Public health snoopers detect vapour aerosol at vape conference and fake a particulates scare

written by Clive Bates | 16 February 2016



In an apparently clandestine operation, undercover public health snoopers ventured into a vape conference carrying concealed air-quality monitoring equipment. They detected … wait for it … e-liquid aerosol in the air. This secretive operation is reported (where else?) the journal *Tobacco Control*.

Let us examine its scientific and policy claims.

The paper concludes:

> *Conclusions PM2.5 concentrations observed at the ECIG event were higher than concentrations reported previously in hookah cafés and bars that allow cigarette smoking. This study indicates that indoor ECIG use exposes non-users to secondhand ECIG aerosol. Regulatory bodies should consider establishing policies that prohibit ECIG use anywhere combustible cigarette use is prohibited.*
>
> *Soule EK, Maloney SF, Spindle TR, et al. Electronic cigarette use and indoor air quality in a natural setting. Tob Control 2016 [link]*

Unethical and contemptuous

To start with, I'm pretty disturbed by the approach to vapers betrayed by this exercise – it seems they did these measurements of the particulates in air at a vaping event covertly, and without permission of the event organisers or knowledge of the participants (emphasis added)

> *The ease of concealment and ability to collect ambient air quality measurements in a natural environment make the Sidepak AM510 an appropriate choice for this type of assessment;*

There's a kind of contemptuous attitude revealed here that takes vapers and their events as subjects for experimentation without their consent rather than people enthusiastically dealing with the health risks of smoking in a way that works for them.

But warped ethics and contemptuous attitude are not the main problems – far from it – and I'm not going to dwell any more on this.

Update 22 February: I have expanded on this section of the discussion in a separate post: What was unethical about snoopers measuring particulates at a vape convention?

Faking a particulates controversy again – more bad science

The key issue with the detection of 'particulates' is what they are made of … these are droplets of e-liquid aerosol. They simply cannot be compared with tobacco smoke particulates, or indeed, the particulates that arise from combustion processes in diesel engines, power stations, biomass or from road surface degradation… These are the types of particulate that underpin the scientific basis for health concerns about $PM_{2.5}$. E-liquid aerosol is physically and chemically completely different – yet heroic analogy has been used to suggest the concerns should be equivalent. To my knowledge, there is no evidence that particle size *per se* is a cause of harm… if it was we'd need to take more care boiling kettles and having showers.

I've discussed the use of misleading arguments about particulates at some length

here: Scientific sleight of hand – constructing concern about particulates and no-one has so far provided any basis for concerns about *this sort of particulate*. Also, see Carl V Phillips Science Lesson: what are vapor, aerosol, particles, liquids, and such?

This issue is actually discussed in the paper here:

> *While ECIG aerosol often contains some of the same chemicals found in combustible cigarette or hookah smoke such as nicotine, the composition (ie, concentration of each chemical per puff or product use) of the PM measured in this study likely differs from PM generated from combustible cigarette and hookah smoking. Therefore, this study does not provide the data needed for a direct comparison of the harms associated with exposure to high concentrations of PM generated from ECIG use and hookah or combustible cigarette smoke.*

Likely differs? How about *totally differs*? But undeterred by this rather fundamental point, the authors try to get back on track by throwing in a bunch of alarming chemical words to make the danger seem clear and present.

> *While the exact harm potential of secondhand exposure to ECIG aerosol is not currently known, the fact that secondhand ECIG aerosol contains fine particulates, nicotine, carcinogenic aldehydes, polycyclic aromatic hydrocarbons and volatile organic compounds indicates that exposure to secondhand ECIG aerosol may present some degree of harm to bystanders. Importantly, any of these bystanders who are not ECIG users have opted not to inhale ECIG aerosols yet, should they share indoor space with an ECIG user who is using their ECIG actively, are involuntarily inhaling these fine particulates.*

But all of this is without any quantification – they didn't measure the composition of aerosol or compare it to cigarette smoke or hookah emissions. And with toxicology, quantities and exposures are what matters. You know: "the dose makes the poison" and "risk = hazard x exposure" and all that.

