



Second- and third-hand smoke exposure pervasive among Canadian infants

CHILD research has provided insight into how much tobacco smoke Canadian infants are exposed to, what increases their likelihood of being exposed to smoke, and how researchers can better understand and measure this exposure.

Published in June 2021 in the *Journal of Exposure Science & Environmental Epidemiology*, the research used data from the questionnaire responses and urine samples of over 2,000 CHILD participants.

Overall, the researchers found that smoking rates were low and parents appeared to be motivated to avoid exposing their child to smoke. Questionnaire responses indicated that most mothers were not smokers, and most families did not allow smoking inside the home.

However, despite this, 89% of infants had measurable levels of nicotine metabolites in their urine, indicative of some smoke exposure, and about 25% of infants had levels that would indicate some regular or intermittent second-hand smoke exposure.

SMOKING OUTDOORS STILL EFFECTS THE BABY

“Of the 12% of families that reported someone had smoked at the household since the child’s birth, 90% indicated that the smoking took place outside the home,” observes senior author Dr. **Tim Takaro**, a professor and clinician-scientist in the Faculty of Health Sciences at Simon Fraser University (SFU).

“Perhaps because of this, most of these families with smokers reported that their children had no exposure to smoking in early life.”

“This discrepancy suggests that parents may not be as aware of the pervasiveness of light second-hand and third-hand smoke as they should be,” comments lead author **Jaclyn Parks**, an M.Sc. graduate in the Faculty of Health Sciences at (SFU).

“However, our study found that smoking outdoors was still associated with about three times the urinary cotinine concentrations in infants, compared to infants who lived in a home with no household smoking.”

Cotinine and trans-3'-hydroxycotinine are metabolites of nicotine found in blood, urine and saliva that researchers use to indicate exposure to tobacco or tobacco smoke.

Third-hand smoke is the lesser-known form of tobacco smoke exposure. It refers to smoke particulates and vapours re-emitted into the air from an inanimate object such as clothing, upholstered furniture or carpeting that was previously exposed to smoke.

INCOME, HOUSING, EDUCATION ALSO AT PLAY

The study further found that income, education, and housing are interrelated factors that influence the likelihood of a child being exposed to tobacco smoke in their early life.

For example, infants in rented homes had higher concentrations of urinary nicotine metabolites than those in owned homes, and those in multi-unit apartments and attached housing had higher levels than those living in single-family detached homes.

The study also offered insights into the methodology of smoke exposure research,

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highlighting the value of asking mothers about prenatal and pre-pregnancy exposure, and shows how cotinine and trans-3'-hydroxycotinine could be used as markers of smoke exposure in populations with relatively little exposure.

PUBLIC EDUCATION NEEDED

“While it is very encouraging to see so many parents making the effort to ensure any household smoking occurs outdoors, and while doing this certainly reduces a child’s exposure to smoke,” concludes Parks, “our study clearly highlights how widespread second-hand and third-hand smoke is, and the need for more prevention in this area and public education on this topic.”

“Canada’s Tobacco Strategy aims to reduce smoking in Canada to less than 5% by 2035.

“We hope that this can be achieved through thoughtful consideration of the social determinants involved in exposure to second-hand and even third-hand smoke, in addition to addressing the lack of regulation around e-cigarette products and their concerning popularity in youth.”



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