

Measuring exposure to second-hand smoke in the home and car : UK, Ireland and Malaysia.

Abstract

Background: Second-hand smoke(SHS)exposure in the private spaces of home and cars continues to be common even in countries with comprehensive smoke-free laws. There is little data available on the concentrations of SHS experienced within these micro-environment. Methods: Linked studies to measure concentration of fine particulate (PM_{2.5}) as a marker for SHS within homes in Scotland, Ireland and Malaysia, and in cars in Scotland and England, were carried out. Sidepak AM510 Personal Aerosol Monitors or Dylos DC1700 devices were used to gather real-time data on PM_{2.5} in smoker's homes and cars. PM_{2.5} concentrations were compared to the World Health Organization limit of 25 ug/m³. Results: The mean PM_{2.5} concentration measured from more than 3800 hours of all data collected from 107 smoking households across all three countries were 76 ug/m³ (range 1-499). The average 1 minute peak level recorded was 507 ug/m³ (range 9-4767). In cars the mean journey concentration of PM_{2.5} was 85 ug/m³ (range 16-331) in journeys where smoking took place (n=49) compared to 7 ug/m³ (range 0.4-29) during non-smoking journeys (n=34). Conclusion: Concentration of SHS in home and cars can be considerable with the average smoking home exceeding the 24 h World Health Organization limit for PM_{2.5} by factors of 3: the respiratory and cardiovascular health effects of the daily exposure to these levels is likely to be substantial. Feedback of this air quality information may be a useful way of encouraging smokers to think about changing their behavior to protect their family from the harmful effects of SHS.

Keyword: Second-hand smoke; Environmental tobacco smoke; PM_{2.5}; Home; Car; UK; Ireland; Malaysia