Appendix 2 (as submitted by the authors): Time Series Analysis

1. We followed Helfenstein[1] and briefly describe intervention/interrupted time series analysis using autoregressive integrated moving average (ARIMA) modeling. Let $\cdots, z_{t-1}, z_t, z_{t+1}, \cdots$ denote the observations and let $\cdots, a_{t-1}, a_t, a_{t+1}, \cdots$ be a white noise series with mean zero and variance σ_a^2. The autoregressive integrated moving average of orders p, d, and q (ARIMA(p,d,q)) where p is the order of autoregressive part, q is the order of moving average part, and d is the order of differencing take the form $w_t = \phi_1 w_{t-1} + \cdots + \phi_p w_{t-p} + a_t - \theta_1 a_{t-1} - \cdots - \theta_q a_{t-q}$ where $w_t = B^d z_t = z_t - z_{t-d}$.
In order to be able to assess the immediate impact of an intervention that starts at time T, on a give outcome we can use the following model $y_t = \omega_0 s_t + \eta_t$, with $s_t = \begin{cases} 1 & \text{for } t \le T \\ 0 & \text{for t < T} \end{cases}$ and η_t being an ARIMA model described above. We followed the so called Box-Jenkins methodology[2] to estimate the orders for η_t and then estimate and assess the significance of each smoking ban for each outcome. The adequacy of the fitted model was assessed by checking for white noise residuals for fitted model.

1. Helfenstein U. The use of transfer function models, intervention analysis and related time series methods in epidemiology. Int J Epidemiol 1991;20: 808-815

2. Box GEP, Jenkins GM. (1970) *Time series analysis: Forecasting and control*, San Francisco: Holden-Day.

Appendix to: Naiman A, Glazier RH, Moineddin R. Association of anti-smoking legislation with rates of hospital admission for cardiovascular and respiratory conditions. *CMAJ* 2010. DOI:10.1503/cmaj.091130.