

the family justice system. To address this evidence gap, this study examined records of depression and anxiety in CYP involved in public and private law proceedings using linked, routinely collected, population-level data across Wales.

**Methods** Retrospective e-cohort study. We calculated incidence of primary care-recorded diagnoses and symptoms of depression and anxiety of those involved in private and public law proceedings, and in a comparison group, using poisson regression. Depression and anxiety outcomes following court proceedings were evaluated using pairwise cox regression, with age and gender matched controls of CYP who had no involvement with the courts.

**Results** CYP in the public group had more than twice the risk of depression (adjusted Incidence Rate Ratios (aIRR): 2.2 (95% Confidence Intervals (CI) 1.9–2.6)) and a 20% increased risk of anxiety (aIRR: 1.2 (1.0–1.5)) relative to the comparison group. Those in the private group had 60% higher risk of depression (aIRR: 1.6 (1.4–1.7)) and a 30% increased risk of anxiety (aIRR: 1.3 (1.2–1.4)) relative to the comparison group. Following involvement in private law proceedings, CYP were significantly more likely to have depression (Hazard Ratio (HR): 1.9 (1.7–2.1)), and anxiety (HR: 1.4 (1.2–1.5)), than the control group. Those involved in public law proceedings, were more likely to have depression than the control group (HR: 2.1 (1.7–2.6)).

**Conclusion** Our findings highlight the vulnerability of CYP involved in family court proceedings and increased risk of depression and anxiety. Schools, health professionals, social workers and family support workers have a key role to play in identifying mental health needs and ensuring CYP receive appropriate support both during and after proceedings.

Wednesday 15 September

Obesity Diabetes & Global Health, 13.00 – 15.25

OP19 **PREDICTING THE RISK OF CHILDHOOD OVERWEIGHT AND OBESITY AT 10–11 YEARS USING HEALTHCARE DATA FROM PREGNANCY AND EARLY LIFE\***

<sup>1</sup>Nida Ziauddeen\*, <sup>1</sup>Paul J Roderick, <sup>1,2,3</sup>Nisreen A Alwan. <sup>1</sup>School of Primary Care, Population Sciences and Medical Education, Faculty of Medicine, University of Southampton, Southampton, UK; <sup>2</sup>NIHR Southampton Biomedical Research Centre, University of Southampton and University Hospital Southampton NHS Foundation Trust, Southampton, UK; <sup>3</sup>NIHR Applied Research Collaboration Wessex, Southampton, UK

10.1136/jech-2021-SSMabstracts.19

**Background** In England, 1 in 3 children aged 10–11 years live with overweight or obesity, with the prevalence in the most deprived areas being more than twice as that in the least deprived. It is important to identify children at risk of becoming overweight or obese in the future to apply early prevention interventions. We aimed to develop and internally validate prediction models of childhood overweight and obesity at age 10–11 years (Year 6) using weight and height measurements at age 4–5 years (Year R) as well as antenatal and birth data in Hampshire.

**Methods** A population-based anonymised linked cohort of maternal antenatal and delivery records for all births taking place at University Hospital Southampton, between 2003 to

2018 and child health records including information on post-natal growth, type of feeding and childhood body mass index (BMI) up to the age of 14 years. Childhood age- and sex-adjusted BMI at 10–11 years was used to define the outcome of overweight and obesity ( $\geq 91$ st centile) in the models. Logistic regression models together with multivariable fractional polynomials were used to select model predictors and to identify transformations of continuous predictors that best predict the outcome. Models were developed in stages, incorporating data collected at 4–5 years and then first antenatal booking appointment, birth and early life predictors. Predictive accuracy was evaluated by assessing model discrimination and calibration.

**Results** Childhood BMI was available for 6566 children between 4–5 years (14.6% overweight/obese) and 10–11 years (26.1% overweight/obese) with 10.8% overweight/obese at both ages. One-fifth of normal weight children at 4–5 years became overweight or obese by 10–11 years, 30.3% of overweight children at 4–5 years were obese by 10–11 years and 68% of obese children remained obese. The area under the curve (AUC) was 0.82 for the model only incorporating BMI at 4–5 years and child gender. AUC increased to 0.84 on incorporating maternal predictors (BMI, smoking, age, educational attainment, ethnicity, parity, and employment status) as measured/reported at the booking appointment. Variables from birth and early life were not retained in the model.

