



# E-cigarettes: evidence from the United Kingdom

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# Outline

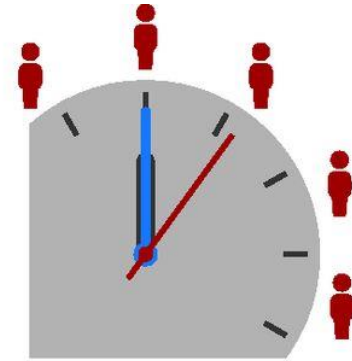
- Relevant Reports
- Tobacco Dependence & Nicotine
- E-cigarette use in the UK
- Safety
- Smoking cessation
- Harm perceptions
- Conclusions

# A global pandemic



The number of people killed globally by tobacco **EVERY YEAR**

**600,000** of these are killed by second-hand smoke



One person dies from tobacco every **6 SECONDS**



**100 MILLION**

The number of deaths from tobacco in the 20th Century



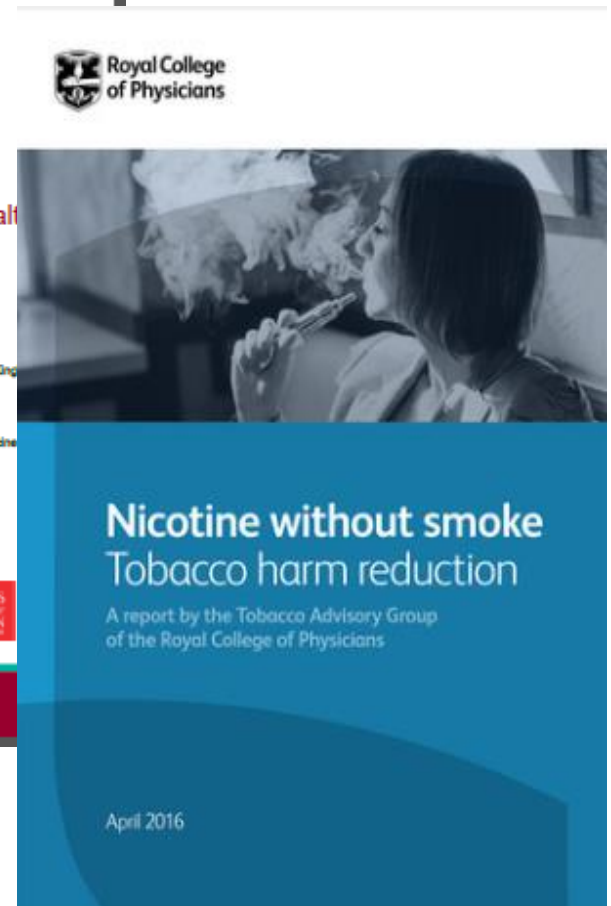
**72 MILLION**

The number of deaths from war in the 20th Century (including WW1 and WW2)

Data sources: WHO; White M. Historical Atlas of the Twentieth Century, 2010.

Design by **Will Stahl-Timmins**. © 2015 BMJ Publishing group Ltd.

# Our reports



# Michael Russell's legacy

The UK's approach to nicotine & tobacco harm reduction has its origins in the work of Professor Mike Russell, who trained some of our leading researchers

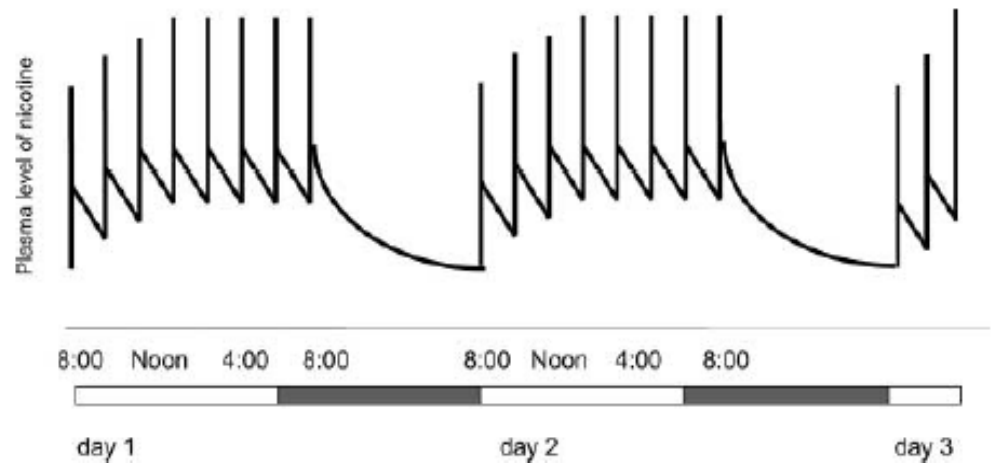
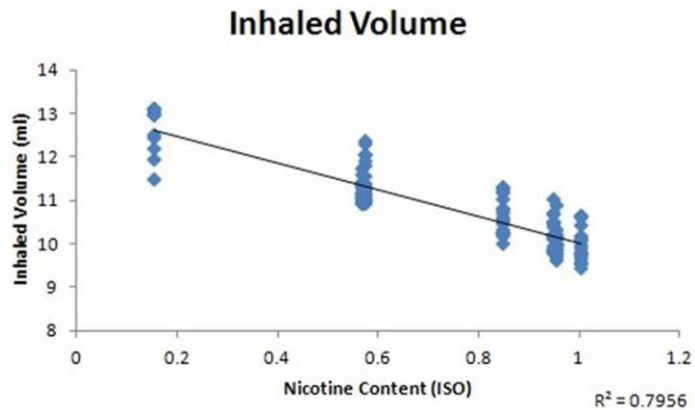
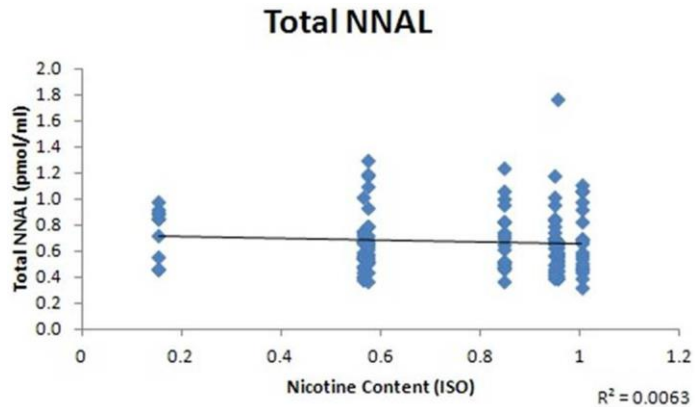


