



## Conference on ‘Food and nutrition security in Africa: new challenges and opportunities for sustainability’

### Capacity building in public health nutrition

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The aim of the present paper is to review capacity building in public health nutrition (PHN), the need for which has been stressed for many years by a range of academics, national and international organisations. Although great strides have been made worldwide in the science of nutrition, there remain many problems of undernutrition and increasingly of obesity and related chronic diseases. The main emphasis in capacity building has been on the nutrition and health workforce, but the causes of these health problems are multifactorial and require collaboration across sectors in their solution. This means that PHN capacity building has to go beyond basic nutrition and beyond the immediate health workforce to policy makers in other sectors. The present paper provides examples of capacity building activities by various organisations, including universities, industry and international agencies. Examples of web-based courses are given including an introduction to the e-Nutrition Academy. The scope is international but with a special focus on Africa. In conclusion, there remains a great need for capacity building in PHN but the advent of the internet has revolutionised the possibilities.

**Nutrition: Public health: Capacity development: International: Africa**

#### Towards improved public health nutrition

Despite advances in knowledge of nutrition and interventions there is still a high prevalence of malnutrition, mainly in developing countries, and an increasing prevalence of obesity and non-communicable diseases in both developed and developing countries. This has to be related to inadequate implementation or ineffective nutrition policies.

Effective and sustainable public health nutrition (PHN) policy depends on many factors. One essential is well-funded scientific research on the effects of foods and drinks and their components on health, the identification and measurement of types of malnutrition, including obesity, in individuals and populations, determination of the underlying causes of poor nutrition and the effectiveness of different interventions to prevent or remedy nutrition problems. The results need to be disseminated to the international scientific community through peer reviewed publications and discussion in scientific meetings.

Research findings on specific topics should be synthesised through systematic reviews and reviewed by expert panels to provide up to date evidence-based information. This can be used for nutrition training and education of nutrition and other health professionals and translated into lay language for dissemination to the general public and to policy makers. Registration of qualified nutrition professionals is desirable to ensure the relevance of advice provided. Formulation and publication of standards are required for nutrition education for different levels of professionals and schools, for meals in schools and other institutions, for food suppliers in the form of food standards, e.g. WHO/FAO Codex Alimentarius<sup>(1)</sup>, and for the general public through nutrition labelling of foods and drinks.

Policy makers must be made aware of the social and economic costs of poor nutrition, of the underlying causes of poor nutrition, and of relevant interventions. Governments should be able to coordinate the sectors

**Abbreviations:** MOOC, massive open online courses; PHN, public health nutrition.  
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involved in the underlying causes, leading to the provision of an adequate food supply which should be regulated to ensure its safety and nutritional quality.

### Role of government

National governments are responsible for the health of the nation and therefore for policies for good nutrition, although non-governmental organisations and charities also play a part. In most countries, nutrition is within the health sector but the causes of nutritional problems are multifactorial, including employment, wages, education, availability and price of food and water, housing and facilities for sport and exercise. Good nutrition therefore involves other sectors such as agriculture, commerce, transport, housing and education. But these are often not incorporated into nutrition policy.

Governments have to deal with a huge range of issues and policies, even within health, and nutrition is often not high on government priorities. The strength of the economy is always a high priority and if the food industry forms a significant part of the economy, governments are reluctant to impose policies detrimental to the profitability of companies. Hence the main emphasis is on voluntary regulation.

### Policy emphasis

#### *In developed countries in relation to obesity and non-communicable diseases*

Undernutrition is already largely removed by adequate incomes, food supply, housing, sanitation, health services and welfare provision. The main policy emphasis in industrialised countries is on personal responsibility, so that education on nutrition and activity and public information are the mainstays. In the UK, the government prefers voluntary compliance of industry with recommendations rather than legislation. This is a source of conflict with many public health nutritionists who urge a more forceful policy. In some cases, the voluntary compliance approach has been successful such as the reduction of salt in processed foods<sup>(2)</sup>. In other cases, the voluntary compliance policy is ineffective<sup>(3)</sup>.

#### *In developing countries mainly in relation to undernutrition*

Policies are hindered not only by lack of resources, both financial and skills, but also by the double burden of disease and often by the multiplicity of non-governmental organisations and aid agencies, each with separate agendas. This is now increasingly recognised by aid agencies, so that there is some prospect of better coordination e.g. through the Scaling Up Nutrition Movement<sup>(4)</sup> (see section on limitations later).