**Conclusion** This prediction modelling can be applied at 4–5 years to identify the risk for later childhood overweight or obesity at 10–11 years, with improved prediction with the inclusion of pregnancy data. These prediction models demonstrate that routinely collected healthcare data can be used to target early preventive interventions.

OP20 **THE IMPACT OF THE SECULAR INCREASE IN BODY MASS INDEX ON HIP FRACTURE RISK IN THE NORWEGIAN POPULATION**

<sup>1</sup>Helena K Kjeldgaard\*, <sup>1</sup>Kristin Holvik, <sup>2</sup>Martin O'Flaherty, <sup>3</sup>Grethe S Tell, <sup>1,4</sup>Haakon E Meyer. <sup>1</sup>Department of Chronic Diseases and Ageing, Norwegian Institute of Public Health, Oslo, Norway; <sup>2</sup>Department of Public Health and Policy, University of Liverpool, Liverpool, UK; <sup>3</sup>Department of Global Public Health and Primary Care, University of Bergen, Bergen, Norway; <sup>4</sup>Department of Community Medicine and Global Health, University of Oslo, Oslo, Norway

10.1136/jech-2021-SSMabstracts.20

**Background** A low body mass index (BMI: weight (kg)/height (m)<sup>2</sup>) is an important risk factor for hip fracture. In Norway, hip fracture rates have declined in recent decades at the same time as BMI has increased in the population; however, to what extent increased BMI has contributed to the declining hip fracture trend is unknown. We aimed to estimate the number of incident hip fractures prevented or postponed (IFPP) attributable to increased BMI using an adaptation of IMPACT coronary heart disease model methods.

**Methods** Hip fractures in Norway from 1999–2019 were extracted from the Norwegian hip fracture database (NORHip) and prevalences of BMI > 25 in the Norwegian population was extrapolated from the fourth wave (1994–5) and the seventh wave (2015–16) of the Tromsø study. Hazard ratios of hip fracture according to age and sex were estimated using data from the Cohort of Norway

(CONOR). We calculated the difference between the observed number of hip fractures in 2019 and the expected number of hip fractures given stable fracture rates. IFPPs in 2019 attributable to changes in prevalences of BMI > 25 were estimated according to sex and 5-year age groups from 50 to 85+.

**Results** Hip fracture rates decreased by 28% from 1999 to 2019 with 2,549 fewer hip fractures observed than expected in 2019. The prevalences of BMI > 25 had increased in all age groups in both men and women over the time period. Unadjusted estimates showed that the increased prevalences of BMI > 25 accounted for ~30% of the decline. Increased BMI explained ~50% of the total number of IFPPs in men and ~25% of the total IFPPs in women.

**Conclusion** The incident hip fracture rates in Norway declined between 1999 and 2019. These preliminary results suggest that increased BMI in the population, reflecting a shift in the population BMI distribution, has significantly contributed to the declining hip fracture incidence, particularly in men.

#### OP21 COMPARING ASSOCIATIONS OF TOTAL AND CENTRAL OBESITY WITH INCIDENT ARTHRITIS: RESULTS FROM THE ENGLISH LONGITUDINAL STUDY OF AGEING

<sup>1</sup>Rozemarijn Witkam\*, <sup>1</sup>James Gwinnutt, <sup>1,2</sup>Jennifer Humphreys, <sup>3</sup>Rachel Cooper, <sup>1</sup>David Selby, <sup>1,2</sup>Suzanne Verstappen. <sup>1</sup>Centre for Epidemiology Versus Arthritis, The University of Manchester, Manchester, UK; <sup>2</sup>NIHR Manchester Biomedical Research Centre, The University of Manchester, Manchester, UK; <sup>3</sup>Department of Sport and Exercise Sciences, Manchester Metropolitan University, Manchester, UK

10.1136/jech-2021-SSMabstracts.21

**Background** Body mass index (BMI) and waist circumference (WC) are the measures most commonly used to identify total and central obesity, respectively. Research on the associations between obesity and incident rheumatoid arthritis (RA) and osteoarthritis (OA) is limited, particularly for central obesity. Therefore, we investigated the associations between obesity defined by both BMI and WC and incident RA and OA in England.

