E-CIGARETTE ACCESS AMONG YOUNG PEOPLE IN CHESHIRE AND MERSEYSIDE

FINDINGS FROM THE 2013 NORTH WEST TRADING STANDARDS SURVEY
E-cigarette access among young people in Cheshire and Merseyside
Findings from the 2013 North West Trading Standards survey

Authors

Karen Hughes, Katie Hardcastle
Centre for Public Health
Liverpool John Moores University
15-21 Webster Street
Liverpool L3 2ET

Andrew Bennett, Robin Ireland, Suzanne Sweeney
Health Equalities Group
151 Dale Street
Liverpool L2 2JH

Kate Pike
Trading Standards North West
New Town House
Buttermarket Street
Warrington WA1 2NH

Centre for Public Health, Liverpool John Moores University

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Summary and key findings

- The 2013 Trading Standards North West survey asked students in years 10 and 11 (age 14-17) if they had ever bought or tried e-cigarettes (referred to as e-cigarette access), along with a range of questions about tobacco smoking and alcohol consumption.

- This report presents examines e-cigarette access among 5,845 young people attending schools in Cheshire and Merseyside that participated in the survey.

- One in eight (12.7%) young people reported having accessed e-cigarettes.

- E-cigarette access was strongly associated with tobacco smoking. Two thirds (66.7%) of regular smokers reported having ever accessed cigarettes, compared with 40% of ex-smokers, 31% of those that smoke only when drinking, 13% of those that have tried smoking and not liked it, and 2.4% of those that have never smoked tobacco cigarettes.

- While most young people that had accessed e-cigarettes were current or ex-smokers, one in eight had never smoked tobacco cigarettes and almost one in five had tried and not liked them.

- Students whose parents or guardians smoked were at significantly increased risk of having accessed e-cigarettes. Almost two thirds (60.2%) of children that had accessed e-cigarettes had parents or guardians that smoked.

- E-cigarette access was strongly associated with alcohol use. Young people that drink alcohol were more likely to have accessed e-cigarettes than non-drinkers, and drinkers that binge drink were more likely to have accessed them than non-binge drinkers.

- One in three young people that reported drinking at least weekly and binge drinking had accessed e-cigarettes.

- Among drinkers, e-cigarette access was associated with drinking alcohol in unsupervised settings, particularly in public spaces (e.g. streets, parks) and at home when parents were out.

- E-cigarette access was also associated with accessing alcohol from adults outside shops, and purchasing it personally from on- or off-licensed premises.

- Young people that used e-cigarettes were significantly more likely to agree with statements supporting drunkenness (e.g. I only drink to get drunk), drinking due to boredom, and indicating alcohol-related harm (e.g. forgetting things after drinking). They were less likely to worry about the long term health effects of drinking alcohol.

- Findings suggest that substantial numbers of young people in Cheshire and Merseyside are experimenting with and using e-cigarettes, and that those that are most likely to use e-cigarettes are those that are already engaged in risky substance use behaviours.

- The development of prevention activity to address e-cigarette use among young people, particularly among non-smokers, should be a priority.
**Contents**

Introduction...........................................................................................................................3

Methods ........................................................................................................................................4
  Sample characteristics .............................................................................................................4

Findings ......................................................................................................................................5
  E-cigarette access and demographics ..................................................................................5
  E-cigarette access and smoking status ..................................................................................5
  E-cigarette access and parental smoking ..............................................................................6
  E-cigarette access and alcohol use .........................................................................................7
  Fake ID ownership and e-cigarette access ............................................................................8
  Multivariate analysis: all students .........................................................................................8

E-cigarette access among smokers .........................................................................................9
  Age of smoking onset .............................................................................................................9
  Tobacco cigarette access methods .........................................................................................9

E-cigarette access among drinkers .........................................................................................10
  Drinking location ..................................................................................................................10
  Obtaining alcohol ................................................................................................................10
  Type of alcohol consumed .....................................................................................................11
  Attitudes towards alcohol .....................................................................................................11
  Multivariate analysis .............................................................................................................12

E-cigarette access by Local Authority area ..........................................................................13

Discussion ..................................................................................................................................14

Recommendations .....................................................................................................................16

References ...................................................................................................................................17

Acknowledgements ....................................................................................................................18

Appendix ......................................................................................................................................18
Introduction

The availability, advertising and use of e-cigarettes (see box) have increased dramatically in recent years. Despite appearing on the UK market less than a decade ago, there were an estimated 1.3 million users nationally by 2013. Unlike other nicotine replacement therapies, e-cigarettes are often used and marketed as a healthier alternative to smoking rather than an aid for complete smoking cessation. However, their relative novelty means their safety and efficacy is still largely unknown. Thus, while they are not recommended by health professionals, there is a general perception that e-cigarettes provide a safer nicotine delivery mechanism for smokers than tobacco products, due to the absence of harmful inhaled toxins.

