preterm. Number of grandchildren increased with increasing number of children in both sexes, providing no evidence for a trade-off between quantity of offspring and their subsequent reproductive "quality".

Conclusions: Early life characteristics can affect reproductive success even in post-demographic transition populations. These effects operate via multiple pathways and include "biological" characteristics such as birthweight having an effect via social facts such as adult marital status. These findings can inform analyses of reproductive career as a determinant of health in later life in this and other similar populations. They also generate hypotheses regarding the potential long term consequences of adverse early environments in concurrent cohorts around the world.

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006   TRENDS IN MATERNAL OBESITY AND HEALTH INEQUALITIES IN A NATIONALLY REPRESENTATIVE SAMPLE OF 619 323 BIRTHS IN ENGLAND, UK, 1989–2007

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Objectives: Maternal obesity has serious implications to the health of both mothers and infants, including maternal and neonatal death, stillbirth, congenital anomalies, poor breastfeeding rates, and obesity in the offspring. There are also additional complications during antenatal, intrapartum, and postnatal periods which impact on maternity services. However, there is an absence of national statistics for maternal obesity in the UK. This study is the first to describe a nationally representative maternal obesity research dataset in England.

Design of the Study: Descriptive epidemiological study using routinely collected data.

Setting: 34 maternity units in England.

Participants: 619 323 women who delivered at the maternity units sampled, between January 1989 and December 2007.

Main Outcome Measures: Trends in first trimester maternal BMI status over time and geographical distribution of maternal obesity by Government Office Regions in England. Demographics of the population were analysed to identify any maternal obesity associated health inequalities, including maternal age, parity, ethnic group, deprivation, and employment. All demographics were tested for multicollinearity. Logistic regression adjusted for all included demographics as confounders.

Results: The demographic characteristics of the study population were representative when compared to census and deprivation data. Obesity in the first trimester of pregnancy is significantly increasing over time, having more than doubled from 7.6% to 15.6% over the 19 years studied ($p < 0.001$). There is significant geographic variation in the incidence of maternal obesity, with the West Midlands, Yorkshire and the Humber and North East Government Office Regions having higher than national average incidence of first trimester obesity. There are health inequalities associated with maternal obesity, including increased odds of being obese with increasing age (1.02, 95% CI 1.02 to 1.02), parity (1.17, 95% CI 1.16 to 1.18), black ethnic group (1.78, 95% CI 1.70 to 1.87), and deprivation (2.20, 95% CI 2.13 to 2.28). There is also an association between super morbid obesity and unemployment (1.50, 95% CI 1.12 to 2.02).

Conclusions: The increase in maternal obesity at booking has yielded an additional 47 500 women per year requiring high dependency care in England. The demographics of women most at risk of first trimester obesity highlight health inequalities associated with maternal obesity which need to be addressed.

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007   INHERITED RISK OF PRE-ECLAMPSIA: USING TWO APPROACHES FOR ANALYSIS

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Background: Several previous research reports have suggested a genetic predisposition to pre-eclampsia but none have demonstrated the effect separately in nulliparous and parous women in the context of other risk or protective factors.

Objective: To assess the magnitude of genetic predisposition to pre-eclampsia with reference to other risk factors in nulliparous and parous women.

Material and Method: The Aberdeen Maternity and Neonatal Databank records all pregnancy and delivery details occurring in Aberdeen, Scotland since 1950. It has now become possible to link pregnancy records of mothers and grandmothers to those of the daughters. Using a nested case control design within this intergenerational cohort, statistical modelling was done with known risk/protective factors for pre-eclampsia, separately for nulliparous and parous women. Conditional logistic regression was used to compare characteristics between parous pre-eclamptics and year and parity matched normotensive controls. In a separate analysis, including all parous women, we used a multilevel approach based on Generalised Estimating Equation (GEE) and specified the link function as binomial. We assumed a working exchangeable correlation of having preeclampsia within a daughter in her pregnancies. Odds ratios (OR) and 95% CI were estimated through GEE with the use of robust standard errors.

Results: There were 34 970 mother-daughter pairs. Of the daughters, there were 1248 nulliparous and 448 parous pre-eclamptics. For nulliparous women, the risk factors remaining in the stepwise model were mother's history of pre-eclampsia (OR 2.13, 95% CI 1.57 to 2.89), booking BMI >30 kg/m^2 (OR 2.06, 95% CI 1.68 to 2.52), age, gestation period, and booking diastolic blood pressure. Smoking ~10 cigarettes a day was protective against pre-eclampsia (OR 0.52, 95% CI 0.44 to 0.62). For multiparae, the risk factors included pre-eclampsia in the initial pregnancy (OR 8.80, 95% CI 1.54 to 50.23), advanced age at delivery (OR 3.09, 95% CI 1.69 to 5.66) and BMI >30 kg/m^2 (OR 2.61, 95% CI 1.62 to 4.20). Smoking 10 or more cigarettes per day was protective (OR 0.57, 95% CI 0.35 to 0.94). A history of maternal pre-eclampsia was not independently associated with an increased risk of development of pre-eclampsia in the multiparae after adjusting for other covariates. Results were similar using the GEE approach.

Conclusion: In nulliparous women, a history of maternal pre-eclampsia was associated with more than doubling of risk of pre-eclampsia. In multiparae, this association was not observed, although a history of pre-eclampsia in a previous pregnancy was strongly associated with increased risk, suggesting genetic susceptibility.

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008   BREASTFEEDING IS ASSOCIATED WITH IMPROVED CHILD COGNITIVE DEVELOPMENT: EVIDENCE FROM THE UK MILLENNIUM COHORT STUDY

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Objective: To assess the relationship between breastfeeding and child cognitive development, and whether this relationship varies according to prematurity.

