



# WELCOME TO THE Positive Choices WEBINAR SERIES

[positivechoices.org.au](http://positivechoices.org.au)



@pos\_choices



@positivechoices1



**Australian Government**  
**Department of Health**



THE UNIVERSITY OF  
**SYDNEY**  
Matilda Centre



# Acknowledgement of country

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I'd like to begin by acknowledging the Traditional Custodians of Country throughout Australia and their connections to land, water and community. I am currently on the land of the Gadigal people of the Eora Nation and pay my respects to Elders, past and present. I further acknowledge the Traditional Owners of the land on which you are and pay my respects to their Elders, past and present/

I would also like to acknowledge any Aboriginal and Torres Strait Islander people joining us for the webinar today.



# Housekeeping

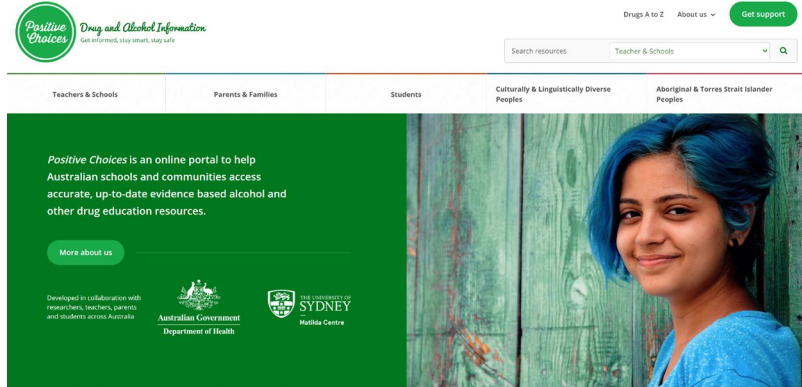
1 Listen only mode.

2 This webinar is being recorded and will be made available on the Positive Choices portal.

3 We will have a question and answer session towards the end of the webinar. Please type into the Q&A box available.



# What is Positive Choices?



Developed by the Matilda Centre in consultation with teachers, parents and students. Funded by Australian Government Department of Health.

- Central access point for trustworthy, up-to-date drug and alcohol information and educational resources.
- Learning resources, factsheets, videos, and games to engage young people with drug education.
- Access to classroom-based drug prevention programs that are proven to reduced drug-related harms.



#### Teachers & Schools

Evidence-based teaching programs and activities, webinars for teachers, and resources for your students



#### Parents & Families

Parenting advice and information to help you talk to children about drugs and alcohol



#### Students

Facts, advice and interactive tools to help you find out information about drugs and alcohol and make positive choices



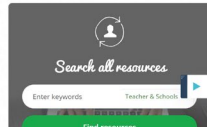
#### Culturally & Linguistically Diverse Peoples

Evidence based drug education resources for individuals from culturally and linguistically diverse communities



#### Aboriginal & Torres Strait Islander Peoples

A collection of culturally appropriate resources based on research and consultation with people from Aboriginal and Torres Strait Islander communities





[positivechoices.org.au](http://positivechoices.org.au)

# E-Cigarettes and Vaping

## What you need to know

Professor Hayden McRobbie

30<sup>th</sup> June 2021

# NDARC

National Drug &  
Alcohol Research Centre

The Difference is Research

# E-cigarettes and vaping: *What you need to know*



UNSW  
SYDNEY

Australia's  
Global  
University

Hayden McRobbie  
Professor, NDARC, UNSW, Sydney Australia  
Consultant in Lifestyle Medicine, Lakes District Health Board  
Rotorua, New Zealand

# Disclosures

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In the past three years I have

- received grant funding from the UK National Institute of Health Research and National Health and Medical Research Council
- received honoraria for speaking at educational symposia and advisory board meetings organised by Pfizer

# What are e-cigarettes?

- Battery operated products that heat and aerosolise a liquid that usually contains:
  - Propylene glycol
  - Vegetable glycerin
  - Flavouring
  - Nicotine
- Technology is continuing to evolve

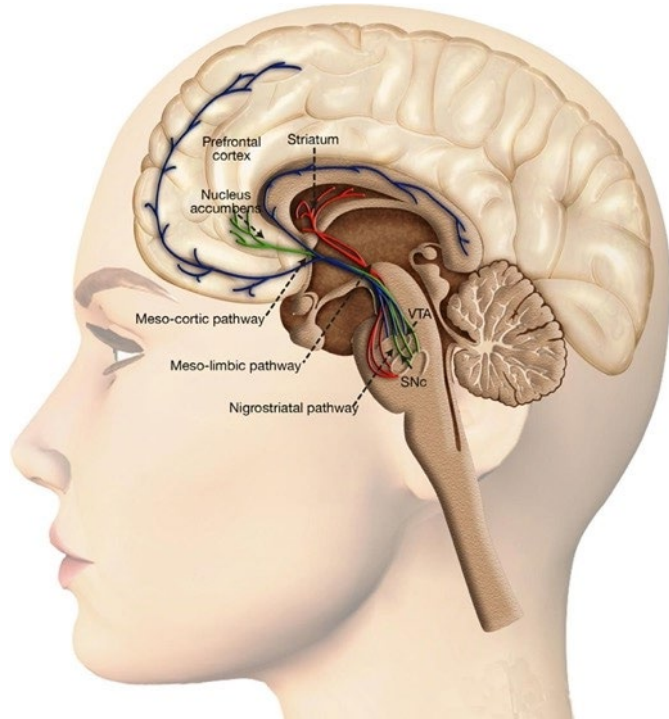


*The Lancet Respiratory Medicine* DOI: (10.1016/S2213-2600(19)30350-9)  
Copyright © 2019 Elsevier Ltd [Terms and Conditions](#)

