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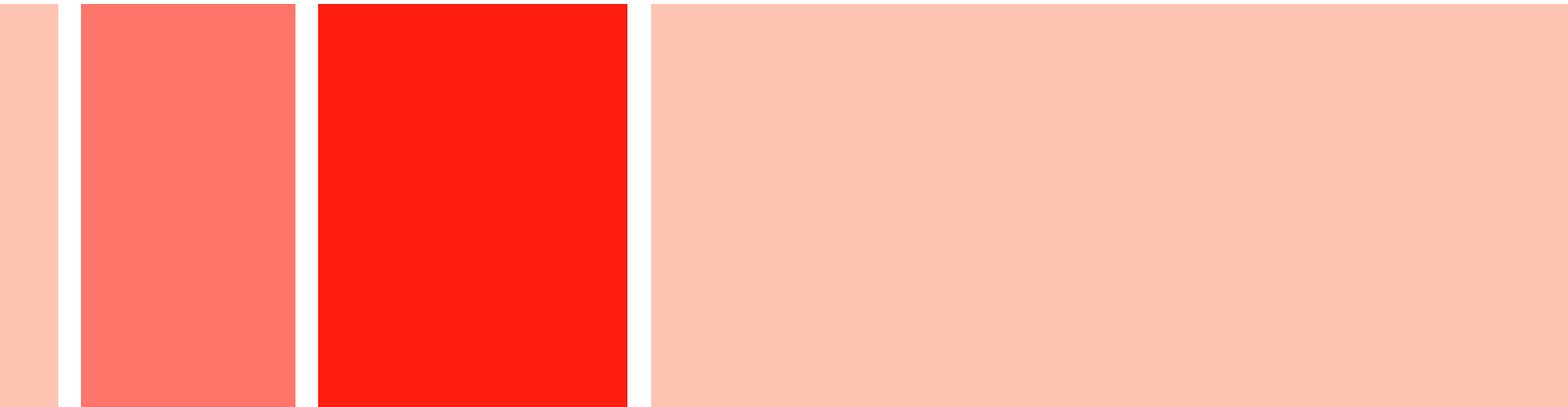
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Exposure to secondhand smoke in cars and homes, and e-cigarette use among 10-11 year old children in Wales: CHETS Wales 2



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Views expressed in this report are those of the researchers and not necessarily those of the Welsh Government.

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Glossary of acronyms

CHETS - CHild exposure to Environmental Tobacco Smoke

SHS – Secondhand smoke

WHO – World Health Organization

Summary

Background

1. The CHETS (CHild exposure to Environmental Tobacco Smoke) Wales repeated cross sectional surveys – conducted before and one year after introduction of legislation prohibiting smoking in enclosed public places – found that this legislation was followed by declines in secondhand smoke (SHS) exposure among children in Wales.
2. However, declines occurred to a greater extent among children with more moderate exposure levels prior to legislation. Limited changes occurred among children of smokers or children from poorer families.
3. Substantial numbers of children continued to be exposed to SHS in homes and cars. Hence, efforts to reduce childhood SHS exposure have since targeted smoking in these ‘private’ spaces.
4. On 13th July 2011 the First Minister announced the Welsh Government’s intention to mount a campaign (Fresh Start Wales) to tackle children’s exposure to second-hand smoke. The First Minister also announced that legislative options would be pursued if children’s exposure to second-hand smoke did not fall sufficiently within three years. The Fresh Start Wales campaign was then launched in February 2012.
5. This survey (CHETS Wales 2) replicated the CHETS Wales survey and aimed to examine whether smoking in cars and homes has declined since the follow-up survey in 2008.
6. The 2014 survey took place against a backdrop of substantial political and media focus on smoking in cars. In England for example, a House of Commons vote favouring introduction of legislation banning smoking in cars coincided with the survey.
7. Hence, no attempt is made to attribute any changes over time to Fresh Start Wales. The study simply aims to provide data on current exposure levels, and how these have changed since 2008.
8. In addition, the study provides data on a highly divisive contemporary public health issue; childhood e-cigarette use.

Methods

9. The 2014 survey replicated the 2007 / 2008 CHETS Wales surveys, recruiting a sample of 75 schools, and collecting questionnaire data from 1601 children within those schools.
10. The same measures of exposure to SHS in private spaces as collected within CHETS Wales were repeated, with a number of further items on smoking in cars added.
11. Saliva samples were not collected in 2014, but questions used to assess smoking in cars and homes were validated against salivary cotinine scores in 2007/08.
12. Additional items on e-cigarette use were also completed.
13. Data were collected in a classroom setting, by staff who were trained in the DECIPHer research centre.

Results

14. In 2014, 9% of children said that smoking was allowed in their family vehicle; a decline from 18% in 2008.
15. Among children with smoking parents, 20% reported that smoking was allowed in their family car; a decline from 35% in 2008.
16. Four percent reported being exposed to smoke in a car the previous day; a decline from 7% in 2008.
17. The majority of children (61%) who reported that smoking was allowed in their family vehicle agreed that smoking in cars, particularly when carrying children, should be banned.
18. Smoking in the home also declined substantially. In 2008, 33% of children reported that they had at least one parent figure who smoked in their home, falling to 22% in 2014.
19. In 2008, only 29% of children with at least one smoking parent figure reported that they did not have a parent figure who smoked in their home. Hence, in 2008, where parent figures smoked, it was still the norm to do so in the home. However, this rose to 48% in 2014, meaning that almost half of children who reported that one or more parent figures smoked reported that they did not smoke in the home.