***"Smokers smoke for the nicotine, but die from the tar"***

*Professor Mike Russell, Maudsley Smokers Clinic, 1979*

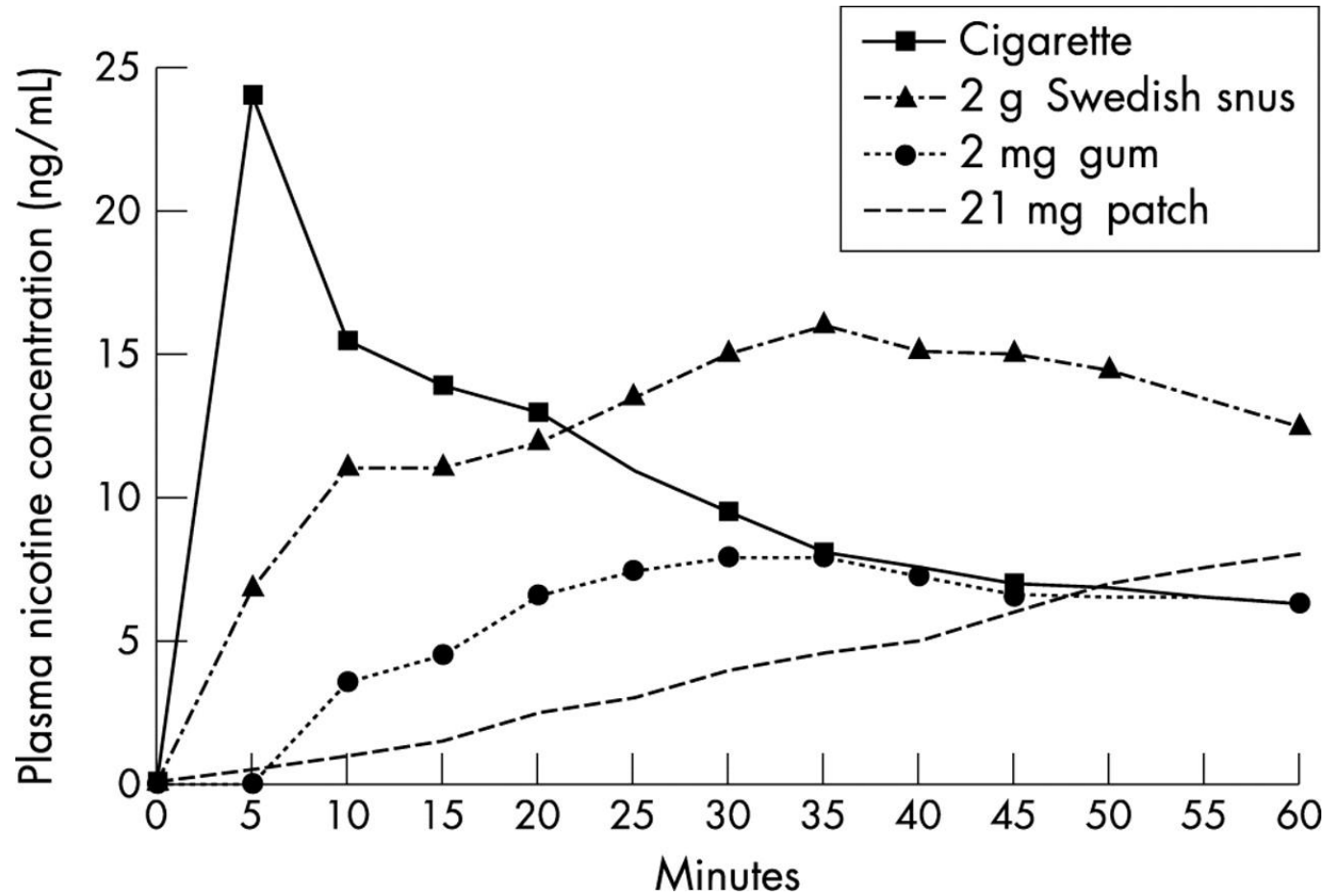


# Tobacco Dependence



Benowitz et al. (1982). Clin Pharmacol Ther, 32, 758-764.

