

before and after onset of the service with a 3-month phase-in period, using segmented linear regression with 9-month (April 2014–December 2014) pre- and 36-month (April 2015–March 2018) post-intervention periods. Rate of GP interactions were similarly compared before and after using 21-month pre- and 36-month post-intervention periods. Rates of A&E presentations and GP interactions for practice population in Drumchapel – an area within NHS Greater Glasgow & Clyde with similar rates of deprivation, but with no such service in place – were used as a comparison group. Autoregressive and moving average terms and a Fourier term to adjust for seasonality were included in the models.

Results Govan practices had a lower rate of A&E presentations than Drumchapel practices across all time points. A&E presentations did not change significantly over time between April and December 2014 in either area. At April 2015, SHIP onset, a level change of -4.34 (-7.44, -1.24) A&E presentations was observed in both areas, but no significant change in trend over time comparing pre and post SHIP in either area. Onset of SHIP was therefore not associated with a reduction in level or trend in A&E presentations. Rate of interactions with GP was greater for the Govan practices than those of Drumchapel at all time points, prior to January 2015, increasing over time in both areas. After April 2015, there was a significant level change of 33.78 (19.57, 47.99) per 1000 in both areas. GP interactions in Govan however saw a significant reduction of -1.48 (-2.87, -0.09) per 1000 per month, following onset of SHIP, between April 2015 and March 2018. This is equivalent to SHIP being associated with an absolute reduction of 37 GP interactions per thousand and a relative reduction of 7.2% by March 2018.

Conclusion The Govan SHIP initiative was associated with no significant change in A&E presentations and a small reduction in GP interactions. A cost effectiveness analysis is recommended.

P34 **EVALUATING STAKEHOLDER INVOLVEMENT IN BUILDING A DECISION SUPPORT TOOL FOR NHS HEALTH CHECKS: CO-PRODUCING THE WORKHORSE STUDY**

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Background Ensuring academic research leads to research that is useful for end users is a key challenge in the health research arena. Stakeholder engagement is being increasingly recognised as an important way to achieving impact. The workHORSE project was designed to continuously engage with stakeholders, via four iterative workshops and an e-platform, to inform the development of an open source/open access modelling tool to enable commissioners to quantify the potential cost-effectiveness and equity of the NHS Health Check Programme. An objective of the project is to evaluate the involvement of stakeholders in the process of building the workHORSE computer modelling tool.

Methods The design of the workshop programme was theory-based using the Cairney/Oliver key co-production principles. We identified stakeholders using our extensive networks and snowballing techniques. Iterative development of the decision

support modelling tool was informed through engaging with stakeholders during three workshops (to date). We used detailed scripts facilitating open discussion and opportunities for stakeholders to provide additional feedback subsequently. At the end of each workshop, stakeholders completed stakeholder engagement questionnaires to explore their views and experiences throughout the process. The research team also completed questionnaires to explore their expectations prior to the workshops and their experiences thereafter.

Results A total of 25 stakeholders have participated, of which 11 attended two or more workshops. They spanned all levels: local (NHS commissioners, GPs, local authorities and academics), third sector and national organisations (including Public Health England).

Stakeholders experiences were positive overall. They felt valued and commended the involvement of practitioners. Major reasons for attending included being able to influence development and having insight and understanding of what the tool could include and how it would work in practice. They appreciated the iterative process involving a series of workshops which provided opportunities for them to learn about and reflect upon the model's capacity, usage and usefulness. Researchers saw the process as an opportunity for developing a common language and trust in the end product and ensuring the support tool was transparent. The workshops have acted as a reality check ensuring model scenarios and outputs are relevant and fit for purpose.

Conclusion Computational modellers rarely consult with end users when developing tools to inform decision-making. The added value of co-production (collaboration and iteration with stakeholders) potentially enables modellers to produce a 'real-world' operational tool. Likewise, stakeholders have increased confidence in the decision support tool's development and applicability in practice.

P35 **USING THE SOCIAL ECOLOGIC FRAMEWORK TO IMPROVE THE INFLUENZA VACCINATION STRATEGY AMONG THE PORTUGUESE ELDERLY**

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Background In a context of lower than targeted influenza vaccination (IV) coverage, identifying factors associated IV uptake is essential to improve population coverage. Although extensive work has been done in this field, scarcer studies focused on framing these factors within a multifactorial model. Having the social ecological model (SEM) as framework, this study intended to identify and quantify the SEM levels associated to seasonal IV uptake in the Portuguese population aged 65 and more years.

Methods Data from the Portuguese 2014 National Health Survey was restricted to individuals aged 65 and more years (n=5669). The outcome of interest was self-reported IV uptake in the 2 years previous to the interview. Twenty three independent variables were selected from the survey and were allocated in one of the five SEM levels: individual, interpersonal, organizational, community and policy. Sex stratified and age adjusted analysis using Poisson regression were performed

for each SEM level. To evaluate statistical significance and marginal contribution of each SEM level for explaining IV uptake, the full model was fitted (all variables from all 5 SEM levels). To determine joint statistical significance of variables of each SEM level, the model without respective SEM level was compared with the full model using likelihood ratio test. Additionally, marginal contribution of each SEM level was measured by relative reduction in magnitude of pseudo R square.