The rapid proliferation of e-cigarettes in the UK has been facilitated by an absence of regulation controlling their promotion and sale. This has raised major public health concerns around the potential harms they pose to children. Along with safety issues, these include the damaging effect that e-cigarette use in public places might have on the ‘no smoking’ health message, and the potential for e-cigarettes to act as a gateway to smoking. The wide range of e-cigarette flavourings available, brightly coloured designs and factors such as celebrity endorsement have also raised alarms that e-cigarettes are being specifically marketed towards youth.

Given these concerns, in January 2014 the government announced its intention to ban e-cigarette sales to under-18s. Further regulation is expected both nationally and from Europe, likely including restrictions on the promotion of e-cigarettes to children.

Electronic cigarettes, or e-cigarettes, are nicotine delivery devices that offer a comparable smoking experience to tobacco cigarettes. They provide doses of nicotine, typically combined with flavouring, through an atomiser powered by a component such as propylene glycol. The user inhales and exhales the nicotine-containing vapour produced by the device as they would with a normal cigarette.

Understanding the extent of e-cigarette access by young people, which young people are most affected, and consequently what health interventions and enforcement measures might be required is thus a matter of urgency.

Most research on e-cigarettes to date has focused on adults, and has found that use is largely limited to current and ex-smokers. A survey of 11-18 year olds in 2013 found that two thirds had heard of e-cigarettes, and 7% of these children had tried them. However, anecdotal reports suggest that access to e-cigarettes may be much more common, particularly in older teenagers. To examine this issue, in 2013 Trading Standards North West included a question on e-cigarette access in their biennial alcohol and tobacco school survey. This report uses data from the Trading Standards survey to examine access to e-cigarettes among young people in Cheshire & Merseyside.

This is one of two studies exploring the role of e-cigarettes in young people’s lives in Cheshire & Merseyside. The accompanying report presents a qualitative study examining teenagers’ attitudes towards, and experience of, e-cigarettes and provides further background information on e-cigarette use.

Methods

Trading Standards North West’s 2013 survey was conducted in schools across the North West between January and April 2013. Schools participated on a voluntary basis and 49 schools in Cheshire & Merseyside took part. Questionnaires were completed anonymously by year 10 and 11 students during lesson times. They collected a range of data including:

- **Student demographics:** age, gender, postcode (used to assign students to a national deprivation quintile; see appendix).
- **Smoking-related behaviours:** smoking status, age of first smoking, methods of obtaining cigarettes, e-cigarette access, whether parents/guardians smoked.
- **Alcohol-related behaviours:** frequency of drinking and binge drinking, drink types consumed, drinking locations, methods of obtaining alcohol, motivations for drinking and experience of alcohol-related harms.

This question on e-cigarettes asked “Have you ever bought or tried an e-cigarette?” Students that answered ‘yes’ to this question were categorised as having accessed e-cigarettes. The full sample size for Cheshire & Merseyside was 6,129. However, cases were excluded if data on gender (n=41) or e-cigarette access (n=234) were missing, or if answers were unreliable (n=9). The final sample was 5,845.

Sample characteristics

Local authority samples sizes ranged from 77 in Halton up to 1,125 in Sefton (Table 1). Student demographics varied widely, with females accounting for between 46.8% (Halton) and 71.1% (Wirral) of local samples. Only Cheshire East had a substantial sample of 17 year olds (26.3%), and these young people accounted for 80.9% of all 17 year olds surveyed across Cheshire & Merseyside. Deprivation also varied widely, with proportions assigned to the most deprived quintile ranging from 2.1% in Cheshire East up to 95.5% in Liverpool. These broad differences between samples mean that comparisons of e-cigarette access levels across local authority areas are not appropriate.

