



## NUTRITION ECONOMICS – FOOD AS AN ALLY OF PUBLIC HEALTH

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### ABSTRACT

Non-communicable diseases (NCD) are a major and increasing contributor to morbidity and mortality in developed and developing countries. Much of the chronic disease burden is preventable through modification of lifestyle behaviors, and increased attention is being focused on identifying and implementing effective preventative health strategies. Nutrition has been identified as a major modifiable determinant of NCD. The recent merging of health economics and nutritional sciences to form the nascent discipline of nutrition economics aims to assess the impact of diet on health and disease prevention, and to evaluate options for changing dietary choices, while incorporating an understanding of the immediate impacts and downstream consequences. In short, nutrition economics allows for generation of policy-relevant evidence, and as such the discipline is a crucial partner in achieving better population nutritional status and improvements in public health and wellness. The objective of the present paper is to summarize presentations made at a satellite symposium held during the 11th European Nutrition Conference, 28 October 2011, where the role of nutrition and its potential to reduce the public health burden through alleviating under-nutrition and nutrition deficiencies, promoting better-quality diets and incorporating a role for functional foods were discussed.

**Keywords:** Nutrition economics, Health economics, Public health, Cost-effectiveness.

### INTRODUCTION

Nutrition economics is relevant in all countries and applies to policies concerning fortified, conventional and functional food entities. The tasks of nutrition economics are first to assess the impact of diet on health and disease prevention, expressed

in policy-relevant terms, and second to evaluate options for changing dietary choices, including regulatory measures, social marketing, differential pricing, direct service provision and negotiations with industry. Economic evaluation determines the relative efficiency of alternative



investment strategies for enhancing wellbeing, and, in the context of nutrition economics, can be employed to ensure that scarce resources are allocated more efficiently to reduce the burden of harm from inadequate-quality diets. A methodological approach for the measurement of health outcomes in nutrition may be considered depending on a three-point continuum of efficacy, effectiveness and efficiency. Efficacy is a standard measure used in randomized controlled trials to determine whether an intervention works under controlled conditions. The outcomes have high internal validity, but often low external validity, and may not be easily generalized. A treatment may be efficacious in randomized controlled trials, but if the treatment is not used in the correct way by people in their everyday life, then the intervention will not have effectiveness. Thus, effectiveness refers to whether an intervention works under real daily life circumstances, without the

rigorous compliance conditions applied in efficacy trials. Efficiency adds cost considerations to the latter by asking the question ‘is it worth it? Value may be defined as the real health outcome per unit of financial investment.

### **The economic burden of under nutrition**

The commitment by governments to eradicate hunger and under nutrition is not only an ethical imperative, but also a sound investment that will yield significant economic gains and major social benefits. Investment in nutrition in early life will benefit not only the present generation, but also their children as well as subsequent generations.

Data on the economic costs of under nutrition help to inform the policy decision-making process. It is important to consider the effects of under nutrition in terms of both its impact on short- and long-term outcomes. Early nutrition defines to a great extent how many people will survive infancy and what quality of life they can expect up until death. Under nutrition and infection in



childhood are major determinants of a short life expectancy, while physical activity and diet have greater influence on the causes of morbidity and mortality among ageing populations. Among the leading risk factors for morbidity worldwide, high blood pressure is a major contributor to mortality in both developed and developing countries alike, while tobacco use increasingly influences morbidity in developing countries(,4). Nutrient deficiencies, such as Fe, I, Zn and vitamin A, still have an important effect on mortality and disability-adjusted life years among children aged under 5 years in developing countries.

While significant gains in life expectancy have been observed in many countries over the last 50 years, a loss in life expectancy has been observed in eight countries of sub-Saharan Africa and in North Korea. A net gain in healthy life years has been demonstrated from the beginning to the end of the twentieth century among American males by an elevation in the age of onset of some chronic conditions,

including heart disease, arthritis, neoplasm and respiratory conditions of 7–10 years. Indeed, prevention of morbidity and mortality is demonstrated to have a direct effect on economic growth. In India, half of the recent economic growth may be accounted for by the increasing survival and prevention of disability among the adult population, leading to enhanced productivity in older age. An investment in increasing adult survival rate by 1 % in developing countries is linked to a 0.05 % increase in gross domestic product growth rate, while a similar increase of 1 % in investment: gross domestic product ratio is associated with a 0.014 % increase in growth.

Many countries have targeted school feeding programmes based on low body weight rather than weight for height indices. Foods distributed in such programmes are high-energy/high-protein foods but are often not fortified with adequate micronutrients, resulting in very



limited gain in weight and no gain in body length. One of the problems in providing food to undernourished children is that while weight and fat gains may be achieved, less progress is made in terms of length for age, suggesting a trend towards making children heavier and possibly promoting obesity. A better approach would be to target under nutrition during the prenatal period and early years of life.

The consequences of linear growth retardation are multiple. Growth retardation can lead to a higher risk of death in childhood, lower scores in developmental tests (IQ) and in school performance, with higher rates of drop outs and a decrease in lean body mass, which affects physical work capacity. Higher risks of labour complications in women and retarded fetal growth have also been observed. The latter suggests a Tran's generational effect of under nutrition in which the effects are passed from the mother to the next generation.

### **Economics of nutrition: its role in evidence-policy translation**

The three main roles of economics in relation to nutrition are: (i) establishing the cost or burden of disease, that is, defining how big the problem is or how important nutrition is in health and well-being; (ii) economic evaluation, to define which services to expand by comparing the performance across different nutrition interventions and between nutrition and other modalities for improving health; and lastly (iii) establishing how best to achieve the desired change in nutritional behavior.

### **Cost of illness/burden of disease**

In estimating the burden of poor nutrition, published studies build part of the case for developing and implementing effective interventions. Studies in this area aim to assess the morbidity and mortality attributable to poor diet in terms of years of life lost, disability-adjusted life years lost, deaths and/or quality-adjusted life years (QALY) lost, as well as expenditure on treatment of nutrition-related conditions. The impact on total



economic output or indirect costs can also be measured, estimating how nutrition-related diseases affect workforce participation and productivity. Developing these estimates requires good-quality data on the relative risk of disease attributable to alternative foods or whole diet patterns and of present food consumption patterns.

### **Economic evaluation**

Economic evaluation is used to evaluate the benefits and costs of a single intervention, or compare the costs and consequences of two or more alternatives in order to best enable resource allocation choices. Economic evaluation typically seeks to express inputs and outputs in monetary terms, in order to calculate a net present value, or return on investment (value of benefits relative to value of costs) of the future stream of benefits and costs, known as a cost-benefit analysis. Health economics more often takes the form of cost-utility analysis, where performance is measured in terms of the cost of achieving a QALY gain, or cost-effectiveness analysis,

where performance is expressed as the cost of achieving a predetermined clinical outcome or event. All health economic evaluations need to draw upon the best available clinical evidence.

### **CONCLUSION**

The emerging field of nutrition economics aims to assess the impact of diet and health on disease prevention and to characterize the health and economic aspects of specific changes in nutritional behavior and nutrition recommendations. In the present paper, the importance of translating the influence of nutrition on health and its impact in reducing the public health burden has been illustrated from three different perspectives, i.e. alleviating under-nutrition and nutrient deficiencies, enhancing conventional foods and offering selected functional foods. There is a need to improve awareness among health authorities and decision makers of the very considerable benefits of better-quality diets and of the effective and cost-effective policies that can



achieve that goal. Nutrition economics has a major role in informing this desirable policy direction.

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