

Panorama des thèmes de recherches sur la QAI

Jelle Laverge - Ghent University

*Avec le soutien du Fonds Européen de Développement Régional et de :
Met de steun van het Europees Fonds voor Regionale Ontwikkeling en van :*

IAQ?



Volatile organic chemicals in a strawberry

Esters

Methyl butyrate
Ethyl butyrate
Methyl hexanoate
Ethyl hexanoate
Hexyl acetate
(E)-2-hexenyl acetate
Butyl hexanoate
Hexyl butyrate
Methyl octanoate
Ethyl octanoate
Octyl acetate
Octyl butyrate
Octyl-2-methyl butyrate
Hexyl hexanoate
Octyl isovalerate
Decyl acetate
Octyl hexanoate
Decyl butyrate

Lactones

Gamma-decalactone
Gamma-dodelactone

Aldehydes

Furfural
5-hydroxy methyl furfural

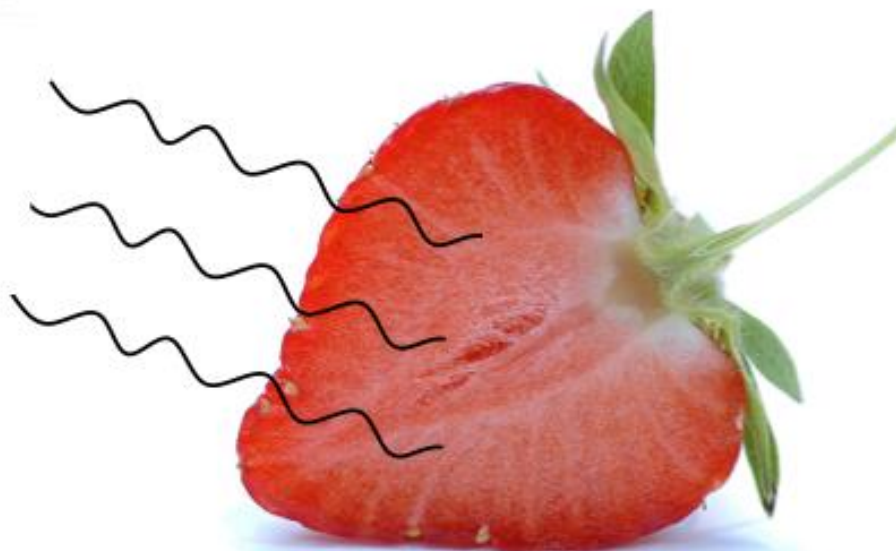
Terpenes

Limonene
Linalool
(E)-Nerolidol

Alcohols

Hexanol
Octanol

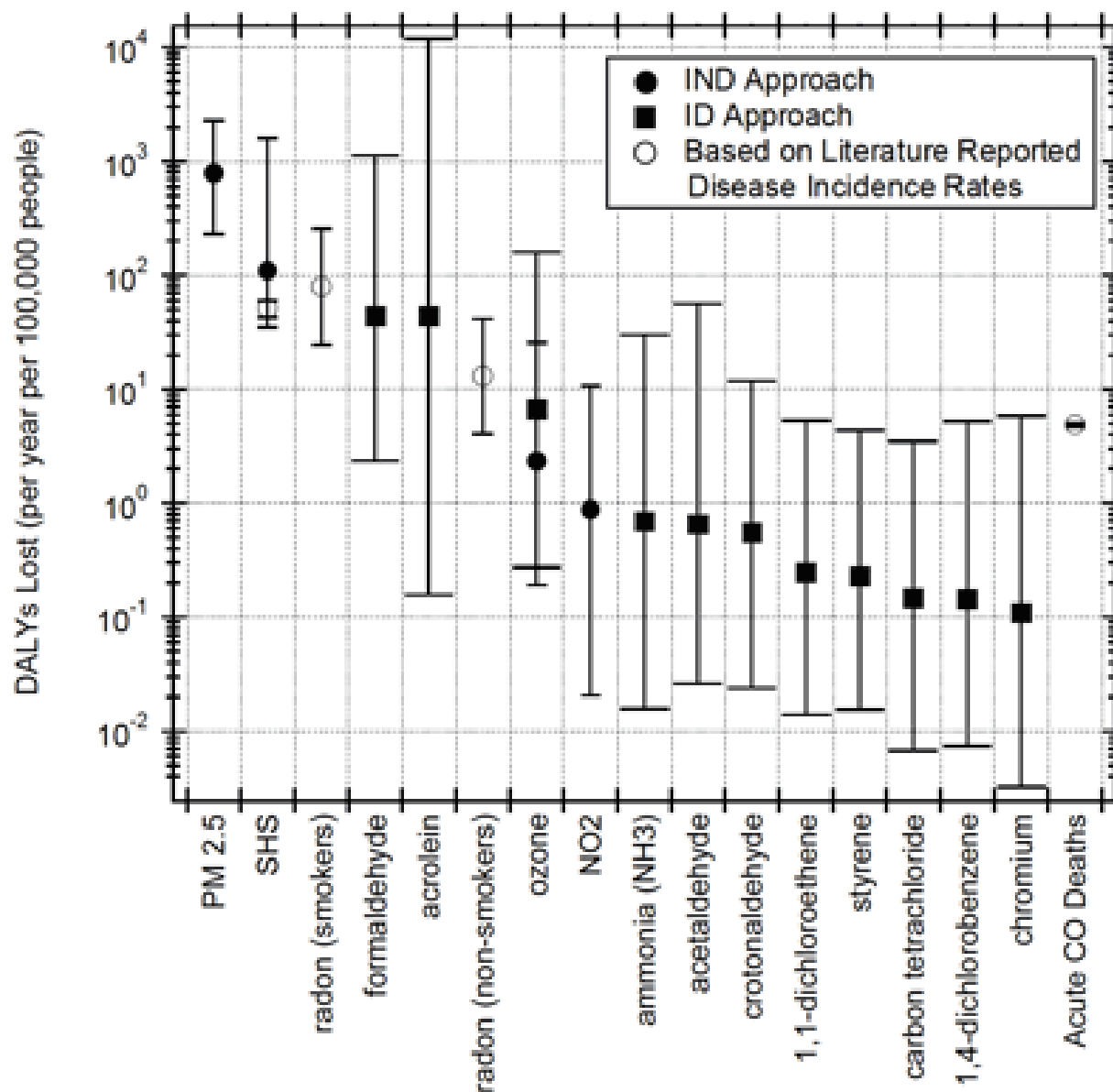
these put together are what you “smell”



