

E-cigs & toxicology: nothing new under the Sun

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Basic idea

- **Toxicology of emissions from e-cigs: we are not ignorant**
- **Rich experience with other sources of environmental & workplace emissions.**
- **There is no reason to assume precautionary posture that amounts to willful ignorance**
- **Read: 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 Jan 9;14:18. PubMed PMID: 24406205**

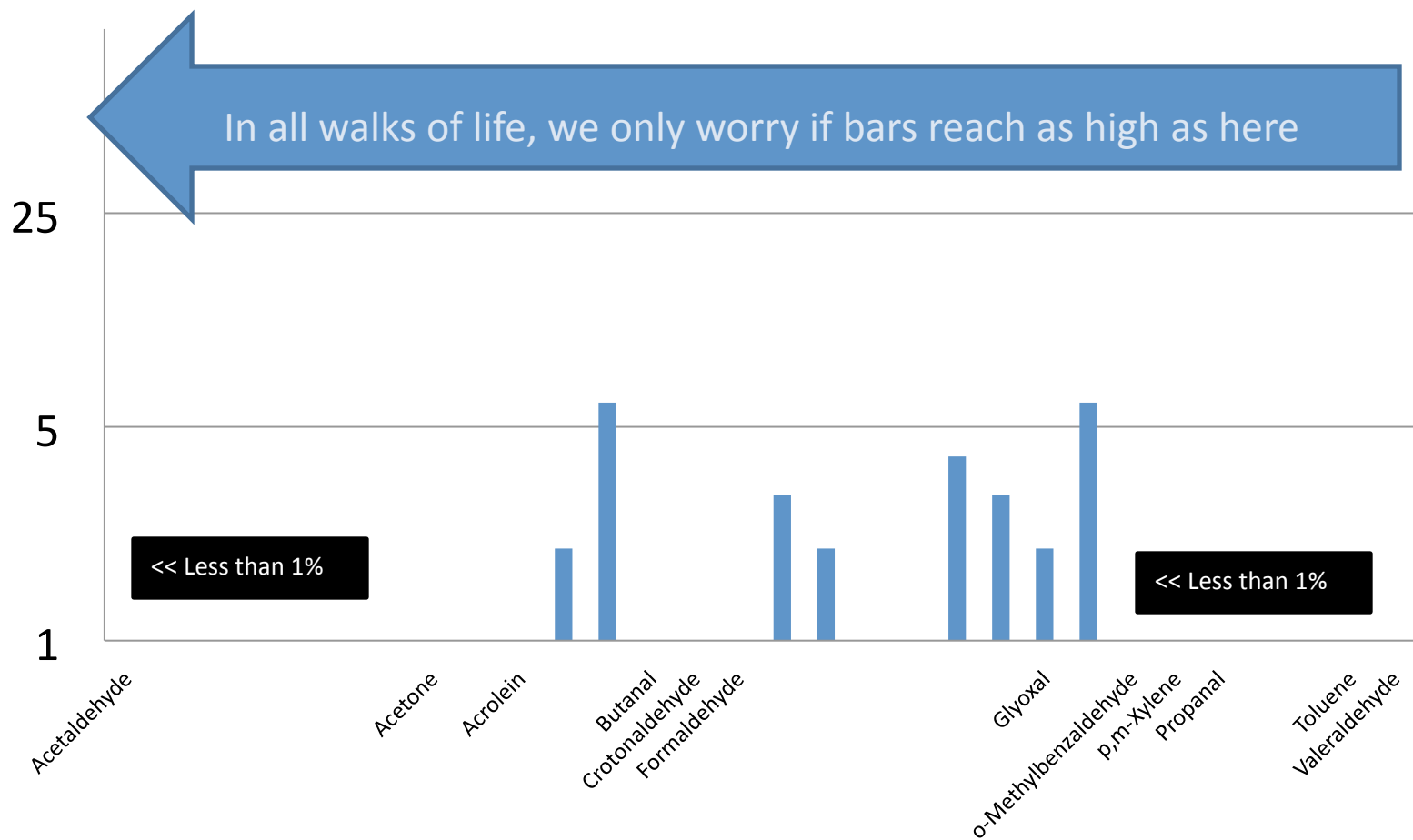
“The dose makes the poison”

Paracelsus, 1538

Specific response to question posed by workshop

- What are the identities, quantities and origins of the chemical constituents of the e-cigarette aerosols inhaled and exhaled aerosols by users?

