NICOTINE AND TOXICANT EXPOSURE FROM E-CIGARETTES

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With thanks to:

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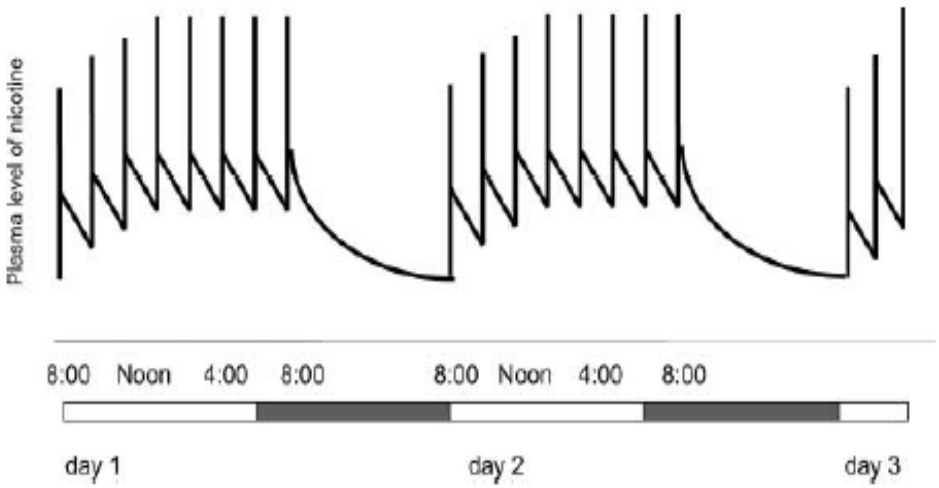
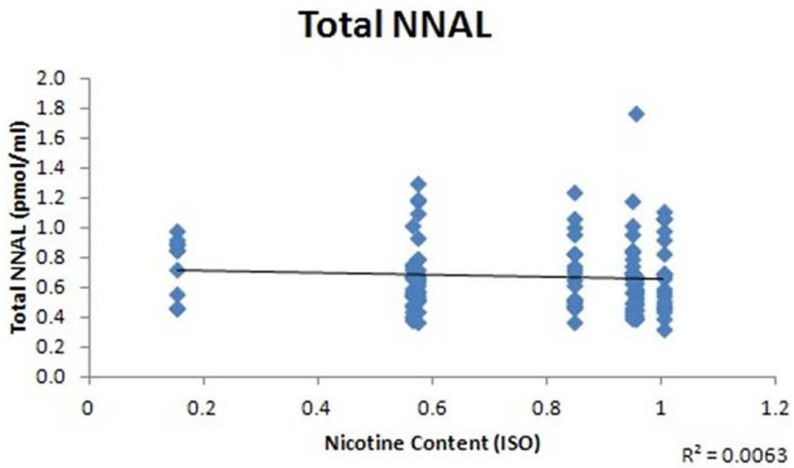
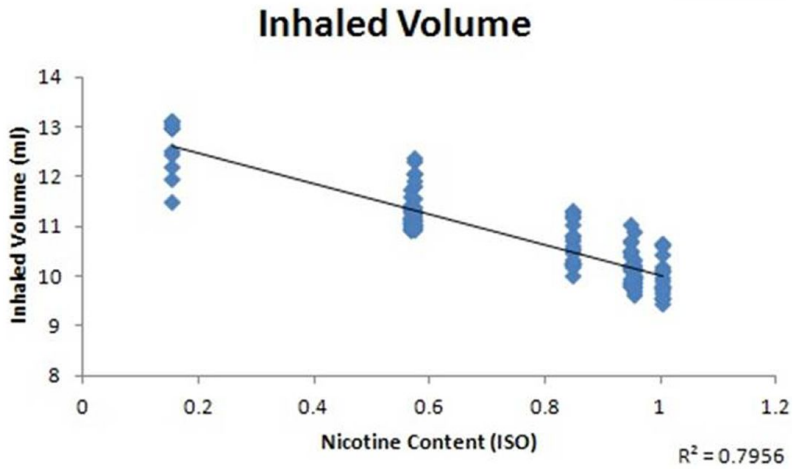
Nicotine and Smoking







Munafò & McNeill (2013). J Psychopharmacol, 27, 13-18.