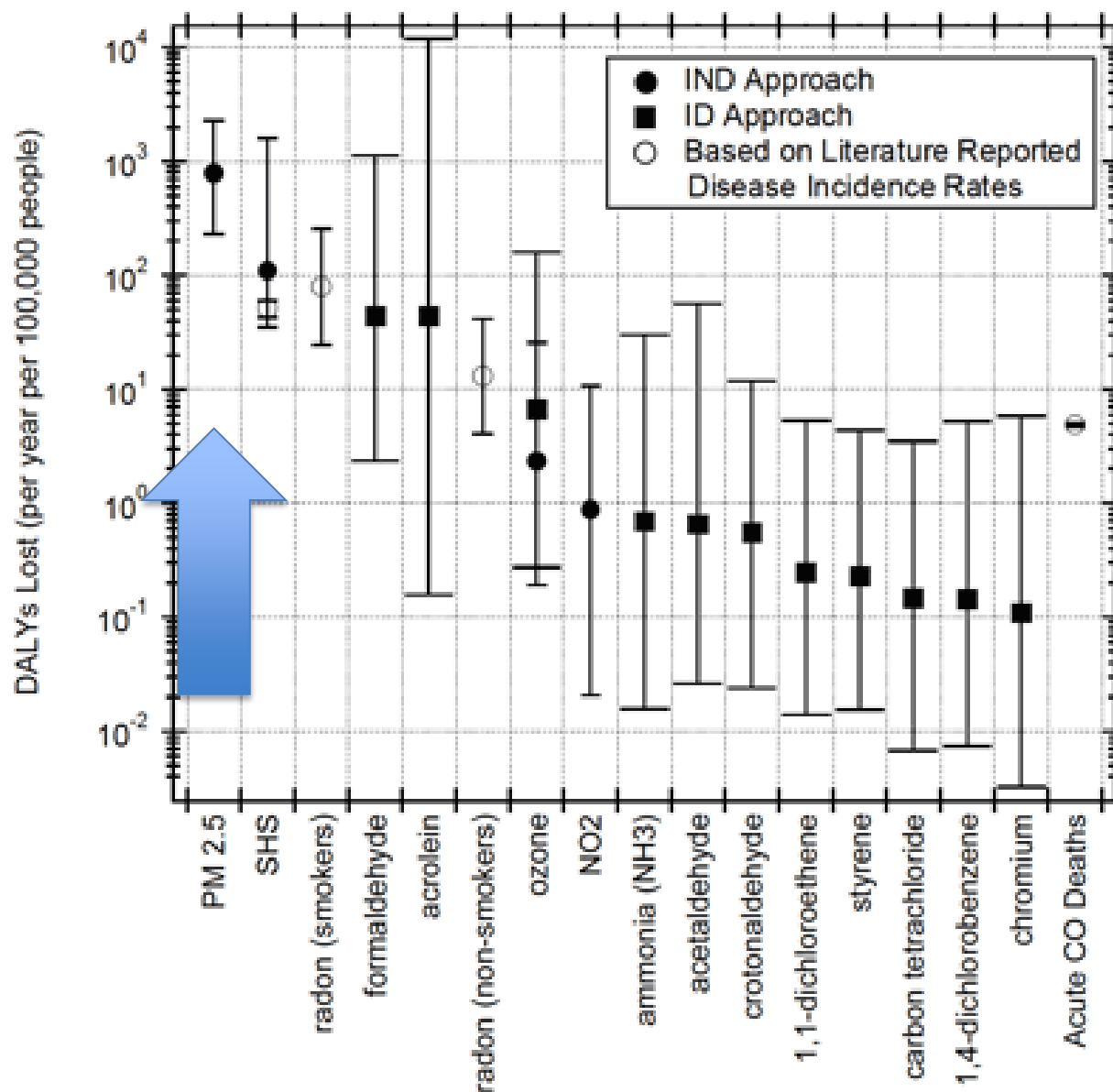
from Kafkas and Paydas, *World Journal of Agricultural Sciences* 3(2) 191-195 (2007)

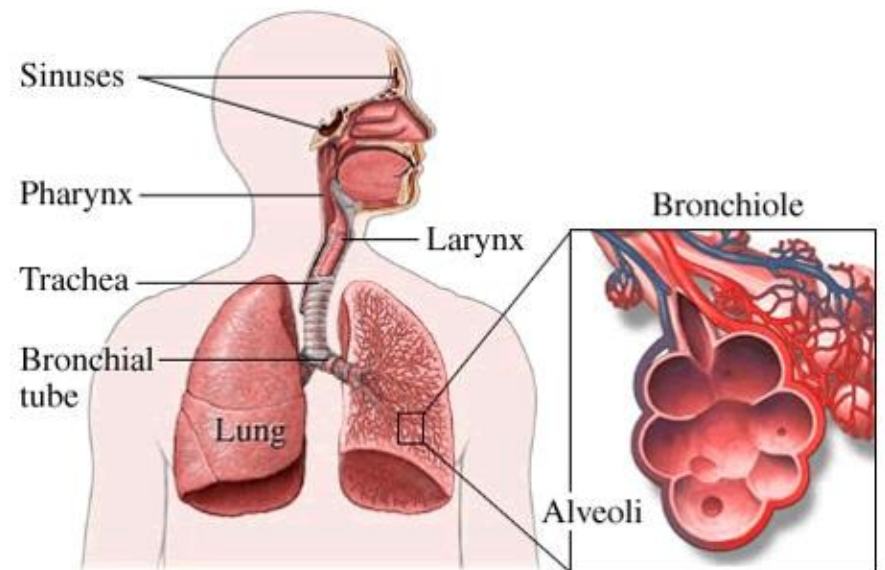
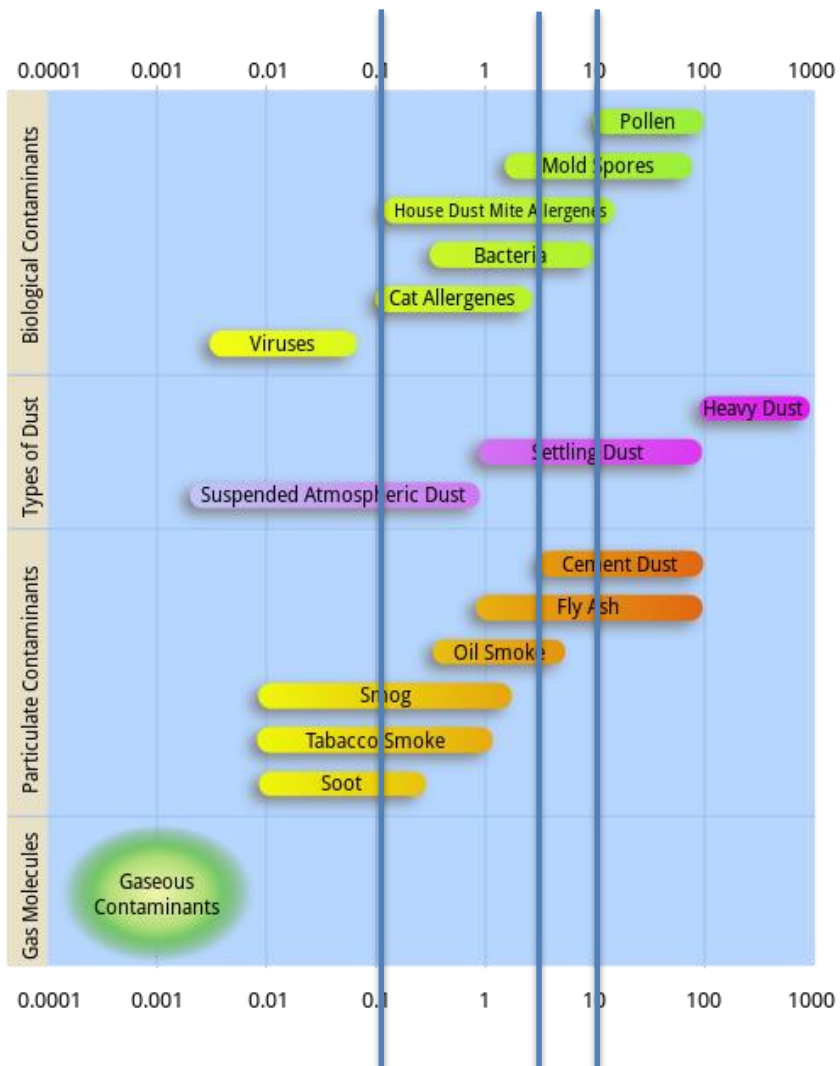