Photo credit: Mandie Mills, CDC



# Nicotine



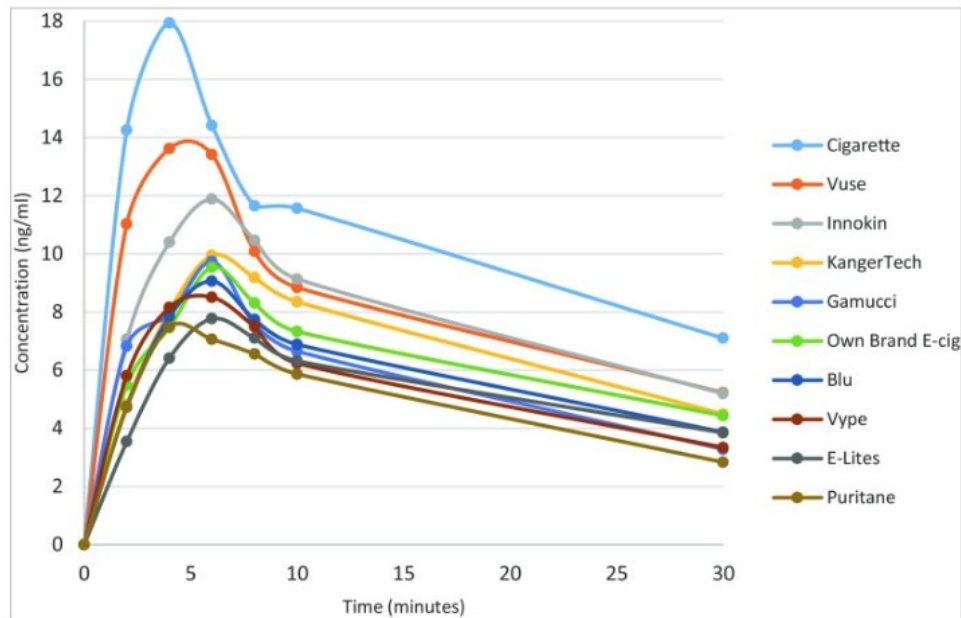
- Contained in the tobacco leaf in as a nicotine salt
- Increasing alkalinity converts it to a freebase form (more readily absorbed)
- Acts on the mesolimbic dopaminergic pathway ('rewards' behaviour)

*People smoke for the nicotine but die from the tar*

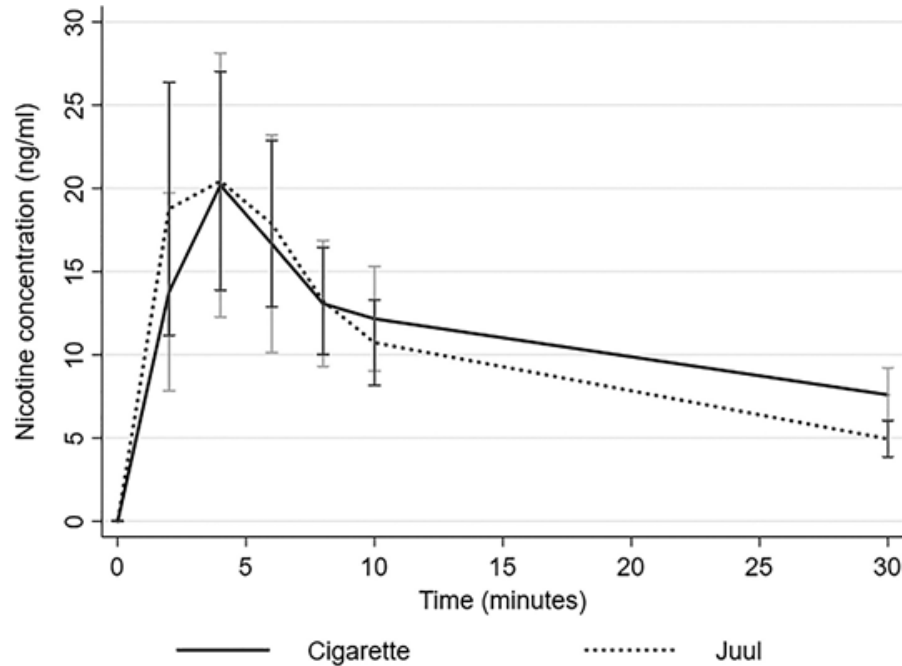
# Nicotine delivery from e-cigarettes

In general, the faster the nicotine delivery, the more likely the product is to:

- be more satisfying
- be better at alleviating tobacco withdrawal symptoms
- have greater dependence liability



