. He committed to strengthening the capacity of African governments and partners to improve the nutritional well-being of their populations.[17,18] A key principle of the U.S. State Department's First Quadrennial Diplomacy and Development Review is to increase the host country's nutrition institutional capacity. Human capital is a core component of the USAID/Food for Peace Guidance under the Food Security Framework.

These global efforts suggest strong political will and increased donor support and investment to improve nutritional outcomes and reduce mortality from undernutrition, especially for women and children. These major U.S. government high-level commitments to scale up nutrition should be capitalized on; they can help spur coordinated efforts to integrate nutrition into national workforce strategies so that human capacity to provide nutrition services and interventions is strengthened. This includes positioning and empowering frontline workers as the face of nutrition interventions for measurable results, with appropriate levels of nutrition training.

Strengthening Nutrition Capacity for Frontline Workers

Frontline workers and frontline health workers are the backbone of effective public service and health systems. They are the only staff available to serve millions of children and their families who live beyond the reach of hospitals and clinics, and in most countries, they provide the bulk of nutrition services. To save more lives, greater investments are needed to strengthen the frontline workforce in the fight against malnutrition, by providing adequate training, supervision, and support to carry out successful programs.

Providing Nutrition Interventions–Who Is Involved?

In most high-burden stunting countries, there is consensus among stakeholders that there are insufficient numbers of trained staff in nutrition throughout the public service and implementing organizations of the country. A recent nutrition capacity needs assessment in Malawi found that "limited numbers of frontline staff are a major obstacle to sustaining program results and the scaling-up of successful (nutrition) interventions."[19] It is important to consider who is available to deliver nutrition interventions and services, and where they are working. Most high-burden malnutrition countries deliver nutrition interventions and services ad hoc through a variety of cadres with unclear, undocumented roles and responsibilities for nutrition.

A crucial question with respect to implementing nutrition interventions at scale is whether nutritional goals can be achieved faster by strengthening the capacity and training of multisectoral frontline workers, or by establishing and/or scaling up the supply of professionally trained Nutritionists and/or Dieticians? Or should we focus on both strategies—with the establishment of a professional cadre of trained Nutritionists for a long-term goal. Most stakeholders who work toward reducing malnutrition agree that integration of nutrition competencies into the existing health and community cadres of workers is a high priority, but is the simultaneous long-term strategy of investing in "professionalizing" cadres of Nutritionists/Dieticians or mid-level managers also required? The evidence base, unfortunately, is lacking on what it will take to make progress along this path, with few developing countries now "professionalizing" Nutritionists/Dieticians[20] on a wide scale. However, an opportunity exists for future credentialing of such a cadre if countries plan competency-based training that is measured by performance reviews. These clearly defined competency standards—defining statements about a profession or work role can eventually be used to allow for certification cadres and assist credentialing. Table 1 (next page) illustrates typical cadres of public sector workers that may deliver priority nutrition interventions.

UN Photo

Trained healthcare professionals are essential to even routine medical or nutritional tasks.

Mainstreaming Nutrition in the Public Workforce

The recognition of nutrition competencies within defined cadres of public service workers and the development of national competency-based training are the initial steps in the process to mainstream nutrition into the workforce and strengthen workforce development. A ***National Nutrition Workforce Strategy*** lays the foundation for sucessful mainstreaming of nutrition within the public workforce. Successful governance for nutrition requires a ***National Nutrition Strategy (NNS)*** supported by strong national leadership and adequate resources to ensure that nutrition is given the priority it deserves. The NNS lays the foundation to scale up effective nutrition action across sectors in high-burden stunting countries[21] and accelerates support to achieve the MDGs. Support from donors to SUN[22] has encouraged countries to develop an NNS and implementation plan. The development of a ***National Workforce Strategy*** for nutrition (as part of the overall NNS) for public sector worker cadres at all levels (national, sub-national, community) provides the underpinning for strengthening human capacity to implement and manage priority nutrition interventions and services. This strategy should highlight the nutrition competency capacity gaps and describe, in detail, the cadres of workers that need nutrition competencies, the targeted workforce size (number of people that need to be reached) capacity development strategies to deploy, train, manage, motivate and support the workforce. This will help lay the foundation to ensure that there are enough skilled personnel to meet both national nutrition goals and targets and the MDGs.

The outlined strategies and activities should be "cross sectoral", cutting across multiple sectors[23] (agriculture, education, social protection, community development, water, sanitation and hygiene) and involve multisectoral focal persons

and cadres to provide the needed requisite knowledge, skills, workplace functions and motivation of professionals from these sectors to address nutrition issues.[24]

In order for nutrition-specific and nutrition-sensitive interventions to be implemented at scale, efforts to increase the number of trained frontline workers is essential, as is integration of nutrition within a countries Human Resource Management (HRM) System that deploys and utilizes the various cadres and nutrition workforce effectively.[25] A National Nutrition Workforce Strategy needs to clearly identify who will be performing priority nutrition interventions. In most cases, it will be existing cadres of the public workforce, for example within the health sector it would be frontline health workers, in other cases a new cadre of public workers may need to gain nutrition competencies, such as agricultural extension officers or social welfare officers. The strategy should plan for capacity gaps in human resources at the national and sub-national levels and across sectors and ministries. This

