

Zero Harm Is Not An Option

Submission to

The Standing Committee on Health,
Aged Care and Sport inquiry into the use
and marketing of electronic cigarettes
(E-cigarettes) and personal vaporisers in
Australia

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The author has no commercial or other interest in any electronic cigarette or tobacco company.

Can we die more slowly?

An intractable problem

Tobacco smokers die, on average, ten years earlier than the never smokers.

In 2016, 14.2% of Australian adults smoked tobacco regularly; that is, about 3.5 million people.¹

Using an estimated average of 13 cigarettes per day,² and an average cost of a cigarette of 95 cents,³ each smoker spends about \$4,700 per year buying cigarettes.

That is, each year Australians spend about \$16.4 billion per year buying cigarettes.

In 2013-14 in Tasmania the estimated direct costs of smoking (health and medical costs, reduced labour, etc) were \$469 million, and the estimated intangible costs (based on the value of years lost from premature death) were \$696.4 million.⁴ That is, a total of \$1.17 billion at about \$14,600 per tobacco smoker.

Using these figures, the health costs of smoking in Australia are about \$51 billion per year.

In 2013, about 14.7% of Australians were regular smokers.¹ So over the last three years smoking appears to have declined by 0.5%, an average of 41,000 smokers each year. But this number is not significant and is likely to be no more than a rounding error.

That is, the number of smokers in Australia has flat-lined.

It is likely that we have reached, or are approaching, the point where further reductions in the numbers of smokers will very difficult to achieve. The vast majority of “easy targets” (people who had smoked infrequently) have already quit, and new smokers (primarily children) have important social and economic reasons not to start smoking. So it is very likely that the existing smokers come primarily from disadvantaged groups (mental health, criminal and low socio-economic status) and, most importantly, from people who have tried and failed to quit in the past, **and consequently have given up trying to quit.**

For example, Australian states and territories have legislated for a ban on cigarette smoking in prisons. However this ban is not effective because it has no long-term benefits:

Follow-up studies of prisoners [in the US] after their release have found that 56% reported resuming smoking on their first day of release, 84% had relapsed within 3 weeks, and 39% by a month after release [presumably a misprint for 93%]. Another follow-up study found that 63% of former prisoners had relapsed on the first day of release, 82% by 1 week, 86% by 1 month, and 97% at 6 months.⁵

1 Greenhalgh, EM, Bayly, M, & Winstanley, MH. 1.3 Prevalence of smoking—adults. In Scollo, MM and Winstanley, MH [editors]. Tobacco in Australia: Facts and issues. Melbourne: Cancer Council Victoria; 2015. Available from <http://www.tobaccoinaustralia.org.au/chapter-1-prevalence/1-3-prevalence-of-smoking-adults>

2 Greenhalgh, EM, Scollo, MM, & Bayly, M. 2.3 Self-reported measures of tobacco consumption. In Scollo, MM and Winstanley, MH [editors]. Tobacco in Australia: Facts and issues. Melbourne: Cancer Council Victoria; 2016. Available from <http://www.tobaccoinaustralia.org.au/chapter-2-consumption/2-3-self-reported-measures-of-tobacco-consumption>

3 Scollo, M, Bayly, M. 13.3 The price of tobacco products in Australia. In Scollo, MM and Winstanley, MH [editors]. Tobacco in Australia: Facts and issues. Melbourne: Cancer Council Victoria; 2016. Available from <http://www.tobaccoinaustralia.org.au/chapter-13-taxation/13-3-the-price-of-tobacco-products-in-australia>

4 Have your say, proposed new laws for personal vaporisers (Electronic cigarettes), tobacco licensing, and smoking bans, 2017, Tasmanian Government Department of Health and Human Services. Available from http://www.dhhs.tas.gov.au/publichealth/tobacco_control/electronic-cigarettes

5 *Smoking bans in prison: time for a breather?* Available from https://www.mja.com.au/system/files/issues/203_08/10.5694mja15.00688.pdf

Prisoners are trading and smoking nicotine patches following a smoking ban in Northern Territory jails, researchers have found. The evaluation of the smoke-free policy, carried out by the Menzies School of Health Research, said patch misuse was a key finding for correctional jurisdictions to consider when planning smoke-free facilities.⁶

So these bans have not changed the number of smokers.

Reducing tobacco smoking to zero is not credible, and the definition of “smoke-free” is that 5% or less of the population smoke.⁷

The best that we can expect from current policies is for the number of smokers in Australia to fall to about 1.2 million people, with health costs of about \$18 billion per year.

But if current trends continue it will be impossible to reach that target.

That is, it is probable that the traditional policies of nicotine therapies, drugs and price increases will not deliver the significant reductions in smoking that are necessary. And “feel good” policies, such as prison bans, add nothing.

Where to next?

In 1994 a remarkable prediction was made:

If people have difficulty overcoming both nicotine dependence and long-term habit change, then surely the solution is to help them avoid most of the health risks with only a minimal alteration in their nicotine-seeking habits. This implies a nicotine replacement device, which looks like a cigarette and delivers cigarette-like boli of nicotine, but does not deliver the tar and carbon monoxide that cause the vast majority of smoking-related disease. The development and promotion of such a product (and its eventual replacement of tobacco) could have massive beneficial public health implications lasting into the 21st century.⁸

Ten years later e-cigarettes were invented.

Initially they were ineffectual and had no useful purpose. However they developed rapidly until, in 2017, they are sophisticated, well designed and well engineered systems to deliver nicotine. Professional interest in e-cigarettes did not start until they had become fairly common and were being used as an aid to tobacco smoking cessation. The earliest studies that I have seen date from about 2010 - 2011.

As a result of the very rapid advances in design, early research must be treated with care because it often refers to devices and their use that are now obsolete.

Medical and health authorities are necessarily cautious, and probably the most compelling example of this is thalidomide.⁹ Consequently almost all conclusions are expressed in terms such as “may do harm” and “might be safe”. Most recommendations are based on “when in doubt restrict it or ban it”. And most lists of possible side-effects of drugs include those for which the only evidence is a single, dubious case.

6 *NT prison smoking ban paved way for nation*, 2016. Available from <http://www.news.com.au/national/breaking-news/nt-prison-smoking-ban-paved-way-for-nation/news-story/c8fae6f579e194c82a1f0396cfb3ad50>

7 <https://www.acosh.org/who-we-help/smoking-in-australia/tobacco-free-future/> and <https://publichealthmatters.blog.gov.uk/2017/06/16/our-ambition-for-a-smokefree-nation-is-in-sight/>

8 *A Risk Assessment Matrix for Public Health Principles: The Case for E-Cigarettes*, 2017. Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5409564/pdf/ijerph-14-00363.pdf>

9 *Fifty years of independent expert advice on prescription medicines*. Available from <https://www.tga.gov.au/book/fifty-years-independent-expert-advice-prescription-medicines-02>

However we must also look at *when* such statements are made. Although thalidomide causes birth defects, about 40 years after it was first used the drug has been authorised to treat two different diseases.¹⁰ That is, there can be, and in this case has been, a shift of perception from “does cause harm” to “probably safe” in a different and new context.

