

**Submission  
No 24**

## **E-CIGARETTE REGULATION AND COMPLIANCE IN NEW SOUTH WALES**

**Organisation:** Lung Foundation Australia

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**Lung  
Foundation  
Australia**

# **E-cigarette regulation and compliance in NSW**

## **Lung Foundation Australia**

November 2023

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## Executive Summary

It is unacceptable that we continue to see high rates of youth vaping, despite strong efforts from NSW Government to tackle the growing use and protect public health. The increasing use of e-cigarettes is creating a new public health crisis and current public health legislation is failing to protect children and non-smokers from being exposed to toxic chemicals. The use of e-cigarettes is known to result in short term health impacts; however, the long-term health impacts remain unknown. Young people are becoming the next generation to become dependent on nicotine, with most vaping products widely available containing various amounts of this addictive substance. Many young people who vape do not know they are vaping nicotine and are unaware that they are becoming addicted.

Schools are continuing to highlight the need for more to be done as they struggle to manage vaping use by students. Despite efforts to educate youths and parents on the harms of vaping, vaping use is persistent and has become somewhat of a normality. Schools have implemented strong measures to discourage vaping, from installing vape detectors to locking bathrooms, however, some students are being suspended and are missing out on vital education. Current measures to prevent vaping at school are ineffective, but we stress that this issue is much larger than education alone and we are pleased to see the Federal Government taking strong action. Lung Foundation Australia are regularly contacted by parents and work closely with clinicians and consumers who express strong concern about these products and what it will mean for future generations. Ex-smokers understand the industry tactics used and do not want to see young people go down the same path as them with addiction and lung disease.

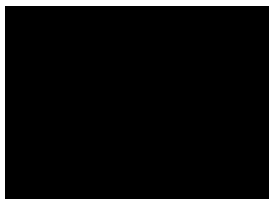
Lung Foundation Australia have taken a strong role in vaping over the last few years, conducting a roundtable with young people, creating the 'Unveil what you Inhale' campaign, supporting research and developing information and resources. However, we need strong policy change to support the federal reforms and eliminate supply of vapes (excluding through the prescription pathway accessed through a pharmacist). We commend the NSW Government for their ongoing investment and work to reduce vaping by young people and tackle the growing illegal market of nicotine vaping products being sold at brick-and-mortar stores. NSW has led the implementation of a key public health campaign on the harms of e-cigarettes and have shared this campaign with several states across Australia, allowing for greater reach and impact.

However, we stress that now is the time to continue and bolster these efforts with significant reforms being implemented in the near future. We welcome and strongly support the vaping reforms announced by Federal Health Minister, The Hon. Mark Butler MP, on the 2nd of May 2023, and the ban on the importation of non-nicotine vaping products. Lung Foundation Australia support the progress being made to ban all vaping products outside of the use of vaping products for smoking cessation and the recommendations proposed in the consultation by the Therapeutic Goods Administration for vaping products. A ban of vaping products at a national level that address importation, sale, supply and manufacturing of vaping products, will protect the health of all Australians now and into the future. The strong federal reforms proposed highlight the importance of tackling this public health issue and protecting all Australians from the harms of vaping. These reforms empower the New South Wales (NSW) Government (and all other state and territory governments) to take clear action that will protect the health of the community and reduce the burden on the health system and economy. It is now more vital than ever that the NSW Government implements strong measures that support the new reforms made by the Federal Government to protect the health of residents. We highlight the release of the National Tobacco Strategy 2023-2030 which NSW endorsed, and importantly, the need for NSW to align with the strategy objective of preventing the uptake of e-cigarettes by young people and those who have never smoked. In fact, a 2022 YouGov survey by Lung Foundation Australia found 83% of NSW residents think the government needs to do more to protect young people from the harms of vapes.

**Lung Foundation Australia recommend:**

- 1. Work collaboratively with the Australian Government to support and implement federal reforms. In NSW, this will include amendments to ensure consistency with the legislation, and a commitment to local monitoring and enforcement.**
- 2. Continue to expand current enforcement and compliance measures, and significantly intensifying all compliance monitoring and enforcement following the prohibition of all vaping products outside of the prescription model.**
- 3. Prohibiting all forms of advertising, marketing, promotion and sponsorship in relation to e-cigarette products, components and liquids, and cooperative work between governments to take strong action against illegal marketing including online and via social media.**
- 4. Ongoing investment in awareness and educational campaigns for target groups such as children and young people, as well as the communities supporting them. We note the importance of messaging to both youths and adults that does not create stigma around vaping.**

We commend the NSW Government for their strong action to date with significant investment in education campaigns and monitoring and enforcement. We support the federal reforms, and the important role NSW will need to play in that process to protect public health. Lung Foundation Australia will continue to urge all Australian states and territories to support the ban on all vaping products, outside of the prescription model as announced by the federal government. NSW will play an integral role in preventing illegal sale of vaping products following the ban and further an ongoing role in tobacco control more broadly. Ultimately, we now have the opportunity to protect public health and change course to avert a new public health crisis, and we look forward to seeing NSW maintain and bolster their work in this space.



**Mark Brooke**

Chief Executive Officer

Lung Foundation Australia

## About Lung Foundation Australia

Lung Foundation Australia is Australia's only national charity and leading peak body dedicated to supporting people with a lung disease, including lung cancer. For over 31 years we have been a trusted, national touch point on matters of lung health for people living with lung disease, their families, carers, health professionals and the general community. There are over 30 different types of lung disease and together these impact one in three Australians. Our mission is to improve lung health and to reduce the impacts of lung disease on all Australians. We are working to ensure that lung health remains a community priority through activities including promoting lung health and early diagnosis and advocating for policy change and research investment.