# Nicotine delivery from JUUL



- JUUL is a cartridge-type END that became very popular in the US
- This independent study tested nicotine delivery from a 59 mg/ml JUUL device and compared it with nicotine delivery from a combustible cigarette
- Vapers could use Juul *ad lib* for 5 minutes

safety

Some controversy

effectiveness for quitting smoking

increased youth  
uptake

# Trends in e- cigarette use

findings  
from the National Drug Strategy Household  
Survey 2019

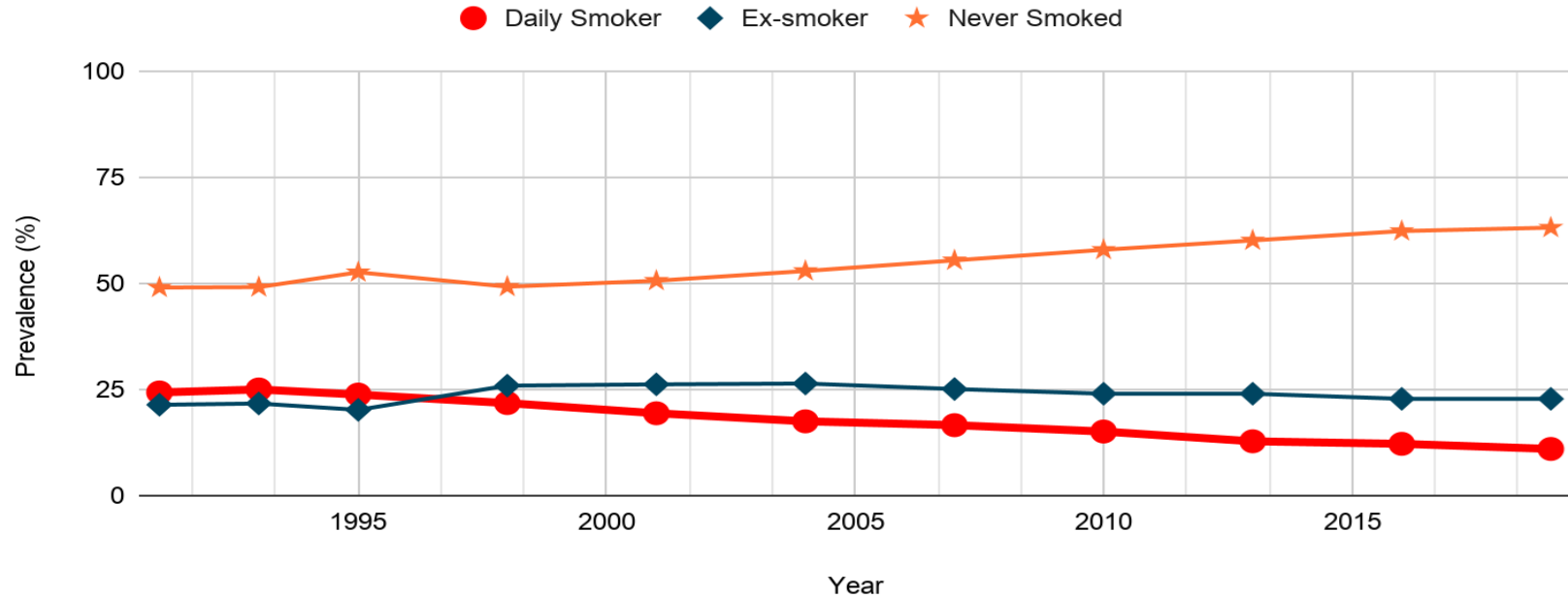


Australian Government  
Australian Institute of  
Health and Welfare

**National  
Drug Strategy  
Household  
Survey 2019**

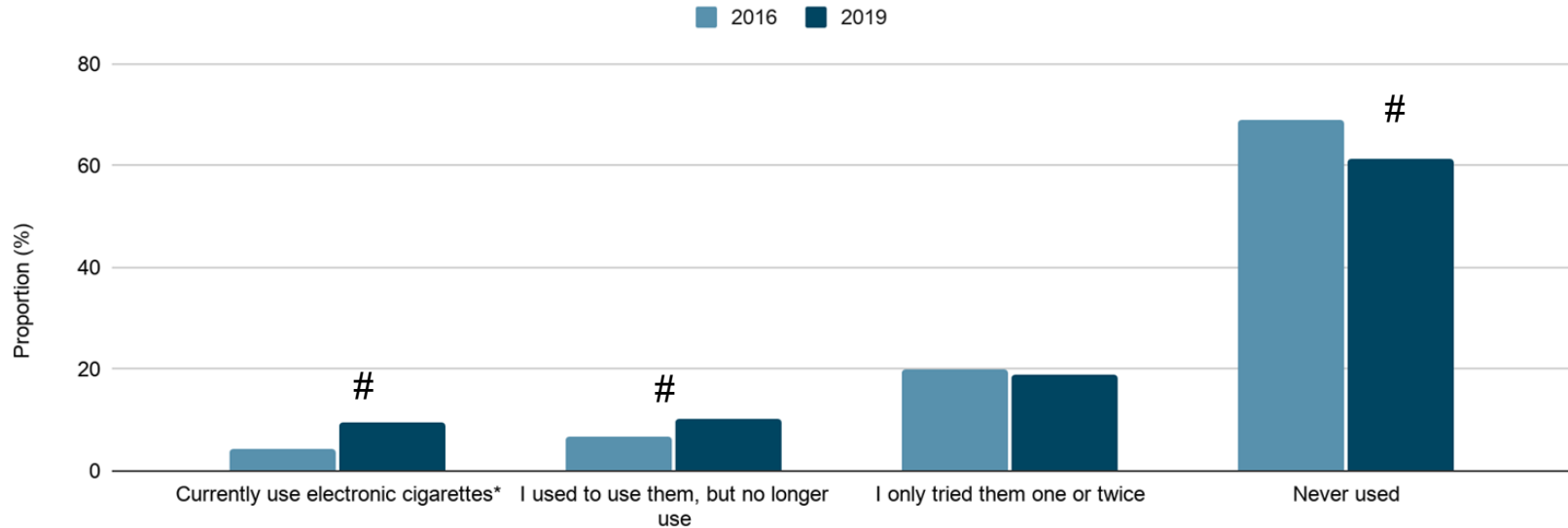
# Smoking prevalence is declining

## Smoking Status (1991-2019)



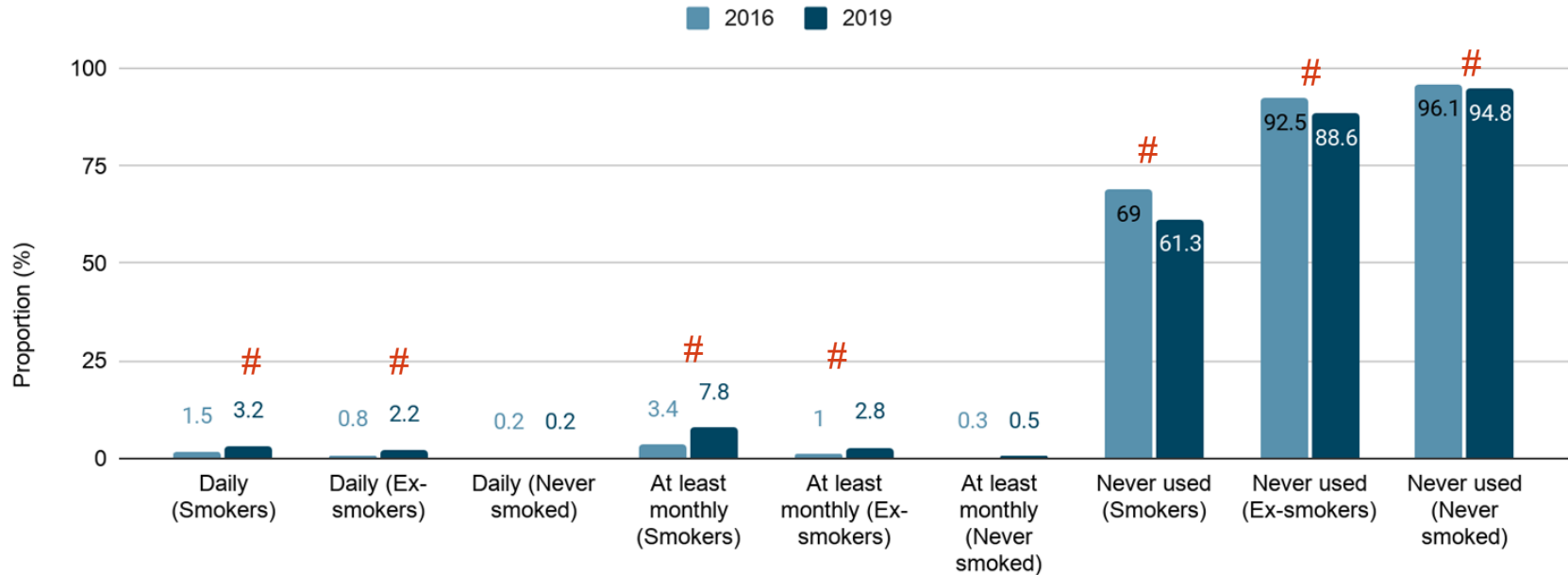
# E-cigarette use has increased

Use of e-cigarettes



# The vast majority of never smokers have never used e-cigarettes

Frequency of e-cigarette use in people aged 14+