Logue et al.
LBNL



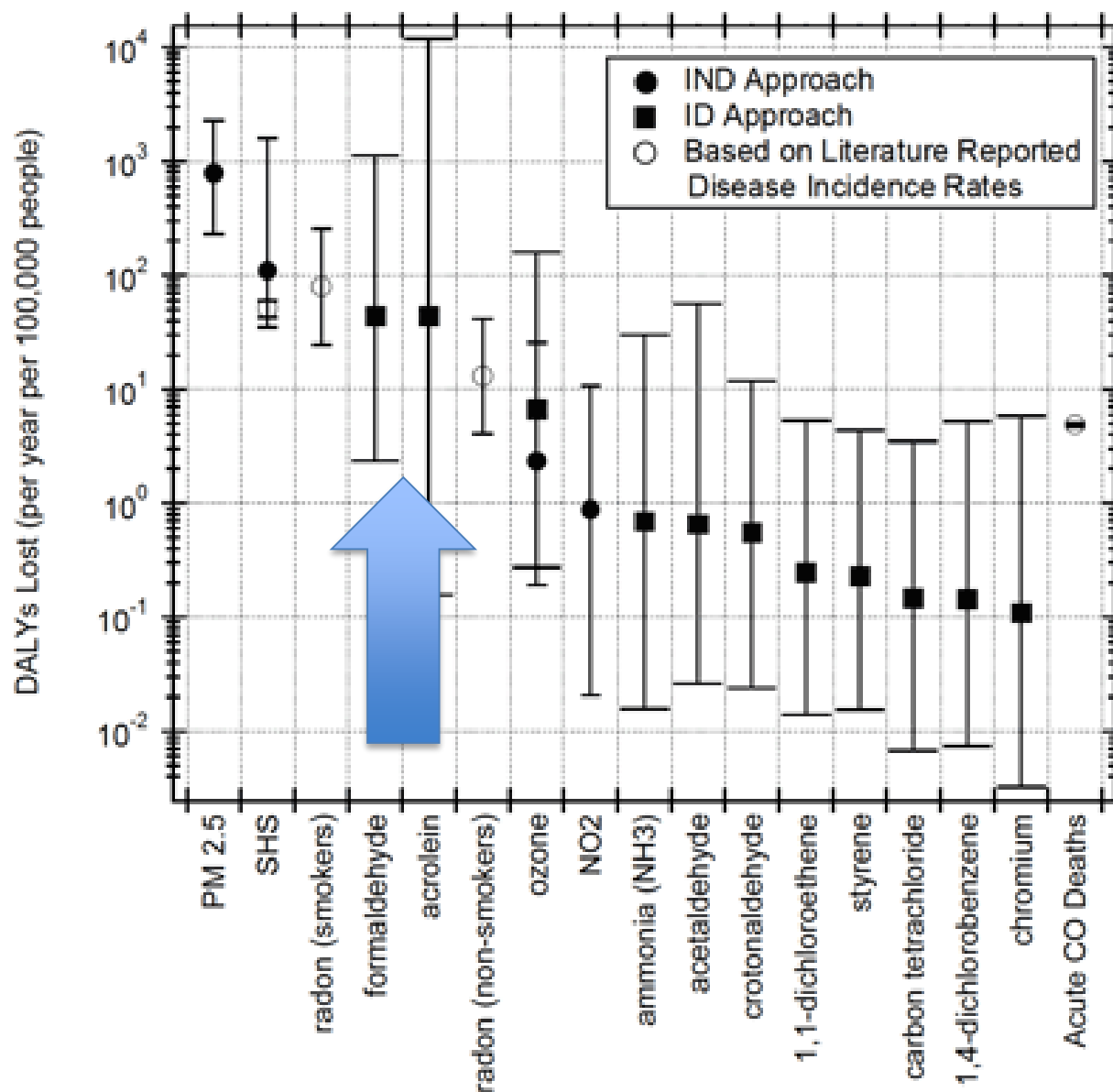
Logue et al.
LBNL





wikipedia: particulates

Logue et al.
LBNL



Description	Abbreviation	Boiling Point Range (°C)
Very volatile (gaseous) organic compounds	VVOC	<0 to 50–100
Volatile organic compounds	VOC	50–100 to 240–260
Semi volatile organic compounds	SVOC	240–260 to 380–400

< C6

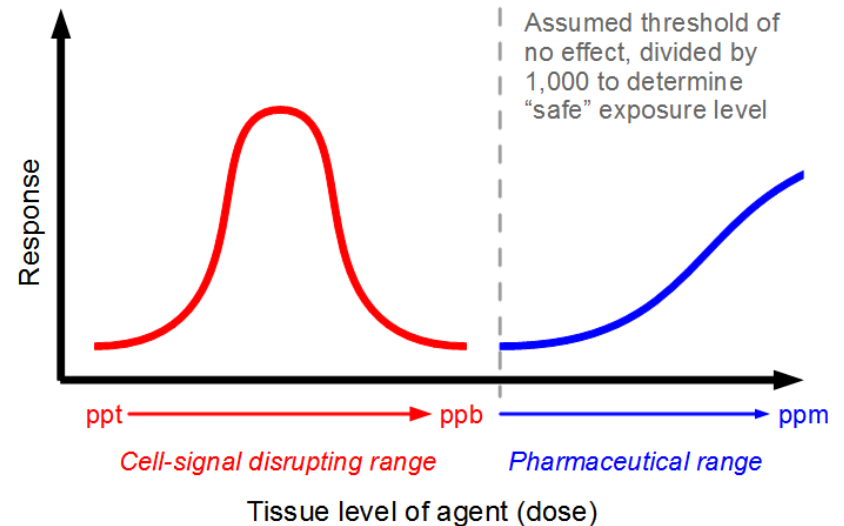
C6-C15

> C16





Inverted-U dose-response curve for some endocrine disrupting chemicals



Quid?

