Joint IAEA-WHO-UNICEF Workshop on the Analysis of Biological Pathways to Better Understand the Double Burden of Malnutrition and to Inform Action Planning

Bio and abstract book

IAEA Headquarters, Vienna, Austria, 3-5 October 2017
Biographical Summary:

Barry M. Popkin, PhD, is the W. R. Kenan, Jr. distinguished professor of nutrition at the University of North Carolina at Chapel Hill (UNC). He has a PhD in economics and established the Division of Nutrition Epidemiology at UNC and later established and ran the UNC Interdisciplinary Obesity Center, funded by the National Institutes of Health (NIH). He has developed the concept of the Nutrition Transition, the study of the dynamic shifts in our environment and the way they affect dietary intake and physical activity patterns and trends and obesity and other nutrition-related noncommunicable diseases. His research program focuses globally (both the US and low and middle income countries) on understanding the shifts in stages of the transition and programs and policies to improve the population health linked with this transition (see www.nutrans.org). He has played a central role in placing the concerns of global obesity, its determinants, and consequences on the global stage and is now actively involved in work on the program and policy design and evaluation side at the national level, including collaborative SSB/junk food tax evaluation research in Mexico (with the National Institute of Public Health) in evaluating the impact of the Mexican SSB and nonessential food taxes and similar work with the Institute of Nutrition and Food Technology, University of Chile in evaluating an SSB tax and marketing/FOP controls. He is working with 8 other countries currently in developing tax and regulatory policies to create healthier diets and prevent obesity and other nutrition-related NCD’s. He has received a dozen major awards for his global contributions, including: 2016 World Obesity Society: Population Science & Public Health Award – for top global researcher in public health with also significant service contributions.; 2015; UK Rank Science Prize; and The Obesity Society Mickey Stunkard Lifetime Achievement Award.

Abstract:

The rapid shifts in the stages of the nutrition transition and the double burden of malnutrition in low and middle income countries

The double burden of malnutrition can be measured at the national or household level. I use only nationally representative surveys with solid measured weight and height and anemia status. I tested age adjustment for adults and found in the end we did not need this and present only nationally representative results. The major data are from the DHS-Measure surveys of the 1990 to present supplemented by 5 other nationally representative surveys. For most countries we have a very early period and recent period so we can look at change in the double burden. Only for iron status do we have just one recent survey. Changes in high country-level double burden defined by WHO-UNICEF cutoffs are presented along with recent high double burden countries using iron status and well as wasted/stunted/thinness status and overweight/obesity.
Biographical Summary:

Dr. Nugent is Vice President for Global Noncommunicable diseases (NCDs) at RTI International, a global NGO. She has more than 30 years of experience in global development as a researcher, practitioner, and policy advisor to governments. She has advised the World Health Organization, the U.S. government, corporations, foundations, and nonprofit organizations on the economics and policy environment of NCDs. She is a member of WHO Expert Advisory Panel on NCD Management, the Lancet Commission on Noncommunicable Diseases and Injuries of the Poorest Billion, and she works with the World Health Organization Global Coordination Mechanism Working Group on Noncommunicable Disease Financing. She was Series Editor and Principal Investigator for Disease Control Priorities, 3rd Edition, and senior health fellow at the Center for Global Development.

Abstract:

Economic Aspects of the Double Burden of Malnutrition

The economic impacts of under-nutrition are well-known to have serious long-term consequences for households, especially due to the developmental effects of stunting and LBW in children. The economic impact of obesity and overweight also has serious consequences, including risk of diabetes and other chronic diseases, as well as productivity impairments. The economic cost of obesity and overweight has been estimated in the U.S. and other countries to be on the order of billions in lost GDP due to direct medical costs and indirect productivity impacts. However, the economic impacts of the double burden of malnutrition have not been estimated as such. This paper first summarizes the evidence on economic impacts of all forms of malnutrition, comparing the economic costs of underweight to those of overweight, and comparing results from different geographies. Consideration will be given to what overlap and synergies might exist at the national and household levels between undernutrition and overweight/obesity that may drive DBM, especially in a persistent manner. Then, using economic modelling, this paper evaluates a set of promising double-duty interventions that can reduce the double burden of malnutrition using a benefit-cost approach. Some of the interventions analysed will be derived from Paper 3, and the presentation will review the evidence for the interventions expected to have the best return on investment.
Biographical Summary:

Boyd Swinburn is Professor of Population Nutrition and Global Health at the University of Auckland and Alfred Deakin Professor with the Global Obesity Centre, Deakin University, Melbourne. He is also Co-Chair of World Obesity Policy & Prevention section and co-chair of the Lancet Commission on Obesity. His research interests are in policy and community approaches to reducing obesity and diet-related NCDs.

Abstract:

The Double Burden of Malnutrition: How do we get out?
The proposal to conceptualise and address malnutrition in all its forms as a whole rather than a series of parts is signposted within the Sustainable Development Goals, the Decade of Action on Nutrition and other high level UN documents systems but it is far from being operationalised on the ground where silos of funding, institutions, programs and policies predominate. While there is still an urgent need to implement existing, recommended policies and programs for undernutrition and obesity, joined up actions are also needed. Many such ‘double duty’ actions are currently being articulated. A clear feature of many double duty actions is that they address some of the underlying systemic determinants within food systems, governance systems, accountability systems, and business systems which are driving the malnutrition outcomes in the first place. These determinants are deeply embedded and may only begin to change when the combined pressure for better nutrition, action on climate change, environmental restoration, social justice, and sustainable development create sufficient demand for 21st Century societal paradigms for political economies.
Biographical Summary:
Shane Norris is a Research Professor in the Department of Paediatrics and the Director of the MRC/Wits Developmental Pathways for Health Research Unit at the University of the Witwatersrand, Johannesburg. He has over 19 years of research experience in longitudinal cohort studies and epidemiology and his research expertise and interest includes: (i) maternal and child health, (ii) child nutrition, growth, and body composition, and (ii) developmental origins of obesity and metabolic disease risk. He is the co-PI of the Birth to Twenty cohort, which is the longest running birth cohort in Africa.

Abstract:

Double Burden of Malnutrition: Situation analysis from Africa
The aims of this presentation are to: (i) review the literature and examine contemporary child growth in terms of stunting prevalence across Africa; (ii) discuss child stunting within the context of economic growth and obesity, and (iii) elucidate the implications for child nutrition. It is evident that stunting in under-5-year-old children still plagues Africa and has not decreased as expected in line with the concomitant improvement in economic development over the past decade. Persisting and possibly widening inequality ensures that not all segments of the population, in particular the most vulnerable, benefit equally from economic growth. Of concern is the association between the increasing economic progress across Africa and the rising adult obesity, especially amongst females. Furthermore, in some African countries, such as South Africa, we are seeing a much earlier presentation of the double burden of malnutrition where stunting still plagues infancy but in early childhood there is a burgeoning prevalence of overweight and obesity. More and more African countries are now afflicted with a double burden of malnutrition. The implication for child nutrition is that African countries need not only apply a multi-sectoral approach to accelerate the reduction in stunting levels, but also, to arrest and prevent the onset of child obesity.
Biographical Summary:

Dr. Udomkesmalee is the Senior Advisor and Former Director of the Institute of Nutrition, Mahidol University, Thailand and the Adjunct Associate Professor in the Department of International Health, Bloomberg School of Public Health, Johns Hopkins University, USA. She is currently a member of several international committees, such as Co-Chair of the Independent Expert Group for Global Nutrition Report; Board members of The New York Academy of Sciences/Sackler Institute for Nutrition Science and the International Food Policy Research Institute (IFPRI); Advisor to the Scaling Up Nutrition (SUN) Movement Capacity Strengthening Initiative; Steering Committee of the Micronutrient Forum etc. Her research interest covers the areas of micronutrients, maternal and child nutrition policy and program implementation.

