

Smoke-free Air Laws Effective at Protecting Children from Secondhand Smoke

No Protection Found for Children Exposed to Secondhand Smoke in Homes

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Boston, MA—Researchers at the Harvard School of Public Health (HSPH) have found that children and adolescents living in non-smoking homes in counties with laws promoting smoke-free public places have significantly lower levels of a common biomarker of secondhand smoke exposure than those living in counties with no smoke-free laws.

The children living in non-smoking homes in U.S. counties with smoke-free laws had 39% lower prevalence of cotinine in their blood, an indicator of tobacco smoke exposure, compared to those living in counties with no smoke-free laws. Children living in homes with smokers exhibited little or no benefit from the smoke-free laws.

The study appears in the June 7, 2010 advance online edition of the journal *Pediatrics*.

“The findings suggest that smoke-free laws are an effective strategy to protect both children and adults from exposure to secondhand smoke. In addition, interventions designed to reduce or prevent adults from smoking around children are needed,” said Melanie Dove, who received her doctorate in environmental health at HSPH in 2010 and led the study.

The HSPH researchers examined data from the 1999-2006 National Health and Nutrition Examination Survey (NHANES), a cross-sectional survey designed to monitor the health and nutritional status of the U.S. population. They analyzed the cotinine levels in 11,486 nonsmoking youngsters, aged 3-19 years, from 117 counties, both with and without exposure to secondhand smoke in the home.

In addition to a 39% lower prevalence of detectable cotinine, the researchers also found that children in non-smoking homes had 43% lower mean cotinine levels.

Over the past decade the number of state and local smoke-free laws in the nation has grown significantly. For example, the number of smoke-free laws in workplaces, restaurants and bars in the U.S. has increased from 0 in 1988 to 175 in 2006.

“These laws have been shown to reduce exposure to secondhand smoke among adults. Our results show a similar association in children and adolescents not living with a smoker in the home,” said [Gregory N. Connolly](#), senior author of the paper and director of the Tobacco Control Research Program at HSPH. [Douglas Dockery](#), professor of environmental epidemiology and chair of the Department of Environmental Health, also was a study author.

According to the 2006 Surgeon General's Report, there is no safe level of exposure to secondhand smoke. Children are particularly vulnerable to the toxic compounds in secondhand smoke because they have higher breathing rates and their lungs are still developing, the authors write. Exposure to secondhand smoke in children can irritate the lungs, resulting in coughing or wheezing, and can trigger an asthma attack in children with asthma. Secondhand smoke also has been associated with sudden infant death syndrome, respiratory illnesses and middle ear disease.

For children, the home is the primary source of secondhand smoke exposure and most of the smoking is done by the parents. Potential exposure sources for children outside the home include cars, private child care centers, restaurants, shopping malls and parks.

Approximately 20 percent of the youth in the HSPH study lived with a smoker in the home. These children had the highest cotinine levels and could benefit the most from an intervention to reduce exposure, regardless of smoke-free laws that might be in place, say the researchers. "One way to reduce or prevent adults from smoking around children is for physicians to counsel parents to stop smoking," said Connolly.

This research was funded by the Flight Attendants Medical Research Institute Clinical Innovator Award. Dove's research was supported in part by a National Institute of Environmental Health Sciences Training Program in Environmental Epidemiology.

"Smoke-free Air Laws and Secondhand Smoke Exposure Among Nonsmoking Youth, NHANES 1999-2006," Melanie S. Dove, Douglas W. Dockery, and Gregory N. Connolly. *Pediatrics*, Vol. 126, No. 1, July 2010, online June 7, 2010.

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