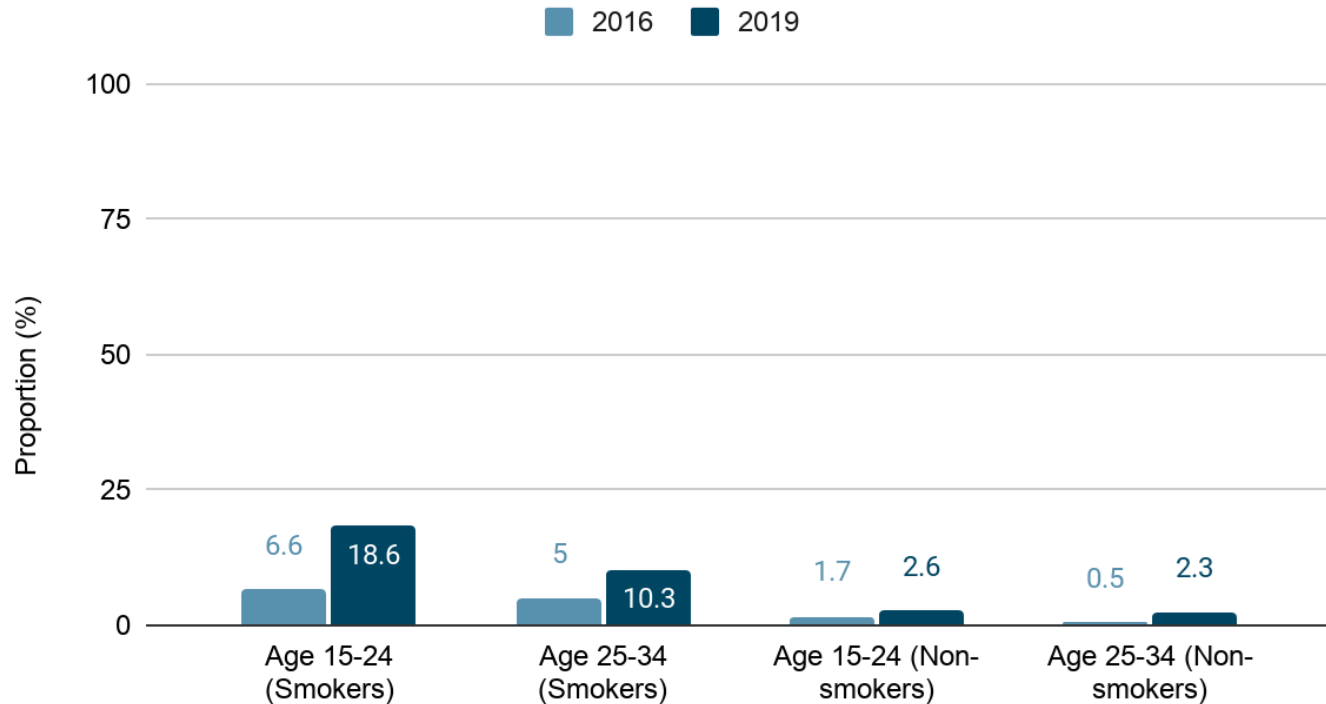




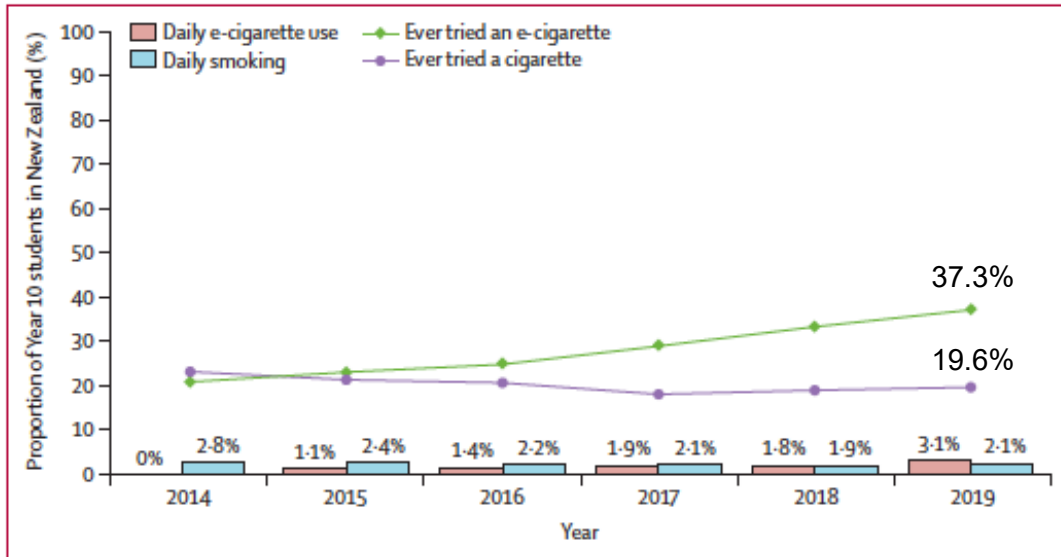
# Use among young people

## Current use of e-cigarettes

\*Current use: daily, weekly, at least monthly, less than monthly



# Vaping and smoking in youth aged 14-15 in New Zealand



**Figure: Use of e-cigarettes and cigarette smoking in Year-10 students in New Zealand, 2014-19**  
Cochran-Armitage trend test found that all four groups showed a statistically significant trend over time,  $p < 0.0001$ .