There appears to be some inconsistency in the assessment of harm, and what is deemed to be acceptable harm varies. In this submission I use some examples in order to contrast attitudes to e-cigarettes with other situations where the risk of harm is important.

Current evidence shows that e-cigarette use is predominantly associated with tobacco smoking cessation. And, as graphically illustrated by the submissions to this inquiry:

E-cigarettes are used successfully to quit when all other therapies have failed.

That is, e-cigarettes provide an entirely new tool with which to tackle tobacco smoking, a tool that has the potential to substantially reduce the number of smokers in Australia.

This submission begins by suggesting the ways in which e-cigarettes should be regulated. It then examines the evidence that supports these recommendations.

Zero harm is not an option

The catastrophic failure of the US attempt to prohibit alcohol is the most obvious example of the fact that zero harm is not possible. And the failure of Australian laws to eliminate the use of drugs, such as ice, is another example of the futility of attempts to achieve total abstinence.

The best that a society can do is to manage harm.

Irrespective of any laws and their policing, drug rehabilitation and needle exchanges must be a corner-stone of government policy.

And irrespective of any laws and their policing, tobacco smoking reduction, not eradication, must be the basis for future policies.

10 *Fifty years of independent expert advice on prescription medicines*. Available from <https://www.tga.gov.au/book/fifty-years-independent-expert-advice-prescription-medicines-02>

The appropriate regulatory framework for E-cigarettes and personal vaporisers in Australia

At present, the laws regarding e-cigarettes vary and are different in all jurisdictions. This lack of uniformity is not desirable and the Commonwealth Government should correct this problem.

Recommendation 1: The Australian Government should pass legislation so that all states and territories of Australia have consistent laws regarding e-cigarettes.

Recommendation 2: The Australian Government should recognise that tobacco harm reduction is a valid and effective policy to achieve a “smoke-free” Australia.

According to the TGA, *current government policy supports the cessation of smoking rather than harm reduction*. This statement is strange, because cessation is simply an extreme, desirable and unattainable form of harm reduction.

Governments usually recognise individual differences, and frame policies and laws that reflect diversity. Consequently a largely punitive, one-size-fits-all approach cannot work with all people. The government needs to recognise that some smokers cannot quit completely, but their decreased use of tobacco produces significant health benefits.

Anything and *everything* that would help to decrease tobacco smoking must be used.

Recommendation 3: The Australian Government should recognise that e-cigarettes can play a significant role in tobacco harm reduction.

Research into e-cigarettes is developing rapidly. There is now a clear trend showing that e-cigarettes are a viable and very important tool to reduce tobacco smoking:

- (a) About 97% of e-cigarette use is by smokers trying to quit, and often successfully quitting, and by ex-smokers to maintain their cigarette-free status. The recreational use of e-cigarettes is very small.
- (b) E-cigarette use often occurs after a smoker has tried to quit using other methods and failed.
- (c) Nicotine is an essential component of e-cigarettes when they are used as a substitute for tobacco.
- (d) *Nicotine does not kill*, tobacco kills, and addiction to nicotine is not a social nor a medical problem.
- (e) E-cigarettes do not contain the tars and chemicals in tobacco and the best estimate at present is that e-cigarettes are at least 95% less harmful than tobacco smoking.
- (f) Current evidence shows that most e-cigarette use by children occurs *after* previously smoking tobacco and e-cigarettes act as *a gateway from tobacco*.
- (g) Passive breathing of e-cigarette vapour by bystanders causes no or negligible harm.

Because using an e-cigarette provides the same physical and psychological stimuli as smoking a tobacco cigarette, there is a possibility that their use could reduce the “smoke-free” threshold below 5%, something that other therapies cannot do and might even fail to reach.

Recommendation 4: The Australian Government should regard e-cigarettes as a legitimate mechanism to reduce tobacco smoking, and treat them in a similar way to other quit therapies, such as nicotine replacement therapies.

In particular, government legislation of e-cigarettes should be distinct from and separate from legislation for tobacco products.

E-cigarettes are *not* tobacco cigarettes and to legislate their use in the same way that tobacco is legislated would largely prevent their use to reduce cigarette smoking.

Some restrictions on the sale and use of e-cigarettes is inevitable, but they should be rational and based on the principle that e-cigarettes are a valid form of tobacco reduction therapy. For example, banning minors (under 18 years of age) from buying and possessing e-cigarettes is to be expected. But the Government must recognise that some minors smoke tobacco, and these people need special consideration to help them quit; appropriate services are required for them.

Legislation needs to cover many aspects of e-cigarettes, but I will limit my views to parts of three areas: *Sale, Use and Promotion*.

Recommendation 5: Sale.

(a) E-cigarette liquid containing nicotine should be freely available.

This recommendation conflicts with the current status of nicotine defined by the TGA, and that status needs to be changed.

(b) There should be no excise duty or other taxes on e-cigarettes, other than the standard GST already charged on products.

The focus of the legislation should be on the sale of e-cigarettes as tobacco replacement therapies. In this context it is essential that they are much cheaper than tobacco to make them a viable and attractive alternative.

(c) E-cigarettes and E-cigarette liquid should not be sold to people under the age of 18.

(d) E-cigarette liquid must be in child-proof bottles and accurately labelled with the quantities of all ingredients. The bottles and their containers must be marked with appropriate warnings that the contents is poisonous and provide safe storage suggestions.

(e) E-cigarettes must be accompanied by a pamphlet describing how to use them.

E-cigarette use is not simple and some instruction is necessary.

I do not have the knowledge to comment on licensing conditions, but sale should be allowed at all outlets that presently sell tobacco and specialist e-cigarette shops (bricks and mortar or online). Some of these outlets would not have the facilities or training to instruct e-cigarette users and printed matter is needed.

(f) Vendors should be allowed to display e-cigarettes and demonstrate their products.

That is, e-cigarettes should be treated similarly to nicotine replacement therapies, except that they should not be available from self-service shelves.

Recommendation 6: Use.

- (a) E-cigarette use in public open areas (such as streets, parks and sporting venues) should be allowed.*
- (b) E-cigarette use in closed areas that are privately owned but public (such as restaurants and hotel bars) should be allowed if the owner permits it.*

Except perhaps for nicotine inhalators, tobacco quitting therapies are not visible. The purpose of easing restrictions compared with tobacco smoking is promote the use of e-cigarettes in preference to tobacco cigarettes. Also, if a tobacco smoker sees a person using an e-cigarette in an area where tobacco cigarettes are banned then it will send a strong message that there exists an acceptable alternative to tobacco smoking.

Recommendation 7: Promotion.

- (a) Tobacco products currently have graphic information of the harm caused by tobacco. This sequence of images and text should also include information encouraging smokers to use e-cigarettes as a less harmful alternative.*
- (b) Front line organisations and people (particularly Quit Australia and general practitioners) should provide advice on e-cigarettes and recommend their use for tobacco cessation.*

At the present time, it is reasonable if such advice is a last resort after other quit methods have failed (a frequent occurrence).