### Pressure groups

Pressure groups play an important role in fostering policy change at the government and international agency levels. These groups include organisation such as Action Centre

La Faim – Action Against Hunger<sup>(5)</sup>, Action on Sugar<sup>(6)</sup>, Baby Milk Action<sup>(7)</sup>, The British Heart Foundation<sup>(8)</sup>, Consensus Action on Salt and Health<sup>(9)</sup>, Consumers International<sup>(10)</sup>, The Food Commission<sup>(11)</sup>, International Baby Food Action Network<sup>(12)</sup>, Oxfam<sup>(13)</sup>, SUSTAIN<sup>(14)</sup>, West Africa Health Organisation<sup>(15)</sup>, World Action on Salt and Health<sup>(16)</sup>, World Cancer Research Fund<sup>(17)</sup> and World Obesity Federation<sup>(18)</sup>.

### Growth of nutrition evidence

The nutrition evidence base is constantly growing, as research develops in relation to the effects of nutrients and foods on health and at what life stages. Also there is an increasing evidence of ‘what works’ i.e. policies and programmes that are effective in combatting malnutrition. The 1970s was a critical period in international food and nutrition policy. There was very little evidence available then on the effectiveness of nutrition interventions, as these were often carried out without evaluation of impact. But the widespread food crises of the early 1970s and a subsequent World Food Conference in 1974<sup>(19)</sup> engendered a great deal of interest and many publications on PHN, mainly in developing countries. Over the same time the concept was developed that nutrition is an important factor in national development rather than just an outcome<sup>(20)</sup>. This led to the emergence of multisectoral National Nutrition Planning, an approach that was promoted by FAO and United States Agency for International Development in several countries<sup>(21–24)</sup>.

National Nutrition Planning recommended a systematic approach starting with analysis of the types, extent and causes of malnutrition, coordination of the sectors involved in the underlying causes of malnutrition, selection of the most effective intervention for the specific nutrition problem, evaluation of its effects, and continuing with reiteration of the process. But it soon became apparent that the evidence of effectiveness was not available and so choices of interventions had to be made on intelligent guess work. The need for such a fall-back was a spur to more evaluations of programmes and policies. This later led to the reviews of effective programmes, including Malnutrition: what can be done<sup>(25)</sup> What works<sup>(26)</sup> and subsequently the influential *Lancet* series on Mother and Child Malnutrition focusing on the critical first 1000 d<sup>(27)</sup>. The focus was mainly on developing countries and most of the evaluations were of single issue interventions such as breast feeding and micro-nutrient supplements.

### Limitations in the selection of effective interventions

Review of effective interventions is limited by the difficulties of evaluation, in particular the difficulty of obtaining a control group against which to measure the effects of the intervention. Some are relatively easy to evaluate if the intervention is limited and can be well controlled with a comparative placebo or equivalent population without the intervention. An example is vitamin and

mineral supplementation. Others such as agricultural or economic interventions in the form of subsidies or taxation are much less easy to control and to properly evaluate. This produces emphasis on interventions that remedy nutrient deficiencies, but does not deal with the underlying causes of malnutrition and is therefore less sustainable. A criticism made of this emphasis is that, it plays into the hands of the pharmaceutical industry that supplies the vitamins and minerals and the food industry that supplies special complementary food formulations such as ready to use therapeutic foods and medicalised problems that are fundamentally economic and political.

Interventions that address underlying causes of nutrition problems including poverty due to lack of employment and low wages, low value of agricultural and other products, environmental pollution, lack of education, trade inequalities, etc. are termed nutrition-sensitive interventions or indirect nutrition interventions. These interventions are likely to be more effective and sustainable in the long run but are more difficult to prove scientifically.

In the meantime therefore interventions that have been proven to be effective remain the simpler direct nutrition interventions and the conclusions of these reviews have been propagated by several bodies such as the Copenhagen Consensus and the Scaling Up Nutrition movement. The 2008 *Lancet* series has had a significant impact on international nutrition policy. It stimulated an increase in political commitment in many countries and organisations to reduce undernutrition. Many agency strategies were revised to focus on the first 1000 d (pregnancy and the first 2 years) and this focus was adopted in the Scaling Up Nutrition movement.