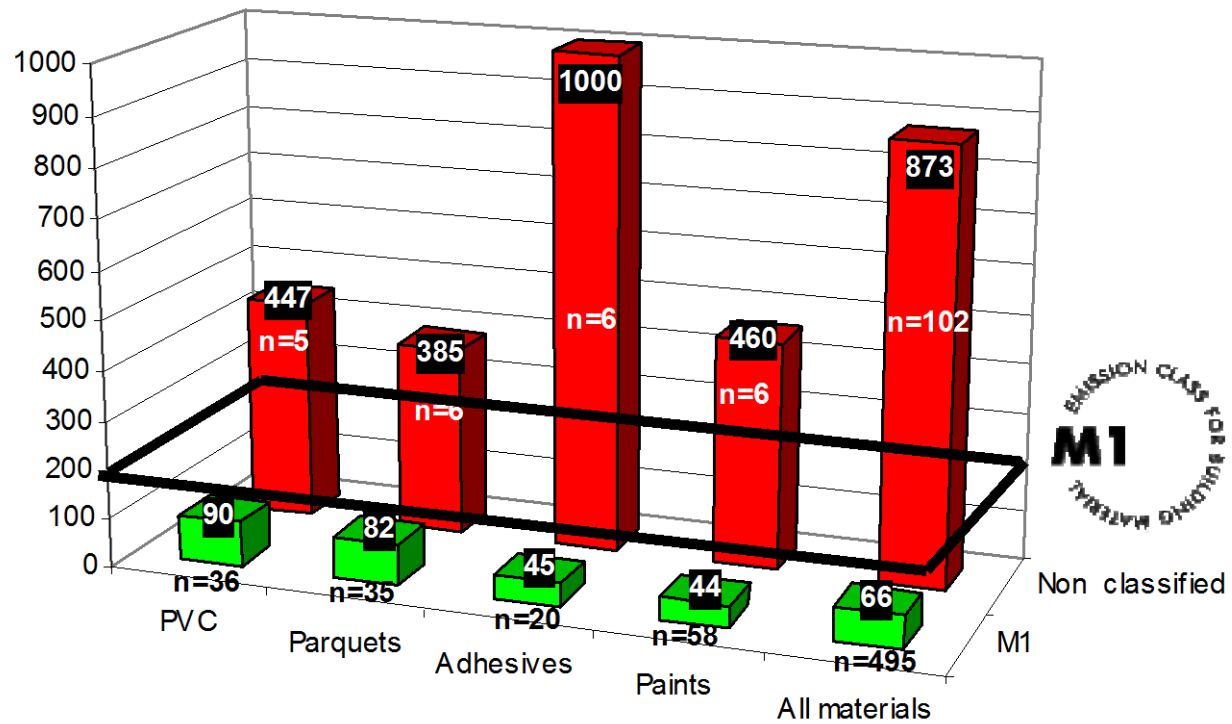


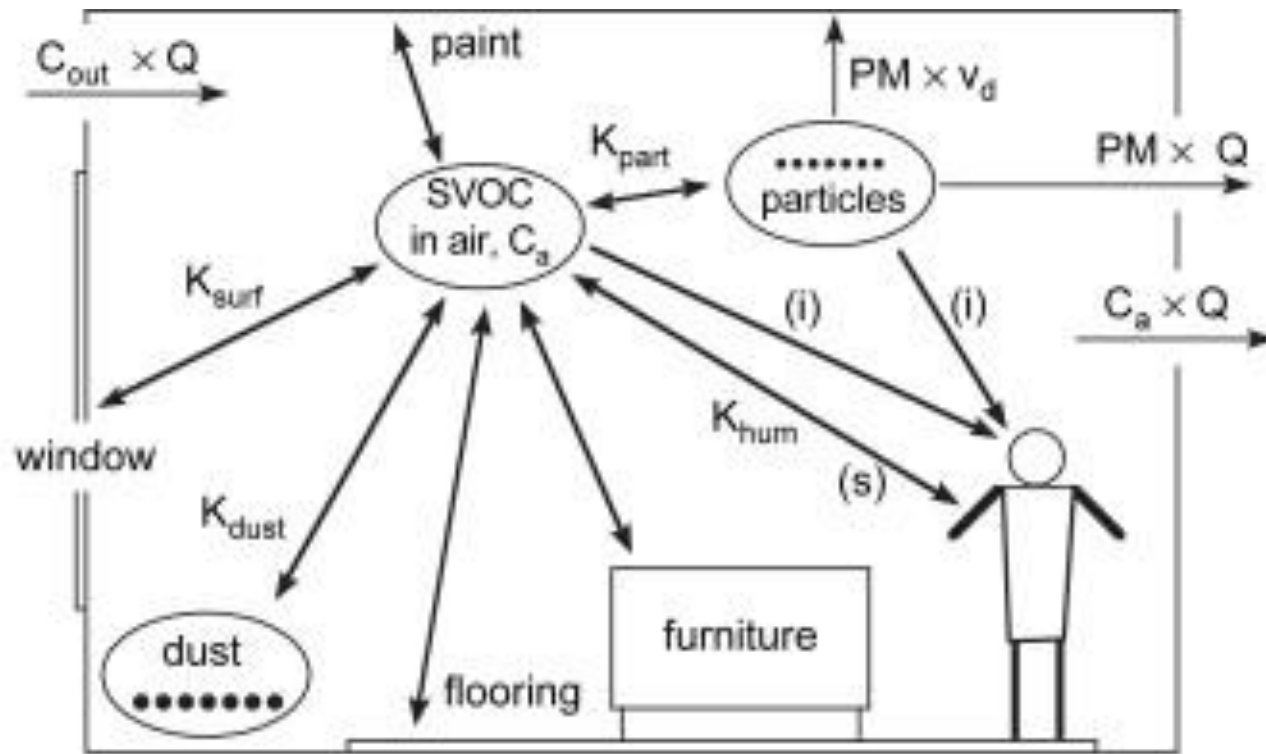
*If there is a pile of manure in a space,
do not try to remove the odor by ventilation.
Remove the pile of manure.*

