

## Parallel session

▶ **S6** HOW TO MAKE CHILDHOOD LIFESTYLE HEALTHIER?

Co-chairs: M. NICOLINO &amp; D. WEGHUBER

## Parallel session

**S7** HOW TO PREVENT UNDESIRABLE WEIGHT GAIN IN ADULTS?

Co-chairs: P. OUVRARD &amp; L. LETRILLIART

**Children & adolescents obesity: evolution of prevalence in Europe**

A. RITO – INSA - PT

The WHO Childhood Obesity Surveillance Initiative (COSI/WHO Europe) is an ongoing, systematic process of collection, analysis, interpretation and dissemination of descriptive information for monitoring childhood nutritional status and measuring trends in overweight and obesity in primary school children (6-10). A surveillance initiative which produces comparable data between European countries and allows the follow up of childhood obesity every 3 years. The first data collection took place in the school year 2007/2008 where 13 countries participated. The second round of the study (2009/2010) comprised 17 countries and in the third round 2 more countries joined the study making a total of 19 participating countries. The fourth round had 35 countries from the WHO European Region participating, out of the 40 already enrolled in the study. After almost a decade of its launch, COSI/WHO Europe is now the WHO largest European study with about 300 000 participating children.

COSI involves taking standardized weight and height measurement and the collection of social, family, school environment, diet and physical activity variables through a methodology which follows the common protocol and approach, developed by WHO Europe.

During the last 10 years, COSI data has suggested a presence of an increasing north-south gradient, with the highest prevalence of overweight and obesity found in Southern European countries.

In the last round (4th- 2016) the highest prevalence of overweight in boys was shown in Cyprus (43%), Greece, Italy and Spain (42%) whereas the lowest prevalence of overweight boys was found in Tajikistan (9%); Turkmenistan (11%); Kazakhstan (17%) and Denmark (18%).

Nevertheless, since 2008, a significant decrease in the prevalence of both overweight and obesity was recorded in Greece, Italy, Portugal and Slovenia. Portugal alone showed a downward trend from 37,9% in 2008 to 30,7% in 2016 in overweight children. A decreasing tendency was also observed in Ireland and Spain. Belgium, Czech and Norway have stable prevalences; whereas the picture is less definite in Bulgaria, Latvia and Lithuania. An increasing tendency in obesity was observed among Latvian girls and Bulgarian boys. A similar pattern has been recorded among Lithuanian boys for both overweight and obesity.

Data were also collected on eating habits and physical activity patterns, since these are closely linked to the energy imbalance that results in children becoming overweight and obese. There was considerable variation between countries in relation to frequency of consumption of healthier food items and of less healthy food items, with some countries showing low prevalence of overweight with the poorest healthy food habits (eg. Kazakhstan showing that only 49% of the children had breakfast every day)

There was also considerable variation between countries in indicators of physical activity (going to school by foot or by bike, attending a sports or dance club, and time spent playing outside), media consumption and sleep duration. Walking or cycling to school seemed to be associated with parents' perceptions of the safety of the route and the distance to school.

---

## Little bests in town: how environment and urbanization can drive children's health

D. VAN KANN – Fontys University - NL

---

Unhealthy lifestyle behaviors and subsequent health risks are still increasing and have reached epidemic proportions. It is expected that approximately 60-70 percent of the population will live in cities. These populous areas tend to increase multiple risk factors for unhealthy lifestyles, such as decreased exposure to green space and increased access to unhealthy food. Contrary, these populous areas provide a range of opportunities which are not present in rural and remote areas, such as increased access to walk and cycle facilities. Further, impact is the result of effectiveness of an intervention multiplied by its reach. However, in many (school-based) health promotion interventions reach is problematic. Recognizing and acting on the opportunities provided by the reach urbanization causes, can transform the challenges in unexpected advantages.

Lifestyle patterns are formed in childhood. As children are 'packed' within broader systems, the school, home, and neighborhood environment, focusing on multiple actors and settings simultaneously is needed. In the home environment, parental practices and modeling behavior are important determinants of fruit and vegetable (F&V) intake. A recent meta-analysis, however, showed only very small increases in F&V intake in successful interventions. School policies to encourage healthy dietary behaviors are also identified as influencing factor, in which direct provision was indicated as strongest associate of higher F&V intake, underlined by a recent meta-analysis that indicated availability as the strongest predictor of F&V intake. Evidence on the effectiveness of exposure to environmental characteristics in the neighborhood on F&V is limited, though a higher density of healthy food outlets seems to affect healthy nutrition positively. Contrary, fast food exposure in the environment is positively associated with BMI. Integrating evidence on environmental characteristics and school

policies would suggest that creating F&V-supportive urbanized environments have the potential to affect children's F&V intake. Environmental changes further enable people to break (un)healthy habits, which have been identified as inhibitor of desired, healthy changes in adolescents.

Considering the broader system in which a child operates and allow interactions between different settings may be key in successfully design health-supportive environments. Successfully designing health-supportive environments is further enhanced by a combined top-down, bottom-up approach. In such a co-design approach, both empirical evidence on environmental influences and local needs by end-users and other stakeholders can fully interact with each other leading to a better fit in the local environment. Integration of needs of end-users further implies customizing interventions (e.g. low SES families), rather than implementing one-size-fits-all interventions. In this strategy, useful generic principles are used which are translated to the needs of the target population, leading to unique urban environments in which it becomes more easy for children and their families to adopt a healthy lifestyle, such as sufficient F&V intake and sufficient physical activity.

