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Background New Deal for Communities (NDC), a 10-year area-based regeneration initiative begun in 1999 in 39 disadvantaged neighbourhoods in England, has the potential to reduce health inequalities because it focuses on key social determinants of these inequalities: unemployment, crime, education, housing and the physical environment. This study assesses whether the NDC initiative impacted on health inequalities across the socioeconomic spectrum of areas in England.

Methods The study primarily utilises secondary data including household surveys undertaken as part of a national evaluation of the NDC initiative led by Sheffield University. Representative samples of 500 residents per NDC area and matched comparator area in 2002, 2004, 2006 and 2008 provide data on health, lifestyles, wellbeing, demography and social determinants of health. The Health Survey for England in the same years provides information for representative samples drawn from across the socioeconomic spectrum, here categorised as highest, middle and lowest tertile of area deprivation. Logistic regression was used to estimate baseline differences in health and its social determinants, the time trend and differential time trends in NDC and non-intervention areas adjusted for sex, age, ethnicity and baseline education based on over 125,000 observations across eight years. Outcomes of interest included self-rated health, mental health inventory, smoking, employment status and housing tenure.

Results Initial analyses indicated a higher likelihood of smoking in non-intervention areas of medium deprivation (OR; 95%CI: 1.33; 1.10, 1.60), non-intervention areas of high deprivation (1.80; 1.48, 2.19), matched comparator areas (1.77; 1.46, 2.15) and NDC areas (1.97; 1.68, 2.31) compared with reference areas of low deprivation. Smoking declined over time but there was no evidence of differential rates of decline in the different areas. The likelihood of unemployment was considerably higher in all areas compared with the reference (for example, 4.29; 3.55, 5.18 in NDC areas). The likelihood of unemployment dropped over time in NDC areas but not in other areas (OR for time by NDC interaction: 0.93; 0.89, 0.96). Results for other outcomes are also available.

Conclusion The study indicates that the NDC intervention may have contributed to reducing a key social determinant of health inequalities, namely unemployment. Similar reductions were not observed in non-intervention high, medium or low deprivation areas in England which may eventually feed through into a narrowing of health inequalities between NCD and other areas. This initial work will be extended to examine impact across different intervention approaches and historical and current contexts.

Population Based Studies: Early Life I

OP09 LIFE-COURSE BODY MASS INDEX, BIRTHWEIGHT AND LIPID LEVELS IN MID-ADULTHOOD: A NATIONWIDE BIRTH COHORT STUDY

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Background Cardiovascular disease (CVD) is a major public health problem. Clinical trials have shown that lowering total- and/or low-density lipoprotein (LDL)-cholesterol reduces the risk of CVD. Therefore, to reduce the burden of CVD, improvement in lipid profiles is an important goal. To achieve this, a better understanding is needed of biological pathways leading to lipid levels. Lipid levels track from childhood to adulthood, implying that influences on adult cholesterol levels begin at young ages. There is scant evidence on the role of growth, including trajectories of body mass index (BMI) across the life-course with respect to lipids. We aimed to determine whether there are phases of the life-course that are particularly important for adult lipid levels.

Methods In the 1958 British Birth Cohort weight and height were recorded at birth (weight only), 7y, 11y, 16y, 23y, 33y and 45y. In 3,927 men and 3,897 women we assessed whether (i) birthweight was associated with 45y lipids and whether associations were due to catch-up growth to 7y; (ii) there were particular periods when BMI, or change in BMI, influenced subsequent lipid levels; (iii) associations between current BMI and lipid levels were modified by BMI at younger ages; and (iv) duration of obesity was associated with lipid levels. Analyses were sex specific, adjusted for covariates and used multiple imputation to account for missing data.

Results Birthweight was inversely associated with triglycerides and in women with total- and LDL-cholesterol; associations persisted after adjustment for 7y BMI. Associations with lipids strengthened with age of BMI measurement, e.g. per standard deviation (SD) higher BMI at 11y and 45y triglycerides were higher by 4.01% (95% confidence interval: 2.26%, 5.75%) and 19.75% (18.18%, 21.32%) respectively in women. BMI change was related to lipids, with strongest associations for the interval preceding lipid measurement: per SD increase in BMI 33–45y total-cholesterol and triglycerides were higher by ~3% and ~21% respectively. Associations between 45y BMI and lipids were stronger for those with lower than higher BMI at younger ages (P for interactions: <0.01 to ≤0.05). This effect-modification was seen from childhood (7y in women; 11y in men). Obesity in childhood but not thereafter and longer duration of obesity were unrelated to adult lipid levels.

