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Just 10 minutes in a car with a smoker boosts harmful pollutants by up to 30 percent

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Just 10 minutes spent in the back seat of a car with a smoker in the front, boosts a child's daily exposure to harmful pollutants by up to 30%, reveals research published online in *Tobacco Control*.

Pollutant levels exceeded those found in restaurants, bars, and casinos, the study showed.

Children are very vulnerable to the effects of second hand smoke, because most of this occurs in cars and private homes—locations not covered by outright public bans on smoking—say the authors.

They base their findings on 22 assessments of the air quality inside a stationary vehicle after three cigarettes had been smoked over the course of an hour.

On each occasion, levels of pollutants that are normally emitted by cars as well as by cigarettes, were measured in the back seat of a vehicle at the breathing height of a child—with the front windows completely down (position 1), and again with the windows open just 10 cm (position 2).

These pollutants were also measured outside the vehicle and included particulate matter, polycyclic aromatic hydrocarbons (PAH), and carbon monoxide, plus nicotine.

Exposure to PAH, in particular, has been linked to immune system

disturbances, wheeze, IQ changes, and allergic sensitisation, say the authors.

The pollutant levels inside the car at both window settings were three times as high as those measured outside, the results showed.

The average particulate matter levels inside the car were 746.1 µg/m3 at position 1 and 1172.1 µg/m3 at position 2. The average size of the particulate matter was 0.3 µm.

Average levels of carbon monoxide reached 2.8 parts per million when cigarettes were extinguished, while those of PAH were around 10 times as high inside the car as they were outside.

Nicotine levels varied between 5.06 µg/m3 and 411.3 µg/m3 for both window positions inside the car.

On the basis of their findings, the authors calculate that spending even a short amount of time inside a car with a smoker would make a significant difference to a child's daily exposure to harmful pollutants.

Just 10 minutes at 1697 µg/m3 would increase a child's average daily exposure to particulate matter by up to 30%, and by 18% at levels of 1000 µg/m3, calculate the authors.

They point out that levels of harmful pollutants found inside the car exceeded those found in restaurants, bars, and casinos.

"Children are more vulnerable than adults, and their exposures to tobacco smoke in a vehicle are completely controlled by the adults with whom they share the vehicle," they write.

"Although regulations have been enacted to protect non-smokers,

including children in many public venues, second hand smoke exposures to children in vehicles are permitted in 44 of 50 US states, and in most countries worldwide."

They conclude that their findings support moves to restrict this type of exposure in cars, especially those carrying children.

More information: Particulate mass and polycylic aromatic hydrocarbons expsosure from second hand smoke in the back seat of a vehicle, Online First, doi 10.1136/tobaccocontrol-2012-050531

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