We raise awareness about the symptoms and prevalence of lung disease, and we champion equitable access to treatment and care. As a patient-representative charity, we partner with people living with lung disease, health professionals, researchers, medical organisations, and the Australian community. Together, we can drive reform in the delivery of health services across the country and assist the more than seven million Australians impacted by lung disease and lung cancer. Lung Foundation Australia has offices across several Australian states. We are committed to achieving integration with state-based health systems so that the community has access to timely and accurate information and support.

### Our work in vaping

Lung Foundation Australia recognised a significant gap in education and resources for vaping and developed have developed a suite of resources including factsheets, animations and e-learning material.

#### **Unveil what you inhale**

In 2021, Lung Foundation Australia developed a suite of educational resources for the campaign '*Unveil what you inhale*' to bring attention to the harms and unknown risks of vaping.<sup>i</sup> These resources are designed by and for young Australians, educators and parents and carers, to arm you with accurate and evidenced-based information. In a pioneering study, funded by Lung Foundation Australia and Minderoo Foundation, researchers at Curtin University tested the chemicals and toxicity of 52 flavoured e-liquids, finding 100% of the e-liquids were inaccurately labelled and 21% contained nicotine, despite this being illegal in Australia.

#### **Vaping eLearning modules for young people**

In March 2023, Lung Foundation Australia launched eLearning for young people aiming to bring awareness to the harms of vaping, fill critical knowledge gaps around vapes and encourage participants to be vape-free advocates amongst their friends and community. Informed by the Roundtable and the emerging evidence of growing rates of youth vaping and increasing community concern, this eLearning aims to address the rapid rise in recreational use of vapes.

#### **First Nations young people**

This project aims to address the rapid rise in recreational use of e-cigarettes (vapes) by young people through the development of accessible, practical resources for Aboriginal and Torres Strait Islander young people and their families/teachers. Resources includes a series of three short animations on key topics relating to vaping and an additional factsheet for further information. Topics discussed include health harms of vaping, environmental harms and how vaping impacts your life. The factsheet includes discussion questions for individuals to self-reflect on or to facilitate discussion amongst groups.

## Support for government action

Lung Foundation Australia completed a YouGov survey in 2022. Results found 83% of NSW residents think more needs to be done to protect children from vaping and 75% of NSW residents are concerned about the potential dangers of vaping. Young Australians are also highly concerned with 80% of those aged 18-24 years agreeing the government needs to do more to protect children from e-cigarettes.

In December 2022, a survey by Lung Foundation Australia with over 550 responses found 96% of respondents were extremely or moderately concerned about youths accessing vaping products and almost half reported having a friend or family member who vapes. Additionally, 84% said it was extremely important for the government to take urgent action on vaping products.

In 2023, Cancer Council Australia released a new report re-iterating support for policy action to limit e-cigarette availability and use by the public with almost nine in ten Australian adults supporting government action to stop a new generation of Australians becoming addicted to nicotine.<sup>ii</sup> Additionally, those aged 18-24 years strongly agree that e-cigarettes are highly addictive, e-cigarettes should be regulated to stop a new generation of Australians from becoming addicted, advertising of e-cigarettes in and around shops should not be allowed and vaping should not be allowed on public transport, in pubs, restaurants or other indoor venues.<sup>iii</sup>

## Terms of Reference

Lung Foundation Australia are pleased to provide feedback aligned to the Committee's Terms of Reference:

### (a) The current situation in NSW regarding:

#### **i. The prevalence of e-cigarette use among children and young people**

##### Key points:

- Recent data has indicated that the prevalence of vaping in Australia continues to rise, with youth uptake of significant concern.
- The New South Wales Health Population Survey found the rates of e-cigarette use has increased significantly, with ever use for 16–24-year-olds increasing from 21.4% in 2019-2020 to 32.7 in 2020-2021.
- Research from New South Wales found 32% of students surveyed (14-17 years old) reported being an ever-vaper.
- We know that vapes are linked with negative health outcomes and using both vapes and tobacco cigarettes at the same time for a prolonged period of time, exposes the user to the toxins in both cigarettes and e-cigarettes.
- E-cigarettes are designed to appeal to young people and are being sold in bright coloured packaging, in a range of flavours and are inexpensive.



## Prevalence of vaping in Australia

Recent data has indicated that the prevalence of vaping in Australia continues to rise, with youth uptake of significant concern. In Australia, between 2016 and 2019 the proportion of people who had ever used e-cigarettes increased from 8.8% to 11.3% with a notable rise among youth and young adults.<sup>iv</sup> Nearly 2 in 3 (64%) current smokers and 1 in 5 (20%) people who had never smoked aged 18–24 reported having tried e-cigarettes.<sup>v</sup>

The Generation Vape study conducted by Cancer Council NSW found almost one-third of students sampled aged 14–17 years (32%, n=233) reported being an ever-vaper, of which more than half (54%) had never smoked prior to starting vaping. More than half of ever-vapers had used a vape that they knew contained nicotine (53%, n=123). “Flavourings and taste” were rated as the most important characteristic of vapes.<sup>vi</sup> Additionally, the NSW Health Population Survey found the rates of e-cigarette use has increased significantly, with ever use for 16–24-year-olds increasing from 21.4% in 2019–2020 to 32.7 in 2020–2021.<sup>vii</sup>

