

Youth smoking and vaping in Wales: Findings from the School Health Research Network 2019 Student Health and Wellbeing survey

Executive summary

- Despite large population declines in smoking prevalence in recent decades, tobacco remains a leading cause of death and disability, and continued monitoring of youth smoking trends is needed to inform existing tobacco control policy.
- Since their emergence in UK markets over the past decade, e-cigarettes have been increasingly recognised as having a role to play in helping smokers to quit. However, much debate has centred on their use by young people and whether vaping may act as a gateway into smoking or might renormalize smoking. Regulations for e-cigarettes such as age of sales restrictions, and restrictions on marketing and product labelling have been introduced in the past few years.
- This report presents data on smoking and vaping obtained from 119,388 11-16 year olds from 198 secondary schools in Wales between September and December 2019. Prevalence estimates were explored by gender, school year, family affluence, and across local Welsh Health Boards. To explore recent change over time, data were combined with the 2017 Student Health and Wellbeing survey (n=103,971).
- In 2019, 11% of 11-16 year olds reported ever having smoked a cigarette, while the proportion of adolescents smoking at least weekly remained at 4%. Smoking uptake continues to be substantially higher among children from poorer families.
- Experimentation with e-cigarettes fell for the first time since measurement began in 2013, but remained greater than experimentation with tobacco: overall, 22% of 11-16 year olds reported having ever tried an e-cigarette (down from 25% in 2017), although weekly use was rare.
- Current use of e-cigarettes remains concentrated among current smokers, with 1% of non-smoking 11-16 year olds reporting at least weekly use of e-cigarettes.
- While e-cigarette use appears to be declining among young people in Wales, the long term decline in smoking has stalled, and action is needed to prevent uptake of smoking among young people.

Contact

Dr Nicholas Page

PageN2@cardiff.ac.uk

DECIPHer, Cardiff University, 1-3 Museum Place, CF10 3BD



Background

Tobacco is a leading driver of mortality, morbidity and health inequalities¹ – and smoking from an early age increases risk of experiencing more severe harms in later life.² In the UK, substantial population-level declines in youth smoking uptake have occurred in recent decades following a greater focus on restriction and de-normalisation within tobacco control strategies,³ including bans on marketing and smoking in enclosed public spaces.⁴ A particular focus on youth smoking via increasing the legal age of purchase, introducing standardised packaging for tobacco products, and restricting point of sale displays, has coincided with a large decrease in rates of regular smoking among young people in Wales – from 10% of 11-16 year olds smoking at least weekly in 1985/86 to only 4% by 2017.⁵ However, these reductions have slowed recently with youth smoking rates remaining relatively consistent since 2013/14.⁵

Alongside this decline in youth smoking, e-cigarettes have emerged as a commonly used means for adults to quit smoking.⁶ While it is increasingly accepted that e-cigarettes have a role in helping adult smokers to quit, concerns have been widely expressed regarding their use by young people, and in particular the risk that such use may act as a gateway to smoking or may renormalize tobacco use. E-cigarette use among young people has been monitored in Wales since 2013 with rapid growth in experimentation observed between 2013 and 2015.⁷ However, there is evidence that smoking norms continued to decline as e-cigarettes emerged, and by 2017 there was some evidence to suggest this initial rate of growth was beginning to plateau: 25% of 11-16 year olds reported having ever tried e-cigarettes in 2017, representing modest growth from 2015.⁵ In 2017, experimentation with e-cigarettes was twice as common as experimentation with tobacco.⁵ Despite concerns that e-cigarettes may act as a gateway into smoking,⁸ widespread use among young people remained rare, with regular use concentrated among current smokers, and little regular use among young people who have never smoked.

Here we provide the latest figures on adolescent smoking and e-cigarette use ('vaping') in Wales, drawn from the School Health Research Network's 2019 Student Health and Wellbeing survey. In 2017, a majority of young people perceived e-cigarettes as less harmful than tobacco. However, our 2019 data collection

¹ Sreeramareddy CT, Harper S, Ernstsén L. Educational and wealth inequalities in tobacco use among men and women in 54 low-income and middle-income countries. *Tobacco Control*. 2018; 27(1): 26-34.

² Huggett SB, Keyes M, Iacono WG, McGue M, Corley RP, Hewitt JK, et al. Age of initiation and transition times to tobacco dependence: Early onset and rapid escalated use increase risk for dependence severity. *Drug and Alcohol Dependence*. 2019; 202:104-10.