Design: Population-based cohort (Sweeps 1 and 3 of the UK Millennium Cohort Study).
Setting: UK.
Participants: 11 801 white singleton children born in 2000–2002.
Comparison Groups: Children were grouped according to their breastfeeding status (ever vs never; and duration of any and exclusive breastfeeding). Results were stratified according to gestational age at birth: 37–42 weeks (term); 33–36 weeks (moderately preterm); and 28–32 weeks (very preterm).
Main Outcome Measures: British Ability Scales (BAS) tests were administered when the children were aged 5 years. Age-adjusted ability scores and t-scores for the BAS Naming Vocabulary, Pattern Construction and Picture Similarities scales were used.
Results: 11 007 children (93%) were born at term, 684 (6%) were born moderately preterm, and 110 (1%) were born very preterm. The mean BAS naming vocabulary score decreased with prematurity (110.3 in those born at term, 109.8 in those born moderately preterm, 107.9 in those born very preterm). The proportion of children ever breastfed varied according to prematurity (68% in those born at term, 62% in those born moderately preterm, 76% in those born very preterm), as did the proportion of children breastfed for at least 3 months (37% in those born at term, 27% in those born moderately preterm, 32% in those born very preterm). After adjusting for confounders (including the baby's sex and birthweight; the mother's age, education, social class, smoking and alcohol in pregnancy, and whether this was her first child), ever breastfeeding was associated with a higher mean BAS naming vocabulary score in children born at term (adjusted difference in mean between ever breastfed and never breastfed 1.3, 95% CI 0.6 to 2.1, p<0.001). The effect was stronger in children born moderately preterm (2.3, 95% CI 0 to 4.6, p = 0.05) or very preterm (4.6, 95% CI −1.0 to 10.1, p = 0.11). Among those children who were ever breastfed, there was a small increase in mean BAS naming vocabulary score associated with each additional month of breastfeeding. A similar effect of breastfeeding was observed when using BAS pattern construction and picture similarities scales, and BAS standardised t-scores. Further analysis will explore whether these effects are mediated through parenting and childcare factors.
Conclusions: These results, based on one of the largest observational studies of the effect of breastfeeding and child development, suggest that breastfeeding is associated with improved cognitive development, particularly in those born preterm.

Physical activity

009 TRACKING OF PHYSICAL ACTIVITY BEHAVIOURS DURING CHILDHOOD, ADOLESCENCE AND YOUNG ADULTHOOD: A SYSTEMATIC REVIEW

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Background: Many health promotion programmes for physical activity are targeted during childhood and adolescence, as these life stages are seen to be important for the development of health behaviours. The underlying assumption is that physical activity will become habitual or "track" (ie will be a stable aspect of behaviour between different ages). Given the considerable variation between studies in the extent to which physical activity demonstrates tracking, this systematic review examined studies that provided data on the tracking of physical activity behaviours in children and young people.
Methods: Seven bibliographic databases were searched systematically in July–August 2008 using search strategies built around three groups of keywords: physical activity, study type, young people. Studies had to be prospective, longitudinal studies that reported data on any physical activity behaviour for at least two time-points (≥ 2 years apart). The study was restricted to community-based populations who were ≤ 18 years at baseline. Two reviewers independently undertook data extraction from all suitable papers, and performed quality appraisal.
Results: The database search yielded 10 685 titles, from which 59 were included in the review. There were only 15 papers that specifically examined tracking of physical activity behaviours. Tracking co-efficients ranged from −0.11 to 0.59; all indicating low or moderate tracking of physical activity, with no clear differences between males and females. Moderate tracking was observed in studies where follow-up was five years or less. The highest degree of tracking was observed for club sport participation and even over long follow-up, sports training and organised physical activity showed higher tracking than other physical activity behaviours. Physical activity levels declined consistently during adolescence, as did sports participation. However, the decrease in physical activity was less marked among those who participated in sports in early adolescence, and those who participated with parents or at high levels. The likelihood that young people continue with specific sports over short periods is generally low, but the likelihood that they continue to take part in any team, individual or vigorous activity is higher.
Conclusions: In general, tracking of physical activity behaviours between childhood, adolescence and young adulthood is low, but the evidence is limited. Levels of physical activity during childhood/adolescence decrease with age. Research is needed to explore the reasons why adolescents and young adults give up physical activity and participation in sports, although there are several factors in adolescence that do lessen the chances of being inactive at a later age.

010 THE MULTIPLE SCALES OF AREA EFFECTS ON HEALTH: FROM EVIDENCE TO IMPLICATIONS FOR PUBLIC HEALTH PRACTICE AND POLICY

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Background: In area effects on health research, the influence of area characteristics on health is conceptualised and measured in multiple ways. Each conceptualisation, and its empirical application, is therefore likely to provide a unique identification and understanding of the environmental determinants of health and their potential mechanisms of influence, and may convey different information for public health practice and policy. Using as an example the influence of the built environment on physical activity in Montreal, Canada, the objectives of this presentation are to: (1) present results of associations between built environment characteristics and walking measured using different statistical and spatial approaches; and (2) discuss how these findings may inform public health practice and policy to promote active living.
Methods: Data on walking behaviours of 2716 adults were linked to area-level data on population density, land use mix and accessibility of services, and analysed using multilevel modelling and spatial analysis procedures.
Results: In multilevel models, greater land use mix (OR 2.85, 95% CI 1.44 to 5.64) and accessibility of services (OR 1.05, 95% CI 1.02 to 1.08), but not population density, are significantly associated with more walking. These findings are extended by illustrating the scale dependence of area effects, eg population density influences walking significantly only in small areas defined by a 500 m street-network buffer around individuals' residence (OR 1.04; 95% CI 1.01 to 1.06) and not in larger areas delimited by 750 m or 1000 m