Table 1 Human Resources Involved in Providing Priority Nutrition Interventions


Frontline Health Workers


Agriculture Extension Workers


Nutritionists/Dieticians


Community Extension


Educators

Cadre	Role
Agriculture Extension Officers/ Workers	Agricultural Extension Officers[26,27] are intermediaries between research and farmers. They operate as facilitators and communicators, helping farmers in their decision-making and encouraging them to incorporate appropriate knowledge so as to achieve the best results in sustainable production and general rural development. Agricultural extension[28] was once known as the application of scientific research, knowledge, and technologies to improve agricultural practices through farmer education. The field of extension now encompasses a wider range of communication and learning theories and activities (organized for the benefit of rural people) by professionals from different disciplines. Often, nutrition education and extension at the community level is included in extension officers' job description. Currently, there is no widely accepted definition of agricultural extension.
Nutrition Focal Person	A Nutrition Focal Person is an existing frontline health worker or public sector worker who is given the roles and responsibilities of overseeing, coordinating, and implementing the integration of basic nutrition services[29] into other health or agriculture services (within their existing structures). The nutrition focal person ensures quality monitoring and scaling up. Generally, these staff are assigned nutrition coordination tasks that are in addition to their posts; they perform these duties on a part-time basis, and they may or may not have nutrition qualifications or formal professional training in nutrition. They may come from the health, agriculture, community development, and/or education sectors. Ideally, focal persons will have training based on the national nutrition curriculum (if available), and will ensure that equipment and materials are available and functioning, assess clients according to national guidelines, provide appropriate counseling, keep the necessary records for monitoring and evaluation, and either provide clients with the further care they need (i.e., specialized food) themselves, or refer them to someone who can provide it.
Nutrition Educator[30]	Nutrition Educators/Instructors are expected to be able to respond to situations or challenges with a body of knowledge and experience, not simply to perform rote teaching. Nutrition educators must have both skills and up-to-date scientific knowledge to foster meaningful engagement and training. Moreover, their work must include efforts to ensure that trainees are personally involved and interested in learning. Professors and teachers play a primary role in pre-service education and training to establish basic competence in both nutrition and education.
Nutrition Officer[31]	Nutrition Officer is a generic term for an individual who is professionally trained in nutrition and is expected to provide essential nutrition services at sub-national levels. In many countries, nutrition officers are also involved in planning nutrition activities and may play a coordinating and/or supervisory role. In some countries, they are the same as Nutrition Focal Persons; in other cases, Nutrition Focal Persons may work with Nutrition Officers as the point people for specific sectors.

requires significant investment in workforce planning and management in order to meet capacity development needs, support the introduction and/or strengthening of nutrition within the national workforce, endorse a supportive work environment, support adequate staff remunerations and incentives and reinforce supportive supervision. Table 2 below offers a depiction of the components needed to strengthen human capacity for nutrition.

Assessing Human Capacity Needs in Nutrition

A national capacity needs assessment for nutrition examines and analyzes gaps in human resources, training institutions, and related infrastructure/material needs. The assessment gathers information on the capacity of a country's training institutions and the workforce's current knowledge, competencies, abilities, and skills to plan, manage, monitor, and report on nutrition services at all levels. It outlines gaps and needed actions (e.g., who needs to be trained and how). A minimum set of priority nutrition interventions defined in the national nutrition strategy are evaluated to inform workplace planning. Official roles and responsibilities need to be agreed upon and clearly defined among all relevant cadres within a country. This should include an analysis of tasks and workloads within the different categories of staff, leading to an action plan to best deploy available workers. The needs assessment should help foster consensus among host government officials and implementing partners about how to scale up nutrition. The Table 3 below summarizes some of the main capacity needs identified in a nutrition capacity needs assessment in Malawi.

Table 3 Nutrition Capacity Needs Assessment in Malawi

The capacity needs assessment conducted in Malawi in 2010 identified the following needs :

- Support for line ministries and other implementing partners to recruit officers to fill existing vacancies in nutrition.
- Training for new nutrition technicians at all levels.
- Institutional support to enhance the capacity of training colleges to increase their recruitment and the number of graduates who have benefited from high-quality training.

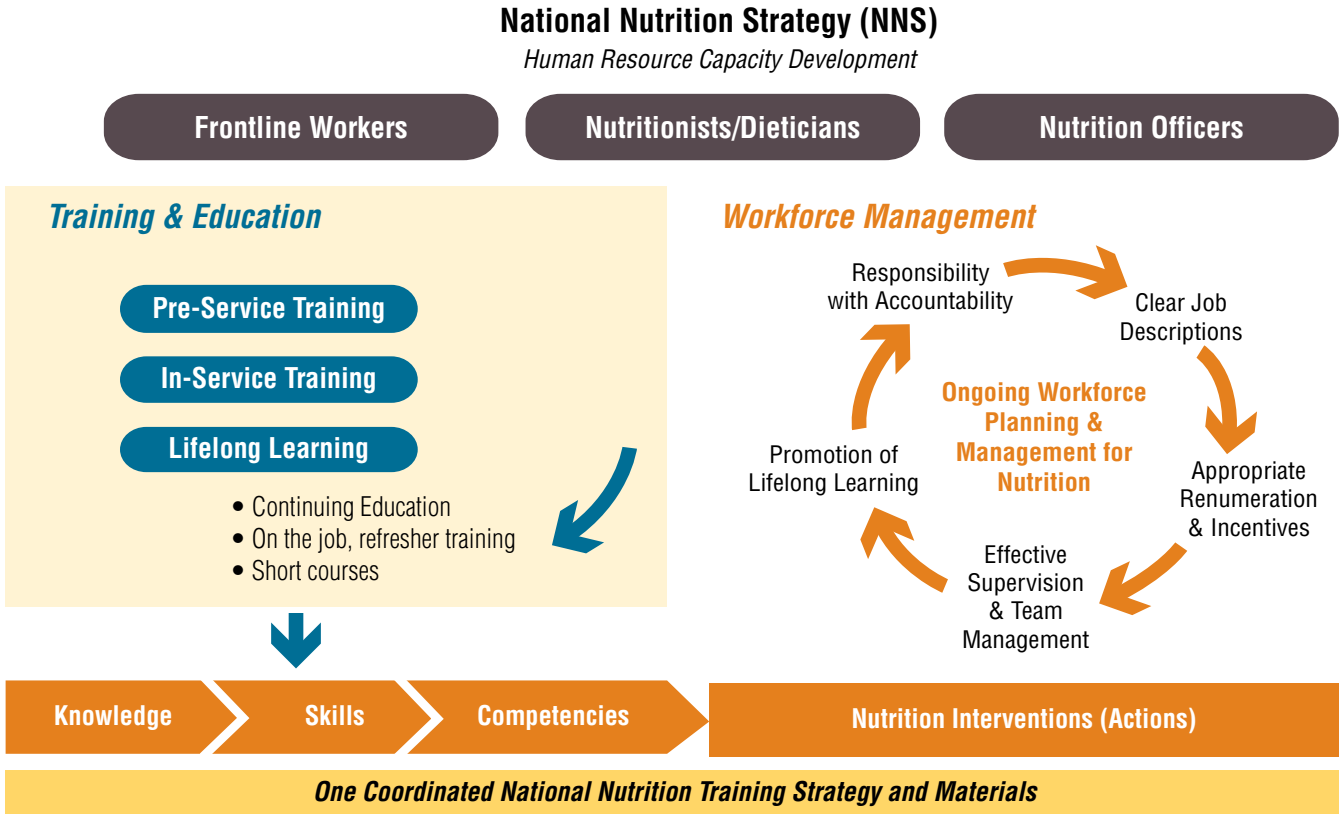
Source: National Stakeholders Workshop on Capacity Development in Nutrition. Department of Nutrition, HIV and AIDS. Office of the President and Cabinet Government of the Republic of Malawi and Food and Agriculture Organization of the United Nations. 2010.

