

**Background** Previous studies have suggested that in-utero exposure to infection is associated with an increased risk of childhood seizures, but there is a lack of evidence regarding in-utero exposure to influenza. The objective of this study was to investigate whether in-utero exposure to the H1N1 pandemic, influenza infection, or vaccination is associated with a higher risk of childhood seizures.

**Methods** Registry-based study including all children born in Norway between 01/10/2009 and 31/12/2015 (n=254,347). Data were linked from sources including the Medical Birth Registry, the Norwegian Immunisation Register, the primary care reimbursement system, and the Norwegian Patient Registry. We investigated three exposures: 1) in-utero exposure to the H1N1 pandemic ( $\geq 1$  pregnancy day during the main H1N1 pandemic wave), 2) in-utero exposure to maternal influenza infection (diagnosis of influenza-like illness in primary care, and/or laboratory confirmed H1N1 infection), and 3) in-utero exposure to H1N1 vaccination. We used Cox Proportional Hazards modelling to compare the incidence of seizures (any seizure, febrile seizure, epilepsy) according to exposure status from birth until 31/12/2015. Hazard ratios were adjusted for parity, maternal age, multiplicity, sex and maternal smoking.

**Results** 24.4% (62,032) children were exposed in-utero to the H1N1 pandemic, of whom 3.7% (2,299) were exposed in-utero to maternal influenza. Among 77 671 children with  $\geq 1$  in-utero day during the vaccination period, 34.9% (n=27,138) were exposed to vaccination. The risk of febrile seizures was slightly increased after in-utero exposure to the pandemic (aHR 1.06, 95% CI 1.00–1.12), but there was no evidence of an increased risk of epilepsy (aHR 1.08, 95% CI 0.93–1.26). There was no evidence of an overall association between in-utero exposure to maternal H1N1 infection and childhood seizures (febrile seizures aHR 1.17, 95% CI 0.92–1.49; epilepsy aHR 0.93, 95% CI 0.50–1.75). However, when stratified by trimester of exposure we observed a 40% increased risk of febrile seizures after infection during the second trimester (aHR 1.42, 95% CI 1.02–1.99). In-utero exposure to vaccination was not associated with an increased risk of childhood seizures.

**Discussion** This large study benefits from virtually no loss to follow-up and mandatory vaccination reporting. The limitations includes our inability to validate outcome data, and the under-reporting of influenza infection. Our finding of no increased risk subsequent to in-utero exposure to H1N1 vaccination supports the safety of vaccination in pregnancy. Although we found no overall evidence that in-utero exposure to maternal H1N1 infection was associated with febrile seizures, a small increased risk of febrile seizures after second trimester exposure warrants further investigation.

OP04

#### THE ASSOCIATION BETWEEN THE CHILDCARE ENERGY-BALANCE ENVIRONMENT AND UK 3–4-YEAR-OLDS' ANTHROPOMETRIC INDICES

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**Background** Although parents provide the majority of childcare before they enter formal schooling, preschool-aged children now spend increasing amounts of time in out-of-home

care. Childcare centres, in addition to parents, therefore have a significant responsibility for shaping children's energy-balance behaviours. However, little is known about how the UK childcare environment influences children's anthropometric indices. We assessed how the amount of time spent in childcare, and how the nutrition, physical activity and overall childcare environment were associated with children's anthropometric indicators (z-BMI score; waist-to-height ratio (WHR); sum of skinfold thickness (SST)).

**Methods** We recruited 3–4 year-old children across socio-economic strata from 30 childcare centres in Cambridgeshire, UK. Trained personnel measured children's height, weight, waist circumference, and subscapular and triceps skinfolds. Parents reported weekly childcare attendance patterns; we assessed the childcare environment relating to obesity (e.g. nutrition and physical activity) using the Environment and Policy Assessment and Observation system. We explored associations between childcare attendance and environment and anthropometric outcomes using two-level hierarchical regression (level 1: child; level 2: childcare centre). All models were adjusted for child ethnicity; maternal educational attainment; maternal BMI; and maternal employment. WHR and SST models were additionally adjusted for child sex and age in months (which are both taken into account when calculating z-BMI scores).

**Results** 196 children (49% female) from 30 childcare centres provided valid data. Neither time spent in care, nor the nutrition, physical activity, or overall childcare environment were associated with children's z-BMI score, WHR and SST. These findings remained after adjusting for child and maternal variables; several of the latter were independently associated with the outcomes of interest.

**Discussion** In contrast to previous international evidence, neither time spent in childcare nor the environment itself were associated with UK preschool-aged children's adiposity-related outcomes. The childcare environment remains important to the Government's obesity strategy, and has been central to intervention efforts to prevent or reduce early childhood obesity to date. However, family-level factors also warrant substantial attention when considering obesity prevention strategies for young children.

## Health inequalities 1

OP05

#### WHICH AGES AND CAUSES OF DEATH EXPLAIN THE WIDENING LIFESPAN VARIATION GAP IN SCOTLAND? A POPULATION BASED STUDY USING ROUTINE DATA

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**Background** Scotland's relative lifespan variation ranking within Western Europe deteriorated after 1980. It is not clear how Scotland's national lifespan variation trend is associated with socioeconomic inequalities in age and cause of death. We calculate lifespan variation for deprivation quintiles over a thirty year period. We apply stepwise decomposition by age and cause of death to better understand the changing nature of mortality inequalities.