20. Similarly, the percentage of children living in smoke free homes increased from 63% to 74%. Again, among children who reported that at least one parent figure smoked, those reporting that their home was smoke-free (i.e. that smoking was not allowed at all in their home) were a clear minority in 2008 (34%). However, in 2014, half (51%) of children with one or more smoking parent figure reported living in a home where smoking was not allowed.
21. Smoking in cars and homes was significantly more prevalent among children from poorer families. Despite their families being less likely to own a car, children from the poorest families were almost twice as likely (35%) to report that they were in a car where smoking took place almost daily or sometimes (5% and 31%) than their most affluent peers (2% and 18%).
22. In 2014, 67% of children reported that they had heard of e-cigarettes. Overall, 6% of children report having used an e-cigarette. The vast majority of children who reported having used an e-cigarette had never smoked a tobacco cigarette.
23. Among children whose parents smoked, 8% report having used an e-cigarette, compared to 3% of those whose parents did not.
24. Among non-smoking children who reported having used an e-cigarette 14% reported that they might start smoking within the next 2 years (compared to 2% of those who had not used an e-cigarette).
25. While few children said that they will smoke within two years, children who had used an e-cigarette were substantially less likely to say that they definitely will not smoke, and more likely to say that they might.

Conclusions

26. Smoking in cars carrying children has declined considerably in recent years, with substantial increases in smoking restrictions in private spaces reported by children with smoking parents.
27. However, a large proportion of children with smoking parents continue to be exposed to smoke in cars and homes, while substantial socioeconomic patterning remains.
28. The Welsh Government has now announced that it will legislate to ban smoking in cars carrying children. Further research is needed to understand the impact of this

legislation on children's exposure to SHS, health and health inequalities, and understanding issues of enforcement and compliance.

29. Despite a decline in smoking in the home, a sizeable minority of children are still affected by this. Therefore, continued efforts to reduce children's exposure to smoke in the home remain vital.
30. E-cigarette use appears to represent a new form of childhood experimentation with nicotine, which is more prevalent among 10-11 year old children than smoking.
31. E-cigarette use is more common among children whose parents smoke, and there is some suggestion that it may be associated with weaker anti-smoking intentions.
32. Further longitudinal research is needed to understand which comes first (the smoking intention or the e-cigarette use) and whether e-cigarette use predicts actual smoking behaviour as well as behavioural intention.

1 Introduction

Childhood secondhand smoke exposure

- 1.1 It is widely recognised that passive smoking is harmful to health (Department of Health and Committee on the Medical effects of Air Pollutants 1997; Scientific Committee on Tobacco and Health 2004). Indeed, the World Health Organization (WHO) state that 'scientific evidence has unequivocally established that exposure to tobacco smoke causes death, disease and disability' (World Health Organization 2005).
- 1.2 As children's lungs are still developing and their breathing rate is faster than that of adults, they are particularly vulnerable to SHS; in 2004, an estimated 61% of disease caused by secondhand smoke (SHS) exposure worldwide was borne by children (Öberg et al. 2011).
- 1.3 Growing recognition of the dangers of SHS led all UK countries to implement legislation prohibiting smoking in enclosed public places and workplaces in the last decade (Scotland-March 2006, Wales-March 2007, Northern Ireland (NI)-April 2007 and England-July 2007). By 2011, 11% of the world's population lived in countries where smoking was prohibited in public spaces (Hyland et al. 2012).
- 1.4 Smoke-free legislation primarily aimed to protect adults such as hospitality workers from SHS. However, impacts on childhood SHS exposure received significant international scrutiny. The case against legislation made by its opponents centred largely on potential consequences for children, and arguments that banning smoking in public spaces would displace smoking into the home.
- 1.5 While some evidence to support the 'displacement hypothesis' was reported in Hong Kong (Ho et al. 2010) and the USA (Adda and Cornaglia 2006), studies in all UK countries refuted this hypothesis. In fact, increases in the adoption of voluntary home smoking restrictions were reported in Scotland (Phillips et al. 2007; Akhtar et al. 2009) and England (Jarvis et al. 2011). Although in Wales the proportion of homes with full smoking restrictions did not change significantly (Moore et al. 2012) fewer children reported that their parents smoked inside the home a year after legislation (Moore et al. 2011).

- 1.6 A growing body of international evidence indicates that introduction of smoke-free legislation was, in most countries, followed by increases in voluntary restrictions on smoking in private spaces rather than displacement (Cheng et al. 2011; Mons et al. 2013). Hence, the move toward legislation perhaps contributed to making smoking in front of children an increasingly socially unacceptable, or 'denormalised' behaviour (Jarvis et al. 2012).
- 1.7 However, declines in childhood SHS exposure predominantly occurred among groups who were at relatively low risk prior to legislation, primarily children of non-smokers (Akhtar et al. 2007; Holliday et al. 2009) and children from more affluent families (Martin et al. 2006; Jarvie and Malone 2008; Moore et al. 2011; Gartner and Hall 2012; Moore et al. 2012).
- 1.8 While the growing denormalisation of smoking in front of children is welcome, large proportions of children, particularly those from poorer backgrounds or with smoking parents, continued to be exposed to SHS in cars and homes after legislation (Moore et al. 2012). Action to further reduce smoking in homes and cars may therefore play a significant role in reducing overall SHS exposure levels and interrupting the intergenerational reproduction of health inequalities.
- 1.9 Due to the private nature of the home and car there are additional challenges involved in introducing government intervention to regulate behaviour in these spaces. Government regulation of private spaces is often regarded as an invasion of privacy (Freeman et al. 2008). Hence, legislation will often only be considered where efforts to achieve change via voluntary means have not fully addressed the problem. For example, despite campaigns in 1963, 1970 and 1971 seatbelt use rates remained low until implementation of legislation in 1983 (Lund 1986).
- 1.10 Some have argued that only in the most authoritarian of states would legislation around smoking in the home be acceptable (Freeman et al. 2008). Hence, efforts to reduce smoking in homes continue to centre around promotion of voluntary adoption of smoke-free homes.
- 1.11 However, cars represent a space in which many behaviours are already heavily regulated, including the ban on the use of mobile phones in cars in 2003, and the above example of seat-belt use, occupying an intermediary position between private and public (Phillips et al., 2007). Recent surveys indicate that the majority

of adults in the UK, Canada, USA and Australia (Thomson and Wilson 2009; Hitchman et al. 2011; Roberts and Kawol 2014) think that smoking around children and in cars carrying children should be avoided or banned. Another survey found that a majority of Canadian children supported this view (Leatherdale et al. 2008).