Defining Nutrition Competencies for the Public Workforce

To strengthen human capacity to deliver priority nutrition interventions at scale, a country needs to develop a

Table 2 Strengthening Human Capacity to Implement Priority Nutrition Interventions at Scale

The diagram in Table 1 illustrates a National Workforce Strategy for Nutrition as integral to a National Nutrition Strategy.



workforce strategy that uses evidence-based systematic approaches to produce sufficient numbers of skilled workers with the needed technical competencies in nutrition.[32] This requires clearly defining the challenges and gaps in nutrition competencies and training, followed by the strategic scaling up of proficient nutrition competencies within various public service cadres. Without specific articulation of the nutrition competencies that are required of people working in this field, workforce development and continuing professional development will be inefficient.[33,34,35,36,37] The *Lancet* Series on Maternal and Child Undernutrition[38] emphasizes that both institutions and approaches to training need institutional reforms in order to adopt competency-driven approaches in the design of nutrition curricula and adapt these competencies to local and changing conditions.[39] To train frontline workers effectively, core, basic competencies[40] need to be defined. These are the essentials needed to implement priority nutrition interventions and accelerate the response to malnutrition.

Very few countries have developed and clearly defined nutrition competencies and the related competency-based nutrition training curricula. In 2011 and 2012 respectively, a series of articles were published on nutrition workforce development through international peer-reviewed public health nutrition journals; furthermore nutrition competencies were defined.[41] One major breakthrough was the "Competency Framework for Global Public Health Nutrition Workforce Development" published by the World Public Health Nutrition Association in 2011.[42]

Competencies in nutrition vary by country. Assessing the needs requires looking at the existing human resources structures and supply, as well as clearly delineating the various roles and responsibilities in implementing nutrition interventions. Frontline workers (including community extension agents and volunteers) are often the first responders; they play a crucial role in delivering services to vulnerable populations and households in need. Countries may also decide to establish or "professionalize" a cadre of professional public health allied workers such as Nutritionists and/or Dieticians with certification, accreditation, and/or licensure; however in low resource settings this is not a short-term strategy. In other settings, it makes most sense to 'mainstream' nutrition competencies into other sector cadres while identifying and training mid-level managers that can coordinate and manage decentralized nutrition interventions and services. What are the job descriptions of the different cadres of workers? If there are certified Nutritionists and/or Dieticians or mid-level Nutrition Officers within the country, how are these individuals identified, recruited, and deployed, and what are their roles and responsibilities?

Table 3 What are Competencies?

Competency is the consistent application of knowledge and skills to the standard of performance required in the workplace. It is the ability to transfer and apply skills and knowledge to new situations and environments. Competent" staff have the ability—that is, the requisite knowledge and skills—to proficiently perform their jobs.

"Competency standards aim to define the work and performance of the profession and therefore help define and delineate roles. Preventing overlap between professions may improve efficiency and this has been a compelling argument in favour of competencies.[43]"

Standards help define the nature of the work of a profession and help communicate the complexity of work that may increase the credibility of the profession amongst the community. ***Competency standards are defining statements about a profession or work role that can be used to assist***

A ***National Workforce Strategy and Implementation Plan for Nutrition*** looks at three components of the workforce- development, training and management. A nutrition workforce strategy should include clearly define institutional arrangements (with roles and responsibilities for delivering the training courses), a well-defined list of competencies that ensure that learning is closely tied with job performance, a certification/accreditation/licensure process, a monitoring and evaluation framework, and an action plan with costs specified in a budget.

Pre-Service and In-Service Training

A critical part of scaling up nutrition is expanding and strengthening pre-service and in-service training for frontline workers who are already trained but whose education has left them with gaps in necessary background or skills. Donor support to help higher learning institutions and governments improve their national curricula for pre-and in-service training would help boost enrolment and increase the number of people qualified in nutrition competencies.

In-Service Training (IST)[44] is important in order to equip frontline workers with the knowledge, skills, and competencies to perform their work–and ultimately improve the nutritional status of the targeted groups.[45] IST is usually the largest area of donor support. Additional investment and support is needed, however, to ensure that IST fits into the overall Nutrition Workforce Strategy for Nutrition and is suited to the size, skills, and diversity of the nutrition workforce.

Although ***Pre-Service Training*** may take a long time to establish and implement, it has many advantages–it creates the opportunity to strengthen the capacity of large numbers of potential professionals, influencing the content of their

training and identifying skills and competencies they need to acquire. Pre-service training provides a golden opportunity to equip graduates with the knowledge and competencies the work environment will require and equip them to integrate themselves into the workforce.

Pre and in-service training courses needed to keep pace with the latest evidence, strategies, guidelines, and scientific thinking on nutrition, and to enable workers to establish and maintain basic competence in both nutrition and education. When a national training strategy and plan is first put in place, support is needed for a national landscape analysis to map out, review, and update existing nutrition training curricula and materials. Its elements will include interconnected curricula for each cadre of workers so as to accommodate different levels of qualifications and experience. Investment is also needed to harmonize and coordinate nutrition curricula within countries.