Table 1: Sample demographics, by local authority area

<table>
<thead>
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<tbody>
<tr>
<td>No. of students (schools)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Gender (%)</td>
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<td></td>
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<td></td>
</tr>
<tr>
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<td>52.5</td>
<td>53.2</td>
<td>50.6</td>
<td>47.3</td>
<td>48.1</td>
<td>48.3</td>
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<td>28.9</td>
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<td>46.8</td>
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<td>1.3</td>
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<td>18.0</td>
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<td>1.8</td>
<td>2.3</td>
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<td>49.3</td>
<td>42.9</td>
<td>51.8</td>
<td>45.4</td>
</tr>
<tr>
<td>16</td>
<td>27.7</td>
<td>42.3</td>
<td>42.9</td>
<td>23.8</td>
<td>23.3</td>
<td>30.1</td>
<td>55.0</td>
<td>45.8</td>
<td>50.9</td>
</tr>
<tr>
<td>17</td>
<td>26.3</td>
<td>0.5</td>
<td>1.3</td>
<td>0.2</td>
<td>1.0</td>
<td>1.8</td>
<td>0.6</td>
<td>0.5</td>
<td>1.4</td>
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<tr>
<td>(Least deprived) 1</td>
<td>37.5</td>
<td>7.3</td>
<td>0.0</td>
<td>0.4</td>
<td>0.0</td>
<td>16.5</td>
<td>16.7</td>
<td>36.3</td>
<td>24.9</td>
</tr>
<tr>
<td>(Most deprived) 3</td>
<td>17.3</td>
<td>41.6</td>
<td>40.3</td>
<td>16.6</td>
<td>0.7</td>
<td>11.9</td>
<td>10.7</td>
<td>2.2</td>
<td>28.0</td>
</tr>
<tr>
<td>(Least deprived) 5</td>
<td>2.1</td>
<td>28.1</td>
<td>48.1</td>
<td>63.4</td>
<td>95.5</td>
<td>42.6</td>
<td>36.0</td>
<td>22.2</td>
<td>23.1</td>
</tr>
</tbody>
</table>

* see appendix for details of how students were assigned to a deprivation quintile.
Findings

E-cigarette access and demographics

One in eight (12.7%) young people surveyed in Cheshire & Merseyside reported having accessed e-cigarettes. Prevalence of reported e-cigarette access was highest in 16 year olds (Figure 1). There was no significant difference in e-cigarette access by gender (males 13.0%, females 12.4%), nor by deprivation quintile (least to most deprived quintiles, 13.0%, 12.1%, 12.8%, 14.4%, 12.2%).

E-cigarette access and smoking status

Two thirds (64.1%) of young people had never smoked tobacco cigarettes and 18.6% had tried smoking and not liked it. Four per cent were ex-smokers, 5.3% smoked only when drinking alcohol and 8.0% were regular smokers (<5/day 2.4%, 6-10/day 2.4%, 11-20/day 1.2%, >20/day 2.0%).

There was a strong relationship between smoking status and e-cigarette access. Two thirds (66.7%) of all regular smokers reported having accessed e-cigarettes as did a third (31.0%) of those who only smoked when drinking alcohol (Figure 2). Levels of e-cigarette access fell to 12.6% of those who had tried and not liked smoking and 2.4% of those who had never smoked. Over a third (40.3%) of ex-smokers had accessed e-cigarettes, although no data were available to identify if these young people had used e-cigarettes to help them quit smoking.

Figure 1: E-cigarette access by age

Figure 2: Percentage of students having accessed e-cigarettes, by smoking status
As there were no significant differences in e-cigarette access between regular smokers (smoking <5 per day or any higher quantity), these students were combined into a single regular smoker category for further analysis.

Figure 3 shows the smoking status of young people that had accessed e-cigarettes. Over half were current smokers (regular smokers 42.8%, smoke when drinking alcohol 13.2%). Only 12.8% classed themselves as ex-smokers. Importantly, although prevalence of e-cigarette access was lowest among students that had never smoked, these young people accounted for the largest proportion of the sample meaning that never-smokers accounted for one in eight (12.3%) of all those that had accessed e-cigarettes. Further, almost one in five students that had accessed e-cigarettes had tried tobacco cigarettes and not liked them. However, it is not possible from the data to determine whether young people accessed e-cigarettes before or after they tried conventional cigarettes. Further analysis on e-cigarette access among smokers is provided on page 9.

E-cigarette access and parental smoking

Overall, a third (39.0%) of young people had a parent or guardian that smoked. However among those that had accessed e-cigarettes this increased to 60.2% (compared with 36.0% of those that had not accessed e-cigarettes; Table 2). Thus, prevalence of e-cigarette access was twice as high among students with parents/guardians that smoked (19.3%) than those with non-smoking parents/guardians (8.2%, P<0.001). The association between e-cigarette access and parental smoking was confirmed in multivariate analysis (see page 8).

Parental smoking was also strongly associated with young people’s tobacco smoking status. Students that were regular tobacco smokers were most likely to have parents or guardians that smoked (67.6%) while those that had never smoked tobacco cigarettes or that only smoke when drinking were least likely (both around 33%).