³ Hallingberg B, Maynard OM, Bauld L, Brown R, Gray L, Lowthian E, et al. Have e-cigarettes renormalised or displaced youth smoking? Results of a segmented regression analysis of repeated cross sectional survey data in England, Scotland and Wales. *Tobacco control*. 2020; 29: 207-216.

⁴ Barber S. Tobacco control policy overview. London: House of Commons Library; 2017.

⁵ Hewitt G, Anthony R, Moore G, Melendez-Torres GJ, Murphy S. Student Health and Wellbeing in Wales: Report of the 2017/18 Health Behaviour in School-aged Children Survey and School Health Research Network Student Health and Wellbeing Survey. Cardiff, UK: Cardiff University; 2019.

⁶ Stepney M, Aveyard P, Begh R. GPs' and nurses' perceptions of electronic cigarettes in England: a qualitative interview study. *British Journal of General Practice*. 2019; 69: e8-e14.

⁷ Moore G, Brown R, Page N, Hallingberg B, Maynard O, McKell J, et al. Young people's use of e-cigarettes in Great Britain before and immediately after introduction of EU Tobacco Products Directive regulations: a mixed-method natural experimental evaluation. *International Journal of Drug Policy*. Forthcoming.

⁸ Chapman S, Bareham D, Maziak W. The Gateway Effect of e-cigarettes; Reflections on main Criticisms. *Nicotine & Tobacco Research*. 2019; 21(5): 695–698

occurred shortly after outbreaks of vaping related lung injury in the US.⁹ Hence we also examine change in risk perceptions for e-cigarettes relative to tobacco following this outbreak.

The School Health Research Network (SHRN)

SHRN was established in 2013 and is a partnership between Welsh Government, Public Health Wales, Cancer Research UK, the Wales Institute of Social and Economic Research Data and Methods (WISERD), and Cardiff University.¹⁰ School membership as of 2019 is 210 schools, which includes all maintained secondary and middle schools in Wales. The Network is led by the Centre for Development, Evaluation, Complexity and Implementation in Public Health Improvement (DECIPHer) at Cardiff University.

The Student Health and Wellbeing (SHW) survey

The SHW survey is a biennial survey administered to a core sample of 11-16 year olds attending SHRN member schools and was developed from the World Health Organisation's Health Behaviour in School-aged Children (HBSC) survey (which is undertaken every four years and which, as of 2017, has become subsumed into the larger SHW survey). The SHW survey aims to monitor adolescent health behaviours in Wales to increase understanding and inform policy.

In 2019, 119,388 students from 198 schools (representing 94% of eligible schools) participated in the SHW survey, providing a nationally representative sample of adolescents in Wales.

This report focuses on students who provided responses to questions concerning use of tobacco (smoking) and e-cigarettes (vaping). Ever use of tobacco was ascertained by asking students at what age they first smoked a cigarette, with response options ranging from 'never' to '16 years old'. Students who reported having ever tried a cigarette (more than a puff) were classed as ever smokers. Current smoking status was obtained by asking students how often they smoked at present, with students reporting daily or weekly smoking classed as current smokers. Equivalent measures of ever and current use of e-cigarettes were derived from comparable survey items. Perceptions of the harmfulness of tobacco and e-cigarettes were ascertained by asking a subsample of students which of the following statements they agreed with most; 'tobacco cigarettes are worse for your health than e-cigarettes', 'e-cigarettes are worse for your health than tobacco cigarettes', tobacco and e-cigarettes are equally bad for you', or 'I don't know'.

This report provides national prevalence estimates for smoking and vaping as well as breakdown by gender, school year, family affluence, and Welsh health board. A three category gender measure is used that includes the additional response option 'neither word describes me' (n=1,472; 1.2% of total sample). Family affluence is measured using the six item Family Affluence Scale (FAS),¹¹ with scale scores

⁹ https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html

¹⁰ <http://www.shrn.org.uk/>

¹¹ Hartley JE, Levin K, Currie C. A new version of the HBSC Family Affluence Scale-FAS III: Scottish qualitative findings from the international FAS development study. *Child indicators research*. 2016;9(1):233-45.

categorised into low, medium and high affluence in accordance with the international HBSC survey protocol. Due to item non-response, sample base sizes vary. For each of the reported estimates, 95% confidence intervals are available within the Appendix.

Findings

Smoking

Ever smoked a cigarette

In 2019, 11% of 11-16 year olds in Wales reported having ever smoked a cigarette (more than a puff: Figure 1a). Breakdowns by gender revealed a marginally higher rate of ever smoking among adolescent females compared to males, while the highest rate was reported among students self-identifying as neither male nor female (31%) – almost three times the national average. Among both males and females, the proportion reporting having ever tried a cigarette was found to increase linearly with age, represented here by school year (Figure 1b). Consistent with existing evidence on health inequalities, a greater proportion of less affluent students reported ever smoking (Figure 1c). Smoking experimentation varied by Welsh Health Board with ever smoking prevalence ranging from 6% in Cardiff and Vale to 14% in Powys (Figure 1d).