The Copenhagen Consensus 2012<sup>(28)</sup> is a consensus achieved by a panel of economic experts, mainly Nobel Laureates, who set priorities based on the cost-effectiveness of solutions to world challenges, including hunger and malnutrition. In 2012, they ranked the most highly cost-effective interventions for the reduction of chronic undernutrition in pre-schoolers. These supported the type of interventions proven to work, including the provision of micronutrients and complementary foods, treatment for worms and diarrhoea and behaviour change.

The characteristics of the Scaling Up Nutrition movement are listed briefly here<sup>(4,29)</sup>. It started in 2010 as a partnership between developing countries, academics, civil societies, the private sector, development agencies (e.g. FAO, UNICEF, World Food Programme, WHO, United Nations Standing Committee on Nutrition, Renewed Efforts Against Child Hunger and Undernutrition) and the World Bank. It is based in countries that have volunteered to sign up to a commitment to reduce malnutrition in the first 1000 d of life using multi-sectoral, scaled up cost-effective interventions, supported by scaled up domestic and external assistance to nutrition. By July 2014, fifty-three countries had signed up.

#### Effectiveness of nutrition-sensitive interventions

Work on the evaluation of the effectiveness of nutrition-sensitive interventions is beginning to accumulate, for

example, through the International Food Policy Research Institute and the Institute of Development Studies<sup>(30–33)</sup> and the follow-up *Lancet* series on maternal and child malnutrition in 2013<sup>(34–37)</sup>. The evidence of effectiveness of nutrition-sensitive interventions is less strong, largely because of poor quality evaluations<sup>(37)</sup>. But there is evidence of what works from countries that have made recent strides in nutrition e.g. Brazil, China and Thailand<sup>(35)</sup>. This work will be encouraged by improved research on nutrition sensitive actions and recent US funding providing more than four times the amount for nutrition-sensitive actions that address the underlying causes of malnutrition than nutrition-specific interventions that address the more immediate causes by providing food, nutrients and medical care.

#### Reviews of interventions for non-communicable diseases

There are few comprehensive reviews of interventions for non-communicable diseases but recently there have been a number of reports assessing the effectiveness and cost-effectiveness of various types of interventions. These include a WHO report on interventions on diet and physical activity: what works<sup>(38)</sup>, policy and actions to tackle obesity in England<sup>(39)</sup>, drug and lifestyle interventions in pre-diabetes<sup>(40)</sup>, to reduce dietary salt intake<sup>(41)</sup>, to promote fruit and vegetable consumption<sup>(42)</sup>, to compare weight watchers and the lighten up to a healthy lifestyle<sup>(43)</sup>, to assess diet and exercise to reduce overweight and obesity<sup>(44)</sup> and to determine the effect of 'traffic light' nutrition labelling and junk food tax<sup>(45)</sup>.

#### Nutrition capacity building

Over 20 years ago Alan Berg, Chief Nutritionist at the World Bank criticised the nutrition world for focusing only on the science of nutrition and called for increased emphasis on training for its application<sup>(46)</sup>. Much of the nutrition capacity building available including online is targeted to nutritionists and other health professionals and is mainly limited to basic nutrition, the relationship between food, nutrition and health. There are some describing techniques (e.g.<sup>(47,48)</sup>) but much less about the practical aspects of policy making and interventions. Nutrition capacity building needs to be much wider. Now there are many efforts in capacity building that go beyond the traditional education and information<sup>(30)</sup>.

Many different levels of capacity are needed to be able to devise and conduct effective policies and interventions to improve nutrition. It could be limited to nutrition and health professionals and to basic concepts. But for improvements in PHN, nutritionists need training in developing appropriate programmes and policies and in influencing the public, other health professionals and policy makers. Much has been written on this need (e.g.<sup>(49–69)</sup>) and in relation to Africa in particular (e.g.<sup>(70–80)</sup>).

Who? – *who needs capacity building?* The target participants could be: the general public; nutritionists;

other health workers e.g. doctors, nurses, midwives, pharmacists, etc.; related sector workers in for example, agriculture, education, social services, commerce; and policy makers, at local or national level.

What? – *what information is needed?* Depending on the target audience this could include: basic nutrition i.e. the relationship between food, nutrients and health; the many causes of poor nutrition; assessment of nutritional status; effective policies and interventions; evaluation.

How? – *what techniques can be learned?* Nutrition research techniques, including data search, topic selection, nutritional assessment, laboratory and field methods, analysis of data, reporting findings, presentation at scientific meetings, and publication in scientific and other journals; the use of tools such as food composition data and types of equipment; methods and content of advocacy to decision makers; nutrition education/information techniques for public, professionals; the design and conduct of interventions including their evaluation.