Recommendations:

1. Urbanization can be considered as a major chance for creating sufficient impact by F&V and other lifestyle interventions;
2. The creation of health-supportive (urban) environments contain changes in multiple types of environment and should be tailored to the needs of vulnerable populations;
3. Environments in which healthy alternatives take less effort than current unhealthy patterns are most likely to be successful in changing lifestyle behaviors;
4. Supportive environments should be co-designed by end-users to become effective;
5. Focus on the broader system in which children operate; Children are exposed to multiple settings throughout the day. Integrative programs are needed, such as providing healthy alternatives to children in the environment in combination with a supportive (urban) social environment, e.g. role modeling by parents and GP's.

---

## Adolescence “the revolution age”: How to make a healthy revolution?

A. VANIA – Sapienza University of Rome - IT

---

Adolescence is a well-known pivot of human development. In contrast with the literal meaning, this “pivot” is not a single point or moment but a quite long period of time, going from the first signs of pubertal changes to the end of height growth and cognitive development. This is why adolescence has been divided into three phases: pre-adolescence, adolescence (or intermediate a.), and late adolescence; each of them has different characteristics. During all its duration many aspects of a single person's life are going to change, some of them dramatically. The youth is not the only one facing and coping with them: parents and family, peers, teachers and doctors share the same task. All of them must cooperate, in accordance with their role/age/responsibility, to give rise to the adult which, in embryo, the adolescent contains, and to transform a possibly devastating revolution into a healthy one.

My personal field of interest is, since ever, human nutrition. Supposedly, adolescence does not affect this aspect: a child eats, a teen eats, an adult eats... always the same process, and with the same purpose, isn't it? Actually not. Nutrition is not the same as eating. It includes at least as many relational aspects as biochemical and physiologic ones.

Relational aspects, during adolescence, may outdistance all the others, thus becoming the most important ones, those which may drive the feeding behaviour with such a power as never seen before, and possibly not even after. Let's make some examples, although with a generalisation that does not apply to every single adolescent: as an adolescent, (1) what my family eats easily becomes one more point of friction with my parents, and at the same time one more point to defy. (2) What my peers eat is likely to become "my" model of eating, and (3) what they think of "me" eating something, in turn, can become an unbearable burden. Similarly, (4) what teachers and doctors say about food, proper eating behaviour, and so on, is readily as stupid as all the other topics "adults" are used to speak about, while I start (5) to realise that my eating behaviours can modify my physical aspect, and (6) imagine that I can control any aspect of it, almost in a magical way.

While it is difficult to tell what can make such a revolution a healthy one, it is easier to identify aspects most likely unsuccessful. Adults – including many physicians and health personnel – tend to transfer "their" way of seeing life to the adolescent instead of trying to understand the latter's way of thinking. Picturing frightening scenarios about future health, actively stimulating the adolescent to follow sage adults' example, pointing to a more "adequate" peer (usually not the most popular one), are all examples of unsuccessful approaches. Invert them can be easy to dictate, not as much their (inverted) application.

In my presentation I will try to clarify how using the appropriate communicative register, staying at the same "eyelevel" with the youth, being an influencer, on the contrary, can be more helpful. The final goal of any person dealing with adolescents should be to put themselves at a level where they can grasp what we try to transmit.

---

## Diet in pregnancy in relation to subsequent maternal and neonatal health

F. MCAULIFFE – University College Dublin - IR

---

Pregnancy is a unique time in the lifecourse where the short and longterm health of mother and baby can be influenced. The increased physiological demands of pregnancy can act as a biological stress test for life to predict a woman's future health. Pregnancy is considered a "diabetogenic state" of insulin resistance, exposure to which may result in long-term alterations of normal glucose metabolism. Gestational diabetes increases the risk of type 2 diabetes in later life, and fasting glucose below levels used to diagnose gestational diabetes are associated with increased adverse maternal outcomes. These effects are more marked in the setting of increased gestational weight gain.

Whether the immediate and lasting effects of pregnancy on a woman's metabolic health and body composition can be influenced through dietary or environmental manipulation is pertinent for all women, but requires further study. Multiple studies have found that maternal dietary intakes are suboptimal both in terms of macro and micronutrients.

In a longitudinal study with longterm follow up of mother and baby following a dietary intervention in pregnancy (ROLO study and ROLO kids) it was noted that mothers' HbA1c at 5 years' post-intervention was associated with early-pregnancy fasting glucose.

Postnatal maternal weight retention was associated gestational weight gain and dietary glycaemic index at 5 years postpartum.

Additionally the *in-utero* environment influences fetal development and may have a lasting impact on offspring and their future disease risk. Nutrition during pregnancy and the maternal environment have been associated with altered body composition at birth and health later in life. Inadequate energy or protein intakes in pregnancy have also been linked with increased risk of non-communicable diseases such as type-two diabetes and obesity.

The ROLO study noted that maternal dietary, glycaemic index, saturated fat intake and lipids associated with childhood adiposity at 2 years of age and that maternal protein intake in pregnancy was related to child weight and length up to 5 years of age.

Recommendations for clinical practice:

1. Improving maternal nutrition in pregnancy requires input from all healthcare professionals involved in maternity care;
2. Improvements in maternal dietary glycaemic index may reduce excessive gestational weight gain and improve maternal glucose homeostasis;
3. A focus on maternal saturated fat intake may be an additional approach to reduce excessive fetal and infant growth and childhood obesity.