From this statement, you might assume because the '*exact* harm potential … is not currently known' we are just in the process of narrowing down the science to the last decimal point of risk. But in reality, there is currently no basis for

believing there is any material risk to bystanders from e-liquid aerosol. The exposures to active users are extremely low, and exposure to bystanders would be well below the threshold of concern and far lower than from cigarettes.

Public Health England's evidence review p64-65 looks at studies in this area and concludes [link]:

> *EC release negligible levels of nicotine into ambient air with no identified health risks to bystanders.*

Nothing in this study overturns that finding. For more on the risks of e-liquid aerosol, see this in-depth review:

For more on the risks of e-liquid aerosol, see this in-depth review:

> ***Conclusion*** *Current state of knowledge about chemistry of liquids and aerosols associated with electronic cigarettes indicates that there is no evidence that vaping produces inhalable exposures to contaminants of the aerosol that would warrant health concerns by the standards that are used to ensure safety of workplaces. However, the aerosol generated during vaping as a whole (contaminants plus declared ingredients) creates personal exposures that would justify surveillance of health among exposed persons in conjunction with investigation of means to keep any adverse health effects as low as reasonably achievable. Exposures of bystanders are likely to be orders of magnitude less, and thus pose no apparent concern.*
>
> *Burstyn I. Peering through the mist: systematic review of what the chemistry of contaminants in electronic cigarettes tells us about health risks. BMC Public Health 2014;14:18. [link]*

In this study, Igor Burstyn is discussing exposure to active vapers and finds exposures to be below workplace safety thresholds, with no reason for concern about bystander exposure once these aerosols are exhaled and diluted into the ambient air.

Making a policy proposal based on almost

nothing

Tobacco Control embarrasses itself again, as it appears no-one involved noticed that this study provides no basis whatsoever to draw the following policy conclusion:

> *Regulatory bodies should consider establishing policies that prohibit ECIG use anywhere combustible cigarette use is prohibited.*

Regular readers will know that I think policy-making is a tough discipline that incorporates science, economics, rights and responsibilities, risk politics, law, options appraisal and impact assessment. It is truly risible that any research journal allows policy conclusions to be published that are based on such wholly inadequate and partial analysis – in this case a few readings of e-cig aerosol PM. To justify this policy proposal, they would need to consider (at least):

- why should regulators decide this issue at all? When should regulators intervene and when should it be left to owners and operators of premises like this hotel? The authors don't say.
- how can a study that "*does not provide the data needed for a direct comparison of the harms associated with exposure to high concentrations of PM generated from ECIG use and hookah or combustible cigarette smoke*" be used as a basis for justifying equivalent policies for smoking and vaping? It can't.
- did they translate their findings into an estimate of the risk of harm? No, their methodology doesn't allow for that, and if they had, they wouldn't have found a material risk.
- did they consider the weakness of generalising findings from a vape conference to a single crude rule applied to all settings? No.
- have they articulated and estimated the costs and benefits of their policy proposal – including welfare costs to vapers, losses to businesses and infringement of property rights? No.
- have they assessed possible unintended consequences – e.g. vaping bans leading to more smoking or relapse of vapers to smoking? No.
- have they examined the underlying justification for smoking bans to see if applies here? No. And it doesn't.
- have they considered alternative approaches, such as prescription in

> some places and owner discretion in others? No. They've reached straight for the bluntest instrument.

It's as though the authors think that getting something published in a journal somehow entitles them to insert a 'policy payload' to vent their priors and biases as if their article justifies them, no matter what the study finds and whatever limitations it has. If this was a credible journal, it would prohibit policy proposals in conclusions unless they were the main subject of the paper and the policy analysis had been worked through at least as carefully as above.

I am not saying that no-one should care about the impact of vaping on indoor air quality. Just that based on what we know, the issue is more a matter nuisance and etiquette. The judgements of owners and managers should determine the vaping policy in any particular setting. Clearly those running a vaping conference may have different preferences to someone running a nursery school. It's pretty obvious that a vaping conference might make different decisions about vaping policy and the hotel might choose to be vape friendly to encourage this trade.