

# Myth-busting 12 cardinal beliefs in modern vaping theology

APACT David Yen Memorial Lecture  
Bangkok Sept 3  
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# 12 tenets of vaping theology cultists

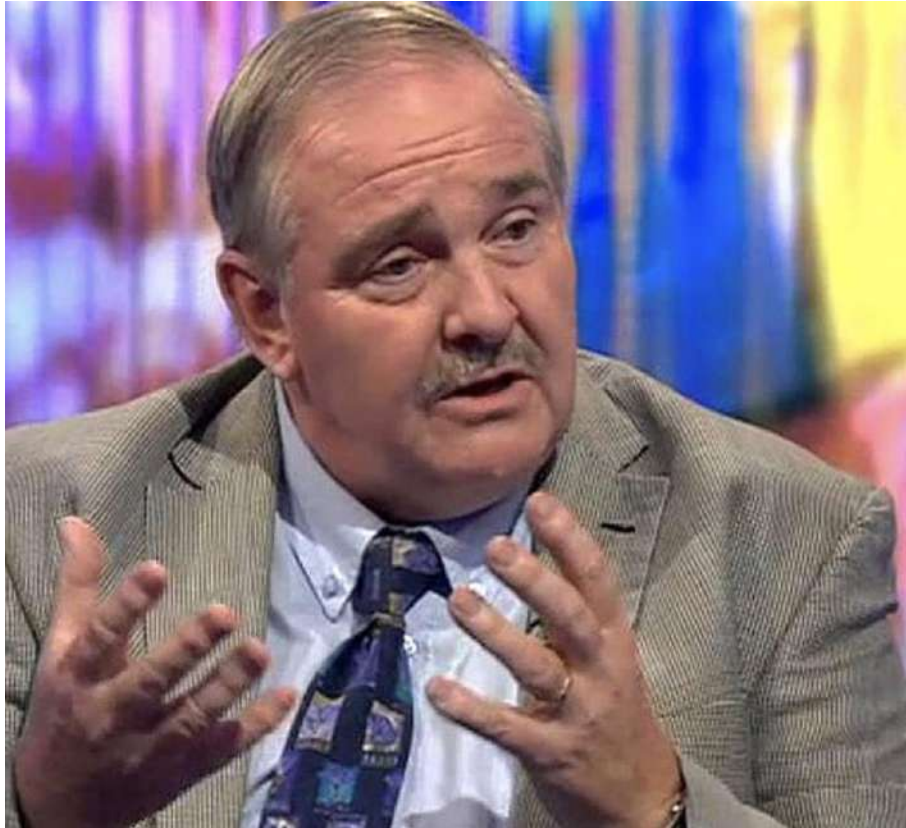


- › 1. E-cigs 95% less harmful than smoking
- › 2. It's not too soon to call e-cigs almost 100% benign
- › 3. Nicotine is harmless, almost – smoke causes all the harm
- › 4. 1000s of flavouring chemicals are nothing to worry about
- › 5. Dual users significantly reduce cigarettes smoked per day: no-brainer harm reduction
- › 6. 2<sup>nd</sup>hand vape is all but totally harmless
- › 7. Many smokers just can't quit ... e-cigs are therefore needed!
- › 8. E-cigs are very effective for smoking cessation
- › 9. Nations with high vaping rates are seeing smoking fall faster
- › 10. Vaping does not increase uptake of smoking in kids
- › 11. Big Tobacco is a minor player in vaping
- › 12. Big Tobacco really wants to get out of smoking



# 1. Vaping is 95% less harmful than smoking

A conjured, magic number lacking any worked calculations



**Prof David Nutt meeting with selected participants  
held in July 2013**

- › “the most significant advance [in medicine] since antibiotics”
- › “the greatest health advance since vaccinations”
- › rejection of the opportunity of harm reduction from vaping “is perhaps the worst example of scientific denial since the Catholic Church banned the works of Copernicus in 1616”.