Conclusion Our study suggests that life-course trajectories of body size influence adult lipid levels, with the consequences of a high adult BMI for adult lipid levels being particularly adverse for those with lower BMI at earlier life-stages.

OP10 EFFECTS OF SOCIO ECONOMIC POSITION IN CHILDHOOD AND ADULTHOOD ON CARDIOMETABOLIC RISK FACTORS: THE JERUSALEM PERINATAL FAMILY FOLLOW-UP STUDY

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Background Studies indicate that Socio Economic Position (SEP) might be an important predictor of cardiometabolic disease mortality and morbidity; yet the importance of timing of the effect of SEP on cardiometabolic risk factors has not been fully established. Our aim was to assess the independent effect of SEP in both childhood and adulthood on cardiometabolic risk factors in young adults and to examine potential interactive effects of SEP at both time points on these risk factors.

Methods This is a prospective follow-up of 1132 individuals, born in Jerusalem between the years 1974–76, to young adulthood with bio-medical data at mean age 32. Outcomes include Body Mass Index (BMI), Waist to Hip Ratio (WHR), blood pressure, waist circumference (WC), pelvis circumference, body fat percentage, fasting levels of Triglyceride (TG), HDL-C, LDL-C, glucose, insulin, and lifestyle characteristics, including smoking and physical activity. SEP in childhood was based on father's occupation (scale 1–6) and in adulthood, on subject's occupation (scale 1–5). Additional analyses used maternal and subject's years of education. GLM and logistic regression models were used with mutual adjustment for SEP at both time points and further adjustment for gender, ethnic origin

and fasting duration. Log transformation was used for TG and insulin levels.

Results Independently of current SEP, lower childhood SEP was significantly associated with higher logTG (β=0.013, p=0.042), higher LDL (β=1.979, p=0.023), higher body fat percentage (β=0.476, p=0.025) and higher odds of physical inactivity (OR=1.13, p=0.043). Independently of childhood SEP, lower adulthood SEP was significantly associated with lower HDL level (β=–0.934, p=0.026), higher WHR (β=0.006, p=0.002), and higher odds of smoking (OR=1.31, p=0.001) and physical inactivity (OR=1.34, p<0.0001). Significant interactions were found between SEP in both time points and LDL, WHR and WC (p for interactions=0.01, 0.024 and 0.055 respectively). The detrimental effect of lower SEP in adulthood on LDL level was strongest among subjects with high SEP in childhood (β=4.54, p<0.0001), compared with those having lower SEP in childhood. Similar trends were observed for WHR and WC (β=0.011, p<0.0001 and β=1.754, p=0.004 for associations of adulthood SEP with WHR and WC respectively, among subjects with high childhood SEP). Analyses, based on education as a measure of SEP, yielded similar interactive patterns.

Conclusion Adverse SEP at both childhood and adulthood has an independent influence on physiological and behavioral risk factors. The interaction between SEP in childhood and adulthood in their effect on cardiometabolic risk factors points to the important role played by social mobility in affecting adult poorer health.

THE ASSOCIATION OF CHILDHOOD ADIPOSITY, AND ITS DISTRIBUTION, WITH CARDIOMETABOLIC OUTCOMES: RESULTS FROM 13 EUROPEAN COHORTS

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Background Adiposity in childhood has been associated with increased cardiovascular risk which may be established in childhood and adolescence. Also centrally distributed fat (waist circumference) has been suggested to be a better marker of cardiometabolic risk compared to body mass index (BMI). We aimed to assess the association of adiposity measures with cardiometabolic outcomes in children and consider if the magnitude of these associations differ by adiposity measurement.

Methods European cohorts with data available on BMI and waist circumference and cardiometabolic outcomes (at least blood pressure) were invited to participate in the collaborative project. Cross-sectional associations between adiposity measures (age- and gender-standardised z scores) and cardiometabolic outcomes and prospective associations (cardiometabolic outcomes measured at least 12 months after adiposity measurement) were examined. Results from individual cohorts were pooled using a random-effect meta-analysis and heterogeneity between them explored.

