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Swiss association for tobacco control

Summary of Findings: Adverse Effects of Passive Exposure to Heated Tobacco Products and E-Cigarettes

Key Messages

- HTPs and e-cigarettes pollute indoor air with harmful substances like VOCs, ultrafine particles, and nicotine, posing health risks to bystanders.
- Passive and thirdhand exposure can lead to respiratory effects and systemic nicotine absorption, especially in enclosed spaces.
- Public awareness is low, highlighting the need for education and inclusion of these products in smoke-free policies.
- Comprehensive smoke-free policies must include e-cigarettes and HTPs, as ventilation alone cannot eliminate exposure risks—indoor bans are essential for public health protection.

Background

While passive exposure to conventional tobacco smoke is a well-established health hazard (American Lung Association, 2024), new nicotine delivery technologies such as e-cigarettes and heated tobacco products (HTPs) are often marketed as "cleaner" alternatives. Despite these claims, scientific evidence increasingly shows that emissions from both products contain harmful substances that can adversely affect indoor air quality and the health of bystanders.

Heated Tobacco Products (HTPs)

Heated tobacco products are marketed as healthier alternatives to conventional cigarette smoking, as the tobacco is merely heated without being burned. However, products such as IQOS or glo emit harmful pollutants, including volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons, carbon monoxide, and ultrafine particles, that degrade indoor air quality and expose bystanders to toxic substances (Auer et al., 2017; Peruzzi et al., 2020). Indoor use of heated tobacco products (HTPs) contributes to elevated levels of VOCs and particulate matter, and although emissions are lower than those from traditional combustion cigarettes, passive exposure can still result in the inhalation of harmful substances, particularly in confined spaces like

vehicles (Schober et al., 2019).
These emissions pose health risks comparable to conventional tobacco products and can lead to respiratory and cardiovascular effects in non-smokers (Giongo et al., 2023; Znyk et al., 2021).

E-Cigarettes (Vapes)

E-cigarette vapor contains a complex mixture of harmful substances, including propylene glycol or glycerol, nicotine, flavouring agents, VOCs, ultrafine particles, carbonyl compounds (e.g., formaldehyde, acetaldehyde), heavy metals, and a wide variety of additives (Grana et al., 2014; Kopa-Stojak & Pawliczak, 2024). Additionally, e-cigarette liquids contain flavouring agents such as diacetyl (DA) and acetyl propionyl (AP), which are associated with severe respiratory diseases such as bronchiolitis obliterans when inhaled. The levels at which these compounds have been detected often exceed safety thresholds, leading to serious air pollution and health risks both for users and non-users (Farsalinos et al., 2015).

Studies confirm that even non-users passively inhale and retain substances from e-cigarette emissions (Su et al., 2021; Ballbè et al., 2014), which can lead to adverse health effects (Hess et al., 2016). Even brief exposure can cause immediate respiratory effects, such as airway inflammation and reduced lung function (Tzortzi et al., 2018). Melstrom et al. (2018) provided direct evidence that non-users can systemically absorb nicotine after short-term exposure to secondhand e-cigarette aerosol, with measurable increases in cotinine levels in serum, saliva, and urine. This effect was particularly pronounced in close-range exposures.

Despite being marketed as cleaner alternatives, e-cigarettes significantly pollute indoor air. Thirdhand exposure is also a concern, with nicotine and tobacco-specific nitrosamines (TSNAs) accumulating on surfaces, fabrics, and dust, where they persist long after active use has ceased (Son et al., 2020). Notably, even in spaces where emissions appear less dense than traditional cigarette smoke, health risks from cumulative exposure, particularly for vulnerable groups, cannot be excluded (Destaillats et al., 2020; Kopa-Stojak & Pawliczak, 2024).

Public Awareness and Policy Implications

Ludovichetti et al. (2024) and Campo et al. (2022) found that while awareness for the dangers of traditional smoking is high, public understanding of the risks associated with passive exposure to e-cigarettes and HTPs remains limited and confused. This knowledge gap underscores the need for targeted public education and the inclusion of these products in comprehensive smoke-free policies.

Conclusion

Despite marketing claims that e-cigarettes and heated tobacco products are "cleaner alternatives," substantial evidence shows both product types emit harmful substances that deteriorate indoor air quality and pose health risks to non-users. To protect public health, particularly that of vulnerable groups, comprehensive smoke-free policies must encompass e-cigarettes and HTPs, alongside stricter regulations on product composition and emissions.

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