The NSW Health Population Survey data demonstrates continual increases in e-cigarette use particularly amongst young people with 16.5% of people aged 16–24 years currently vaped in 2021–22, up from 4.5% in 2019–20.<sup>viii</sup> Similarly, overall vaping use has increased from 2% of the general population in 2019–2020 to 5.9% in 2021–22.<sup>ix</sup> Further e-cigarette use amongst Aboriginal people in NSW is rising with 25.9% of Aboriginal people had ever vaped in 2021–22 and 11.5% of Aboriginal people currently vaping in 2021–22.<sup>x</sup> We are witnessing a significant rise of vaping products in NSW, and it is noted the newer products that contain high concentrations of nicotine salt are increasing in popularity.<sup>xi</sup> Most vaping products available contain nicotine, driving vaping use and leaving many addicted and unable to stop vaping. New research found that the current use prevalence for Australians aged 15–30 years was 14%, which was significantly higher than the results of the National Drug Study Household Survey which found 4.5% for 15–24-year-olds and 4.8% for 25–29-year-olds.<sup>xii</sup> Ever use was higher but aligned with the NSW generation vape data with 41% of 18–39 years having tried or used e-cigarettes.<sup>xiii</sup> E-cigarette users in the study mainly used nicotine e-cigarettes however, only some accessed e-cigarettes via a prescription.<sup>xiv</sup> Those under 18 years believed it was somewhat easy to get e-cigarettes online and in stores which affirms findings of other Australian studies which demonstrates youth are readily accessing e-cigarettes.<sup>xv</sup>

## Vaping by those who smoke

Vaping devices have been marketed as an alternative to smoking tobacco cigarettes however many who use vaping products continue to smoke cigarettes. The Health of Queenslanders 2023 further reports that 12.2% of daily smokers currently vape and 27.6% of those who are current smokers also currently vape.<sup>xvi</sup> We know that vapes are linked with negative health outcomes and using both vapes and tobacco cigarettes at the same time for a prolonged period of time, exposes the user to the toxins in both cigarettes and e-cigarettes. Research from NSW found that the increase in e-cigarette use between 2016 and 2020 by young adults who smoke or have recently quit weakens claims that these products are designed for older smokers who have struggled to quit using other methods.<sup>xvii</sup> Additionally, the prevalence of both ever vaping and current vaping from 2018 to 2022 has increased for every age group expect for one where the current vaping rates remained the same.<sup>xviii</sup>

## Social Media

E-cigarettes are designed to appeal to young people and are being sold in bright coloured packaging, in a range of flavours and are inexpensive.<sup>xix</sup> E-cigarette marketing and advertising is common on social media platforms and high-profile influencers are used to advertise these products to younger generations.<sup>xx</sup> E-cigarette companies have further sponsored music festivals, featured fashion and style as themes from promotion and maintained relationships with international motor



sport.<sup>xxi</sup> Anecdotal evidence has also demonstrated that young people are obtaining vaping products from social media platforms such as Facebook and Snapchat, as well as getting vapes delivered to their house. The ongoing marketing and advertising of e-cigarettes towards young generations is driving vaping use and are making vapes become socially normal in Australia. We cannot continue to allow tobacco companies to target young generations and lead a new generation of tobacco addiction.

### **Generation Vape Research Project: E-cigarette and tobacco use among young adults aged 18-24 years in Australia:**

Online survey of 2460 young adults aged 18-24 years in Australia and qualitative group discussions found:

- Vaping and smoking rates among young adults in Australia are far higher than previously estimated, with 33% of young adults current smokers and 38% current vapers.
- Majority of young adults see access to vapes as easy, with most using disposable devices (75%).
- Vaping is seen as a separate, socially acceptable behaviour compared to smoking, and perceived as normal and "not a big deal".
- Current vapers (n=937) most often vape when socialising (72.1%), at a friends house (24.1%), home alone (17.7%), Feeling stressed/anxious (16.3%) and seeing other vape/smoke (15.5%).
- 25% of current vapers have tried to quit vaping before
- Young adults accept that vaping is likely to be harmful, but believe it is unlikely to be as harmful as smoking tobacco, however there is growing concern related to nicotine and addiction.

#### **How parents impact their teenager's vaping and smoking behaviours:**

- Evidence shows that parental smoking behaviour and attitudes can play a key role in influencing adolescent smoking and vaping behaviours.
- Risk of vaping and smoking uptake among 14-17-year-old teenagers was 52% (p<0.001) and 79% (p<0.001) higher, respectively, if their parent was an ever-vaper. Teenagers tend to regard vaping as being safer than their parents do.
- 2021/2022 survey of 3242 14-17-year-old teenage children:
  - 29% ever-vapers
  - 23% ever-smokers
- 2021/2022 survey of 3242 parents:
  - 18% current-vapers, 9% ex-vapers
  - 29% current smokers, 30% ex-smokers

***Cancer Council NSW unpublished data from generation vape, reference available on request.***

## ii. Health risks associated with e-cigarette products

### Key Points:

- E-cigarettes are harmful to health and risks include poisoning, acute nicotine toxicity including seizures, burns and injuries, lung injury, dual use with cigarette smoking and increased smoking uptake in non-smokers.
- In addition to nicotine, more than 200 chemicals have been associated with e-liquids many of which are not tested for inhalation and have the potential to pose serious health harms to the community.
- Vapes are mislabelled, with some studies reporting 100% of vapes tested contained ingredients not listed on the package, including nicotine.
- Increases in calls to poisons hotlines particularly for young children and hospitalisations due to vaping.
- Nicotine is harmful to the developing brain and may increase risk for future addiction to other drugs.
- Short-term exposure to passive vaping has been shown to irritate eyes, irritate airways and worsen respiratory conditions.
- Non-smokers who use e-cigarettes are three times more likely to go on to smoke combustible tobacco cigarettes.
- Vaping products are cleverly designed to make the experience for the user enjoyable with the addition of flavourings, flavour enhancers and nicotine salts.
- Caution must be taken and whilst vaping products are potentially less harmful than smoking, youths are unnecessarily being put in harms way and do not require vaping products as a smoking cessation tool.

