Biological samples (blood and cheek-swabs) will be taken from children and parents for obesity and taste gene testing.

Results: The first stage of the follow-up will cover early childhood development from the prenatal period until the age of 3 years. The ongoing analysis will study how mothers weight gain during pregnancy affects child's weight and whether the environmental and genetic influences in development of obesity can be separated. The effect of genetic variation in bitter taste receptor on child feeding, eating patterns and weight gain will also be examined.

Conclusions: The research aims not only at gaining information about the correlations between different factors affecting childhood obesity, but also at producing results having more practical applications for use of childhood obesity prevention in children and families.

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20 – Economics of obesity: nutrition and physical activities substitution effect

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Introduction: Scientific evidence has demonstrated that child obesity depends on education and economic status of parents, and geographical location. Differently from the majority of published studies, we explain obesity in terms of a rigorous economic model suitable to design a science-based health policy scheme. The model is based on a neoclassical approach, and analyses the obesity problem in terms of a set of nutritional and physical activity choices.

Method: We propose a two-step methodology of economic choice modelling. In the first step, we suppose a utility model, where people choose the most efficient combination between calorie intake and energy consumption. In the second step, we estimate the cross-elasticity between the utility of nutrition and that of physical activity, given the observed levels of BMI. A case study referred on a population of 898 students (age 11–19 years) in the South of Italy is presented.

Results: The estimation of the cross-elasticity between and across different types of foods and physical activity, allows the comparison between different social groups. Students belonging to lower income groups show higher preference towards high calorie foods, with respect to healthy food. Similarly, students belonging to parents with higher education, show higher preference towards physical activity, in respect to food consumption.

Conclusions: The estimation of the cross-elasticity is valuable information to public policy aimed at the reduction of obesity. Diversified policy measures may be targeted to specific social groups, in order to increase the effectiveness of the policy and to reduce social inequalities.

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21 – Fluid consumption data extract from a French national survey: INCA2

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Nutritional recommendations are mainly based on dietary surveys of population: this is the case for intake recommendation as well. In order to make consistent recommendation on a European scale, the European Food and Safety Agency (EFSA) has very recently published a scientific opinion, in which it defines adequate intake of water as 2·0 l/d for females and 2·5 l/d for males, from fluids and food moisture. Considering that food moisture contains 20% of water on

average, this represents 1·6 l of water intake per day for females and 2 l of water intake per day for males. French national dietary survey (INCA 2) included more than 4000 people aged 3–79 years between 2006 and 2007. Volunteers declared all their food and fluid intake during a 7-d period. Main results of the present study showed (i) total consumption of fluids are 745, 856, 943, 1022, 1491, 1626 and 1422 ml for 3–6, 7–10, 11–14, 15–17, 18–34, 35–59 and ≥60-year-old population, respectively; (ii) 80 % of French adults, 18–79 years of age, drink less than 2 l of fluids daily; (iii) water is the most consumed fluid in France (~800 ml on average); (iv) the 25 % of higher sugared beverages adult drinkers consume more than 450 ml of SB per day; (v) SB represent 20 % of total fluid consumption for children and adolescents (3–17-year-old); and (vi) SB represent on average 17 % of simple sugar daily intake for children and adolescents. A very large part of French people should drink more in order to better satisfy water adequate intake proposed by EFSA. In addition, even if water remains the most consumed fluid in France, the consumption of sugared beverages represent significant intake of sugar and simple sugar, especially for children and adolescents.

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Poster Abstracts: Metabolic and Genetic Aspects

22 – Tracking changes in metabolic function with changes in body composition

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Introduction: It is unknown whether changes in body composition measured by either DXA or BIA are predictive of changes in metabolic health in obese children.

Method: Children completed a DXA scan, BIA measurement, an oral glucose tolerance test and a hyperglycaemic clamp at baseline (*n* 113) and follow-up (*n* 64). Differences between sample characteristics and metabolic outcomes were compared, as were changes over time. Linear regressions were used to test the association between change in body composition variables and change in metabolic outcomes adjusting for baseline age, BMI *Z*-score, ethnicity and gender.

Results: For every 1 % increase in PF over time, there was a decline in M and M/LBM of 0·13 and 0·17, respectively, using BIA. Each kilogram increase in BiaFM was predictive of a 0·08 decline in M, a 0·13 decline in M/LBM, a 1·49 decline in IGI and a 4·31 decline in DI over time ($P < 0·05$). Each kilogram increase in DXFM was predictive of a 0·09 decline in M, a 0·02 decline in M/LBM, a 1·68 decline in IGI and a 4·79 decline in DI over time ($P < 0·05$). For each 1 kg increase in FFM, declines in M/LBM, IGI and DI were observed (0·19; 1·94 and 5·66 for DXAFFM and 0·21; 3·37 and 9·71 for BiaFFM).

Conclusions: Changes in PF, FM and FFM over time as measured by DXA and BIA can indicate associated change in metabolic health in obese children and adolescents. BIA could be used easily in a clinical setting to track such metabolic changes. DXA – dual energy X-ray absorptiometry; BIA – bioelectric impedance analysis; PF – percent fat; M – insulin sensitivity; M/LBM – insulin sensitivity/lean body mass; IGI – insulinogenic index; DI – disposition index.

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23 – Serum neopterin and tryptophan concentrations in obese children

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