Daily vaping in never smokers = 0.8%

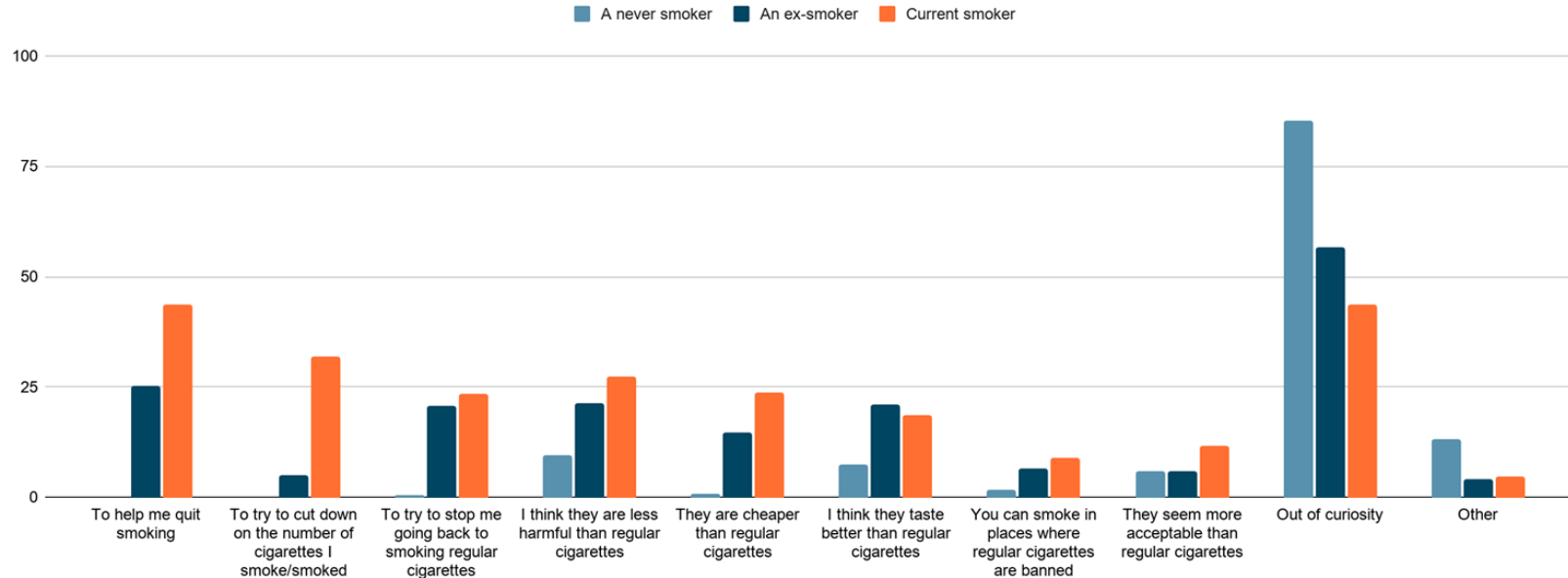
	Total sample (n)	Ever tried e-cigarettes*	Daily use of e-cigarettes
<b>Never smoked</b>			
2014	23 479	2613/23 479 (11.1%)	NA
2015	16 760	2196/16 760 (13.1)	59/16 665 (0.4%)
2016	19 525	2800/19 525 (14.3%)	84/19 402 (0.4%)
2017	21 917	3997/21 917 (18.2%)	164/21 775 (0.8%)
2018	23 059	4862/23 059 (21.1%)	101/22 513 (0.4%)
2019	21 776	5349/21 776 (24.6%)	175/21 385 (0.8%)
<b>Regular smoker†</b>			
2014	1806	1285/1806 (71.2%)	NA
2015	1127	828/1127 (73.5%)	88/1114 (7.9%)
2016	1088	861/1088 (79.1%)	125/1064 (11.7%)
2017	1254	1118/1254 (89.2%)	181/1242 (14.6%)
2018	1400	1323/1400 (94.5%)	194/1351 (14.4%)
2019	1553	1488/1553 (95.8%)	364/1513 (24.1%)
<b>Daily smoker</b>			
2014	833	634/833 (76.1%)	NA
2015	509	398/509 (78.2%)	50/499 (10.0%)
2016	513	414/513 (80.7%)	85/498 (17.1%)
2017	530	486/530 (91.7%)	109/520 (21.0%)
2018	533	504/533 (94.6%)	99/509 (19.4%)
2019	548	518/548 (94.5%)	159/536 (29.7%)

All groups had a statistically significant increase over time (Cochran-Armitage trend test,  $p < 0.0001$ ). NA—not available. \* Ever tried, defined as ever tried an e-cigarette (even a single puff or vape). † Regular use, defined as smoked at least daily, weekly, or monthly.

**Table 3: E-cigarette use according to smoking status in Year 10 students in New Zealand, 2014-19**

# Reasons for using e-cigarettes

Reasons for use, by smoking status, when people (age 14+) first started using e-cigarettes



**Can e-cigarettes help people stop smoking?**

# Cochrane Review: April 2021 Update



**Cochrane**  
**Library**

Cochrane Database of Systematic Reviews

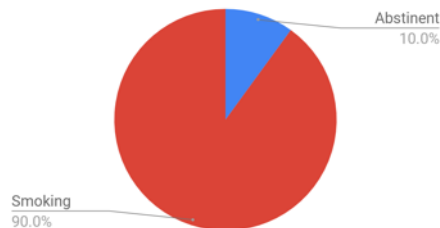
## Electronic cigarettes for smoking cessation (Review)

Hartmann-Boyce J, McRobbie H, Lindson N, Bullen C, Begh R, Theodoulou A, Notley C, Rigotti NA, Turner T, Butler AR, Hajek P

# Headline results

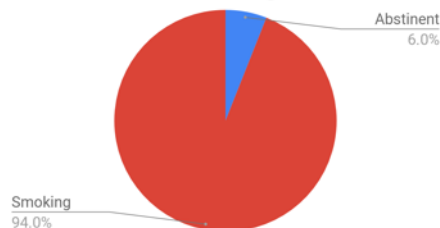
- More people probably stop smoking for at least six months using nicotine e-cigarettes than using:
  - nicotine replacement therapy (3 studies; 1498 people), or
  - nicotine-free e-cigarettes (4 studies; 1057 people).
- Nicotine e-cigarettes may help more people to stop smoking than no support or behavioural support only (4 studies; 2312 people).

6+ month abstinence rates using ENDS



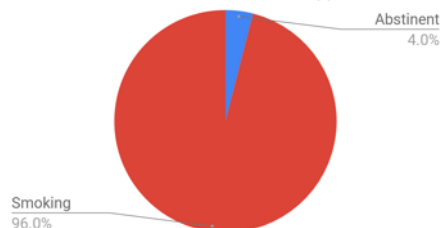
**10-11 out of every 100** people using nicotine e-cigarettes

6+ month abstinence rates using NRT or nicotine



**6 out of every 100** people using NRT or non-nicotine e-cigarettes

6+ month abstinence rates without support or



**4 out of every 100** people using behavioural support only or no support

# Adverse effects

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- There were low numbers of adverse effects in all study groups
- Low certainty evidence that there is no difference in the adverse event rate between groups
- Most common side effects associated with e-cigarettes use include:
  - Throat or mouth irritation
  - Headache
  - Cough
  - Nausea
- No significant difference in serious adverse events

# Are e-cigarettes safe?

Not 100% safe...