Abstract:

Double Burden of Malnutrition: Situation analysis from Asia Pacific

Over the past two decades, countries in Asia and the Pacific regions demonstrated a remarkable economic growth, contributing to the overall decline in undernutrition with diversity of magnitude and trend. During 2005 to 2016, the fastest rate of stunting reduction was observed in Eastern and Central Asia while the Oceania (exclude Australia and New Zealand) showed an upward trend (37 compared to 38%). At the country level, the under-five stunting prevalence rates in Cambodia (41%), Lao PDR (44%), Papua New Guinea (50%) and Timor-Leste (58%) remain among the highest in the world. On the under-five wasting, the 2016 prevalence remains high in South Asia (15.4%), Oceania (9.4%) and South East Asia (8.9%). Asia is home to 56% all stunted and 69% all wasted children under five years old. On the other hand, the rapid economic transition in the region during 1980 and 2008 resulted in the fastest percentage of increase of adult overweight in South East Asia (204%) and the Pacific (174%). These two regions also showed the fastest rise in childhood overweight during 2005 to 2016. China, India, Indonesia and Pakistan are among the top ten countries that contribute to over 50% of global burden on obesity. In addition, the Pacific Island countries experience the highest rates of adult obesity (35-48%) on a global scale. Therefore, the co-existence of undernutrition represented by stunting, wasting and overweight/obesity, known as double burden of malnutrition is highly prevalent in Asia and the Pacific. Evidence base for decision making and efforts for strengthening human resource capacity to implement effective programs at local settings are required to make and sustain progress. The diversity of countries in Asia and the Pacific provides an opportunity to share and learn, to collaborate and pool resources towards one common goal: to end malnutrition in all its forms.
Biographical Summary:
Dr. Manuel Ramirez-Zea is the Head of the INCAP Research Center for the Prevention of Chronic Diseases (CIIPEC) at the Institute for Nutrition of Central America and Panama (INCAP) as well of the Laboratory of Physiology and Body Composition and the Unit of Nutrition and Chronic Diseases, at INCAP. After finishing his Doctoral studies 18 years ago in the US on exercise physiology, with a strong emphasis in nutrition, Dr. Ramirez-Zea returned to INCAP. Dr. Ramirez-Zea has implemented several research projects on epidemiology and interventions on primary and secondary prevention of chronic diseases related to obesity, nutrition, physical activity, and cardiometabolic risk factors in children and adults. Funding for these projects has been granted by the National Heart, Lung, and Blood Institute; IAEA; the International Development Research Center (IDRC); Medtronic; National Cancer Institute; United Health; and Global Challenges Canada. He has mentored several undergraduate (8), graduate (24), and post-graduate (7) students. He has more than 60 publications in peer-reviewed journals and book chapters.

Abstract:
Double Burden of Malnutrition: Situation analysis from Latin America
As the prevalence of obesity increases in developing countries, the double burden of malnutrition (DBM) has become a public health problem, particularly in countries where the prevalence of stunting and anemia remains high. The prevalence estimates of the double burden at household level (households with a stunted child and an overweight or obese woman) in Latin America ranged from 20% in Guatemala to 2.7% in Brazil. The prevalence of the double burden of overweight and anemia at the individual level in preschool- or school-aged children ranged from as low as 1.2% in Brazil to 8.4% in Ecuadorian children <5 y. The prevalence of the double burden of overweight and anemia at the individual level in women ranged from 3.4% (Colombia) to 13.6% (Brazil). To assess if the coexistence or joint prevalence of the two conditions was solely the result of the independent occurrence of each one of them, we compared the observed prevalence of the double burden with the expected prevalence under the assumption that the two conditions are uncorrelated. In only 2 of 16 comparisons, observed prevalence rates were higher than expected, whereas 10 were lower than expected and 4 were not significantly different. We conclude that the expectation of an association between the risks of undernutrition and excess body weight did not hold. Although undernutrition and excess body weight risks seem to be largely unrelated at the individual and household levels, the fact remains that both types of conditions are very common in Latin American countries: overweight and obesity coexist with undernutrition (either stunting, anemia, or zinc deficiency) at the national level. It is therefore clear that the double burden does exist in Latin American countries. All countries have in place programs aimed at preventing undernutrition and most countries are in the process of implementing obesity prevention as part of the policy agenda.
Biographical Summary:

Dr. Schindler is a nutritionist trained at the University of Vienna, Austria. Since last year she works at the Austrian Ministry of Health as head of the Division Mother, Child, Adolescents and Women’s health and Nutrition. She worked for many years as researcher at the Medical University in Vienna. Her main research interests are nutrition in the context of disease, including morbid obesity, diabetes, disease and age-related malnutrition. She co-founded nutritionDay worldwide, a project to increase awareness of disease and age-related malnutrition in hospitals and nursing homes.

Abstract:

Double Burden of Malnutrition: Situation analysis from Europe

European countries are challenged by the double burden of malnutrition differently. Within these countries, highest rates of obesity have been observed among groups with lower socioeconomic status and education. Moreover southern countries are facing the highest prevalence rates in 6-9 year old children. Nevertheless, during the WHO European Childhood Obesity Surveillance Initiative in 2007/2008 and 2009/2010 a decrease in BMI-for-age Z-scores was observed in some countries (Wijnhoven et al. 2014).

Overweight and obesity together with malnutrition and sarcopenia (loss of muscle mass and strength) in the aging society is another great challenge which many European countries face. These issues have a negative impact on health status and result in impaired ability to perform activities of daily living, increased risk of falls and fractures, the loss of independence and premature death. Unfortunately, both the loss of muscle mass and strength, as well as age-related malnutrition are often underestimated by health (care) personnel, but also by the aged persons and their caring relatives.

As with the beginning of 2015 the refugee crisis created new challenges for many countries and even more for migrants. Migrants experience nutrition transition and social inequalities, which are often associated with nutrition inequalities.

Across Europe, challenges are widely acknowledged. However, concrete approaches to solving the problems vary between the countries.

The European Association for the studies of Obesity (EASO) is representing scientists, health care practitioners, physicians, public health experts and patients. EASO aims to support the development of a unified evidence-based approach to tackle obesity across disciplines and countries. Furthermore EASO advocates obesity as an urgent and relevant health priority to policymakers, NGOs, research funders, health professionals, media, industry and the public.
Biographical Summary:

Christine is a technical specialist on the use of stable isotope techniques to assess body composition, total daily energy expenditure and breastfeeding practices. She trained at the University of Glasgow, UK and worked for over 15 years as a researcher at the Scottish Universities Environmental Research Centre and the Royal Hospital for Sick Children, Glasgow. As a consultant, Christine assisted the IAEA in the preparation of eLearning materials and Human Health Series Publications, before joining the staff as a Nutrition Specialist 2009. She was responsible for technical cooperation projects and coordinated research projects that used isotopic techniques to gather data and evaluate interventions in the Member States aimed at prevention of childhood obesity. She retired from the IAEA last year, but continues to provide support as an expert consultant.

Abstract:

Adding the situation analysis based on new IAEA data

Over the past 10-15 years, through its technical cooperation and coordinated research programmes, the IAEA has worked with its Member States in Africa, Asia and Latin America to establish capacity for assessment of breastfeeding practices, body composition and total daily energy expenditure using stable isotope techniques. These techniques have been used to collect baseline data and evaluate interventions designed to prevent and treat malnutrition in all its forms. Recently, a database has been established containing data on infant feeding and growth (and maternal body composition) from 691 mother/baby pairs from Africa (represented by Benin, Central African Republic, Ghana, Kenya, Morocco, South Africa, Tanzania), 258 pairs from Asia and the Pacific (represented by India, Sri Lanka and Thailand), and 301 pairs from Latin America and the Caribbean (represented by Argentina, Brazil, Chile, Cuba, Dominican Republic, Ecuador, Guatemala and Uruguay). Exclusivity of breastfeeding practices, and the amount of human milk consumed by breastfed infants was assessed using the deuterium oxide dose-to-mother technique. The database also contains information on body composition assessed by deuterium dilution, and risk factors for chronic diseases, such as waist circumference, blood pressure, HDL-cholesterol and inflammatory indicators (CRP and IL-6) in 4651 children and adolescents aged 4-18 years from 20 member states, including 2955 from Latin America, 1317 from Asia and 225 from Africa. Data from a recently completed African regional project has not yet been added to the database, and will be presented separately. All data was collected in a standardised way according to IAEA and WHO protocols.

Main findings:

1) Maternal recall generally overestimates the true rate of exclusive breastfeeding;
2) BMI-for-age Z-score (BAZ) cannot be considered a good indicator of adiposity. Although there is no systematic bias, the random error is large and BAZ and fat percent do not give comparable rankings within the population.
Biographical Summary:
Jonathan Wells is Professor of Anthropology and Pediatric Nutrition at UCL Great Ormond Street Institute of Child Health, London, UK, where he co-directs a research group focusing on pediatric energy metabolism and body composition. He completed a degree in social anthropology, an MPhil in biological anthropology, and a PhD in biological anthropology and nutrition, all at the University of Cambridge. He has been based at UCL-GOS-ICH since 1998.

His research group has developed state-of-the-art facilities for measurement of human body composition, energy expenditure and breast-milk intake, including extensive use of isotope-ratio mass spectrometry. These techniques are applied in collaborative studies worldwide, investigating early growth variability, the developmental origins of adult disease hypothesis, and testing nutritional interventions in randomized trials.