# 1. Vaping is 95% less harmful than smoking

## Factoid Fun: Are e-cigarettes really “95% less dangerous” than cigarettes?

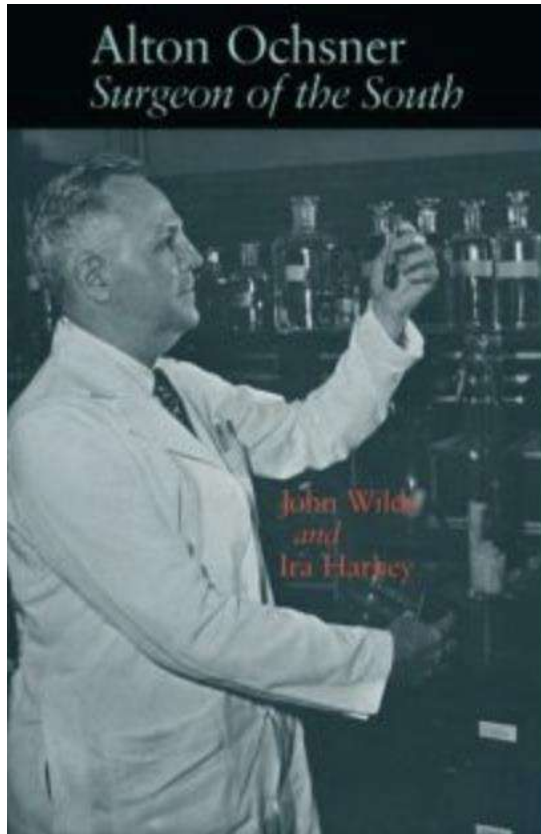
- Public Health England’s Prof John Newton, under oath to a 2017 Australian House of Representatives committee:
- “There's a lot of nonsense talked about-this 95% figure. It's getting beyond a joke really. We are very clear that this is just one of the figures that we have used, and there are plenty more. *We say what really matters is the evidence underlying this figure from the Nutt report.*”
- Source: <https://tinyurl.com/ybn3pjj7>
- But the Nutt report authors noted a MAJOR, fundamental limitation of their nicotine products safety/danger estimates:
- *“A limitation of this study is the lack of hard evidence for the harms of most products on most of the criteria.”*
- Source: <https://www.karger.com/Article/FullText/360220> (2014)
- **Do research limitations get any more fundamental than that?**

# 1. Vaping is 95% less harmful than smoking

- › Even hard-line vaping cultist Carl Philips thinks it's total rubbish
- › “This specific point estimate has rapidly evolved into “fact” (in the political sense of that term). It is repeated in a large fraction of popular press reports and widely used in arguments, snipes, and broadsides from vaping advocates. *It seems to have emerged from nowhere* when the Public Health England report asserted the figure. That traced to what was *actually a huge misinterpretation of what was only a made-up number, from one junk-science journal article.*”  
<https://antithrlies.com/2016/05/25/saying-e-cigarettes-are-95-less-harmful-is-a-very-bad-idea-part-143-of-10000/>
- › Smoking-caused diseases are chronic diseases with long latencies between start/use and disease diagnosis (20-50 years)
- › Vaping common in a few nations for only 5-10 years (eg: UK, USA, France)
- ›

## 2. Not too soon to call all but 100% safe!

Massive uptake in smoking early C20th with mechanisation of production



Alton Ochsner (1986-1981)

- › recalling attendance at his first lung cancer autopsy in 1919, he was told he “might never see another such case as long as we lived”
- › He saw no further cases until 1936 -- 17 years later
- › Then saw another 9 cases in 6 months
- › Since 1960s lung cancer has been (by far) the world’s leading cause of cancer death

## 2. Not too soon to call all but 100% safe!

### Example of “long term” health effects

[www.nature.com/scientificreport](http://www.nature.com/scientificreport)

# SCIENTIFIC REPORTS

OPEN

## Health impact of E-cigarettes: a prospective 3.5-year study of regular daily users who have never smoked

Riccardo Polosa<sup>1,2,3</sup>, Fabio Cibella<sup>4</sup>, Pasquale Caponnetto<sup>1,3</sup>, Marilena Maglia<sup>1,3</sup>, Umberto Prosperini<sup>5</sup>, Cristina Russo<sup>6</sup> & Donald Tashkin<sup>7</sup>

Although electronic cigarettes (ECs) are a much less harmful alternative to tobacco cigarettes, there is concern as to whether long-term ECs use may cause risks to human health. We report health outcome (blood pressure, heart rate, body weight, lung function, respiratory symptoms, exhaled breath nitric oxide [eNO], exhaled carbon monoxide [eCO], and high-resolution computed tomography [HRCT] of the lungs) from a prospective 3.5-year observational study of a cohort of nine daily EC users (mean age 29.7 ( $\pm$ 6.1) years) who have never smoked and a reference group of twelve never smokers. No significant changes could be detected over the observation period from baseline in the EC users or between EC users and control subjects in any of the health outcomes investigated. Moreover, no pathological findings could be identified on HRCT of the lungs and no respiratory symptoms were consistently reported in the EC user group. Although it cannot be excluded that some harm may occur at later stages, this study did not demonstrate any health concerns associated with long-term use of ECs in relatively young users who did not also smoke tobacco.

5 June 2017  
October 2017  
Online: 17 November 2017

- › 16 recruited, 4 drop-outs, 3 excluded = just 9 subjects
- › “study did not demonstrate any health concerns associated with **long-term use of EC**”!

## 2. Not too soon to call all but 100% safe!

### 2018 Report: National Academies of Science, Engineering & Medicine

#### HEALTH EFFECTS OF E-CIGARETTES

**Conclusion 7-1.** There is *substantial evidence* that e-cigarette aerosols can induce acute endothelial cell dysfunction, although the long-term consequences and outcomes on these parameters with long-term exposure to e-cigarette aerosol are uncertain.


