

Exposure to toxins in e-cig vapor varies depending on scenario

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E-cigarettes are often perceived to be less harmful than their traditional counterparts, but they could still expose the people who "vape" and those around them to harmful compounds. Researchers now report in ACS' journal *Environmental Science & Technology* that heavy use and secondhand emissions could lead to inhaled levels of toxins that exceed set exposure limits. But under typical use, secondhand exposure would have a lower impact on health than second- and third-hand cigarette smoke.

While e-cigarettes don't produce tobacco smoke with its associated toxins, the vapors they generate contain other compounds that are potentially dangerous to human health. These include acrolein, a toxin and irritant to the eyes, skin and nasal passages; formaldehyde, which is recognized as a human carcinogen; and diacetyl, a substance that can cause respiratory problems. Hugo Destaillats and colleagues wanted to find out how much of these compounds users and others nearby might be inhaling.

Vapers' intake of [toxic compounds](#) was modeled

for scenarios in which different e-liquids were used with various vaporizers, battery power settings and vaping regimes. The study predicted that heavy users inhaling at a high rate of 250 puffs per day with devices at 3.8 to 4.8 volts would potentially inhale levels of acrolein (up to 10 mg per day), formaldehyde (up to 49 mg per day) and diacetyl (up to 0.5 mg per day) that exceed U.S. occupational limits of 1.3 mg per day, 0.1 mg per day and 7 micograms per day, respectively. Also, a model of indoor exposure estimated that in bars where vaping is permitted, formaldehyde and acrolein levels would often exceed California reference [exposure limits](#). In comparison to secondhand and thirdhand [tobacco smoke](#), the researchers computed that "disability-adjusted life years" lost due to [exposure](#) to secondhand vapor would be one to two orders of magnitude lower under typical vaping use.

More information: Emissions from Electronic Cigarettes: Assessing Vapers' Intake of Toxic Compounds, Secondhand Exposures, and the Associated Health Impacts, *Environmental Science & Technology* (2017). pubs.acs.org/doi/abs/10.1021/acs.est.7b00710

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