<table>
<thead>
<tr>
<th>Accessed e-cigarettes</th>
<th>%</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>36.0</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>60.2</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Smoking status</th>
<th>%</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never smoked</td>
<td>32.8</td>
<td></td>
</tr>
<tr>
<td>Tried but didn't like</td>
<td>46.0</td>
<td></td>
</tr>
<tr>
<td>Ex-smoker</td>
<td>54.4</td>
<td></td>
</tr>
<tr>
<td>Smoke when drinking</td>
<td>33.0</td>
<td></td>
</tr>
<tr>
<td>Regular smoker</td>
<td>67.6</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Figure 3: Smoking status of students that have accessed e-cigarettes

Table 2: % of students with parents/ guardians that smoke by e-cigarette and smoking status
E-cigarette access and alcohol use

Young people were asked how often they drank alcohol and how often they drank five or more alcoholic drinks on one occasion (a commonly used measure of binge drinking). Three quarters (73.8%) of participants reported drinking alcohol and over half (58.7%; 79.9% of drinkers) reported binge drinking at least occasionally. Students that drank alcohol at any level were more likely to report e-cigarette access than non-drinkers (16.0% of drinkers, 3.2% of non-drinkers, P<0.001).

Young people were grouped into five drinker types based on their answers to questions on alcohol consumption (see Table 3; 73 students could not be classified due to missing data). Most drinkers were occasional binge drinkers, while regular moderate drinkers accounted for just 1.2% of the sample.

Figure 4 shows the strong relationship between e-cigarette access and drinker type (P<0.001). E-cigarette access was increased in individuals who reported binge drinking, rising to almost one in three young people who were regular binge drinkers (Figure 4). The strong relationship between e-cigarette access and binge drinking was confirmed in multivariate analysis (see page 8). Further information on e-cigarette access among drinkers is provided on page 10.

Table 3: Definitions of drinking categories and the percentage of students in each group*

<table>
<thead>
<tr>
<th>Drinking status</th>
<th>% of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-drinker</td>
<td>26.5</td>
</tr>
<tr>
<td>Occasional moderate drinker</td>
<td>13.6</td>
</tr>
<tr>
<td>drink &lt;weekly, never binge</td>
<td></td>
</tr>
<tr>
<td>Regular moderate drinker</td>
<td>1.2</td>
</tr>
<tr>
<td>drink &gt;= weekly, never binge</td>
<td></td>
</tr>
<tr>
<td>Occasional binge drinker</td>
<td>42.1</td>
</tr>
<tr>
<td>drink &lt;weekly, binge</td>
<td></td>
</tr>
<tr>
<td>Regular binge drinker</td>
<td>16.6</td>
</tr>
<tr>
<td>drink &gt;= weekly, binge</td>
<td></td>
</tr>
</tbody>
</table>

*73 students could not be classified due to missing data

Figure 4: e-cigarette access by drinking status
Fake ID ownership and e-cigarette access

Young people were asked if they had fake ID (i.e. age identification), although only 4,203 out of the 5,845 students from Cheshire & Merseyside answered this question. Of these, 6.5% reported having fake ID.

Young people with fake ID were significantly more likely to have accessed e-cigarettes (41.2%) than those without fake ID (14.1%, P<0.001; only 4.4% of those who did not state whether they had fake ID or not reported having accessed e-cigarettes).

Multivariate analysis: all students

Data on student demographics, smoking status, parental/guardian smoking and drinking status were entered into a logistic regression analysis to identify factors independently associated with e-cigarette access (Table 4). This confirmed the very strong relationship between smoking status and e-cigarette access. Young people with any smoking experience were significantly more likely to have accessed e-cigarettes than non-smokers, with odds rising to 53.5 among regular smokers. There was also a strong independent relationship between parental smoking and e-cigarettes.

Compared with non-drinkers, young people that reported binge drinking even occasionally had increased odds of e-cigarette access. However, moderate drinkers had no increased risk compared with non-drinkers. Despite having no initial relationship with e-cigarette access in chi squared analysis, after controlling for demographics, smoking and drinking behaviours, being male was found to be associated with e-cigarette access. However neither age nor deprivation level had an independent relationship with e-cigarette access.

| Table 4: Odds of e-cigarette access by demographics and smoking and drinking behaviours |
|-----------------------------------------------|-------------------|----------------------|-----------------
| Gender                                       | AOR   | 95% CIs             | P      |
| Female                                       | Ref   |                      |        |
| Male                                         | 1.41  | (1.15-1.72)          | P<0.001|
| Smoking status                               |       |                      |        |
| Non-smoker                                   | Ref   |                      |        |
| Tried but didn't like it                     | 4.84  | (3.60-6.50)          | P<0.001|
| Ex-smoker                                    | 21.47 | (14.90-30.94)        | P<0.001|
| Smoke when drinking                          | 15.15 | (10.61-21.63)        | P<0.001|
| Regular smoker                               | 53.45 | (38.70-73.84)        | P<0.001|
| Drinking status                              |       |                      |        |
| Non-drinker                                  | Ref   |                      |        |
| Occasional moderate drinker                  | 1.43  | (0.88-2.32)          | ns     |
| Regular moderate drinker                     | 1.11  | (0.40-3.09)          | ns     |
| Occasional drinker, binge                    | 1.86  | (1.30-2.67)          | 0.001  |
| Regular drinker, binge                       | 2.33  | (1.59-3.42)          | <0.001 |
| Parent/guardian smokes                       |       |                      |        |
| No                                           | Ref   |                      |        |
| Yes                                          | 1.76  | (1.44-2.15)          | P<0.001|