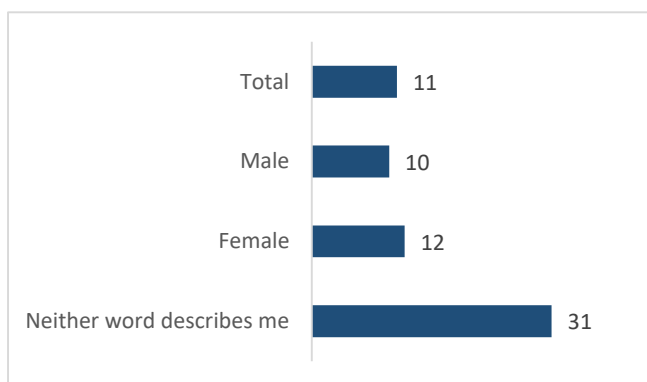


Figure 1a % of 11-16 year olds having ever smoked, overall (n=111,500) and by sex (n=110,608; excluding 892 gender non-response)

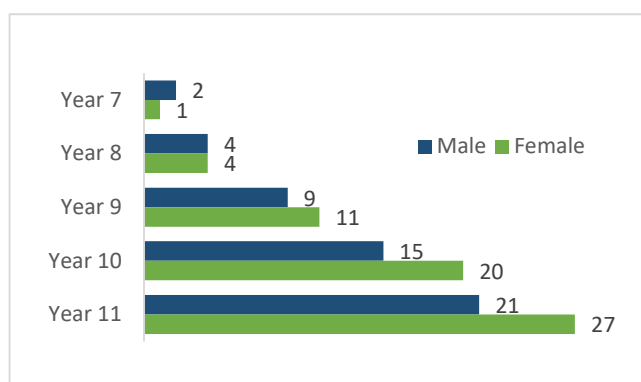


Figure 1b % of 11-16 year olds having ever smoked by sex and year group (n=109,336)

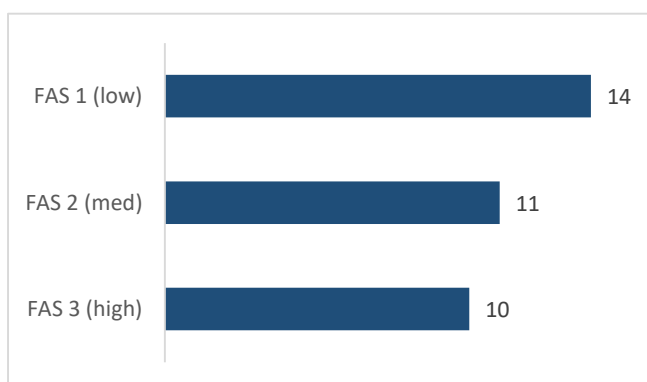


Figure 1c % of 11-16 year olds having ever smoked by family affluence (n=105,332)

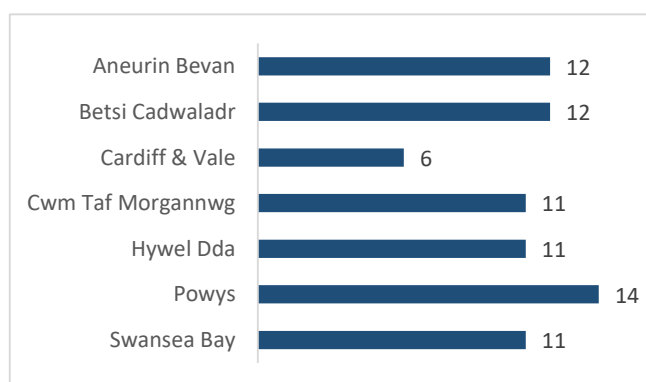


Figure 1d % of 11-16 year olds having ever smoked by local health board (n=111,500)

Current smoking

Data for 2019 showed 4% of 11-16 year olds smoke at least weekly in Wales, with little gender difference. However, similar to smoking experimentation, current smoking prevalence was markedly higher among adolescents who self-identified as neither male nor female (Figure 2a). Further breakdown by gender and school year showed growth in prevalence with increasing school year, rising from around 1% of students in Year 7 to 8% in Year 11 (Figure 2b). Consistent with smoking experimentation, current smoking was more common among less affluent students (Figure 2c). With the exception of noticeably lower rates of current smoking within Cardiff and Vale (2%), little variation was observed between Welsh Health Boards (Figure 2d).