### *Health impacts*

A global systematic review on the health impacts of e-cigarettes by the Australian National University in 2022, identified health risks of e-cigarettes including: addiction; intentional and unintentional poisoning; acute nicotine toxicity, including seizures; burns and injuries; lung injury; indoor air pollution; environmental waste and fires; dual use with cigarette smoking; and increased smoking uptake in non-smokers.<sup>xxii</sup> Less direct evidence indicates adverse effects of e-cigarettes on cardiovascular health markers, including blood pressure and heart rate, lung function and adolescent brain development and function.<sup>xxiii</sup>

In June 2022, The National Health and Medical Research Council (NHMRC) CEO statement on e-cigarettes outlined the national advice on e-cigarettes based on the most up to date scientific evidence.<sup>xxiv</sup> The statement included:

- All e-cigarette users are exposed to chemicals and toxins that have the potential to cause harm. In addition to nicotine, more than 200 chemicals have been associated with e-liquids.
- E-cigarettes containing nicotine are addictive and people who have never smoked are more likely to take up tobacco smoking.
- E-cigarettes have not been proven to be a safe and effective smoking cessation tool. There are however proven safe, evidence-based treatments available to help smokers quit such as nicotine replacement therapy (NRT), pharmacotherapy and behavioural interventions. Speak with your doctor about the most appropriate option for you.
- For former smokers, using an e-cigarette may increase the chance of smoking relapse.<sup>xxv</sup>

There is some evidence that vaping can cause inflammation of the mouth which can lead to gum disease and other oral health problems.<sup>xxvi</sup> A study published in December 2022 demonstrated that those who were vaping had a higher risk of developing caries.<sup>xxvii</sup> Evidence also suggests the potential for nicotine e-cigarettes to lead to oral cavity cancer creating a heightened awareness on the short- and long-term health risks of vaping.<sup>xxviii</sup>

The escalating cases of EVALI (e-cigarette or vaping product use associated lung injury) in 2019, brought serious attention to the dangers of e-cigarette use.<sup>xxix</sup> The inflammatory response in the lungs caused by inhaling substances was strongly associated with Vitamin E acetate and THC.<sup>xxx</sup> By mid-February 2020, the Centers for Disease Control in the US reported more than 2,800 cases of lung injuries requiring hospitalisation and 68 deaths in the US.<sup>xxxi</sup>

### *Hospitalisations*

It has recently been reported that more than 100 people have been admitted to hospital with vaping-related illnesses in recent years, staying on average more than six days.<sup>xxxii</sup> Data from private health insurer indicated that vaping-related disorders were often closely linked with mental illnesses such as severe depression and anxiety.<sup>xxxiii</sup> Private Healthcare Australia released this information which also found that the average age of people hospitalised was 55 years with chest and lung disorders accounted for one in every five hospitalisations.<sup>xxxiv</sup> The youngest recorded was only two years old, suffering from an accidental exposure to vaping.<sup>xxxv</sup>

### *Poisonings in children*

E-liquids contain a cocktail of chemicals including nicotine which can cause potential lethal side effects in small quantities. The Victorian Poisons Information Centre reported a 232% increase in calls about poisoning from e-cigarettes has been reported in the past four years, with more than 100 of the calls last year related to children under the age of four.<sup>xxxvi</sup> Additionally, other Australian states are experiencing similar increased with 171 calls to the NSW Poisons Information Centre regarding children aged 15 and under regarding vapes and e-cigarettes in 2021.<sup>xxxvii</sup> Similarly, The Queensland Poisons Information Centre noted a 486% increase in calls for children exposed to e-cigarettes and vaping products since 2020.<sup>xxxviii</sup>

### *Nicotine*

Vaping products often contain the addictive drug nicotine which when used by adolescents can harm the parts of the brain that control attention, learning, mood, and impulse control.<sup>xxxix</sup> Nicotine is harmful to the developing brain (development occurs until around 25 years of age) and may increase risk for future addiction to other drugs.<sup>xl</sup> Nicotine dependence can quickly occur and when a person discontinues use, they may experience nicotine withdrawal symptoms including irritability, restlessness, feeling anxious or depressed, trouble sleeping, problems concentrating and cravings for nicotine.<sup>xli</sup> Youths may use vapes as a way to manage stress or anxiety causing nicotine dependence which can in turn be a source of stress.<sup>xlii</sup> A tobacco survey from the United States found the most cited reason for current use of vapes was "I am feeling anxious, stressed, or depressed" (43.4%).<sup>xliii</sup>

The Gold Coast Public Health Unit have sized nearly 11,000 disposable vapes since 2019 as a result of complaints from the community.<sup>xliv</sup> Laboratory testing completed on 1518 of those vapes revealed 83 per cent of the vapes contained nicotine and the average quantity was 35,000 to 45,000 milligrams per kilogram.<sup>xlv</sup> A study funded by Lung Foundation Australia also highlighted the concerns of nicotine with 1 in 5 vapes tested containing nicotine.<sup>xlvi</sup>