**Conclusion 7-2.** There is *substantial evidence* that components of e-cigarette aerosols can promote formation of reactive oxygen species/oxidative stress. Although this supports the biological plausibility of tissue injury and disease from long-term exposure to e-cigarette aerosols, generation of reactive oxygen species and oxidative stress induction is generally lower from e-cigarettes than from combustible tobacco cigarette smoke.



### 3. Nicotine is almost harmless – smoke causes all the harm

High Priest of Vapers: Michael Russell in 1976

- › **“People smoke for the nicotine but they die from the tar”**
- › Nicotine promoted as an almost vitamin-like substance



**NICOTINE**  
-The Wonder Drug

No scientific reason links nicotine to lung cancer nor any other type of cancer.

- Pain Relief
- Relief of Anxiety
- Relief of Depression
- Improved Concentration
- Improved Performance

Relief of some Symptoms for:

- Schizophrenia
- Tourettes Syndrome
- Parkinson's Disease

1246 x 1052



### 3. Nicotine is almost harmless – smoke causes all the harm

## > Nicotine in angiogenesis, cell proliferation, apoptosis

*Critical Reviews in Toxicology*, 2012; 42(1):68–89  
© 2012, Informa Healthcare USA, Inc.  
ISSN 1040-8444 print/ISSN 1547-6898 online  
DOI: 10.3109/10408444.2011.623150

informa  
healthcare

#### REVIEW ARTICLE

#### Nicotine: specific role in angiogenesis, proliferation and apoptosis

Alessio Cardinale<sup>1</sup>, Candida Nastrucci<sup>1\*</sup>, Alfredo Cesario<sup>1,2</sup>, and Patrizia Russo<sup>1</sup>

<sup>1</sup>IRCCS “San Raffaele Pisana”, Rome, Italy and <sup>2</sup>Department of Thoracic Surgery, Catholic University, Rome, Italy

#### Abstract

Nowadays, tobacco smoking is the cause of ~5–6 million deaths per year, counting 31% and 6% of all cancer deaths (affecting 18 different organs) in middle-aged men and women, respectively. Nicotine is the addictive component of tobacco acting on neuronal nicotinic receptors (nAChR). Functional nAChR, are also present on endothelial, haematological and epithelial cells. Although nicotine itself is regularly not referred to as a carcinogen, there is an ongoing debate whether nicotine functions as a ‘tumour promoter’. Nicotine, with its specific binding to nAChR, deregulates essential biological processes like regulation of cell proliferation, apoptosis, migration, invasion, angiogenesis, inflammation and cell-mediated immunity in a wide variety of cells including foetal (regulation of development), embryonic and adult stem cells, adult tissues as well as cancer cells. Nicotine seems involved in fundamental aspects of the biology of malignant diseases, as well as of neurodegeneration. Investigating the biological effects of nicotine may provide new tools for therapeutic interventions and for the understanding of neurodegenerative diseases and tumour biology.

**Keywords:** nAChR, apoptosis, angiogenesis, cancer, cell proliferation, neuronal diseases, Alzheimer, Parkinson, Prions, non-neuronal cells

> “Nicotine .. deregulates essential biological processes like regulation of cell proliferation, apoptosis, migration, invasion, angiogenesis, inflammation and cell-mediated immunity in a wide variety of cells, including foetal, embryonic and adult stem cells, adult tissues as well as cancer cells.”

### 3. Nicotine is almost harmless – smoke causes all the harm

- › Neil Benowitz lecture to nicotine/vaping conference in Poland 2019

## Major Safety Concerns for Nicotine

- **Addiction**
- Cardiovascular disease
- Reproductive Toxicity
- **Impaired Adolescent Brain development**
- **Infectious Disease Risk**
- **Cancer**
- **COPD**
- **Definite**
- Probable
- Probable
- **Possible**
- **Possible**
- **Possible**
- **Unlikely**

### 3. Nicotine is almost harmless – smoke causes all the harm

- ...and not to mention addiction.
- Vapers take ~200 puffs/day (up to 611 or 223,000/year) [Martin et al 2016 doi:10.1152/ajplung.00170.2016]



You ain't getting away that easily.

Smoke when you can. Vape when you can't

## 4. 1000s of flavouring chemicals are nothing to worry about

### So why are asthma salbutamol inhalers not flavoured?



- › 2.7 million people with asthma in Australia (25m population)
- › Av daily puffer use 1-2 puffs max 4 times in 24hrs
- › Av puffs taken by exclusive vapers: 200/day up to 611
- › Salbutamol unpleasant taste
- › Better compliance if flavoured especially with children?

