Conclusion This study showed a reduced risk of dementia for individuals with a higher level of engagement in cognitively stimulating activities such as reading, playing computer games, visiting art and museums contributing to a multifaceted level of leisure activities, that may preserve cognitive reserve until later in life and hinting to the psychosocial paradigm.

Thursday 10 September

Diet and Obesity

OP55

CHILDHOOD OVERWEIGHT AND OBESITY AT THE START OF PRIMARY SCHOOL: EXTERNAL VALIDATION OF PREGNANCY AND EARLY-LIFE PREDICTION MODELS

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Background Tackling the childhood obesity epidemic can potentially be facilitated by risk-stratifying families at an early-stage to receive prevention interventions and extra support. As part of the Studying Lifecourse Obesity Predictors (SLOPE) study, we developed prediction models for childhood overweight and obesity using routinely-collected antenatal and early-life healthcare data in Hampshire, South of England.¹ As a model usually performs better in the data used for its development, external validation is needed to check its performance in similar but new target population. This analysis aimed to externally validate these models using data from the Born in Bradford (BiB) cohort in the North of England.

Methods BiB is a longitudinal multi-ethnic birth cohort study which recruited 12,453 women (13,776 pregnancies) at around 28 weeks gestation between 2007 and 2010 in Bradford. Data from the routine National Child Measurement Programme measurement at 4–5 years in school was linked to the maternal and early-life BiB cohort data. The outcome was defined as body mass index (BMI) ≥ 91 st centile at 4–5 years based on the UK clinical cut-off used to develop the SLOPE models. Maternal predictors included BMI, highest educational attainment, partnership and smoking status at booking, ethnicity and intake of folic acid supplements. Early life predictors included birthweight, gestational age, sex and weight at 1 or 2 years. Discrimination was assessed using the area under the receiver operating curve (AUC) and calibration using calibration slope (equal to one in well-calibrated model).

Results Data were available for 6292 women for the early pregnancy models and 3801 women and children for the early-life models. The AUC was comparable to the development model at all stages (early pregnancy, birth, ~ 1 year and ~ 2 years). The AUC at development was 0.66 (95% confidence intervals (CI) 0.65 to 0.67) compared to 0.64 (95% CI 0.62 to 0.66) on external validation. Similarly, the AUC was 0.83 (95% CI 0.82 to 0.84) at ~ 2 years at development and 0.81 (95% CI 0.79 to 0.83) on external validation. Models were less well-calibrated on external validation ranging from 0.87 (standard error (SE) 0.04) to 0.91 (SE 0.06) across the stages compared to 0.98 (SE 0.03) to 0.99 (SE 0.01) at development.

Conclusion The SLOPE models developed for predicting childhood overweight and obesity risk performed reasonably well on external validation in a birth cohort with a different geographical location and ethnic composition. However, recalibration by updating the model intercept may be required to improve calibration in other populations.

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OP56

WHAT IS THE LIKELIHOOD OF OVERWEIGHT OR OBESITY IN YOUNGER CHILDREN SHARING A HOUSEHOLD WITH AN OLDER CHILD WHO IS OBESE OR SEVERELY OBESE? CROSS-SECTIONAL ANALYSIS OF LINKED NATIONAL CHILD MEASUREMENT PROGRAMME DATA

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Background The National Child Measurement Programme (NCMP) assesses the weight status of 4–5 and 10–11 year-old children attending state schools. We linked pseudonymised NCMP records to pseudonymised unique household identifiers derived from general practice electronic health records to investigate the likelihood of overweight or obesity in a younger household child member based on the oldest child's weight status, sex and ethnic background.

Methods We assigned an encrypted Unique Property Reference Number using a validated address-matching algorithm to addresses of patients registered in mid-2018 with all 159 GP practices in four inner east London boroughs. We identified 36,789 children (18,714 five-year-olds [9,326 girls] and 18,075 11-year-olds [8,989 girls]) with NCMP records living in 16,434 households, representing 33.8% of 48,602 registered households with two or more children who would have been eligible for NCMP measurements in the preceding five school years. We identified the oldest child in the household with a NCMP record as the reference child.

We used binary logistic regression to estimate the likelihood (Odds Ratio [OR]; 95% confidence intervals [CI]) of at least one younger household member with NCMP-recorded overweight or obesity (BMI centile ≥ 91 st) according to the reference child's weight status (reference category: healthy weight), sex (male), and ethnic background (White) after adjustment for household size and composition, and borough of residence (Stata/MP 15).

Results The number of children with a NCMP record per household ranged from 2–8 (median 2, IQR 2–2) with 13,170 (80.1%) including only two. 50.0% of 16,434 reference children were girls, with 18.2%, 33.5% 18.6% from White, South Asian or Black ethnic backgrounds respectively. 5.4% (n=890) of reference children were severely obese (≥ 120 th of the 95th centile) and 24.0% (n=3,936) had a younger household member with NCMP-recorded overweight or obesity.

After mutual adjustment, reference children who were obese (OR 3.50; 95% CI: 3.08,3.96), severely obese (4.29; 3.69,4.99) or from Black ethnic backgrounds (1.52;

1.35,1.72) were more likely, and those who were underweight (0.42; 0.28,0.64) less likely, to share a household with an overweight or obese younger child. No difference was identified in relation to the reference child's sex (1.03; 0.95,1.12).

