



Impact of Lexington's Smoke-free Law on Indoor Air Quality

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October 27, 2004

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Purpose of the Study:

To measure indoor air quality in Lexington's public places before and after Lexington's smoke-free law went into effect.

Background:

On April 27, 2004, Lexington-Fayette County implemented a smoke-free ordinance prohibiting smoking in all public buildings including restaurants, bars, bingo parlors, pool halls, public areas of hotels/motels, and all other buildings open to the public. The ordinance was scheduled to go into effect on September 26, 2003, but there was a 7-month delay in enforcement due to a legal challenge.

Currently, about 34% of the U.S. population is protected by a local or state smoke-free law. Exposure to the fine particles from the burning end of a cigarette is inhaled deep into the lungs and increases the risk of heart disease, stroke, cancer, and respiratory disease. One California study showed a 82% average decline in air pollution after smoking was prohibited.¹ In Delaware, researchers found that 90% of the air pollution in hospitality venues was attributed to tobacco smoke in a study conducted before and after implementation of their statewide smoke-free law.²

Method:

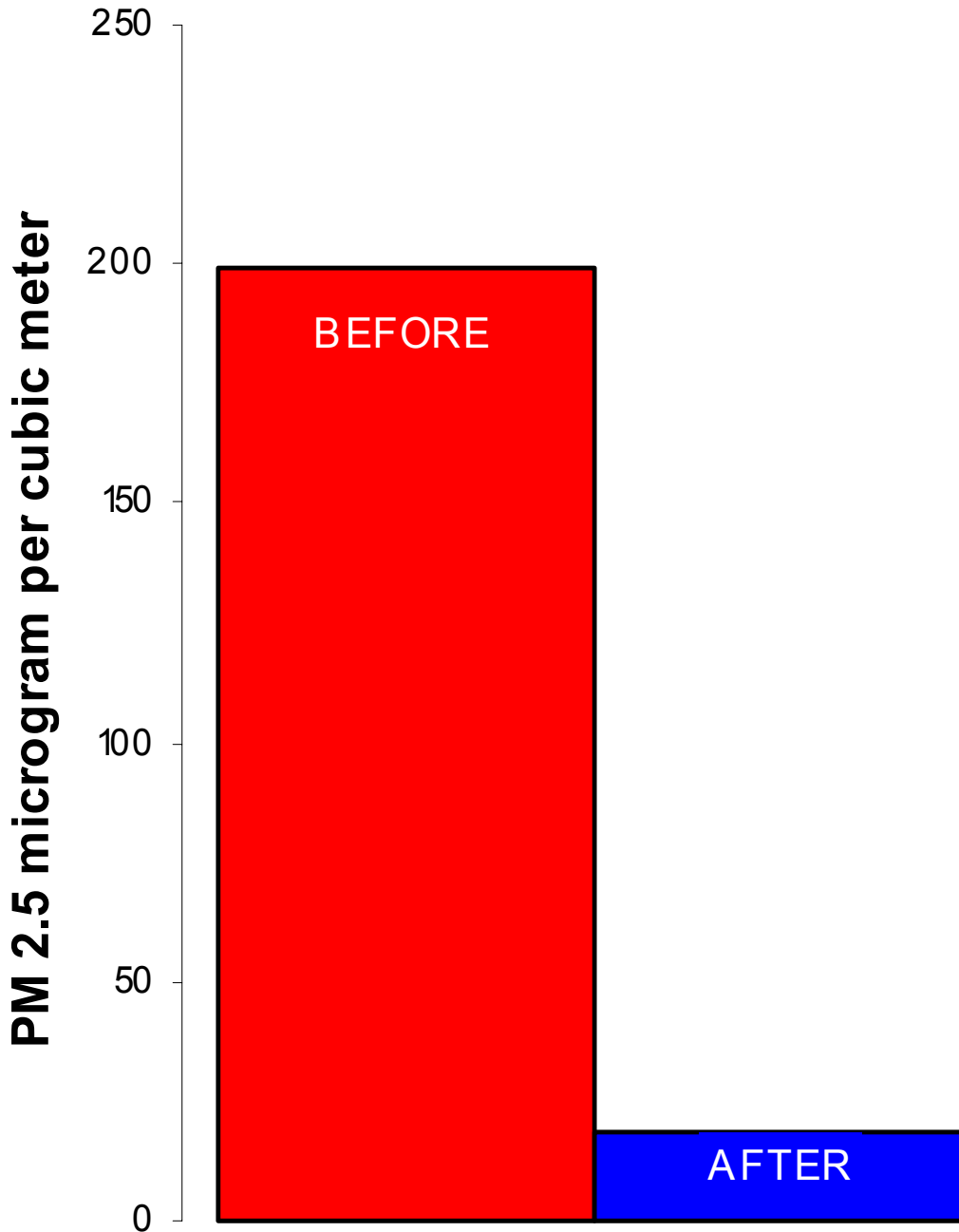
Indoor air quality was assessed using the MetOne Aerocet 531 photometer in 10 hospitality venues in Lexington-Fayette County. Of the 10 establishments, three were restaurants, three were bars, and four were other venues including two music clubs, a bowling alley, and a coffee house. The monitor was calibrated against a standard method in a series of laboratory experiments to ensure accuracy. The first phase (before the smoke-free law was scheduled to go into effect) was conducted Friday and Saturday from 7:30pm to 12:30am, September 19, 20, and 27, 2003. The second phase (after the law was in effect) was conducted during the same time periods one year later, September 17-19, 2004. The average time spent in each venue was 43 minutes. The number of people inside, the number of burning cigarettes, and building characteristics such as maximum occupancy were recorded.

