Conclusion The apparent causal effect of maternal net weight 'gain' on birthweight (and hence macrosomia) is difficult to identify because the total maternal weight gain observed includes that of the offspring. A tautological association is therefore observed even when maternal weight has no causal effect on birthweight. Existing evidence regarding the 'effect' of GWG on birthweight should therefore be viewed with caution and should not be used to inform guidelines on 'ideal' gains in weight.

RF33 EVALUATION OF PUBLIC HEALTH INTERVENTIONS USING A COMPLEX SYSTEMS LENS: A CRITICAL REVIEW

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Background There has been a growth in interest in applying systems thinking to public health research: including greater consideration of the complex and changing nature of real-world environments within which public health interventions take place. In this paper we present the results from a critical review that asked the question: how can a systems approach be applied in the context of public health evaluation?

Methods A critical review of the literature was conducted to identify contrasting examples of systems approaches for in-depth comparison and analysis. To inform our protocol and identify relevant studies we held consultations with international researchers with relevant expertise (n=32). We tracked citations from previous reviews and searched Scopus, Medline and Web of Science from 01/01/14 to 06/08/17. We used search terms relating to systems and complexity, evaluation, public health and its social determinants. Our inclusion criteria were as follows: studies must (i) self-identify as taking a systems or complexity-informed approach; and (ii) evaluate one or more interventions or changes in a public health relevant field. Study selection, appraisal, data extraction and analysis were conducted independently by at least two reviewers with regular meetings to discuss contrasting viewpoints.

Results Forty-four studies were finally included. Public health topics varied: the most common concerned obesity, transport, education, and tobacco. Evaluations were classified by the systems approach taken; in total 6 approaches were identified: qualitative research (n=13), concept mapping (n=3), network analysis (n=4), system dynamics modelling (n=15), agent-based modelling (n=8), and 'systems friendly' approaches (n=5). These different approaches were used to address different research questions but there was also cross-over between methodological approach and purpose. Some studies lacked clear empirical conclusions for informing future practice.

Discussion Though sometimes portrayed as a novel development in public health research, there are already numerous examples of different public health 'systems evaluations'. There is no single or dominant 'systems approach' to public health evaluation. Nor is there a consistent pattern whereby different approaches address research questions specific to that approach. Rather than advocate for a single approach to systems evaluation, we believe continued innovation in this field is most helpful at this time. To improve utility, some systems evaluations would benefit from improvements in the reporting of empirical findings.

RF34 SOCIOECONOMIC DIFFERENCES IN CARDIOVASCULAR DISEASE RISK FACTOR PREVALENCE IN PEOPLE WITH TYPE 2 DIABETES IN SCOTLAND: A CROSS-SECTIONAL STUDY

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Background Health inequalities exist in outcomes of diabetes in different socioeconomic groups and these are particularly marked for cardiovascular disease. This study explores the association between socioeconomic status (SES) and prevalence of cardiovascular risk factors (smoking, body mass index (BMI), glycated haemoglobin (HbA_{1C}), blood pressure and cholesterol) in people with type 2 diabetes in contemporary Scottish data.

Methods We performed a cross-sectional study of people with type 2 diabetes in Scotland who were alive on 30/6/16 identified from the population-based diabetes register. SES was defined using quintiles of the area-based Scottish Index of Multiple Deprivation (SIMD). Cardiovascular risk factors were defined as: current smoker, obesity (BMI $\geq$ 30 kg/m2), $HbA_{1C} \geq$ 58 mmol/mol, systolic blood pressure $\geq$ 140 mmHg, and cholesterol $\geq$ 5 mmol/l. Logistic regression models adjusted for age, sex, health board, history of cardiovascular disease, ethnicity and duration of diabetes were used to identify odds ratios (OR) (95% confidence intervals) for the most compared to the least deprived SIMD quintile for each risk factor.

Results There were 264,664 people with type 2 diabetes in the study population: mean (SD) age was 66.7 (12.8) years, 56.1% were male, 23.6% were in the most deprived quintile and 15.1% in the least deprived quintile. Less than 5% had missing data on key variables.

Crude prevalence of risk factors in the most/least deprived quintiles were 24.4/8.8% for smoking, 61.9/49.4% for obesity, 43.7/39.7% for above-target HbA_{1C}, 30.5/31.3% for above-target systolic blood pressure and 24.4/24.5% for above-target cholesterol.

Adjusted prevalence of current smoking (OR 3.25 (95% CI 3.09–3.42)), obesity (OR 1.59 (1.54–1.65)) and above-target HbA_{1C} (OR 1.13 (1.09-.17)) were higher in the most compared to the least deprived quintile. Adjusted prevalence of above-target systolic blood pressure was similar (OR 1.00 (0.97–1.04)), and of above-target cholesterol was lower in the most compared to the least deprived quintile (OR 0.85 (0.82–0.88)). Inequalities in current smoking were larger in females (OR 3.66 (3.37–3.96)) compared to males (OR 3.00 (2.81–3.19)). No other risk factors showed interactions between sex and SES.

Conclusion Socioeconomic deprivation is associated with significantly higher prevalence of smoking, obesity, and above-target HbA_{1C} among people with type 2 diabetes in Scotland. Inequalities in smoking status by SES among people with type 2 diabetes appear to have widened over time. Effective approaches to reducing these inequalities at both population