yearly trend in the percentage of the population with body mass index (BMI) in normal-weight (BMI<25), over-weight (BMI 25–29.9), and obese (BMI>30) ranges, is modelled using multinomial logistic regression, stratifying by gender and age group (20–39, 40–59,>60 years). The fitted models are used to compare trends between states and to forecast levels of obesity in the future. A previously developed micro-simulation model is used to assess the burden of 13 diseases caused by obesity and estimate the economic impact implied by the forecasted trends. Data of the US–National Health and Nutrition Examination Survey collected over the same period are used to investigate the extent of self-reporting bias in BRFSS.

Results In 2010, the proportion of obese (BMI>30) men and women in the US was 33% and 35%, respectively, whilst the proportions of over-weight (BMI 25–30) were 42% and 34%. The fitted models forecast an increase in the proportion of obese individuals to up to 70% by 2030. The results reveal increasing levels of obesity in all states, although the rate of increase varies among states. Comparing BRFSS data with data from NHANES, showed that at all ages both men and women slightly over-report their height, whilst women under-report their weight by 5kg on average. Under-reporting of weight is reduced after age 65.

Conclusion Obesity rates are rapidly and steadily increasing in the US posing a threat to population health and a substantial economic burden. As self-reporting bias may significantly underestimate BMI in women, the estimated burden of obesity may be conservative.

OP27 DIETARY FIBRE INTAKE AND FATAL STROKE RISK IN THE UK WOMEN'S COHORT STUDY

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Background In the UK in 2008, stroke was responsible for over 43,000 deaths. Dietary fibre intake may reduce stroke risk through modifying one or more risk factor such as body weight, blood cholesterol, or blood pressure. Food sources of fibre can be examined in relation to risk as different foods contain different types of fibre which have differing proposed actions within the body.

Methods 31,036 women recruited in 1995 provided dietary information relating to the previous 12 months using a 217-item food frequency questionnaire. Total dietary fibre intakes were estimated as both non-starch polysaccharide (NSP) and Association of Official Analytical Chemist (AOAC) values. Insoluble fibre, soluble fibre and fibre (NSP) from a variety of food sources were also examined. Stroke mortality was registered from baseline through the Office of National Statistics. Cox proportional hazard ratios were generated to explore risk using both categorical (fifths of intake) and continuous exposure variables. Model adjustments: age, body mass index, energy intake, ethanol, physical activity, smoking and socio-economic status.

Results After 14 years, 130 fatal stroke cases were observed. Fatal stroke risk was similar for total fibre assessed either as NSP or AOAC and both were protectively associated with risk. Overall, risk was roughly halved in each intake category compared to the lowest although this was only significant in the 3rd (NSP/AOAC) and 4th (AOAC) category. Those consuming 24 vs. 14g/d of NSP or 37 vs. 22g/d AOAC had their risk of stroke halved [Englyst: hazard ratio 0.47 (95% confidence interval 0.24, 0.92) p=0.028] [AOAC: 0.47 (0.25, 0.89) p=0.021]. For fibre from nuts and seeds, the highest intake category (0.85g/d) saw a 56% risk reduction [0.44 (0.23, 0.83), p=0.012] compared to the lowest (0g/d). Fibre from fruit was also protectively associated with risk of stroke in the 4th (5.8g/d) vs. 1st category (1.4g/d) [0.50 (0.25, 0.97), p=0.041]. These significant associations were not seen in every category comparison and results for continuous exposures were not statistically significant for any of the exposures explored. No association was observed with fibre from cereals, vegetables or legumes.

Conclusion Results suggest that fibre from certain food sources and not others may be more beneficial for prevention of stroke. This may occur because different foods contain fibre fractions in varying quantities. Non-significant results for the continuous exposures suggest associations may be non-linear. The results may also reflect benefits simply from 'fruit' or 'nut and seed' consumption rather than specifically fibre from these sources.

OP28 DIET QUALITY AND BLOOD PRESSURE IN MIDDLE-AGED MEN AND WOMEN

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Background Findings from both observational and experimental studies (including the DASH Trial -Dietary Approaches to Stop Hypertension) are consistent with a significant, causal role for dietary salt intake in the distribution of blood pressure (BP) in populations. The DASH diet quality score, based on the intervention arm in the DASH-trial, has emerged as a potentially useful measure of diet quality in adult populations. We have studied associations between DASH score and blood pressure, both clinic and 24 hour ambulatory measurements (ABPM) in middle-aged men and women.