## 4. 1000s of flavouring chemicals are nothing to worry about

### UF Flavor & Extracts Manufacturing Association (FEMA) 2021



- > **“E-cigarette manufacturers should not represent or suggest that the flavor ingredients used in their products are safe because they have FEMA GRAS status for use in food because such statements are false and misleading.”**

## 4. 1000s of flavouring chemicals are nothing to worry about

Leading vaping advocate Clive Bates agrees (statement to Australian Senate 2020)



- › Senator Urquhart: A lot of these flavourings are approved for ingestion in foods but not for inhalation into your lungs.
- › Mr Bates: **You're right. Many of them haven't been evaluated for inhalation.** They are generally recognised as safe as food additives and they're added to these products to make them appealing. **So you're right.** They don't have—
- › Senator Urquhart: I just want to try and get the justification for how it can be safe to inhale stuff that is not meant to be inhaled into your lungs ...
- › Mr Bates: ...With vaping, they're not moving to a situation where they're inhaling chemicals we know to be dangerous—where there are known dangers, the manufacturers tend not to put them in—but they're moving to inhaling chemicals that at least at one level have been recognised as safe for ingestion. **But you're perfectly correct; most of the flavours have not been evaluated as safe for inhalation.**

## 5. Dual users significantly reduce cigarettes per day: a no-brainer for harm reduction!

### Health consequences of reduced daily cigarette consumption

Aage Tverdal, Kjell Bjartveit

*Tobacco Control* 2006;15:472-480. doi: 10.1136/tc.2006.016246

**Objective:** To determine the risk of dying from specified smoking-related diseases and from any cause in heavy smoking men and women ( $\geq 15$  cigarettes/day), who reduced their daily cigarette consumption by  $>50\%$ .

**Design:** A prospective cohort study.

**Setting:** Three counties in Norway.

**Participants:** 24 959 men and 26 251 women, aged 20-49 years, screened for risk factors of cardiovascular disease in the mid-1970s, screened again after 3-13 years, and followed up throughout 2003.

**Outcomes:** Absolute mortality and relative risks adjusted for confounding variables, of dying from all causes, cardiovascular disease, ischaemic heart disease, all smoking-related cancer and lung cancer.

**Results:** With sustained heavy smokers as reference, the smokers of both sexes who reduced their daily consumption (reducers) had the following adjusted relative risks (95% confidence interval (CI)): of dying from any cause, 1.02 (0.84 to 1.22); cardiovascular disease, 1.02 (0.75 to 1.39); ischaemic heart disease, 0.96 (0.65 to 1.41); smoking-related cancer, 0.86 (0.57 to 1.29); and lung cancer, 0.66 (0.36 to 1.21). The difference in cigarette consumption between two examinations was not a significant predictor of death from any of the causes. A follow-up from a third screening of the subgroup who were reducers at both second and third examinations (sustained reducers) did not have a lower risk than those who were heavy smokers at all three examinations.

**Conclusions:** Long-term follow-up provides no evidence that heavy smokers who cut down their daily cigarette consumption by  $>50\%$  reduce their risk of premature death significantly. In health education and patient counselling, it may give people false expectations to advise that reduction in consumption is associated with reduction in harm.

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**“no evidence that smokers who cut down their daily cigarette consumption by  $>50\%$  reduce their risk of premature death significantly.”(Tverdal & Bjartveit 2006)**

**“Although reducing smoking from daily to nondaily was associated with decreased mortality risk, cessation was associated with far greater benefit. Lifelong nondaily smokers have higher mortality risks than never smokers, even among those smoking 6 to 10 cigarettes per month. Thus, all smokers should quit, regardless of how infrequently they smoke.”**

**(Inoue-Choi, Christensen et al. JAMA 2020)**



## 6. 2<sup>nd</sup>hand vape is harmless

No airline allows vaping on board. Now, why might that be?



- > ***“Particle number distribution modes of the electronic cigarette-generated aerosol were in the 120-165 nm range, then similar to the conventional cigarette”*** Fuoco et al [Environ Poll](#) 2014;184:523-9
- > ***(“PM<sub>2.5</sub> concentrations observed at an e-cig vaping event with 59-86 vapers present were higher than concentrations reported previously in hookah cafés and bars that allow cigarette smoking)*** Soule et al [Tob Control](#) 2017;26:109-112

## 7. Many smokers can't quit – e-cigs are therefore needed (hardening hypothesis)

**John Hughes. An update on hardening Nic & Tob Res 2020;22:867**

- › in *none* of the 26 studies examined was there *any evidence* for a reduction in:
  - transition from current to former smoking
  - the number of quit attempts
  - success on a given quit attempt, with several studies finding these measures *increased* over time.
  - These results similar across survey dates, duration of time examined, number of data points, data source, outcome definitions and nations.
  - Conclusion “**These results convincingly indicate hardening is not occurring in the general population of smokers.**”
  - FAR more evidence that smoking is softening, rather than hardening

## 8. E-cigs are very effective for smoking cessation

### Cochrane Library Tobacco Addiction Group 2020

- › “For every 100 people using nicotine e-cigarettes to stop smoking, 10 might successfully stop, compared with only 6 of 100 people using NRT or nicotine-free e-cigarettes, or 4 of 100 people having no support or behavioural support only.”
- › Put another way, if we take 100 smokers participating in an RCT, 90 would still be smoking six months later if they used e-cigarettes, compared with 94 who used NRT, and 96 who just tried to quit alone or got some “behavioural support”.
- › If you went along to your doctor for any health problem and were told “here, take this. It has a 90% failure rate. But I’m describing it as successful.” ...what would you think?