Conclusion Our findings suggest that, over a five-year period in a geographically-defined and ethnically-diverse population with high childhood obesity prevalence, linked NCMP and GP records can be used to identify households with a high burden of childhood obesity. Further analyses of household social, environmental and health characteristics is underway to identify potentially modifiable factors at the household level.

OP57 INEQUALITIES IN BMI IN SCOTLAND, 2008–2018: A REPEAT CROSS-SECTIONAL STUDY

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Background Obesity is associated with diseases such as cardiovascular disease and diabetes as well as mental health. Previously it was shown that the socioeconomic inequalities in adult BMI stabilised in Scotland between 2008 and 2014. The aim of this study is to describe the change in socioeconomic inequalities in BMI between 2008 and 2018.

Methods Data from the annual cross-sectional Scottish Health Survey between 2008 and 2018 for those aged 16–64 years were analysed. Survey years were grouped into 2008–2011, 2012–2015, 2016–2018 and the data were modelled using logistic modelling for outcome 'obese/less than obese' and linear modelling for outcome BMI, for males and females, adjusting for 10 year age group, survey year groupings and SIMD quintile. An interaction term between year and SIMD and year and age were included. Slope Index of Inequality (SII) and Relative Index of Inequality (RII) were calculated. Data were also analysed by 10-year age group.

Results Average BMI and prevalence of obesity increased from 27.2 and 24.9% in 2008 to 27.5 and 25.9% in 2018 among males, and from 27.3 and 26.5% in 2008 to 27.6 and 29.0% in 2018 among females. When broken down by age group, the majority of this increase is observed among females aged 25–34 years and 45–54 years. When the data were modelled, socioeconomic inequalities in BMI were observed for both males (eg average BMI was 0.48 (0.23, 0.73) more in SIMD1, most deprived, compared with SIMD 5) and females (eg OR of being obese in SIMD1 was 1.45 (1.28, 1.63) of SIMD5). There was a significant rise in BMI and obesity prevalence over time. An interaction term between survey year and SIMD, however showed that this rise was not observed in the two most affluent SIMD quintiles and the increase for the three less affluent SIMD quintiles rose in an approximately stepwise fashion, suggesting a widening of inequalities, eg for outcome obese/not obese, adjusting for age, sex, year and SIMD, an interaction term between SIMD and survey year showed an OR of obesity in 2008 in SIMD1 of 1.62 (1.42, 1.85) that of SIMD5, but for each additional year, OR rose by 1.03 (1.003, 1.05) for SIMD1 relative to SIMD5. Both RII and SII saw a large increase between 2012–15 and 2016–18 for males and females.

Conclusion Socioeconomic inequalities in BMI have previously thought to have plateaued, however this study shows that inequalities are now increasing.

OP58 AN INVESTIGATION INTO THE ASSOCIATIONS BETWEEN SOCIO-DEMOGRAPHIC FACTORS, FOOD SOURCES AND DIETARY QUALITY IN SMALL ISLAND DEVELOPING STATES

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Background Globally, some of the highest rates of obesity and non-communicable diseases (NCDs) are found in Small Island Developing States (SIDS). Relatedly, there has been a decrease in consumption of local foods and an increasing reliance on imported foods that are generally energy dense and highly processed. This study aimed to apply a novel quantitative toolkit to investigate the relationship between dietary diversity (DD) and food source, food insecurity and NCD risk in two SIDS: Fiji and Saint Vincent and the Grenadines (VCT).

Methods A dietary toolkit was developed to collect individual-level information on type and frequency of food consumed, food sources, food insecurity and relevant socioeconomic and health data. Regional investigators and partners ensured context-relevant content and implementation. In Fiji and VCT respectively, 95 and 86 households were recruited. All adults and adolescents (15 years and above) living in households, sampled to provide exposure to urban, rural, higher and lower income areas, were surveyed (n individuals=186 SVG; n=147 Fiji). Descriptive statistics and multiple linear regression, with DD as the dependant variable, adjusted for household sampling, were applied to explore associations between sociodemographic factors, food sources and dietary quality.

Results Mean DD score, of a possible score of 10, was 3.7 (SD1.4) in Fiji and 3.8 (SD1.5) in VCT, and this was consistent across sex, age and body mass index. In both settings, more people sourced food by purchasing than any other means (Fiji n=155(83%); VCT n=136(93%)). Regular consumption of own produce and regular food borrowing were associated with greater fruit consumption (difference in median number of servings/week: Fiji 1(95%CI 0,2); VCT 5 (95%CI 1,9) and Fiji 2(0,4); VCT 9(5,13)), respectively. Purchasing from a small shop was associated with higher consumption of sugar-sweetened beverages (Fiji 4(1,7); VCT 7 (1,13)). Multivariable analysis results, presented as adjusted regression coefficients (β (95%CI)), indicated that purchasing from a small shop was inversely associated with DD (-0.52 (-0.91, -0.12); p=0.011), as was rural residence (-0.46 (-0.92, 0.00); p=0.049). Borrowing food was positively associated with DD (0.73 (0.21, 1.25); p=0.006), as was age (0.01 (0.00, 0.03); p=0.063) and higher education (0.44 (0.06, 0.82); p=0.023).

Conclusion Our findings suggest barriers and facilitators to diet quality and links with food sources in SIDS that may