

## An often-made claim that e-cigarettes are '95% safer' is not valid

January 9 2020, by Brian McNeill



Credit: CC0 Public Domain

The frequently cited claim that e-cigarettes are "95% less risky" or "95% less harmful" than combustible cigarettes is outdated, misleading and invalid—and should no longer be made in discussions on the dangers of



vaping, according to an editorial published today in the *American Journal of Public Health* by six leading experts on e-cigarettes and public health.

"The '95% safer' estimate is a 'factoid': unreliable information repeated so often that it becomes accepted as fact," wrote the authors, including Thomas Eissenberg, Ph.D., co-director of the Center for the Study of Tobacco Products at Virginia Commonwealth University.

"Public health practitioners, scientists, and physicians should expose the fragile status of the factoid emphatically by highlighting its unreliable provenance and its lack of validity today, noting the many changes in e-cigarette devices and liquids, the accumulation of evidence of potential harm, the increased prevalence of use, and the growing evidence that <u>e-cigarette use</u> is associated with subsequent cigarette smoking," they wrote.

The editorial, "Invalidity of an Oft-Cited Estimate of the Relative Harms of Electronic Cigarettes," re-examines the "95% safer" claim that originated in July 2013 when a group of experts in decision science, medicine, pharmacology, psychology, <u>public health</u> policy and toxicology rated the relative harm of 12 nicotine-containing products by using 14 criteria addressing harms to self and others. They concluded that combustible cigarettes were the most harmful and that electronic nicotine delivery systems were substantially less harmful.

However, the experts acknowledged that their study lacked hard evidence for the harms of most products it was evaluating. Despite that lack of evidence, the claim that e-cigarettes are "95% less risky" or "95% less harmful" was widely publicized, notably by Public Health England and the Royal College of Physicians.

Since then, Eissenberg and his co-authors wrote, a considerable amount



of evidence of the potential harms of e-cigarettes has accumulated.

E-cigarette devices have changed significantly since the original study, they wrote, so much so that even if the original estimate was valid in 2013, it can no longer apply.

"For example, in addition to using different materials and more numerous heating coils, many e-cigarettes today can attain power output that exceeds that of most over-the-counter 2013 models by 10 to 20 times (i.e., up to and sometimes exceeding 200 watts)," they wrote. "Greater power increases the potential harms of e-cigarette use because more aerosol is produced that exposes users to increased levels of nicotine and other toxicants."

E-liquids also have changed since 2013, with widespread availability of thousands of flavors that use chemicals "generally recognized as safe" to eat but with unknown pulmonary toxicity, they wrote.

One particularly notable change has been the pervasive marketing of liquids with protonated nicotine, also known as "nicotine salt," which is made by adding an acid to free-base nicotine. Aerosolized protonated liquid is less aversive to inhale than free-base nicotine, thereby allowing users to increase the nicotine concentration of the liquid and likely increase their own nicotine dependence.

"Protonated nicotine e-cigarette liquids are available today in concentrations greater than 60 milligrams per milliliter, and these liquids have become very popular, sparking a 'nicotine arms race,'" they wrote.

Recent evidence also suggests that vaping harms users. One recent study cited in the article found that "[e-cigarette] aerosol constituents could injure the respiratory system or worsen preexisting <u>lung disease</u> through a variety of mechanisms." It also points to research associating wheezing,



a symptom of potential respiratory disease, with e-cigarette use. And it notes that e-cigarette use has been shown to increase heart rate, blood pressure and platelet activation, and decrease flow-mediated dilation and heart rate variability, effects that suggest long-term cardiovascular risk.

The editorial also highlights research conducted since 2013 that found ecigarette use is linked with a greater risk of the user starting to smoke combustible cigarettes.

Studies in the past six years also have shown that e-cigarette aerosol is not harmless, they wrote.

"For example, propylene glycol (PG) is one of the primary constituents of e-cigarette aerosol and is generally recognized as safe when eaten but, when injected intravenously over a period of days, is toxic," they wrote. "E-cigarette aerosols containing propylene glycol and vegetable glycerin, another common constituent, cause inflammation in human lungs, suggesting differing safety profiles for inhaled versus ingested propylene glycol and vegetable glycerin."

Along with Eissenberg, a professor in the VCU Department of Psychology in the College of Humanities and Science, the editorial was co-written by Aruni Bhatnagar, Ph.D., of the American Heart Association Tobacco Regulation Center, University of Louisville; Simon Chapman, Ph.D., of the School of Public Health, University of Sydney, Australia; Sven Eric Jordt, Ph.D., of the Department of Anesthesiology, Duke University School of Medicine; Alan Shihadeh, Sc.D., of the Maroun Semaan Faculty of Engineering and Architecture, American University of Beirut in Lebanon; and Eric K. Soule, Ph.D., of the Department of Health Education and Promotion, East Carolina University.

Eissenberg and his colleagues were inspired to write the editorial after



hearing report after report at the annual meeting of the Society for Research on Nicotine and Tobacco on the risks associated with ecigarette use.

"It just occurred to me that with all these pieces of evidence, that we needed perhaps to revisit this '95% safer' claim to see whether it still had any validity today," Eissenberg said. "We all agreed that this was something that we really needed to do. We wanted people to take a look at the number and decide for themselves."

It's important to understand the "95% safer" claim is bogus, he said, because it continues to be cited as a reason to start or continue vaping.

"People are using that claim as a reason to either keep using e-cigarettes if they started some time ago, or if they're nicotine-naive—if they've never used nicotine before—they hear 95% safer than combustible cigarettes and they say, 'Well, that's safe enough for me.' And so then they started using," he said.

The editorial's biggest takeaway, Eissenberg said, is that we simply do not know the long-term risks of e-cigarette use.

"It doesn't make any sense for us to claim that we know that it's 95% safer than combustible cigarettes," he said. "The fact is: we don't know whether e-cigarette use is as lethal as combustible cigarette use, less lethal than combustible cigarette use, or more lethal than combustible cigarette use.

"You have to understand: We've been studying combustible cigarettes for the last 60 to 70 years. And so we have a huge database with which we can look at how many people die from that behavior," he continued. "We don't have anything near that kind of history with electronic cigarettes. What we do know is that they are delivering toxicants to the



human lung and that over repeated use, in some cases, we see health effects from those toxicants that <u>e-cigarette</u> users are inhaling."

**More information:** Thomas Eissenberg et al. Invalidity of an Oft-Cited Estimate of the Relative Harms of Electronic Cigarettes, *American Journal of Public Health* (2020). DOI: 10.2105/AJPH.2019.305424

Provided by Virginia Commonwealth University

Citation: An often-made claim that e-cigarettes are '95% safer' is not valid (2020, January 9) retrieved 2 May 2024 from <u>https://medicalxpress.com/news/2020-01-often-made-e-cigarettes-safer-valid.html</u>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.