Lifelong Learning

In most high burden stunting countries, no effective mechanisms exist to encourage and motivate frontline workers to participate in continuing education activities for nutrition. An important component of a National Nutrition Workforce Strategy is to develop a strategy for continuing education and certificate short courses curricula in collaboration with higher education institutions and related professional associations. Continuing education is critical for updating, maintaining and developing the skills of various public sector cadres who need nutrition skills and competencies. Competencies in nutrition must be periodically renewed through refresher training since the nutrition environment and communication are constantly evolving. Investments in continuing education for nutrition should encourage well-structured continuing education programs with short courses and continuing education credits and certificates that can be awarded to various cadres for nutrition. Continuous professional development through education (face-to-face refresher training, distance learning, e-learning, etc.) is especially critical for frontline workers being trained in nutrition. This includes periodic review and updating of in-service refresher training, curriculum, and course outlines in line with human resource requirements and national and international nutrition standards.

Community nutrition education programs support low-income communities to increase the coverage of quality priority nutrition interventions and strengthen the nutritional and health status of women and children. Local community participation encourages the generation of community-based solutions to reduce undernutrition; this is critical in order for priority nutrition interventions to be provided and malnourished people referred to facility-based nutrition services. Most frontline workers (including home-based care providers, volunteers, and agriculture extension workers) have only rudimentary training in nutrition and little to no skill in communicating with people in vulnerable households in order to give them information on nutrition. Investments in training are needed. Another area of support needed is in identification and facilitation of nutrition linkages and referrals[46] among communities. Ultimately, this will help institutionalize nutritional care and support in existing community-based programs, including those that focus on orphans and vulnerable children.

Professionalizing Nutrition within the Workforce

In most countries, it is necessary to upgrade the nutrition competencies amongst various cadres of workers. Again, this may include frontline health or community workers, allied public health nutritionists, or mid-level nutrition officers working at sub-national levels. One major barrier to scaling up nutrition in high-burden countries is the failure to professionalize nutrition throughout the health and other sectors. In addition to strengthening nutrition competencies it may be necessary to upgrade the professional qualifications and experience of various cadres of workers implementing nutrition interventions and services. Credentialing is the establishment of a self-regulatory process instituted by the relevant profession to determine and acknowledge that an individual has demonstrated competence to practice. This

Staff skill in communicating nutrition and health information to families is essential to a good outcome for the patient.

Richard Leonardi/Bread for the World

can be accomplished through various methods including certification, accreditation, and licensing.

Certification often comes early in a person's career; it signifies that he or she has successfully completed a training course and met performance standards.[47] An official certificate should be given so that trainees have a record of what they have learned and can prove their eligibility for jobs that require this training. Accreditation applies to programs rather than to individuals; it means that training programs are periodically evaluated based on well-defined standards.[48,49] The third, licensing, is for individuals; it involves adhering to formal legal requirements for practicing a profession and may include competency testing or re-testing and/or requirements for refresher training or other continuing education.[50]

Governance, Decentralization, and Nutrition

Scaling up nutrition requires decentralization.[51] Although policies and governance are initiated at the national level, management of public sector human resources is usually decentralized which prevents consistency for nutrition service delivery and accountability for results. Formal, transparent management of human resources[52] for nutrition allows more effective service delivery; it offers clearly defined standard operating procedures that reflect responsibilities, accountability, and lines of authority. The institutional arrangements for nutrition need to be reviewed to ensure that national and sub-national level government authorities have the authority and adequate systems and capacity to plan, recruit and manage identified cadres with appropriate nutrition competencies within and create an enabling work environment for the integration of nutrition within these cadres of workers.

Investment in host country nutrition capacity to provide leadership and governance, as well as support to strengthen policies and management, is critical to scale up nutrition effectively. To help countries attract investment for mainstreaming nutrition into the workforce, an advocacy for nutrition in the workforce brief (illustrated in table 4) can be developed. This advocacy brief could help track nutrition, similar to other cadres through a type of scorecard to see if countries are on track. For example, WHO has recently introduced an indicator for nutrition governance[53,54] that defines and tracks the strengths and weaknesses of national nutrition governance systems. The ***WHO Landscape Analysis to Accelerate Action in Nutrition*** information system also includes indicators to track if a degree in nutrition exists, the number of trained nutrition professionals per 100,000 population and year as well as the nursing and midwifery personnel density per 10,000 population and year.

Conclusion

Leveraging the unprecedented global momentum to scale up nutrition and achieve the Millennium Development Goals will require investments and support to strengthen human capacity in nutrition knowledge, skills and competencies. In addition, strengthening the capacity of various workforce cadres to implement nutrition interventions at the national and sub-national levels requires a systematized approach that actively addresses workforce challenges and plans solutions through a robust National Nutrition Workforce Strategy and Implementation Plan. Successful implementation will improve service delivery, efficiency, and management systems within a national multisectoral nutrition response. It will require a transformation of how frontline workers and allied public health nutritionists and/or dieticians are trained and perform—encouraging competency-driven approaches while institutionalizing roles and responsibilities. Approaches to mainstream nutrition within a country's public sector workforce also needs to address barriers to managing decentralization, reflect the local country context and the growing global evidence base on mainstreaming nutrition within the workforce.