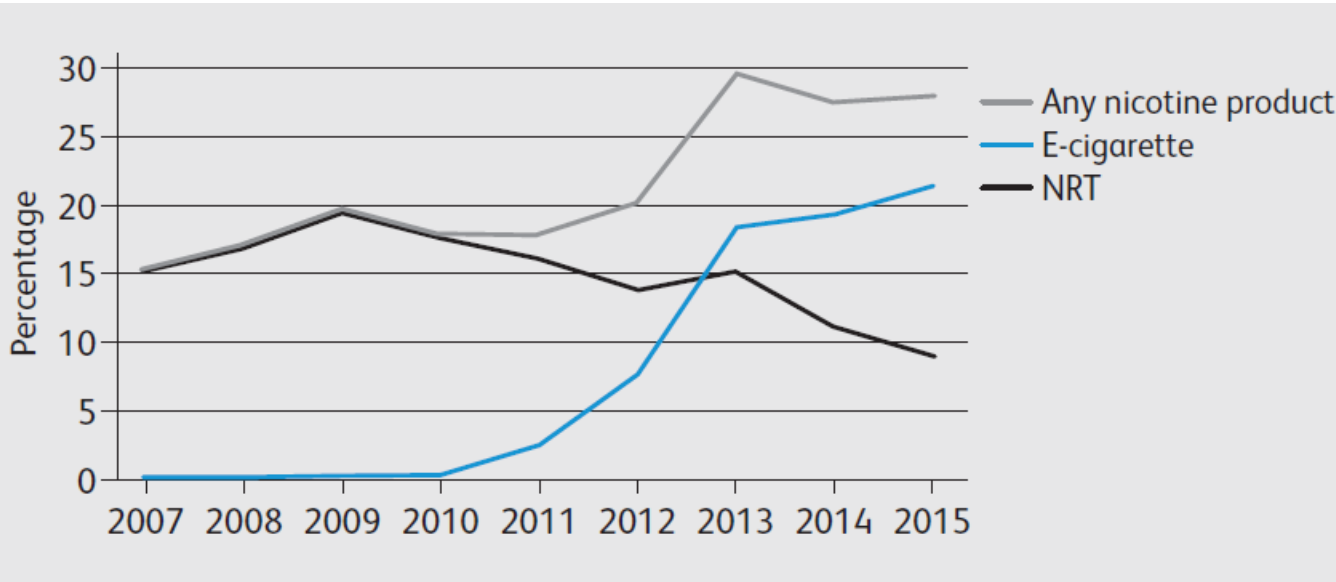
# Nicotine Delivery



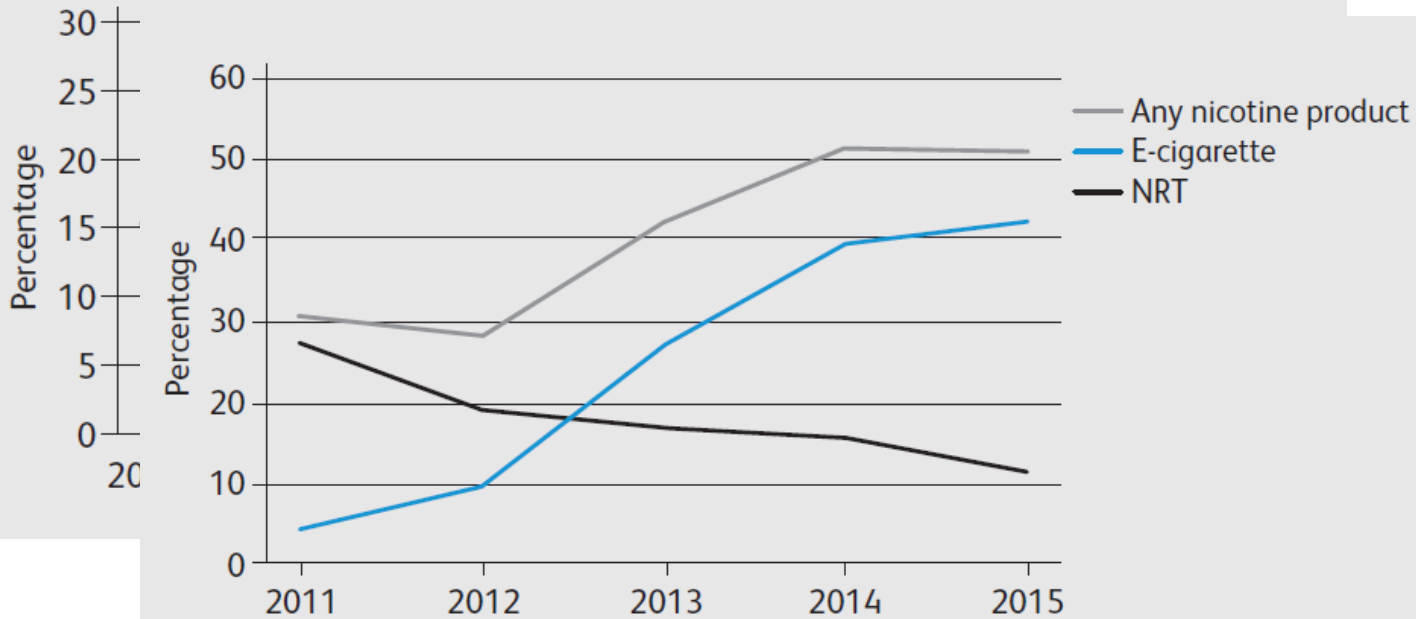
# **E-cigarette use**



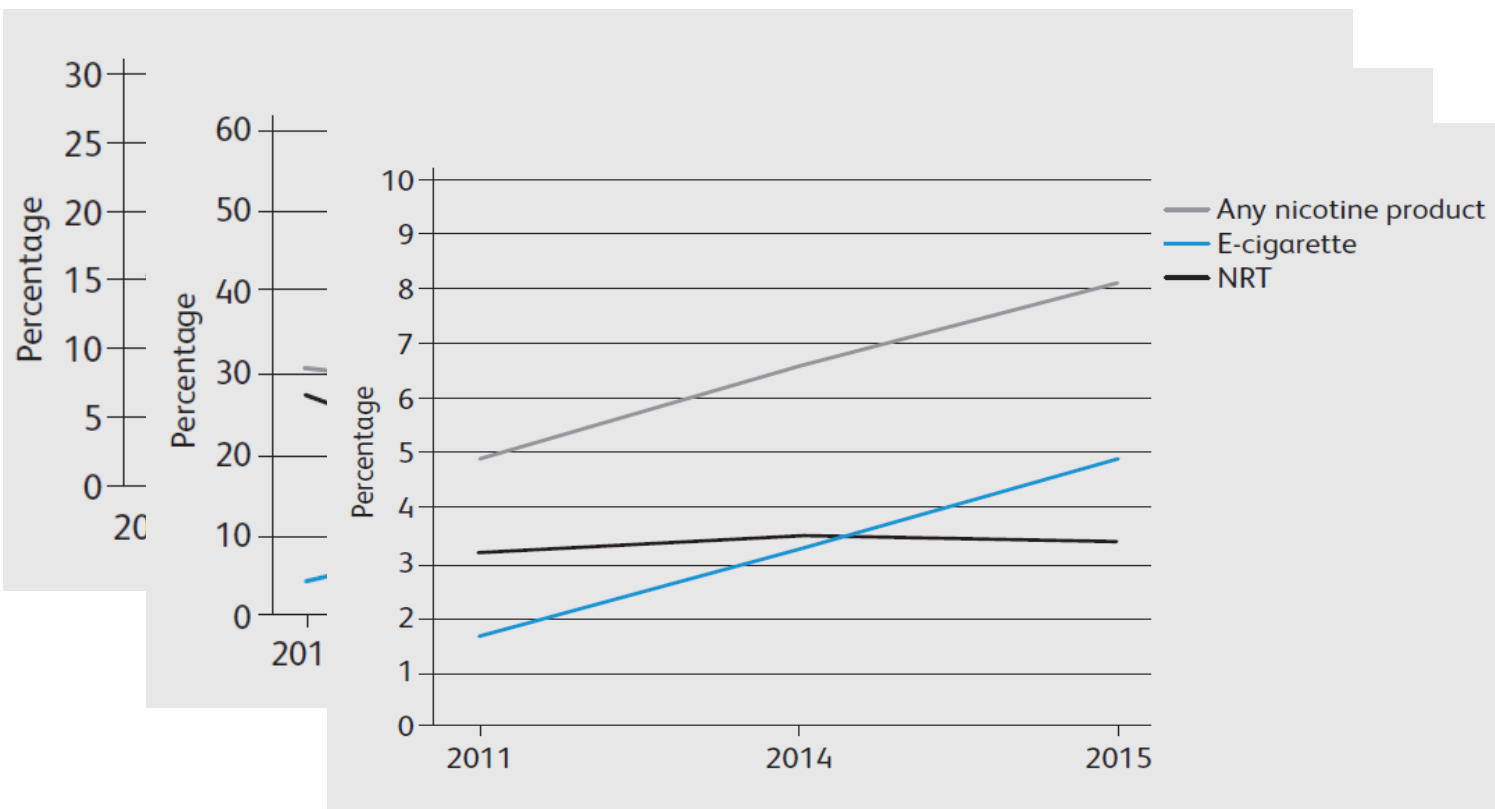
# Current Smokers



# Former Smokers (recent)

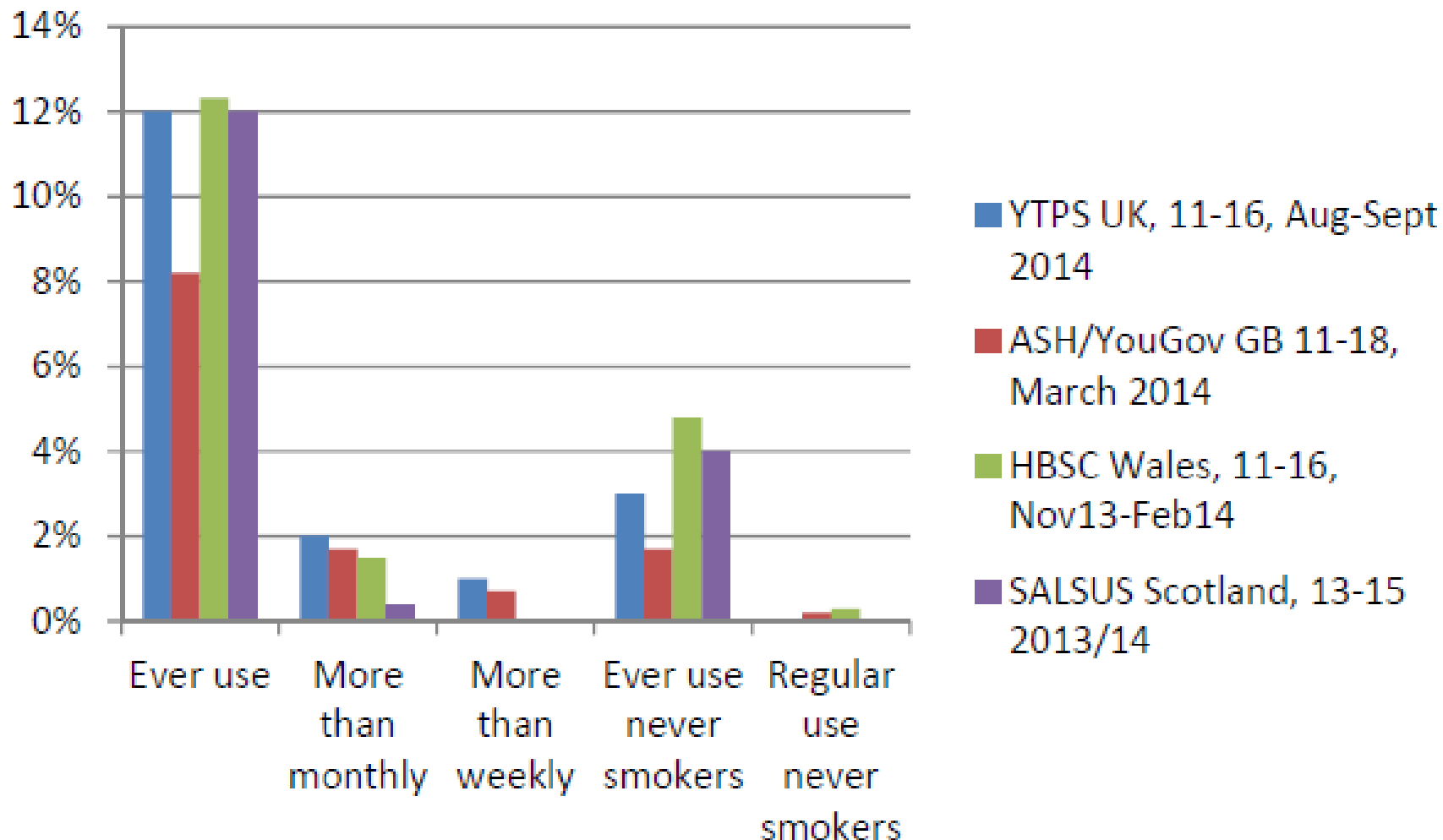


# Former Smokers (long term)





# Regular e-cigarette use among children is confined to those who have smoked



Source: Bauld L, MacKintosh A, Ford A, McNeill A . *Nicotine & Tobacco Research*, 2015

**Safety**

# Defining safety

- Are electronic cigarettes safer than tobacco cigarettes?
- Safer = less harmful
- In discussions of safety the appropriate comparator is tobacco – both harm to users and bystanders



# E-cigarettes as a harm reduction strategy

- In contrast to 'reduced risk' cigarettes no combustion takes place in e-cigarettes
- In contrast to smokeless tobacco, e-cigarettes are not tobacco products
- They contain nicotine and flavourings which can be toxicants, but toxicants present are at much lower levels than in tobacco
- All the evidence suggests e-cigarettes are safer than tobacco cigarettes