Methods We used cross-sectional data from two studies of men and women aged 50 to 69 years, recruited in 1998 (n=1018) and 2010 (n=2047). Participants completed a physical examination including three standardised clinical BP recordings and a general health and lifestyle questionnaire. A sub-sample (n=1189) in 2010 had 24hr ambulatory BP measurements (ABPM). Diet quality was assessed using a DASH score constructed from a standardised Willett FFQ. DASH scores were categorised into quintiles, with lower quintiles indicating less healthy diets. Hypertension was defined as clinic BP>140/90mmHg (mean of readings 2 and 3) and 24-hour ABPM >130/70mmHg.

Results Clear inverse trends were seen between DASH scores and systolic (SBP) and diastolic (DBP) BP in clinic and ABPM recordings. The associations between DASH score and clinic BP were similar in the 1998 and 2010 datasets. In the 2010 data, clinic SBP increased by 7.5 mmHg in men and 5.1 mmHg in women between the highest and lowest DASH quintiles and 24-hour ABPM systolic BP increased by 6.3mmHg and 5.4mmHg in men and women respectively between the highest and lowest DASH quintiles. In fully adjusted analyses, the odds ratios (OR) for clinic hypertension and ABPM hypertension in participants with DASH score in the first relative to the fifth DASH score quintile were as follows: clinic hypertension: OR 1.60 (95% CI 0.9–2.8), ABPM hypertension: OR 4.2; 95 % CI [1.1–15.9]). Stratifying by gender, these trends persisted for men however they were attenuated for women.

Conclusion This study provides evidence of criterion validity for the use of DASH score as a measure of diet quality, especially in the diet-hypertension relationship in men. Our findings are consistent with the hypothesis that dietary patterns exert effects beyond the sum of the component parts. Public policy promoting a DASH-style healthy diet could have a significant impact on population health by reducing average blood pressure in the population.

Socioeconomic Inequalities II

OP29 ETHNIC AND SOCIOECONOMIC INFLUENCES ON CHILDHOOD BLOOD PRESSURE: THE CHILD HEART AND HEALTH STUDY IN ENGLAND (CHASE)

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Background Compared to UK white European adults, UK black African-Caribbean adults have higher mean systolic (SBP) and diastolic (DBP) blood pressure; UK South Asian adults have higher mean DBP but lower SBP. However, information on blood pressure in UK children from different ethnic groups is limited. The aim of this study was to compare blood pressure levels in UK children of black African-Caribbean, South Asian and white European origin.

Methods A cross sectional study of 5,666 UK primary school children of South Asian, black African Caribbean, and white European origin aged 9 to 10 years was undertaken. Ethnic and socioeconomic differences in SDP and DBP (as means and differences with their 95% confidence intervals) were obtained from multilevel linear regression models fitting school as a random effect in order to take account of the natural clustering of children within school. All analyses were adjusted for sex, age, month of assessment, blood pressure observer, room temperature and time of day of measurement fitted as fixed effects. The effects of adjustment for height, adiposity (fat mass index, sum of skinfolds) fitted as continuous variables, and socioeconomic circumstances on ethnic differences in blood pressure were then explored.

Results After adjustment for height and adiposity, black African-Caribbean children had a lower mean SBP than white Europeans (mean difference 1.62 mmHg, 95% CI 0.86, 2.38 mmHg), while mean DBP was similar (mean difference 0.58 mmHg, 95%CI –0.12, 1.28 mmHg). The mean SBP difference was particularly marked in black African children. In similar analyses, South Asian children had a lower mean SBP (mean difference 1.10 mmHg, 95%CI 0.34, 1.86 mmHg) than white Europeans and a higher mean DBP (mean difference 1.07 mmHg, 95%CI 0.37, 1.76 mmHg). The mean DBP difference was particularly marked among Indian and Bangladeshi, rather than Pakistani, children. Blood pressure was largely unrelated to socioeconomic circumstances; the ethnic differences in blood pressure were not affected by socioeconomic adjustment.

Conclusion A blood pressure pattern similar to that in adults is present in UK South Asian but not in UK black African-Caribbean children at 9–10 years. This suggests that key determinants of ethnic differences in blood pressure operate at different stages of the life course in these different ethnic groups. Understanding the reasons for the early emergence of ethnic differences in blood pressure (particularly among South Asians) is an important research priority.