---

## Parallel session

---

### **S6** HOW TO MAKE CHILDHOOD LIFESTYLE HEALTHIER?

Co-chairs: M. NICOLINO & D. WEGHUBER

---

## Parallel session

---

### **S7** HOW TO PREVENT UNDESIRABLE WEIGHT GAIN IN ADULTS?

Co-chairs: P. OUVRARD & L. LETRILLIART

#### Combining physical activity and healthy diet

S. CZERNICHOW – Georges Pompidou European Hospital - FR

According to the World Health Organization, excess weight affects 1.9 billion adults worldwide, of whom 650 million are obese. The obesity classification is based on the body mass index (kg / m<sup>2</sup>), which classifies individuals at population level. While this criterion does not make it possible to classify individuals at individual level, it does serve to compare populations with each other and to define risk levels.

Several population studies have shown the role played by the urban environment on the prevalence rate of obesity. For example, a Canadian study has found that in neighbourhoods with more areas where walking was possible, the obesity rate increased at a lower rate over the years. This highlights that accessibility to physical activity is important in terms of ability to change behaviours. Similarly, an intervention study showed that neighbourhood poverty levels influenced the prevalence of obesity in the neighbourhood. Finally, the implementation of several public health programmes, for example the National Health Nutrition Programme (PNNS) in France, are important elements in accommodating lasting behavioural changes at population level.

At individual level, there are now many intervention studies highlighting the role of dietetics and physical activity in weight control. Beyond simply reducing calories in a moderate, controlled manner over several months, controlling portion sizes and reducing the energy density of food has been shown to be important in weight control.

Finally, the latest American recommendations recall the essential role of frequent and regular consultation and follow-up, at least every 15 days at the beginning of care, in order to provide effective dietary advice and monitor weight changes over several months. This highlights the importance of nutritional treatment compliance but also the difficulty of successfully achieving it over the long term. New technologies may help to provide this type of monitoring for both patients and physicians.

---

## How state of the art technology can help people maintain weight loss?

S. STUBBS & C. DUARTE – Leeds University - UK

---

Predictors of weight loss maintenance (WLM) can be either physiological or psychological characteristics of subjects, processes of behaviour change or intervention components with which participants engage during attempted weight loss (WL) and WLM. Almost half the adult population make a weight loss attempt (WLA) each year; 80% of such attempts are subject to weight regain, largely due to eating rather than physical activity behaviours.

Predictors and correlates of outcomes vary between individuals and can change between phases of WL and attempted WLM. In many models of WL and WLM: (i) predictors explain relatively little (~ 20-30% of the variance in longer-term weight outcomes; (ii) many predictors are the sum of several small constituent variables, each accounting for a small proportion of the variance; (iii) inter-individual variability in predictors and correlates of outcomes is high (iv) most of the variance remains unexplained.

Initial weight loss is achievable in the short term but it leads to changes in physiological and emotional systems, which can increase the probability of weight relapse. Ultimately we need a better understanding of the interplay between physiology and behaviour to develop adaptive strategies of long-term weight loss. It is currently unclear how rate, extent or specific WL approaches predict subsequent WLM. Behaviour change techniques associated with self-regulation of activity and eating behaviour (e.g. goal setting, action plans, self-monitoring, relapse prevention plans) and aspects of motivation are important for WLM. Evidence that stress management and emotion regulation may be important for relapse prevention is strongly suggestive but less concrete.

Greater standardisation of predictive constructs and measures of energy balance behaviours, in more clearly defined study populations, tracked longitudinally would improve prediction of who is likely to maintain weight loss or relapse. Modelling within and between-subject patterns of variability in behaviour, and identifying effective mediators of both sustained behaviour change and relapse are central to understanding and improving longer-term WLM. Such studies require multidisciplinary collaborations that link mechanistic research to innovative interventions and knowledge exchange to have an impact on the weight and health of the population.

Recommendations and applications:

1. There are now standardised behavioural change taxonomies to characterise and quantify the active components of behavioural interventions, but there is a need to develop an equivalent framework to profile appetitive, psychological and behavioural energy balance characteristics of participants entering weight management programmes;
2. Eating behavior profiles will help us better match WL intervention components to specific energy balance behaviours of individuals;
3. Tracking technologies should be used routinely used to accurately track energy balance behaviours throughout WM interventions;
4. By combining state of the art digital tracking technologies and data aggregation capabilities it will be possible to develop a Behavioral Energy Balance Framework that will greatly enhance personalised self-monitoring of energy balance behaviours during WMAs;
5. Analytical and predictive frameworks specifying how energy balance behaviours change over time will lead to the next generation of WLM interventions using novel screening, tracking and personalised-navigation tools.

---

## How should nutritional advice be administered during a routine consultation?

J.M. LECERF – Pasteur Institute of Lille - FR

Patients do not consult a practitioner on the grounds of prevention. Apart from vaccination, prevention is not considered a medical act by the practitioner. Yet there are many opportunities to approach prevention: either the doctor can prompt the patient or he can take advantage of health problems raised by the patient. Nutrition is an ideal subject on which to engage in dialogue and give advice.