# Not harmless but around 5% of the risks of smoking

**EXTREME**

**Toxicity**

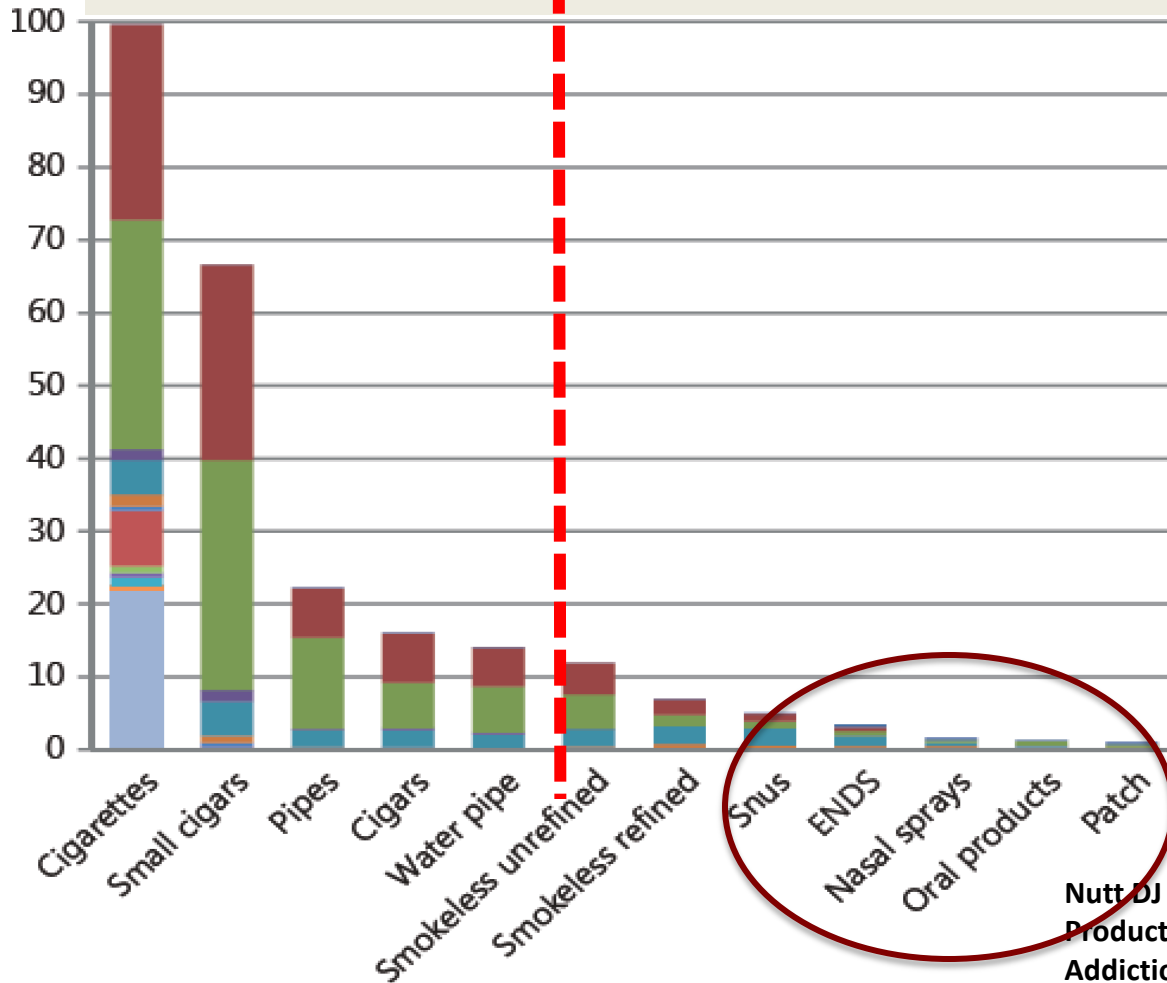
**Cigs - Combustibles**

**MUCH Less Harm**

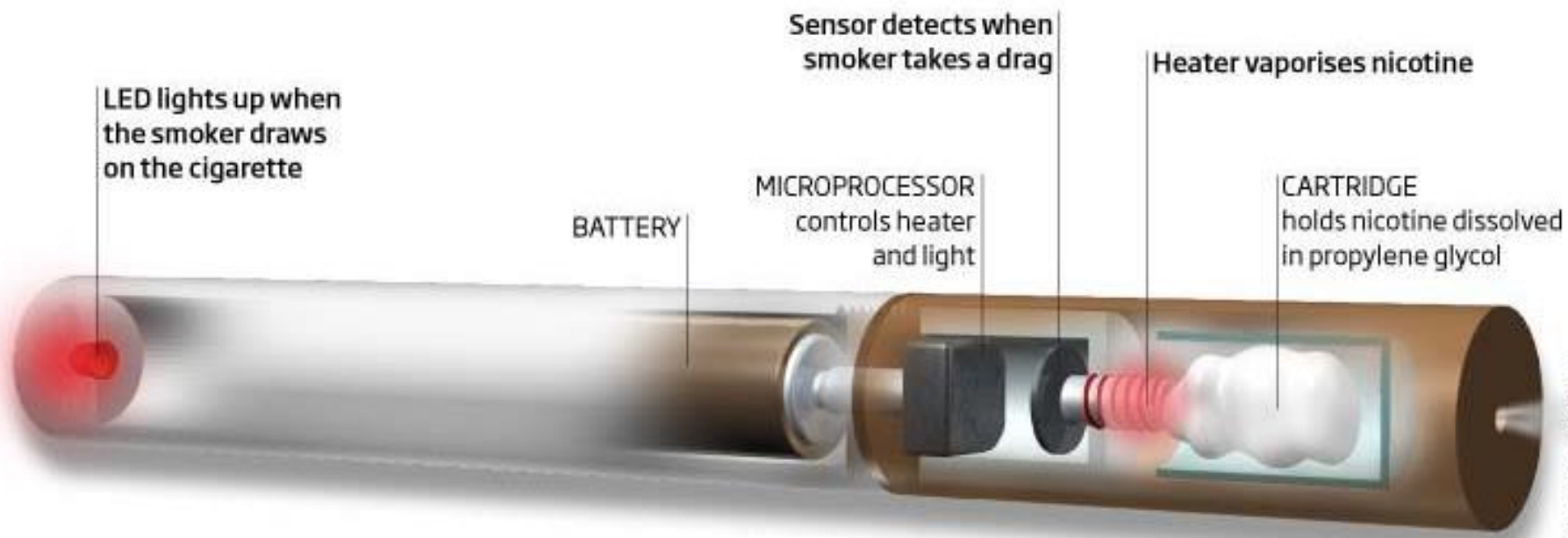