1.12 Although, children are likely to spend less time exposed to SHS inside cars than inside homes, the small and enclosed nature of vehicles means that SHS exposure is likely to be of an intense nature (Sendzik et al. 2009; Pawson et al. 2011; Semple et al. 2012). Adolescents regularly exposed to SHS in cars have been found to exhibit symptoms of nicotine dependence (Belanger et al. 2008), while there is some evidence that exposure to SHS in cars may increase the risk of children becoming active smokers (Glover et al. 2011).

1.13 In 2011, the Welsh Government announced its intention to renew efforts to eliminate childhood secondhand exposure. In 2012, it launched the 'Fresh Start Wales' campaign. This campaign comprised a range of social marketing techniques through multimedia advertisements with the tagline 'Smoking in your car poisons your children' and signposts to services that support quitting. The Welsh Government indicated that if insufficient voluntary changes in the prevalence of smoking in cars are observed in the following three years, legislation to prohibit smoking in cars carrying children in Wales would be considered.

Electronic cigarettes

1.14 While the primary focus of the survey when it was commissioned was on smoking in private spaces, it included a number of questions on a key emerging issue; children's use of electronic cigarettes (or e-cigarettes).

1.15 E-cigarettes are hand-held devices which deliver smokeless nicotine through a battery-powered vaporisation process. Debates around e-cigarettes have gained substantial momentum since the survey was commissioned, becoming a highly polarising issue within the public health community.

1.16 E-cigarettes contain toxins including carcinogens, but are likely to be safer than tobacco cigarettes (Goniewicz et al. 2014). Hence, their harm reduction potentials (which are contingent on them being effectively adopted by smokers as a

substitute for tobacco), have led many leading public health experts to urge the World Health Organization not to recommend regulating them as tobacco products or to restrictions on their marketing (Abrams et al. 2014). Although not universally regulated or licensed as smoking cessation devices, their marketing emphasises potential smoking cessation benefits (Marisa et al. 2013). While this evidence base is at present underdeveloped, there is some emerging evidence that e-cigarettes may offer promise for smoking cessation (Bullen et al. 2013).

- 1.17 However, other leading public health experts have argued for greater regulation of the use and marketing of e-cigarettes, pointing to emerging evidence that e-cigarettes are not adopted primarily as smoking cessation tools (Aktan et al. 2014). First, early studies indicate that most adult e-cigarette users are 'dual users', who use e-cigarettes as well as, rather than in place of, tobacco (Pearson et al. 2012), with e-cigarettes commonly adopted as a means of using nicotine in places where smoking is prohibited (Etter 2010).
- 1.18 In addition, emerging international evidence indicates that e-cigarettes are now used by increasing numbers of non-smokers, including adolescents who have never used tobacco (Bialous and Sarma 2014; Dutra and Glantz 2014; Grana et al. 2014). Harms of carcinogens and other toxins within e-cigarettes are a significant concern, with harm reduction arguments holding little weight where used by children, especially those who would not otherwise have been using tobacco. Public health researchers on both sides of the current divide regarding regulation agree that efforts should be made to prevent young people from taking up e-cigarettes. To date, policy responses to concerns around uptake of e-cigarettes by children have led to actions such as bans on sales of e-cigarettes to under 18s (<http://www.legislation.gov.uk/ukpga/2014/6/contents/enacted>).
- 1.19 More controversially, some have expressed concern regarding the visibility of e-cigarettes in places where marketing or use of tobacco has been banned, arguing that this may reverse efforts to de-normalise smoking as a strategy to reduce children's uptake of smoking (Hsu et al. 2013). Tobacco companies have increasingly invested in e-cigarettes, with some arguing that marketing has aggressively targeted youth (Marisa et al. 2013; McCarthy 2014). Hence, concern is growing that while presenting itself as a partner, the industry is seizing new opportunities to promote nicotine addiction in young people. In addition to debates

regarding the marketing of e-cigarettes, governments such as those in parts of the US have responded to such concerns by banning use of e-cigarettes in public places (McCarthy 2013). In the UK, the Welsh Government has recently issued a white paper consulting on potential similar legislation

(<http://wales.gov.uk/consultations/healthsocialcare/white-paper/?lang=en>).

- 1.20 Arguments for limiting the visibility of e-cigarettes presume that perceptions of e-cigarette use as a normative behaviour will increase uptake by children. Perhaps the most commonly studied source of normative influence on adolescent smoking uptake is parental smoking, with children whose parents smoke consistently shown to be more likely to take up smoking themselves (Leonardi-Bee et al. 2011a).
- 1.21 While parental influence upon e-cigarette use has yet to be investigated, if e-cigarette use is driven by normative factors, it is likely that children whose parents use e-cigarettes will be more likely to use them. Given that as described, most adult users of e-cigarettes also smoke tobacco, children whose parents model e-cigarette use will probably also model smoking.
- 1.22 Hence, e-cigarette use may be seen by children as a safer means of mimicking nicotine use than smoking a tobacco cigarette. As e-cigarettes are often assumed to be safe, parents may also be less reluctant to allow children to use e-cigarettes than they would tobacco.
- 1.23 Peer influences on smoking have also been well established (Simons-Morton and Farhat 2010), although little research has considered whether e-cigarette use may represent a means of imitating peer smoking behaviours.
- 1.24 As described, while childhood e-cigarette use is itself a cause for concern, the most significant concern among those arguing for greater regulation is that e-cigarettes may act as a gateway into smoking tobacco (Dutra and Glantz 2014). This perhaps represents an implicit assumption that e-cigarette use is so intrinsically linked with tobacco use that promotion of e-cigarettes will ultimately increase the uptake of tobacco.
- 1.25 Opponents of regulation point to a lack of evidence for the 'gateway' effect (Abrams et al. 2014). Arguments against restricting visibility include the absence of evidence that e-cigarette use and tobacco smoking are seen by young people

as synonymous, and concerns that limiting the visibility of safer alternatives may perversely protect tobacco markets.