1. The patient comes about an acute pathology, an infection for example. He can be reminded of the importance of diet and lifestyle for the immune system, the need to stay well hydrated and consume fruits and vegetables.
2. The patient comes about a chronic pathology (e.g. coronary heart disease, high blood pressure, cholesterol, diabetes). This opportunity can be used to remind him that drugs do not replace nutrition.
3. The patient comes for a prescription renewal, a vaccine or an “administrative” consultation (certificate). It is also an opportunity to check his weight or blood pressure and tell him that people are on hand to give dietary advice.
4. It is also possible to approach prevention by advising other people in the family, especially regarding the diet of a child or elderly person.
5. Sometimes the patient spontaneously asks a question about diet or weight. You must always answer him. Potentially offer a longer consultation on another occasion.

Advice should not be given in excess. It must not be judgmental. It must not be too categorical. It must take into account the patient's habits and therefore may not be standard. It must be cautious, "positive" and caring. You must be able to repeat it. It must be precise and accurate. If the doctor does not know the answer to a question, he must make enquiries. The patient's readiness to listen must be taken into account.

All in all, some recommendations:

1. Every opportunity to address a prevention issue should be taken;
2. The doctor is doing his job when he spends time on prevention. It is a medical act;
3. He must be personally convinced of the importance of food and healthy living;
4. It is important to explain to the patient how and why this recommendation affects his health.

---

## Fostering collaboration between General Practitioners and Dietitians to improve nutritional patient care

T. LIBERT – EFAD - FR & E. NEWMANN - EFAD - FR

---

Improving the nutritional status of the population is a major challenge for Public Health policies in Europe and worldwide. Dietitians are experts in providing nutritional and dietetic care and are employed in different health care settings. Nutritional care in the community and primary care will become more important. This is caused by ageing of the population and associated prevalence of diseases in older adults. In addition, there is a growth of outpatient surgery and decreased length of stay in hospitals, which accentuates the need for patient nutritional care outside the hospital. To provide optimal nutritional care outside the hospital, dietitians and general practitioners (GPs) need to collaborate. In the present study, the current situation in different European countries regarding collaboration between GPs and dietitians was investigated.

A survey was conducted among the 27 European national associations of dietitians, all EFAD members, to clarify the current situation regarding the cooperation between GPs and dietitians.

All the associations that responded (N=18) find that general practitioners do not make optimal use of the expertise of dietitians in their country. There is a lack of awareness of the profession of dietitian, as well as its added value for the nutritional monitoring of patients. On the other hand, dietary counseling is not reimbursed in most of the countries surveyed, which is also one of the reasons why GPs do not refer to dietitians. According to dietitians, collaboration between GPs and dietitians should be improved in order to provide optimal nutritional care. How this collaboration could be improved needs to be studied.



## Parallel session

---

### ▶ **S8** CHILDHOOD OBESITY CARE

Co-chairs: M. NICOLINO & D. WEGHUBER

---

## Parallel session

---

### **S9** PREVENTING OBESITY RELATED DISEASES & BRAIN DECLINE

Co-chairs: M. MCCARTHY & L. LETRILLIART

---

## Psychological profile to become and to stay obese ?

A. TANGHE – Zeepreventorium De Haan – BE

---

The presentation will successively deal with the psychological models to explain for the onset or maintenance of child obesity.

Five psychological perspectives on childhood obesity are selected. The boundary model of Herman & Polivy (1980) was brought forward as an explanation model for understanding the overeating behaviour in obese people. Others describe obese children as overresponsive to external cues and this overresponsiveness is seen as a personality trait. Learning theories put forward how (dysfunctional) learning mechanisms can explain also why obese people eat in front of food cues, without feeling hungry. Finally, obesity can be seen as an expression of a family pathology or an emotional problem.

Psychological explanation models are still subject of discussion. Personality variables, eating behaviour, restraint attitudes, psychopathology and emotional factors, learning mechanisms as well as the role of the family are to be considered in an assessment process. It may help to better empathise with both parent and child. Furthermore, it can help to tailor the treatment program to the individual needs of an obese child. Further research is needed to find out whether already during the intake psychological indicators can be found that are predictors of negative therapy outcome.

---

## Dietary approach to treat obese children

D. WEGHUBER – Paracelsus Medical School – AT

---

Dietary patterns learnt early in life track into later childhood and adulthood and form the basis for future eating patterns. Meta-analyses have clearly demonstrated that multidisciplinary interventions for the treatment of children who are overweight or obese are more effective the younger the child is. The main objective of treatment is a permanent change in the child's eating habits and lifestyle, rather than attaining rapid weight loss through low-calorie diets. It is pivotal to involve the whole family and set realistic goals.

Starting point of the educational process is the assessment of the child's and the family's dietary habits by means of the assessment of meal composition, portions, frequency of food intake, food preferences or aversions, use of condiments, cooking methods and food presentation as well as drinking habits.

Dietary advice includes to eat five meals a day (three meals and no more than two snacks), to have adequate breakfast, to avoid eating between meals, to avoid high-energy and low nutrient density foods (e.g. sweetened or energizing drinks, fruit juices, fast food, high energy snack) to increase the intake of fruit, vegetables and fiber rich cereals and to limit portions.

Currently, there are no randomized controlled trials examining the effects of different diets on child's or weight and body composition, regardless of potential confounders such as treatment intensity, behavioural or physical activity strategies. A hypocaloric diet can be considered as initial step within a long-term strategy, but needs to fulfil recommended minimal energy and macro- and micronutrient intake levels based on sex, age, and ideal weight for stature, and warrants close medical surveillance in specialized paediatric centers. Replacement meals are not recommended due to lack of evidence of efficacy and safety. No significant lasting effect has been demonstrated for diets with specific macronutrient composition. This includes diets with low glycemic index and load. Traffic light and modified traffic light diets are used to achieve reduced caloric intake through categories of foods grouped by nutrient density and might be effective even in the long-term.

