Plenary Lectures

PL1-1
GLOBAL EFFORTS TOWARDS ACHIEVING THE MILLENNIUM DEVELOPMENT GOALS (MDGS) AND NUTRITION WELL-BEING
Ala Alwan, Assistant Director General, WHO, Switzerland

Abstract not received.

PL1-2
CONTRIBUTION OF AGRICULTURE AND FOOD SECURITY ON NUTRITION: THE GLOBAL HARMONIZATION EFFORTS
Alexander Mueller, Assistant Director General, Natural Resources Management and Environment Department, FAO, Chair of the UN Standing Committee on Nutrition
FAO focal point for the organization of the World Summit on Food Security, Rome, November 2009

The present financial and economic crisis, in combination with persisting high food prices, has been devastating for the world's most vulnerable populations (the urban poor, displaced populations, rural landless, pastoralists and most smallholder farmers). The number of hungry people in the world has, for the first time passed 1 billion. Limited access to food obliges people to switch to poorer diets and resort to other harmful coping mechanisms. More attention should be paid to the fundamental connection between hunger, disease, poverty and the availability, access to and quality of local foods. Good health and enhanced management of natural resources for production and livelihoods are both essential in the fight against malnutrition. The present crisis underscores the urgent need to improve food and nutrition security worldwide, systematically and sustainably, by going well beyond the immediate emergency response. Consumers must be able to make good dietary and lifestyle choices. The key to changing diets is making healthy food choices accessible and affordable. Nutrition education based on locally available foods and cultural preferences will both improve food practices and contribute to shaping demand thereby re-orienting food and agricultural activities and policies. The SCN facilitates cooperation among UN agencies and partner organizations to end malnutrition in all of its forms at all levels. A rights-based approach to development, which combines the right to food and the right to health, must be adopted. Cooperation in research, policy-making and practice between the agriculture and health sectors is critical and the ICN is a major contributor.

PL2-1
GENETICS OF HUMAN HYPERTENSION: DIETARY INFLUENCE OF GENETIC EXPRESSION
Gordon H. Williams, MD, Hormonal Mechanisms of Cardiovascular Injury Laboratory, Harvard Medical School and Brigham and Women's Hospital, Boston, Massachusetts, USA

An anticipated outcome of the genetic revolution is more individualized treatment and prevention strategies. Two distinctively different approaches have been undertaken: intensive assessment of the human genome with highly developed statistical techniques but with heterogeneous distant phenotypes versus intensive assessment of phenotypes with the identification of homogeneous intermediate phenotypes with associated mechanistic pathways and directed candidate genotyping. To date for hypertension the latter approach has been the most productive, likely because of the substantial impact of diet on expression of the underlying genetic alteration. There is increasing evidence that a limited number of genes identify homogeneous subgroups of hypertensives that theoretically should respond to specific therapies, particularly when there is a defect in volume homeostasis. These subgroups have in common dietary sodium intake and in some cases caloric intake as substantial co-factors. The first group, non-modulators, comprising 25-30% of hypertensives, has dysregulation of tissue angiotensin II (ANGII) production when Na intake is modified in the adrenal and the vasculature with disproportionately reduced aldosterone (ALDO). They have abnormalities in renal function but normal renin levels, are salt sensitive and are associated with polymorphic variants of angiotensinogen, adipocyte leucine aminopeptidase, angiotensin converting enzyme (ACE) and ALDO synthase genes. Their pathophysiology is corrected by administering an ACE inhibitor. The second group has disproportionately increased ALDO levels and has a strong association between, salt sensitivity, low renin (comprising a third of the subjects in this group), polymorphisms in the β-2 adrenergic receptor (β2AR) gene and dysregulated ALDO secretion. A third group, comprising 9% of the low renin subgroup, have polymorphisms in the alpha adducin gene and abnormalities in intracellular sodium levels. Thus, these three groups share in common salt sensitivity of their blood pressure and comprise nearly 70% of that group. A fourth intermediate phenotype has higher urine free cortisol levels. They differ from the above groups in having heritable, salt resistant hypertension and comprise about 15% of the hypertensive population. Thus, a substantial fraction of mild-moderate hypertensives can be separated into distinct intermediate phenotypes with varying requirements for specific dietary intake for expression of the hypertension. These data raise the possibility of using genetics to target specific therapy, dietary and pharmacologic, to individual patients.

PL3-1
GLOBAL PARTNERSHIPS FOR COMBATING OBESITY AND CHRONIC DISEASES
K. Srinath Reddy, Public Health Foundation of India

Overweight and obesity now constitute an expanding global epidemic, with serious health consequences. Chronic diseases too now pose a major public health challenge to all regions of the world. Their rising contribution to mortality and morbidity in low and middle income countries calls for global partnerships, to share knowledge and facilitate preventive action at national, regional and global levels. Many of the determinants which impact upon obesity as well as chronic diseases are also common to other global concerns such as climate change, food crisis and zoonotic infections. Wide ranging partnerships are, therefore, needed not only across the public health and nutrition communities across the world but also with policy, professional and civil society groups engaged with environment, agriculture, food processing, trade, finance, education, urban development, communications and other relevant sectors. Lessons gleaned from other global movements related to environmental protection, tobacco control and infectious diseases should help to shape strategy for creating such global platforms. The message of 'adequate and appropriate nutrition across the life span' will help to transcend divides between 'under' and 'over' nutrition, while commitment to 'sustainable and equitable development' will build bridges between diverse social movements. Only when the prevention of overweight-obesity and chronic diseases is seen both as an economic imperative as well as an integral part of the right to health, will a global consensus emerge and concerted global action commence. Public health nutrition must lead the way in fostering trans-disciplinary education and research that can enable multi-sectoral policies, programmes and partnerships.

