Contributors NAA conceived the study idea and is PI of the SLOPE (Studying Lifecourse Obesity PrEdictors) study. NZ cleaned and managed the raw data. EJT analysed the data. EJT drafted the abstract. All authors contributed to the study design, interpreted the results, revised the abstract for content and approved the final version before submission.

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OP65

PREDICTION MODELS FOR POPULATION TOBACCO USE: A SYSTEMATIC METHODOLOGICAL REVIEW TO IDENTIFY BEST MODELLING STRATEGIES

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Background Smoking remains a top public health priority, killing over 6m people annually. Planning future tobacco control policies can greatly benefit from population prediction models for tobacco use (mathematical models that simulate tobacco exposure and its health impact in the population). Those models were mainly developed to project trends and simulate policy as identified in a systematic review published in 2013. Common outcomes were changes in tobacco use behaviour, tobacco-related morbidity/mortality, and economic impact. We updated, expanded and enhanced the 2013 review. We aimed to identify best modelling practices, highlight common pitfalls, and develop a quality-assessment checklist.

Methods We systematically searched PubMed, Embase, CINAHL Plus, EconLit, and PsycINFO for publications between July 2013 and August 2019 using the search strategy of the 2013 review. We included studies referring to tobacco product or tobacco use and projected a tobacco-related outcome. We only included studies in English. Two reviewers independently assessed the eligibility of the identified studies through title and abstract screening followed by full-text review; all discrepancies were resolved in consensus with a third reviewer. We designed and piloted a data-extraction form based on existing guidelines to collect information such as model structure, data sources and transparency. We analysed the evidence using narrative synthesis. We developed a quality-assessment checklist for population prediction tobacco models, including the risk of bias and standard quality criteria.

Results In total, 5046 records were identified of which 830 were duplicates; 80 papers were included in this review. A diverse range of modelling/simulation methodologies, including microsimulations, decision-trees, and agent-based models have been used in population tobacco use prediction modelling. However, methodological transparency was notably lacking. Furthermore, the tobacco modelling community apparently works mostly in 'silos', hindering the diffusion of good modelling practice, and promoting wasteful repetition of effort. For example, while some models appropriately simulate smoking intensity and duration to model cumulative hazard, others only simulate smoking status (i.e. never/ever/current).

Conversely, the modelling teams participating in the Cancer Intervention and Surveillance Modelling Network (CISNET)

collaborated well, sharing data, methodological advancements and 'building blocks' for their models.

Worryingly, some tobacco models received industry funding, making bias likely.

Conclusion Population prediction modelling for tobacco use is an active area of research. However, our systematic methodological review identified variable quality and an overall lack of transparency. More active collaboration using transparent methods and open-source code could avoid wasteful duplication of effort, speed scientific progress and benefit both the tobacco control community and wider society.

OP66

OPINIONS AND EXPERIENCES OF A NATIONAL SMOKEFREE PRISON POLICY: EVIDENCE FROM THE TOBACCO IN PRISONS STUDY

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Background A national smokefree prison policy was implemented in Scotland from November 2018. The removal of tobacco from a prison system poses some distinct potential challenges, not least because prisons are 'homes' and rates of smoking in the prison population are very high. The Tobacco In Prisons study (TIPs) is internationally unique in comprehensively studying the introduction of restrictions on smoking in Scottish prisons, using data collected before, during and after the change to prison smoking policy. This paper presents opinions and experiences of prison smoking restrictions among people in custody (prisoners) and staff in Scotland, and identifies implementation success factors and lessons that are highly relevant for other jurisdictions and areas of public health.

Methods Surveys of staff (online) and people in custody (paper-based) were conducted in November-December 2016 (return rates: 26.6% (staff); 33.8% (people in custody)); May-July 2018 (31.4%; 25.9%) May-July 2019 (16.1%; 18.1%). The surveys contained identical or similar questions on topics related to smoking, smoking cessation/abstinence and smoking restrictions in the prison context. Topics were also explored qualitatively with staff and people in custody at similar time points to the surveys via 34 focus groups and 99 interviews in total. Changes in survey responses over time were analysed using descriptive statistics and logistic regression analyses, adjusting for potentially confounding socio-demographic variables. Qualitative data were thematically analysed to identify the diversity of views and experiences.

Results The new smokefree policy is widely accepted as the new 'norm' in Scottish prisons, although support was consistently higher among staff than people in custody before, during and after implementation. Both the surveys and qualitative work suggest that perceptions of some of the potential difficulties ('hard to enforce') and negative consequences ('cause a lot of trouble') of a smokefree prison policy reduced post implementation. Participants identified several implementation success factors relating to: planning and communication, smoking abstinence/cessation products/services, and partnership working.

Conclusion Our study confirms that smokefree prison policies can be successfully implemented, despite widespread

concerns, providing that the removal of tobacco is well managed and enhanced support measures are available for smokers. Some of the general factors shaping the successful introduction of smokefree prisons in Scotland are relevant to other areas of public health transformation e.g. setting clear objectives and timescales; collaboration and teamwork; and involving staff at all levels and end-users in change processes.