Funding for this study was provided by a grant from The Robert Wood Johnson Foundation Developing Leadership in Reducing Substance Abuse Fellows Program.

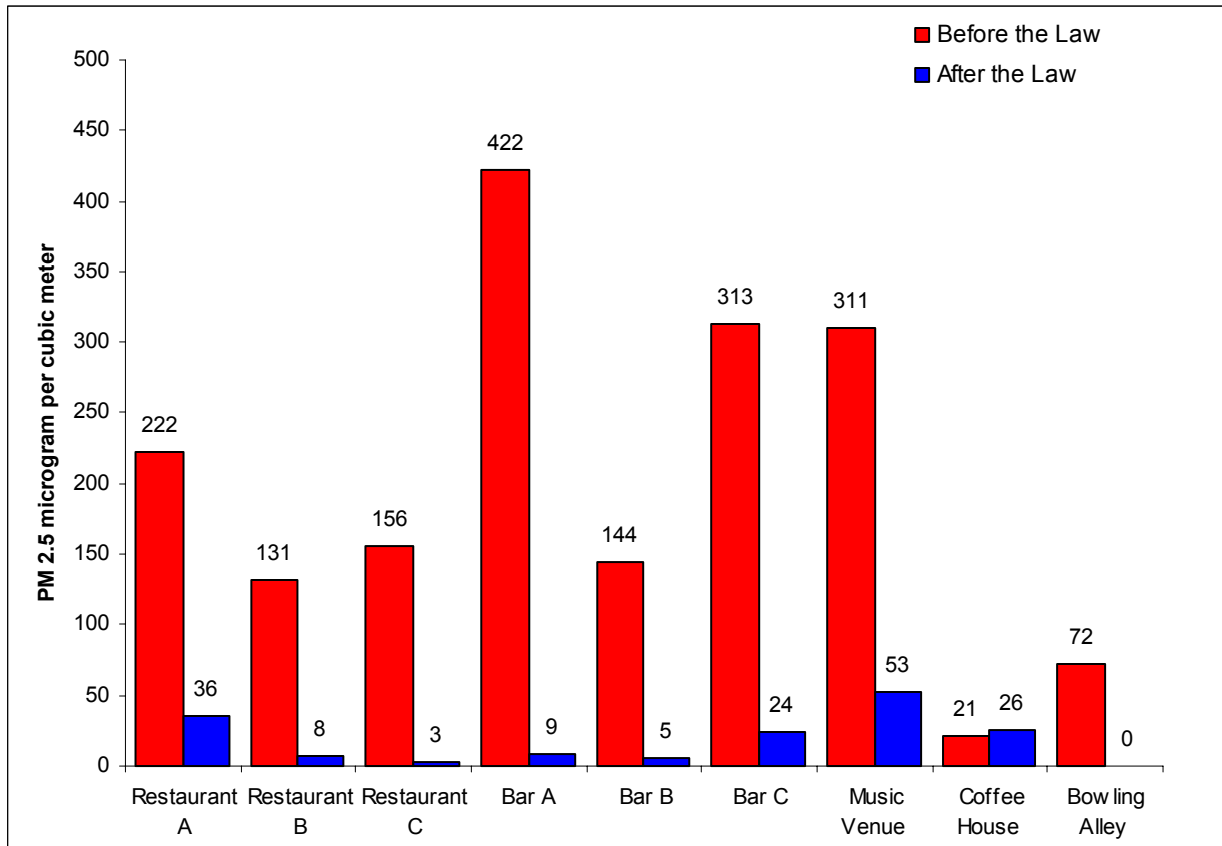
¹ Ott, W, Switzer, P, Robinson, J. Particle concentrations inside a tavern before and after prohibition of smoking: Evaluating the performance of an indoor air quality model. *J Air Wast Manag Assoc* 1996;46:1120-1134.