Max von Pettenkofer, 1858

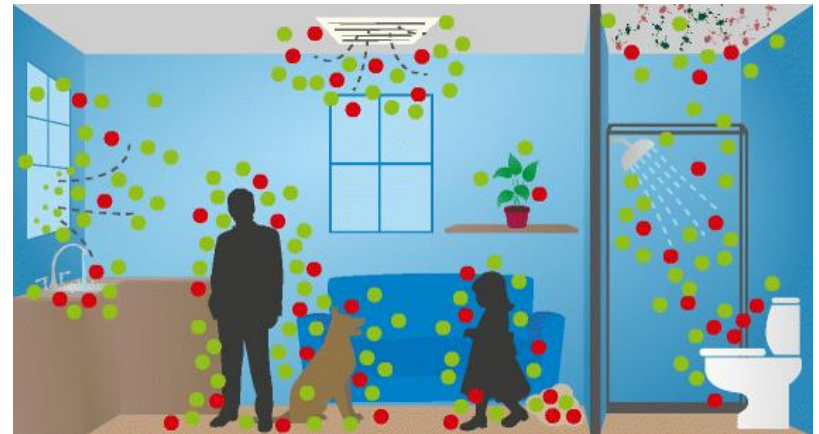
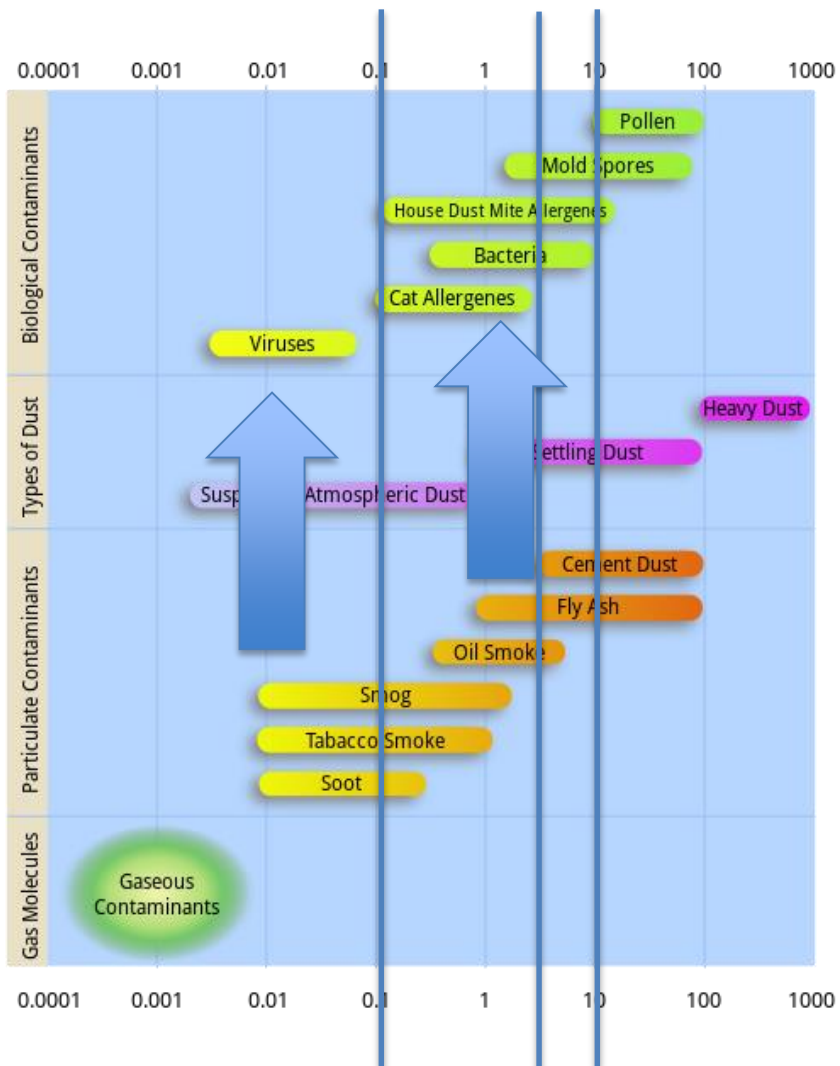


TVOC SER [$\mu\text{g}/\text{m}^2\text{h}$]