Given the fact that obesity is a chronic disease and the limited effect of treatment in the long-term, the development and validation of chronic care models is mandatory. A system-wide approach for screening and early identification of children who are overweight or obese with clear referral pathways for further assessment and treatment is the foundation for efficient multi-disciplinary concepts of weight management service delivery.

Recommendations for the application in daily practice:

1. It is pivotal to involve the whole family and set realistic goals. Starting point of the educational process is the assessment of the child's and the family's dietary habits.
2. Dietary advice includes to eat five meals a day (three meals and no more than two snacks), to have adequate breakfast, to avoid eating between meals, to avoid high-energy and low nutrient density foods (e.g. sweetened or energizing drinks, fruit juices, fast food, high energy snack), to increase the intake of fruit, vegetables and fiber rich cereals and to limit portions;
3. No significant lasting effect has been demonstrated for diets with specific macronutrient composition. This includes diets with low glycemic index and load;
4. Traffic light and modified traffic light diets are used to achieve reduced caloric intake through categories of foods grouped by nutrient density and might be effective even in the long-term.

---

## From physical activity to physical fitness

D. THIVEL – Clermont Auvergne University - FR

---

Exercise interventions (combined with dietary restrictions) are first line strategies to treat pediatric obesity and the promotion of active lifestyle from the youngest age is essential to prevent its development. While encouraging adults to exercise and engage into physical activities remains difficult, this is particularly true when it comes to children and adolescents, especially overweight and obese ones. Physical abilities and capacities evolve over childhood and each step is crucial to properly develop adults' physical fitness that will be determinant for physical activity level.

While the lack of physical activity is most of the time incriminated for its role in the development of overweight and obesity in youth, practitioners have to consider the physical impairments and limitations induced by obesity that limit the children and adolescents' engagement into activities.

Practically, practitioners have to structure their clinical assessment in order to:

1. Identify simple and clear indicators of the patient's physical activity level (active transportation, physical education, etc.);
2. Determine the nature and time devoted to sedentary behaviors.
3. Determine whether there are barriers to movement (does the patient report difficulties in performing activities of daily living such as climbing stairs, tying shoe lace, showering, jumping, skipping, etc.);
4. Identify whether additional assessment and treatment will be required (identify indication that the child has physical or psychosocial barriers that might limit participation in physical play?) and refer to an adapted physical activity specialist if needed.

After a brief presentation of the main physical activity guidelines and first necessary steps that must be considered by practitioners, this presentation will try to identify the main physical limitations induced by obesity in youth.

## Parallel session

---

### S8 CHILDHOOD OBESITY CARE

Co-chairs: M. NICOLINO & D. WEGHUBER

---

## Parallel session

---

### S9 PREVENTING OBESITY RELATED DISEASES & BRAIN DECLINE

Co-chairs: M. MCCARTHY & L. LETRILLIART

---

#### Improvement F&V intake in weight management in adults with morbid obesity

G. DE PERGOLA – University of Bari – IT

---

Multiple lifestyle strategies may reduce the incidence of obesity, and one of them includes an increase in fruit and vegetable (F&V) consumption, even though the findings regarding the benefits of F&V on weight control are still inconsistent. Some studies reported that higher F&V consumption reduced weight and BMI, whereas others did not find such relationship. A meta-analysis of human randomized controlled trials concluded that there was no empirical evidence that increasing F&V would have a discernable effect on body weight. Another systematic review suggested that the inverse relationship between F&V consumption and adiposity among overweight adults was weak. However, a recent meta-analysis showed that high intake of fruit was inversely associated with weight change; although no significant changes were observed for vegetable or combined F&V consumption. The most recent epidemiological study on this topic (China Health and Nutrition Survey) examined prospectively the relationship between change in F&V consumption, weight, and change in BMI in a total of 4357 adults. The authors showed that, independently of potential confounding factors (age, BMI, education level, total energy intake, physical activity, alcohol and smoking), an increase in F&V consumption by 100 g was associated to significant weight loss (211 g) and decrease in BMI (0.94 kg/m<sup>2</sup>) in men ( $P < 0.001$ ), whereas the changes did not reach the significance in women. Potential reasons for sex difference might be explained by less vegetable consumption in women compared with men. Moreover, different socio-economic factors and hormone level between genders could also influence weight gain. There are several hypothetical mechanisms by which F&V may be protective against obesity. One potential explanation for weight reduction by F&V consumption may be a decrease in the total energy intake. Furthermore, several components of F&V, such as fiber content, glycemic load (GL) and polyphenols, might also be responsible for their anti-obesity effects. Fibers in F&V increase satiety, reduce hunger feeling and energy intake, and prevent weight gain. In addition, lower-GL of F&V produces fewer and smaller postprandial glucose spikes that may decrease subsequent insulin levels and hunger. Also, diets with low-GL or low-glycemic index (GI) may increase resting energy expenditure, promoting weight maintenance. Moreover, polyphenols may influence insulin sensitivity, gut microbiome, and adipose tissue metabolism.

On the basis of the above data and previous information, I would suggest the following recommendations to apply in daily practice:

1. To eat not less than 5 daily portions of F&V, 3 of vegetables and 2 of fruits;
2. To eat F&V of different color;
3. To keep in mind that juice is not fruit: fruit juice is a sweet drink;
4. To eat whole grains and legumes.