The health impacts of the use of E-cigarettes and personal vaporisers

Quantity matters. For example:

The risk of lung cancer increases with the number of cigarettes smoked and the duration of smoking.

The risk of pneumococcal infection, the most common cause of severe pneumonia, is two- to four-fold in smokers compared to non-smokers, with the risk increasing as daily cigarette consumption increases.¹¹

So a person who has smoked only a single cigarette in their life probably has a miniscule (if any) increased risk of lung cancer and pneumococcal infection. That is:

In order to assess risk we must know what quantity produces an unacceptable risk.

Paracetamol

In England and Wales an estimated 41,200 cases of paracetamol poisoning occurred in 1989 to 1990, with a mortality of 0.40%. It is estimated that 150 to 200 deaths and 15 to 20 liver transplants occur as a result of poisoning each year.¹²

Paracetamol overdose results in more calls to poison control centers in the US than overdose of any other pharmacological substance, accounting for more than 100,000 calls, as well as 56,000 emergency room visits, 2,600 hospitalizations, and 458 deaths due to acute liver failure per year. A study of cases of acute liver failure between November 2000 and October 2004 by the Centers for Disease Control and Prevention in the USA found that paracetamol was the cause of 41% of all cases in adults, and 25% of cases in children.¹²

It's the most common painkiller in every medicine cupboard but paracetamol is poisoning 8,000 Aussies a year. More than 150 patients a week are hospitalised as a result of paracetamol poisoning and experts say the problem is on the rise.¹³

The toxic dose of paracetamol is highly variable. In general the recommended maximum daily dose for healthy adults is 3 grams. Higher doses lead to increasing risk of toxicity. In adults, single doses above 10 grams or 200 mg/kg of bodyweight, whichever is lower, have a reasonable likelihood of causing toxicity. Toxicity can also occur when multiple smaller doses within 24 hours exceed these levels.¹²

The problem with this drug is the relatively small overdose that will cause damage. The recommendation is 6 tablets per day, but it is possible that 8 tablets per day could cause liver problems and 20 tablets could cause death.

However, paracetamol is freely available and consumed in vast numbers, despite it being known that it does cause harm, and it is clear that Australian authorities regard 3 or 4 people in 1000 being poisoned (based on the above estimate) as acceptable collateral damage.

11 Hurley, S, Greenhalgh, EM & Winstanley, MH. 3.4 Lung cancer. In Scollo, MM and Winstanley, MH [editors]. Tobacco in Australia: Facts and issues. Melbourne: Cancer Council Victoria; 2015. Available from <http://www.tobaccoinaustralia.org.au/chapter-3-health-effects/3-3-lung-cancer>

12 Paracetamol toxicity. Available from https://en.wikipedia.org/wiki/Paracetamol_toxicity

13 Paracetamol, the most common household medicine is poisoning 150 Australians a week. Available from <http://www.news.com.au/lifestyle/health/health-problems/paracetamol-the-most-common-household-medicine-is-poisoning-150-australians-a-week/news-story/f112dfb79efc50e4cf84ea57884ce5c9>

In this case, a small change in quantity produces a significant change in outcomes.

A failure to consider quantity can lead to some bizarre situations:

*Women who take paracetamol during pregnancy may have sons with less masculine traits - a lower sex drive ... a study in the journal Reproduction suggests.*¹⁴

However, the report continues:

The results have so far been shown only in mice. Experts stress that pregnant women typically take painkillers for much shorter periods than the daily dose given to mice.

Fortunately I am not a mouse with a bad headache, but I did burn the house down playing with matches.

Similarly with burnt food:

*A person would need to eat 75kg (165lbs) of [deep fried] chips every day for two years, for instance, to be getting the cumulative dose of acrylamide (200 mg/kg daily) used in one rat study that showed the compound could cause DNA damage when it latched on to haemoglobin in the blood.*¹⁵

That is, any statement claiming the harm caused by something must quantify the amount of the thing that causes the harm.

Nicotine

*The recent rise in the use of electronic cigarettes, many forms of which are designed to be refilled with nicotine-containing “e-liquid” supplied in small plastic bottles, has renewed interest in nicotine overdoses, especially in the possibility of young children ingesting the liquids. A 2015 report on e-cigarettes by Public Health England noted an “unconfirmed newspaper report of a fatal poisoning of a two-year old child” and two published case reports of children of similar age who had recovered after ingesting e-liquid and vomiting. They also noted case reports of suicides by nicotine. Where adults drank liquid containing up to 1,500 mg of nicotine they recovered (helped by vomiting), but an ingestion apparently of about 10,000 mg was fatal, as was an injection. They commented that “Serious nicotine poisoning seems normally prevented by the fact that relatively low doses of nicotine cause nausea and vomiting, which stops users from further intake.” Four adults died in the US and Europe, after intentionally ingesting liquid. Two children, one in the US in 2014 and another in Israel in 2013, died after ingesting liquid nicotine.*¹⁶

The three cases involving children in the UK must be seen in the context of:

*Friday 22 May 2015 ... It is estimated that there are now 2.6 million vapers in Britain.*¹⁷

A very conservative estimate is that there must have been about 8 million bottles of e-liquid in houses at that time, producing one death and two recoveries (a total of about 0.0001% of the number of vapers).

Although nicotine poisoning associated with e-cigarettes justifies taking precautions (child-proof caps and storing liquid in places inaccessible to children) it does not justify banning these liquids.

14 The Mercury (Hobart), June 24, page 11.

15 <https://www.theguardian.com/science/2017/jan/27/how-burnt-toast-became-linked-to-cancer-acrylamide>

16 *Nicotine poisoning*. Available from https://en.wikipedia.org/wiki/Nicotine_poisoning

17 *Electronic cigarette use among smokers slows as perceptions of harm increase, 2015*. Available from <http://ash.org.uk/media-and-news/press-releases-media-and-news/electronic-cigarette-use-among-smokers-slows-as-perceptions-of-harm-increase/>

E-cigarette vapour

It is very easy for opponents of e-cigarettes to make statements, based on evidence, that e-cigarettes cause harm.

However, when that evidence is quantified it is usually found that the supposed harm is minimal and, sometimes, effectively non-existent.

In 2015, Public Health England produced the report *E-cigarettes: an evidence update*.¹⁸ With regard to passive inhalation it quantifies the relative risk of tobacco cigarettes and e-cigarettes (ECs):

Four studies examined nicotine exposure from passive vaping. ... Estimating environmental nicotine exposure, however, has to take into account the fact that side-stream smoke (ie the smoke from the lighted end of the cigarette, which is produced regardless of whether the smoker is puffing or not) accounts for some 85% of passive smoking and there is no side-stream EC vapour.

... nicotine from EC vapour gets deposited on surfaces, but at very low levels. This poses no concerns regarding exposure to bystanders ..., an infant would need to lick over 30 square metres of exposed surface to obtain 1mg of nicotine.

ECs release negligible levels of nicotine into ambient air with no identified health risks to bystanders.

