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[Back to Conference page](#)

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158-2

The Hazard of Tobacco Smoke Pollution in Cars: Evidence From an Air Quality Monitoring Study

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Objective: Tobacco Smoke Pollution (TSP) has been identified as a serious public health threat. Accordingly, laws have been developed to reduce TSP exposure. However, there have been few, if any, successful attempts to pass laws in cars where the small cabin space may contribute to concentrated exposure. The present investigation attempted to quantify the levels of TSP exposure in cars measuring fine particles less than 2.5 microns in diameter (PM_{2.5}), one marker of TSP, which is easily inhaled deep into the lungs. A second objective was to provide the evidence base for possible laws to reduce TSP exposure in cars.

Methods: Four smokers and their cars completed 5 controlled *in vivo* air-sampling conditions. Each condition varied on whether the car was moving, presence of air conditioning, open windows, and combinations of these air flow influences. Air quality readings were measured using a TSI Dustrak. PM_{2.5} was measured in the car while one cigarette was smoked during the condition, and for at least 3.5 hours after participant first entered the car.

Results: High PM_{2.5} peak levels, >5900 µg/m³, were observed under the condition with the least airflow. In the greatest airflow condition PM_{2.5} peaks exceeded 200 µg/m³. This study demonstrates that TSP in cars can reach unhealthy levels, even under the best realistic ventilation conditions. There is a need to begin to communicate these high exposure levels and harm from TSP. These findings support the need to take the necessary steps to protect the public from further harm through smoke-free car policies.

See more of [Measuring Secondhand Smoke in Workplaces, Homes, Cars and Outdoors](#)

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