model. Introduction of a high n3 diet in adulthood reversed the increase in adiposity but not that in BP. The latter contrasts with our previous demonstration that programmed hypertension is prevented when offspring are raised on a high n3 diet from birth[1,2].

1. C.S. Wyrwoll *et al., Endocrinology,* 147:599–606, 2008.
2. C.S. Wyrwoll *et al., J Endocrinol.,* 198:571–579, 2008.

P-3B-75

Life-course socioeconomic factors, skin colour and abdominal obesity in adulthood in a Brazilian birth cohort

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Obesity is an increasingly prevalent nutritional disorder throughout the world. In particular, abdominal obesity is associated with cardiovascular and metabolic risk.
Objective: To evaluate the effects of skin colour and life-course socioeconomic indicators on waist circumference (WC), hip circumference (HC) and waist-hip ratio (WHR) in young adults.
Methods: Population-based birth cohort study. Individuals born in 1982 in Pelotas (southern Brazil) were visited on a number of occasions from birth to age 23–24 y. A sample of the cohort was sought in 2006 and 972 individuals were located. Assessment of the three dependent variables (WC, HC and WHR) was carried out in 856 subjects (442 males, 414 females). The independent variables were collected at the different follow-up visits: self-reported skin colour (2004), family income at birth (1982), family income in adulthood (2004) and family income change (1982 and 2004). Possible confounding or mediating variables were also collected in 2004: current smoking, sedentary behaviour, fiber and fat intake, alcohol consumption, attained education of the individual and parity (for women). ANOVA was used in crude analyses and multiple linear regressions in adjusted analyses. The adjusted analyses took into account the different levels of determination. Tests for linear trend were used for ordinal variables. Stata 9.0 (Statacorp, College Station, Texas, USA) was used for analysis. Appropriate institutional ethics committee clearance and participants' informed consent were obtained.
Results: In men, family income at birth and in 2004–05 were positively associated with WC and HC ($\beta = \sim 2.4$ cm and $P < 0.001$ in all the cases), but not with WHR ($\beta = \sim 0.005$ and $P = 0.1$ in both periods). Regardless of current income, men born to wealthier families had larger WC and HC as adults ($\beta = 1.7$ cm and $p < 0.01$ for both circumferences). Skin colour was not associated with any of the outcomes. In women, early poverty was associated with smaller HC

($\beta = 1.4$ cm; $p = 0.05$), and current poverty with larger WC ($\beta = -2.3$ cm; $P = 0.003$). Poverty at any age thus led to higher WHR ($\beta = -0.015$ for family income at birth and -0.011 for family income in adulthood; $P < 0.01$ in both cases). Black women had larger WC and HC than white women ($\beta = \sim 3.2$ cm and $P \leqslant 0.01$ in both cases), but there were no differences in WHR ($\beta = 0.006$; $P = 0.4$). All the associations were partially mediated by education and behavioural variables.
Conclusions: The effects of early socioeconomic position on WC and HC persist even after adjustment for adult socioeconomic position, highlighting the importance of interventions during the first years of life. Support: Partially funded by The Wellcome Trust. The initial phases of the cohort study were made possible by support from the PRONEX, the Brazilian Ministry of Health, International Development Research Centre of Canada, and the United Nations Development Fund for Women (UK).

P-3B-76

Intergenerational 'mismatch' and adiposity in a developing population: The Guangzhou Biobank Cohort Study

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Background: Intergenerational 'mismatch' between maternal and adult environments, common in developing economies, has been hypothesized as contributing to obesity. In a population with recent socio-economic development, we examined whether the association of maternal conditions, proxied by maternal literacy, with adult adiposity, proxied by body mass index (BMI) and waist-hip ratio (WHR) were modified by later life conditions, proxied by socio-economic position (SEP) at three life stages. We also examined if maternal conditions had sex-specific associations with adult adiposity.
Methods: In a cross-sectional study of 19,977 adults ($\geqslant 50$ years) from the Guangzhou Biobank Cohort Study (phases 2 and 3 in 2005–8), we used multivariable linear regression to assess the association of maternal literacy with BMI and WHR, and whether the associations varied with sex, age or SEP.
Results: The adjusted association of maternal literacy with WHR varied with sex (p-value = 0.04). In men, maternal literacy was not associated with WHR or BMI. In women, maternal illiteracy was associated with higher WHR (0.004, 95% confidence interval (CI) 0.002 to 0.006) and higher BMI (0.17, 95% CI 0.04 to 0.29), after adjustment for age, lifestyle, life course SEP and paternal literacy. There was little evidence that associations