Regarding carcinogens inhaled by e-cigarette users:

Two recent worldwide media headlines asserted that EC use is dangerous. These were based on misinterpreted research findings. A high level of formaldehyde was found when e-liquid was over-heated to levels unpalatable to EC users, but there is no indication that EC users are exposed to dangerous levels of aldehydes;

Users of simple e-cigarettes, that just have a switch linking the battery to the heating coil, control temperature by controlling how long the switch is activated. Modern e-cigarette systems have sophisticated electronics that enable the user to control temperature directly or indirectly. I use variable voltage, variable wattage systems that control the power delivered to the heating coil. The two main ingredients in e-cigarette liquid are Propylene Glycol (PG), a thin liquid that vaporises at 188°C, and Vegetable Glycerin (VG), a thick liquid that vaporises at 290°C. After a while the liquid I use becomes thicker indicating that more PG has vaporised than VG, so much of the time it is heated to less than 290°C and very rarely exceeds that temperature significantly. Very little, if any aldehyde is produced.

And regarding particles inhaled by e-cigarette users:

Trace levels of several metals (including tin, copper, silver, iron, nickel, aluminium, chromium, lead) were found, ... [The] number of microparticles from 10 electronic cigarette puffs were 880 times lower compared with one tobacco cigarette. [There is] no evidence of levels of contaminants that may be associated with risk to health. These include acrolein, formaldehyde, tobacco-specific nitrosamines, and metals.¹⁹

18 *E-cigarettes: an evidence update*, 2015. Available from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/457102/E-cigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England_FINAL.pdf

19 Konstantinos E. Farsalinos and Riccardo Polosa, "Safety evaluation and risk assessment of electronic cigarettes as tobacco cigarette substitutes: a systematic review", *Ther Adv Drug Saf* 2014, Vol. 5(2). Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4110871/>

Also, *Safety evaluation and risk assessment*, page 73, provides a graph of toxic emissions scores. Four different cigarettes scored between 100 and 134. The e-cigarette tested scored zero.

In addition:

*The levels of heavy metals found in vapor were minimal, and considering the dispersion of these molecules in the whole room air, it is unlikely that any of these metals could be present in measurable quantities in the environment. ... Particulate matter exposure is definitely associated with lung and cardiovascular disease. ... but, in general, emissions from electronic cigarettes are incomparable to environmental particulate matter or cigarette smoke microparticles. ... Although evaluating the effects of passive vaping requires further work, based on the existing evidence from environmental exposure and chemical analyses of vapor, it is safe to conclude that the effects of electronic cigarette use on bystanders are minimal compared with conventional cigarettes.*²⁰

A more recent systematic review of case reports has found:

*Twenty-six case reports representing 27 individuals (one study contained reports for two individuals) were published between April 2012 and January 2016, and these were grouped into categories of effect according to their health outcomes. Of the 27 individuals, 25 had negative effects subsequent to use or exposure to ECs and their refill fluids,*²¹

However:

*A recently released report by the Centers for Disease Control and Prevention (CDC) showed that in 2014, 3.7 percent of American adults used electronic cigarettes or vapor products on a regular basis. That figure represents more than 9 million adult consumers, according to the U.S. Census Bureau.*²²

That is, about 0.0003% of e-cigarette users had reported negative effects.

The harm caused by tobacco is beyond dispute.²³ And, based on current evidence, the harm caused by e-cigarettes is dramatically less:

*In a nutshell, best estimates show e-cigarettes are 95% less harmful to your health than normal cigarettes, and when supported by a smoking cessation service, help most smokers to quit tobacco altogether.*²⁴

20 Konstantinos E. Farsalinos and Riccardo Polosa, "Safety evaluation and risk assessment of electronic cigarettes as tobacco cigarette substitutes: a systematic review", *Ther Adv Drug Saf* 2014, Vol. 5(2). Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4110871/>

21 *Potential health effects of electronic cigarettes: A systematic review of case reports*, 2016. Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4929082/pdf/main.pdf>

22 *New CDC Data: More Than 9 Million Adults Vape Regularly in the United States*, 2015. Available from <https://www.atr.org/new-cdc-data-more-9-million-adults-vape-regularly-united-states>

Electronic Cigarette Use Among Adults: United States, 2014, 2015. Available from <https://www.cdc.gov/nchs/data/databriefs/db217.pdf>

23 Winstanley, MH & Greenhalgh, EM. 3.0 Introduction. In Scollo, MM and Winstanley, MH [editors]. *Tobacco in Australia: Facts and issues*. Melbourne: Cancer Council Victoria; 2015. Available from <http://www.tobaccoaustralia.org.au/chapter-3-health-effects> (includes 2017 updates)

24 *E-cigarettes: an evidence update*, 2015. Available from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/457102/Ecigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England_FINAL.pdf

The need to use good quality research is highlighted by:

“We just don’t have the data,” Samet, scientific editor of the 2014 Surgeon General Report on smoking, told Healthline” ... there’s a new quit-smoking campaign by the U.S. Centers for Disease Control and Prevention (CDC) that includes, for the first time, warnings about e-cigarette hazards. The campaign features a woman who smoked cigarettes, and also vaped e-cigarettes, and suffered a collapsed lung at age 33.²⁵

Apparently we are expected to believe that the cigarettes she smoked were harmless and e-cigarettes caused the problem. That is not credible.

25 <http://www.healthline.com/health-news/does-switching-to-e-cigarettes-make-your-body-any-healthier-040715>

The use and marketing of E-cigarettes and personal vaporisers to assist people to quit smoking

Even when there is a quantifiable risk of harm, public policy often decides to accept that risk because it reduces harm. That is, a decision is made between two or more options and an option that reduces harm is chosen.

Seat belts

While a seat belt of good design and properly worn will prevent the occupants of a car being flung violently against the steering wheel, dashboard, or wind-screen, the force applied to the body by the restraining effect of the belt is considerable and increase the chance of intra-abdominal injuries. The use of seat belts is associated with a unique injury profile collectively termed “the seat belt syndrome”. Skin abrasions of the neck, chest and abdomen – i.e., the classic seat belt sign – indicate a high chance of an internal injury.²⁶

That is, wearing a seat belt can cause significant, serious harm. But:

Among drivers and front-seat passengers, seat belts reduce the risk of death by 45%, and cut the risk of serious injury by 50%.²⁷

This large reduction in deaths and injuries has justified Australian laws making the wearing of seat belts compulsory, even though they themselves cause significant harm.

X-rays

Studies have associated x-ray exposure with thyroid, breast, and lung cancer and leukaemia. The US Report on Carcinogens (RoC) is a list of known or reasonably anticipated human carcinogens (cancer causing substances). X-rays are classified as a known human carcinogen in the RoC. The International Agency for Cancer Research (IARC), an agency of the World Health Organization, classifies x-rays as carcinogenic to humans.²⁸

However:

A diagnostic x-ray should be performed to provide information that helps medical staff treat a patient’s condition appropriately. In general, this information is much more important to a person’s health than the small estimated rise (typically less than 0.01%) in the chance of developing cancer perhaps a decade or more later.²⁹

It is clear that the possible harm from x-rays is very small when compared with the benefits.

