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Children 1

| OP01 | CHANGES IN THE RELATIONSHIP BETWEEN ASTHMA AND ASSOCIATED RISK FACTORS IN CHILDREN AGED 8–13 OVER FIFTY YEARS: ECOLOGICAL STUDY FROM ABERDEEN, NORTH EAST SCOTLAND |

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Background Asthma is the most common chronic childhood medical condition globally. After sharp rises in prevalence over the second half of the twentieth century, falling prevalence has been found in some countries including the United Kingdom during the first decade of the twenty-first century. In order to gain insight into the hitherto unconfirmed factors underlying changing susceptibility to asthma, we used data from one of the longest-running paediatric asthma epidemiology studies in the world: the Aberdeen Schools Asthma Survey (ASAS). We hypothesised that the relationship between asthma and associated risk factors had changed between 1964 and 2014.

Methods An ecological study design was used. Parents of children aged 8–13 in state schools in the City of Aberdeen, North East Scotland, were invited to participate in a questionnaire survey in May 1964, May 1989 and then at five-year intervals to 2014. Child history of asthma and eczema, parental smoking, parental asthma, sex and socioeconomic status (SES) were determined. 2 knot structural change models, with knots after 1964 and 1999, were constructed to assess changes in the relationship between child history of asthma and these risk factors over time.

Results Data for analysis were available for 15 108 children aged 8–13 (75% response rate). Asthma prevalence rose from 4% in 1964 to 28% in 2004 before falling to 22% in 2009 and 19% in 2014. Parental smoking prevalence fell in a near-linear fashion from 58% in 1989 to 28% in 2014. The odds ratio (OR) for a child with asthma to have eczema increased between 1989 and 1999 by 1.031 (95 confidence interval 1.028, 1.035) and by 1.042 (1.038, 1.047) between 2004 and 2014. The OR for a child with asthma to have a parent who smoked rose by 1.032 (1.028, 1.036) between 1989 and 1999 and by 1.043 (1.038, 1.047) between 2004 and 2014. The OR for a child with asthma to have a parent with asthma, to be male and to be from the most deprived communities also rose over the study period.

Conclusion As hypothesised, we found that the relationship between asthma and associated risk factors such as child eczema, sex, parental smoking, parental asthma and deprivation changed over the period 1964 to 2014. Limitations in our study include regulatory changes and falling response rates over time. The changing nature of relationships with asthma suggests that modification of environmental exposures, e.g. to second-hand smoke, can reduce population asthma susceptibility.

| OP02 | TRENDS IN CURE AND RELAPSE BY CLINICAL CHARACTERISTICS FOR CHILDREN DIAGNOSED WITH LEUKAEMIA AGED 0–17 YEARS IN YORKSHIRE 1990–2009: A POPULATION-BASED STUDY |

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Background The 10 year survival estimates for children aged 0–14 years diagnosed with leukaemia have increased from 23% during the early 1970s to 81% for 2001–2005. Statistical cure models offer an alternative approach to examining survival by simultaneously estimating the proportion of patients cured and the survival of those 'uncured'. The proportion cured is defined as the proportion of patients as a group for whom there is no excess mortality compared to the general population. The aims of this study were to estimate the cure proportion for childhood leukaemia and examine trends by clinical prognostic risk factors. Trends in relapse free survival were also examined.

Methods Children aged 0–17 diagnosed with leukaemia between 1990 and 2009 were extracted from the Yorkshire Specialist Register of Cancer in Children and Young People (n=583). Flexible parametric cure models were used to estimate cure proportions and median survival times (MSTs) of those 'uncured' by age at diagnosis, sex, diagnostic subtype, white cell count (WCC), and period of diagnosis. A further cure model based on relapse free survival and a competing risk model for relapse with death as a competing risk were also fitted to examine patterns of relapse.

Results The standardised (adjusting for age, sex, subtype and WCC) cure proportion increased from 0.63 (95%CI: 0.55–0.70) for those diagnosed between 1990 and 94 to 0.83 (95%CI: 0.75–0.88) for those diagnosed 2005–2009. Over this same time period the MST of the uncured remained around 2 years. There were significant differences in cure proportions by age, subtype and WCC, and differences in MST by age and subtype. Models based on relapse free survival found that the proportion cured increased from 0.45 (95%CI: 0.38–0.53) to 0.78 (95%CI: 0.71–0.84) and the MST to relapse or death remained between 1.5–1.7 years. The risk of relapse decreased over time (Hazard ratio 0.18 (95%CI: 0.10–0.31) for 2005–2009 compared to 1990–1994).

Conclusion These results demonstrate that the proportion of patients cured, defined either by overall survival or relapse free survival, has increased substantially. There was no change in the median survival time of the uncured group during this time period, however, the risk of relapse has decreased. Cure models provide an alternative and clinically informative method to assess trends in survival for cancer patients.

| OP03 | IS IN-UTERO EXPOSURE TO MATERNAL H1N1 INFLUENZA INFECTION AND VACCINATION ASSOCIATED WITH AN INCREASED RISK OF CHILDHOOD SEIZURES? A NORWEGIAN REGISTRY-BASED STUDY |

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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 tricep 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