PL3-2
GLOBAL PARTNERSHIPS FOR COMBATING OBESITY AND CHRONIC DISEASES
W Philip T James, London School of Hygiene and Tropical Medicine; International Association for the Study of Obesity.

The prevention challenge has three dimensions: dietary interventions for those with adult chronic diseases, population prevention and pregnancy/early childhood "generational prevention". Population dietary change now has to be linked to food issues with climate change, population growth, limited water and land resources, fuel intensive agriculture and agricultural research. Multi-sectoral initiatives are needed; grass-root movements are valuable but time consuming and societally demanding; governmental action as in smoking prevention can have profound and rapid effects if backed by academia and the press. Population dietary determinants parallel tobacco and alcohol use: commodity prices, their ready availability and marketing are key factors explaining food patterns not "consumer choice" . Nutritionists need to act locally and politically; agricultural and food industries can be allies in promoting change but dietary patterns dominated by western influences challenge public health requirements with powerful food industries promoting their inappropriate products. Nutritionists need to become political advocates of public health and join forces with the environmental movement to produce solutions for local, sustainable food of high nutritional quality. We need to set an agenda for all governmental and big business related food outlets with standards where "food choices" are always nutritionally "healthy" and where Asian, Middle East, African and Latin American foods are designated as local only when they have the traditionally high nutritional profile of the original products. A global nutritional profile for "healthy foods" with the use of traffic light labelling is a challenging need because these moves will have a profound industrial influence promoting health.

PL4-1
NUTRITION, LIFESTYLE AND CANCER
J. A. Milner, National Cancer Institute, USA

Inappropriate dietary habits are implicated in cancer deaths throughout the world. The complexity of this interrelationship is underscored by the vast array of bioactive food components that may influence risk or change tumor behavior. This presentation will focus on the use of nutrigenomics technologies which includes nutrigenetics (genetic profiles that modulate the response to food components), nutritional epigenetics (influence of food components on DNA methylation and other epigenetic events and visa versa) and nutritional transcriptomics (influence of food components on gene expression profiles) and associated changes in proteomics and metabolomics for developing predictive models for evaluating the benefits and risk associated with dietary change. The response to foods, or their constituents, is highly dependent on insults arising from excess caloric intake, bacterial or viral infections, and/or environmental pollutants. While correlations have been made between "omic" events and the interrelationship between foods/supplements and cancer risk, few have been confirmed. Likewise, the molecular mechanisms accounting for the observation remains largely obscure. It is becoming increasing apparent that inadequacies or excesses of the same nutrient, whether essential or non-essential, may increase cancer risk. Furthermore, time/duration of exposure for such nutrients as folic acid and vitamin D may explain why some evidence points to benefits, while other to harm. While many uncertainties exist about the precise role of diet in health, the use of "omic" technologies holds great promise in determining who will benefit most and who will be placed at risk from dietary change and the most appropriate timing for intervention.

PL5-1
NUTRITION AS A SOUND INVESTMENT FOR HUMAN CAPITAL
Juan Rivera, Instituto Nacional de Salud Pública, México

Abstract not received.

PL5-2
NUTRITION AS A SOUND INVESTMENT FOR HUMAN CAPITAL
Susan Horton, Associate Provost, Graduate Studies, University of Waterloo, Ontario, Canada

Investments in nutrition confer important economic benefits, as well as improving health and quality of life. Nutrition investments can reduce health spending, increase current productivity, and (through cognitive and educational improvements) increase future productivity. Investing in micronutrients is a particularly attractive investment (complemented by deworming). Micronutrient supplements were the top investment ranked in the 2008 Copenhagen Consensus (out of more than 30 considered), and micronutrient fortification the third from the top. Nutrition education, complementary foods and community-based treatment of severe acute malnutrition all have good benefit:cost and cost-effectiveness outcomes.
International assistance for nutrition has barely increased over the last decade, while assistance for health has increased from $3bn to $15bn annually. Part – but not all – of this is the $7bn annual commitment for HIV/AIDS.
Increased resources for health resulted from firstly identifying safe and effective interventions, which were also cost-effective; second, costing out the required "package" of interventions; and third, mobilizing support around a plan, including support from the international donor community, developing countries, and civil society.
A package of investments in nutrition has recently been costed, which includes many of the interventions identified in the 2008 Lancet series, with some additions. The annual cost estimated is just over $10bn per year, to which developing country governments and households can contribute. A Global Action Plan is under discussion. Implementing this plan will be vital to achieving Millennium Development Goals 1 and 4 for child nutrition and child survival.