**Non combustible**

**No Harm**

**= no use at all**

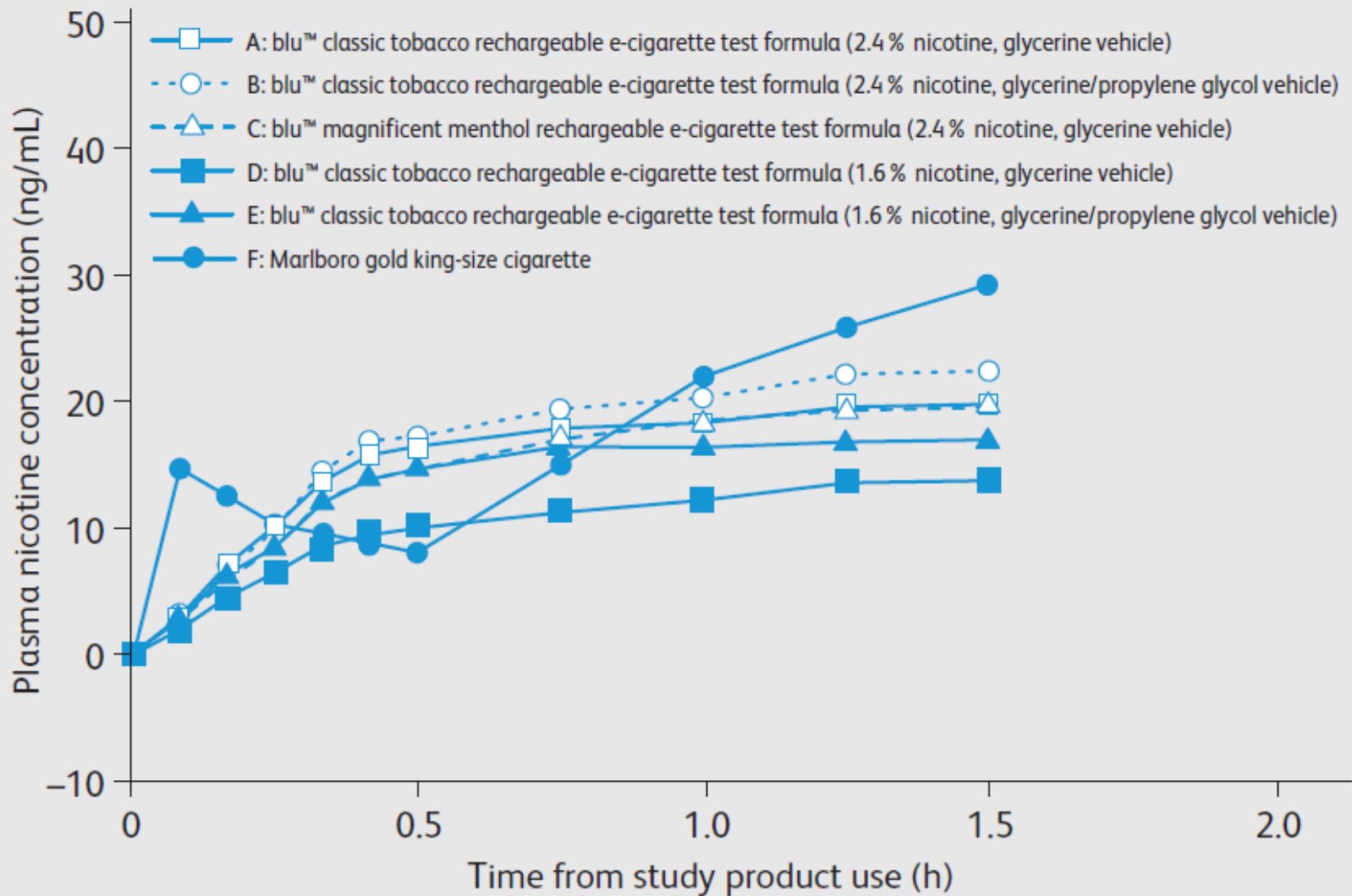


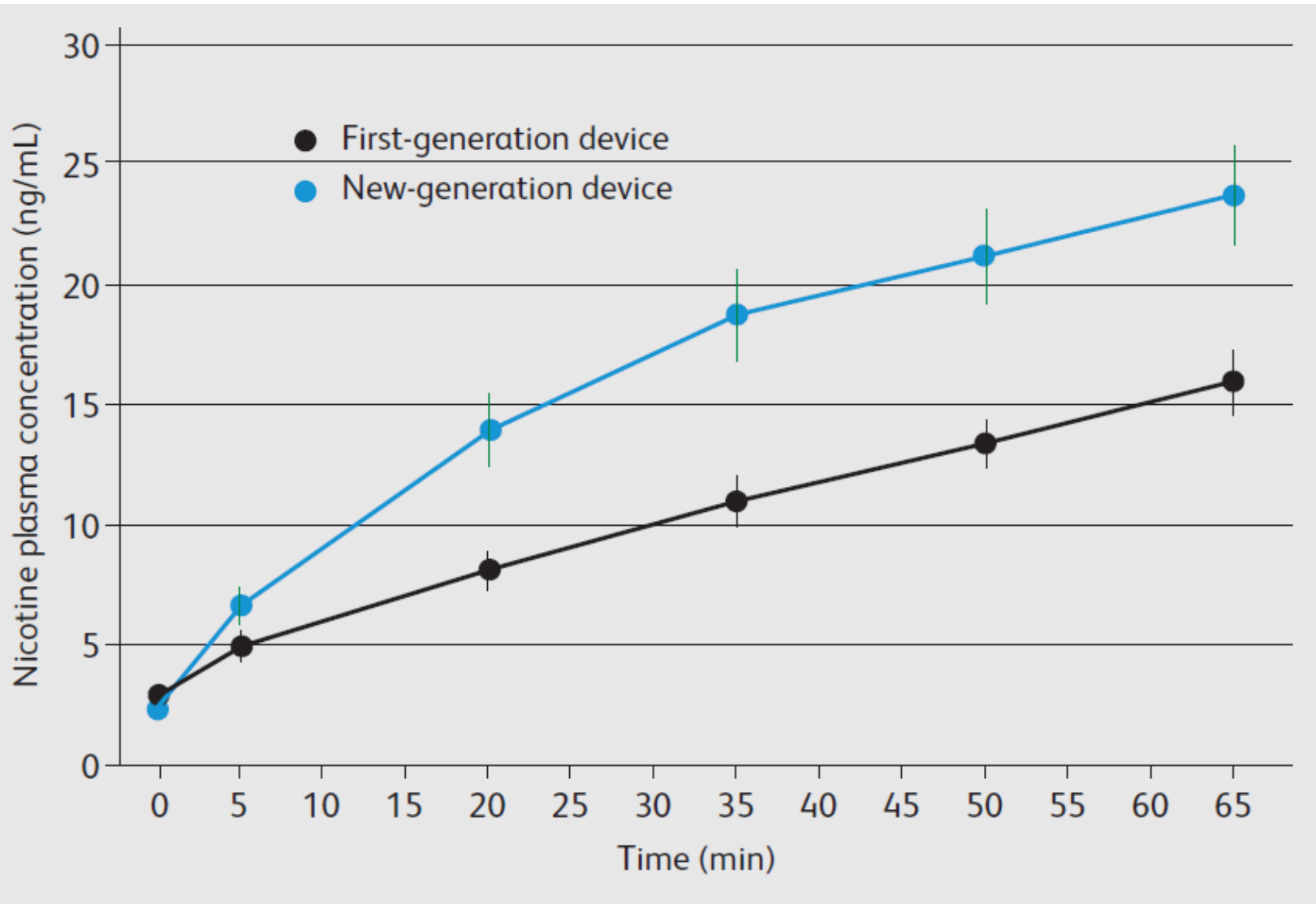
Nutt DJ et al Estimating the Harms of Nicotine-Containing Products Using the MCDA Approach – European Addiction Research March 2014