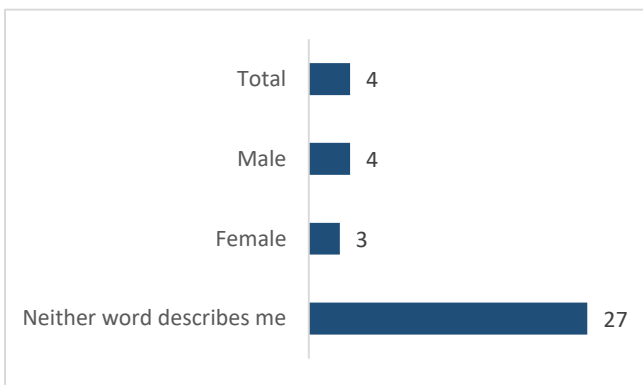


Figure 2a % of 11-16 year olds smoking at least weekly, overall (n=112,217) and by sex (n=111,311; excluding 906 gender non-response)

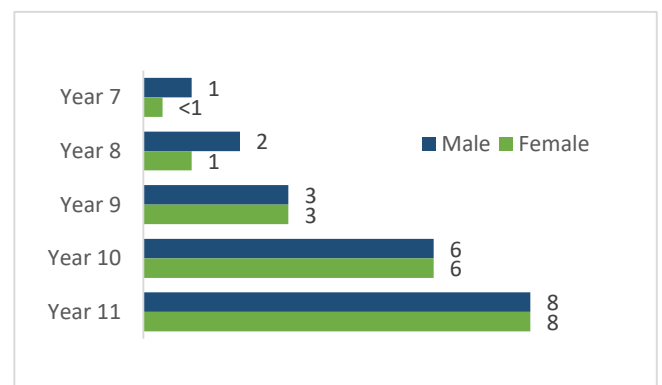


Figure 2b % of 11-16 year olds smoking at least weekly by sex and year group (n=110,038)

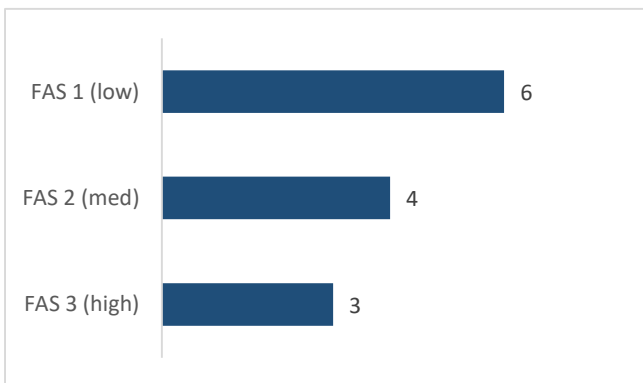


Figure 2c % of 11-16 year olds smoking at least weekly by family affluence (105,946)

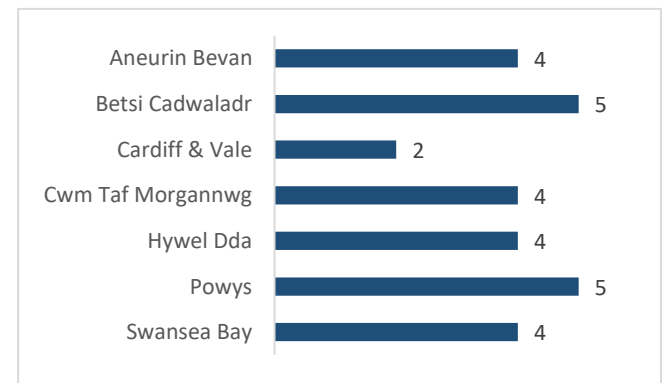


Figure 2d % of 11-16 year olds smoking at least weekly by local health board (112,217)

Vaping

Ever tried an e-cigarette

In 2019, 22% of 11-16 year olds in Wales reported having ever tried an e-cigarette (Figure 3a). Experimentation with e-cigarettes was similar for males and females with adolescent males reporting a marginally higher rate of ever use. However, students self-identifying as neither male nor female reported a notably higher rate of experimentation - almost twice the national average. Similar to trends in smoking, the proportion of 11-16 year olds experimenting with e-cigarettes increased linearly with school year (Figure 3b) and was greatest among the least affluent (Figure 3c). Some variation in rates of experimentation between Welsh Health Boards was also shown with lower rates of ever use identified in Cardiff and Vale (17%) and Hywel Dda (18%) respectively (Figure 3d).