Table 4 Illustrative Advocacy Nutrition in the Workforce Policy Brief Scorecard

NATIONAL NUTRITION MILESTONES		
National Nutrition Strategy		✪✪✪
National Nutrition Workforce Strategy		✪✪✪
Human Resources for Nutrition Capacity Needs Assessment		✪✪✪
REGULATION FOR NUTRITION WORKFORCE		
Legislation exists recognizing Nutritionist as an autonomous profession		✪✪✪
Nutrition Officers and/or Nutritionists hold a protected title		✪✪✪
A license/certificate is required to practice as a Nutrition Officer and/or Nutritionist		✪✪✪
NUTRITION PROFESSIONAL ASSOCIATIONS		
A nutrition association exists47		✪✪✪
Number of nutrition professionals represented by an association		✪✪✪
Association(s) affiliated with Nutritionists and/or Nutrition Officers		✪✪✪
NUTRITION EDUCATION & TRAINING		
Pre-Service Training	**In-Service Training**	
College/University offering pre-service training	In-service training for Nutrition Officers	✪✪✪
	In-service training for Facility-Based Health Workers	✪✪✪
	In-service training for Community-Based Workers	✪✪✪

Key Terms and Definitions	
Competency[55]	Competencies are underlying characteristics within a given functional area that lead to successful performance. They may include knowledge and skills as well as various levels of motivation. Competence is a combination of knowledge, skills, and behavior used to improve performance; or the state or quality of being adequately or well qualified, having the ability to perform a specific role.
Priority Nutrition-Specific Interventions	Priority Nutrition Interventions are the package of high-impact nutrition interventions proven to be effective in improving nutrition and preventing related disease. The authors of the Lancet Series on Maternal and Child Undernutrition estimate that universal coverage with the full package of proven interventions at observed levels of program effectiveness could prevent about one-quarter of the deaths of children under 36 months of age and reduce the prevalence of stunting at 36 months by about one-third.[56] These priority nutrition interventions should be promoted using a "nutrition through the life cycle" approach, incorporating women's nutrition during pregnancy and lactation, optimal IYCF (breastfeeding and complementary feeding), nutritional care of sick and malnourished children (including zinc, vitamin A, and ready-to-use therapeutic and supplementary foods), and the control of anemia, vitamin A, and iodine deficiencies in the 1,000 days from pregnancy to a child's second birthday.
Nutrition Education[57]	The goal of nutrition education is to reinforce specific nutrition-related practices or behaviors to change habits that contribute to poor health; this is done by creating motivation for change and establishing desirable food and nutrition behavior for the promotion and protection of good health. People learn information about nutrition and develop the attitudes, skills, and confidence that they need to improve their nutrition practices.
Intervention	An intervention[58] is a purposely-planned action designed with the intention of changing a nutrition-related behavior risk factor, environmental condition, or aspect of the health status of an individual, a target group, or a population at large. If implemented at scale, the intervention could significantly reduce the effects of maternal and child undernutrition. Effective interventions are available to reduce underweight, stunting, micronutrient deficiencies, and child deaths.[59] Nutrition interventions are actions within greater nutrition programs.
Frontline Health Worker[60,61]	Frontline health workers are those directly providing services (often first responders) where they are most needed, especially in remote and rural areas. Many are community health workers and midwives, though they can also include local pharmacists and nurses who serve in community clinics. Some physicians may also be considered frontline health workers when they serve in local clinics and address basic health needs. In addition to nutrition services, frontline health workers provide a range of services for families from pre-pregnancy through maternal and newborn care, child health, and the management of chronic and communicable diseases such as tuberculosis, AIDS, and diabetes. Frontline health workers deliver advice and services to patients in their homes and in clinics, serving as counselors, educators, and treatment providers. Because they often come from the communities they serve, frontline health workers understand the beliefs, practices, and norms of those communities, allowing them to provide more culturally appropriate health care.
Community Health Worker[62]	A health worker who receives standardized training outside the formal nursing or medical school curricula to deliver a range of basic health, promotional, educational, and mobilization services and who has a defined role within the community system and larger health system.
High-Burden Stunting Country[63,64]	These countries have the highest burden of undernutrition. In many high-burden countries, malnutrition rates are much higher than would be expected given national income or economic growth rates. Examples include India (where robust economic growth has been sustained for more than a decade, but there have been no significant reductions in malnutrition), Guatemala, Angola, and Pakistan. The following 36 high-burden countries are home to 90 percent of the world's 17 million stunted children younger than 5: Afghanistan, Angola, Bangladesh, Burkina Faso, Burundi, Cambodia, Cameroon, Côte d'Ivoire, Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, Guatemala, India, Indonesia, Iraq, Kenya, Madagascar, Malawi, Mali, Mozambique, Myanmar, Niger, Nigeria, Nepal, Pakistan, Peru, Philippines, South Africa, Sudan, United Republic of Tanzania, Turkey, Uganda, Viet Nam, Yemen, and Zambia.
Human Resources Planning[65]	Human resources (HR) planning refers to classic HR administrative functions, such as identification of current and future human resources needs and evaluation of the HR requirements for an organization to achieve its goals. HR planning should serve as a link between human resources management and the overall strategic plan of an organization.