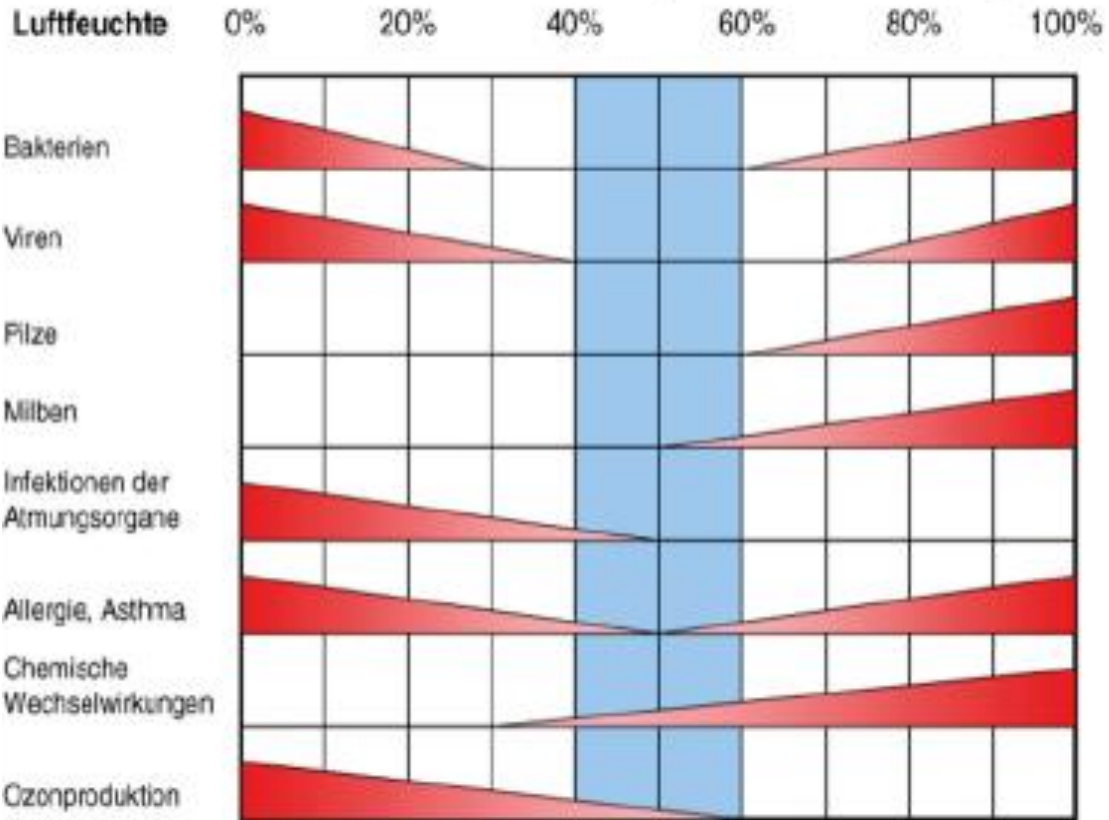


(i) - inhalation intake; (s) - skin permeation



wikipedia: particulates

Raumluftheuchte und menschlich-biologische Wechselwirkungen



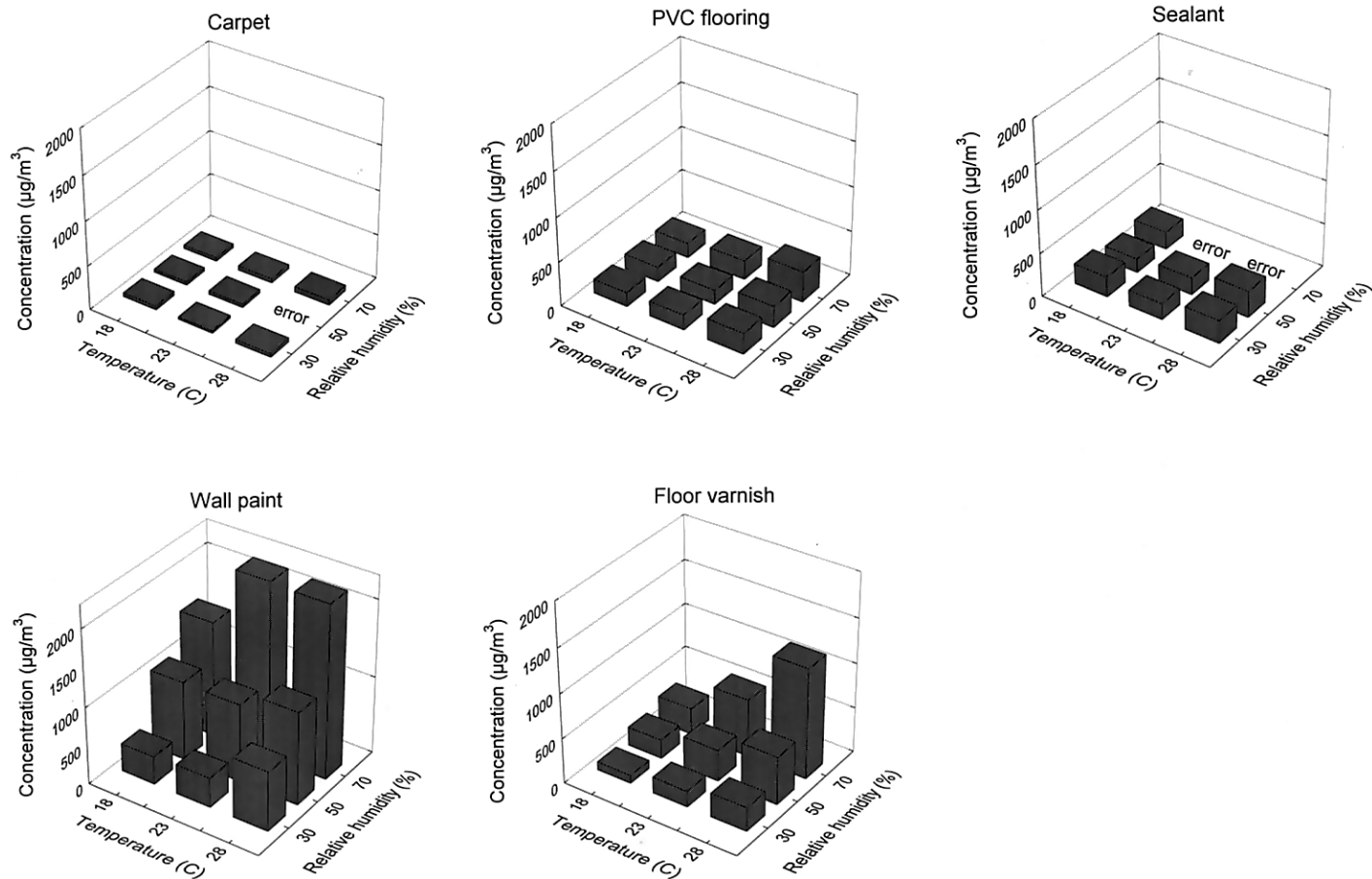


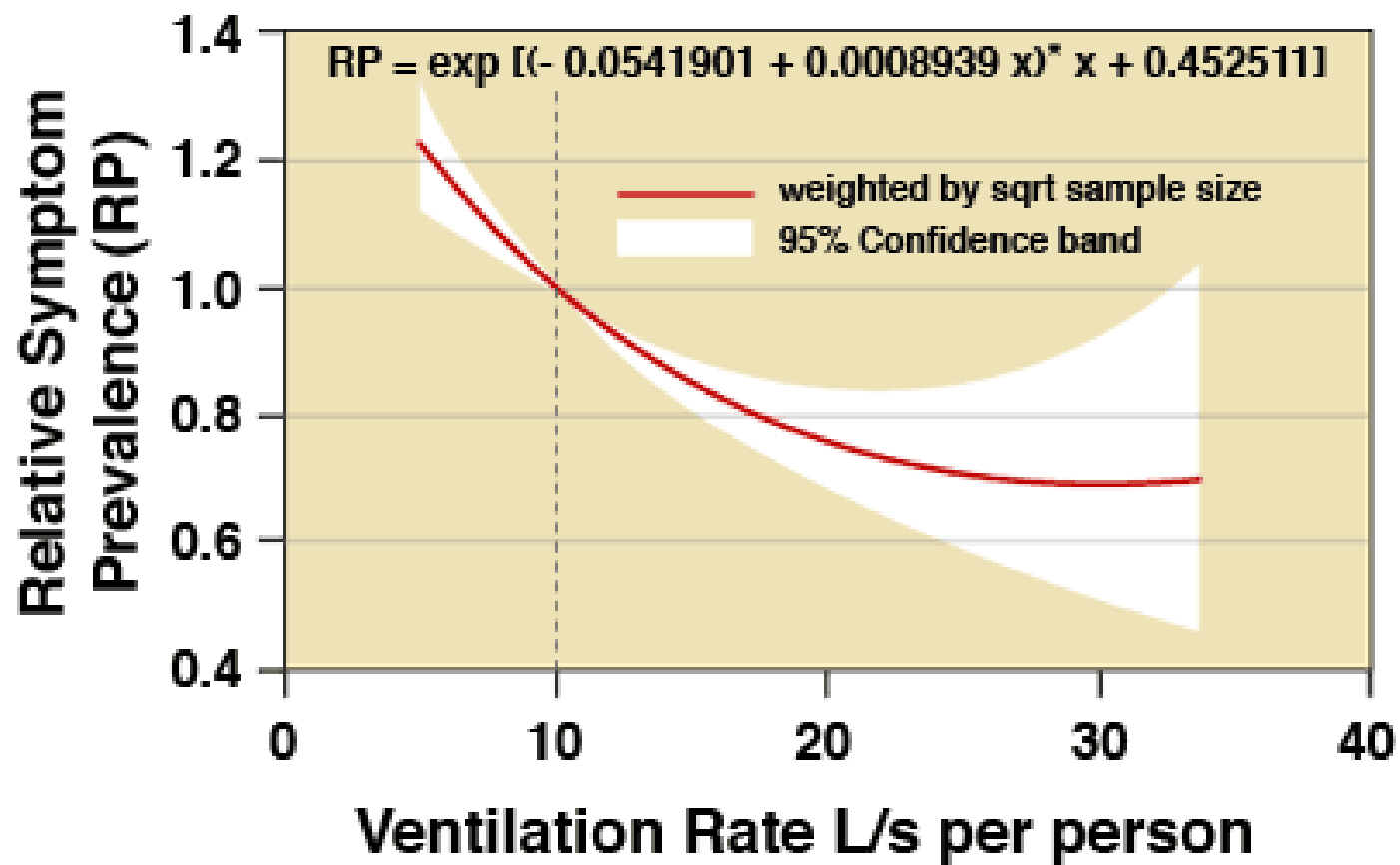
Fig. 2 Measured concentration of TVOCs emitted from the five materials at the nine levels of temperature and humidity

