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Heat-not-Burn tobacco cigarettes: a need for validated research standard is implied. – reply

Reto Auer, MD, MAS^{1,3}; Jacques Cornuz, MD, MPH³; Aurélie Berthet, PhD²

¹Institute of Primary Health Care (BIHAM), University of Bern, Bern, Switzerland; ²Institute for Work and Health (IST), University of Lausanne and Geneva, Lausanne, Switzerland; ³Ambulatory Care Clinic, University of Lausanne, Lausanne, Switzerland

Corresponding author: Dr. Reto Auer, MD, MAS
Assistant Professor of Primary Care,
Institute of Primary Health Care (BIHAM), University of Bern
Gesellschaftsstrasse 49, 3012 Bern, Switzerland
P: +41 31 631 58 79, F: +41 31 631 58 71
reto.auer@biham.unibe.ch

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There is general agreement on the need for rigorous independent studies of IQOS that will accurately inform the public. When we began our research, PMI advertisements claimed IQOS produced “no smoke”. We thus designed our exploratory study to detect chemicals typical of pyrolysis, the presence of which defines an aerosol as “smoke”. We chose a comparison cigarette (a brand regularly smoked by millions) based on convenience, because the comparison was incidental, rather than the heart of the experiment. We did not set out to provide a benchmark for the regulatory industry, so comparison with a 3R4F standard cigarette was unnecessary. Tobacco content naturally varies, and differences may be compounded by process fluctuations in cigarette manufacture.¹ Standard cigarettes reduce such variations, but they are no more representative of cigarettes used by smokers world-wide than any other single brand of cigarette. Since we were not benchmarking, using the more expensive standard cigarette, and waiting for its delivery would have held up our real work, which was identifying the presence of harmful chemicals in IQOS smoke. Our validated and standardized analytical methods are not likely to have caused the wide standard deviation in our measures of IQOS smoke: variation in IQOS tobacco content is the likely explanation.

Caruso and Polosa complain that we did not use standard methods when we tested IQOS. But standards for conventional cigarettes need to be adapted to this new smoking technology.² Since all studies that tested the IQOS had been commissioned by PMI, and these also used “non-standard” smoking regimens and “non-validated” instruments,^{3,4} we argue no “standard” exists yet for testing the IQOS. We adapted the standard ISO regimen to better simulate the IQOS smoke scenario, and hope others will also help improve techniques for accurately measuring the new smoking technologies; this is how standards evolve. Necessary modifications to the smoking regimen probably account for the discrepancy between some tobacco company results and our results.⁵ To measure airborne volatile organic compounds (VOCs), we used the validated NIOSH sampling method (2549:1996) and our own accredited analytical method (ISO 17025). We used validated methods (NIOSH 5506 and ISO 17093) to detect and quantify both particle bound and gaseous airborne polycyclic aromatic compounds (PAHs). We adapted the method to sample PAHs for the IQOS so it was more sensitive, and averaged concentrations over smoke generated by 10 IQOS cigarettes.

We did not intend to test for combustion, but pyrolysis, which produces the harmful components of smoke. We showed that tobacco is pyrolyzed when heated to 330°C in the IQOS, which supports our argument that the IQOS aerosol should be called “smoke”. We were glad to read that Maeder & Peitsch agree, in their full review of the research letter, that the IQOS is not devoid of pyrolytic processes.⁶ We are pleased that the question of what constitutes “smoke” is a topic of debate in the scientific community.

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