OP30 ARE THE ASSOCIATIONS BETWEEN ADIPOSITY, INSULIN RESISTANCE AND CIRCULATING GLUCOSE CONCENTRATIONS IN CHILDHOOD INFLUENCED BY ETHNICITY? EVIDENCE FROM THE CHILD HEART AND HEALTH STUDY IN ENGLAND (CHASE)

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Background Ethnic differences in type 2 diabetes risk between South Asians and white Europeans originate before adult life. Although South Asian adults have greater metabolic sensitivity to adiposity this has been little studied in childhood. We have therefore examined the associations between adiposity, insulin and glycated haemoglobin (HbA1c) levels in children of South Asian and white European origin. Data on children of black African-Caribbean origin are also reported.

Methods This was a cross-sectional school-based study of 4633 nine and ten year-old children (response rate 68%) predominantly of South Asian, black African-Caribbean and white European origin. Participants had detailed assessments of adiposity (including body mass index, skinfold thicknesses and fat mass index from bioimpedance) and provided fasting blood samples for assessment of HbA1c and insulin resistance (Homeostatic model assessment-insulin resistance; HOMA-IR). Associations between HOMA-IR (log transformed), HbA1c and adiposity markers were estimated using multilevel linear regression.

Results All adiposity measures were positively associated with insulin resistance in all ethnic groups. However there were clear ethnic differences in the strength of association (p ethnic difference <0.001). The percentage increase in HOMA-IR for a one SD increase in fat mass index was 36.3% (95% CI 32.1%, 40.5%) for South Asians and 25.1% (95% CI 21.1%, 29.3%) for white Europeans; black African-Caribbeans were similar to white Europeans (26.4%, 95% CI 22.5%, 30.4%). All adiposity markers were positively associated with HbA1c in both South Asians and black African-Caribbeans: the percentage increase in HbA1c for a one SD increase in fat mass index in was 0.04% (95% CI 0.02%, 0.06%) in both ethnic groups. However there was no association among white Europeans (0.01%, 95% CI 0.00%, 0.03%).

Conclusion Even in childhood, both insulin resistance and HbA1c levels appear more sensitive to adiposity in South Asians. Among children of black African-Caribbean origin, HbA1c levels but not insulin resistance appear more sensitive to adiposity. The reasons for these differences in sensitivity to adiposity need to be understood. The results imply that early prevention of childhood obesity among South Asians and black African-Caribbeans is a particular priority for future control of type 2 diabetes in these high risk ethnic groups.

OP31 ETHNIC DIFFERENCES IN THE DEVELOPMENT OF DISABILITY OVER 20 YEARS: RESULTS FROM THE SABRE STUDY

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Background As life expectancy increases, healthy ageing becomes more salient, and therefore it is important to understand how conditions such as disability may affect the later years of our extended lives. Ethnic differences in disability have been observed in some countries, however there is a lack of evidence from British ethnic groups.

Methods Follow-up data over 20 years from 1789 White, Indian Asian and African Caribbean men and women were examined from a community-based study in West London. Disability was measured using the performance-based test of locomotor function and self-reported functional limitation, instrumental and basic activities of daily living (IADL/ADL) questionnaires. Logistic regression analyses examined ethnic group differences in disability, adjusting for socioeconomic, behavioural, adiposity and chronic disease risk factors.

Results After full adjustment, Indian Asian people were significantly more likely to have developed all of the disability outcomes, compared with UK Whites (locomotor dysfunction: OR 2.20, 95% CI 1.56–3.11; functional limitation: OR 2.77, 2.01–3.81; IADL impairment: OR 3.12, 2.20–4.41; ADL impairment: OR 1.56, 1.11–2.24). Health behaviours, central adiposity, and chronic disease burden explained only a proportion of this excess risk. There were no ethnic group differences in locomotor dysfunction, functional limitation and IADL impairment between African Caribbean and White participants, however African Caribbean people showed a reduced risk of ADL impairment (OR 0.59, 0.38–0.93), after multivariate adjustment.

Conclusion These findings demonstrate dramatic ethnic group differences in performance-based and self-reported disability between White, Indian Asian, and African Caribbean people in the UK. The excessive risk experienced by Indian Asian people was partly explained by health behaviours, adiposity, and chronic