Harm from x-rays is caused to about 1 in 10,000. In contrast, harm caused by nicotine poisoning is about 1 in 1,000,000 and reported negative effects of e-cigarettes are about 3 in 1,000,000.

26 *Seat belt syndrome: Delayed or missed intestinal injuries, a case report and review of literature*, 2016. Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4818312/>

27 *Policy Impact: Seat Belts*, 2011. Available from <https://www.cdc.gov/motorvehiclesafety/seatbeltbrief/>

28 *Cancer myth: Medical imaging (x-rays) and cancer*, 2014. Available from <https://www.cancerwa.asn.au/resources/cancermyths/medical-imaging-myth/>

29 *Radiation protection, X-rays*, 2013. Available from <http://www.arpansa.gov.au/radiationprotection/Basics/xrays.cfm>

E-cigarette use to quit tobacco smoking

In 2014, statistics of e-cigarette use in the USA were:³⁰

- *12.6% of adults had ever tried an e-cigarette even one time [40.2 million out of a population of 318.9 million].*
- *About 3.7% of adults currently used e-cigarettes [regular use, 11.8 million].*
- *Among current cigarette smokers who had tried to quit smoking in the past year, more than one-half had ever tried an e-cigarette and 20.3% were current e-cigarette users.*
- *Among adults who had never smoked cigarettes, 3.2% had ever tried an e-cigarette.*

In 2015 there were 48.2 million people in the USA who currently smoked cigarettes (15.1%).³¹

2013 data from Victoria was very similar:³²

7.3% of Victorian adults had used electronic cigarettes in the past 12 months.

And in the 18-29 age group:

53.8% of current smokers, 30.5% of former smokers and 4.8% of never smokers had used an electronic cigarette in the past year.

In 2015 a survey was conducted by the NSW Cancer Council.³³ The results mirror the other surveys: Those people who had ever used an e-cigarette were predominantly tobacco smokers (53%), occasional smokers (21%) or ex smokers (7%), and only 2% had never smoked tobacco. The main reasons for using e-cigarettes were to help quit smoking or to help cut down.

In Great Britain, Action on Smoking and Health (ASH) regularly surveys adult e-cigarette use. The latest survey in 2017 includes the following summary:³⁴

- *An estimated 2.9 million adults in Great Britain currently use e-cigarettes (vape) up from 700,000 in 2012, the first year ASH collected figures.*
- *For the first time there are more ex-smokers (1.5 million) who use e-cigarettes than current smokers (1.3 million). Over half (52%) of e-cigarette users are now ex-smokers and 45% are smokers.*
- *The main reason given by ex-smokers who are currently vaping is to help them stop smoking while for current smokers the main reason is to reduce the amount they smoke.*

That is, only about 3% of e-cigarette users have never smoked tobacco. The ASH report also notes that:

Over a third (36%) of ex-smokers who have tried e-cigarettes but no longer use them said they had used them as part of a quit attempt.

30 *Electronic Cigarette Use Among Adults: United States, 2014, 2015.* Available from <https://www.cdc.gov/nchs/products/databriefs/db217.htm>

31 *Current Cigarette Smoking Among Adults in the United States, 2015.* Available from https://www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smoking/

32 *Cancer Council & Heart Foundation, Position statement - Electronic cigarettes.* Available from http://wiki.cancer.org.au/policy/Position_statement_-_Electronic_cigarettes

33 *Walsberger S, Havill M. NSW Community Behaviours, Beliefs & Attitudes Towards E-cigarettes: Results of an Online Survey* Sydney, 2015. Available from http://www.smh.com.au/cqstatic/ghe3xc/150528_ecig_srv_results_report.pdf

34 *ASH Use of e-cigarettes (vapourisers) among adults in Great Britain, 2017.* Available from <http://ash.org.uk/information-and-resources/fact-sheets/use-of-electronic-cigarettes-vapourisers-among-adults-in-great-britain/>

Surveys in Europe give similar results:

Our representative study found that regular users of electronic cigarettes in Germany are almost exclusively either smokers or ex-smokers who had quit in 2010 or later.³⁵

Smoking prevalence was high among those who vape: 83.1% were smokers (74.7% were daily smokers) and 15.0 % were former smokers. ... Vaping ex-smokers represented ... approximately 400,000 people. This figure represents an initial estimate of the number of smokers who have successfully stopped smoking, at least temporarily, thanks to e-cigarettes.³⁶

Ever e-cigarette use was reported by 31.1% of current smokers, 10.8% of former smokers, and 2.3% of never smokers. ... E-cigarette use in the European Union appears to be largely confined to current or former smokers, while current use and nicotine use by people who have never smoked is rare. Over 30% of current e-cigarette users polled reported smoking cessation and reduction.³⁷

It is clear that e-cigarettes are being used as an aid to quit tobacco smoking.

Although professional organisations regard anecdotal evidence with scepticism, it is often the reason that health researchers become aware of an area of importance and so leads to new research; the progress of thalidomide research follows this pattern. The submissions to this inquiry into e-cigarettes provide important evidence. At the time of writing, there have been 108 submissions, of which 2 are confidential and 1 is irrelevant (about hearing). Of the remaining 105 submissions:

- (a) 96 submissions (91.4%) provide anecdotal evidence that e-cigarettes are being used successfully to quit tobacco smoking. As some submissions refer to multiple people, particularly because of the influence submitters had on smokers around them, the number of successful quits is much greater than 96.
- (b) At least 82 submissions (78.1%) state that quitting is total and there is no parallel use of both e-cigarettes and tobacco cigarettes.
- (c) 73 submissions definitely (69.5%), and 13 submissions probably (12.4%), state that e-cigarettes were used successfully after attempts to quit using other methods failed. The most prominent other method was nicotine replacement therapy (NRT, patches etc), but several also failed to quit using drugs that often had unacceptable side-effects.
- (d) 40 submissions (38.1%) cited sourcing e-liquid with nicotine as a major problem.

The anecdotal evidence submitted to this inquiry supports the fact that quitting can be extremely difficult:

Many smokers experience long-term, perhaps lifelong, disruption in their mood and/or cognitive ability following smoking cessation. Consequently, they may never be able to give up all use of nicotine and may require long-term treatment, support, or nicotine maintenance to enable them to sustain abstinence from smoking. For this kind of

35 Eichler M, Blettner M, Singer S: The use of e-cigarettes—a population-based cross-sectional survey of 4002 individuals in 2016. *Dtsch Arztebl Int* 2016; 113: 847–54. DOI: 10.3238/arztebl.2016.0847. Available from <https://www.aerzteblatt.de/pdf/DI/113/50/m847.pdf?ts=12%2E01%2E2017+16%3A11%3A27>

36 Electronic cigarette use in France in 2014. Abstract available from <https://www.ncbi.nlm.nih.gov/pubmed/26687039>

37 Electronic cigarette use in the European Union: analysis of a representative sample of 27 460 Europeans from 28 countries. Abstract available from <https://www.ncbi.nlm.nih.gov/pubmed/27338716>

*smokers, tobacco harm reduction (THR), the substitution of low-risk nicotine products for cigarette smoking, could be a realistic compromise likely to offer substantial public health benefits.*³⁸

As I note later, nicotine by itself is probably harmless and actually may confer some benefits.