Vaping is becoming increasingly common in Australia with the Generation Vape study by Cancer Council NSW finding more than half of ever-vapers had used a vape that they knew contained nicotine and a further 27% did not know whether they had used a vape containing nicotine or not.<sup>xlvii</sup>

The flavoured and affordable disposable devices often contain nicotine salts which have a lower pH, allowing higher levels of nicotine to be inhaled with less throat irritation than free-base nicotine.<sup>xlviii</sup>

The use of nicotine salts in vapes resulted in higher ratings of appeal, sweetness, and smoothness, whilst having lower reports of bitterness and harshness compared to free base nicotine.<sup>xlix</sup> These effects were more prominent among never-smokers and such research demonstrates that nicotine salt formulations can enhance appeal and sensory experience of vaping.<sup>l</sup>

Vaping products not only contain nicotine but in unknown concentrations. It is said that 50mg of nicotine in one vape is equivalent to 50 cigarettes however the actual nicotine concentration users are exposed to vary widely and is dependent on how many puffs are taken.<sup>li</sup> Additionally, newer devices contain more puffs and a device which has 4,000 puffs and high nicotine concentrations can equate up to 20 packs of e-cigarettes nicotine equivalent.<sup>lii</sup>

E-cigarettes products available to the public are incorrectly labelled meaning Australians are consuming nicotine in unknown quantities. From 1 January to 30 September 2022, 93 out of 1,465 (6%) of new clients to the Victorian Quitline service reported wanting help to quit vaping.<sup>liii</sup> Reports of children as young as 13 years are seeking support due to nicotine addictions from e-cigarettes.<sup>liv</sup> Clearly, young people are becoming dependent on nicotine and may will require support and help to be able to reduce vaping use.

### *Passive Vaping*

Additionally, breathing in secondhand vape or passive vaping may cause health harms, with research indicating secondhand nicotine vape exposure was associated with increased risk of bronchitis symptoms and shortness of breath among young adults.<sup>lv</sup> Short-term exposure to passive vaping has been shown to irritate eyes, irritate airways and worsen respiratory conditions.<sup>lvi</sup> There is conclusive evidence that e-cigarette use results in increased airborne particulate matter in indoor environments.<sup>lvii</sup>

### *Gateway to Smoking*

Tobacco use remains the leading preventable cause of morbidity and mortality in Australia, responsible for 8.6% of the total burden of disease and injury in 2018.<sup>lviii</sup> Recent studies have demonstrated a link between vaping and smoking, with those who vape more likely to go on to smoke regular cigarettes.<sup>lix</sup> There is evidence that non-smokers who use e-cigarettes are three times more likely to go on to smoke combustible tobacco cigarettes.<sup>lx</sup> Whilst ever-vapers were 18 times more likely to be ever-smokers than those who had never vaped, and ever-smokers were seven times more likely to be ever-vapers than those who had never smoked.<sup>lxi</sup> Public health measures have resulted in significant declines in smoking rates over the past two decades, with the smoking rate decreasing to 11.2% in Australians aged 15 and over.<sup>lxii</sup> Vaping use has been increasing significantly in recent years and has the potential to increase smoking rates in Australia, impacting the years of hard work that has been done to reduce smoking and protect public health.

Whilst nicotine vaping products are accessible in Australia, there are increasing concern regarding dual use of tobacco and e-cigarette use. A study completed in NSW found that many respondents reported duals use of tobacco and e-cigarettes with 25% of users saying that they used e-cigarettes to reduce but not quit smoking and 8% using e-cigarettes where smoking was not allowed.<sup>lxiii</sup>

### *Understanding what is in e-liquids*

E-liquids contain a cocktail of chemicals causing known and unknown health impacts. Research from The Australian National University found that e-liquids contain over 243 chemicals and the levels of chemicals inhaled by the user can vary greatly and is dependent on the e-liquid contents, puffing rate, type of device and the battery voltage or heating power.<sup>lxiv</sup>

Lung Foundation Australia and Minderoo Foundation commissioned Curtin University in 2021 to test 52 flavoured e-liquids available for sale over the counter in Australia.<sup>lxv</sup> The results found:

- 100% of the e-liquids were inaccurately labelled.
- 100% contained chemicals with unknown effects on respiratory health.
- 21% contained nicotine despite this being illegal.
- 62% contained chemicals likely to be toxic if vaped repeatedly.<sup>lxvi</sup>

The testing found 62% of new e-liquids contained between 1 and 3 toxic chemicals at concentrations above the acute inhalation toxicity limits. The study concludes that 100% of the e-liquids tested contained one or more of 19 chemicals that do not have established safe inhalation toxicity levels. Many of the chemicals have been tested for ingestion toxicity however this does not mean a chemical is safe to inhale. The e-liquids were not accurately labelled with ingredient lists incomplete or missing entirely.

The study further found that propylene glycol and glycerol were the main ingredients by proportion in each e-liquid however, the values of each of these on the label did not match the content. Benzyl alcohol, a solvent/flavour enhanced was found 65% of the e-liquids and is a dermal sensitising agent and skin allergen the elicit severe reactions in some people. Nicotine was found in one in five e-liquids and is relatively common in 'nicotine-free' e-liquids and can cause health implications and addiction.

Flavouring chemicals were detected in the e-liquids including furfural, thymol, and 4-(4-methoxyphenyl)-2-butanone which were found infrequently or at very low levels. Other flavouring chemicals found frequently or at high concentrations were menthol, ethyl maltol, trans-cinnamaldehyde and ethyl vanillin. This is particularly concerning as these chemicals have known health implications.