Fang, Clausen & Fanger, 1999



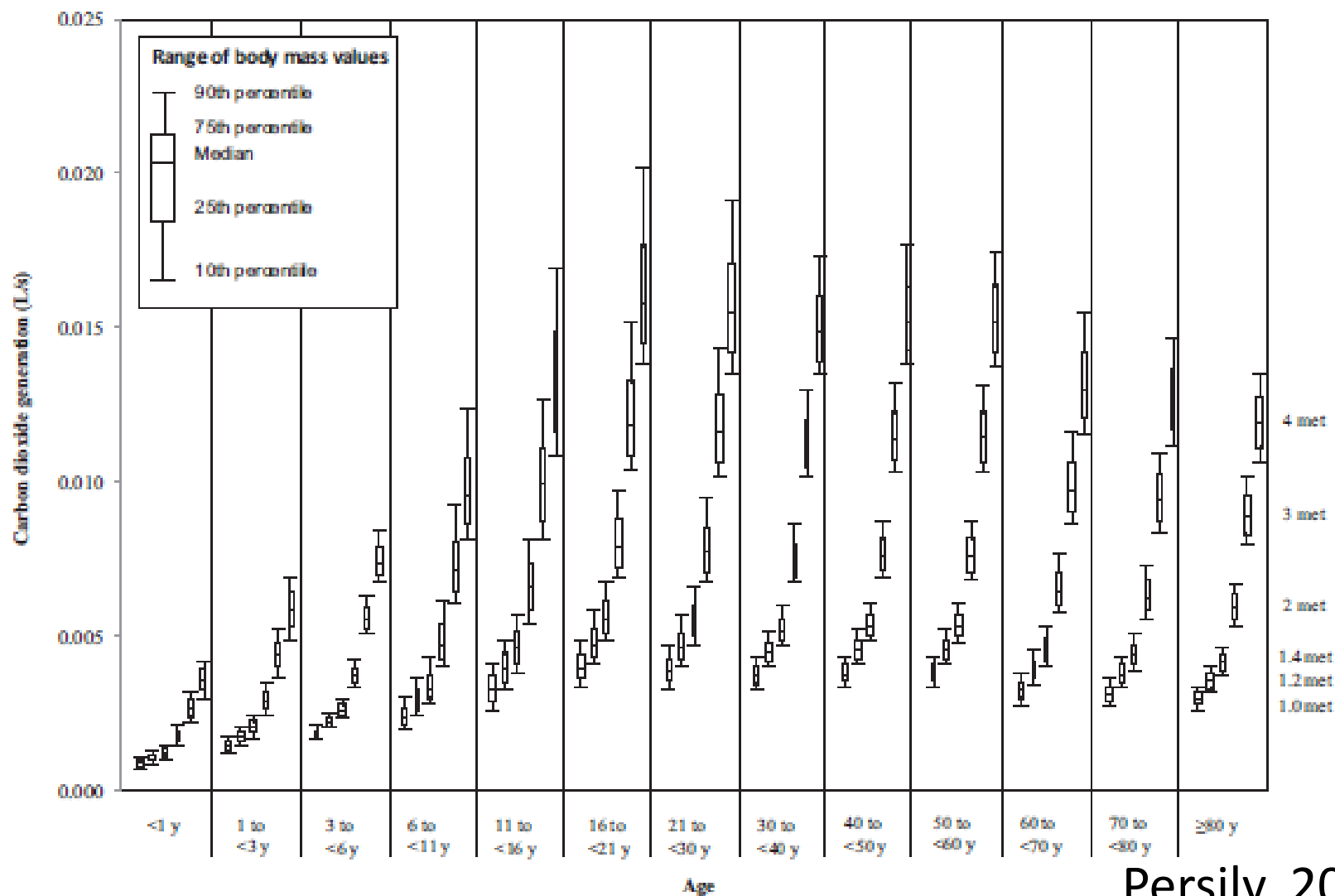
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extremely sensitive and require a high ventilation rate to make them feel that the air is acceptable. On the other hand, the curve shows that others are rather tolerant, judging even extremely low ventilation rates as acceptable.

Figure 2 shows the percentage of dissatisfied predicted by eqn. (1) as a function of the actually measured percentages of dissatisfied in the experimental studies [4, 5].