E-cigarettes as a gateway to tobacco smoking

The possibility that children and young people might take up tobacco smoking after using e-cigarettes is called the *gateway effect*. However, evidence suggests that this does not occur.

Some research is unsatisfactory because it fails to clarify whether use of tobacco occurred before or after use of e-cigarettes. But research in Britain contradicts the gateway hypothesis:

*Most use among young people appears to be single or very occasional experimentation. Use more than once a month is relatively rare and more than once a week extremely rare.*³⁹

*The prevalence data on the use of e-cigarettes by both adults and children presented in Chapter 7 demonstrate that e-cigarette use in Britain is, to date, almost entirely restricted to current, past or experimental smokers. As with NRT, there is no evidence thus far that e-cigarette use has resulted, to any appreciable extent, in the initiation of smoking in either adults or children; the extremely low prevalence of use of e-cigarettes among never-smoking adults and children indicates that, even if such gateway progression does occur, it is likely to be inconsequential in population terms. Although it remains important to monitor the use of e-cigarettes in young people, to ensure the quick identification of evidence of any increase in uptake of smoking arising from e-cigarette use, it appears that, to date, concerns over gateway progression into smoking are unfounded. The association between e-cigarette and tobacco cigarette use is therefore more likely to arise from common liability to use of these products, and to **use of e-cigarettes as a gateway from, rather than to, smoking.**⁴⁰ [my emphasis]*

*Although children's awareness of and experimentation with electronic cigarettes is increasing, regular use remains rare and is most common among those who currently smoke or have previously smoked. This indicates that it is unlikely that electronic cigarettes are currently acting as a gateway, something which leads causally to smoking.*⁴¹

In addition, the evidence given above clearly shows that there is no gateway effect in adults.⁴²

38 A Risk Assessment Matrix for Public Health Principles: The Case for E-Cigarettes, 2017. Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5409564/pdf/ijerph-14-00363.pdf>

39 Royal College of Physicians, *Nicotine without smoke: Tobacco harm reduction*, April 2016. Available from <https://www.rcplondon.ac.uk/projects/outputs/nicotine-without-smoke-tobacco-harm-reduction-0>

40 Royal College of Physicians, *Nicotine without smoke: Tobacco harm reduction*, April 2016. Available from <https://www.rcplondon.ac.uk/projects/outputs/nicotine-without-smoke-tobacco-harm-reduction-0>

41 ASH *Use of electronic cigarettes among children in Great Britain*, 2016. Available from <http://ash.org.uk/information-and-resources/fact-sheets/use-of-electronic-cigarettes-vapourisers-among-children-in-great-britain/>

42 See also: A Risk Assessment Matrix for Public Health Principles: The Case for E-Cigarettes, 2017. Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5409564/pdf/ijerph-14-00363.pdf>

Australian policy positions

The Australian Medical Association

The AMA's policy on e-cigarettes was formulated in 2015,⁴³ apparently as an addendum to its tobacco smoking policy. It does not make any recommendations, but it makes three main points.

First:

The inhaled aerosol is often flavoured, raising concerns about their intended appeal to young people and their potential to act as a gateway to tobacco smoking. ...

There are legitimate concerns that e-cigarettes normalise the act of smoking. This has the potential to undermine the significant efforts that have been dedicated to reducing the appeal of cigarettes to children, young people and the wider population. These concerns are supported by research findings that young people using E-cigarettes progress to tobacco smoking.

Although the AMA cites evidence from the USA (referring to 2014 or earlier studies), the more recent evidence from other countries cited above contradicts this view.

Second:

The evidence supporting the role of E-cigarettes in cessation is mixed and low level, and E-cigarettes are not currently recognised as cessation aids by the National Health and Medical Research Council, the Therapeutic Goods Administration or the World Health Organisation. In fact, using an E-cigarette may significantly delay the decision to quit smoking.

Current evidence again contradicts the concerns of the AMA.

The suggestion that e-cigarette use may delay the decision to quit smoking is strange, given that dual use is relatively small and given that *any reduction* in tobacco use has positive health benefits.

And third:

In addition, there is uncertainty about the longer term health implications of inhaling the vapours produced by the illegally imported (and unregulated) solutions.

The action to restrict liquid containing nicotine makes it very difficult for e-cigarette users in Australia to get liquid from regulated sources.

However, the lack of any references for the AMA's third statement must make us wonder if it is simply an opinion unsupported by evidence. Certainly it appears that many millions of e-cigarette users throughout the world are not having problems due to lack of regulation.

43 Tobacco Smoking and E-cigarettes - 2015. Available from <https://ama.com.au/position-statement/tobacco-smoking-and-e-cigarettes-2015>

The National Health and Medical Research Council

The NHMRC has a more substantial policy document.⁴⁴

First, at the end, under the heading “Where can I get more information?” only one evidence-based report is listed, the World Health Organisation report of 2016.⁴⁵ This report is used as the primary evidence for the opinions of the NHMRC. But I assume the NHMRC CEO has not read the rebuttal of the WHO report.⁴⁶ In summary, UKCTAS states that WHO:

focuses excessively on the risks of e-cigarettes and fails to quantify the risks

fails to compare adequately with smoking, the primary reason for e-cigarette use

misrepresents second hand vapour risks

discounts the evidence that e-cigarettes do help smokers quit

unjustifiably supports e-cigarette prohibition

Consequently the NHMRC considers that there are health risks, but fails to quantify those risks and fails to compare them adequately to the risks of tobacco smoking.

Three claims are made by the NHMRC.

First:

There is currently insufficient evidence to demonstrate that e-cigarettes are effective in assisting people to quit smoking ... Smokers wishing to quit are advised to consult their general practitioner. First-line treatments include a range of TGA-approved nicotine replacement therapies and prescription medications that have been tested for safety and efficacy.

From the wording, it appears that the NHMRC is implying that lack of evidence necessarily means rejecting e-cigarettes. However, as I have noted above, both research and anecdotal evidence strongly supports the use of e-cigarettes as an aid to quitting.

To have restricted treatments to nicotine replacement therapies and drugs would have disadvantaged the many people who have quit successfully after failing with these therapies. Indeed, it has the effect of suggesting to people who are trying to quit that smoking tobacco is preferable to e-cigarette use.

However, the NHMRC does not explain the term *first-line treatments* and does not comment on second-line treatments, assuming they exist. Perhaps e-cigarettes (and other unknown things) are the second line?

The second claim is:

There is some evidence that e-cigarettes could act as a gateway into nicotine addiction or tobacco cigarette smoking.