## 8. E-cigs are very effective for smoking cessation

### **RCTs very different to real-world use**

- › **Many exclusion criteria for NRT (eg: mental health) 59% motivated to quit would be excluded**
- › **Often get support as well**
- › **Lots of contact with researchers (av 7.6 times)**
- › **Smokers can tell when they are allocated to placebo**
- › **Drop-out rates less (~ 50% in real world varenicline do not renew their script)**
- › **Participants get drugs free**
- › **Participants are often paid**

## 8. E-cigs are very effective for smoking cessation

Summary of e-cigarette transitions from Wave 1 to Wave 2 by cigarette smoking status  
(n=2932)

Positive outcome at Wave 2 n=524 (17.9%)	Negative outcome at Wave 2 n=1116 (38%)	Remained the same n=1291 (44%)
143 dual users who quit EC and smoking	886 dual users who relapsed to smoking exclusively	902 dual users continuing as dual users
104 dual users who became EC users only	109 EC only but now smoking	389 EC users continuing as exclusive EC users
277 EC only who quit EC	121 EC only who progressed to dual use	

Coleman et al Tobacco Control 2018: PATH Negative outcome >2x more likely than positive outcome

## 8. E-cigs are very effective for smoking cessation

**Brouwer et al Tobacco Control 2020 (PATH waves 1-4)**

<http://dx.doi.org/10.1136/tobaccocontrol-2020-055967>

- › **“Cigarette use was persistent, with 89.7% of exclusive cigarette users and 86.1% of dual users remaining cigarette users (either exclusive or dual) after any one year.”**
  
- › **“Among all W1 (Wave 1) daily smokers, there were no differences in discontinued smoking between daily smokers who vaped (concurrent users) and exclusive daily smokers”**
  
- › **“smokers with established concurrent use [smoking and vaping] were not more likely to discontinue smoking compared to those not vaping ... it is clear that the rates of transitioning away from smoking remain unacceptably low” [Gravelly et al 2020– ITC 4 country data <https://doi.org/10.3390/ijerph17197084>]**



# NASEM conclusions

**Conclusion 17-1.** Overall, there is *limited evidence* that e-cigarettes may be effective aids to promote smoking cessation.

**Conclusion 17-2.** There is *moderate evidence* from randomized controlled trials that e-cigarettes with nicotine are more effective than e-cigarettes without nicotine for smoking cessation.

**Conclusion 17-3.** There is *insufficient evidence* from randomized controlled trials about the effectiveness of e-cigarettes as cessation aids compared with no treatment or to Food and Drug Administration–approved smoking cessation treatments.

## 9. Nations with high vaping rates are seeing smoking fall faster

Prof Robert West, BBC “Inside Health” Feb 2016  
<http://www.bbc.co.uk/programmes/b070dq8h>

### Quitting “actually been relatively small”

- 7m44-8m.01: “Now, that raises an interesting question. If they [ecigs] were the game changer, if they were going to have the massive effect on, you know, everyone switching to ecigarettes and stopping smoking, we might have expected to see a bigger effect than we’ve seen so far, which has actually been relatively small.”

### Cutting down “not much”

- 10m40s: “We know that most people who use ecigarettes are continuing to smoke and when you ask them they tell you that they are mostly doing that to cut down the amount they smoke. But we also know they are smoking, it’s not really that much different from what they would have done since they started using ecigarettes.”