### Benzaldehyde

Benzaldehyde which is added to e-liquids for its almond-like flavour was found in 94% of the tested samples. It increases systemic nicotine exposure and blood nicotine concentrations in smokers, reduces phagocytosis and is an inhalation irritant. Additionally, benzaldehyde can react with propylene glycol in e-liquids creating aldehyde propylene glycol acetals that activate airway irritant receptors.

### Nicotine

Nicotine was identified in 21% of the e-liquids sampled (1 in 5) with concentrations ranging from 145 µg/L to 3.25mg/L. The study only tested for freebase nicotine however, nicotine salts are becoming more common in e-liquids as they are able to increase nicotine content without causing the user to experience uncomfortable side effects such as a throat burn.

### Menthol

Menthol is added to enhance the addictive properties of nicotine and inhibits nicotine metabolism. Menthol was found in 75% of the e-liquids at concentrations ranging from 4 µg/L to 200 mg/L. Despite menthol being present in most samples, only a few were labelled as being 'menthol' or 'ice flavoured.' On the other hand, one 'menthol' e-liquid contained no menthol and may have instead contained potentially carcinogenic compounds such as pulegone, or synthetic "coolants" such as *N*-ethyl-*p*-menthane-3-carboxamide (trade name WS-3).

## Ethyl maltol

Ethyl maltol is used in e-liquids as a sweetener however the effects of heating and inhaling it are largely unknown. It has been found to increase free radical formation which induce oxidative stress which affect cell survival and proliferation, and inflammation. Iron and copper are potential present in e-liquids due to coil residue and can react with ethyl maltol producing toxic hydroxypyranone complexes.

## trans-Cinnamaldehyde

trans-Cinnamaldehyde impairs innate immune cell function in the lung and suppresses bronchial airway epithelial cell ciliary motility and mitochondrial function. Additionally, it inhibits microsomal CYP2A6, impairs neutrophil, macrophage and natural killer cell function, and reduces oxidative burst when heated and inhaled.

## Ethyl vanillin

Ethyl vanillin is widely used in foods, beverages, drugs and cosmetics due to its vanilla odour and flavour. When present in e-liquids it reduces oxidative burst and inhibits *in vitro* free radical formation. Similar to benzaldehyde, both *trans*-cinnamaldehyde and ethyl vanillin react with propylene glycol in e-liquids to produce aldehyde propylene glycol acetals that activate airway irritant receptors.

Additionally, the study identified 2-chlorophenol in many samples and similar chemical have been found as pesticide or herbicide residues or decomposition by-products in canola oil. This acutely toxic chemical used in disinfectants and insecticides notes a problem in the e-liquid manufacturing process.

## Polycyclic Aromatic Hydrocarbons

Polycyclic aromatic hydrocarbons (PAHS) are produced during the thermal decomposition of organic material including tobacco. The lower temperature thermal decomposition in e-cigarettes produce an increased proportion of low molecular weight PAHs including acenaphthylene, fluorene, and anthracene. Most PAHs are known or suspected carcinogens with exposure to these causing a variety of health impacts in humans. Once again, the impacts of PAHs when inhaled has not been thoroughly studied however, in this study PAHs were detected at very low levels.

## Contaminants

Additionally, 2-Chlorophenol (a toxic contaminant) was found in 48% of the e-liquids at concentrations ranging from 1µg/L to 200µg/L. This is likely due to contamination in low grade glycerol being used in some of the e-liquids.

## Other studies on the chemicals in vapes

Additional studies have been undertaken in Australia to understand the contents of vaping products, particularly as the devices continue to increase in popularity in young generations. All studies have shown that vaping liquids contain a diverse range of chemicals and many of them have unknown impacts from inhalation.

## NSW Health

NSW Health have collated key chemicals found in vapes. These chemicals included acetone (which is found in nail polish remover, acrolein (found in herbicide), 2-chlorophenol (found in disinfectant/cleaning products/insecticide), pulegone (found in insecticide), rare earth elements, formaldehyde, heavy metals and particulate matter.<sup>lxvii</sup>

## The Australian National University

A global systematic review was published in 2022 by the Australian National University.<sup>lxviii</sup> The study ultimately found that the complex and highly variable array of chemicals can be broadly categorised as originating from e-liquids (e.g. nicotine, solvent carriers (propylene glycol, ethylene glycol and glycerol), formed by chemical reactions in the heating element (e.g. aldehydes, free radicals and reactive oxygen species and furans), and originating from the device (e.g. metals including aluminium, copper, iron, lead and tin).<sup>lxix</sup> There are currently thousands of e-cigarettes on the market with over 15,000 flavours identified for sale in 2017.<sup>lxx</sup>

## University of Wollongong

The University of Wollongong Australia have been investigating the chemical contents of e-cigarettes and in July 2022 reported that 90% of the e-liquid in vapes is propylene glycol and vegetable glycerine of varying ratios in each e-liquid, confirming previous work by Curtin University.<sup>lxxi</sup> Propylene glycol enriches flavours however higher percentages will cause a more noticeable throat hit when vaping.<sup>lxxii</sup> Vegetable glycerine is sweeter and is responsible for the generation of the vapour cloud, with higher percentages causing more visible and larger clouds.<sup>lxxiii</sup> Flavourings used in vapes are food grade and approved for ingestion, however many have not been tested to ensure they are safe to inhale.<sup>lxxiv</sup> Additionally, many vapes contain cooling agents to counteract the nicotine throat burn and make the experience less uncomfortable.<sup>lxxv</sup> In October 2022, a joint investigation by the University of Wollongong Australia and the Daily Telegraph found the three most common vape brands sold in Australia contain significant levels of nicotine (around 20mg/ml), multiple artificial flavours and cooling agents.<sup>lxxvi</sup> The cooling agent WS23 can provide a cooling sensation to mask the traditional burn of nicotine and there is almost no information on potential inhalation or toxicity of that chemical.<sup>lxxvii</sup> In 2023, The University of Wollongong Australia are undertaking an analysis of the contents of e-liquids, however, have already found the two thirds of the 1000 vapes tested contained nicotine.<sup>lxxviii</sup>