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Key Terms and Definitions	
National Nutrition Strategy[66]	A National Nutrition Strategy (NNS) is a strategy adopted by a national government that commits institutional leadership to guide and coordinate efforts to reduce undernutrition. The NNS prioritizes the allocation of government and donor resources to improve nutritional outcomes. It is guided by the following principles: • The NNS will oversee implementation of nutrition interventions and coordinate with key sectors (for example, Ministries of Agriculture, Food, and Disaster Management; business; non-governmental organizations; academia). • The NNS will seek to intervene at different stages of the life cycle, with a strong focus on the ''window of opportunity" from pregnancy through the first two years.
Nutritionist/[67] Dietician[68]	A nutritionist is a person who advises on issues related to the impacts of food and nutrition on health. Different professional terms are used, depending on the country, employment setting, and context. (These terms include Dietician, Clinical Dietician, Food Service Dietician, Nutritionist, Public Health Nutritionist, Sports Nutritionist). This is a professional occupation and requires formal training at a higher educational institution in food and nutritional science, nutrition education, dietetics, or a related field. In many countries, nutritionists are registered with health professional councils or professional associations. Dieticians and nutritionists assess, plan, and implement nutrition interventions. They may conduct research, assessments, and education to improve the nutritional status of individuals and communities. Dieticians[69] assist clients in determining and handling their food needs and nutrition-related concerns via short- and long-term therapy strategies.
Training	On the job training is additional in-service training to attain competency in the skills needed for an occupation. It is employee training at the place of work while he or she is doing the actual job. Usually a professional trainer (i.e., Trainer of Trainers), or sometimes an experienced employee, serves as the course instructor and uses hands-on training, often supported by formal classroom training.
Sub-National[70]	Sub-national refers to an administrative division or entity; it is a portion of a country or other political division established for the purpose of government. Administrative divisions are each granted a certain degree of autonomy and are required to manage themselves through their own local governments. Countries are divided into these smaller units to make it easier for government to manage land and national affairs. For example, a country may be divided into provinces, which in turn are divided into counties, which in turn may be divided in whole or in part into municipalities. Examples include: Provinces, States, Zones, Regions, Districts, Councils, Wards, Villages.
Scaling Up[71]	The definition of "scale" is widespread achievement of impact at affordable cost. Increased impact is a function of the coverage of a population, program effectiveness (quality of implementation and efficacy of interventions employed), efficiency (cost per beneficiary), sustainability (continuity, ownership), and equity (reaching the hardest to reach, usually the poor). Scaling up is the process of expanding (the Government's/Implementing partners) impact, centralizing operations to expand interventions/programs to more people over a wider geographic coverage area to be implemented more quickly and cost effectively. Scaled-up programs usually reach (or provide access for) much of the targeted population within a specified area (i.e., nutrition).
Supportive Supervision[72,73]	Supportive supervision should be considered capacity building rather than evaluation for the purpose of imposing sanctions. A supervision session consists of: • An assessment of practices (through observations that include taking anthropometrics, discussions and review of counseling, etc.). • A participatory discussion of observations, highlighting both positive and negative findings. • A discussion of a small number of weaker areas that everyone agrees can be improved. Supportive supervision for nutrition entails working with nutrition-focused personnel to establish goals, monitor performance, identify and correct problems, and proactively improve the quality of nutrition services.
Workforce Planning[74]	In its simplest terms, workforce planning is getting "the right number of people with the right skills, experiences, and competencies into the right jobs at the right time." Workforce planning is a comprehensive process that provides managers with a framework for making staffing decisions based on an organization's (or government's) mission, strategic plan, and budgetary resources, combined with a set of desired workforce competencies.

Endnotes

[1] *The Lancet* 2008; 371: 608–21. Published online, January 17, 2008. DOI:10.1016/S0140-6736(07)61695-X. London School of Hygiene &Tropical Medicine, London, UK. (S. S. Morris Ph.D., R Uauy Ph.D.); International Union of Nutrition Sciences (R Uauy MD); and UNICEF, New York, NY, USA.(B Cogill PhD)

[2] The Lancet Series on Child and Maternal Undernutrition. Maternal and Child Undernutrition: Effective Action at National Level. Jennifer Bryce, Denise Coitinho, Ian Darnton-Hill, David Pelletier, Per Pinstrup-Andersen, for the Maternal and Child Undernutrition Study Group. Vol. 371, February 9, 2008.

[3] The Scaling Up Nutrition movement is for all countries whose populations experience undernutrition and for all stakeholders committed to providing support; it provides principles and directions for increased support for countries as they scale up their efforts to tackle maternal and child undernutrition across a range of sectors and stakeholders (developing countries, donors and multilateral institutions, civil society organizations, academic institutions, and the private sector).

[4] World Health Organization. http://app.s.who.int/nutrition/landscape_analysis/en/index.html.High-Burden Stunting Countries: Afghanistan, Angola, Bangladesh, Burkina Faso, Burundi, Cambodia, Cameroon, Côte d'Ivoire, Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, Guatemala, India, Indonesia, Iraq, Kenya, Madagascar, Malawi, Mali, Mozambique, Myanmar, Niger, Nigeria, Nepal, Pakistan, Peru, Philippines, South Africa, Sudan, United Republic of Tanzania, Turkey, Uganda, Viet Nam, Yemen, Zambia.

[5] Global Experience of Community Health Workers for Delivery of Health Related Millennium Development Goals: A Systematic Review, Country Case Studies, and Recommendations for Integration into National Health Systems, Zulfiqar A. Bhutta, Zohra S. Lassi, George Pariyo and Luis Huicho, Division of Women & Child Health, The Aga Khan University, Karachi, Pakistan; Makerere University School of Public Health, Kampala, Uganda; Universidad Peruana Cayetano Heredia, Universidad Nacional Mayor de San Marcos and Instituto de Salud del Niño, Lima, Peru. Global Health Workforce Alliance, World Health Organization. Accessed at http://www.who.int/workforcealliance/knowledge/publications/alliance/Global_CHW_web.pdf

[6] The Lancet Series on Maternal and Child Undernutrition. "Effective international action against undernutrition: why has it proven so difficult and what can be done to accelerate progress?" *Lancet* 2008; 371: 608–21. Published online. January 17, 2008. DOI:10.1016/S0140-6736(07)61695.

[7] The Lancet series on Maternal and Child Undernutrition. *The Lancet*, Volume 371. 2008.

[8] Capacity strengthening/building on an individual level requires the development of conditions that allow individual participants to build and enhance their existing knowledge and skills. It also calls for the establishment of conditions that will allow individuals to engage in the "process of learning and adapting to change." United Nations Committee of Experts on Public Administration (2006). United Nations Economic and Social Council Definition of basic concepts and terminologies in governance and public administration. http://unpan1.un.org/intradoc/groups/public/documents/un/unpan022332.pdf. The United Nations Development Programme (UNDP) defines capacity development as the process through which individuals, organizations, and societies obtain, strengthen, and maintain the capabilities to set and achieve their own development objectives over time.

[9] Saul S. Morris, Bruce Cogill, Ricardo Uauy, The Lancet Series on Maternal and Child Undernutrition. *Lancet* 2008; 371: 608–21. Published online. January 17, 2008. DOI:10.1016/S0140-6736(07)61695-X. London School of Hygiene &Tropical Medicine, London, U.K. (S. S. Morris PhD, Prof. R. Uauy); International Union of Nutrition Sciences (R. Uauy, MD); and UNICEF, New York, NY (B. Cogill PhD)

[10] Copenhagen Consensus 2008 Challenge Paper on Hunger and Malnutrition. Sue Horton, Harold Alderman, and Juan A. Rivera. Draft of May 11, 2008.

