Intergrowth (IG) 21st project proposed alternative curves derived from multinational healthy preterm infants based on the hypothesis that normal VPT growth differs from term infants. We used these two approaches to investigate EUGR prevalence in a multinational sample of European VPT infants. **Methods** Data come from the EPICE (Effective Perinatal Intensive Care in Europe) project, an area-based study of infants born at less than 32 weeks' gestation in 2011/12 in 19 regions from 11 European countries. We included 6,471 infants discharged home before 50 weeks PMA. EUGR was defined as weight at discharge for PMA and sex <10th percentile using Fenton and IG references. We compared the prevalence of EUGR by selected neonatal characteristics and country of birth, using X2 tests. We used generalized linear regression models with a Poisson distribution and robust standard errors to estimate adjusted risk ratios (aRR).
Results The prevalence of EUGR using Fenton's references was 43.9% for boys and 45.2% for girls (NS) compared to 33.6% for boys and 25.5% for girls for IG (p<0.01). Prevalence of EUGR by country ranged from 24.7% in Sweden to 60.1% in Portugal for Fenton and from 14.0% in Sweden to 43.7% in Portugal for IG. Lower gestational age at birth, being small for gestational age at birth and having a severe neonatal morbidity were risk factors for being EUGR, regardless of the reference. Boys were more growth restricted than girls when using IG, but not Fenton. Adjusting for case-mix did not reduce variability between regions: the aRR for EUGR for Portuguese compared to Swedish VPT infants was 2.5 (95% confidence interval (CI): 2.0–3.1) for Fenton and 3.3 (95% CI: 2.6–4.6) for IG.
Conclusion Accurately identifying infants with sub-optimal growth is important for clinical care and for research on the etiology and consequences of EUGR. The difference in EUGR prevalence linked to choice of reference as well as the large variations between countries suggest that references should be validated in their target populations before adoption.

RF14 | **CHANGES IN TRAJECTORIES FOR BLOOD PRESSURE AMONG CHINESE CHILDREN AND ADOLESCENTS: EVIDENCE FROM CHINA HEALTH AND NUTRITION SURVEY 1991–2011**

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Background High blood pressure (BP) in adults is an important risk factor for cardiovascular disease (CVD) development and mortality. Childhood BP is not affected by antihypertension treatment, tracks into adulthood and is associated with early target organ disease. Previous reviews reported the varied trend of childhood BP between and within countries. Little is known whether BP trajectories during childhood have changed over time in developing countries with rapid economic development like China. As BP is strongly associated with body-size, we investigated whether BP trajectories have changed among Chinese children and adolescents and estimated the role of BMI and height trends to explain the change in BP trajectories during the past 2 decades.
Methods China Health and Nutrition Survey (CHNS), a mixed longitudinal household survey with eight waves from 1991 to 2011, was used to create four birth cohorts (children aged 7–17y, born in 1981–85, 1986–90, 1991–95, 1996–2000,

N=~16000). Within each gender group, mixed effects cubic growth models were applied to estimate child-to-adolescent trajectories for systolic and diastolic BP (SBP and DBP) with and without adjustment for BMI and height by gender- and age-standardised z-scores. Between-cohort differences were examined by testing the interactions of each cohort with age terms.
Results Trajectories for SBP increased across cohorts: those for later-born cohorts tended to lay above early-born cohorts in both genders. After the adjustment of height and BMI, the differences in mean SBP reduced. The reduction was more evident in adolescence (vs childhood) and with adjustment for height (vs for BMI) trajectories.

For example, the difference between the last (born in 1996–2000) and first (born in 1981–85) cohorts was 1.90 mmHg (*95% CI*: 0.54–3.26) for boys and 2.58 mmHg (*95% CI*: 1.18–3.98) for girls at 7y, and there was no difference at 16y after adjustments. Similar patterns were seen for DBP.
Conclusion Our study is the first to investigate the change in BP trajectories during childhood in China. Later-born Chinese children and adolescents are characterized by higher BP than the earlier generations at the same age. This BP trend during recent decades was partly explained by more rapid growth in height and BMI in later-born children. Future study should exam other potential risk factors on BP trend in Chinese children.

RF15 | **NATIONAL DATA OPT OUT PROGRAMME: CONSEQUENCES FOR MATERNAL AND CHILD HEALTH RESEARCH IN ENGLAND**

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Background The National Data Opt Out Programme was implemented in 2018 to enable users of the English NHS to electronically opt out of sharing their patient information for purposes other than their direct care. It has been reported that opt outs may affect the reliability of data used to evaluate services and conduct public health research; however, biases arising from opt outs have not previously been quantified. The aim of this study was to describe the extent to which rates of birth and maternity outcomes at Clinical Commissioning Group (CCG) level may be biased by patient opt outs.
Methods We selected one common and one rare maternity/birth outcome: the rate of deliveries with caesarean sections and rate of births with very low birth weight. Average 2016 rates (per total number of deliveries/births) for both childbirth indicators are published online by Public health England. The percentage of total patients that have opted out as at 31 December 2018, by CCG, is publically available through NHS Digital. We simulated outcome rates across each CCG had opt outs not been applied to the data.
Results As at December 2018, the median CCG opt out rate across England was 2.4%, ranging from a minimum of 0.3% to a maximum of 10.1%. The average published proportion of deliveries with caesarean section was 27.3% (95% CI 25.6, 29.1) and births with very low birth weight 1.18% (95% CI 0.84, 1.67). For the caesarean section indicator, our simulation produced an average minimum value of 26.6% and a

maximum value of 29.3%. For the very low birth weight indicator, the average minimum was 1.15% and average maximum 3.88% (2.32 times the published upper confidence interval).