SOURCE: SAMHSA, VERISPAN







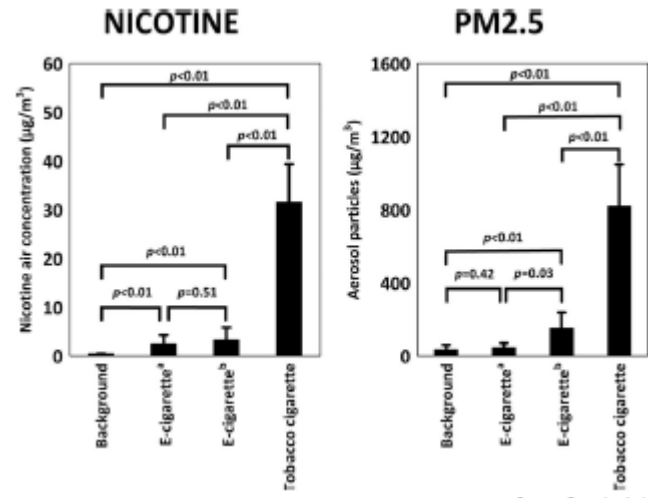
# Toxicants in vapour

Toxic compound	Conventional cigarette [ $\mu\text{g}$ ]	Electronic cigarette [ $\mu\text{g}$ per 15 puffs]	Conventional vs. electronic cigarette
Formaldehyde	1.6-52	0.20-5.61	9
Acetaldehyde	52-140	0.11-1.36	130
Acrolein	4.6-14	0.07-4.19	4
Toluene	6.4-9.0	0.02-0.63	23
NNN	0.012-0.37	0.00008-0.00043	145
NNK	0.009-0.08	0.00011-0.00283	30
Cd	0.03-0.35	0.001-0.022	16
Ni	0.003-0.60	0.011-0.029	15

Source: Goniewicz et al, Tobacco Control, 2013

# Risks to bystanders

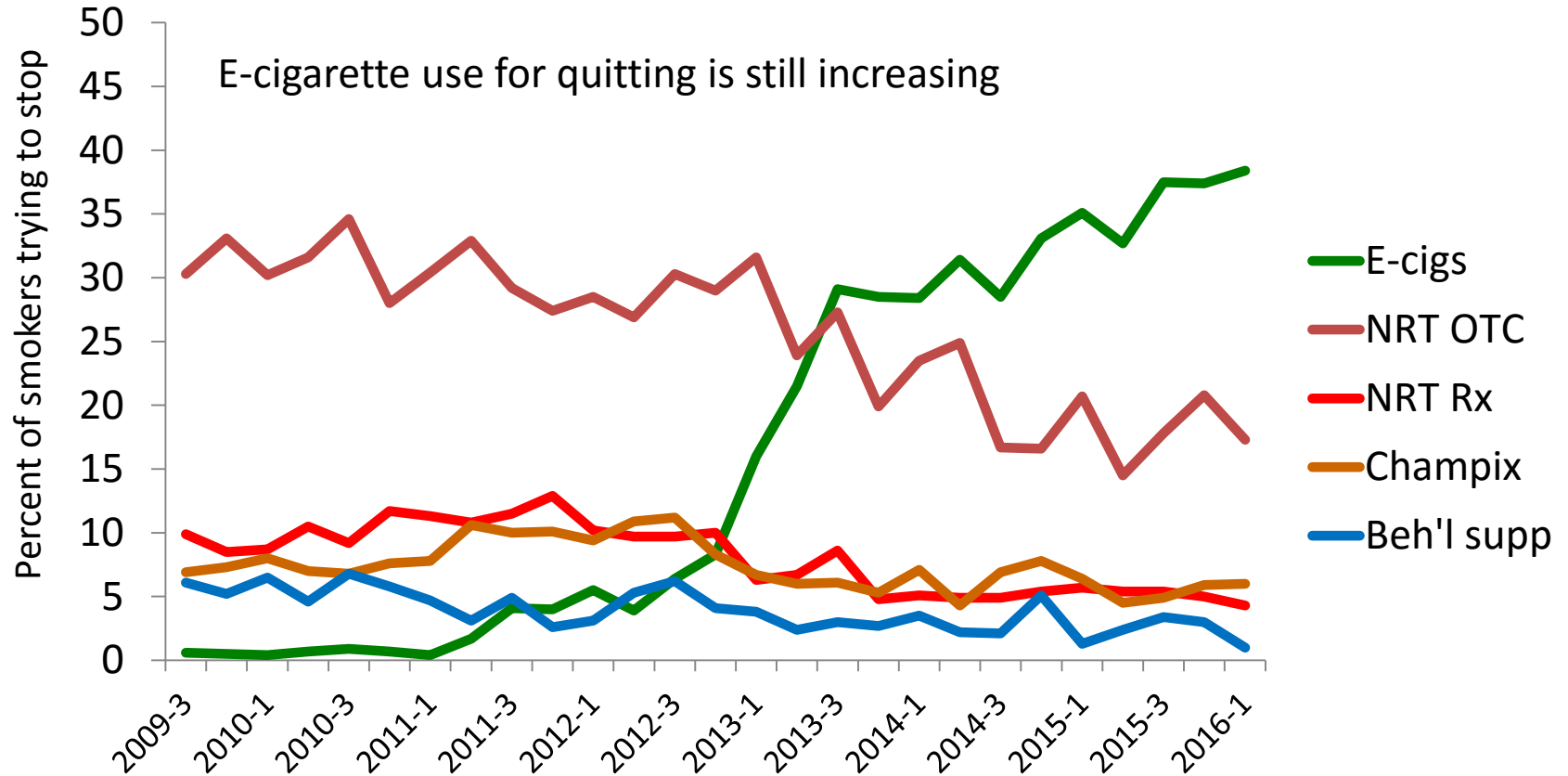
- Several studies now exist comparing second hand smoke to second hand vapour
- Overall they show that e-cigarettes are a source of secondhand exposure to nicotine but not to combustion toxicants



Earlier studies have focused on vapour exhaled by users but an additional recent one measured PM2.5 levels in vaping, smoking & non smoking homes. PM2.5 levels were similar between non smoking & vaping homes but much higher in the homes of smokers.