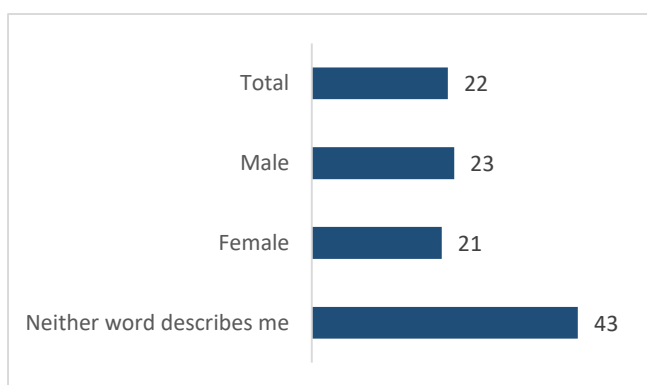


Figure 3a % of 11-16 year olds having ever vaped, overall (n=110,010) and by sex (n=109,172; excludes 838 gender non-response)

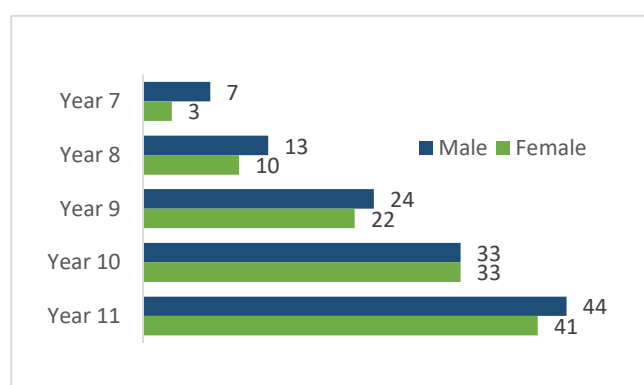


Figure 3b % of 11-16 year olds having ever vaped by sex and year group (n=107,948)

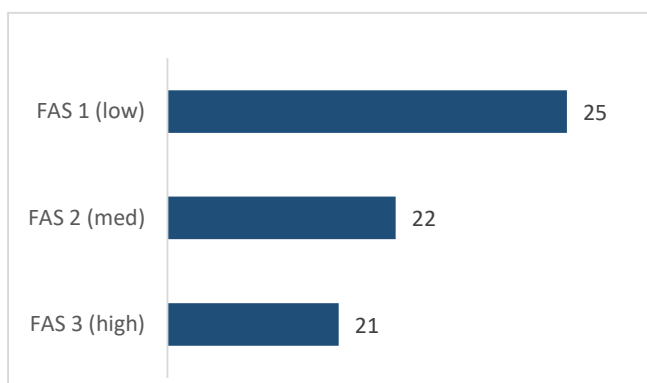


Figure 3c % of 11-16 year olds having ever vaped by family affluence (n=104,279)

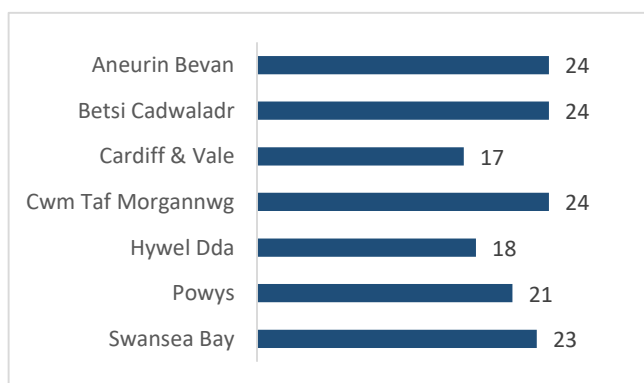


Figure 3d % of 11-16 year olds having ever vaped by local health board (n=110,010)

Current e-cigarette usage

Overall, 3% of 11-16 year olds in Wales reported at least weekly use of e-cigarettes. While little difference in prevalence was observed between males and females, those self-identifying as neither male nor female reported substantially higher rates of current use (Figure 3a). Similar to trends in e-cigarette experimentation, current use was more common among older adolescents (Figure 3b). While there were clear socioeconomic differences in experimentation with vaping, socioeconomic differences in current use were small (Figure 3c). Breakdown by Welsh Health Board identified Hywel Dda as having the lowest rate of current e-cigarette users – with as little as 1% of 11-16 year olds reporting at least weekly use. This was in contrast to 4% in Betsi Cadwaladr where current e-cigarette usage was found to be highest (Figure 3d).

