

# A cross-sectional study on levels of second-hand smoke in restaurants and bars in five cities in China

R L Liu, Y Yang, M J Travers, Z Feng, Q Li, Y Jiang G T Fong,  
L Li, Y Nan, G R J O'Connor, A Hyland,

## Abstract

**Objectives:** To assess indoor second-hand smoke (SHS) exposure in restaurants and bars via PM<sub>2.5</sub> (fine particles 2.5 mm in diameter and smaller) level measurements in five cities in China.

**Methods:** The study was conducted from July to September in 2007 in Beijing, Xi'an, Wuhan, Kunming and Guiyang. Portable aerosol monitors were used to measure PM<sub>2.5</sub> concentrations in 404 restaurants and bars. The occupant density and the active smoker density were calculated for each venue sampled.

**Results:** Among the 404 surveyed venues, 23 had complete smoking bans, 9 had partial smoking bans and 313 (77.5%) were observed to have allowed smoking during sampling. The geometric mean of indoor PM<sub>2.5</sub> levels in venues with smoking observed was 208 mg/m<sup>3</sup> and 99 mg/m<sup>3</sup> in venues without observed smoking. When outdoor PM<sub>2.5</sub> levels were adjusted, indoor PM<sub>2.5</sub> levels in venues with smoking observed were consistently significantly higher than in venues without smoking observed (F=80.49, p,0.001). Indoor PM<sub>2.5</sub> levels were positively correlated with outdoor PM<sub>2.5</sub> levels (partial rho=0.37 p,0.001) and active smoker density (partial rho=0.34, p,0.001).

**Conclusions:** Consistent with findings in other countries, PM<sub>2.5</sub> levels in smoking places are significantly higher than those in smoke-free places and are strongly related to the number and density of active smokers. These findings document the high levels of SHS in hospitality venues in China and point to the urgent need for comprehensive smoke-free laws in China to protect the public from SHS hazards, as called for in Article 8 of the Framework Convention on Tobacco Control, which was ratified by China in 2005.

## Recommended Citation:

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