## 9. Nations with high vaping rates are seeing smoking fall faster

### Little difference between vapers, ex-vapers & never vapers in daily cigarettes

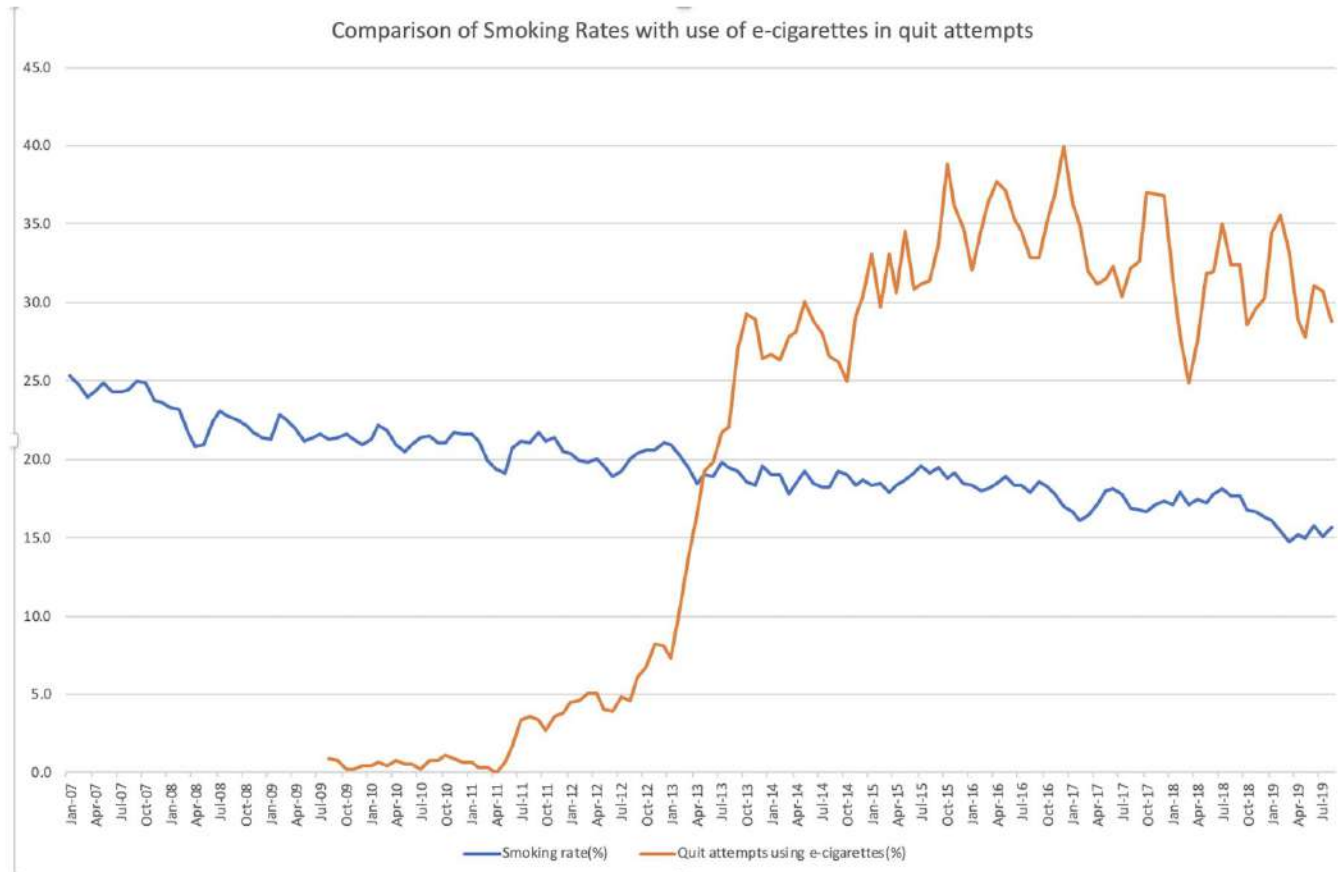
**Table 3. Average daily cigarette consumption, by e-cigarette use, Great Britain, 2014 to 2019<sup>1,2,3,4,5</sup>**

All cigarette smokers aged 16 and over	Average daily cigarette consumption <sup>1</sup>				Mean
	Current e-cigarette user (vaper)	Ex vaper <sup>3</sup>	Tried vaping, but didn't continue to vape	Never vaped	
	2014	10.1	11.7	12.6	
2015	11.8	12.2	11.3	10.3	
2016	10.9	12.8	10.6	11.0	
2017	10.5	11.9	11.1	10.1	
Based on re-designed question <sup>4</sup>					
2018	8.8	9.3	8.9	7.4	
2019	8.0	10.5	10.0	8.1	
Weighted base (000s) <sup>5</sup>	1,245	502	3,699	2,578	
Unweighted sample	134	53	366	348	