44 NHMRC CEO Statement: *Electronic cigarettes (e-cigarettes)*, 2017. Available from <https://www.nhmrc.gov.au/guidelines-publications/ds13a-ds13>

45 WHO *Electronic Nicotine Delivery Systems and Electronic Non-Nicotine Delivery Systems (ENDS/ENND)*, November 2016. Available from http://www.who.int/fctc/cop/cop7/FCTC_COP_7_11_EN.pdf

46 UK Centre for Tobacco and Alcohol Studies, *Commentary on WHO report on electronic nicotine delivery systems and electronic non-nicotine delivery systems*, 26 October 2016. Available from <http://ukctas.net/pdfs/UKCTAS-response-to-WHO-ENDS-report-26.10.2016.pdf>

Nicotine addiction is not important, because it is almost harmless and addiction to it does not lead to significant problems; nicotine does not produce psychiatric disorders or anti-social behaviours:

It is not nicotine that is causing smoking-related diseases; nicotine is not a carcinogen and does not promote cardiovascular disease or obstructive lung diseases. It is anticipated that any product delivering nicotine without involving combustion, such as e-cigarettes, would confer a very significantly lower risk compared with conventional cigarettes and other combustible sources of nicotine.

In addition, the notion that nicotine may have significant positive effects is largely neglected. Akin to caffeine and several other psychoactive substances, it is not surprising that nicotine can improve several cognitive aspects of the individual including memory, level of attention, alert response and response time.⁴⁷

Also, as shown above, there is significantly more evidence that e-cigarettes act as a gateway from cigarette smoking rather than towards cigarette smoking.

And the third claim is:

... more serious adverse events have also been reported, with over 200 incidents of e-cigarettes overheating, catching fire or exploding reported to date in the US and UK alone.

The failure to quantify this risk is unacceptable. There are about 14.7 million e-cigarette users in the US and the UK who would have multiple e-cigarettes and batteries, probably more than 28 million in total. So 200 incidents represents about 0.0007% (7 in 1,000,000) of batteries failing.

Also, no data is provided about the frequency of such incidents in batteries not associated with e-cigarettes, such as mobile phones, laptops and household items. As I have noted, it is impossible to reduce risk to zero and decisions have to be made about acceptable risk. 200 incidents are unfortunate, but they are utterly insignificant when compared to the benefits of tobacco smoking cessation.

The Public Health Association

The PHA bases its views on the WHO report discussed above.⁴⁸ It recommends that there should be more independent research *with particular attention to the following:*

- *The potential risks of e-cigarettes to users and non-users*
- *The development and promotion of e-cigarettes as a means of engaging children, young people and non-smokers;*
- *The maintenance of the smoking habit through e-cigarettes;*
- *The role played by e-cigarettes in smoking cessation over time*
- *The impact of advertising and promotion of e-cigarettes in undermining tobacco control developments*

All proposals focus on trying to prove that e-cigarettes are bad and there are no proposals to investigate the growing evidence of the benefits of e-cigarettes. The bias is obvious.

47 *A Risk Assessment Matrix for Public Health Principles: The Case for E-Cigarettes*, 2017. Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5409564/pdf/ijerph-14-00363.pdf>

48 WHO *Electronic Nicotine Delivery Systems and Electronic Non-Nicotine Delivery Systems (ENDS/ENNDs)*, November 2016. Available from http://www.who.int/fctc/cop7/FCTC_COP_7_11_EN.pdf

The Cancer Council and the Heart Foundation

These two organisations produced an undated joint report,⁴⁹ probably in 2015 because, except for a very strange reference to a web site of photographs of tobacco advertising, all references are 2014 or earlier. The report begins with:

The limited evidence available points to a risk that widespread electronic cigarette use could undo the decades of public policy work in Australia that has reduced the appeal of cigarette use in children.

This emotive statement, that is *not* supported by evidence, is followed by three recommendations of which one is relevant here:

Recommendation 1 – Ban the retail sale of non-nicotine electronic cigarettes (unless the product has been approved by the TGA)

It is currently unlawful to sell electronic cigarettes that contain nicotine in any form. ...

That is, the Cancer Council and the Heart Foundation want a total ban of all e-cigarettes. But there are three problems. First, it seems that the Cancer Council and the Heart Foundation do not know that modern e-cigarettes are simply devices that vaporise liquid and there is no difference between those used with nicotine and those used without nicotine, the liquid being sold separately. Second, past experience has shown that total bans are impossible to enforce in practice and fail catastrophically; such as the bans in jails mentioned above. And third, as noted above, such a ban would force some people back to smoking tobacco, an outcome that the Cancer Council and the Heart Foundation should find unacceptable.

The Therapeutic Goods Administration

In 2017 the TGA handed down its final decision in an application to have e-cigarette liquid containing nicotine listed as a therapeutic good and consequently for sale.⁵⁰ The request was rejected.

Although I have only read the summary, it is clear that the advice given to the TGA by the joint ACCS-ACMS meetings totally ignored research supportive of e-cigarettes and only presented evidence *against* e-cigarettes:

- (a) Four of the six reasons cited nicotine dependence and the danger of nicotine overdose.

As noted above, the possible harms from nicotine addiction are exaggerated and overdoses of nicotine do not pose a serious problem. Both must be examined in the context of e-cigarette use but they are not; again quantity matters.

It appears that the TGA is inconsistent. Nicotine inhalers are a cigarette-shaped, nicotine replacement therapy, approved by the TGA, and is available from supermarkets without the need for advice, so that non-smokers (and perhaps children) can buy them. The recommended use is up to 90 mg of nicotine per day.⁵¹ Apparently, contrary to the TGA's opinions, this device does not have a risk of nicotine addiction or overdose and I assume it is not available in Western Australia.⁵²

49 *Position statement - Electronic cigarettes*. Available from http://wiki.cancer.org.au/policy/Position_statement_-_Electronic_cigarettes

50 <https://www.tga.gov.au/sites/default/files/scheduling-delegates-final-decisions-23-march-2017.pdf>

51 [https://www.icanquit.com.au/quitting-methods/nicotine-replacement-therapy-\(nrt\)/nicotine-inhaler](https://www.icanquit.com.au/quitting-methods/nicotine-replacement-therapy-(nrt)/nicotine-inhaler)

52 http://ww2.health.wa.gov.au/Articles/A_E/Electronic-cigarettes-in-Western-Australia

- (b) The fifth reason is that the electronic nicotine delivery system (ENDS) “*is used for Tobacco Harm Reduction, assistance with cessation and recreational use.*” This statement is not a reason but a comment that actually supports e-cigarette use. Presumably it was made because “*Current government policy supports the cessation of smoking rather than harm reduction.*”

Recreational use is very small (about 3% of e-cigarette users) and there is plenty of evidence that e-cigarettes are used to totally or partially quit tobacco smoking. In addition, the current government policy of cessation, and not harm reduction, is unrealistic:

*Indeed, although potentially millions of lives could be saved, the focus of most health regulatory authorities and tobacco control policies has been to encourage complete and simultaneous abstinence of smoking, tobacco use and nicotine among smokers, regardless of relative risk. For existing smokers, advice by the health authorities is almost exclusively focused on either quitting unassisted or with the use traditional nicotine replacement therapies (NRTs) supported by the medical community, such as the nicotine patch and gum, despite the well documented long-term effectiveness of those products. This approach, however, ignores the reality that many smokers cannot or do not want to achieve this goal, and for these smokers the alternative of reducing the risk of smoking-related diseases while continuing to take clean nicotine is the only realistic option. Is the objective of such policies the greatest reduction in nicotine use or the greatest reduction in the deaths and illnesses caused by the way nicotine is delivered?.*⁵³ [My emphasis]

- (c) The sixth reason given was that “*The use of a warning statement ‘not to be sold to a person under the age of 18 years’ is not likely to be effective unless there is enforcement of this requirement.*”

Considering the warning statements and their enforcement with regard to tobacco, this comment is strange.