# Smoking Cessation

# Aids used in most recent quit attempt



N=11375 adults who smoke and tried to stop or who stopped in the past year; method is coded as any (not exclusive) use



## Evidence for Everyday Health Choices



Electronic cigarettes (ECs) containing nicotine may increase the chance of quitting smoking long term compared to using ECs without nicotine, but better evidence is needed to be certain about these findings. No serious side effects were associated with their use (up to 2 years). How effective they are compared with nicotine patches is unknown



Cochrane review. 2 randomized controlled trials with >600 smokers, using real or placebo (fake) ECs, and data from observational studies

Help to quit  
smoking:  
electronic  
cigarettes

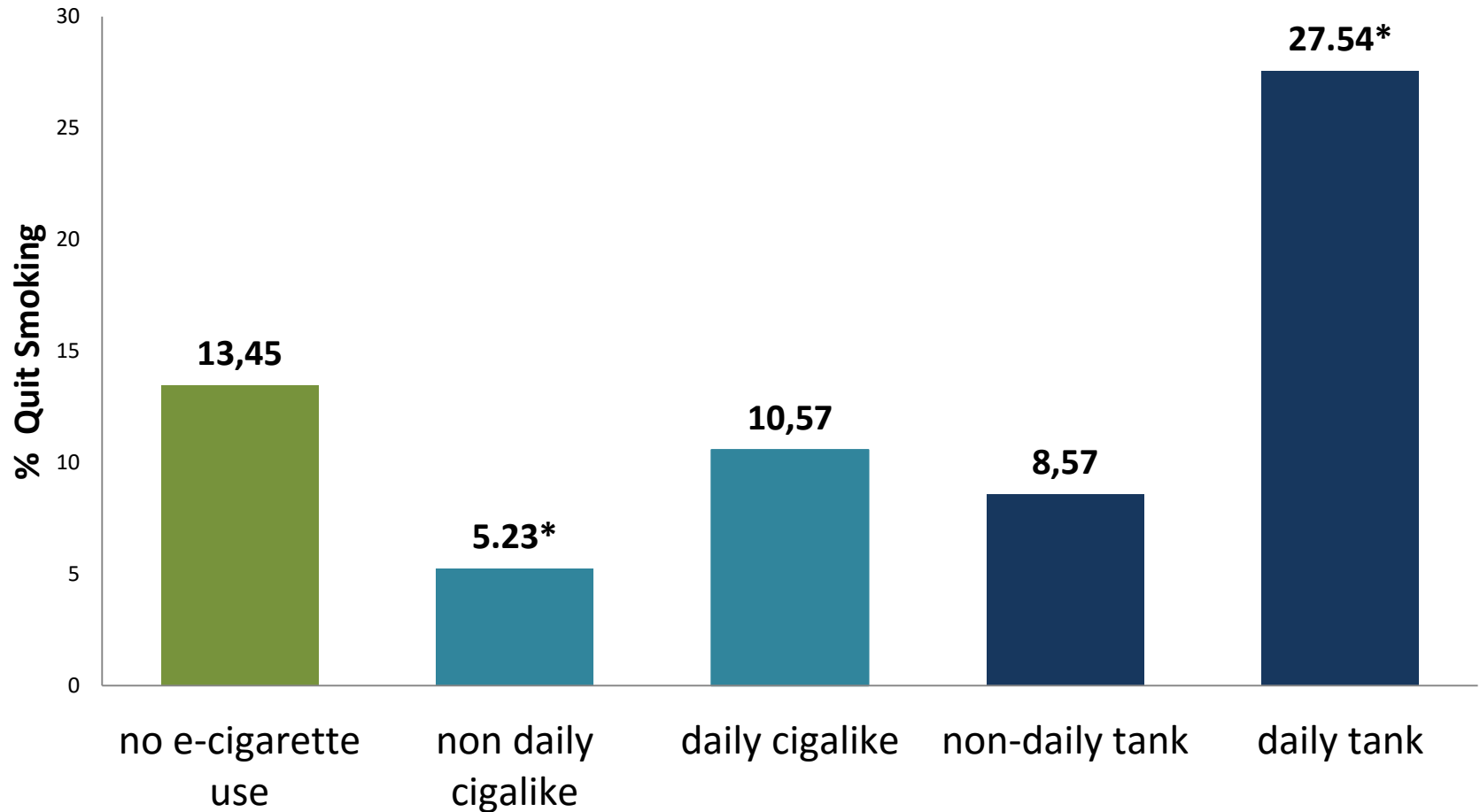


# UK observational studies (use during quit attempts)

1. Cross-sectional study, smokers in England who used e-cigarettes to quit were significantly more likely to quit than smokers using **no help** or **OTC NRT** (Brown et al, *Addiction*, 2014)
2. Cohort study, International Tobacco Control Policy Evaluation Study, smokers in England and US who used e-cigarettes to quit were more likely to quit than smokers using **no help** or **NRT but no more or less likely than using varenicline/bupropion** (Hitchman et al, 2015)
3. New study, 18,000 smokers quit in England using e-cigarettes who would not otherwise have done so (Brown et al, *BMJ*, 2016)

# Quitting in relation to type & frequency of e-cig use at follow up

Raw data shown; \* shows significantly different from non-users after adjusting for confounding factors



# Advising on E-cigarette Use

NICE

Recommendation 5:  
Advising on licensed  
nicotine containing  
products

PHE (2015)  
recommends that  
cessation services  
should offer support  
to those using e-cigs  
in a quit attempt

desire to smoke – and for the long term, if necessary, to prevent relapse.

- Tell people that some nicotine-containing products are not regulated by the MHRA<sup>[4]</sup> and, therefore, their effectiveness, safety and quality cannot be assured. Also advise them that these products are likely to be less harmful than cigarettes.