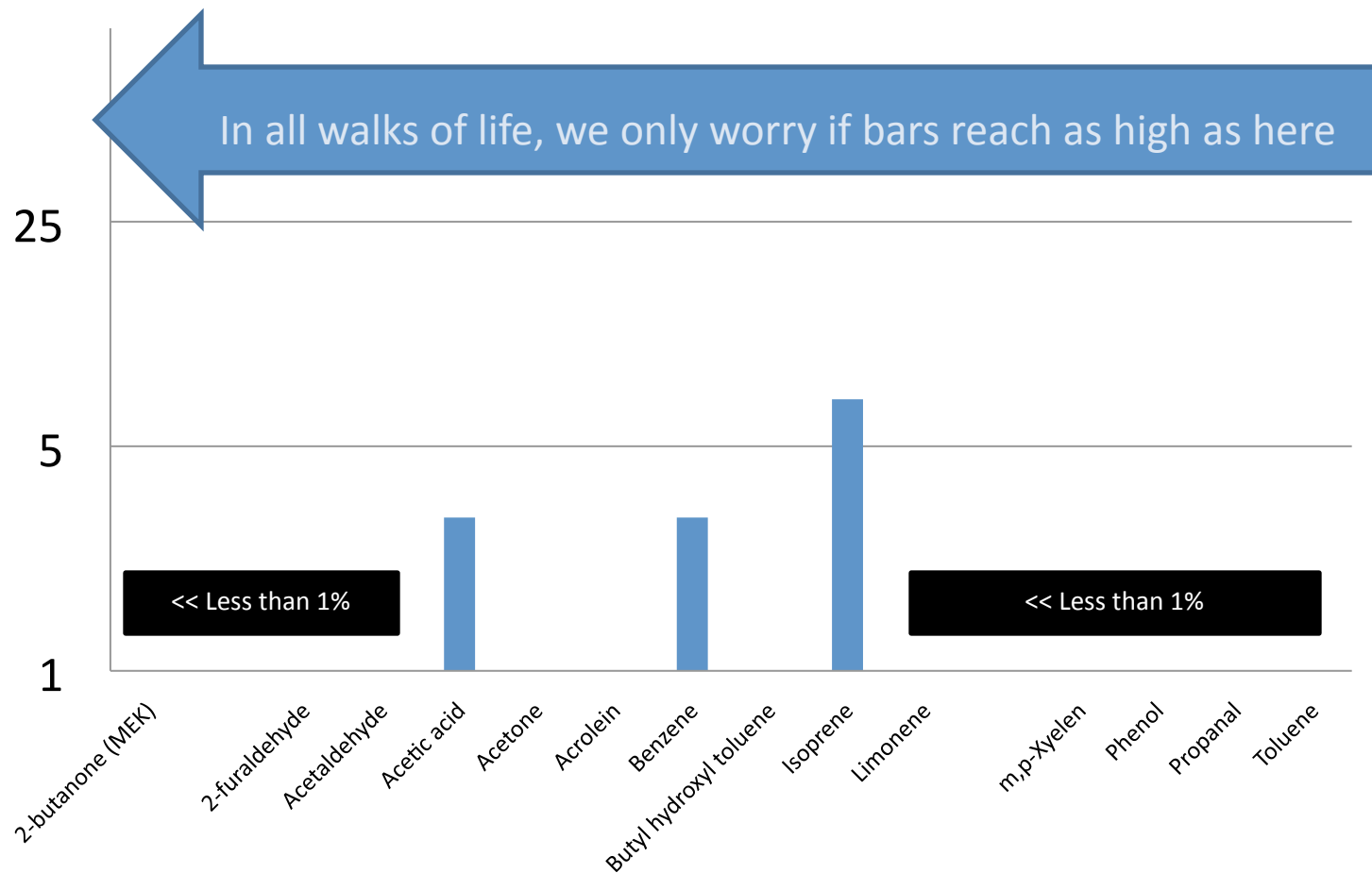
% of exposure limit predicted: smoking machine experiments



Specific response to question posed by workshop

- What are the identities, quantities and origins of the chemical constituents of the e-cigarette aerosols inhaled and exhaled aerosols by users?

% exposure limit predicted: from vapors



Most important to remember

- **We know a great deal about e-cigarettes!**
- **If they did not have word “cigarettes” in name of the product, nobody would be concerned:**
 - ... What's in a name? that which we call a rose*
 - By any other name would smell as sweet*
- **It is not appropriate to regulate e-cigarettes as if we learnt nothing from environmental sciences since 16th century: **scientists do not fear every chemical & neither should the public.****

Some other questions & answers

Q: What methods exist to measure chemicals in aerosols (including particle size distribution)?

A: There is **wide range of established chemical assays** because there is nothing novel about ingredients of e-cig emissions.

The question about particles is irrelevant – particles are not generated in vaping, only droplets. Studies that report “particles” mistake them for droplets/mists that scatter light: it is an artifact of measurement device known to all experts in the field of environmental measurements.

Q: What are the quantitative and qualitative relationships between the chemical contents in e-liquids (e.g., nicotine, humectants, flavorings) and chemical constituents in aerosols inhaled by users?

A: New compounds are not generated during typical vaping: **chemistry of e-liquids is an excellent predictor of chemistry of the aerosol.**

Q: Given that the e-liquids and aerosols contain varying mixtures of toxicants, what comparative toxicity evaluations could be conducted between different e-cigarette products?

A: **Methods exist and are used all over the World** to evaluate hazard of complex mixtures. Threshold Limit Values or analogous exposure limits that are most well-developed in occupational health are most suitable since they are meant to protect average person, not as some incorrectly claimed, healthier-than-average/“resistant” persons.