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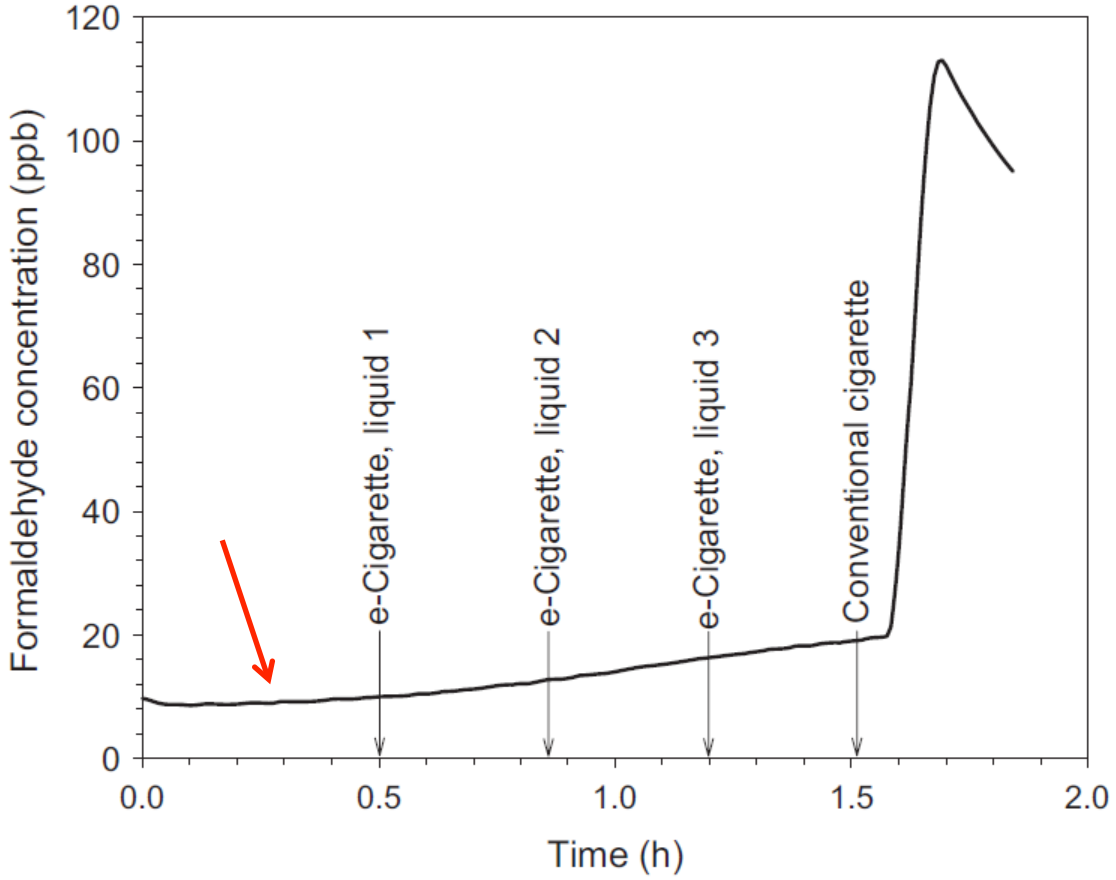
Nicotine vs Smoking

Table 4 Concentrations ($\mu g/m^3$) of selected compounds during the 8-m^3 emission test chamber measurement of e-cigarette A and conventional cigarette using Tenax TA and DNPH