---

## Improved lifestyle & decreased diabetes risk over 13 years: the Finnish experience

M. UUSITUPA – University of Eastern Finland - FI

---

The prevalence of type 2 diabetes (T2D) is increasing worldwide. The main risk factors for T2D are overweight and obesity and sedentary lifestyle. Furthermore, the quality of diet may play a role in the development of T2D. Interest for prevention of T2D aroused already in 1980s, and the first controlled prevention trial, the Chinese Da Qing IGT and diabetes study with three intervention clinics arms and a control arm was published in 1997. In that study both diet and exercise and diet + exercise combined decreased the incidence of T2D among individuals with impaired glucose tolerance (IGT). The Finnish Diabetes Prevention Study was started in 1993 in five centers in Finland. Altogether 522 middle-aged obese individuals with IGT were randomized into intervention or control groups. The main goals of the intervention were weight loss, improving the quality of diet (more dietary fiber and less total and saturated fats) and increasing exercise. Dietary counselling was intensive with seven sessions during the first year of the intervention. Control group received general instructions about healthy diet and lifestyle. The original study lasted 3.2 years, but both groups were followed for over 10 years. Lifestyle intervention resulted in 58 % reduction in the incidence of T2D and the group difference remained significant over the whole follow-up period. Adherence to lifestyle changes was related to long-term success. The incidence of T2D was lowest in the group who had a high fiber but low-fat diet that was based on the frequent use of fruit, vegetables, local berries and whole grain products, e.g. from oats and rye, and low-fat/fat-free milk products. Intervention was effective independent of family history of diabetes or genetic risk score. However, no difference were found in major cardiovascular events between the intervention and control groups, but lifestyle intervention resulted in significant reduction in early diabetic retinopathy in a subgroup analysis of 214 study participants. Furthermore, lifestyle intervention had beneficial effects on low grade inflammation, blood pressure and serum triglycerides. Today, some 10 well-controlled trials have confirmed the benefits of lifestyle changes in the prevention of T2D in individuals at high risk for T2D, including the American DPP study published in 2002. To conclude: T2D is preventable by changing lifestyle with permanent weight loss, healthy dietary choices and increasing physical activity, and lifestyle changes have sustained beneficial effects for many years after the active intervention.

---

## Current nutrition practices among cardiologists

**P. ASSYAG** – French Federation of Cardiology - FR

---

In France, cardiologists practice their profession in a hospital or practice to provide care and treat patients with cardiovascular disease, according to the latest recommendations of learned societies. As a result, cardiologists often find that they need to provide advice to promote a balanced diet. In this context, we at the French Federation of Cardiology have decided to conduct a survey into current nutrition practices among cardiologists, in partnership with APRIFEL. This survey involved 200 hospital and private practice cardiologists and may be summarised as follows: This is a low priority area for cardiologists. Indeed, in terms of prevention, cardiologists regularly support their patients with giving up smoking, suggest regular physical activity and, less frequently, a balanced diet (5 pieces of fruit and vegetables a day, oily fish, lean meats, etc.) with moderate consumption of salt and alcohol.

Nutrition remains a secondary topic with only 4.3 patients out of 10 on average who spontaneously ask for advice on diet in order to prevent cardiovascular diseases.

The second lesson from this survey is that cardiologists say they give nutritional advice on average to 6.5 out of 10 patients, a minority use educational materials and instead use laboratory brochures. Nearly 8 out of 10 cardiologists recommend a nutrition specialist to help their patients lose weight.

Thirdly, in addition to the lack of time mentioned by half of cardiologists, they suffer from a lack of training to improve their support for patients. Nearly 8 out of 10 cardiologists consider the topic difficult to explain to their patients. Cardiologists are aware of the complexity of this area and are open to the idea of better support; this would come from materials but also complementary training as expressed by nearly 8 out of 10 cardiologists.

Which actions for improvement are recommendable?

First and foremost, this area is part of the national health strategy put in place by the French Ministry of Health, which combines a balanced diet with regular physical activity.

Thus, the French Federation of Cardiology will continue to produce and disseminate educational materials on nutrition written by health professionals in this area of cardiovascular disease prevention.

---

## Diet for the mind: what to eat to prevent Alzheimer's and cognitive decline?

**T. NGANDU** – National Institute for Health and Welfare (THL) - FI

---

With the aging of the population, number of persons living with dementia, Alzheimer's disease and cognitive impairment is expected to increase rapidly. Prevention plays a key role in reducing or curbing this epidemic worldwide. There is increasing evidence from epidemiological studies linking various modifiable risk factors throughout the life course with the development of dementia. Of particular interest are lifestyle factors like diet and physical exercise.



Several single nutrients and dietary patterns (eg. Mediterranean diet, MIND-diet) have been shown to be associated with risk of dementia and cognitive impairment. Randomised controlled trials (RCTs) targeting these factors are much needed to prove the associations, yet these studies pose methodological challenges. Given the multifactorial etiology of dementia and late-onset AD, multi-domain interventions targeting several risk factors and mechanisms simultaneously are most likely to be effective.

This presentation gives an overview of recent nutritional trials and multimodal interventions and discusses future directions in the field.

The Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) is a pioneering trial providing the first evidence from large RCT that a multi-domain lifestyle intervention may prevent cognitive impairment. The results of this study will be presented with particular focus on the nutritional component and participant compliance to the recommended dietary changes. New results concerning secondary outcomes and sub-group analyses will also be presented.