Where? – *where can this capacity building be obtained?* Traditionally, capacity development has been carried out in universities and colleges for professionals, in schools for children, and through newspapers, magazines, radio and television for the general public. More recently it has been made available by distance learning using mail, computers and CDs, and most recently by the revolutionary advent of the internet: e-learning. The advent of electronic technology has transformed the global scene and the possibilities for capacity building.

### Examples of e-learning materials

Many examples of e-learning materials in nutrition exist already. These are provided by: universities e.g. University of Southampton<sup>(81)</sup>, London School of Hygiene and Tropical Medicine<sup>(82)</sup>; nutrition societies e.g. British Association for Parenteral and Enteral Nutrition<sup>(83)</sup>; food companies e.g. Nestle Nutrition Institute<sup>(84)</sup>, Unilever Food Solutions<sup>(85)</sup>; other companies e.g. Fitness Industry Training<sup>(86)</sup>, High Speed Training<sup>(87)</sup>, non-governmental organisations e.g. eTALC<sup>(88)</sup>; government bodies e.g. FANTA<sup>(89)</sup>, NICE<sup>(90)</sup>; international agencies e.g. UNICEF<sup>(91)</sup>, FAO<sup>(92)</sup>, WHO<sup>(93,94)</sup>; web archives e.g. The Nutrition and Food Web Archive<sup>(95)</sup>.

#### *Massive open online courses*

Universities face a new competitor in the form of massive open online courses (MOOC)<sup>(96)</sup>, which have the advantages of low start-up costs, economies of scale, lower price for students, wider access, flexibility. The first MOOC started in Canada in 2008 as an online computing course and in 2012 three large MOOC providers were launched: edX<sup>(97)</sup>, Coursera<sup>(98)</sup> and Udacity<sup>(99)</sup>, run by or associated with Harvard, MIT and Stanford Universities. These three sources by June 2014 have provided courses to over 12 million students of which about

one-third are Americans, but about half from developing countries: USA 138 000; Europe 72 000; India 60 000; other Asia 60 000; Africa 33 000 and Latin America 32 000. There is an on-line list of MOOC courses<sup>(100)</sup>. On this list are several nutrition courses. But online learning has its pitfalls, with a lower percentage of students passing the courses, high drop-out rates, the possibility of cheating in exams, and lack of interaction with other students. Students need more personalised support.

### Properties of existing e-learning materials

Some material is completely free and available for use; for others it is required to register and in many cases pay a fee. Some provide complete courses which run at specific times and have a maximum number of participants. Most are on-line but others provide the e-learning on CD Rom. Those that charge are obviously limited to people who can afford the fees. Some are provided free or at low cost through external funding. Not all are specifically relevant to nutrition capacity building in Africa.

### e-Learning for Africa

Dr Luis Gomes Sambo, the WHO Regional Director for Africa (2010–2015), has urged African countries to embrace e-learning and has listed major e-health projects in the region e.g. Telemedicine Network for Francophone African Countries<sup>(101)</sup>, organised by Geneva University Hospitals; Access to Research Initiative<sup>(102)</sup>, supported by WHO and major publishers; ePortuguese Project<sup>(103)</sup>, a WHO platform; and Pan African eNetwork Project<sup>(104)</sup>, provided by Indian Universities, but none of these focuses on nutrition.

It was on this premise that the eNutrition Academy<sup>(105)</sup> is being developed specifically for Africa initially by a consortium of the Nutrition Society, the American Society for Nutrition, the African Nutrition Society, the Federation of African Nutrition Societies and the International Union of Nutrition Societies. The eNutrition Academy was launched at the 6th African Nutritional Epidemiology Congress Meeting in Accra, Ghana in July 2014. The concept was received with much enthusiasm and with many offers of training materials and collaboration. We hope that this will be accompanied by funding support from organisations that are keenly aware of the need for improved PHN in Africa.

### Conclusions

There remains a great need for capacity building in PHN not only for the nutrition and health workforce but also for policy makers and workers in other sectors, as the causes of nutritional problems are multifactorial and require collaboration across sectors in their solution. In view of limited human and material capacities in many countries and specifically in Africa, the advent of the internet has revolutionised the possibilities.



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None.

### Authorship

Catherine Geissler is solely responsible for the formulation and writing of this paper.

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