

The critic's guide to bad vaping science

written by Clive Bates | 7 December 2016



“Full of sound and fury but signifying nothing” -
Shakespeare

This is part one of a twin post. Part 2 is [Five questions to put to the US Surgeon General on e-cigarette science](#) (next posting).

To respond to the forthcoming publication of a new US Surgeon General publication on e-cigarettes, I have have expedited my long-planned guide to bad science in the field of e-cigarettes and vaping in the hope that commentators, opinion formers and members of the public will give this review proper critical scrutiny.

So here it is: Version 1.0 of a critic's guide to bad e-cigarette and and vaping science. This is the informed critic's plain language guide to questioning the science of sensationalist and alarmist e-cigarette studies.

Here it is: [The critic's guide to bad vaping science](#) (PDF - 15 pages)

This is the table of contents, which I hope is in itself a handy guide to interrogating bad science.

1 Toxic chemicals have been identified in e-cigarette vapor or e-liquids

- 1.1 Did they show potentially harmful exposure?
- 1.2 How risky compared to smoking?
- 1.3 How risky compared to other risks?
- 1.4 Were measurements made in realistic human operating conditions?
- 1.5 Are inappropriate proxies being used for risk?
- 1.6 Are heroic but flawed analogies being used to suggest more risk than there is?

2 Adverse health effects from e-cigarettes are reported

- 2.1 Was vaping the cause?
- 2.2 Was the person suffering from adverse impacts a smoker before using e-cigarettes?
- 2.3 Is the study just observing the effect of nicotine on the body?
- 2.4 Is there evidence of actual harm or is it just a change in the body or brain?
- 2.5 Is it based on a cell culture study and are the limitations recognized?
- 2.6 Is it based on an animal study and are the limitations recognized?

3 Claims second-hand vapor is toxic and indoor vaping should be banned

- 3.1 Are exposures to second-hand vapor potentially harmful?
- 3.2 Is difference between risk and nuisance and its policy relevance understood?
- 3.3 Is the real question about who should decide: the law or the property owner?

4 Nicotine damages the adolescent brain

4.1 What is the specific nature of the harm to humans?

4.2 Where is the evidence for the damage in the human population of smokers?

4.3 How does this compare to damage from alcohol, cannabis or caffeine?

5 More children using e-cigarettes and gateway effects

5.1 Did they characterize use properly?

5.2 Could the rising use of e-cigarettes be a good thing?

5.3 High level of smoking associated with vaping?

5.4 Have they defined a gateway effect?

5.5 Are they assuming prior behavior caused the later behavior?

6 E-cigarettes keep people smoking and reduce quit rates

6.1 Has vaping been wrongly conceptualized as though it is a medical intervention?

6.2 Has the importance of product's consumer appeal been recognized?

6.3 Was "dual use" described as problematic?

6.4 Did they claim there are no benefits to cutting down?

6.5 Not enough randomized controlled trials (RCTs)?

7 Flavors and e-cigarette marketing aimed at children

7.1 Do they assume it is just obvious that childish names appeal to kids?

7.2 Why would adolescents try to emphasize their childishness?

7.3 Have preference for particular flavors been misrepresented as a cause of vaping?

- 7.4 Could it be a benefit that some flavors are attractive to adolescents?
- 7.5 Who is young?
- 7.6 Is an e-cig ad an anti-smoking ad?
- 8 Citing uncertainty and appeal to the 'precautionary approach'
- 8.1 Have they understood what is known?
- 8.2 Are they asking the impossible?
- 8.3 Do they realize that 'precautionary approach can do harm to health?
- 9 Tobacco industry involvement implies inevitable harm
- 9.1 Is the malign influence of tobacco companies assumed or demonstrated?
- 9.2 Is there over-reliance on decades old statements, documents or behaviors?
- 9.3 Is there a proper understanding of how the nicotine market works?
- 9.4 Are the authors concerned about the right things?
- 10 Policy recommendations in a scientific paper
- 10.1 Do policy recommendations go beyond what their research justifies?
- 10.2 Have policy-making disciplines been followed?
- 10.3 Are the authors' policy positions revealing biases?
- 10.4 Have unintended consequences been ignored?