Building upon the experience from the FINGER and the LipiDiDiet trial, the MIND-AD project (Multimodal preventive trials for Alzheimer's Disease: towards multinational strategies) has been initiated. In this ongoing trial, a multidomain lifestyle intervention is tested along with a nutraceutical product for persons with prodromal AD.

FINGER represents a pragmatic model, which is now being tested in diverse populations and settings (Europe, USA, China, Singapore, Australia). To promote synergy across these trials and optimize efforts towards dementia prevention, we recently launched the World-Wide FINGERS Initiative. WW-FINGERS is an interdisciplinary network, to share experiences and data, and plan joint initiatives focusing on dementia prevention.

There is increasing evidence that it is possible to prevent or postpone late-life cognitive impairment and dementia with multi-domain lifestyle interventions. Tailored multimodal interventions combining non-pharmacological, nutritional and pharmacological approaches may be the most effective strategy to prevent cognitive impairment and dementia. WW-FINGERS will facilitate synergistic use of data from several countries, creating a unique opportunity for rapid implementation of knowledge and definition of effective and feasible prevention programs for diverse populations.

Recommendations for daily practice:

1. Healthy diet including plenty of fruits and vegetables, fish, unsaturated fats and whole grain products is beneficial also for the prevention of cognitive decline;
2. Dementia prevention is a lifelong journey, but it is possible to achieve benefits from lifestyle changes also in old age;
3. Targeting several risk factors at the same time, and tailoring interventions to take into account individual needs may be the optimal strategy;
4. What is good for the heart is also good for the brain.

# S10 FOOD CONTAMINANTS: WHEN WE MIX SCIENCE AND POLITICS

Co-chairs: J. RAMSAY & J.M. LECERF

## Organic vegetable products: from perceptions to scientific realities

M.J. AMIOT-CARLIN – INRA - FR

The organic sector is booming. This growth is affecting both supply and demand. It is reported that the consumption of organic products is closely associated with socio-economic, health and lifestyle indicators. Consumers have an increasingly negative perception of products derived from intensive production and industrialisation. The organic farming label offers consumers a guarantee of assurance that synthetic chemicals and GMOs have not been used in production. Organic products are thus preferred because of two salient features: the absence of crop protection products and the presence of substances with a positive influence on nutritional and sensory qualities. In general, organic and local are often undistinguishable for consumers, such that they would not buy organic products from remote sources.

What about the scientific reality? Organic regulations help produce products with specific qualities. On the health front, several articles, review and meta-analysis conclude that organic fruits, vegetables and cereals have fewer detectable pesticide residues than conventional products; no difference in mycotoxin concentrations has been reported between organic and conventional cereals. In terms of toxic metals, only cadmium concentrations have been found to be lower in organic cereals. Regarding nutritional quality, a recent meta-analysis showed that concentrations of various antioxidants are higher in organic plant products: this is true for polyphenols with +19 to +69% depending on the family (phenolic acids, flavanols, etc.), and for some carotenoids and vitamin C, but with smaller amplitudes, from +6 to +12%. For minerals, the differences are small; magnesium and zinc levels have been found to be slightly higher in organic vegetables. However, protein levels are lower in organic cereals (-15%). From a sensory point of view, most studies do not show significant differences between organic and conventional products. Some processing methods used in organic sectors such as the lesser degree of refining can have an impact on taste. Organic is considered a model food system in terms of sustainability. In fact, organic products have certain environmental benefits (reduced pollution and conservation of biodiversity) and social benefits (producer-consumer proximity via short supply chains). However, considering the accessibility for consumers, the prices of organic products are higher.

From a health point of view, rigorous studies comparing the effect of consumption of organic versus conventional products are non-existent. A French study in the Nutrinet-Santé cohort indicates that a higher consumption of organic foods, mainly vegetables, is associated with less metabolic syndrome risk, which is supposed to be due to less exposure to synthetic pesticides and/or endocrine disruptors. Studies are needed to validate this hypothesis.

As a recommendation, a diet with more organic or non-organic plant products provides protection against the risk of chronic disease incidence.



---

## Endocrine disruptors: What are they and where do we go from here?

L. MULTIGNER – INSERM - FR

---

Chemical substances, both natural or man-made, having hormonal properties which may cause adverse health effects, were grouped under the generic term called Endocrine Disruptor. In the early 1990s, most attention was focused on substances having steroidal hormone properties and therefore on their undesirable effects (potential or confirmed) on reproductive system. Since then, new modes of action involving multiples biological signalling pathways, both endocrine or non-endocrine, have been identified. Considering that the various signalling pathways interact with one another, the potential undesirable effects might affect almost all systems and functions of an organism. Endocrine disruptors therefore cover a very wide field with imprecise borders and our understanding varies according to one's point of view. In addition, the science of Endocrine Disruption built around these substances currently deals between rigorous scientific approaches and over-simplistic interpretations. The result is an image that brings in mind Ansel Adams' words: "There is nothing worse than a sharp image of a fuzzy concept".

Environmental and health protection agencies have rightly seized upon substances that have potential health consequences. But to approach risk assessment and regulation, it is necessary to rely on an operational definition and not on a theoretical definition based on concepts, even if these concepts are widely accepted by the scientific community. The main challenge for an operational definition is that an endocrine disruptor should refer, as a starting point, to a mode of action and not to a health event. Faced with the many modes of action identified to date and to our lack of knowledge about their exact roles in the pathophysiological processes that may lead to an adverse health event, the operational definition of endocrine disruptors is far from obvious. In Europe, a definition has recently been proposed, encompassing several successive stages: i) that the substance has a hormonal mode of action, ii) that the exposure to this substance is associated with the occurrence of an undesirable health event, iii) that the adverse event may be explained by the hormonal mode of action mentioned. However, such a proposal based on the strict weight of evidence raises controversy. For a long time to come, it is to be feared that the issue of endocrine disruptors may still struggle between scientific evidence and misuse application of the precautionary principle by powerful interest groups.