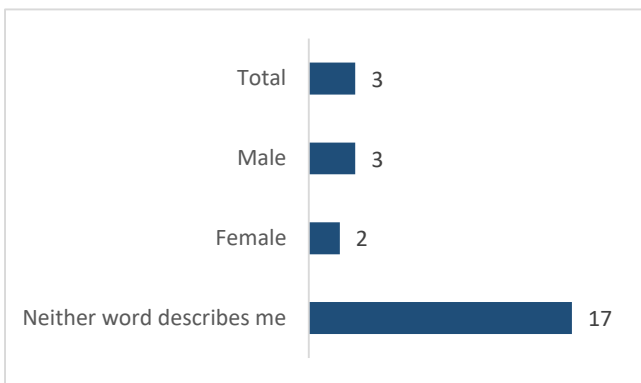


Figure 4a % of 11-16 year olds vaping at least weekly, overall (n=109,457) and by sex (n=108,631; excludes 826 gender non-response)

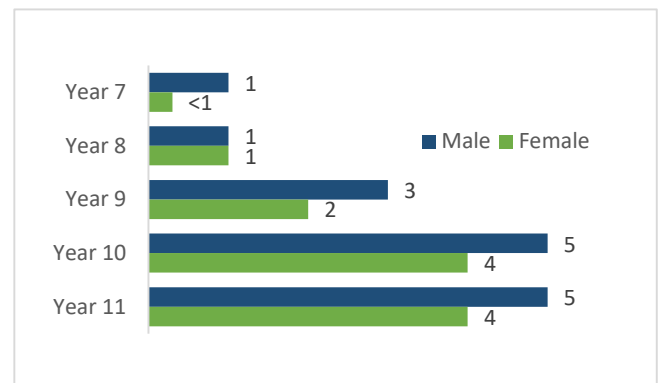


Figure 4b % of 11-16 year olds vaping at least weekly by sex and year group (n=107,430)

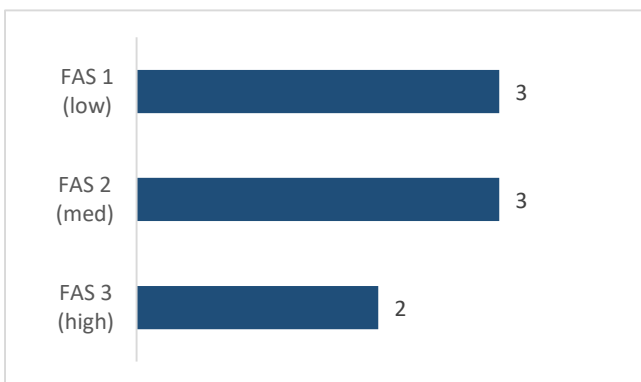


Figure 4c % of 11-16 year olds vaping at least weekly by family affluence (n=103,787)

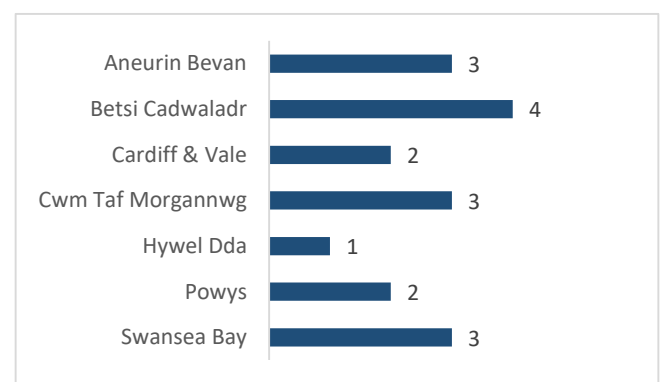


Figure 4d % of 11-16 year olds vaping at least weekly by local health board (109,457)

E-cigarette use by smoking status

According to data in 2019, among those 11-16 year olds who reported having never smoked, 14% had tried an e-cigarette at least once. By contrast, the vast majority of those who had smoked a cigarette (more than a puff) in their lifetime had tried an e-cigarette at least once (Figure 5a). Current e-cigarette use (weekly or more) was concentrated among current smokers; among non-smokers, 1% reported current use of e-cigarettes in 2019, compared to 38% of current smokers (Figure 5b).