Results For both men and women, older age groups (85 or more vs 65–69 age group; PR=1.59 for men and PR=1.56 for women); having 3 or more chronic conditions (PR=1.39 for men and PR=1.35 for women); number of GP and outpatient visits in the previous 4 weeks were associated to higher IV uptake. For men, only 2 out of the 5 SEM levels were associated to IV uptake (individual and organizational). For women 3 levels were relevant for this preventive measure (individual, organizational and community). Main marginal contribution for explaining the IV uptake, came from individual (17.9% and 16.3%) and organizational (30.7% and 22.7%) levels for both men and women respectively.

Conclusion Besides individual characteristics, like age and health status - known determinants of IV uptake - this study highlights the importance of access and use of health care services for adoption of IV preventive measure. Moreover, it evidences a sex differential behaviour that should be accounted in the definition of the IV campaign strategy.

P36

A STRATEGY TO IDENTIFY YOUNG CHILDREN WITH DEVELOPMENTAL DISABILITIES VIA PRIMARY CARE RECORDS

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Background Electronic health records use clinical codes to classify disease and conditions, not disability (how impairment affects human function). Codes for the degree of disability are not routinely recorded alongside the diagnosis, unless part of the diagnostic code e.g. profound learning disability. Existing strategies identify conditions associated with disability, prioritising either identifying every person with possible or highly probable disability to limit type I (false positive) or type II (false negative) misclassification error.

In high income countries, 1–4% of children have developmental disabilities. They can be diagnosed before the age of five but, in practice, developmental delay is often diagnosed and the disabling condition (e.g. autism spectrum disorders or cerebral palsy) diagnosed when the child is older. Diagnoses of both delay/generalised developmental disorders and a disabling condition diagnosis could indicate disability severity. Is a sensitive or specific strategy or a combination of both necessary to obtain a realistic estimate of developmental disability prevalence in preschool children?

This study aimed to develop and compare strategies to identify children with possible and probable developmental disabilities diagnosed before the age of five in primary care data.

Methods Two case ascertainment strategies were developed and the primary care records of children in the Born in

Bradford (BiB) cohort study (from birth to their fifth birthday) searched: 1) to identify children with conditions associated with substantial developmental disability (autism spectrum disorders, Down syndrome and cerebral palsy and moderate-profound learning disability); and 2) to identify children with indicators of developmental disability (developmental delay, generalised developmental disorders, mild and unknown severity learning disability).

Results The combined UK prevalence of the disabling conditions is 417 per 10,000 children below age 18. The prevalence in the study sample (n=9,727) was 85 per 10,000 (n=47 autism spectrum disorders, n=24 Down syndrome, n=12 cerebral palsy). None had moderate-profound learning disability. Half also had disability indicators (53%, n=44). The prevalence of disability indicators was 450 per 10,000 (n=438). Of those with only indicators (n=394), 75.9% had a single indicator. The most common indicators in both the condition and indicator groups were speech delay, developmental delay and developmental language delay.

Conclusion Using only disabling condition clinical codes for case ascertainment via primary care data is likely to greatly underestimate disability prevalence in children under the age of five. Where independent disability verification is not possible, the number of disability indicators may reflect disability severity.

P37

HOW CAN THE RECENT STALLING OF LIFE EXPECTANCY GAINS IN SCOTLAND BE BEST EXPLAINED?

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Background Annual gains in life expectancy in Scotland have been slower in recent years than in the previous two decades for males and females. Similar slowdowns or even reversals have been observed in England, Wales, Northern Ireland and the USA. This contribution explores the contribution of specific causes of death to the changes in mortality by age and cause for two time periods: 2000–02 to 2012–14 and 2012–14 to 2015–17.

Methods Life expectancy at birth was calculated from death and population counts available from National Records of Scotland (NRS), disaggregated by five year age categories and by ICD-10 underlying cause of death. Arriaga's method of life expectancy decomposition was applied to produce estimates of the contribution of different age groups and underlying causes of death to life expectancy at birth in each of the two periods.

Results Life expectancy trends deteriorated after 2012–14 and life expectancy subsequently fell. The worsening trend involved increased inequalities as it was more profound with increasing area deprivation. Almost all age groups saw a worsening of trends in the later time periods and this was also seen across almost all causes of death. In particular, the previously observed rapid improvements in circulatory causes which benefited those aged 55–84 years most, more than halved. There were also absolute increases in mortality rates for those aged 35–49 years due in large part to increases in drug-related deaths; and amongst those aged 90+ years due to increased mortality from dementia/Alzheimer's.