## Human health risk assessment on the consumption of F&V containing residual pesticides: a cancer risk/benefit perspective and non-cancer risk analysis

M. VALCKE – INSPQ - CA

Possible adverse health effects of pesticide residues in food are of concern for the population and public health authorities. Besides, abundant and varied consumption of fruit and vegetables (F&V) is a recognized preventive measure against some chronic health risks, including cardiovascular diseases and several types of cancer. Joint analysis of both issues is thus necessary for building sound public health policies. This study therefore aimed to evaluate the health risks and benefits associated with the chronic consumption of F&V in which residual pesticides can be measured, in the province of Quebec, Canada. Based on a representative sample of Quebecers (n = 4727, aged 1-79) enrolled in a Canadian nutrition survey, statistical distributions of their chronic dietary exposure to 169 different pesticide active ingredients (PAI) through the consumption of F&V was evaluated, including 135 for which non cancer toxicological reference values (TRV) were available in the literature. Among these, an oral cancer slope factor (SF) was also available for 28 PAI. Computing the ratio of the exposure estimates over each available TRV allowed generating ranges of PAI-specific non-cancer risk quotients (RQ) in toddlers (1-3 years), children (4-8 years), adults (19-50 years) as well as the entire population (1-79 years). Similarly, multiplying the entire population's mean chronic exposure value with the available SF allowed estimating the total cancer risk. The annual number of cancer cases estimated to be « prevented » was calculated for the province of Quebec based on the population's etiological fraction of the cancer risk that some F&V prevent its basal population risk, as well as the F&V consumption data. Non-cancer RQ > 1 were obtained at the 95<sup>th</sup> percentile of children's or toddler's exposure for 10 of the 135 PAIs, and considering the most severe pesticide-specific TRV. When the least severe TRV was considered, no RQ >1 were obtained. Total lifetime cancer risk attributable to the sum of the 28 carcinogenic pesticide exposures was estimated to be  $3.3 \times 10^{-4}$ , which corresponds to 39 new cancer cases annually in the Province of Quebec. For each estimated case of cancer triggered by PAI exposure through residues present in F&V, at least 88 cases were deemed « prevented » by the consumed F&V. Non-cancer risk were not clearly affected by socioeconomical status nor by the number of daily portions of F&V consumed. 21 PAI were identified as of priority toxicological interest, with emphasis being put on dithiocarbamates and imazalil, the major contributors to cancer and non-cancer risk. Chronic non-cancer health risks investigated are low and anti-cancer health benefits of F&V consumption by far outweigh the corresponding PAI-related risk. However, some risk estimates are not negligible and uncertainties remain.

Such work contributes to orientate public health policies as well as recommendations for practitioners. Thus:

1. Reducing PAI usage, with a particular focus on priority PAI mentioned above;
2. Recommending an abundant and varied F&V diet;
3. Stressing out the importance of water washing them, is desirable.

This work warrants further studies addressing its uncertainties.

---

## Why should we believe the evaluations of official bodies?

J. RAMSAY – EFSA - IT

---

The EU's General Food Law entered into force in 2002 marking a step change in the way food is regulated in the EU. Coming soon after a series of food safety scandals at the turn of the century, the most prominent of which was the BSE crisis, it created a system in which responsibility for risk assessment (science) and for risk management (policy) are kept separate. This model has proved to be resilient and has provided a strong basis for science-based policymaking and internal market and international trade. It has also ensured that the EU's 500 million citizens enjoy some of the highest food safety standards in the world.

Yet, the system is not unshakeable. Food fraud incidents such as the horsemeat scandal and the contamination of eggs with fipronil generated widespread public concern and led to questions being asked about whether national and European agencies were doing all they could to safeguard consumers from harm. Food safety agencies also regularly come under fire for their assessments of products submitted by industry for approval, such as pesticides, GMOs and food additives. Assessments that are perceived to conclude in favour of business can lead to allegations that an agency is "too close" to industry or that its experts have conflicts of interest. The most high-profile example of this in recent years is the ongoing debate over the safety of the pesticide active substance glyphosate, a controversy that continues to mobilise campaigners and non-governmental organisations, generate headlines in mainstream media, and hold the attention of politicians at a national and European level.

At the heart of this debate is the issue of trust. What levers and drivers affect the extent to which a food safety agency is trusted by its stakeholders? What explains why some food safety issues break through into mainstream political and media discourse while the vast majority of work carried out by agencies goes unnoticed and unchallenged? Is it really the case that trust in the official bodies responsible for food safety is on the decline, as some stakeholders would have us believe?

This presentation will explore these questions from the perspective of the European Food Safety Authority (EFSA), using the glyphosate controversy as a case study and making reference to recent research that EFSA has carried out on reputation. The presentation will argue that, while measures to improve trust can be made, the criticism levelled at EFSA is often unfounded and serves as a proxy for a wider societal debate about agriculture practices or the role that multinational organisations have in the food supply chain. In essence, the foundations of the food safety system in the EU remain strong.