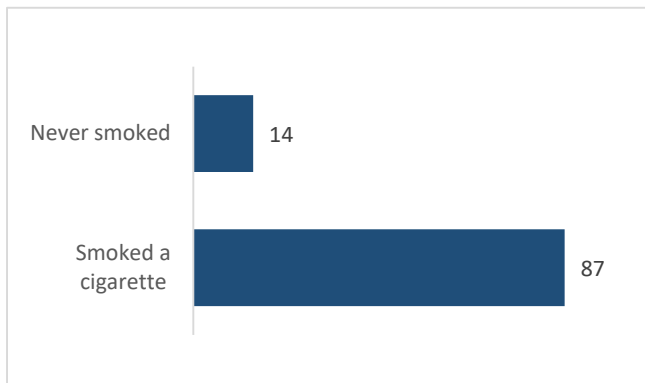


Figure 5a % of 11-16 year olds having ever vaped by smoking status (ever smoked, n=107,564)

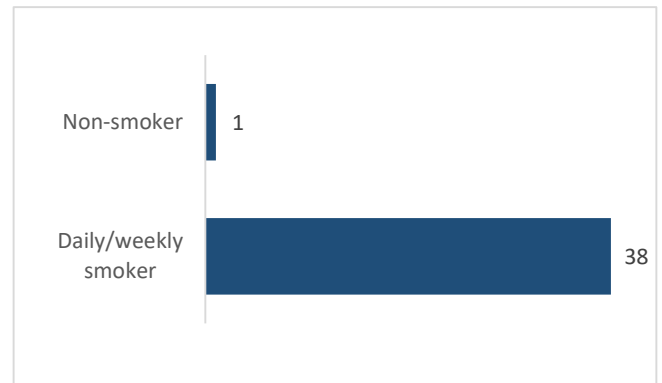


Figure 5b % of 11-16 year olds vaping at least weekly by current smoking status (n=107,461)

Perceptions of harmfulness to health

Youth perceptions of whether smoking or vaping is more harmful to health were assessed among a subsample of 11-16 year olds (Figure 6). In 2019, almost half of respondents stated that both use of tobacco and e-cigarettes were equally as harmful to health, while a third believed that smoking was worse. Only a small minority of young people believed vaping to be worse for their health than smoking.

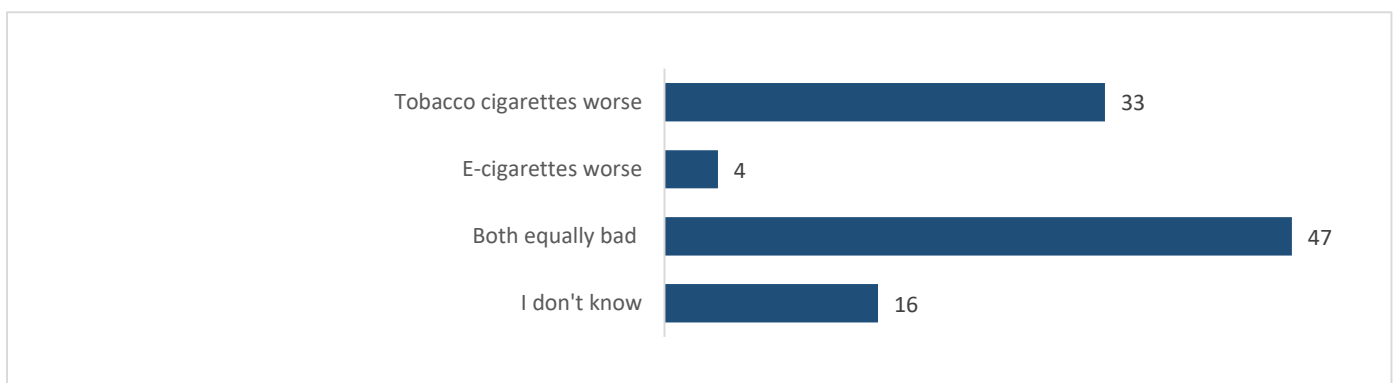


Figure 6 % of 11-16 year olds who agreed with the above statements on perceptions of harm to health from use of tobacco and e-cigarettes (n=25,188)

Changes from 2017¹²

- In Wales, the proportion of 11-16 year olds reporting having ever smoked a cigarette (more than a puff) declined slightly from 12% in 2017 to 11% in 2019. However, no change in current (weekly or more) smoking was observed with prevalence remaining stable at 4% (the fourth survey in a row for which a figure of 4% has been recorded).¹³
- A decline in the proportion of 11-16 year olds reporting having ever tried an e-cigarette was also observed – falling from 25% in 2017 to 22% in 2019. This is the first recorded fall in adolescent e-cigarette experimentation in Wales since measurement began in 2013. Current e-cigarette use prevalence also declined from 3.3% to 2.5% over this time.
- While current use of e-cigarettes was rare and concentrated predominantly among current smokers, the proportion of non-smokers who reported at least weekly use of e-cigarettes fell from 2% of 11-16 year olds in 2017 to 1% in 2019.
- Youth perceptions of tobacco and e-cigarette harmfulness have changed over time: the proportion of 11-16 year olds believing that both substances are equally as harmful to health increased by 11 percentage points (from 36-47%) between 2017 and 2019. This increase was mirrored by a marked reduction in the percentage of adolescents believing that cigarette smoking was more detrimental to health than vaping – falling from 45% of 11-16 year olds in 2017 to 33% by 2019.