- 1.26 However, as with the smoking cessation arguments used to make the case against regulation, this lack of evidence for gateway effects is inevitable, given that e-cigarettes are a new phenomenon. Experts on both sides of the divide continue to emphasise a lack of evidence for their opponents' position, while themselves advancing untested hypotheses regarding the harms or benefits of e-cigarettes. Further research is needed in order to dispassionately support or refute the various hypotheses currently being advanced on both sides of this debate.

About this report

- 1.27 This report presents findings of a replication of the 2007-08 CHETS (Child exposure to Environmental Tobacco Smoke) Wales surveys, which examined changes in childhood exposure to SHS following earlier smoke-free legislation. The main aim of this survey is to examine whether children's exposure to smoke in cars, and the home, have fallen since the 2008 survey.
- 1.28 The 2014 survey took place at a time of intense political and media emphasis on smoking in cars. Shortly before the inception of the campaign, the British Medical Association (2011) called for an outright ban on smoking in all vehicles. More recently, a call was issued by almost 600 respiratory health professionals for MPs to back a ban on smoking in cars carrying children (Hopkinson et al. 2014). A House of Commons vote on legislation in England was won in early 2014. Section 95 of the UK Children and Families Act 2014 <http://www.legislation.gov.uk/ukpga/2014/6/contents/enacted>) provides enabling powers for the Welsh Ministers to make regulations to prohibit smoking in private vehicles carrying under 18s.
- 1.29 Given this rapidly evolving political context, changes in smoking in private spaces, it is not possible to attribute any changes in exposure to specific actions, such as the Fresh Start Wales campaign. However, findings will provide a clear indication of the extent of the problem in 2014.
- 1.30 In addition, this report examines the prevalence of e-cigarette use among 10-11 year old never smoking children in Wales. It then examines potential normative

influences on children's e-cigarette use, including parental smoking and e-cigarette use, and peer smoking.

- 1.31 Finally, the study will test the hypothesis that children who report having used an e-cigarette will be more likely to report an intention to take up smoking tobacco.

Research questions

Against this background, this study set out to answer the following research questions

- 1.32 Has the adoption of smoke free private spaces where children are present increased in Wales from 2008 to 2014, overall and among at risk groups?
- 1.33 Does exposure continue to be patterned by socioeconomic status (have socioeconomic inequalities narrowed, widened or remained the same)?
- 1.34 Are increases in smoking restrictions in private spaces reported by children of smokers?
- 1.35 What are children's views on whether or not smoking in cars should be banned?
- 1.36 What is the prevalence of e-cigarette use among 10-11 year old children in Wales?
- 1.37 Is e-cigarette use patterned by parental smoking behaviour?
- 1.38 Is e-cigarette use associated with greater intentions to take up smoking?

2 Methods

Study design

- 2.1 CHETS Wales was a repeated cross-sectional study of Year 6 school children in 2007 and 2008. Children were surveyed within 75 schools in order to evaluate changes in SHS exposure after the introduction of smoke free legislation, using analysis of salivary cotinine and self-report questionnaires. The findings of CHETS Wales are reported elsewhere (Moore et al. 2009; Holliday et al. 2009).
- 2.2 A further survey (referred to throughout as CHETS Wales 2) was commissioned in 2014 to capture changes in smoking in cars and other private spaces since 2008. The 2014 survey repeated the questionnaire, though did not collect saliva samples.
- 2.3 The study protocols of CHETS Wales, and CHETS Wales 2, were separately reviewed and approved by the Cardiff University School of Social Sciences Research Ethics Committee.

Sample

- 2.4 The original CHETS Wales survey included students from a nationally representative sample of 75 state maintained primary schools across Wales. Obtaining this sample involved a number of stages.
- 2.5 All state maintained schools in Wales with Year 6 students were identified.
- 2.6 Schools were selected using systematic stratified random sampling. Schools were stratified according to high/low (cut off point identified as average entitlement across whole sample; 17.12%) free school meal entitlement (used as a proxy for socioeconomic status) and Local Education Authority.
- 2.7 Within each stratum, schools were selected on a probability proportional to school size. Where schools declined, replacement schools were identified from within the same stratum.
- 2.8 A letter was sent to the Head Teacher of each selected school inviting them to participate. This letter contained explicit information regarding the commitment of the research team in terms of minimising disruption to the usual school day and

the level of commitment which would be required of the school in terms of data collection requirements.

- 2.9 Schools were asked to reply, indicating whether they were willing to participate, and reasons for non-participation where relevant. Schools which did not respond within two weeks were followed up by telephone until a decision regarding participation was received.
- 2.10 In order to maximise comparability to the samples obtained in CHETS Wales, the same schools were approached to take part in CHETS Wales 2. For schools who declined to participate, or could not be contacted, another school was randomly sampled from the same strata. All schools participating in the study were paid £50 for their time.
- 2.11 Within each school, one Year 6 (final year of primary school; age 10-11) class was randomly selected to participate in the study, with all students in the class included. This was achieved by assigning each class in the school year a number and then generating a random number to identify the class which would participate. Due to the small size of many (in particular, rural) primary schools in Wales, in some cases the whole of Year 6 were included in the survey.
- 2.12 A number of school classes were mixed, containing students from Years 5 and 6. As a consequence, the sample also included students from Year 5, where taught within the same class as Year 6 students.

Variables

Smoking in cars

- 2.13 In all survey years, children were asked 'Is smoking allowed in your family car, van or truck?', with response options of 'yes', 'no', 'I don't know' or 'don't have a family car, van or truck'. SHS exposure in a car the previous day was assessed by asking 'While you were inside a car yesterday was anyone smoking there?' Response options were 'I wasn't inside a car yesterday', 'there was no-one smoking there', 'yes, someone was smoking there', 'I don't know'.
- 2.14 In 2014, children were asked two further questions about smoking in cars. First, 'How often do people smoke in your car, van or truck when you are inside it?'. Second, 'How often are you in a car, van or truck where people are smoking?'.