Source: Opinions and Lifestyle Survey  
Office for National Statistics

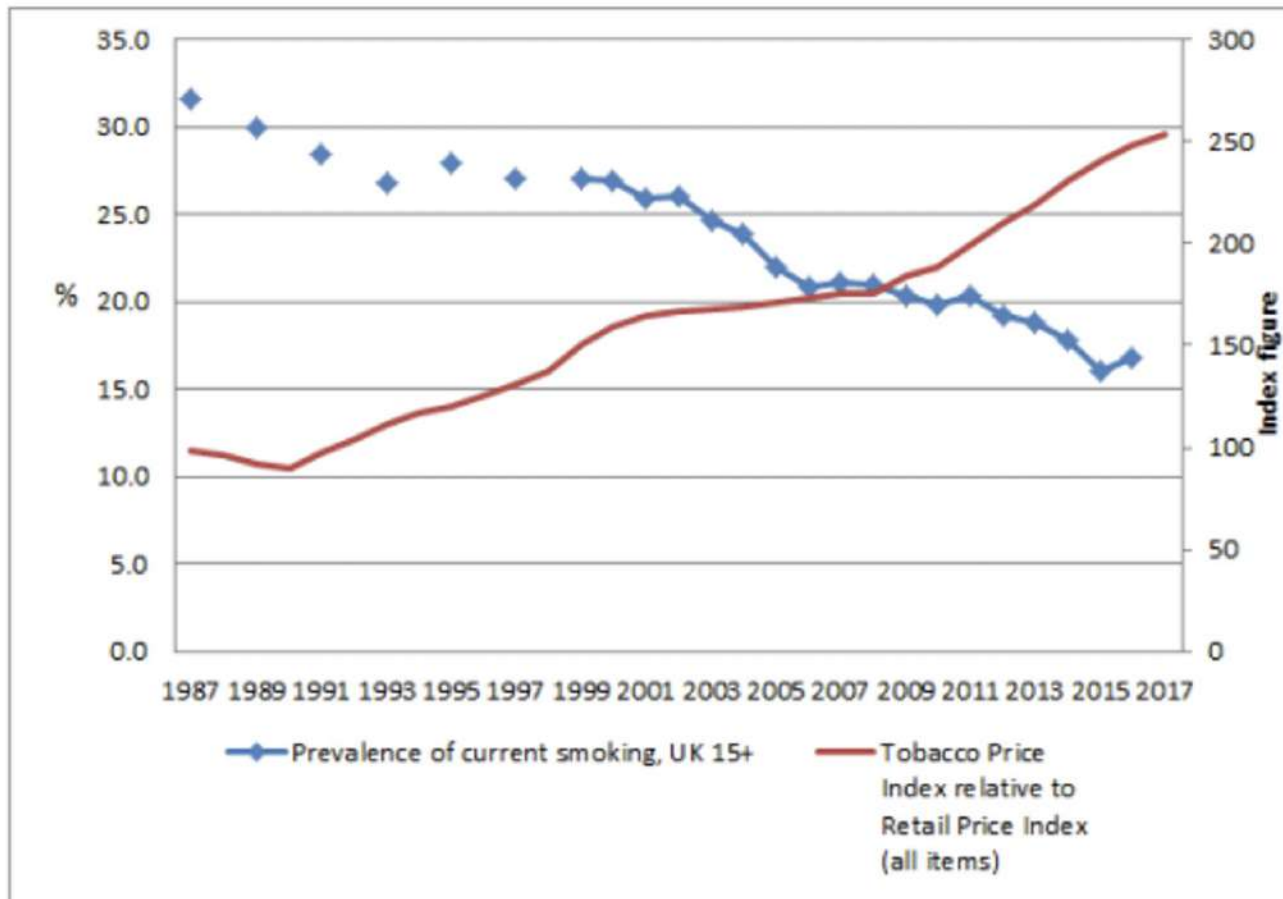
## 9. Nations with high vaping rates are seeing smoking fall faster

### English smoking prevalence & use of e-cigs in quitting attempts (Smoking In England data 2007-2019)



## 9. Nations with high vaping rates are seeing smoking fall faster

### UK smoking prevalence & tobacco price index relative to retail price index



## 10. Gateway effects to smoking?

- › Many cohort studies show youth who use e-cigs have higher ORs for later smoking initiation than non-users.
- › Typically dismissed via
  - › 1: “common liability” theory: (“kids who try stuff, try stuff”)
  - › 2: alleged incompatibility of falling youth smoking with rising youth e-cig use
  - › 3: argument that most youth users are not daily but infrequent users & not plausible that infrequent use could “gateway”
  - › 4: argument that ecigs are a gateway *out of* smoking, not *into* it

# 10. Gateway effects to smoking?

## NASEM conclusions on uptake

### INITIATION AND CESSATION

**Conclusion 16-1.** There is *substantial evidence* that e-cigarette use increases risk of ever using combustible tobacco cigarettes among youth and young adults.

**Conclusion 16-2.** Among youth and young adult e-cigarette users who ever use combustible tobacco cigarettes, there is *moderate evidence* that e-cigarette use increases the frequency and intensity of subsequent combustible tobacco cigarette smoking.

“strong evidence of plausibility and specificity of a possible causal effect of e-cigarette use on smoking...” with the Committee “consider[ing] the overall body of evidence of a causal effect of e-cigarette use on risk of transition from never to ever smoking to be substantial” [p16-32].

