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### Background:

Prisons were one of few workplaces where smoking was still permitted after the smoking ban in indoor public places in Scotland in 2006. This study compares SHS exposure assessments in Scotland's 15 prisons six months after smoke-free policy was introduced (in Nov 2018) with levels measured in 2016 before the policy was announced.

### Methods:

In 2016, 128,431 mins of PM2.5 (marker of SHS) concentration data were collected from residential halls and 2,860 mins for 'task-based' measures; 2019 figures were 126,777 and 3,073 mins. Six days of fixed-site monitoring in halls in each prison commenced on 22.5.19. Task-based measurements were conducted to assess SHS for specific locations and activities (e.g. cell searches). Typical daily PM2.5 exposure profiles were constructed for the prison service and time-weighted average exposure concentrations were estimated for shift patterns for residential staff pre- and post-implementation of the policy. Staff self-reports of exposure to SHS were gathered via surveys.

### Results:

Measured PM2.5 in residential halls declined markedly; median fixed-site concentrations reduced by >91% compared to baseline. Changes in the task-based measurements (89% average decrease for high-exposure tasks) and time-weighted average concentrations across shifts (>90% decrease across all shifts), provide evidence that staff exposure to SHS has significantly reduced. The percentage of staff reporting no exposure to SHS rose post-ban.

### Conclusions:

This is the first study to objectively measure SHS levels before, during and after implementation of smokefree policy across a country's prison system. The dramatic reduction in SHS exposures confirm complementary qualitative data and stakeholder reports of the ban's success in removing tobacco. The findings show that SHS can be effectively eliminated through a well-applied smoking ban in the challenging context of prisons; and are highly relevant for other jurisdictions considering changes to prison smoking rules.

## Changes in exposure to second-hand smoke following a smoking ban across a national prison system

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