Both had response options of 'about every day', 'sometimes', 'never', 'I don't know', 'don't have a family car, van or truck'.

Smoking in the home

2.15 For SHS exposure in the home, children were asked to respond to the question 'While you were inside your home yesterday was anyone smoking there?'

Response options were 'I wasn't at home yesterday', 'there was no-one smoking there', 'yes, someone was smoking there', 'I don't know'.

2.16 Children were also asked 'Is smoking allowed inside your home?', with response options of 'no, smoking is not allowed at all' (coded as full restriction), 'smoking is allowed in certain areas only', 'smoking is allowed only on special occasions in our home' (both coded as partial smoking restriction), 'smoking is allowed anywhere in our home' (coded as no restriction), and 'I don't know'.

Parental smoking and parental smoking in the home and car

2.17 In order to categorise children according to whether parent figures smoked, children were asked 'do any of the following people smoke?' in relation to i) father, ii) mother, iii) stepfather (or mother's partner), iv) stepmother (or father's partner). Response options were 'smokes every day', 'smokes sometimes', 'does not smoke', 'I don't know', 'I don't have or see this person'. The parent was classified as smoking if the child responded 'smokes every day' or 'smokes sometimes', with all other responses classified as non-smoking parents. Children were coded as having no parent figures who smoke, a father figure only who smokes, a mother figure only who smokes, or two parent figures who smoke.

2.18 In addition children were asked about parent figures who smoked within their home using the same question format. For the 2014 survey, this measure was repeated for parent figures' smoking behaviour in cars.

Perceived frequency of SHS exposure

2.19 To provide a measure of children's typical perceived frequency of SHS exposure, children were asked to respond to the question 'How often are you in a place where people are smoking?'. Response options were 'about every day', 'sometimes', 'never' or 'I don't know'.

Attitudes to SHS and smoking in cars

- 2.20 In all survey years, children were asked 'How much do you mind people smoking around you?', with response options of 'I mind a lot', 'I mind a bit', 'I don't mind very much', 'I don't mind at all'. Children were also asked 'How much do you agree or disagree that adults should be allowed to smoke in front of children?', from a scale from strongly agree to strongly disagree.
- 2.21 In 2014, children were also asked to indicate their attitude to smoking in cars by circling on a scale of 1-5 how much they agreed or disagreed with the following statements: 'There should be a complete ban on smoking in cars' 'Smoking should be banned in cars carrying children under 16' and 'I don't mind when people smoke around me when travelling in a car together'.

Child smoking behaviour

- 2.22 Children were asked to respond to the question 'How often do you smoke tobacco at present?'. Responses were 'every day', 'at least once a week but not every day', 'less than once a week' or 'I do not smoke'. Children who gave a response other than 'I do not smoke' were classified as smokers. Children were also asked if they had ever smoked tobacco.

Age

- 2.23 Children were asked to indicate the year and month of their birth on the smoking questionnaire. The month that the questionnaire was completed was recorded, and children's age in years calculated.

Socioeconomic status

- 2.24 As a measure of socioeconomic status, children were asked to complete the Family Affluence Scale (FAS; (Currie et al. 2008)), which comprises the following items: 'Do you have your own bedroom for yourself (no/yes)?'; 'Does your family own a car, van or truck (no, yes one, yes two or more)?'; 'During the past 12 months, how many times did you travel away on holiday with your family (not at all, once, twice, more than twice)?'; and 'How many computers does your family own (none, one, two or more than two)?'. These items were summed and taken as a marker of family affluence.

Perceived social norms and visibility of smoking

- 2.25 Children were asked to rate perceived prevalence of smoking in Wales by indicating i) how many children their age in Wales smoked, and ii) how many adults in Wales smoked. Response options were 'nearly all', 'about three-quarters', 'about half', 'about a quarter', 'hardly any' and 'I don't know'.
- 2.26 Perceived visibility was assessed by asking 'Thinking about the last month, how often have you seen people smoking outside of or near the entrance of the following places: Leisure facilities (for example swimming pools and sports clubs); The doctors surgery; The hospital; Bus stations; Train stations; Cinema. Response options were 'regularly', 'occasionally', 'never', 'haven't been to this place in the last month'.

E-cigarettes

- 2.27 Children were asked if they had heard of e-cigarettes and whether they ever used an e-cigarette (yes once; yes more than once; never). Questions on parental e-cigarette use followed the same format as items for parental smoking described above.
- 2.28 To measure the visibility of e-cigarettes in indoor and outdoor places children were asked two separate questions of, 'In the last month, how often have you seen people using e-Cigarettes inside the following places'; and 'In the last month, how often have you seen people using e-Cigarettes outside the following places': Leisure facilities (for example swimming pools and sports clubs); The doctors surgery; The hospital; Bus stations; Train stations; Cinema. Response options were i) Regularly, ii) Occasionally, iii) Never, iv) Haven't been to this place in the last month.

Consent

- 2.29 The consent procedures used for CHETS Wales were replicated in CHETS Wales
2. Once schools had agreed to participate in the study, they were asked to sign and return a commitment form.
- 2.30 Parental consent was obtained through letters sent to the parents or carers of potential participants in each school. Information sheets were provided which clearly stated that parents had the option of withdrawing their child from data

collection at any time. In all schools, these letters were delivered to the homes of parents/carers using the Royal Mail, to ensure that these letters would be received. For reasons of data protection, pre-prepared letters were addressed and posted by schools to students' home addresses.

- 2.31 An 'opt out' system was implemented in all but one school whereby parents/carers informed their child's school if they *did not* wish their child to participate in the study. The remaining school requested this to be an 'opt-in' consent procedure whereby parents/carers informed their child's school if they *did* wish their child to participate in the study. A deadline was set by which this information had to be returned to schools after which time the school was telephoned by the study team and asked for details regarding withdrawn or participating students.
- 2.32 At each data collection session, students were also asked to complete an assent form (introduced for CHETS Wales 2) after having read an information sheet and having had the study explained to them to ensure they fully understood what they were invited to do, and to give them the opportunity to withdraw from the data collection session if they did not wish to participate.