He has used evolutionary theory to develop novel theoretical frameworks for public health nutrition across the life-course, and recently led a Lancet series on ‘Evolutionary Public Health’. He is the author of two monographs, ‘The evolutionary biology of human body fatness: thrift and control’ (2010) and ‘The metabolic ghetto: an evolutionary perspective on nutrition, power relations and chronic disease’ (2016), both published by Cambridge University Press.

Abstract:
A socio-ecological model of the double burden of malnutrition

The double burden of malnutrition emerges through the exposure of individuals to contrasting nutritional stresses at different points during the life course, which may reflect inter-generational effects. During early life, the pathways towards stunting, overweight or both may emerge under the umbrella of maternal phenotype, which represents the primary nutritional influence during early ‘critical windows’ of development. Compensatory catch-up growth may interact with unhealthy diets and sedentary environments from early childhood onwards. There are several common risk factors for the double burden manifesting within individuals and families, including maternal phenotype, food insecurity and gender inequality. Beyond physiological components of risk, particular attention should be directed to the lack of personal agency that underlies exposure to food insecurity, poverty and the obesogenic niche.
Biographical Summary:
Bert is Prof of Paediatrics at Ludwig-Maximilians-Universität München, Germany and heads the Div. Metabolic & Nutritional Medicine at Dr. von Hauner Children’s Hospital, Univ. of Munich Medical Centre. He authored 890 journal articles (Times Cited 17 497, H-index 66), 208 book chapters, and 36 books/monographies. He is President, Federation of International Societies of Paediatric Gastroenterology, Hepatology & Nutrition (fispghan.org), Immediate Past-President, European Society Paediatric Gastroenterology, Hepatology & Nutrition (espghan.org), council member, United European Gastroenterology (ueg.eu), European Pediatric Association (epa-unepta.org), The International Society for Developmental Origins of Health and Disease (dohadsoc.org), and The International Society for Research in Human Milk and Lactation (ishml.net/). He serves as Strategic Technical Advisor on Nutrition, International Pediatric Association. His research grant funding exceeded 20 mio. € during the last decade and was provided by the European Commission, the European Research Council, the German Research Council, the German Federal Ministry of Education and Research, the governments of Bavaria and Norway, the US NIH and other public funding bodies. He is member of the grant review board medicine, German Research Council and chairs the Clinical Trial grant review board, German Research Council and serves as Co-ordinator of the EU FP7 EarlyNutrition Project (project-earlynutrition.eu) and the EU Erasmus+ Capacity Building in Higher Education Project Early Nutrition eAcademy South East Asia, Managing Director, Early Nutrition Academy (www.early-nutrition.org), Chair, Committee on Nutrition, German Society Paediatrics (dgkj.de), Chair of the Scientific Board of the German Government supported Network Young Families, and Member of the German National Breastfeeding Committee. Bert is Editor in Chief of Annals Nutrition & Metabolism and of World Review of Nutrition and Dietetics, and Associate Editor of Curr Opin Clin Nutr Metabol Care and of Monatsschrift Kinderheilkunde.

Abstract:
Trans-generational impact of the double burden of malnutrition
A convincing body of scientific evidence demonstrates that early nutrition and lifestyle factors acting during sensitive time periods of developmental plasticity in pregnancy, infancy and early childhood have long-lasting programming effects on later health, performance and disease risks (1-4). Early growth characteristics are closely linked with later health outcomes including physical and cognitive performance, and with disease risks. Evidence is particularly convincing for early growth modulation of later risks of obesity, adiposity, and associated non-communicable diseases such as type 2 diabetes, hypertension, cardiovascular diseases, and asthma. Fetal and infant growth is modulated by genetic, epigenetic, inflammatory, endocrine, nutritional and metabolic factors. Improved nutrition offers major preventive opportunities. During the sensitive time window before and during the first 1000 days of life (270 days of pregnancy and 2 x 365 days of the first two postnatal years), nutrition and metabolism modulate cytogenesis, organogenesis, metabolic and endocrine responses,
pre- and postnatal growth trajectories, epigenetic regulation of gene expression, and hence induce programming effects on long-term health and disease risks until old age (www.project-earlynutrition.eu). We are following three identified key mechanisms in early programming: 1) “Fuel mediated ‘in utero’ programming” indicates that intrauterine excessive supply of fuels such as glucose and fatty acids induces increased fetal growth and neonatal adiposity, along with increased later obesity; 2) “Accelerated postnatal growth programming” indicates a link between high weight gain in early childhood and an increased risk of later obesity and other adverse outcomes; 3) “Mismatch programming” reflects a developmental mismatch between sub-optimal prenatal conditions with low birthweight followed by an obesogenic childhood environment with high weight gain, which leads to a very high risk of obesity and related co-morbidities. Before and during pregnancy, a balanced diet and regular physical activity have short as well as long-term positive effects on health and well-being, amongst others on the risk of obesity and its related disorders in later life. The available data show that plasma metabolites responding to nutritional supplies are related to birthweight, and to a weaker extent to postnatal weight gain and later body weight and obesity risk until adolescence. Better insights into the metabolic regulation of early weight gain can offer opportunities for more targeted and optimized health prevention though nutritional interventions that promote physiological growth and reduce the risk of later obesity, adiposity and related NCD.

References:
Biographical Summary:

Dr Yajnik is the Director of the Diabetes Unit at the King Edward Memorial Hospital and Research Centre in Pune, India. He trained in Pune and in Oxford, UK, and investigates the high susceptibility of Indians to diabetes and related disorders. He is known for his description of the ‘thin-fat’ Indian (high body fat percent at low BMI) and its intrauterine programming by maternal nutritional and metabolic factors.

He is the currently President of SNEHA India (Society for Natal Effects on Health in Adults) and a Trustee of the International DOHaD society. He is an Honorary Visiting Fellow, MRC Lifecourse Epidemiology Unit, Southampton, UK, visiting Professor at University of Exeter UK, and of the Danish Diabetes Academy, and adjunct Professor IISER, Pune. He received Helmut Mehnert award of International Diabetes Federation (2009), David Barker medal of International DOHaD society (2011), and Outstanding Investigator Award of World India Diabetes Foundation.

Dr Yajnik is advisor to many organizations including Department of Biotechnology (DBT), Indian Council of Medical Research (ICMR), National Institute of Nutrition (NIN), India, WHO (Geneva), FIGO (Federation International of Gynecology and Obstetrics) and the Wellcome Trust, London, UK.

Abstract:

The double burden of malnutrition across the life course

High rates of diabetes in those born lower birth weight and those who are shorter is a classic example of the double burden across the life course. Small size at birth is related to small size of the mother and fetal undernutrition, while smaller height is also contributed by post-natal and pubertal undernutrition. Subsequent rapid growth (catch up) in weight predisposes to obesity and diabetes, even though these children are not overweight or obese by reference standards. Thus, becoming overweight in relation to the past is a strong risk factor for diabetes. Populations with high rates of low birth weight have lower age at diagnosis of diabetes which manifests at lower BMI than usually blamed. Considerable human evidence is available from developing countries like India and from multi-generationally undernourished animal models.

Biological mechanisms contributing to this pattern of growth and disease predisposition include: 1) nutrient reallocation to growth of adipose rather than lean tissue (‘thin-fat’ phenotype) during early life, 2) high insulin resistance and low disposition index (lower pancreatic B-cell function in relation to insulin resistance manifest from early childhood, 3) increased susceptibility B-cell damaging exposures.
Biographical Summary:

Merete Eggesbo is the PI of the Norwegina Human Milk (HUMIS) study initiated to explore environmental risk to child health, in particular environmental toxicants and gut microbiome. She leads a small research group at the Norwegian Institute of Public Health, an extensive network of international collaborators, and more than 70 publications on this topic.

Abstract:

The link between endocrine disruptors and malnutrition

A recent WHO-UN report states that there is now clear evidence that synthetic chemicals with endocrine disruptive properties (EDCs) pose a threat to human health. These chemicals may exert their hormonal mimicking effects at very low doses. The metabolic system is a vulnerable target for EDCs, and chemicals may induce metabolic dysregulation adding to the detrimental effects of undernutrition and malnutrition. Specifically, diverse chemicals may cause aberrant fetal growth resulting in newborns being underweight for their gestational age, or overweight. Both conditions are associated with long-term adverse health effects. Furthermore, exposure during the breastfeeding period may further augment aberrant growth, either growing too fast or too slow.

Some of the best evidence comes from large multicenter studies, involving thousands of mother child pairs, linking PCB exposure to lower birth weight and reduced postnatal growth. In contrast to those effects, prenatal exposure to DDE/DDT is linked to later overweight and obesity. Metabolic disruption is not restricted to these chemical classes but also includes perfluorinated chemicals, dioxins and furans, non-persistent chemicals and more. Intriguing sex differences are found, girls may be more susceptible for the effect of dioxins for instance, supporting the hypothesis that hormonal pathways are involved.