Analysis uses backward conditional logistic regression. AOR = adjusted odds ratio; 95% CIs = 95% confidence intervals; Ref = reference category; ns = not significant. Analysis uses binary logistic regression with age and IMD quintile also entered into the model (not significant).
E-cigarette access among smokers

Age of smoking onset

Students that had smoked were asked how old they were when they first started smoking. Those that smoked at an earlier age were more likely to report e-cigarette access. For example, across current or ex-smokers (that provided a first smoking age), 57.8% of those that smoked before the age of 13 had accessed e-cigarettes compared with 49.1% of those that started smoking later (P=0.029).

Age of smoking onset was further examined among 16 year olds (Figure 5). Most current or ex-smokers had started smoking after the age of 13 (57.8%). There was a clear relationship between early smoking and continued smoking; 78.7% of those that first smoked <12 years of age were regular smokers at age 16 compared with 37.1% of those who first smoked at age 15 or 16. Equally, 74.5% of those that smoking <12 years of age had accessed e-cigarettes compared with 47.6% that starting smoking aged 15+

Tobacco cigarette access methods

Smokers were asked where they got their tobacco cigarettes from. Looking just at regular smokers, the most commonly reported method of obtaining cigarettes was buying them from shops (off-licences, supermarkets or newsagents; 59.1%). A third (32.1%) obtained them from siblings or friends over the age of 18; a quarter (26.1%) from parents or guardians; and a fifth each from siblings/friends under 18 (20.2%) or unregulated sources such as street sellers and private houses (19.7%).

In chi squared analysis, there were no associations between regular smokers’ tobacco cigarette access methods and e-cigarette access. However, in a multivariate analysis that controlled for the influence of other factors (demographics, parental smoking, age of smoking onset, drinking), e-cigarette access was associated with obtaining cigarettes from unregulated sources (AOR 2.00, P=0.038).

Age was the only other factor independently associated with e-cigarette access among regular smokers, with 16 year old regular smokers having the greatest odds of e-cigarette access (compared with 14 year olds).

![Figure 5: Regular smoking and e-cigarette access by age of smoking onset, 16 year olds](image-url)
E-cigarette access among drinkers

The Trading Standards survey asked students that consumed alcohol a range of questions about their drinking behaviours and alcohol access methods. In terms of drinking patterns, e-cigarette access was more common among drinkers that reported binge drinking at any frequency (18.8% compared with 5.1% of non-binge drinkers, \(P<0.001\)) and those that drank at least weekly (29.9% compared with 11.5% of those drinking less than weekly, \(P<0.001\)).

Drinking location

Drinkers were asked where they mostly drank alcohol (and asked to tick all options that applied). The most common locations for drinking alcohol were at functions with friends (49.2%) or family (45.0%) and at home when parents were in (42.6%). The least common locations were in on-licensed premises (14.4%) and outside (streets, parks, shops; 12.3%). Figure 6 shows levels of e-cigarette access by drinkers based on where they mostly drink alcohol. Drinking alcohol in family situations (at home when parents are in or at functions with family) was associated with significantly lower levels of e-cigarette access, while alcohol consumption in other settings was associated with higher levels. Young people that reported consuming alcohol outside (e.g. streets, parks, shops), in on-licensed premises and at home when parents are out reported particularly high levels of e-cigarette access (with 35.1%, 27.2% and 25.5% having accessed e-cigarettes respectively).

Obtaining alcohol

Drinkers were asked where they got their alcohol from and asked to tick all response options that applied. The most common responses were getting alcohol from parents or guardians (55.3%) or from friends/family over the age of 18 (45.9%). The least common method was taking it from parents or guardians without consent (5.0%). Other methods were each reported by around one in ten young drinkers.

**Figure 6: Percentage of drinkers having accessed e-cigarettes by where they mostly drink alcohol**

- *At home when parents are in
- ***At home when parents are out
- **At friend's house when parents are in
- ***At friend's house when parents are out
- Functions (weddings/parties) with friends
- **Functions (weddings/parties) with family
- ***Pubs, nightclubs and discos
- ***Outside (streets/parks/shops)

Drink in this location
- Yes
- No

* students were asked to tick all that applied; *\(P<0.05\), **\(P<0.01\), ***\(P<0.001\). 30 drinkers did not answer these questions.
Figure 7 shows the relationships between drinkers’ methods of obtaining alcohol and e-cigarette access. Only being bought or given alcohol by parents or guardians was associated with lower levels of e-cigarette access (11.7% vs 21.6% of those not reporting this method of obtaining alcohol, P<0.001).