Summary

There are two problems with the above policy positions:

First, they are out-of-date. Knowledge about e-cigarettes is advancing rapidly and much significant research has been published in the years 2015 to mid 2017. This new evidence supports the use of e-cigarettes as an aid to quitting tobacco with few side-effects and few, if any, unintended consequences.

Second, they are biased against e-cigarettes. Although caution is to be expected and ringing endorsements unlikely, the policies are too negative and fail to consider the *relative harm* of tobacco and e-cigarettes, and the *relative benefits* of using e-cigarettes instead of smoking tobacco.

It is to be hoped that the Australian professional bodies update their positions to reflect current knowledge.

53 *A Risk Assessment Matrix for Public Health Principles: The Case for E-Cigarettes*, 2017. Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5409564/pdf/ijerph-14-00363.pdf>

Anecdotal and cost information

My personal experience

I was born in 1944 when there were no limitations on smoking tobacco. Indeed, because of the rampant, seductive advertising it was seen as the right thing to do, and children like me emulated their smoking parents. So when I was about 12 years old, I stole a packet of cigarettes and tried them. But my parents did not want me to smoke, so it was not until I went to university that I smoked regularly.

In the early years smoking was fashionable, so when I could afford them a Black Sobranie dangled from my lips at motor-car hill-climbs. After graduating, smoking was just an acceptable behaviour, and I smoked while giving lectures, smoked in restaurants, smoked in aeroplanes, smoked everywhere. And I became a serious smoker, from 20 to 40 cigarettes a day.

Eventually, in my forties, public policy started to catch up and, although I could still smoke anywhere and everywhere, it was now seen as a bad thing to do. So I tried to quit. First “cold turkey”; that lasted for a few weeks. Then with patches a few times. Then with gums and inhalers. But nothing worked. One time I stuck 2 or 3 high strength patches on my body and continue to smoke! And I had no problems adapting to the new restrictive laws. So when I was at a restaurant I would get up between courses, go outside and smoke. When I decided I could not smoke inside my home I got into the habit of going outside regularly, no matter the weather; which is why I have always lived in houses with covered porches!

Eventually I gave up. That is, I gave up trying to quit. Attempting to quit again was pointless as I knew I would fail. Also, in their wisdom, governments and manufacturers decided to make quitting aids as expensive as cigarettes, so there was no financial incentive. And horrific packaging had no effect because my health was good, probably because I have lucky genes, and I did not have cancer, gangrene or other problems. The messages were irrelevant to me. I did have one problem, symptoms of the early stages of emphysema, and I could not walk rapidly up hill or up stairs, and running was out of the question. But I am an “intellectual” who spends his time sitting and hates exercise. So a slow death by suffocation did not worry me much. I did try to cut down and managed to get to 10 to 15 cigarettes a day, but less was impossible. The price increases didn't matter much, I just switched from an expensive brand to a cheap one. And if I didn't have enough money I would just go without something else.

For many years I have studied the history and design of pocket watches and have a web site devoted to them. And that led to a sequence of events that no one could have predicted.

One day Ron was looking at Gumtree and accidentally saw a gold watch for sale and, as he did not collect watches, he should have ignored it. But irrationally he bought it! Then, somehow he chanced upon my name and sent me an email, asking if I could give him some information. So a total stranger contacted me and a few days later we met at my home. While inspecting his purchase I pulled out my packet of cigarettes, apologised and said I had to go outside for a smoke. Ron joined me, but instead of a cigarette he puffed on an e-cigarette. I had never seen one before and I was fascinated! So on January 10, 2017 Ron visited me again, put a collection of e-cigarette batteries, spare parts and liquid on the table and said “Try it. A gift for helping me with the watch.” I stopped smoking. Except for one day early on, when I was under considerable stress, I have not smoked since.

The most powerful incentive I had was also completely unexpected. One day a daughter gave me a hug and with a huge grin she said “You smell nice!” It was the first time that I had smelled nice in 55 years.

In the past when I felt anxious, angry or frustrated, I would smoke tobacco cigarettes and calm down. Smoking at these times was necessary. And mood and stress were the reasons why past attempts to quit failed, I experienced *long-term disruption to my mood and cognitive ability*.⁵⁴

The same effect has occurred with e-cigarettes. The one day I failed and smoked 14 tobacco cigarettes was to control stress, but I realised that e-cigarettes do the same thing. Clearly it is the nicotine that produces the effect.

It is also nicotine that allows me to work efficiently and *that nicotine may have significant positive effects is largely neglected*.⁵⁴ When I have a problem, like writing this submission, I “smoke”, in the past tobacco and now e-cigarettes, and find my brain works much better. For me there is no doubt that addiction to nicotine is a benefit.

Comparative cost of cigarettes and e-cigarettes

Ron told me that he and his wife Clair used to smoke 90 cigarettes a day between them. Then, about 5 years ago, they switched to using e-cigarettes. He told me that they kept count of how much they were saving, but after they had reached \$100,000 they stopped. I did not believe him. But ...

The following table estimates how much they spent on cigarettes using the average cost of cigarettes calculated from Scollo and Bayly.⁵⁵

Year	Average cost per cigarette \$	Annual cost
2012	0.64	\$21,056.85
2013	0.68	\$22,452.58
2014	0.78	\$25,661.72
2015	0.87	\$28,466.09
2016	0.95	\$31,311.13
Total cost 2012 - 2016		\$128,948.37

The cost of e-cigarettes (the battery system, spare parts and liquid) is difficult to quantify, but my experience suggests a cost of about \$500 per year, certainly less than \$1,000 per year. (This assumes the batteries only last one year.)

The direct savings achieved by Ron and Clair over 5 years, from quitting tobacco and using e-cigarettes, are about \$124,000. In my case, a relatively lighter smoker, the savings will be about \$26,000.

The importance of these figures is obvious:

A person who switches from tobacco cigarettes to e-cigarettes has a substantial increase in their disposable income and consequently a significant increase in the wealth of Australia.

54 *A Risk Assessment Matrix for Public Health Principles: The Case for E-Cigarettes*, 2017. Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5409564/pdf/ijerph-14-00363.pdf>

55 Scollo, M, Bayly, M. 13.3 The price of tobacco products in Australia. In Scollo, MM and Winstanley, MH [editors]. *Tobacco in Australia: Facts and issues*. Melbourne: Cancer Council Victoria; 2016. Available from <http://www.tobaccoinaustralia.org.au/chapter-13-taxation/13-3-the-price-of-tobacco-products-in-australia>