WHO conducts a global monitoring program on selected chemicals in human milk and this has revealed large geographical differences, with country specific exposure profiles. In general, DDT/DEE is a larger challenge in the developing world than in the developed world due to its use as Malaria prophylaxis. In contrast, PCBs are in general a challenge to industrialized countries. Dioxins and furans are a challenge to specific countries regardless of development status. Combining the country exposure profiles with estimated thresholds for effects of specific chemicals can be used to target known sources of the specific chemicals of highest concern in each individual country.
Biographical Summary:
Dr Routledge graduated in Cell Biology from the University of Newcastle upon Tyne in 1986 and studied carcinogenesis for my DPhil from University of York in 1991. He is currently an associate professor of environmental toxicology in the School of Medicine, University of Leeds. For the last eight years he has been involved in studying the health impact of exposure to mycotoxins such as aflatoxin and fumonisins, particularly in Africa. His group uses biomarkers to assess exposure and recent studies have included measuring exposure in several African countries and assessing the impact of aflatoxin and fumonisins on child growth in Tanzania and Gambia.

Abstract:
The role of mycotoxins contamination in the double burden of malnutrition
Child growth impairment is one outcome of under nutrition. However, in sub-Saharan Africa nutrition based interventions have been unable to fully address this problem. Exposure to mycotoxins such as aflatoxin and fumonisins are common in this region as a result of contamination of dietary staples such as maize and peanuts. The measurement of biomarkers to assess exposure to these mycotoxins provides a more accurate and objective measure of exposure than estimating intake of contaminated food. This presentation will review studies that have shown an association between aflatoxin or fumonisins exposure and impaired child growth in several African countries. The scale of exposure in six African countries assessed in recent years will also be presented. Mechanisms underlying growth impairment due to mycotoxin exposure are unclear, with some evidence for a role of damage to the insulin like growth factor (IGF) axis and changes to DNA methylation associated with aflatoxin exposure. Reduced nutrient uptake as a result of damage to the intestinal epithelium and/or impaired immune function leading to increased infections may also play a role and further work is required to elucidate these mechanisms. Of more critical importance is the development and application of low cost, community based interventions to reduce mycotoxin exposure.
Biographical Summary:

Dr Belzer is Assistant Professor at the Laboratory of Microbiology at Wageningen University and Research (WUR). Her research aims to understand the way microbial species in the gastrointestinal tract are able to degrade host-produced glycans (human milk and mucus). The ability of these microorganisms to ferment host-produced glycans makes them ‘keystone species’ within the intestinal microbiota that are crucial for immune, metabolic and neurologic imprinting. Topics vary from the microbiome of early and late life, human, mice, in health, and disease. The main microbial players are the mucus degrading *Akkermansia muciniphila*, intestinal butyrate producing Clostridia species and early life microbiota members like bifidobacteria.

Dr. Belzer was trained at the University of Utrecht (MSc.), Erasmus Medical Center (PhD.), and has worked at Harvard Medical School, TIFN and Wageningen University and Research. Dr. Belzer is currently part of NWO funded; Soehngen Institute of Microbiology (SIAM) and participates as a Dutch PI in the EU funded JPI-microbiomics consortium EARLYMICROHEALTH. Her research has led to papers in top journals like Nature Medicine, PNAS and ISMEJ and has resulted in several patents.

Abstract:

The role of the microbiome in the double burden of malnutrition

The human body is colonized by symbiotic microorganisms, that play an important role in maintaining health. This so-called ‘microbiota’ has the ability to release energy and nutrients from fibers that are indigestible to the host. The contribution to the digestion of our food by the microbiota results in increased energy yield from food substances. On top of this our microbiota synthesizes essential vitamins and molecules that contribute to metabolic and immune health.

A different gut microbiota has been detected in malnourished people in comparison with healthy individuals. As such microbiota differences are presented between people that are healthy or those that suffer from either; over-nutrition (obesity and overweight), or, under-nutrition (anorexia, food deprivation, gastric bypass surgery). Most studies have focused on children, as they are most vulnerable due to the high energy and nutrient need during growth. Malnutrition in children leads to a reduction in growth rate, immune and cognitive development. Alongside these development effects, also the gut microbiota remains immature.

The maturation of the microbiome does not correspond to the chronological age of an individual. In fact, the microbiota reaches an adult stage between the age of 3-6 years. Microbiota maturation is accompanied with increased microbiota diversity and the presence of specific microbiota taxa. Is has been reported that the microbiota of formula fed babies is more mature compared to that of breast fed infants. The maturation of the microbiota is also reported to be faster in c-section born babies.
Overall maturation of the microbiota can be directly associated with type the nutrition. Being either, human milk, formula or solid food.

Investigations on malnourished infants resulted in an interesting phenomena. The microbiota of malnourished children does not mature fully as opposed to healthy children. A food intervention, rescuing children from malnutrition also immediately matured the microbiota. This means that certain microbiota members typical for an adult like microbiota start to become members of the intestinal track of the formerly malnourished children when proper nutrition is introduced. It is thought that the increase in microbial diversity might be beneficial in food digestion growth development of the children.

In summary it is possible that in the near future the microbiota could be a marker for malnutrition as well as a target for nutritional intervention studies.
Biographical Summary:

Professor Corinna Hawkes is Director of the Centre of Food Policy at City, University of London, UK, which runs postgraduate education programmes, conducts research and engages extensively with policymakers with the mission of advancing the integrated and inclusive food policy. She is also the Co-Chair of the Global Nutrition Report, an international report taking an integrated approach to tracking progress to address the double burden of malnutrition across the globe.

Professor Hawkes expertise is in policies to help address poor quality diets and malnutrition worldwide. Corinna works internationally, having worked in the past for organizations such as the World Health Organization, the International Food Policy Research Institute, the University of Sao Paulo and World Cancer Research Fund International. In 2013 she established the NOURISHING Framework which tracks policies to promote healthy eating worldwide and in 2015 coined the term “double duty actions” to address malnutrition.


Abstract:

The role of double duty actions role in addressing malnutrition
The term “double duty action” was coined by the Global Nutrition Report in 2015, with its definition later refined in a Policy Brief published by the World Health Organization. In the context of the double burden of malnutrition, a double duty action is an intervention, programme or policy that has the potential to simultaneously reduce the risk or burden of both undernutrition and overweight, obesity or diet-related NCDs. This presentation will outline the concept of double duty and how it can be a useful frame for interventions to address the double burden of malnutrition.
Biographical Summary:

Francesco Branca is the Director of the Department of Nutrition for Health and Development in the World Health Organization, Geneva. Previously, he was president of the Federation of the European Nutrition Societies and a senior scientist at the Italian Food and Nutrition Research Institute. Dr. Branca graduated in Medicine and Surgery and specialized in Diabetology and Metabolic Diseases at the Universita’ Cattolica del Sacro Cuore, Roma and obtained a PhD in Nutrition at Aberdeen University.

Abstract:

Framework for action and impact across the Decade of Action on Nutrition
Author: Barry POPKIN
Affiliation: Carolina Population Centre, University of North Carolina
Country: USA
Contact: popkin@unc.edu

Biographical Summary:

Barry M. Popkin, PhD, is the W. R. Kenan, Jr. distinguished professor of nutrition at the University of North Carolina at Chapel Hill (UNC). He has a PhD in economics and established the Division of Nutrition Epidemiology at UNC and later established and ran the UNC Interdisciplinary Obesity Center, funded by the National Institutes of Health (NIH). He has developed the concept of the Nutrition Transition, the study of the dynamic shifts in our environment and the way they affect dietary intake and physical activity patterns and trends and obesity and other nutrition-related noncommunicable diseases. His research program focuses globally (both the US and low and middle income countries) on understanding the shifts in stages of the transition and programs and policies to improve the population health linked with this transition (see www.nutrans.org). He has played a central role in placing the concerns of global obesity, its determinants, and consequences on the global stage and is now actively involved in work on the program and policy design and evaluation side at the national level, including collaborative SSB/junk food tax evaluation research in Mexico (with the National Institute of Public Health) in evaluating the impact of the Mexican SSB and nonessential food taxes and similar work with the Institute of Nutrition and Food Technology, University of Chile in evaluating an SSB tax and marketing/FOP controls. He is working with 8 other countries currently in developing tax and regulatory policies to create healthier diets and prevent obesity and other nutrition-related NCD’s. He has received a dozen major awards for his global contributions, including: 2016 World Obesity Society: Population Science & Public Health Award – for top global researcher in public health with also significant service contributions.; 2015 ; UK Rank Science Prize; and The Obesity Society Mickey Stunkard Lifetime Achievement Award.