Prevalence of e-cigarette access was particularly high among drinkers that reported asking adults outside shops to buy alcohol for them (37.2%) or buying alcohol themselves from off-licensed premises (32.2%) or pubs and nightclubs (31.0%), compared with young people that did not report these methods.

**Type of alcohol consumed**

Of the 4,307 young people that reported drinking alcohol, 48.4% (n=2,083) provided information on the types of alcohol they consumed in a normal week. Of these, 52.7% reported drinking spirits, 41.9% lager, 35.7% alcopops, 32.1% cans of cider, 28.9% wine and 12.6% large bottles of value cider.

E-cigarette access was more likely to be reported by those that reported drinking wine (20.7% vs 16.6% non-wine drinkers, P=0.026), spirits (24.2% vs 10.6% of non-spirits drinkers, P<0.001) and particularly large bottles of value cider (35.4% vs 15.3% of those not consuming this drink).

**Attitudes towards alcohol**

Young people were asked how strongly they agreed or disagreed with a range of statements on alcohol. Table 5 shows the proportions agreeing/strongly agreeing with these statements based on whether or not they had accessed e-cigarettes. Students that had accessed e-cigarettes were more likely to agree with all statements on drunkenness with, for example, 74.0% agreeing that “it is normal to get drunk” compared with 54.8% of those that had not accessed e-cigarettes.

E-cigarette users were also more likely to agree that they drink alcohol because their friends do, and because there is nothing else...
to do; that they tend to forget things after drinking; and that they don’t really worry about the long-term health effects of drinking alcohol. They were less likely to agree that they feel in control when drinking and to ensure that they are not on their own when out drinking.

Finally, young people were asked if they had ever been violent or in a fight whilst drunk, with 14.5% of drinkers stating yes. Those that had been involved in such alcohol-related violence were significantly more likely to have accessed e-cigarettes (43.1%) than those that had not (11.2%, P<0.001).

### Multivariate analysis

To identify factors independently associated with e-cigarette access among drinkers, a multivariate analysis was conducted including variables on participant demographics (age, gender and deprivation quintile), binge drinking, weekly drinking, alcohol consumption locations and alcohol access methods. This found that e-cigarette access among drinkers was significantly associated with:

- Binge drinking (AOR 3.08, P<0.001)
- Drinking >= weekly (AOR 2.05, P<0.001)
- Getting alcohol from adults outside shops (AOR 2.12, P<0.001)
- Buying alcohol personally from:
  - onicensed premises (AOR 1.52, P=0.002)
  - officensed premises (AOR 1.36, P=0.015)
- Drinking outside in parks, streets, shops etc. (AOR 1.67, P<0.001)
- Drinking at home when parents were out (AOR 1.38, P=0.004)

Drinkers were less likely to have accessed e-cigarettes if they were given or bought alcohol from parents (AOR 0.67, P<0.001).

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**Table 5: Agreement with statements on alcohol consumption among drinkers that have and have not accessed e-cigarettes**

<table>
<thead>
<tr>
<th>Statement</th>
<th>% agreeing with statement*</th>
</tr>
</thead>
<tbody>
<tr>
<td>I'm not really worried about the long term health effects of drinking alcohol</td>
<td>53.8 37.4 &lt;0.001</td>
</tr>
<tr>
<td>It is normal to get drunk</td>
<td>74.0 54.8 &lt;0.001</td>
</tr>
<tr>
<td>Getting drunk is fun</td>
<td>86.2 69.9 &lt;0.001</td>
</tr>
<tr>
<td>I tend to forget things when I've been drinking</td>
<td>53.0 32.4 &lt;0.001</td>
</tr>
<tr>
<td>I make sure I'm not on my own when out drinking</td>
<td>83.5 87.6 0.004</td>
</tr>
<tr>
<td>I worry that my drink may get spiked</td>
<td>28.7 32.2 ns</td>
</tr>
<tr>
<td>I always feel in control when I drink alcohol</td>
<td>52.9 63.1 &lt;0.001</td>
</tr>
<tr>
<td>I only drink alcohol to get drunk</td>
<td>58.1 29.2 &lt;0.001</td>
</tr>
<tr>
<td>I drink alcohol because there's nothing else to do</td>
<td>35.9 13.0 &lt;0.001</td>
</tr>
<tr>
<td>I drink alcohol because my friends do</td>
<td>32.7 26.3 0.001</td>
</tr>
</tbody>
</table>

* Combining ‘agree’ and ‘strongly agree responses; ns = not significant
E-cigarette access by Local Authority area

The wide variation between local authority areas in sample size and participant demographics means that direct comparisons of e-cigarette access cannot be made.