² Repace, J. Respirable particles and carcinogens in the air of Delaware hospitality venues before and after a smoking ban. *J Occup Environ Med* 2004;46:887-905.

**Fine Particle (PM 2.5 $\mu\text{g}/\text{m}^3$)
Indoor Air Pollution
Drops 91% After Lexington's Smoke-Free Law**



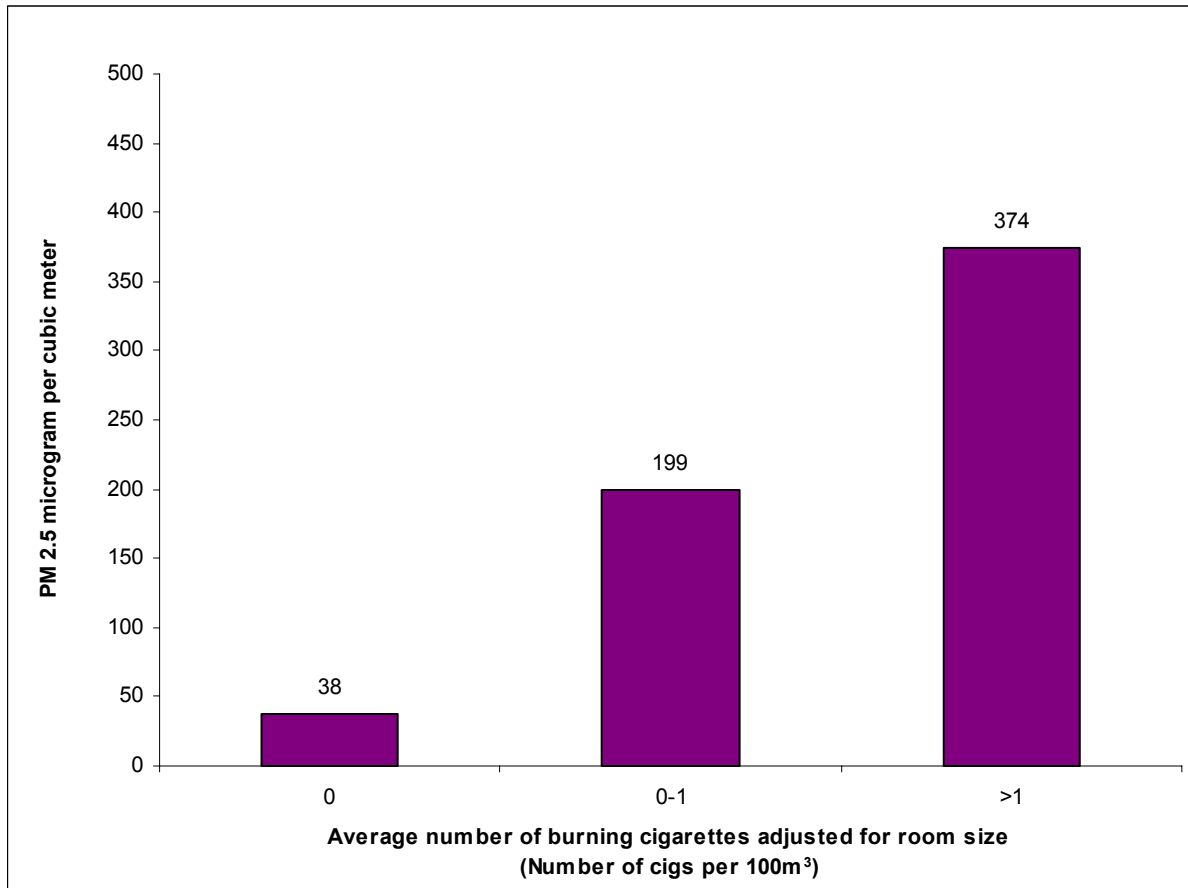
Indoor Air Pollution Before and After Lexington's Smoke-Free Law



Note. One venue was excluded due to smoking after the law was in effect and other potential problems

- Average indoor fine particle levels were $199 \mu\text{g}/\text{m}^3$ before the smoke-free law.
- After the smoke-free law, average fine particle levels were $18 \mu\text{g}/\text{m}^3$. This is 11 times lower than the level before the smoke-free law.
- There is no standard for indoor air quality. However, the federal standard for outdoor fine particle levels is $65 \mu\text{g}/\text{m}^3$ for 24 hours.

Indoor Air Pollution Increased as More Cigarettes Were Smoked



- As more cigarettes were burned, the average indoor fine particle levels increased significantly.