Abstract:

Bridges, linkages and opportunities in addressing malnutrition: double-duty and beyond (Popkin and Nugent)

We discuss a very new reality facing low and middle-income countries (LMICs). This is mainly due to the very rapid shift in the food system. I lay this out and give a few country examples of the large increase in sugar-sweetened beverages and junk food sales/capita for several countries to give some sense of the speed of change. I go on to discuss some of the key dimensions of change in body composition that are unique to LMICs and how this poses major health risks in the future for LMICs far beyond what the overweight and obesity statistics show.
Biographical Summary:

Dr. Nugent is Vice President for Global Noncommunicable diseases (NCDs) at RTI International, a global NGO. She has more than 30 years of experience in global development as a researcher, practitioner, and policy advisor to governments. She has advised the World Health Organization, the U.S. government, corporations, foundations, and nonprofit organizations on the economics and policy environment of NCDs. She is a member of WHO Expert Advisory Panel on NCD Management, the Lancet Commission on Noncommunicable Diseases and Injuries of the Poorest Billion, and she works with the World Health Organization Global Coordination Mechanism Working Group on Noncommunicable Disease Financing. She was Series Editor and Principal Investigator for Disease Control Priorities, 3rd Edition, and senior health fellow at the Center for Global Development.

Abstract:

Bridges, linkages and opportunities in addressing malnutrition: double-duty and beyond (Popkin and Nugent)

We discuss a very new reality facing low and middle-income countries (LMICs). This is mainly due to the very rapid shift in the food system. I lay this out and give a few country examples of the large increase in sugar-sweetened beverages and junk food sales/capita for several countries to give some sense of the speed of change. I go on to discuss some of the key dimensions of change in body composition that are unique to LMICs and how this poses major health risks in the future for LMICs far beyond what the overweight and obesity statistics show.
Biographical Summary:
Charlotte Dufour has been working on nutrition-sensitive agriculture and food systems since 2005, primarily with FAO in Afghanistan, Africa and at the global level. Prior to this, she worked on emergency nutrition and resilience programming in crisis-affected countries with Action Contre la Faim and Groupe Urgence-Réhabilitation-Developpement. She holds Ba in Human Sciences from Oxford University and a MSc in Public Health Nutrition from the London School of Hygiene and Tropical Medicine.

Abstract:

Nutrition-sensitive agriculture and food systems intervention

Charlotte Dufour will provide an overview of the range of food system-related interventions, which can be implemented to promote healthy diets and address the double-burden of malnutrition - from food production, processing, storage, and marketing to consumer protection and awareness. She will emphasize what can be done to enhance the nutritional impact of individual interventions and highlight the importance of adopting a systems-wide approach involving complementary actions and multiple stakeholders. Finally, she will share existing guidance and tools which professionals working in food-related sectors can use to better address the double-burden of malnutrition through work.
Biographical Summary:

Bryony Sinclair is Senior Policy & Public Affairs Manager at World Cancer Research Fund (WCRF) International, where she advocates for a comprehensive policy approach to promoting healthy diets at a global level to reduce the risk of diet-related non-communicable diseases (NCDs). Bryony leads the process for updating the NOURISHING policy database, which contains examples of implemented government food policy actions from around the world. Bryony is interested in better understanding the evidence needs of policymakers to support the development and implementation of more effective policy. Bryony is a member of the Canadian Partnership Against Cancer Prevention Policy Steering Committee.

Before joining WCRF International, Bryony worked at the Canadian Cancer Society reviewing and synthesizing health policy research on cancer control issues. Bryony holds a Master of Public Health from the University of Alberta (Canada) and has expertise in policies relating to preventing NCDs through diet, weight and physical activity.

Abstract:

WCRF International NOURISHING policy framework

Comprehensive policy action is urgently needed to address malnutrition in all its forms as governments are off-track to meet the global targets on nutrition and non-communicable diseases (NCDs) by 2025 and the nutrition-related targets of the Sustainable Development Goals by 2030.

World Cancer Research Fund International’s NOURISHING framework was developed to highlight where governments need to take action to promote healthy diets and reduce overweight, obesity and diet-related NCDs. The framework brings together ten policy areas across three domains: food environment, food system and behaviour change communication. The framework is accompanied by a regularly updated database, providing an extensive overview of implemented government policy actions from around the world, as well as evaluations of included policies.

This presentation will provide an overview of the NOURISHING framework and policy database and demonstrate how the framework can be used as a lens to identify double-duty actions to help address malnutrition in all its forms. Policies from the database that have the potential for double-duty action will also be highlighted.
Biographical Summary:

Dr. Shoo Lee is a neonatologist and health economist. He is Scientific Director of the Institute of Human Development, Child and Youth Health (IHDCYH) at the Canadian Institutes of Health Research; Professor of Paediatrics, Obstetrics & Gynaecology and Public Health; Paediatrician-in-Chief and Director of the Maternal-Infant Care (MiCare) Research Centre at Mt. Sinai Hospital and Senior Clinician Scientist of the Lunenfeld-Tannenbaum Research Institute. Dr. Lee received his medical degree from the University of Singapore, completed his paediatric training at the Janeway Children’s Hospital in Newfoundland and neonatal fellowship training at Boston’s Children’s Hospital, and received his PhD in Health Policy (Economics) from Harvard University.

As the founder and Chairman of the Canadian Neonatal Network™ and the International Neonatal Collaboration, Dr Lee fosters collaborative research, and he leads the CIHR Team in Maternal-Infant Care. His research focuses on improving quality of care, patient outcomes and health care services delivery. He developed Family Integrated Care model and piloted the concept at Mount Sinai Hospital.

Abstract:

**HeLTI Linked International Intervention Cohorts**

Non-communicable diseases (NCD) are increasing worldwide and are currently responsible for more than 60% of global deaths, of which about 80% occur in low- and middle-income countries. Overweight and obesity, including among children and adolescents, are major risk factors for cardiovascular disease, diabetes and premature death in adults.

Globally, the prevalence of obesity in children is increasing and reflects changing patterns towards unhealthy diets and physical inactivity. This is true in many high income countries such as Canada and also among those experiencing rapid economic growth and demographic transition such as China, India and South Africa. The WHO Commission on Ending Childhood Obesity (ECHO) and Global Action Plan endorsed by the 2017 World Health Assembly acknowledge the need for greater evidence to inform policy and actions.

Recognizing the need for high quality data to understand and respond to the needs of children in future generations, national research funding agencies in Canada, China, India and South Africa, in collaboration with the World Health Organization, are supporting a programme of research to generate evidence that will inform national policy and decision-making. The initiative will utilize a Developmental Origins of Health and Disease (DOHaD) approach, which recognizes that programming for many chronic diseases starts early in foetal life and the effects can be inter-generational in nature.
To date, joint funding mechanisms have been established between CIHR and the national research agencies in each country; research teams have been selected based on their knowledge of the science, experience to implement complex intervention studies and ability to sustain cohorts; a joint proposal development workshop has been held to identify a common intervention framework and agree core outcome and process measures; and a data management workshop has addressed mechanisms for data and sample management. IAEA is supporting the teams in using radioisotopes for assessment of obesity.

The specific objectives of the initiative are:

1. To conduct a set of harmonized, coordinated studies that will evaluate interventions along the life course from pre-conception to childhood to promote metabolic fitness and optimal early development in children between 3-5 years of age;

2. To conduct mechanistic studies that will explain the effect of the selected interventions;

3. To conduct complementary policy and economic analyses;

4. To develop cross-country, cross-site collaborations that will provide a learning platform and training environment for young and talented scientists;

5. To use the generated evidence to guide policy and actions in the near future, and identify research and programmatic needs for long-term strategies.
Authors: Catherine MAH

Affiliation: University of Toronto

Country: Canada

Contact: catherine.mah@mun.ca; catherine.mah@utoronto.ca

Biographical Summary:

Catherine L. Mah MD FRCPC PhD is Associate Professor in the Faculty of Health at Dalhousie University. She directs the Food Policy Lab, a multidisciplinary program of research in the policy and practice of public health, with a focus on health-promoting innovations in the food system. Her work integrates population health intervention research, policy science, and community action on environmental contexts for consumption. Dr. Mah previously held fellowships at the School of Public Policy and Governance at the University of Toronto, Kyoto University, Toronto Public Health, and the Centre for Addiction and Mental Health. She continues to hold an appointment at the Dalla Lana School of Public Health at the University of Toronto. Her current research focuses on strengthening data and policy options to negotiate dual aims in community nutrition and economic development, funded by the Canadian Institutes of Health Research and the Social Sciences and Humanities Research Council, in collaboration with local collaborators, Health Canada, and FLEdGE, a global research partnership on food and sustainability led by Wilfrid Laurier University.