			E-cigarette			Conventional cigarette
Compounds	CAS	Participant blank	Liquid 1	Liquid 2	Liquid 3	
1,2-Propanediol	57-55-6	<1	<1	<1	<1	112
1-Hydroxy-2-propanone	116-09-6	<1	<1	<1	<1	62
2,3-Butanedione	431-03-8	<1	<1	<1	<1	21
2,5-Dimethylfuran	625-86-5	<1	<1	<1	<1	5
2-Butanone (MEK)	78-93-3	<1	2	2	2	19
2-Furaldehyde	98-01-1	<1	<1	<1	<1	21
2-Methylfurane	534-22-5	<1	<1	<1	<1	19
3-Ethenyl-pyridine[a]	1121-55-7	<1	<1	<1	<1	24
Acetic acid	64-19-7	<1	11	13	14	68
Acetone	67-64-1	<1	17	18	25	64
Benzene	71-43-2	<1	<1	<1	<1	22
Isoprene	78-79-5	8	6	7	10	135
Limonene	5989-27-5	<1	<1	<1	<1	21
m,p-Xylene	1330-20-7	<1	<1	<1	<1	18
Phenol	108-95-2	<1	<1	<1	<1	15
Pyrrole	109-97-7	<1	<1	<1	<1	61
Toluene	108-88-3	<1	<1	<1	<1	44
Formaldehyde[b]	50-00-0	<1	8	11	16	86
Acetaldehyde[b]	75-07-0	<1	2	2	3	119
Propanal[b]	123-38-6	<0.2	<0.2	<0.2	<0.2	12

Schripp et al. (2013). Indoor Air, 23, 25-31.

Nicotine vs Smoking



Formaldehyde levels after e-cigarette and cigarette use in chamber (8 m^3)

Elevated levels detected **before** e-cigarette use (red arrow)…

Source of formaldeyhde internal metabolism and breath of volunteer

Schripp et al. (2013). Indoor Air, 23, 25-31.

Nicotine vs Smoking

Parameter	Sampling time Minutes	Sampled volume Liters 20℃ 0,101 MPa	Mean concentration µg/m^3 a 20℃ e 0,101 MPa
Naphthalene	300	570,06	2,78
Acenaphthylene	300	570,06	< 0,02
Acenaphthene	300	570,06	0,19
Fluorene	300	570,06	0,47
Phenanthrene	300	570,06	0,37
Anthracene	300	570,06	< 0,04
Fluoranthene	300	570,06	0,13
Pyrene	300	570,06	< 0,01
Benzo(a)anthracene	300	570,06	< 0,16
Chrysene	300	570,06	5,46
Benzo(b)fluoranthene	300	570,06	< 0,33

Cigarette

Romagna et al. (2012). SRNT Europe Annual Meeting.

Smokers (n = 5) and vapers (n = 5)

Hotel room (60 m^3) on separate days

Ad libitum use of cigarette / e-cigarette

Nicotine vs Smoking

Parameter	Sampling time Minutes	Sampled volume Liters 20℃ 0,101 MPa	Mean concentration µg/m^3 a 20℃ e 0,101 MPa	Mean concentration µg/m^3 a 20℃ e 0,101 MPa
Naphthalene	300	570,06	2,78	< 0,02
Acenaphthylene	300	570,06	< 0,02	< 0,02
Acenaphthene	300	570,06	0,19	< 0,03
Fluorene	300	570,06	0,47	< 0,06
Phenanthrene	300	570,06	0,37	< 0,08
Anthracene	300	570,06	< 0,04	< 0,04
Fluoranthene	300	570,06	0,13	< 0,02
Pyrene	300	570,06	< 0,01	< 0,01
Benzo(a)anthracene	300	570,06	< 0,16	< 0,16
Chrysene	300	570,06	5,46	< 0,14
Benzo(b)fluoranthene	300	570,06	< 0,33	< 0,33
			Cigarette	**E-Cigarette**

Romagna et al. (2012). SRNT Europe Annual Meeting.