...but, overall, less harmful than smoking



# Substances that are potentially harmful

## Aerosol (vapour)<sup>1</sup>

- At high temperatures and frequent puffing, PG and VG can form:
  - Acetaldehyde
  - Formaldehyde
  - Acrolein
- Tobacco-specific nitrosamines can be present with tobacco extracts and nicotine
- Oxidising chemicals

## Battery and coil<sup>1</sup>

- Metals, e.g. nickel, chromium, cadmium, lead, tin, silicates

## Liquid<sup>1</sup>

- Nicotine
- Flavouring<sup>2</sup>
  - Benzaldehyde (cherry flavour)
  - Cinnamaldehyde (cinnamon flavours)
  - Diacetyl (butter flavours)

PG, propylene glycol; VG, vegetable glycol.

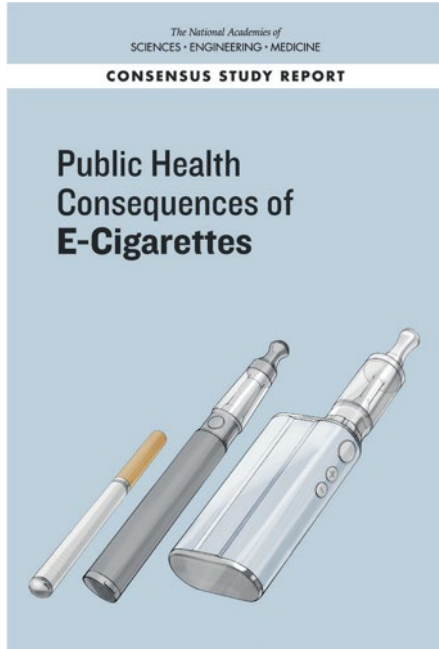
1. Bals R, *et al. Eur Respir J* 2019;53:1801151; 2. Allen J, *et al. Environ Health Perspect* 2016;124:733–9;

# Vaping some substances can be very harmful

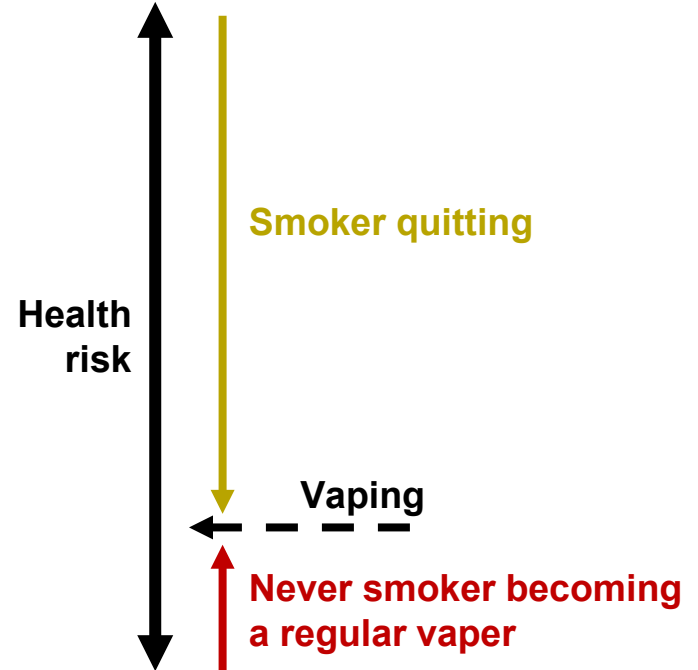
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- In the US in 2019, there were almost 3,000 cases of severe lung injury associated with e-cigarette use or vaping
- This was termed E-cigarette, or vaping, product use-associated lung injury (EVALI)
- It was found that vitamin E acetate
- Vitamin E acetate is used as an additive, most notably in THC-containing e-cigarette, or vaping, products.

# Health risk



*“Overall, the evidence reviewed by the committee suggests that e-cigarettes are **not without biological effects in humans**. For instance, use of e-cigarettes results in dependence on the devices, though with **apparently less risk and severity than that of combustible tobacco cigarettes**. Yet the implications for long-term effects on morbidity and mortality are not yet clear.”*