### iii. The impact of programs and services aimed at preventing uptake or continuing use of e-cigarettes,

#### Key Points:

- E-cigarettes are causing a major burden for schools with one third of principals surveyed suspending or expelling students at least monthly for e-cigarette possession or use.
- It is an ongoing problem for secondary schools and Teachers Unions are expressing high levels of concern.
- Schools continue to take strong measures in a bid to combat vaping including smoke detectors, suspensions and locking of school bathrooms.
- Vaping is diverting educational resources, and this issue must be addressed outside of the school gates.

#### *Perceptions of school principals and teachers*

The University of Melbourne surveyed over 200 secondary school principals and teachers across Australia regarding e-cigarettes.<sup>lxxxix</sup> The study found that nearly half of all school staff member surveyed have found an e-cigarette on school grounds at least monthly.<sup>lxxx</sup> One-third of principals reported suspending or expelling students at least monthly for e-cigarette possession or use.<sup>lxxx</sup> E-cigarette use was identified as an increasing problem in secondary schools by 93% and concern is high with 94% stating they are concerned about e-cigarette use by students.<sup>lxxxii</sup> School policies around vaping were uncommon with only 51% reporting that their school had a policy in place.<sup>lxxxiii</sup> Barriers around enforcing policies included the discreet appearance of e-cigarettes (83%) and difficulties in pinpointing from where the vapor or scent is coming (73%).<sup>lxxxiv</sup> The results demonstrate the increasing problems e-cigarettes are causing in school environments and the urgent need to develop policies in schools and at the government level to reduce youth vaping.<sup>lxxxv</sup> In March 2023 the Queensland Teachers Union expressed high levels of concern reporting that vaping has become an issue across the state over the last three years, despite attempts to educate students and parents about the dangers of vaping.<sup>lxxxvi</sup>

#### *What are schools doing to combat vaping use?*

Schools have resorted to new measures to reduce vaping at schools as a desperate bid to reduce vaping by students. Schools have implemented new vaping policies, smoke detectors, locked school bathrooms, removed bathroom doors and often suspend students due to vaping. Many schools have implemented smoke detectors, particularly within school bathrooms. The South Australian education Minister Blair Boyer stated the government support schools installing vape detection systems as vaping use continues to increase.<sup>lxxxvii</sup> Schools are now needing to find between \$15,000 to \$20,000 to install vape detectors in a bid to combat vaping use at school.<sup>lxxxviii</sup>

However, stronger measures have been taken in many schools with some resulting to locking bathrooms to eliminate vaping during school hours.<sup>lxxxix</sup> A school in Melbourne required students to request an access card to use bathrooms following complaints of vaping at recess and lunchtime.<sup>xc</sup> Schools are clearly struggling with how to manage the ongoing use of vapes by students. Earlier this year, a central Queensland Catholic College suspended more than 30 students following a video emerging of students vaping in a toilet block.<sup>xc</sup> More recently, the NSW Education Department put out a tender for 40,000 vape detectors to be placed in schools by 2024, however the ACT have stated they are not implementing vape detectors and that students are educated on the public health

impacts of substances such as vapes in line with the Australian Curriculum.<sup>xcii</sup> Additionally, the West Australian Education Department is trialling a number of preventive measures to reduce student vaping including installing vape detectors.<sup>xciii</sup>

Vaping is causing a significant burden on schools and interfering with the quality of education that is being delivered. We must address this issue outside of the school grounds and the problem needs to stop before it gets through the school gates. Schools should not be required to implement such drastic measures to protect the health of young people and the government must do more as the actions taken by schools are not enough.

### **Generation Vape Research Project: Teacher's on Vaping – “The single most disruptive thing in our school”**

School plays a critical role in a teenager's identity development and is a key setting for encouraging healthy behaviours among young people. An online cross-sectional survey was conducted with 931 secondary school teachers, principals and administrators across Australia in March and September 2022:

- 12% of teachers were ever-vapers and 29% were ever-smokers.
- In Wave 2, 65.8% of teachers said preventing students vaping in schools was a 'very high' or 'high' priority, in Wave 3 this increased to 70.7% (p<0.014).
- According to teachers, students most commonly obtain their vapes through friends at school (55.4%), friends outside of school (63.5%), or through friends of friends, or siblings of friends (45.2%).
- Most teachers believe that vapes are easily accessible for young people, and that access laws are being ignored and not enforced.
- There was a significant increase in school communication about the harms of vaping 'once' and 'more than five times' (73.2% in W2 and 84.5% in W3)
- Despite this strong focus on resources development and education, access to and use of vapes by teenagers remains a large public health concern.

