

Discussion Both display ban policies were followed by a decline in the trend for smoking prevalence and quitting attempts in adult smokers. A key strength in this study was its consistent and theory-based approach which allowed us to assign impacts to a certain policy with more confidence. This novel approach to policy analysis could also be applied in other public health disciplines.

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OP88 **EVALUATING THE MOVE TO, AND IMPLEMENTATION IN 2018 OF, SMOKE-FREE PRISON POLICY IN SCOTLAND: THE TOBACCO IN PRISONS STUDY (TIPS)**

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Background Until recently, prisons had partial exemption from UK policies which banned smoking in most enclosed public spaces and were one of few UK workplaces in which staff were exposed to secondhand smoke (SHS) and in which smoking remained normative. In 2016 the Tobacco in Prisons (TIPs) study documented high SHS concentrations in prison residential and other areas, informing new policy, implemented in November 2018, to prohibit smoking throughout all Scottish prisons. Although smoking bans have been introduced in prison systems elsewhere (e.g. England, New Zealand, parts of Australia and the USA), TIPs forms the most comprehensive study internationally of the process and impact of introducing smokefree prisons.

Methods This three-Phase study utilised mixed methods including: 1) surveys with staff and prisoners, focus groups and interviews with prison and NHS staff, and qualitative interviews with prisoners - to assess health, smoking status, beliefs about smoking, e-cigarettes, smoking cessation provision, and the perceived desirability, benefits and challenges of smokefree prison policy; 2) objective measures of SHS before, during and 6 months after smokefree policy was implemented; and 3) use of routinely collected data (e.g. sickness absence, prisoner 'canteen' purchases and medication use) to assess impact of the policy.

Results Phase 1 surveys with prisoners confirmed very high levels of prisoner smoking pre-ban (72%). Phase 1 and 2 survey and interview data demonstrated that prisoners were less in favour of smokefree policies than staff, but supported the introduction of e-cigarettes in the move to smokefree prisons. Survey and interview data from staff and prisoners indicated concerns about the challenges of introducing smokefree policy. Phase 2-3 data showed air quality improved in all prisons comparing Phase 1 (2016) data with the first full working day (3rd December 2018) post-implementation (overall median reduction -81% inter-quartile range -76 to -91%). Post-implementation indoor PM_{2.5} concentrations suggested minimal smoking activity during the period of measurement. Immediately prior to the introduction of smokefree policy, prisoners and staff largely reacted favourably to the

introduction of e-cigarettes, whilst still voicing some reservations about their use and safety.

Discussion This is the first comprehensive evaluation of changes in SHS concentrations, and the attitudes, perceptions, health and behaviours of people living and working across all prisons within a country that has introduced nationwide prohibition of smoking in prisons. Early Phase 3 results suggest that a smoke-free prison policy reduces the exposure of prison staff and prisoners to SHS and can be implemented despite considerable challenges.

OP89 **THE IMPACT OF SMOKE-FREE LEGISLATION IN IRELAND ON LUNG CANCER INCIDENCE AND MORTALITY**

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Background In 2004, Ireland became the first country to institute a comprehensive workplace smoking ban. Previous research has found that comprehensive smoking bans are associated with public health benefits. However, given the relative recency of smoking bans and the long latency of the effect of cigarette smoke on lung cancer, the effect of smoking bans on lung cancer has not been well explored.

Methods An appropriate lag time for the smoking ban was calculated (2010 for lung cancer incidence, 2006 for lung cancer mortality). Using these breakpoints, a one-sample, Poisson-based, interrupted time series analysis was used to compare lung cancer incidence and mortality before and after the modelled interruptions. An identical analysis was applied to brain cancer, a cancer with no known link to smoking or second-hand smoke exposure, as a validity check.

Results Each year following the modelled interruptions, lung cancer incidence and mortality in Ireland decreased 2% (95% CI 1-3, p<0.01) and 1% (95%CI 0-2, p=0.02) relative to the modelled counterfactual. In absolute terms, the smoking ban was associated with 32 (95%CI 14-52) fewer lung cancer incident cases per year and 113 (95%CI 96-131) fewer lung cancer deaths per year, equivalent to 1.36% of the post-interruption lung cancer incident cases and 6.03% of the post-interruption lung cancer deaths.

Discussion The 2004 Irish Workplace Smoking Ban avoided approximately 195 incident lung cancer cases and 1,125 lung cancer deaths to by 2015. This is among the first quasi-experimental studies to examine the effect of a comprehensive smoke-free policy on lung cancer.

OP90 **USING LOGIC MODELS TO INFORM TOBACCO CONTROL POLICY OUTCOME EVALUATION**

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Background A key challenge in the evaluation of population-level public health policies is understanding how each policy is likely to work and in whom. This is particularly challenging in settings where several policies are implemented in a short period. Logic models are a visual representation of the anticipated causal pathway of an intervention and are useful in