[11] 2012 Global Copenhagen Consensus. Investments to Reduce Hunger and Undernutrition. John Hoddinott, Mark Rosegrant, and Maximo Torero. March 30, 2012. Version of April 9, 2012.

[12] A series of highly effective and low-cost nutrition-specific interventions has been identified in peer-reviewed articles in *The Lancet* and other scientific publications. Direct interventions target the immediate causes of undernutrition: inadequate dietary intake and ill health. The Lancet Series on Maternal and Child Undernutrition (*The Lancet*, Volume 371. 2008) recommended 13direct interventions to be implemented at scale in countries with high rates of undernutrition.

[13] Nutrition-sensitive interventions are those conducted in one or several of a range of programs that can have a major impact on nutrition but take place within the context of larger, non-nutrition programs, such as health, agriculture, social protection, or education. These programs may be able to improve nutritional outcomes since they can be adapted to address the determinants of undernutrition; however, evidence that they can make large-scale improvements in nutrition outcomes is currently lacking.

[14] Common sectors that integrate nutrition include: agriculture and food security, education, health, livestock and fisheries, Social Protection/Welfare, and water, sanitation and hygiene sector. Cadres of workers needing nutrition competencies will vary based on country context. For example it may be appropriate for Social Welfare Officers, Agricultural Extension Officers or Frontline Workers among other cadres to have some competencies in nutrition.

[15] USAID's Global Health Strategic Framework: Better Health for Development, FY 2012-FY 2016. http://apps.who.int/medicinedocs/documents/s19251en/s19251en.pdf; http://www.usaid.gov/our_work/global_health/home/Publications/docs/gh_framework_es2012.pdf. These countries include: Bangladesh, Cambodia, Ethiopia, Ghana, Guatemala, Haiti, Kenya, Liberia, Malawi, Mali, Mozambique, Nepal, Rwanda, Senegal, Tanzania, Uganda, and Zambia.

[16] www.thousanddays.org

[17] As recently demonstrated by President Obama's elevation of global nutrition food security at the G-8 Summit. The White House

Office of the Press Secretary. May 17, 2012. Fact Sheet: G-8 Action on Food Security and Nutrition. Accessed at http://www.whitehouse.gov/the-press-office/2012/05/18/press-briefing-senior-administration-officials-food-security

[18] http://www.state.gov/documents/organization/190494.pdf

[19] Report. Nutrition Capacity Assessment in Malawi, Department of Nutrition, HIV and AIDS. Office of the President and Cabinet (OPC). Government of the Republic of Malawi and Food and Agriculture Organization of the United Nations (FAO). December 2009, 2010.

[20] Although some countries may have professionally-trained nutritionists/dieticians, they are generally few in number and often they are not assigned specific duties related to the role of nutritionists, have inadequate guidance and supervision, and are not involved in planning and managing a program of nutrition interventions.

[21] The World Health Organization has highlighted 36 high-burden countries where 90 percent of the world's stunted children live.

[22] The SUN movement is a range of sectors and stakeholders (developing countries, donors and multilateral institutions, civil society organizations, academic institutions, and the private sector) who collaborate and provide principles and directions for increased support for countries as they scale up their efforts to tackle maternal and child undernutrition. The SUN movement's main role is to empower and support action at country level by mobilizing resources, aligning efforts, and supporting leadership and advocacy at the international level. The SUN movement supports nutrition planning and implementation at the country level by building support and garnering resources at the global level, and by bringing together governments, donors, civil society, and other stakeholders.

[23] Although we touch upon other sectors in this brief, we mostly focus on the health sector as few counties have successfully integrated nutrition into other sector cadres of workers with forthcoming strategies and methods to integrate nutrition competencies currently evolving.

[24] Saul S. Morris, Bruce Cogill, Ricardo Uauy, The Lancet Series on Maternal and Child Undernutrition. "Effective international action against undernutrition: why has it proven so diffcult and what can be done to accelerate progress?" *Lancet* 2008; 371: 608–21. Published online. January 17, 2008. DOI:10.1016/S0140-6736(07)61695-X. London School of Hygiene &Tropical Medicine, London, U.K. (S. S. Morris PhD, R. Uauy PhD); International Union of Nutrition Sciences (R. Uauy MD); and UNICEF, New York, NY.

[25] Marden P, Caffrey M, McCaffrey J. Human Resources Management Assessment Approach. Capacity Plus, 2013.

[26] http://www.iycn.org/files/IYCN-Nutrition-Training-for-Ag-Extension-Officers.pdf

[27] Assessment of Pre-Service and In-Service Extension Education. FAO. http://www.fao.org/sd/EXdirect/EXan0001.htm

[28] http://www.meas-extension.org/home/glossary

[29] For the purpose of this paper, basic nutrition services are prevention, treatment, and care of malnutrition, especially pregnant women and during the 1,000-day window between pregnancy and a child's second birthday. These services can include (but are not limited to) monitoring nutritional status, micronutrient supplementation, breastfeeding promotion, behavior change communication for improved complementary feeding, treatment of severe and moderate acute malnutrition, deworming via antihelminthic drugs, and community-based nutrition education and counseling (including on hygiene and hand washing) for improved nutrition practices and improved household food security (e.g., dietary diversity).

[30] Nutrition education for the public. Discussion papers of the FAO Expert Consultation (Rome, Italy, 18-22 September 1995) Accessed at http://www.fao.org/docrep/w3733e/w3733e05.htm

[31] Nutrition Officer is used as a generic term in this paper for an individual who is professionally trained in nutrition and who is expected to administer nutrition services at sub-national levels; generally, a nutrition officer also has some type of coordinating role.

[32] World Health Organization, 2006. Working Together for Health.