Abstract:

Promoting healthier diets through intersectoral interventions in community retail food stores

Retail food stores are everyday political spaces and present a diverse array of health promotion opportunities related to food. This presentation will highlight intersectoral actions connecting the achievement of community nutrition with economic development aims in small retail food stores, drawing from intervention research examples in Canada and Australia.
Biographical Summary:

Dr. Manuel Ramirez-Zea is the Head of the INCAP Research Center for the Prevention of Chronic Diseases (CIIPEC) at the Institute for Nutrition of Central America and Panama (INCAP) as well of the Laboratory of Physiology and Body Composition and the Unit of Nutrition and Chronic Diseases, at INCAP. After finishing his Doctoral studies 18 years ago in the US on exercise physiology, with a strong emphasis in nutrition, Dr. Ramirez-Zea returned to INCAP. Dr. Ramirez-Zea have implemented several research projects on epidemiology and interventions on primary and secondary prevention of chronic diseases related to obesity, nutrition, physical activity, and cardiometabolic risk factors in children and adults. Funding for these projects has been granted by the National Heart, Lung, and Blood Institute; IAEA; the International Development Research Center (IDRC); Medtronic; National Cancer Institute; United Health; and Global Challenges Canada. He has mentored several undergraduate (8), graduate (24), and post-graduate (7) students. He has more than 60 publications in peer-reviewed journals and book chapters.

Abstract:

The Institute of Nutrition of Central America and Panama (INCAP) Nutrition Trial Cohort Study (INTC) in Guatemala
Biographical Summary:

Dr. Simón Barquera is an MD, with graduate MS and PhD degrees in Nutrition Epidemiology (Friedman School of Nutrition Science and Policy, Tufts University, Boston). As of May 2017, he is the Nutrition and Health Research Center Director at Mexico’s National Institute of Public Health, where he also leads the Obesity, Diabetes and Cardiovascular Disease research line (2015-). He has been a consultant for WHO, PAHO, UNICEF and the IAEA in the fields of nutrition, obesity and chronic diseases. Dr. Barquera is co-researcher of the Mexican Health and Nutrition Surveys (1999-2016), member of the Mexican Ministry of Health Chronic Diseases advisory board, the PAHO Expert Group on sodium reduction, the World Obesity Federation Scientific Advisory Board and fellow of the Obesity Society.

Abstract:

Fighting obesity in Mexico: Supporting the design and evaluation of effective social actions and public policies
Biographical Summary:

Dr. Duong Huy Luong, MD.,PhD. is the Vice head of Quality Management Division, Dept. of Medical Services Administration, Vietnam Ministry of Health. He is also teaching at Hanoi Medical University as visiting lecturer. He studied master degree in Sweden and he has attended short training courses in Australia, Switzerland, Thailand, Egypt, UK, USA, Japan, related to health system strengthening, healthcare management and leadership, hospital quality improvement.

During his career, he has been involved in many studies and policy development. He was a key person to set up and develop National Hospital quality standard for all hospitals in Vietnam. He has been working closely with UNICEF office in Hanoi to develop 9 standards related to nutrition, breastfeeding, pediatric and obstetric care in the set 83 hospital quality standards. He is also a principal person in developing and maintaining Patient feedback system in Vietnam.

Abstract:

Incorporating Breast feeding and Clinical nutrition criteria into Hospital accreditation system in Vietnam

Viet Nam is a lower middle income country. Health care system has 1,356 public and private hospitals. Since 1994, Vietnam has implemented the Baby Friendly Hospital Initiative (BFHI). However, only less than 1% of hospitals have been certified as BHIF in over 10 years. In 2013, 83 Hospital Quality Standard of Ministry of Health was launch to encourage and promote hospitals to conduct activities to improve and enhance the health service quality with an aim to bring satisfaction and safety to patients, people and medical staff. Each standard has 5-grade from bad quality to very good quality.

The BFHI was successfully linked with the health system by the standard 83rd is: “The hospital conducts communication, training and practice on breastfeeding in compliance with guidelines issued by MOH and UNICEF”. Through this set of quality standard, the 10 steps for BFHI now became mandatory for all hospitals providing maternal and child care.

Result of assessment showed positive improvements and steady in the BFHI over the last three years from 2014 to 2016, indicating that breastfeeding is gaining increasing importance since the inclusion in the Hospital Quality Standards. The low-cost EENC interventions were implemented in many hospitals. Experience from Vietnam showed that integrating BFHI into the health system coupled with regular monitoring is the most sustainable and effective way to support compliance among maternity services.
Biographical Summary:

Poh Bee Koon is Professor of Nutrition at the Universiti Kebangsaan Malaysia (UKM). She is Leader of the Physical Activity and Energy Metabolism Research Group, and was former Head of the Nutritional Sciences Programme at the Faculty of Health Sciences.

Her research areas focus on childhood and adolescent nutrition, and her research projects are usually related to energy metabolism, physical activity and body composition. She is the Principal Investigator for the South East Asian Nutrition Surveys (SEANUTS) in Malaysia as well as the ToyBox Study Malaysia, an intervention aimed at improving healthy eating and physical activity among preschoolers targeted at reducing obesity rates over the long-term. She is also a co-researcher for the eight-city AsiaFit Study funded by the National University of Singapore “Initiative to Improve Health in Asia” programme.

Prof Poh is a member of the Malaysian Health Professions Act 2016 (Nutrition Profession Panel). She has also been involved in several national task forces, including the Technical Working Group for Nutrition Guidelines to formulate the Malaysian Recommended Nutrient Intakes (2017), Malaysian Dietary Guidelines for Children and Adolescents (2013) and Malaysian Dietary Guidelines (2010), whereby she led team members in preparing the physical activity guidelines section. She was also a member of the Academy of Sciences Malaysia’s Task Force on Obesity, which aimed to promote policies related to obesity reduction. She also serves as a panel member of the Malaysian Paediatric Association’s Positive Parenting programme.

Prof Poh is currently the Associate Editor for the Malaysian Journal of Nutrition, and acts as reviewer for many international and local journals. She has published more than 150 articles in journals, proceedings, books and book chapters; and made more than 200 presentations at conferences in the international and national arena.

She has won numerous awards, including the International Nutrition Foundation–Ellison Medical Foundation Short Term Fellowship, the IAEA Nobel Peace Prize Fund Schools in Nutrition fellowship, the SEAMEO TROPMED Regional Centre for Community Nutrition Fellowship, and many Excellent Teaching, Research and Service Awards from UKM. She is the Honorary Secretary of the Malaysian Association for the Study of Obesity, and Fellow member of the Nutrition Society of Malaysia.
Abstract:

**Tackling double burden of malnutrition: The Malaysian experience**
The double burden of malnutrition has been reported in Malaysian households, among both adults and children. The National Health and Morbidity Survey 2015 reported 6.7% underweight and 47.7% overweight and obesity among the Malaysian adult population, while the South East Asian Nutrition Surveys (SEANUTS Malaysia) reported 8.4% stunting, 5.4% thinness and 21.6% overweight and obesity among children aged 6 months to 12 years old. Micronutrient deficiencies, such as iodine deficiency (48%) and vitamin D insufficiency (47.5%) are also prevalent among children. The Malaysian Ministry of Health has in place many programmes to tackle the double burden of malnutrition, such as food basket, community feeding, salt iodisation, healthy catering training, healthy school meal, healthy community kitchens, and others. However, the more established nationwide programmes generally target undernutrition and healthy eating; whereas programmes tackling overnutrition, such as the weight management programme, and My Body Fit and Fabulous programmes: MyBFF@School, MyBFF@Work and MYBFF@Home, are newer and gaining more attention recently. Other intervention programmes tackling overweight and obesity are being developed by various universities, for example: H.E.B.A.TI™ and Juara Sihat™ programmes focus on primary school children and C.E.R.G.A.S. programme targets secondary school children. More recently, ToyBox Study programme is being adapted for Malaysian preschoolers in collaboration with its European partners from United Kingdom and Greece. The Malaysian government has also adopted the policy to remove all subsidies for sugar, and is working on imposing tax on sugar-sweetened beverages as well as removing food advertisements during peak hours of children’s television viewing. We anticipate that policies and programmes tackling both sides of malnutrition will become more established in the future, with the ultimate aim of improving the nutrition and health status of the whole population.
Author: Igor SPIROSKI

Affiliation: Institute of Public Health

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Biographical Summary:
Igor Spiroski is medical doctor and holds PhD degree in public health. He is heading the Department of Physiology and Monitoring of Nutrition at the National Institute of Public Health. His complementary work includes teaching and research at the Faculty of Medicine of the Ss. Cyril and Methodius University in Skopje, where he is employed as scientific research associate. Dr. Spiroski’s main professional fields of interest are health risk assessment related to nutrition, obesity, particularly childhood obesity, public health aspect of consumer behaviours and food marketing to children. He has authored and co-authored books, book chapters, papers, conference proceedings and brochures. Igor is WHO’s National Nutrition and Non-communicable diseases focal point.