Results A total of 13 cohorts (n=3644–17186 for different outcomes) were included in the cross-sectional analysis. BMI and waist circumference were both positively associated with diastolic and systolic blood pressure (DBP, SBP) and with total cholesterol, LDLc, triglycerides, insulin and CRP, with the magnitudes of association with each outcome being similar for BMI and waist. For example, the mean difference in DBP per standard deviation (SD) increase in BMI was 0.90 mmHg (95% confidence intervals (CI) 0.55, 1.24) and per SD waist was 0.73 mmHg (95%CI 0.33, 1.12); similar results for SBP were 1.73 mmHg (95%CI 1.28, 2.18) and 1.33 mmHg (95%CI 0.83, 1.81). In prospective analysis (6 cohorts, n=3708–7073 for different outcomes) BMI and waist circumference were positively associated with SBP and total cholesterol and inversely with HDLc associations were similar for the two adiposity measurements or were stronger for BMI. For example a 1SD greater BMI

was associated with 1.36 mmHg higher SBP (95%CI 0.67, 2.05) compared with 0.96 mmHg (95% CI 0.35, 1.57) for waist. Direct measurements of fat mass, such as DXA or bioelectrical impedance, did not exhibit stronger associations with risk factors than did BMI. Age at adiposity measurement did not consistently influence the heterogeneity of association between studies.

Conclusion Adiposity in childhood and adolescence is associated with adverse cardiometabolic outcomes. This suggests that interventions should be considered earlier before adverse effects become established. The magnitude of the association is similar between BMI, waist circumference and direct measures of adipostiy. Therefore BMI alone could be considered an adequate measure in public health and health surveillance systems.

CHILDHOOD INFECTIOUS DISEASE AND RISK OF PREMATURE DEATH FROM CANCER: A PROSPECTIVE COHORT STUDY

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Background The hygiene-hypothesis proposes that early-life infectious diseases may protect against a number of adverse health conditions later in life, most notably the development of cancer. Existing investigations of this association, however, have provided equivocal results, possibly due to inadequate adjustment for confounding or the use of retrospective exposure information. This study utilised longitudinal data from the Newcastle Thousand Families Study, a prospective cohort of 1147 individuals born in Newcastle-upon-Tyne (UK) in 1947, to assess the impact of various childhood infectious diseases on death from cancer between ages 15 and 60 years.

Methods Detailed information was collected prospectively at birth and during childhood on a number of early life factors. Episodes of illness during the first 15 years were obtained routinely by health visitors, who regularly visited the participants' homes, or directly from the family doctor or hospital. All study members were 'flagged' by the UK National Health Service Central Register when they died or emigrated. Deaths from cancer between ages 15 to 60 years were analysed in relation to childhood infections, adjusting for potential early-life confounders, using Cox proportional-hazards regression.

Results Of the 1060 study members known to be alive at age 15 years, 88 died before aged 60 years, including 37 from cancer – the leading cause of death. Childhood history of measles and childhood history of influenza, were both independently associated with a lower risk of death from cancer during ages 15 to 60 years (influenza: adjusted hazard ratio, aHR=0.39, 95% CI: 0.17–0.88, p=0.03; measles: aHR=0.49, 95% CI: 0.24–0.98, p=0.04). In contrast, childhood history of whooping cough was associated with a higher risk of death from cancer during ages 15 to 60 years (adjusted HR, aHR=4.88, 95% CI: 2.29–10.39, p<0.0001). The association between whooping cough and cancer-related mortality was borderline significantly different between men and women (p=0.05), with a stronger association among women than men (women: aHR=12.20, 95% CI: 3.01–49.42, p=0.0005; men: aHR=2.10, 95% CI: 0.80–5.50, p=0.13).

Conclusion In a pre-vaccination cohort from the North of England, childhood infection with measles and influenza were associated with a reduced risk of death from cancer in adulthood, while childhood whooping cough was associated with an increased risk. These results suggest that there may be some disease-specific associations between childhood infectious diseases and death from adult cancer, however further studies are required to confirm the specific associations identified.