Conclusion

Monitoring adolescent health behaviours remains essential to developing effective public health policy in Wales. While findings from the 2019 SHW survey show a small decline in youth smoking experimentation from 2017, current smoking prevalence remains unchanged, suggesting declines in current use have stalled since 2013/14. As within previous years, both experimentation and current use of tobacco were shown to increase with age and were higher among young people from less affluent families, with substantial inequalities in smoking uptake evident. By comparison, evidence of declines in both youth experimentation and current use of e-cigarettes was observed relative to 2017. Experimentation with e-cigarettes remains twice as common as experimentation with tobacco in 2019, but has declined, while current use remains rare and concentrated predominantly among smokers. Finally, there is some evidence that youth perceptions concerning the harmfulness of tobacco and e-cigarette use may be changing in Wales, with less young people now believing that cigarette smoking is worse for their health than vaping and more believing that both substances are equally as harmful to health. While reasons for changes in youth perceptions of harmfulness are not yet clear, the US outbreak of vaping-associated lung injury that

¹² Logistic regression models with adjustment for school-level clustering were used to assess statistical significance of change over time. All reported changes are statistically significant ($P < 0.05$) unless stated otherwise.

¹³ These surveys were the 2013/14 Health Behaviour in School-aged Children (HBSC) Wales survey, 2015/16 SHW survey, and 2017/18 HBSC/SHRN SHW survey.

occurred in 2019, and which received global media coverage at the time of our data collection, has been associated with similar changes in harm perceptions among adult smokers in England.¹⁴

Acknowledgements

This work was supported by The Centre for Development, Evaluation, Complexity and Implementation in Public Health Improvement (DECIPHer) as part of the School Health Research Network funded by Welsh Government through Health and Care Research Wales.

¹⁴ Tattan-Birch H, Brown J, Shahab L, Jackson S. Association of the US outbreak of vaping-associated lung injury with perceived harm of e-cigarettes compared with cigarettes. *JAMA Network Open*. 2020; 3(6):e206981

Appendix

95% confidence intervals for prevalence estimates within Figures 1a-4d

	% having ever smoked a cigarette [experimentation]		% smoking at least weekly [current use]		% having ever tried an e-cigarette [experimentation]		% vaping at least weekly [current use]	
	lower	upper	lower	upper	lower	upper	lower	upper
Wales	11	11	4	4	22	22	3	3
Male	9	10	4	4	23	23	3	3
Female	12	12	3	4	20	21	2	2
Neither word describes me	29	34	2	3	41	46	15	19
Year 7 (male)	2	3	1	1	7	8	1	1
Year 8 (male)	4	5	1	2	13	14	1	2
Year 9 (male)	8	9	3	4	23	25	3	3
Year 10 (male)	14	16	6	7	32	34	4	5
Year 11 (male)	21	22	8	9	43	45	5	6
Year 7 (female)	0	1	0	1	3	5	0	0
Year 8 (female)	4	4	1	1	9	11	1	1
Year 9 (female)	11	12	3	4	21	22	2	3
Year 10 (female)	19	21	6	7	33	34	3	4
Year 11 (female)	27	28	8	9	40	42	4	5
FAS 1 (low)	13	14	6	7	24	25	3	4
FAS 2 (med)	11	12	4	4	22	23	2	3
FAS 3 (high)	10	10	3	3	21	22	2	3
Aneurin Bevan	12	12	4	4	24	25	3	3
Betsi Cadwaladr	12	12	4	5	23	24	3	4
Cardiff & Vale	6	7	2	3	17	18	2	2
Cwm Taf Morgannwg	11	12	4	4	24	25	2	3
Hywel Dda	11	12	3	4	17	18	1	2
Powys	13	15	4	5	19	22	2	3
Swansea Bay	11	12	4	5	22	24	3	3

95% confidence intervals for prevalence estimates within Figures 5a-b

	Daily/weekly vaper	
	lower	Upper
Non-smoker	1	1
Daily/weekly smoker	37	40

95% confidence intervals for harm perception estimates within Figure 6

	% agree	
	lower	Upper
Tobacco cigarettes are worse	33	34
E-cigarettes are worse	4	4
Both are equally harmful	46	48
I don't know	15	16