Data collection

- 2.33 Data for CHETS Wales were collected over a ten week period between February – April 2007/8. In order to maximise comparability and avoid seasonal differences in SHS exposure, CHETS Wales 2 was conducted at the same time of year in 2014.
- 2.34 The questionnaire was available in English and Welsh. Data were collected in the classroom environment by DECIPHer trained staff. In all cases, two members of the team were present at each data collection session to offer support and assistance where required.
- 2.35 All staff were provided with a data collection protocol and were given training to maximise standardisation of data collection procedures across the schools and data collection sweeps. All core staff were required to obtain enhanced Disclosure and Barring Service clearance. All support staff were either current students at universities across Wales, and/or currently working with children e.g. a nurse and a supply teacher. All Welsh/Bilingual schools had a fluent Welsh speaker leading the data collection.

2.36 Class teachers were asked to remain present, but for reasons of confidentiality were asked not to intervene in the data collection in any other way unless asked to do so by the member of the research team. Briefing sheets were provided for any school staff present, which explained the nature of the study, and provided information about the data collection and their anticipated role.

Statistical analysis

2.37 Sample descriptions are first provided to examine the comparability of samples at 2007, 2008 and 2014 in terms of sex, age, socioeconomic status, family structure and child smoking status. Differences between time-points were evaluated using design adjusted chi-squared analyses and simple linear regressions.

2.38 As the 2014 sweep involved replacing 24 of the original participating schools, further analyses were run to evaluate whether i) participants in schools who 'dropped out' differed significantly in 2008 from those who participated in 2008 and 2014 and ii) participants in new schools recruited in 2014 differed significantly from those who participated at both time points. These comparisons were made in terms of the above demographic variables, as well as key outcome measures (i.e. parental smoking status and smoking in private spaces).

2.39 Subsequently, frequencies and percentages of children reporting that parent figures smoke, and reporting exposure to secondhand smoke in cars and homes are reported for all three time-points. Significance of change since 2008 was evaluated using logistic regression models adjusted for age and family affluence, with the year of data collection entered as the primary independent variable. To account for the clustered nature of the data sample, random terms for school were included in all models. These analyses were run twice: firstly with the entire sample, and secondly limited to children with at least one smoking parent. The above models were also used to examine socioeconomic inequality in smoke exposure in private spaces in 2014, with percentages of children reporting exposure to SHS plotted on line graphs to illustrate socioeconomic gradients. Frequencies and percentages are presented for all remaining variables.

2.40 For e-cigarette use, frequencies of never-smoking children who reported having used an e-cigarette are presented by a range of demographic variables. Subsequently, binary logistic regression models are used to evaluate factors

associated with use of e-cigarettes, while ordinal logistic regression models are used to test associations of e-cigarette use with intention to smoke.

3 Results

Response rates

- 3.1 Response rates for CHETS Wales are reported elsewhere (Holliday et al. 2009). In brief, 75 of 119 schools approached participated (63.0%) at both time-points, with child level response rates of 91.5% and 90.4% respectively.
- 3.2 Of the 75 schools who participated in CHETS Wales, four could not be invited to participate in CHETS Wales 2 due to closure or change in status (i.e. no longer a mainstream school). Of the remaining 71 schools, 51 participated again in 2014. Forty-three further schools were invited to participate before the target of 75 schools was reached (overall response rate=65.8%). Of the 20 invited schools who did not participate, 14 declined due to other commitments, 5 were in the midst of inspection, and 1 felt it inappropriate to take part at this time as a year 6 pupil had a parent with mouth cancer.
- 3.3 Of the 1862 eligible pupils (i.e. pupils within sampled classes), questionnaires were obtained from 1601 (86.0%). Where opt-out consent procedures were used (n=74 schools, 1810 pupils), 56 children were opted-out by parents, 35 children refused, and 141 were absent on the day of collection. Data were obtained from 1578 pupils (87.2%). Only one school requested opt in consent, resulting in a substantially lower response. Of the 52 eligible pupils in this school, consent was given for 23 children (44.2%), all of whom provided data.

Sample descriptions

- 3.4 Characteristics of the 2007, 2008 and 2014 samples are presented below. Percentages of boys/girls and mean age were almost identical at all three time-points.
- 3.5 Although percentages of children living in two-parent families were slightly lower in the 2014 sample, differences were not significant.
- 3.6 The percentage of children who reported current smoking declined across the 3 surveys, although again, differences were not significant.
- 3.7 The only significant difference was in Family Affluence Scale (FAS) scores, which were significantly higher in 2014 than 2008 ($B=0.84$; 95% CI=0.84 to 1.01). However, differences were driven by a proliferation of computer ownership, with

more than 75% of children in 2014 reporting that their family owned more than 2 computers, compared to 28% in 2008. Where the item relating to computer ownership is deleted, FAS scores are almost identical at all three time-points. In 2014, FAS scores which include or exclude the item on computer ownership are almost perfectly correlated ($r=0.92$). Hence, in analyses presented below, FAS scores exclude the item on computer ownership.

Comparison of drop-outs/new schools with original schools

- 3.8 There were no significant differences between children in schools who participated at both time-points and i) schools who participated in 2008 only or ii) schools who participated in 2014 only, in terms of sex, age, socioeconomic status, family structure, self-reported smoking status, parental smoking and smoking in private spaces.