**Methods** The English Longitudinal Study of Ageing (ELSA) is a nationally representative panel study of non-institutionalised adults aged ≥50 years, with biannual waves of data collection (2002–2019). Participants with at least one nurse visit measuring height, weight and WC and one follow-up assessment were included in this study. BMI of ≥30kg/m<sup>2</sup> and WC ≥102 cm for men and ≥88 cm for women defined total and central obesity, respectively. Outcomes were self-reported incident RA and OA during follow-up. Prevalent RA or OA cases at baseline were excluded. Cox proportional hazards models were used to investigate the associations between total and central obesity and incident RA and OA separately, controlling for baseline covariates (i.e. age, gender, ethnicity, education, occupation, wealth, smoking and alcohol consumption). Gender differences were formally tested by including interaction terms between gender and obesity. Analyses were conducted using Stata v14.

**Results** The RA and OA analyses included 10,931 (54.1% female; mean age 64.0 (standard deviation (SD) 9.6); mean follow-up 8.8 (SD 4.2) years; and 1,216 incident cases of RA) and 9,281 (51.3% female; mean age 63.6 (SD 9.6); mean follow-up 7.8 (SD 4.2) years; and 2,369 incident cases of OA) participants, respectively. In both samples, more women than men had total and central obesity. Total and central obesity

were both associated with incident RA and these associations were maintained after adjustment for covariates (fully-adjusted hazard ratios (HRs) 1.58 (95% confidence interval (CI) 1.39, 1.80) and 1.43 (95% CI 1.25, 1.62), respectively). Similarly, total and central obesity were both associated with incident OA (fully-adjusted HRs 1.45 (95% CI 1.32, 1.60) and 1.42 (95% CI 1.30, 1.55), respectively). There was no evidence of gender differences in any of these associations (p-values from tests of interaction >0.33).

**Conclusion** Both total and central obesity were associated with increased rates of RA and OA among adults aged 50 years and older. There were no gender differences for these associations. Education about obesity and the development of both RA and OA may result in better prevention or early intervention strategies.

#### OP22 THE GLOBAL PREVALENCE OF FEMALE GENITAL MUTILATION: A SYSTEMATIC REVIEW AND META-ANALYSIS OF NATIONALLY REPRESENTATIVE STUDIES

<sup>1</sup>Leen Farouki, <sup>1</sup>Zeinab El Dirani, <sup>2</sup>Sawsan Abdulrahim, <sup>1</sup>Christelle Akl, <sup>1</sup>Chaza Akik, <sup>1</sup>Stephen J McCall\*. <sup>1</sup>Center for Research on Population and Health, American University of Beirut, Beirut, Lebanon; <sup>2</sup>Department of Health Promotion and Community Health, American University of Beirut, Beirut, Lebanon

10.1136/jech-2021-SSMabstracts.22

**Background** Female Genital Mutilation (FGM) entails the removal, cutting and modification of the external female genitalia for non-medical reasons. The UN Sustainable Development Goal 5 (SDG 5.3) on gender equality calls for ending all traditional harmful practices, including FGM by 2030. This systematic review examined the prevalence of FGM and its subtypes globally, by WHO region, and by country.

**Methods** A systematic search using MeSH headings and keywords from inception to March 2, 2020 was undertaken in MEDLINE, PsycINFO, Web of Science, and EMBASE to identify studies that presented data on FGM prevalence. Only nationally representative studies were included in the meta-analysis. Abstract and full-text screening, quality assessment, and data extraction were undertaken independently by two reviewers. Pooled FGM prevalence was estimated by meta-analysis using a Freeman-Tukey double arcsine transformation and a random effects model using R software. FGM prevalence and types of FGM were presented separately by women and girls. Sub-group analysis was presented by WHO region.

**Results** Out of 3205 articles identified in the search, 28 nationally representative studies were included in the meta-analysis, and these studies included estimates for women and girls in 27 and 34 countries, respectively. The pooled prevalence estimate of FGM in women aged 15–49 was 40% (95% CI:26–55%; I<sup>2</sup> =100%) and 15% (95% CI:10–21%; I<sup>2</sup> =100%) in girls aged 0–14 years old. The country with the highest FGM prevalence in women was Guinea (97%) and the lowest, Uganda (0.3%). The highest prevalence in girls was in Mali (77%), and the lowest in Ghana (0%). The most common FGM type was having flesh removed, at 69% (95% CI:59–79%) of women and 70% (95% CI: 55–84%) of girls, followed by having the genital area sewn shut with 11% of women (95% CI:4–20%) and 9% of girls (95% CI:6–12%). The pooled prevalence by WHO region was 39% (95% CI: 24–56%) for women and 15% (95% CI:9–22%) for girls in Africa, and 52% (95% CI:8–93%) for