Abstract:
Promotion of healthy nutrition and lifestyle: experience with regulation of meal standards in schools and kindergartens in The Former Yugoslav Republic of Macedonia

The presentation will focus on the process of regulation of the meal standards in the country and the initial results that show the outcome of the intervention, both in the meals and in the anthropometric characteristics in the nutritional status of school children. Ministry of Health of the Republic of Macedonia asked the Institute of Public Health to prepare Dietary Guidelines for the population in the country. The process started in 2012 and the guidelines were presented in 2014. The same year, Ministry of Education and Ministry of Labor and Social Care initiated the process of creating bylaws that will regulate meals in schools and kindergartens. The bylaws were adopted and presented as regulatory acts to the schools and kindergartens. The documents incorporated the best available scientific data about the macro and micronutrient needs of kindergarten and school-aged children. Also, there is a part in the documents explaining food sources of the nutrients, type of foods recommended for certain meals, foods to promote and foods to avoid.

The data about the quality of the meals before and after the regulation will be presented. Also, data about the prevalence of overweight and obesity of kindergarten and school-aged children will be presented. Those data is obtained through participation of Macedonia in the WHO’s Childhood Obesity Surveillance Initiative (COSI). The presentation will conclude with conclusions and recommendations slide.
Biographical Summary:

Ms Mugambi is currently the head of the Nutrition and Dietetics Unit at the Ministry of Health in Kenya. She is a registered nutritionist by the Kenya Nutritionist and Dieticians Institute and has a degree in Home Economics Food and Nutrition and a masters’ degree in Food and Nutrition (ongoing). Ms Mugambi has worked with government at both district and national level II. and has brings experience as a program manager in a micronutrient program, HIV AIDS nutrition program, food fortification, in development of various policies, guidelines, and training packages at national level. Furthermore she is the focal person for the Global Scaling up Nutrition movement for Kenya, as well as a member of the Africa Nutrition Society.

Abstract:

Implementation of the Kenya Breast-milk Substitutes Monitoring System

Kenya is committed to appropriate infant and young child feeding and the mothers milk is the best for children in the first two years of life. Inappropriate advertising and promotion of breast milk substitutes undermines breastfeeding. Kenya gazetted the breast milk substitute (regulation and control Act) in 2012 to provide for appropriate marketing and distribution of breast milk substitutes, promotion of safe and adequate breastfeeding and proper use of BMS where necessary. A Monitoring system is being set up according to the provisions of the Ac in order to detect violations, report them to the appropriate adjudicating body, and enable the existing enforcement mechanisms to effectively and promptly stop and eliminate violations. The overall goal of the ongoing monitoring and enforcement system is to stop all promotional activities related to designated products such as breast-milk substitutes, feeding bottles and teats. Kenya adopted the WHO guidance and the system involves various government agencies including the port authority, Ministry of Health, Kenya Bureau of Standards, Communication Authority and private sector. The factors that are key to the success of monitoring and evaluation are defined leadership, clear roles and responsibilities, strong interagency coordination mechanism, defined reporting procedures, communication and feedback mechanisms. This is a shared responsibility of county governments and the national government. The implementation committee is established with representation from various stakeholders. Monitoring guideline tools, regulations, and implementation framework has been developed and sensitization has been conducted. Results indicate that there are Minimal violations in public facilities. In a study conducted in Nairobi, Muranga and Isiolo 16% received samples of designated products-all from private facilities 17.6% of facilities from all the counties had written materials that violated Article 4 of the code. Predominantly (89%) from private and faith based HFs from Nairobi county. The challenges faced include, minimal financial and human resource to build capacity and create awareness to all agencies. The devolved functions of government has led to weak enforcement and there are difficulties in controlling what goes to social media violations. There is need to strengthen collaboration and capacity building for both government and nongovernment agencies and to establish mechanisms for registration of designated and complementary food products. Kenya is one of the countries identified for piloting of NetCode protocol developed by WHO.
Biographical Summary:

Maaike Arts is Nutrition Specialist with UNICEF New York. She has worked in the areas of child nutrition and HIV and AIDS for over 25 years. Maaike started her career with the International Babyfood Action Network (IBFAN) in The Netherlands and joined UNICEF in 1996. For UNICEF, she worked with in Pakistan, Honduras, Viet Nam and Mozambique on nutrition, HIV and AIDS and Early Childhood Care. Maaike also worked with the Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) in Mozambique. Maaike’s work has included support for the drafting and implementation of infant and young child feeding programmes and strategies including the Baby-friendly Hospital Initiative, infant feeding in emergencies and infant feeding in the context of HIV, community based counselling and the prevention of overweight and obesity; operations research; and the drafting of training materials. She joined UNICEF New York HQ in August 2014. Maaike holds a Master’s Degree in Nutrition from Wageningen University in The Netherlands.

Abstract:

UNICEF’s approach to the double burden of malnutrition – via Webex

Over the past decades, the focus of UNICEF’s work in Maternal and Child Nutrition has been on the prevention of undernutrition in all its forms, including micronutrient deficiencies, as well as the treatment of severe acute malnutrition. With the increasing rates of overweight and obesity in children all over the world including in the most vulnerable populations, UNICEF has increasingly incorporated the prevention of childhood overweight and obesity into its work.

UNICEF’s organization-wide 2018-2021 Strategic Plan explicitly includes the reduction of malnutrition in all its forms, including overweight and obesity in children and adolescents. In summary, UNICEF aims to ensure “Better diets for better growth”, with a life course approach and emphasis on prevention in the early years of life.

UNICEF will continue its work in the area of early childhood nutrition including the protection, promotion and support for breastfeeding and timely adequate complementary foods and feeding practices. The nature of these interventions build on what was done in the past, but the advocacy for the interventions and the related necessary enabling environment (policies, investments) will be “retrofitted” to incorporate an emphasis on the importance of these issues for the prevention of overweight and obesity in children.

Simultaneously, UNICEF will support “de novo” actions for the prevention of overweight and obesity. These include support for appropriate policies (general policies and strategies on overweight and obesity prevention as well as specific policies and regulatory frameworks on key issues like the
marketing of unhealthy foods and beverages for children, and health related taxes). UNICEF will also develop specific activities for school-age children and adolescents including policy actions for nutrition literacy and other school-related nutrition interventions, and social and behavior change interventions to promote healthy diets for these groups and their caregivers.

Improving the availability of data on the diets and nutritional status of school-age children and adolescents will also be a key area of attention for UNICEF. Given that it is a new area of work with limited information about effective and scalable interventions in low- and middle-income countries, UNICEF will encourage the documentation and sharing of evidence on “what works” for the prevention of childhood overweight and “how to make it work”. UNICEF’s internal monitoring mechanisms including the Nutridash platform are in line with the Strategic Plan and designed to keep track of double-duty actions for the prevention of malnutrition in all its forms.
Biographical Summary:

Jonathan Wells is Professor of Anthropology and Pediatric Nutrition at UCL Great Ormond Street Institute of Child Health, London, UK, where he co-directs a research group focusing on pediatric energy metabolism and body composition. He completed a degree in social anthropology, an MPhil in biological anthropology, and a PhD in biological anthropology and nutrition, all at the University of Cambridge. He has been based at UCL-GOS-ICH since 1998.

His research group has developed state-of-the-art facilities for measurement of human body composition, energy expenditure and breast-milk intake, including extensive use of isotope-ratio mass spectrometry. These techniques are applied in collaborative studies worldwide, investigating early growth variability, the developmental origins of adult disease hypothesis, and testing nutritional interventions in randomized trials.

He has used evolutionary theory to develop novel theoretical frameworks for public health nutrition across the life-course, and recently led a Lancet series on ‘Evolutionary Public Health’. He is the author of two monographs, ‘The evolutionary biology of human body fatness: thrift and control’ (2010) and ‘The metabolic ghetto: an evolutionary perspective on nutrition, power relations and chronic disease’ (2016), both published by Cambridge University Press.