Persily, 2017

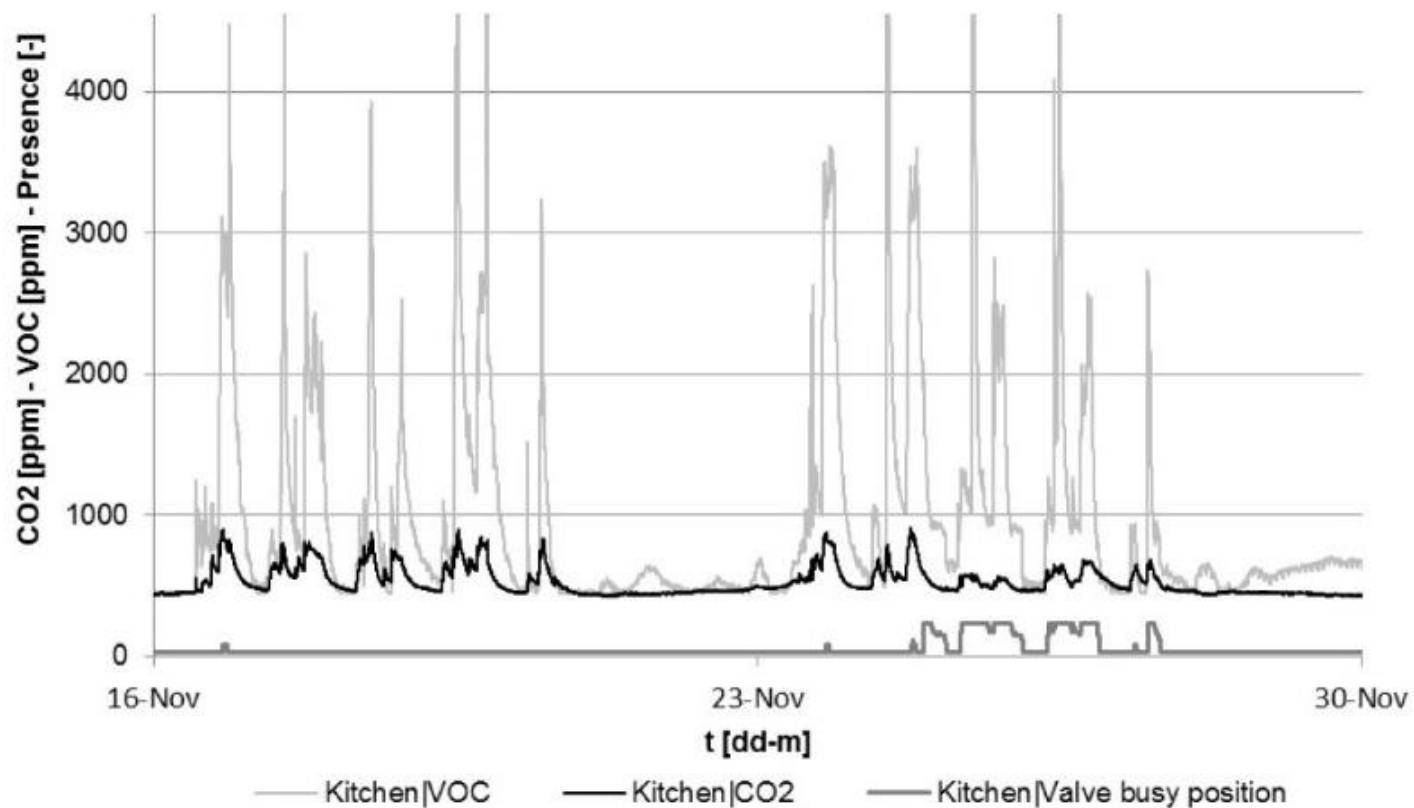
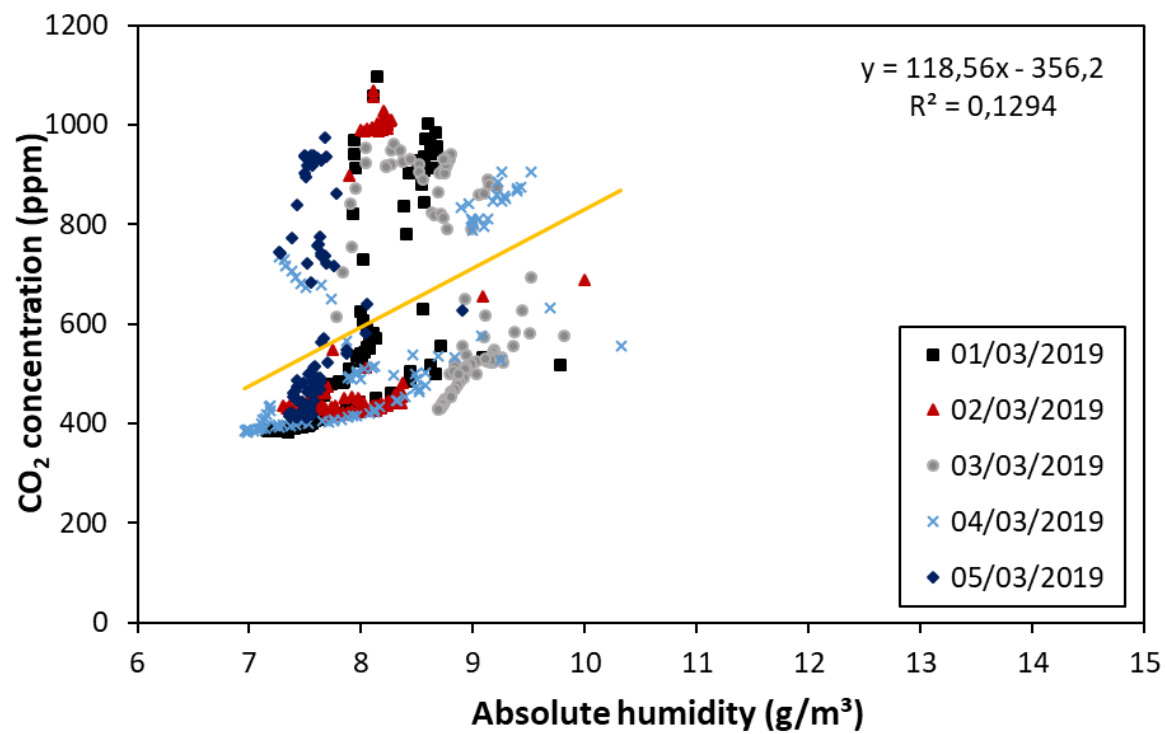
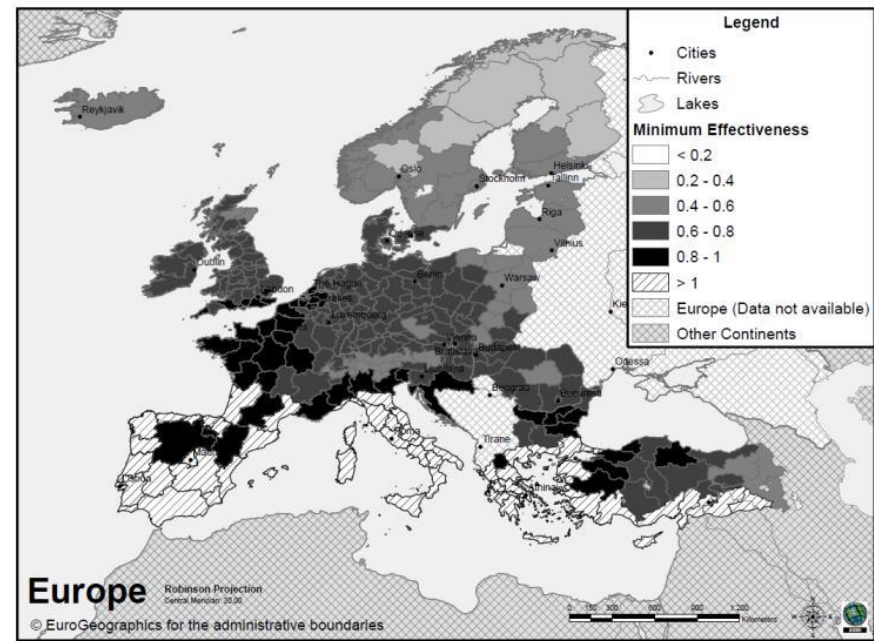
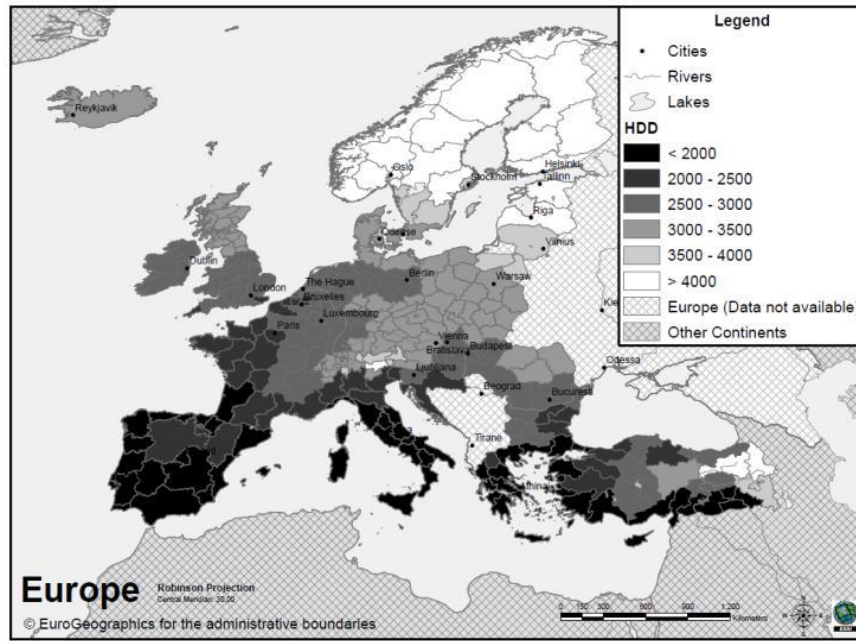


Figure 1: CO₂ and VOC concentrations over 2 weeks [week 1: DCV_{CO2} ; week 2: DCV_{VOC}]





Laverge, Jelle and A. Janssens, 2012, “Heat recovery ventilation operation traded off against natural and simple exhaust ventilation in Europe by primary energy factor, carbon dioxide emission, household consumer price and exergy”, Energy and Buildings

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