Thursday 10 September

Cohort Studies

OP67 HYPERTENSIVE DISORDERS OF PREGNANCY AND THE RISK OF CHRONIC KIDNEY DISEASE: A NATIONAL REGISTRY-BASED COHORT STUDY

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Background Hypertensive disorders of pregnancy (HDP) (preeclampsia, gestational hypertension) are increasingly common complications of pregnancy. HDP are associated with increased risk of cardiovascular disease and end-stage kidney disease in women. Chronic kidney disease (CKD) is highly prevalent, but evidence for associations between HDP and CKD is limited and inconsistent. The underlying causes of CKD are wide-ranging, and HDP may have differential associations with various aetiologies of CKD. We aimed to identify whether HDP are associated with CKD and whether this risk differs by CKD aetiology.

Methods Using data from the Swedish Medical Birth Register, singleton live births from 1973–2012 were identified and linked to data from the Swedish Renal Register and National Patient Register (up to 2013). Preeclampsia was the main exposure of interest and treated as a time-dependent variable. Gestational hypertension was also investigated as a secondary exposure. The primary outcome was maternal CKD, and this was classified into 5 subtypes: hypertensive, diabetic, glomerular/proteinuric, tubulo-interstitial, other/non-specific CKD. Cox proportional hazard regression models were used, adjusting for year of delivery, maternal age, country of origin, education level, antenatal BMI, smoking during pregnancy, gestational diabetes, and parity. Women with pre-pregnancy comorbidities were excluded.

Results The final sample consisted of 1,924,409 women who had 3,726,554 singleton live-births. The mean age of women at first delivery was 27.0 (± 5.1) years. Median follow-up was 20.7 (interquartile range 9.9–30.0) years. 90,917 women (4.7%) were diagnosed with preeclampsia, 43,964 (2.3%) had gestational hypertension, and 18,477 (0.9%) developed CKD. Women who had preeclampsia had a higher risk of developing CKD during follow-up (adjusted hazard ratio (aHR) 1.92, 95% CI 1.83–2.03). The risk differed by CKD subtype, and was higher for hypertensive CKD (aHR 3.72, 95% CI 3.05–4.53), diabetic CKD (aHR 3.94, 95% CI 3.38–4.60) and

glomerular/proteinuric CKD (aHR 2.06, 95% CI 1.88–2.26). The risk of CKD was increased after preterm preeclampsia, recurrent preeclampsia, or preeclampsia complicated by pre-pregnancy obesity. Women who had gestational hypertension also had increased risk of developing CKD (aHR 1.49, 95% CI 1.38–1.61).

Conclusion Women with history of HDP are at increased risk of CKD, particularly hypertensive or diabetic CKD. Preterm preeclampsia, recurrent preeclampsia, and preeclampsia complicated by pre-pregnancy obesity are all associated with higher risk of maternal CKD. Since 10% of women develop clinically significant CKD in their lifetime, the absolute risk of CKD related to HDP may be substantial. Women who experience HDP may benefit from future systematic renal monitoring to prevent CKD onset or progression.

OP68 TECHNICAL AND PRACTICAL CHALLENGES IN IMPLEMENTING DIGITAL APPLICATIONS FOR SELF-MONITORING VISUAL FUNCTION IN THE MONARCH STUDY

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Background The development and implementation of self-monitoring technologies for chronic conditions would ease the burden on patients and hospital services. Digital applications (apps) on smartphones or tablets can transfer information from a remote setting to a care provider, though technical and practical challenges can arise. The MONARCH study is a multi-centre cohort study evaluating the diagnostic test accuracy of two apps for self-testing visual function at home to detect reactivation of neovascular age-related macular degeneration.

Methods Participants are provided with an iPod to test their visual function weekly using both apps. Data are transmitted automatically using a mobile router to online databases maintained by the app developers. Details of anticipated and unanticipated challenges faced throughout set-up, recruitment and follow-up, and remedial actions, have been carefully documented.

Results As of 17/02/2020, 233/274 (85%) participants (40% male; average age 75) from 6 hospitals self-tested their vision at least once.

Anticipated challenges included potential inequalities in recruitment due to the technologies involved and the need for participant technical support. The primary reason given for non-participation was 'put off by technology' (21%). A participant helpline received 186 calls (19.7 hours). Issues with one or both apps was the primary reason for calls (47%), followed by connectivity issues (15%).

Unanticipated challenges included issues setting up and managing iPods remotely, technical issues with the apps, and adherence to self-testing during follow-up. Apple's multiple device management system was used, which resulted in limited control over devices and failed to prevent standard system updates. System updates interfered with app compatibility and confused some participants. Issues with the app databases temporarily halted recruitment and data monitoring on several occasions and prevented some participants from testing.