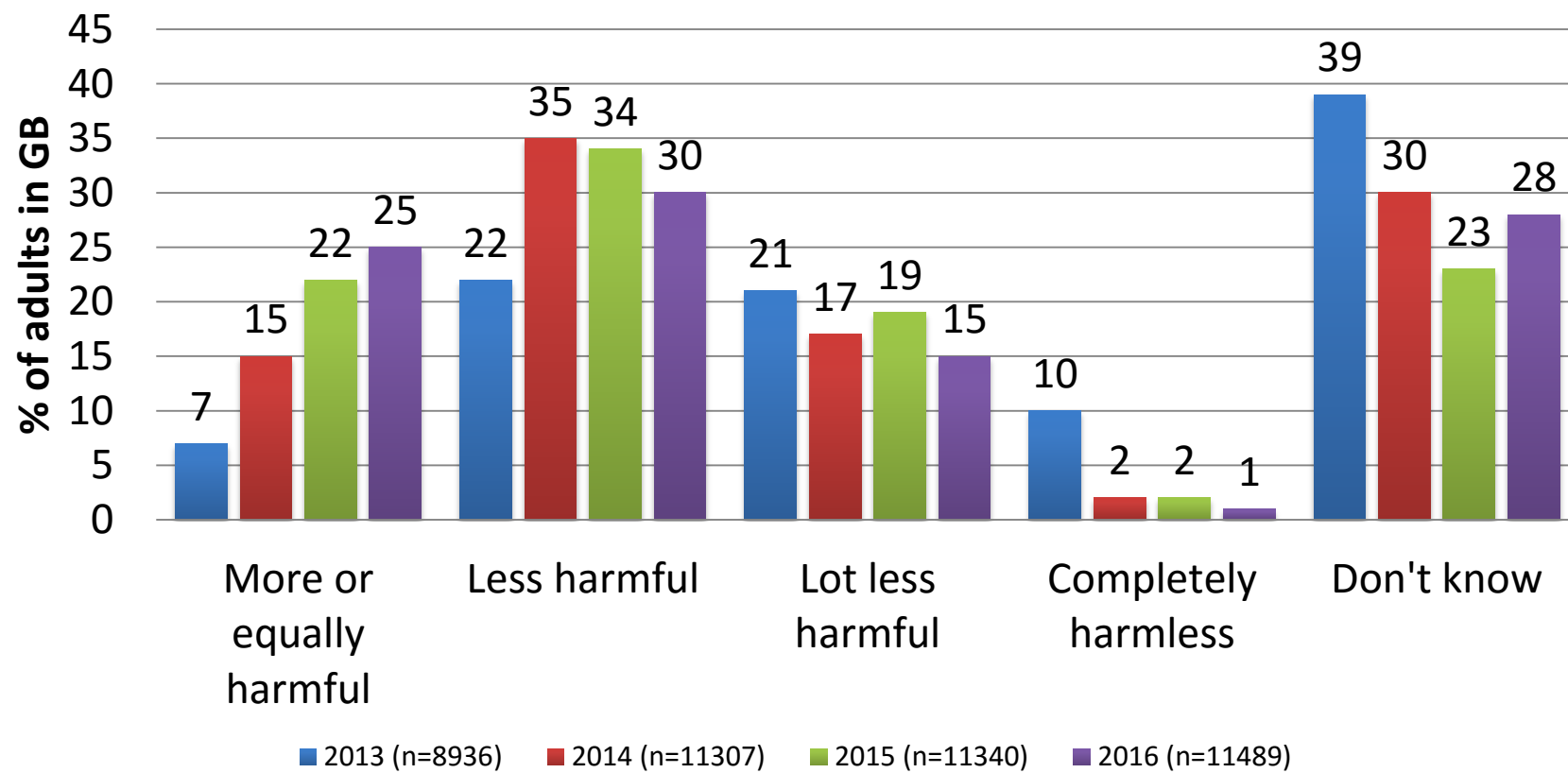
NCSCT Recommendations:

- Be open to e-cig use
- Provide advice & support
- Be positive about e-cigs

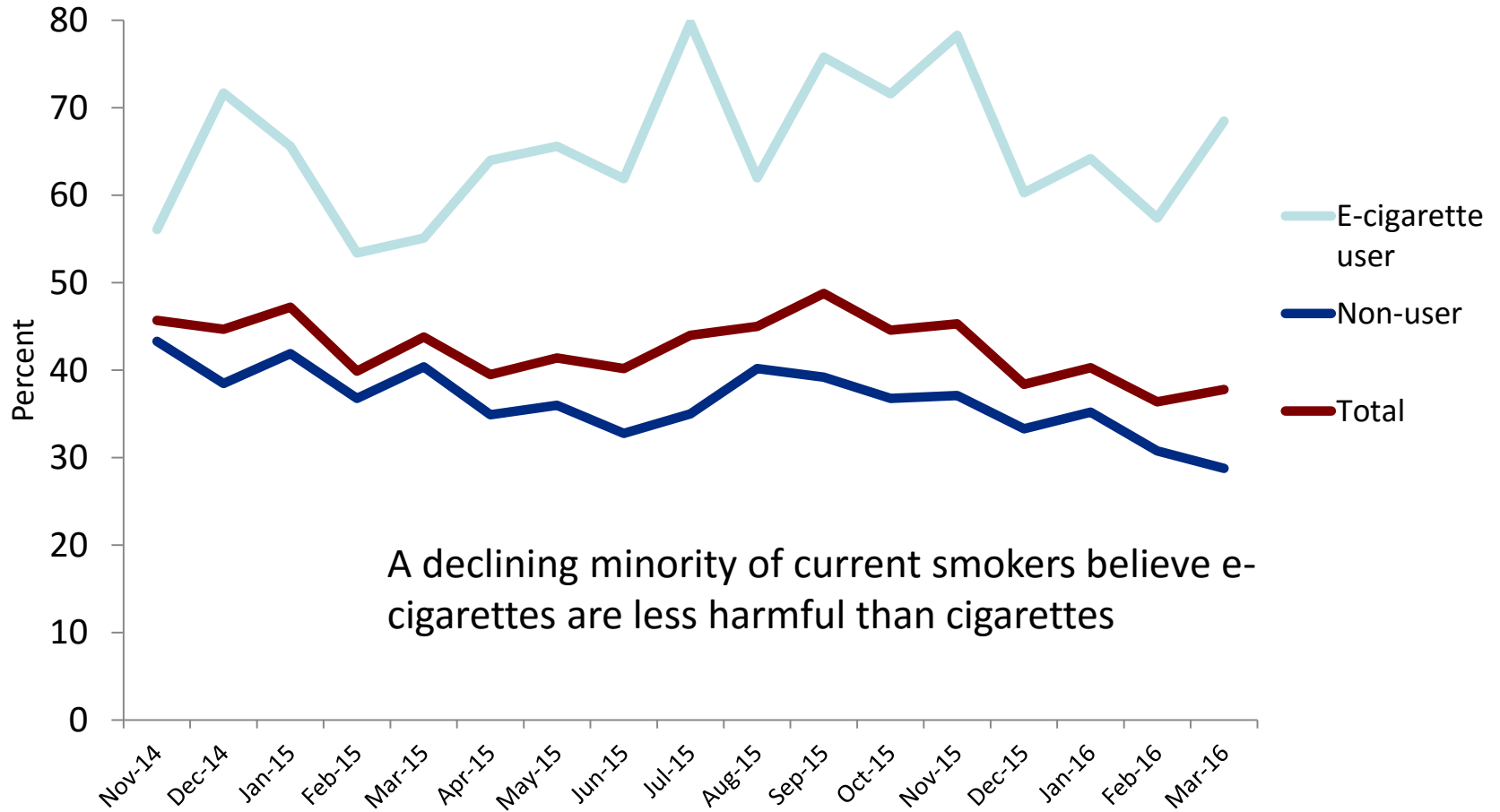
**But... Harm Perceptions**

# Perception of harm is going the wrong way

## Perception of harm relative to cigarettes



# Proportion of smokers believing e-cigarettes less harmful than cigarettes



N=5544 current smokers

# THE UK ELECTRONIC CIGARETTE RESEARCH FORUM

cruk.org

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CANCER  
RESEARCH  
UK

- The evidence on e-cigarettes is developing rapidly with new studies published almost every week
- Led by Cancer Research UK, we have formed a national forum to keep people up to date
- We also provide a monthly evidence briefing of the latest studies from a range of countries. This can be sent to anyone, so let me know if you are interested.



# Conclusions

- E-cigarette use is prevalent in the UK but confined to current or ex smokers
- E-cigarettes are far safer than tobacco
- There is growing evidence of effectiveness for smoking cessation
- Worryingly, the general population and smokers have misperceptions regarding relative harms – this needs to change
- New studies on e-cigarettes are being published on an almost weekly basis, and keeping abreast of the evidence is challenging. However, networks and good information sharing both within and between countries can help with this.

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**Thank you. Questions?**