[33] Hughes R. A socioecological analysis of the determinants of national public health nutrition work force capacity: Australia as a case study. Family and Community Health, 2006. 29(1): 55-67.

[34] Council of Linkages. Core Competencies for Public Health Professionals. 2009. http://www.phf.org/link/core-061109.htm

[35] Galway Consensus Conference (2008) Toward domains of core competency for building global capacity in health promotion: The Galway Consensus Conference Statement. http://www.sophe.org/upload/Galway%20Consensus%20Conference%20Statement%20-%20Final_84911642_6302008111733.pdf

[36] Public Health Agency of Canada, Core competencies for public health in Canada: Release 1.0, in www.phacaspc.gc.ca/core_competencies 2007, Public Health Agency of Canada: Ottawa.

[37] Hughes R., A competency framework for public health nutrition workforce development. 2005, Australian Public Health Nutrition Academic Collaboration. Accessed at www.aphnac.com

[38] The Lancet Series on Maternal and Child Undernutrition. The *Lancet*, Volume 371. 2008.

[39] Frenk et al., 2010.

[40] Competency standards are defining statements about a profession or work role that can be used to assist credentialing.

[41] A series of articles was published in Public Health Nutrition Cambridge Journal PUBLIC HEALTH NUTRITION, VOLUME 15 - ISSUE 11, November 2012. Accessed at: http://journals.cambridge.org/action/displayIssue?jid=PHN&volumeId=15&issueId=11

[42] Hughes R, Shrimpton R, Recine E, Margetts B. A Competency Framework For Global Public Health Nutrition Workforce Development: A background paper. 2011. World Public Health Nutrition Association. Accessible www. wphna.org.

[43] Hughes R, Shrimpton R, Recine E, Margetts B. A Competency Framework for Global Public Health Nutrition Workforce Development: A Background Paper. 2011. World Public Health Nutrition Association. Accessible www. wphna.org.

[44] IST generally includes competency testing and the systematic maintenance of training records in addition to undertaking research to improve cost effectiveness.

[45] Nutrition education for the public. Discussion papers of the FAO Expert Consultation (Rome, Italy, 18-22 September 1995).

[46] A referral system is a process for determining when a referral is needed, a logistics plan in place for transport and funds when required, and a process to track and document referrals.

[47] Evaluation of USAID Human Capacity Development In Health, Carol D. Brancich, Andrew Kantner, August 2003, LTG Associates, Inc., Global Health and Development Strategies (a division of Social & Scientific Systems, Inc.). James Heiby, 2003. Accessed at www.usaid.gov/our_work/global_health/pop/news/report88.doc.

[48] World Health Organization. Health Systems Strengthening Glossary. Accessed at http://www.who.int/healthsystems/hss_glossary/en/index.html Rooney AL, van Ostenberg PR. Licensure, accreditation, and certification: approaches to health services quality. Bethesda, MD. USAID, 1999. Available at: http://www.qaproject.org/pubs/PDFs/accredmon.pdf

[49] http://www.sanfordbrown.edu/About-Us/Accreditation-And-Certification

[50] World Health Organization. Health Systems Strengthening Glossary.

[51] Scaling Up Community-Driven Development For Dummies. The World Bank. Hans P. Binswanger and Tuu-Van Nguyen. September 17, 2004. Available at: http://siteresources.worldbank.org/INTCDD/550121-1138894027792/20806801/Scaling0Up0CDD0for0Dummies.pdf

[52] Heiby, 2003.

[53] Nutrition Landscape Information System (NLIS). Country Profile Indicators, Interpretation Guide. 2010. http://whqlibdoc.who.int/publications/2010/9789241599955_eng.pdf

[54] The nutrition governance score is "strong," "medium," or "weak," depending on the degree to which a specific set of elements are present. Countries have identified these elements as crucial to successful development and implementation of national nutrition policies and strategies. The elements are: 1) Existence of an intersectoral mechanism to address nutrition; 2) Existence of a national nutrition plan or strategy; 3) Whether or not the national nutrition plan or strategy is adopted; 4) Whether the national nutrition plan or strategy is part of the national development plan; 5) Existence of a national nutrition policy; 6) Whether the nutrition policy is adopted; 7) Existence of national dietary guidelines; 8) Allocation of budget for implementation of the national nutrition plan, strategy, or policy; 9) Regular nutrition monitoring and surveillance; 10) existence of a line for nutrition in the health budget. Source: WHO. WHO Global Database on National Nutrition Policies and Programmes. Department of Nutrition for Health and Development (NHD), Geneva, Switzerland.

[55] http://en.wikipedia.org/wiki/Competence_(human_resources)

[56] The Lancet Series on Maternal and Child Undernutrition, Executive Summary, 2008.

[57] Food and Agriculture Organization (FAO). http://www.fao.org/DOCREP/W0078e/w0078e10.htm

[58] Lacey and Pritchett, JADA 2003;103:1061-1072.

[59] The Lancet Series on Maternal and Child Undernutrition, Executive Summary, 2008.

[60] http://frontlinehealthworkers.org/frontline-health-workers/who-they-are/

[61] Frontline Health Worker Issue Brief. Frontline Health Workers Coalition, January 2012.

[62] WHO, 2007. This is also the definition used at the Community Health Worker Evidence Summit organized by USAID in May 2012.

[63] The World Bank. http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTHEALTHNUTRITIONANDPOPULATION/EXTNUTRITION/0,,contentMDK:22555092~menuPK:282580~pagePK:148956~piPK:216618~theSitePK:282575~isCURL:Y,00.html

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[65] http://en.wikipedia.org/wiki/Strategic_human_resource_planning

[66] Scaling Up Nutrition Movement (http://www.scalingupnutrition.org/)

[67] http://en.wikipedia.org/wiki/Nutritionist

[68] World Health Organization, Health worker Classification. http://www.who.int/hrh/statistics/Health_workers_classification.pdf

[69] http://www.reach-partnership.org/

[70] http://en.wikipedia.org/wiki/Administrative_division

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