# Communication to the public

## THE EVIDENCE SO FAR SHOWS THAT E-CIGARETTES ARE FAR SAFER THAN SMOKING



E-cigarettes contain nicotine but **not cancer causing tobacco**



Nicotine is addictive, but does **not cause cancer**



**Tobacco** is the biggest cause of preventable death in the UK

Over **100,000 deaths** per year  = 10,000 



Passively breathing vapour from e-cigarettes is **unlikely to be harmful**



Growing evidence shows e-cigarettes are helping people to **stop smoking**



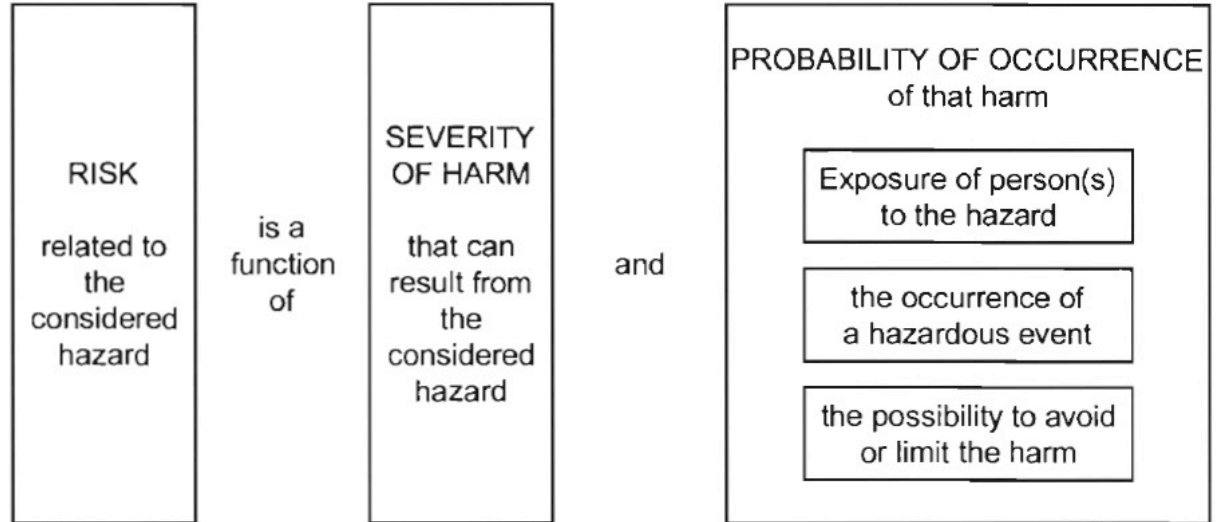
LET'S BEAT CANCER **SOONER**  
cruk.org



CANCER  
RESEARCH  
UK

# Understanding relative risk

Less harmful than  
smoking  
DOES NOT EQUAL  
SAFE



This Photo by Unknown Author is licensed under [CC BY-SA-NC](#)

# Appeal to young people

Do we have a growing problem?

# Some points and questions to consider

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- Surveillance data are often a ‘few steps behind’
- Measures of e-cigarette use vary, so take note of what is being reported e.g.
  - Ever use
  - Any use in the last 30 days
  - Daily use
- Policies and regulations should be considered when comparing data from different countries e.g.
  - The EU Tobacco Products Directive bans advertising, restricts sales to minors and limits nicotine concentration to 20mg/ml
- Are youth who vape those who would have tried smoking tobacco?

# The vaping industry has not been 'squeaky clean'

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Examples of early advertising; now removed





# Use of JUUL and pod-devices

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- Users often find their first experience with vaping as negative, but some persist with use
- Stress relief and addiction were mentioned as reasons for continued use
- Social factors associated with use include:
  - peer and parental influences
  - lack of support for quitting
  - accessibility
- Environmental factors associated with use include:
  - contrasting messages about long- and short-term health effects
  - lack of school vaping policy enforcement, health education, medical screenings, and cessation resources

# Does policy matter?

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Yes. For example the EU limits nicotine concentration to 20 mg/ml (2%)

In 2019

- youth vapers in England were less likely to report using e-cigarettes with  $\geq 2\%$  nicotine (12.8%) compared with Canada (40.5)\*
- self-reported use of products with higher nicotine concentration was associated with significantly greater symptoms of dependence

\*adjusted OR (AOR)=4.96; 95% CI 3.51-7.01)

# Nicotine dependence

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- Vaping can lead to nicotine dependence
- Ongoing vaping is associated with financial cost
- Vaping can expose the user to harmful chemicals (less than smoking)
- The risks of long-term vaping are unknown

# Strategies to prevent or reduce use in young people

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Reviewing existing school tobacco policies



Providing counseling and cessation resources



Training staff



Increasing knowledge through public education campaigns

# Clear messaging aimed at non-smoking youth



# Interventions

JAMA Internal Medicine | [Original Investigation](#)

## Effectiveness of a Vaping Cessation Text Message Program Among Young Adult e-Cigarette Users A Randomized Clinical Trial

Published online 17 May 2021

Amanda L. Graham, PhD; Michael S. Amato, PhD; Sarah Cha, MSPH; Megan A. Jacobs, MPH; Mia M. Bottcher; George D. Papandonatos, PhD

- Randomised 2,588 18-24 year old current e-cigarette users, interested in quitting, to a text message intervention vs. an assessment only control
- Current use = past 30 day use
- At 7 month follow-up, the 30 day point prevalence abstinence rates were:
  - Control: 18.6% (95%CI: 16.7-20.8)
  - Intervention: 24.1% (95% CI: 21.8-26.5)
  - Rate ratio: 1.29 (95% CI: 1.11-1.50),  $p < 0.001$
- Looks promising, but more evidence is needed

# Some key messages

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- Whilst e-cigarettes are less harmful than smoking, there are unlikely to be harmless – especially with long-term use
- People who do not smoke should not use e-cigarettes (regardless of nicotine content)
  - Young people who have not smoked should be advised to cease e-cigarette use (and not smoke cigarettes)
- E-cigarettes may help people who smoke to quit
  - Ideally people should also stop vaping when they feel ‘safe’ not to relapse to smoking
- Getting different messages to different groups has some challenges, but with the right policies and regulations in place it should be possible to make vaping an option for a way out of smoking whilst preventing (or at least substantially limiting) use in young people who do not smoke



positivechoices.org.au

# Questions?

Audio Settings ^



Chat



Raise Hand



Q&A

Leave Meeting





# Where to get help and advice

National Alcohol and Other Drug Hotline

Phone: 1800 250 015

Lifeline

Phone: 13 11 14

Family Drug Support

Phone: 1300 368 186

[www.fds.org.au](http://www.fds.org.au)

Australian Drug information network

[www.adin.com.au](http://www.adin.com.au)

More information and sources  
of help available at

[positivechoices.org.au/  
information/where-to-get-help](http://positivechoices.org.au/information/where-to-get-help)



# THANK YOU

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