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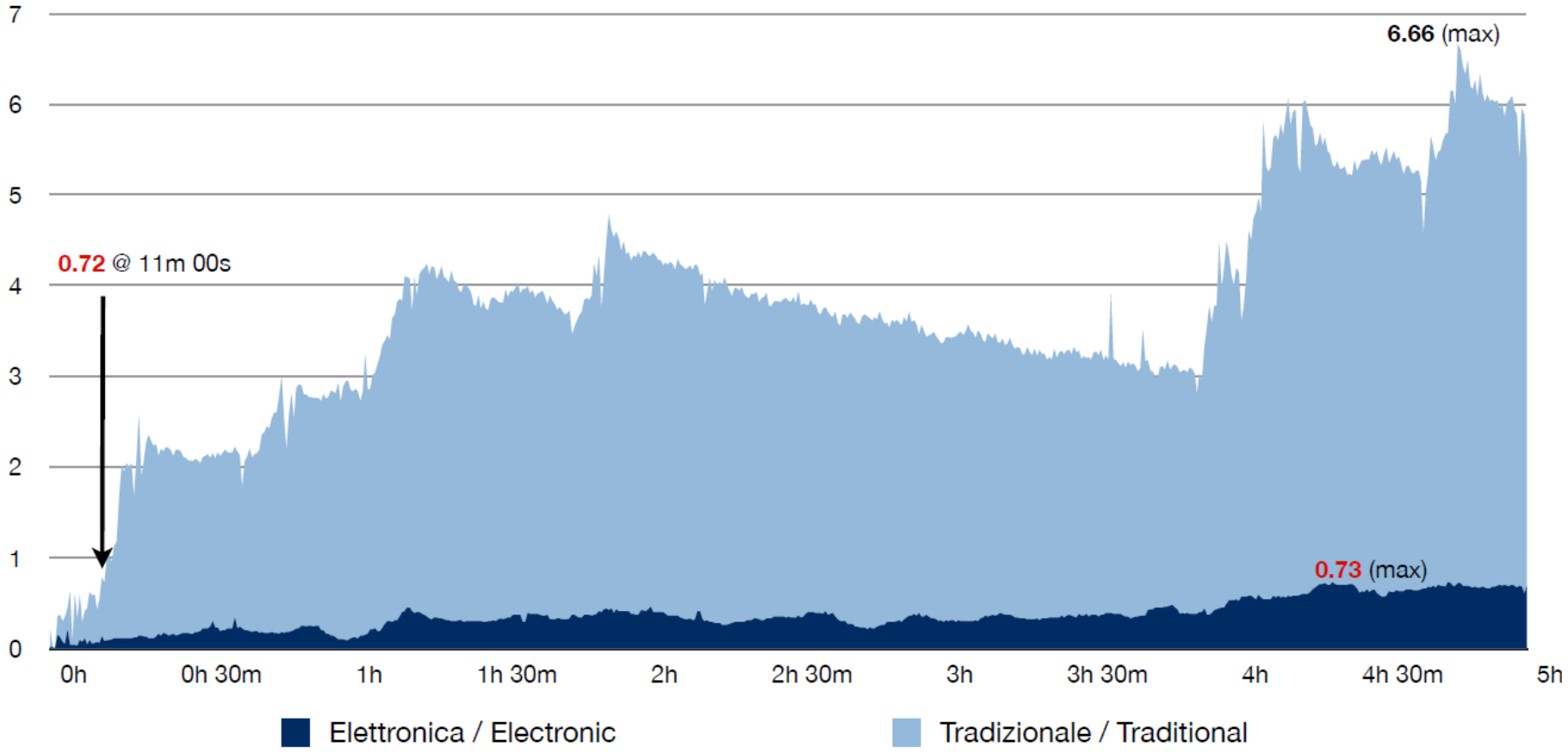
Nicotine vs Smoking



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Passive Smoking vs Vaping

- Deaths attributable to smoking in UK ~101,000/yr
- Deaths attributable to passive smoking in UK ~11,000/yr

- Exposure due to **active** vaping is **much less** than from active smoking

- Passive exposure to vaping is likely to be **much less harmful** than exposure from active vaping

Acknowledgements

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http://www.bristol.ac.uk/expsych/research/brain/targ/

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