Validation of self-reported measures of SHS exposure

- 3.9 Median salivary cotinine values (using 2007-08 CHETS Wales data), broken down by responses to self-report measures are presented in Table 1 below.
- 3.10 Children who reported being in a car where someone was smoking the previous day provided samples with concentrations more than 14 times higher than did those who reported that they were not.
- 3.11 Among children who reported that there were no smoking restrictions in their home, cotinine concentrations were three times higher than for children reporting partial restrictions, whose concentrations were in turn more than 5 times higher than those reporting full restrictions.
- 3.12 Among children who reported that smoking was allowed in their home, median cotinine concentrations were seven times higher where children also reported that smoking was allowed in their car by comparison to those who said it was not (1.3ng/ml vs 0.2ng/ml), and twice as high for children who reported being in a car where someone was smoking the previous day vs those who did not (1.6ng/ml vs 0.8ng/ml).
- 3.13 Hence, while no saliva samples were collected in 2014, the self-reported indicators of SHS used in all survey years appeared to reflect differences in objectively measured SHS exposure in 2007/08.

3.14 Items on smoking in cars captured differences in cotinine concentrations, which were not explained by the fact that children reporting exposure to SHS in cars were also likely to be exposed to smoke in the home.

Table 1. Salivary cotinine concentrations by responses to self-report items on SHS exposure in 2007 and 2008

		Median salivary cotinine concentration (ng/ml)	Frequency and percentage cotinine above 0.1ng/ml
Smoking allowed in car	No (n=1737)	<0.1	594 (35.2)
	Yes (n=572)	1.2	526 (92.4)
	Don't know (n=424)	0.1	235 (55.4)
	Don't own a car (n=157)	1.1	179 (84.8)
In a car where someone was smoking yesterday	No (n=2653)	<0.1	1320 (49.8)
	Yes (n=196)	1.4	186 (94.9)
Parent figures smoke in the home	None (n=1781)	<0.1	588 (33.0)
	Father (n=272)	0.5	225 (82.7)
	Mother (n=299)	1.2	274 (91.6)
	Both (n=406)	1.8	396 (96.3)
Smoking restrictions in the home	Full (n=1557)	<0.1	484 (31.1)
	Partial (n=672)	0.5	534 (79.5)
	None (n=337)	1.7	319 (94.7)

Smoking in cars from 2007 to 2014

3.15 Table 2 indicates that smoking in cars fell substantially over time, with small declines between 2007 and 2008, and halving of exposure since. For example, in 2014, 9% of all children (11% of those who reported that their family owned a vehicle and that they knew whether or not smoking was allowed in it) reported that smoking was allowed in it, a decline from 18% (23%) in 2008.

3.16 Similar declines were observed among children of smokers, though approximately one in five continued to report that smoking was allowed in their family vehicle.

3.17 In 2014, 4% of all children, and 7% of children of smokers reported having been in a car where someone was smoking the previous day; a halving of exposure since 2008.

Table 2. Frequency (and percentage) of children reporting smoking restrictions in car

		Smoking allowed in family car?				In car where someone smoking yesterday?
		Yes	No	Don't know	No car	
Whole sample	2007	327 (20.4)	926 (57.8)	231 (14.4)	118 (7.4)	107 (6.9)
	2008	288 (18.0)	965 (60.3)	234 (14.6)	114 (7.1)	107 (6.7)
	2014	141 (8.9)	1140 (71.7)	195 (12.3)	115 (7.2)	57 (3.6)
Children of smoking parents	2007	301 (38.6)	272 (34.9)	114 (14.6)	92 (11.8)	102 (13.5)
	2008	259 (34.8)	284 (38.2)	123 (16.5)	78 (10.4)	98 (13.3)
	2014	131 (19.6)	371 (55.5)	87 (13.0)	79 (11.8)	46 (7.0)

3.18 In 2014, 15% of children (and 32% of children of smokers) reported that smoking sometimes occurred in their family vehicle when they were present. This is somewhat higher than the 9% (and 20%) who reported that smoking was *allowed* in their family vehicle as described above.

3.19 Among children who reported that smoking was allowed in their family vehicle, 84% (n=116) stated that smoking occurred when they were inside it. For children who said that smoking was *not* allowed in their family vehicle, 5% (n=58) said that people did still sometimes smoke in their family vehicle when they were present. Among children who reported that they did not know whether or not smoking was allowed in their family vehicle, 26% (n=50) report that people did sometimes smoke in their family vehicle when they are present.

3.20 Hence, many children reported that smoking in cars still sometimes occurred even where they were unsure of whether it was 'allowed'. Children who reported not knowing whether or not a smoking restriction was in place were more likely to report that smoking did occur in their vehicle than the sample as a whole. Discrepancy between whether smoking was *allowed* and whether it occurred was greatest for children with parents who smoked.

3.21 Likewise, the percentage of all children reporting that a parent figure smoked in their car was 14% (and 34% of children of smokers); higher than the 9% (and 20%

of children of smokers) who reported that smoking was *allowed* in their family vehicle.

3.22 Among children who reported that smoking was allowed in their family vehicle, 82% (n=112) stated that a parent figure did smoke inside their car. For children who say that smoking was *not* allowed in their family vehicle, 6% (n=61) said that a parent figure does smoke in their family vehicle when they are present. Among children who reported that they did not know whether or not smoking was allowed in their family vehicle, 18% (n=33) reported that a parent figure did smoke in their family vehicle when they were present.

3.23 Hence, some children reported that parents sometimes smoked in their car, even when they were unsure of whether it was *allowed*. Again, children who reported not knowing whether or not a smoking restriction was in place were more likely to report that smoking did occur in their vehicle than the sample as a whole. Discrepancy between whether smoking was *allowed* and whether it occurred was greatest for children with parents who smoked.

Children's views on smoking in cars

3.24 Among the whole sample, 71% of children agreed or strongly agreed that smoking should be banned in cars, with 76% agreeing or strongly agreeing that smoking should be banned in cars if children were present.

3.25 Among children who reported that smoking was allowed in their family vehicle, a small majority agreed that smoking should not be allowed in cars (55%) while a larger majority (61%) agreed that smoking should not be allowed in cars when children are present. Only 1 in 6 children overall, or 1 in 4 children who reported that smoking was allowed in their family vehicle disagreed that smoking in cars should be banned.