**Methods** Census population estimates and mortality records from 1981–2011, were matched with the Carstairs score, an

area level measure of relative deprivation. Life tables by year, sex and deprivation quintile were constructed. Lifespan variation was calculated using  $e^{\dagger}$ . The magnitude of inequalities were estimated using the slope and relative indices of inequality. 95% confidence intervals were produced using Monte-Carlo simulation. The lifespan variation gap between the most and least deprived at (1) the same time point and (2) a comparable level of life expectancy was decomposed. The sensitivity of the results to starting at age 0 were tested by repeating the analysis starting at age 35.

**Results** Lifespan variation for males from the most deprived quintile was 12.2 years (12.1 years–12.3 years) in 1981 and increased to 12.3 years (12.1 years–12.4 years) in 2011. For the least deprived lifespan variation decreased from 11.2 years (11.0 years–11.3 years) to 10.4 years (10.3 years–10.6 years). This caused the socioeconomic gap to widen over time in absolute and relative terms. In 2011 there was a 2.1 year (1.9 year–2.4 year) difference or a 19% (17%–21%) difference. The gap widened because of increasing differences in mortality rates across working ages from external causes. In 1981 external causes explained 55.1% of the gap and by 2011 they explained 69.5% of the gap. Deaths from circulatory disease explain less of the lifespan variation gap over time. At a shared level of life expectancy the most deprived quintile experience higher mortality rates from external causes of death despite arriving at this life expectancy thirty years later in time. Substantive conclusions were unchanged during sensitivity analysis.

**Conclusion** The lifespan variation gap widened because of deaths across working ages from external causes. Scotland must reduce deaths across working adult ages from external causes if it is to reduce the gap and improve its ranking within Western Europe. Routinely monitoring lifespan variation inequalities is valuable for extending our understanding of the changing nature of mortality inequalities and is relevant for countries considering which public health strategies will reduce mortality inequalities.

OP06

#### SOCIO-DEMOGRAPHIC INEQUALITIES IN CARDIOVASCULAR RISK MANAGEMENT AND EARLY DETECTION OF VASCULAR CONDITIONS BY THE NHS HEALTH CHECK: A DIFFERENCE-IN-DIFFERENCES MATCHING ANALYSIS

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**Background** England's National Health Service (NHS) Health Check is a nationwide cardiovascular risk assessment and management programme implemented with aims to prevent cardiovascular disease (CVD), type 2 diabetes mellitus (T2DM) and chronic kidney disease, as well as to reduce inequalities in health. We aimed to compare the impact of the NHS Health Check on: i) Early detection of vascular conditions among population subgroups of age, sex, ethnicity and deprivation; and ii) The management of cardiovascular risk among high-risk population subgroups of age, sex, and deprivation.

**Methods** We obtained retrospective electronic medical records from the Clinical Practice Research Datalink for a randomly selected sample of 1 38 788 patients aged 40–74 years,

without known CVD or diabetes, and were registered with 462 English general practices between 2009 and 2013. We estimated programme impact for each subgroup using a difference-in-differences matching analysis that compared changes in outcome over time and between Health Check attendees and non-attendees.

**Results** 21.4% (29,672/138,788) of the study population attended a Health Check. The programme was associated with increased detection of hypertension and T2DM among Health Check attendees. A significantly greater number of hypertension and T2DM incident cases were detected in male than female attendees (e.g. an additional 4.02%, 95% CI: 3.65% to 4.39%, and 2.08%, 1.81% to 2.35% male and female attendees were detected with hypertension respectively). A significantly greater number of T2DM incident cases were detected among attendees living in the most deprived area (1.60%, 1.23% to 1.97%) compared with those living in the least deprived area (0.79%, 0.52% to 1.06%).

The programme was associated with significant reductions in 10 year CVD risk scores, total cholesterol and systolic blood pressure while statin prescribing increased among high-risk attendees. However, no major differences in programme impact on cardiovascular risk management were observed between subgroups (e.g. programme impact on 10 year CVD risk score was –1.13%, –1.48% to –0.78% in male and –1.53%, –2.36% to –0.71% in female attendees).

**Conclusion** The NHS Health Check may have narrowed inequalities in the diagnosis of hypertension and T2DM but inequalities in the management of CVD risk remained unchanged. Proactive strategies may be required to address known inequalities in CVD outcomes.

OP07

#### IMPACT OF AN INTEGRATED HEALTH AND WELLBEING APPROACH TO ADDRESSING MULTIPLE LIFESTYLE RISKS AND REDUCING HEALTH INEQUALITIES: A MIXED METHODS STUDY

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**Background** The return of public health to local government in England in 2013 created an opportunity to integrate preventive services with agencies that act on the wider determinants of health. A number of local authorities subsequently developed integrated health and wellbeing approaches, in recognition that the previous 'silo' approach to the provision of single-issue lifestyle services had made little impact on inequalities. These integrated services often involve targeting the most disadvantaged geographical and non-geographical communities locally. One example is the Wellbeing for Life (WFL) service in County Durham.

**Methods** The impact of WFL was evaluated using a mixed methods study design, involving: i) ethnographic observations plus interviews and focus groups with clients (n=58), staff (n=47), volunteers (n=15) and external stakeholders (n=10); ii) secondary analysis of intervention monitoring data at baseline (n=1461 clients), three (n=1201), six (n=380) and 12 months (n=133); and iii) a value for money assessment. Primary outcome measures were the EQ-5D and short Warwick