*“...vapes have taken over, for sure”*

*“The public health messaging around smoking was lost so quickly. Kids find smoking ugly and smelly but CANNOT see the connection to vaping”*

*“It's probably the single most disruptive thing in our school at the moment”*

**Cancer Council NSW unpublished data from generation vape, reference available on request.**

There is published evidence on school staff perceptions which additionally demonstrate the need to monitor and address student e-cigarette use in schools.<sup>1</sup>

<sup>1</sup>Pettigrew S. Miller M. Kannan A. Raj T.S. Jun M. and Jones A. (2022) School staff perceptions of the nature and consequences of students' use of e-cigarettes. Australian and New Zealand Journal of Public Health 46: 676-681. <https://doi.org/10.1111/1753-6405.13281>

## (b) NSW's current regulatory framework, in particular:

### **i. Its effectiveness in reducing harm from e-cigarette use**

The dedicated resourcing to vaping enforcement and compliance has led to significant enforcement activity across the state however, NSW Health is receiving an increasing number of complaints regarding advertising, the sale of nicotine e-cigarettes, illicit tobacco, and sales to minors. The current regulations require ongoing, strong enforcement action however, the tobacco and e-cigarette industry continue to undertake illegal activities. We cannot rely upon enforcement measures only to reduce illegal sale of e-cigarettes. The federal reforms will significantly alter the NSW regulatory framework and simplify enforcement processes, allowing all e-cigarettes to be seized without the need to assess nicotine content. This will be paramount in protecting public health and specifically young people from the harms of vaping products.

We commend the work done thus far by NSW Health having seized almost 200,000 nicotine devices and liquids in the first 6 months of 2023 alone. In comparison to other states and territories it is clear, NSW are committed to protecting public health with significant investment in resourcing for authorised officers across all of NSW and we commend this commitment.

### **ii. Its effectiveness in preventing illegal supply**

Currently, most e-cigarettes being sold in Australia contain nicotine and are incorrectly labelled in a bid to bypass the regulatory framework. A study undertaken by the University of Wollongong of 750 vape products found 98% contained nicotine with a wide range of flavourings and other chemicals. The federal reforms will ease this but until these reforms are implemented, strong action is needed to continue to monitor and enforce current regulations as that does pose as a deterrent and needs to be done better. We commend the investment into vaping by Premier Chris Minns, to increase number of inspectors dedicated to enforcement and compliance monitoring. Alongside the new border controls and spending on boarder enforcement, these efforts by NSW Government will be integral to protecting public health and preventing e-cigarettes from ending up in the hands of youth and non-smokers.

### **iii. Challenges to enforcement and compliance and ways to overcome these,**

The sale of nicotine e-cigarettes continues to thrive as compliance and enforcement measures struggle to keep up with the illegal market. Challenges faced for enforcement and compliance:

- **Resourcing:** Funding for authorised officers such as environmental health officers is a priority in order to monitor and inspect all brick-and-mortar retailers selling vaping products, on a regular basis. Further when issues of compliance arise, process of enforcement must be clear and easy to follow noting that prosecution of business that are non-compliant can be a complicated, timely process.
- **Penalties:** Despite recent work being done to increase penalties for non-compliance in NSW, these fines must be significant enough to prevent further non-compliance and deter other businesses from attempting to sell illegal products. Noting that the new reforms coming into place will be under the TG Act we hope to see these incur strong penalties for non-compliance as this will form a key part in preventing the ongoing sale of e-cigarettes.
- **Co-ordination:** Due to the nature of these offences, often co-ordination may be required between Environmental Health Officers, local police, and the Therapeutic Goods Administration.
- **The tobacco industry:** Retailers are becoming increasingly devious to avoid being caught, with many attempting to hide stock from inspectors.

## (c) How NSW can work with the Federal Government to implement reforms on e-cigarette products

Lung Foundation Australia support the work of The Department of Health and Aged Care in progressing reforms to ban all vaping products outside of the prescription model. The consultation held by the Therapeutic Goods Administration in September provided clear guidance and recommendations for implementing such reforms at a national level by embedding the ban within the TG Act. We support this model of implementation noting it will ensure all states and territories will enforce the same legislation and regulation model across Australia, allowing for control over the e-cigarette market.

We urge NSW to work alongside the Federal Government in the implementation of these reforms and continue the strong enforcement action currently being undertaken through the dedicated taskforce. Following the introduction of these laws, NSW will need to ramp up enforcement efforts to monitor for compliance.

NSW has committed significant time and resources into education campaigns, support for young people vaping and compliance and enforcement and we commend the efforts of the tobacco and e-cigarette unit of NSW Health. We commend NSW for the ongoing sharing of intel for enforcement and compliance activities, allowing states and territories to stay ahead of retailers and be aware of new strategies they may be attempting. NSW continues to contribute positively to ongoing reform discussions to protect public health and are dedicated in addressing e-cigarettes across the nation as seen by the sharing education campaigns and subsequent evaluations.

## (d) Any other related matter.

We note the release of The National Tobacco Strategy and the NSW Government commitment to aligning with the framework and implementation. Strengthening regulations on e-cigarettes and novel and emerging products is a key priority outlined in the NTS and we re-iterate the need for New South Wales to support federal action in line with 9.1 to restrict the availability and use of e-cigarettes. The NSW Government must commit to these reforms and implement them at a local level as a matter of priority. The NSW health system will wear the brunt of the cost of ill health so it is in their interests to invest NSW funds into these activities and not rely heavily on federal investment.

Additionally, reducing tobacco use and nicotine addiction is a key focus area of The National Preventive Health Strategy. The strategy outlines policy achievements by 2030 including the implementation of stronger regulation, monitoring and enforcement for novel and emerging products including e-cigarettes. The NSW Government has expressed commitment to the National Preventive Health Strategy and play a key role in leading public health reforms and protecting the health of NSW residents.

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