However, Figure 8 provides the crude prevalence of e-cigarette access reported in each area, along with results from a multivariate analysis that controlled for student demographics and smoking status.

Compared with Wirral (with the lowest crude prevalence), access to e-cigarettes was significantly elevated in Cheshire East (AOR 1.96, P=0.010), Cheshire West (AOR 2.63, P<0.001) and St Helens (AOR 1.68, P=0.035), with increased odds in Warrington just failing to reach significance (AOR 1.64, P=0.062).

Figure 8: Variation in levels of e-cigarette access by local authority area, crude percentages and adjusted odds ratios

*Reference category. Analysis uses backward conditional logistic regression with age, gender, deprivation quintile and smoking status entered into the model. Smoking status and gender (male) were also significant. Adjusted odds ratios are significantly increased where 95% confidence intervals do not cross 1.0, indicated by the red line.
Discussion

One in eight (12.7%) 14-17 year old school students from Cheshire & Merseyside participating in the 2013 Trading Standards North West survey reported having accessed e-cigarettes. Although it is not possible from the survey to identify whether these young people used e-cigarettes or just purchased them, it can be presumed that young people who buy e-cigarettes would at least have an interest in trying them. Thus, prevalence levels identified here suggest that young people’s engagement with e-cigarettes is more common than previously reported through national studies, and this corresponds with findings from the accompanying qualitative study in which teenagers reported widespread use of e-cigarettes among their peers.

E-cigarette access was most common among young people that smoked tobacco cigarettes, with two thirds of regular tobacco smokers having accessed e-cigarettes. This shows a widespread engagement of young smokers with these nicotine delivery devices; and that e-cigarettes are reaching those that may benefit from their use in terms of reducing or preventing tobacco smoking. However, while some teenage smokers may have accessed e-cigarettes to help them give up smoking, prevalence of e-cigarette access among ex-smokers was lower (40.3%) than that for regular smokers, and ex-smokers only accounted for 12.8% of all students that had accessed e-cigarettes (compared with 42.8% being regular smokers). Thus, findings provide little support for e-cigarettes being used by young smokers in Cheshire & Merseyside as a tobacco-smoking cessation tool. This backs up findings from the qualitative study, which suggested that while some older teenagers did see e-cigarettes as a mechanism of reducing tobacco smoking, e-cigarettes were largely perceived as a separate product, used ‘for the sake of it’, to fit in, to impress peers or to portray a certain image of themselves.

Uptake by non-smoking children is one of the main public health concerns with e-cigarettes, given their potential to recruit children to nicotine dependence and act as a gateway to tobacco smoking. While previous reports have found little evidence for such uptake, one in eight (12.3%) young people in Cheshire & Merseyside that had accessed e-cigarettes had never smoked a tobacco cigarette. A further 18.9% had tried tobacco smoking and not liked it. This suggests that experimentation with e-cigarettes among non-smoking young people is not uncommon; a theme that also emerged in the qualitative study. Many focus group participants reported non-smoking peers using e-cigarettes, with factors such as easy access and the wide range of attractive flavours available thought to facilitate their use.

A key finding from this analysis is the association between e-cigarette access and drinking behaviours. Young people that drink were more likely to have accessed e-cigarettes than non-drinkers, and drinkers that drink frequently and binge drink were more likely to have accessed them than moderate drinkers. Specifically, one in three young people that reported drinking at least weekly and binge drinking had accessed e-cigarettes. E-cigarette access was also strongly associated with drinking alcohol outside (in streets, parks etc.) or at home when parents were out, and with accessing alcohol by asking adults outside shops to proxy purchase for them or self-purchasing from licensed premises. These markers of heavy and unsupervised drinking behaviours by teenagers have previously been associated with greater risk of alcohol-related
harm.\textsuperscript{14, 15} Accordingly, students that had accessed e-cigarettes were more likely to agree with statements favouring drunkenness, drinking due to boredom and peer pressure, and indicating experience of alcohol-related harm. For example, over half of young drinkers that had accessed e-cigarettes agreed that they tended to forget things after drinking compared with a third of those that had not accessed e-cigarettes. E-cigarette access was also associated with involvement in alcohol-related violence. These findings point to e-cigarettes being particularly adopted by vulnerable teenagers who are already engaged in substance use and risk-taking behaviours.