Discussion There is substantial geographical variation in the proportion of patients opting out of sharing their NHS data for research and planning. As shown by this simulation, even in areas with average rates of opt outs, published health indicators may be biased and not reflect the true picture of health outcomes. This is particularly the case for rarer – and potentially more severe – events. It is essential that patients are informed of the implications of opting out when deciding whether to consent to sharing their health data for research and planning purposes.

THE EFFECTS OF CARING FOR YOUNG DISABLED CHILDREN ON MOTHERS' HEALTH AND HEALTHCARE USE: FINDINGS FROM THE BORN IN BRADFORD COHORT STUDY

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Rationale Mothers of older disabled children have worse health than mothers of typically developing children but may visit the GP less about their health problems. It is unknown whether these disparities are also present during the preschool period (0–5 years). This study compared the prevalence and frequency of GP visits for symptoms of maternal ill-health in mothers of preschool children with developmental disabilities compared with other mothers.

Methods The primary care records of children in the Born in Bradford cohort study were searched for developmental disability diagnoses before the age of five. Mothers of these children were considered exposed (n=477); all other mothers unexposed (n=9,250). Bivariate and multivariate logistic regression reporting odds ratios (OR) was used to compare the prevalence of psychological distress, head and musculoskeletal (MSK) pain, and exhaustion for exposed versus unexposed mothers in the year prior and five years after the child's birth. Bivariate and multivariate zero-inflated negative binomial regression reporting relative rate ratios (RRR) was used to compare GP visit frequency for these symptoms. Covariates were mother's age, ethnicity, education, subjective financial status, cohabitation status and pre-natal data (in the post-natal models).

Results Prevalence varied little pre-birth. Exposed mothers were more likely than unexposed mothers to have post-natal psychological distress (34.6% exposed versus 30.2% unexposed; OR 1.23; 95% CI 1.00, 1.52) and exhaustion (19.3% versus 14.4%; 1.41; 1.11, 1.78) after the child's birth, but not head and MSK pain (43.4% versus 39.1%; 1.17; 0.96,1.42). Adjusting for covariates did not attenuate these findings. Visit frequency also varied little pre-birth. Visits to the GP increased after the birth, and exposed mothers did not consult more frequently than unexposed: psychological distress (mean 1.1 (standard deviation 2.0) exposed versus 0.9 (2.3) unexposed; RRR 1.00; 95% confidence interval 0.83, 1.20); head and MSK pain (1.0 (1.7) versus 0.9 (1.7); 1.08; 0.83, 1.40); exhaustion (0.3 (0.6) versus 0.2 (0.5); 1.19; 0.76, 1.85). Pakistani ethnicity (versus white British) and pre-natal consultation were strongly associated with higher post-natal consultation rates.

Conclusion Mothers of young children with developmental disabilities may have an increased risk of some symptoms of ill health, but do not consult more frequently. The provision of early family-centred support and increased GP awareness of caregiver status could help identify and support those at risk.

THE EFFECT OF ACCELEROMETER-BASED SLEEP TRAITS ON OBSTERIC OUTCOMES: A MENDELIAN RANDOMIZATION STUDY USING UK BIOBANK

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Background Poor sleep is associated with increased risks of adverse pregnancy and perinatal outcomes in some studies using multivariable analyses, but these associations may be due to confounding, or biased due to the use of self-reported sleep measurements. Mendelian randomization (MR) is less vulnerable to confounding than multivariable regression and using accelerometers to objectively assess sleep will not be affected by reporting bias. Our aim was to use MR to assess the impact of four accelerometer-based sleep traits (i.e. duration, efficiency, fragmentation and chronotype) on obstetric outcomes (pregnancy loss, gestational diabetes, postnatal depression and offspring birthweight).

Methods We conducted a two-sample MR in UK Biobank (UKB). Genetic variants were selected as those that were genome-wide significant in a previous genome-wide association study completed in a sub-sample of UKB females and males (N=85,670): sleep duration (11 variants), efficiency (5 variants), fragmentation (21 variants) and chronotype (6 variants). We estimated the association of each variant with self-reported obstetric outcomes among UKB female of European descent (N=30,310–265,680 for different outcomes with smaller Ns for data available only in online follow-up). In main analyses, we used inverse variance weighting (IVW) to estimate the influence of sleep traits on each outcome. Sensitivity analyses to explore instrument validity included MR-Egger, weighted median and weighted mode estimators. All analyses were performed using R.

Results In IVW analyses, an hour increase in sleep duration was associated with 45 g (95% confidence interval (CI): -80, -10) lower birthweight, but little evidence was found for effects on any pregnancy loss (odds ratio (OR): 0.97; 95%CI: 0.86, 1.10), stillbirth (OR: 1.24; 95%CI: 0.82, 1.87), miscarriage (OR: 0.92; 95%CI: 0.80, 1.07), gestational diabetes (OR: 0.94; 95% CI: 0.35, 2.55), postnatal depression (OR: 1.18; 95% CI: 0.79, 1.77). We also found little evidence for an effect of sleep efficiency, fragmentation and chronotype on any of the obstetric outcomes considered. Results of sensitivity analyses were largely consistent with IVW analyses. Estimates for sleep duration-birthweight effect were -42 g (95% CI: -90, 5) in weighted median, -23 g (95%CI: -84, 39) in weighted mode and 18 g (95% CI: -74, 110) in MR-Egger.

Conclusion We did not find consistent evidence supporting an effect of poor sleep on obstetric outcomes. However, even with large sample sizes some of our results are imprecisely estimated and have wide CIs, and we did not have data to test the relevance of our instruments during pregnancy and to