## 10. Gateway effects to smoking?

**Staff et al Addiction (2021) doi:10.1111/add.15645**

- › **Evaluated the catalyst, diversion & common liability hypotheses by examining associations between e-cigarette use and tobacco cigarette smoking at ages 14 and 17 years, controlling for risk factors.**
- › **Prospective cohort data from the Millennium Cohort Study UK 10,624 infants born Sept 2000- Jan 2002. Followed up ages 11, 14 and 17 years.**
- › **Potential confounders were age 11 risk factors (e.g. alcohol use, externalizing behaviors, parental tobacco use, permissiveness)**

## 10. Gateway effects to smoking?

### Staff et al Addiction (2021) FINDINGS

- › **Among youth who had not smoked tobacco by 14 (n = 9046),** teenagers who used e-cigarettes by 14 compared with non-e-cigarette users, had **more than 5x higher odds of initiating tobacco smoking by 17** and **nearly 3x odds of being a frequent tobacco smoker at 17**
- › **Among youth who had not used e-cigarettes by 14 (n = 9078),** teenagers who had smoked tobacco cigarettes by age 14 had **3x higher odds of initiating e-cigarettes by age 17** compared with non-tobacco smokers and **nearly 3x higher odds of frequently using e-cigarettes at age 17** net of confounders.

# 11. Big Tobacco is a minor player in vaping: all companies support light regulation.

## Vaping as well as smoking *not instead of* smoking

Company	2014	2015	2016	2017	2018	2019
<u>BAT</u> <u>(including</u> <u>RAI from</u> <u>2017)</u>	1.6	2.9	3.4	11.0	9.4	12.0
RAI	9.6	6.3	6.5			
<u>Imperial</u> <u>Tobacco</u>	0.3	4.7	3.9	3.7	3.2	2.8
<u>JTI</u>	4.1	3.3	2.8	3.1	2.8	2.3
<u>Altria</u>	1.1	1.5	1.8	2.5	2.4	0.3
<u>PMI</u>	1.3	0.9	0.6	0.4	0.3	0.2
Others (independent companies)	82.0	80.4	80.4	75.3	63.3	56.2
<u>JUUL Labs</u>			0.6	4.0	18.6	26.2

**Table 1: Tobacco Company % Shares of the Global Market, by value, 2014-2018 (source [Euromonitor International](#), 2019)<sup>6</sup>**





## 12. Big Tobacco *really* wants to get out of smoking

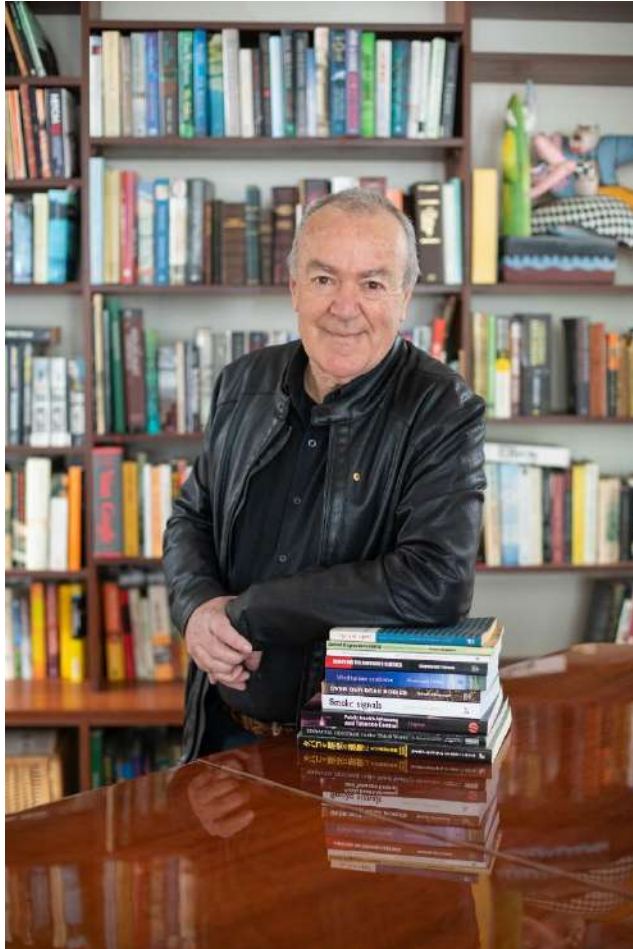


- › **All companies continue to attack effective tobacco control policies**
- › **All their cigarette divisions have staff with KPIs tied to cigarette growth**
- › **All have shareholders to which they have a fiduciary duty to maximise returns**
- › **None have announced unconditional deadlines to stop tobacco sales**
- › **All use the “all other companies will just keep on marketing cigarettes” cigarettes**

## E-cigs: Letting a benevolent or evil genie out of the bottle?

**Possibly one of the most significant periods in tobacco control history or another huge industry diversionary tactic?**





## **Smoking Cessation Methods of Mass Distraction**

Sydney University Press 2022