Abstract:

Assessing body composition to better understand the double burden of malnutrition

Both under-nutrition in early life and subsequent overweight manifest numerous effects on body components, such that measurement of body composition represents an ideal approach to assess both the extent of the double burden of malnutrition in individuals, and its health implications. Early wasting and stunting constrain the structural and functional development of organs and tissues, whilst overweight and excess adiposity perturb metabolism. A wide variety of body composition techniques can provide detail on the physiological expression of the double burden. A simple ‘capacity-load’ model can integrate diverse data in a unified conceptual framework, improving the ability to compare outcomes across populations.
Biographical Summary:

Dr. Klaas R. Westerterp is professor of Human Energyctics in the Faculty of Health, Medicine and Life Sciences and the School of Nutrition & Translational Research in Metabolism (NUTRIM) at Maastricht University, The Netherlands. His field of expertise is energy metabolism, physical activity, food intake and body composition, and energy balance under controlled conditions and in daily life.

Abstract:

Measuring physical activity across the lifespan and its link to the double burden of malnutrition

Physical activity and body composition show a typical pattern over the lifecycle. The most profound change in body size and body composition occurs during growth and maturation, parallel to the development of the physical activity level. Lean body mass and physical performance generally peak in early adulthood. At later age, physical activity and lean body mass decrease while one gets fatter with the risk of developing obesity. Here, evidence for a relation between physical activity changes over the life span and the development of a healthy body composition is presented.

Activity induced energy expenditure increases with body size and body movement during growth. The physical activity level, calculated by expressing total energy expenditure as a multiple of resting energy expenditure to adjust for changes in body size and body composition, gradually increases from early age to adulthood to decrease again in old age. Habitual physical activity has a significant effect on growth of lean body mass during adolescence and thus on peak lean body mass and physical performance in early adulthood. Older subjects have a lower lean body mass and lower physical activity levels but there is no association, suggesting physical activity does not protect against loss of lean body mass at higher age. A healthy life starts with a physically active lifestyle to develop a healthy lean body mass and subsequent prevention of excess fat gain. The change from a physically active to a more sedentary routine in later life requires restriction of energy intake to maintain energy balance.
Biographical Summary:

Hinke is an adjunct professor in Population and Child Health at the Population Research Centre of the University of Groningen in the Netherlands. She has a background as a nutritionist from Wageningen University, then worked as a nutrition officer at this department at IAEA, subsequently obtained a PhD in Medical Sciences from the University of Groningen, based on field work in Pelotas, Brazil, on the influence of socio-economic status on energy utilisation of infants and applying isotope methods, and then moved into social sciences/demography. Her research focuses on inequalities in child health and nutrition, and is inspired by the work of Nobel Laureate Amartya Sen. In her presentation she will demonstrate how a capability approach to child growth could help in developing a multi-dimensional tool for assessing child growth. Such a tool would be context specific, and thus could address contextual issues related to the dual burden of disease, and take these into account in measurement, counselling, training, and development of interventions.

Abstract:

Multi-dimensional indicators of child growth and development

Child growth monitoring has been introduced in the 1970s, with the aim to reduce child mortality and morbidity. Height and weight have been used as the indicators of child growth, and these have been compared against a universal standard for the identification of both under- and overnutrition. Contextual factors have been missing in the actual growth assessment. We argue, that including these factors in the measurements as additional dimensions of growth could further advance our understanding of the (inequality of the) double burden of malnutrition and be used for the development and evaluation of interventions. A capability approach to child growth could give direction to the identification of such dimensions.

The capability approach has its origin in welfare economics, and was first developed by Amartya Sen in the 1980s. It moves away from the focus of resources towards an end; rather it focuses on the concept of capabilities and agency as a means toward an end. It has been employed extensively in the context of human development, for example, by the United Nations Development Programme, as a broader, deeper alternative to narrowly economic metrics such as growth in GDP per capita.

The capability approach has since been applied in the fields of education, disability, and well-being. We aim to expand its use and develop a capability approach to child growth. This implies a moving away from mere anthropometric measurements to include contextual factors as other dimensions into the actual growth measurement with the aim to better be able to target biological, parental, and societal differences and reduce (the inequality of) poor growth outcomes (both under- and overnutrition). We use theories from demography, biology, and social sciences to identify potential
additional dimensions of growth. For example, a country’s stage in the nutrition transition would be a societal dimension that could be included in the assessment of growth. Or, maternal nutritional status could be an additional biological dimension. Other dimensions could be derived from the Rights of the Child. This could eventually contribute to the development of a multi-dimensional indicator of child growth with implications for counselling, training of professionals, development and evaluation of interventions, and comparisons between countries. Such an approach would require a shift in our biomedical thinking, but could give new direction to addressing the issue of the double burden of malnutrition.
Biographical Summary:

Dr. Corella’s interests are focused on the study of genetic and epigenetic determinants of obesity, diabetes, cardiovascular diseases and other cardiovascular risk factors. She has developed research methodology for analyzing gene-environment interactions. Within the gene-environment interaction study, gene-diet interactions have constituted the main research line giving rise to the development of Nutritional Genomics. She has collaborated with Dr. JM Ordovás at the Human Nutrition Research Center, Boston in various populations including White-American, Latinos, Europeans, African-American and Asian populations. Currently, she is also studying how to integrate various omics technologies (genomics, epigenomics, transcriptomics, metabolomics etc) into the field of nutrition, obesity and other metabolic diseases. He has published more than 250 papers in international journals.

Abstract:

The omics approach in measuring the double burden of malnutrition

Over recent years, many omic technologies have been developed that could help to better understand the molecular mechanisms implicated in the so-called double burden of malnutrition. This is characterized by the coexistence of undernutrition along with overweight and obesity, and, in turn, with a higher risk of developing various chronic diseases such as diabetes or intermediate phenotypes (hypertension, dyslipidemias, etc.) or the final phenotypes (stroke, myocardial infarction) of cardiovascular disease, among others. For many years now, the hypothesis of the so-called “thrifty genotype” has been put forward. According to this, subjects with a “thrifty genotype”, in conditions of food scarcity, they optimize the exploitation of those resources and their storage in the form of energy when they are available, being favorable for survival. However, this “thrifty genotype” becomes harmful when there is a surplus of food available, increasing the risk of obesity, diabetes and other chronic diseases. The great advances in genomics have allowed us to study the genome and to investigate the “thrifty genotype” in an increasingly precise and more economical way through the analysis of high density and undertaking genome-wide association studies (GWAS), as well as incorporating next generation sequencing techniques. Although we are still in the research stage, several genes and genetic profiles of greater susceptibility to diabetes, obesity, etc. have already been identified through so-called genetic risk scores (GRS). Increasing our knowledge on validating those scores will also allow us to incorporate them into so-called Nutritional Genomics for
better prevention and treatment of those diseases related to the thrifty genotype. Furthermore, apart from the “thrifty genotype” hypothesis, the “thrifty phenotype” hypothesis was proposed for explaining how a situation of food scarcity could increase the risk of obesity and diabetes in conditions of greater availability, but taking into account the fetal origin. This hypothesis is being validated through epigenomic analyses. The main epigenomic modifications are DNA methylations, but also advances are being made in regulation by micro-ARNs and histone modifications. We shall review the main epigenomic markers and their environmental modulations linked to the “thrifty phenotype”. Likewise, we shall review the advances made in other omics, mainly transcriptomics and metabolomics, as well as the integration of various omics for a better understanding of the double burden of malnutrition.
Biographical Summary:

Jef Leroy, a Belgian citizen, is a Senior Research Fellow in IFPRI’s Poverty, Health, and Nutrition Division. He studies the impact of two large-scale integrated food and nutrition programs in Burundi and Guatemala on maternal and child nutrition and health. He is also involved in research on the impact of aflatoxin on child linear growth in Kenya and Mexico and studies the measurement of linear growth retardation. Before joining IFPRI in July 2009, he was a research associate at the Center for Evaluation Research and Surveys at Mexico’s National Institute of Public Health in Mexico. In Mexico, he worked on the impact evaluation of large scale nutrition and social protection programs. Jef Leroy has a PhD in International Nutrition (Cornell University, USA) and a MSc in Agricultural and Applied Biological Sciences (Ghent University, Belgium).

Abstract:

Which data are missing on implementation aspects and impact?

Although there is a consensus regarding the need to invest in nutrition-sensitive programs in order to address the underlying causes of undernutrition and to improve the effectiveness, reach and scale of both nutrition-specific interventions and nutrition-sensitive programs, the evidence of what works, how and at what cost is extremely limited. Thus, building a strong body of evidence from rigorous, theory-based comprehensive evaluations of different nutrition-sensitive program models that bring together interventions from a variety of sectors (e.g. health, education, agriculture, social protection, women’s empowerment, water and sanitation, etc.) is essential to provide the needed guidance for future investments for improving nutrition. This presentation aims to provide this type of guidance, focusing on how to design and carry out rigorous process, cost and impact evaluations of complex nutrition-sensitive programs; and it aims to de-mystify some of the perceived insurmountable challenges that have prevented investments in rigorous evaluations of such programs in the past.