While unsupervised alcohol consumption was associated with increased access to e-cigarettes, accessing alcohol through family situations was negatively associated with e-cigarette access. Drinkers that obtained alcohol from parents and that drank mainly at family functions or at home when parents were in were less likely to have accessed e-cigarettes than other drinkers. Parents can have an important influence on teenage behaviours not only through establishing rules, monitoring behaviour and communicating effectively, but also in the attitudes and behaviours that they pass on to them. The role of parents is emphasised by the strong relationship found here between e-cigarette access and parental smoking. Students whose parents/guardians smoked were at increased risk of having accessed e-cigarettes, and almost two thirds of young people that had accessed e-cigarettes had parents or guardians that smoked. Although students were not asked how they accessed e-cigarettes, in focus groups participants often cited parents as an important source, with examples provided of both parents purchasing e-cigarettes on children’s behalf and children using their parent’s e-cigarette without their knowledge.\textsuperscript{13} Generally, participants reported their parents had much more relaxed attitudes towards e-cigarettes than tobacco cigarettes.

Finally, although differences in sample sizes and student demographics across local authority areas prevents direct comparison of e-cigarette access levels across Cheshire & Merseyside, multivariate analysis suggested that young people in some areas may be at increased risk of exposure to e-cigarettes. Compared with students from Wirral, those from Cheshire West, Cheshire East and St Helens had increased odds of e-cigarette access, with elevated odds in Warrington just failing to reach significance. While no focus groups were undertaken in Cheshire West or East, participants in focus groups in St Helens and Warrington both suggested high engagement with e-cigarettes among local teenagers. Thus, while all areas should focus attention on teenage e-cigarette use, these areas may be in particular need of interventions to address the proliferation of e-cigarettes among young people.

Overall, analysis of Trading Standards survey data and findings from focus groups suggest that e-cigarettes are being experimented with and used by substantial number of young people in Cheshire & Merseyside. Combined findings from both studies should help inform the development and targeting of appropriate responses to e-cigarette use by young people.
Recommendations

- Information should be developed for young people on the potential risks and harms associated with e-cigarette use; the chemical content of e-cigarettes; e-cigarette testing, including safety and quality issues; and current and proposed regulations surrounding their sale and use.

- Interventions that aim to challenge young people’s views that everyone is using e-cigarettes may be useful. While use is high in some population groups, overall seven out of eight young people had never accessed e-cigarettes.

- Prevention work addressing the uptake of e-cigarettes by non-smoking young people should be considered a priority.

- Wider educational approaches should be used to provide young people with the skills they need to critically appraise information that is presented online or in the press, and become more informed media consumers.

- Guidance should be developed for schools and youth services to provide them with the tools they need to talk to young people about e-cigarette use and advice on developing policies addressing their use.

- Guidance and information should also be developed for parents and carers who can support e-cigarette education with young people in the home.

- With age restrictions on the sale of e-cigarettes to under-18s imminent, it will be important to ensure that parents and other adults are aware of any related legislation regarding proxy purchasing. Parents, other family members and proxy purchasers recruited outside shops are already key sources of access to e-cigarettes for young people.

- Future implementation of the Trading Standards survey should consider collecting further information on e-cigarette use, identifying use and purchasing of e-cigarettes separately and identifying whether e-cigarettes were used before or after tobacco cigarettes.

- In addition to survey data, school and community based stop smoking services should consider developing data collection systems to identify the role of e-cigarettes in young people’s uptake and quitting of tobacco cigarettes.
References

8. Torjesen I. E-cigarettes are to be regulated as medicines from 2016. *BMJ* 2013; 346: f3859.
Acknowledgements

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Appendix

Assigning students to quintile of deprivation

The Index of Multiple Deprivation (IMD) 2010 was used to assign students to a quintile of deprivation using a three stage process. Where students had provided their full postcode (n=2,608 cases), this was mapped directly to a Lower Super Output Area (English geographical areas with an average population size of 1,500) for which an IMD score is routinely calculated at a national level. Where only partial postcode was provided, those that spanned more than one LSOA were assigned to the LSOA that contained the majority of postcodes possible within the partial postcode (n=1,200 cases). Where no postcode information was available, students were allocated to an LSOA based on school postcode; a proxy measure used in previous studies (n=2,037 cases). Students were assigned to a national quintile of deprivation based on the IMD score of their allocated LSOA (1=most affluent, 5=most deprived). All postcode linkage was undertaken in a separate data file to that containing student behavioural and demographic data with ID codes used to link deprivation quintile to anonymous student data prior to analysis.

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Centre for Public Health
Liverpool John Moores University
Henry Cotton Building
15-21 Webster Street
Liverpool L3 2ET
UK
+44 (0)151 231 4510
www.cph.org.uk