varied with SEP at any stage, although continuity of poor conditions into early life may have exacerbated the positive association of maternal illiteracy with higher WHR in women.
Conclusions: Mismatched maternal and later life conditions do not appear to be associated with adiposity, but poor maternal conditions in developing populations may increase adiposity in women. Whether such sex-specific intergenerational effects are driven by epigenetics, maternal sex hormones or other mechanisms remains to be determined. Our findings, although preliminary, imply that a transient epidemic of obesity may occur in the first generation of women who experience economic development.

P-3B-77

Maternal distress in early life predicts the waist-hip ratio in schoolchildren

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Objective: This study was undertaken to determine the association between risk of overweight at age 10–11 years, and exposure to stress during pregnancy, the postpartum period and early school-age. Low birth weight, and maternal psychopathology in later childhood have been reported to contribute to stress and overweight in children. Our findings will determine whether maternal distress in early life also has a role to play in the development of overweight in children.
Methods: This was a longitudinal follow-up of the nested case-control study of the 1995 SAGE birth cohort in Manitoba, Canada. As part of a research objective to investigate the association between overweight in pre-adolescence and the onset of adolescent asthma, waist and hip measurements were obtained during a clinic visit at 10–11 years of age. In chronological order, the evaluated child stress exposures were: low birth weight (proxy for pregnancy stress), maternal distress in the postpartum period and recent stress hormone levels (cortisol, DHEA), which were assayed in a blood sample obtained in children at age 7–10 years. The ratio of cortisol and dihydroepiandrostrenone (DHEA), a proposed marker of the stress response, was also assessed. Multiple linear regression was conducted to determine the relationship between the waist/hip ratio and: low birth weight, postpartum maternal distress and recent stress markers in children (cortisol, DHEA, cortisol/DHEA). Maternal distress was defined from provincial database records, as at least one health care encounter or prescription medication for depression or anxiety during the postpartum period. Results are presented as regression coefficients at the 95% level of confidence. All analyses were adjusted for sex. Appropriate institutional ethics committee clearance and participants' informed consent were obtained.
Results: Hormone levels and waist-hip measurements were available for 375 children, 10–11 years old, in the SAGE nested case-control study. At this age, 50% of children had a waist-hip ratio of 0.84 and in 10%, the ratio approached risk for overweight (0.93 and higher). The waist-hip ratio was significantly higher in girls than boys. Sex-adjusted waist-hip ratios increased linearly with plasma levels of DHEA (increase in waist-hip ratio of 0.005 for each unit increase in DHEA level, $p < 0.03$). Independent of this correlation with a marker of recent stress, exposure to maternal distress in the postpartum period predicted an increase of 0.014 in the waist-hip ratio of children ($p < 0.02$). The waist-hip ratio was unrelated to low birth weight status, cortisol levels and the cortisol/DHEA ratio.
Conclusions: We found risk for overweight in a population of Canadian schoolchildren to be predicted by exposure to maternal distress in early life, independent of recent stress in the child, a recognized determinant of overweight. We were unable to find greater risk for overweight in children born low birth weight, a common outcome of stress during pregnancy. Although the pathways by which maternal distress leads to overweight are unknown, they may be related to the non-responsive feeding styles of depressed mothers during the postpartum period.

P-3B-78

Maternal nutrient reduction from 0.16 to 0.9 of gestation is accompanied by increases in Agouti-related peptide protein expression in fetal baboon hypothalamic arcuate and paraventricular nuclei

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Objective: Food intake in post-natal animals is regulated by hypothalamic peptides including the orexigenic Agouti-related peptide (AGRP), e.g., in hamsters, food deprivation increases AGRP gene expression in hypothalamic arcuate (ARC) neurons. Most studies of ARC control of appetite have been done in postnatal rodents, but development of these systems in non-rodent species, appears to occur during fetal life. However to our knowledge, only 3 fetal studies on this subject have been published to date: two for sheep and one for the rhesus monkey. In order to provide further data we determined the normal distribution and effect of moderate maternal nutrition reduction (MNR) on AGRP protein expression In near term fetal baboon ARC and paraventricular (PVN) nuclei. We hypothesized that AGRP protein