3.26 Among the whole sample, 86% of children disagreed or strongly disagreed that adults should be allowed to smoke in front of children in general, compared to 6% of children who agreed or strongly agreed. Among children with one or more parent figures who smoked, 79% disagreed or strongly disagreed that adults should be allowed to smoke in front of children in general.

Table 3. Frequency (and percentage) of children expressing each level of agreement that smoking in cars should be banned and whether adults should be allowed to smoke in front of children

		Strongly agree	Agree	Don't agree or disagree	Disagree	Strongly disagree
Any car	All children	934 (60.0)	175 (11.2)	178 (11.4)	82 (5.3)	189 (12.1)
	Children whose parents allow smoking in car	58 (41.4)	19 (13.6)	30 (21.4)	13 (9.3)	20 (14.3)
Cars carrying children	All children	1058 (67.9)	133 (8.5)	103 (6.6)	67 (4.3)	197 (12.4)
	Children whose parents allow smoking in car	72 (51.4)	14 (10.0)	18 (12.9)	13 (9.3)	23 (16.4)
Adults should be allowed to smoke in front of children	All children	62 (3.9)	31 (2.0)	137 (8.6)	366 (23.1)	989 (62.4)
	Children with at least one parent figure who smokes	32 (4.8)	16 (2.4)	94 (14.2)	154 (23.2)	367 (55.4)

3.27 Table 4 describes the frequency and percentage of children's feelings about people smoking around them. Within the whole sample in 2014, 86% reported that they 'mind a lot' or 'mind a bit' when people smoke around them, only a small change from 2008 (88%). Among the subsample of children with at least one parent who smoked, the percentage of children reporting that they 'mind a lot' or 'mind a bit' decreased slightly, though a majority still reported that they disliked adults smoking in front of them.

Table 4. Frequency (and percentage) of children's feelings about people smoking around them

		Mind a lot	Mind a bit	Don't mind very much	Don't mind at all
All children	2007	1045 (66.4)	346 (22.0)	125 (7.9)	58 (3.7)
	2008	1007 (63.4)	389 (24.5)	118 (7.4)	74 (4.7)
	2014	961 (62.0)	371 (23.9)	133 (8.6)	86 (5.5)
Children with at least one smoking parent	2007	441 (57.7)	192 (25.1)	87 (11.4)	45 (5.9)
	2008	392 (53.3)	210 (28.5)	84 (11.4)	50 (6.8)
	2014	326 (49.9)	176 (27.0)	87 (13.3)	64 (9.8)

Parental smoking behaviour and smoking in the home

3.28 Table 5 indicates small declines in the percentages of children reporting that one or more parent figure smoked, falling from 47% in 2007 to 40% in 2014. Larger declines were observed in the percentages of children reporting that one or more parent figures smoked in the home, falling from 37% in 2007, to 33% in 2008, and to 22% in 2014.

Table 5. Frequency (and percentage) children reporting that parent figures smoke/smoke in the home (whole sample)

	No smoking parent figure	Father smokes	Mother smokes	Both smoke
2007	825 (52.8)	230 (14.7)	187 (12.0)	322 (20.6)
2008	858 (55.5)	235 (15.2)	187 (12.1)	267 (17.3)
2014	929 (60.2)	211 (13.7)	164 (10.6)	240 (15.5)
	No parent figure smokes in home	Father smokes in home	Mother smokes in home	Both smoke in home
2007	973 (63.2)	148 (9.6)	161 (10.5)	258 (16.8)
2008	1009 (66.8)	144 (9.5)	164 (10.9)	194 (12.8)
2014	1153 (78.0)	93 (6.3)	91 (6.2)	141 (9.5)

3.29 Table 6 provides data on parental smoking in the home, limited to children with at least one parent figure who smokes. These figures indicate substantial reductions in the proportion of children of smokers, whose parents smoked in the home, falling from 74% in 2007 to 71% in 2008 and to 52% in 2014. Hence, by 2014, almost half of children who reported that at least one of their parent figures smoked, reported that those parent figures did not smoke in the home.

Table 6. Frequency (and percentage) children reporting that parent figures smoke in the home (children who report that one or both parent figures smoke)

	No parent figure smokes in home	Father smokes in home	Mother smokes in home	Both smoke in home
2007	192 (25.7)	142 (19.0)	158 (21.2)	254 (34.1)
2008	201 (29.2)	138 (20.1)	159 (23.1)	190 (27.6)
2014	289 (47.7)	92 (15.2)	88 (14.5)	137 (22.6)

3.30 As indicated in Table 7, percentages of children living in 'smoke-free' homes (i.e. homes where smoking was not allowed at all) increased slightly between 2007 and 2008, though more markedly between 2008 and 2014. In 2007, 59% of children lived in a smoke free home, compared to 63% in 2008, rising to almost three-quarters in 2014.

3.31 The percentage of children reporting that their home has no smoking restriction declined substantially, from 14% in 2007 to 12% in 2008 falling to 4% by 2014. Hence, 1 in 25 children in 2014 reported living in a home with no smoking restrictions. Similar declines were observed for children of smokers, among whom half reported living in a smoke free home in 2014, compared to 1 in 3 in 2008.

3.32 One in 11 children with at least one parent figure who smoked reported living in a home with no smoking restrictions in 2014, compared to 1 in 4 in 2008.

3.33 As with smoking in cars, a substantial proportion of children who reported not knowing whether or not smoking was allowed in their home reported that parents did smoke in the home. However, children who reported not knowing whether a restriction was in place were only slightly more likely to report parental smoking in the home than the sample as a whole (25% vs 22% in 2014; 37% vs 33 in 2008).

Table 7. Frequency (and percentage) of children reporting smoking restrictions in the home

		Full restriction (‘smoke-free home’)	Partial restriction	No restriction
Whole sample	2007	841 (59.1)	385 (27.1)	196 (13.8)
	2008	883 (62.7)	361 (25.6)	164 (11.7)
	2014	1041 (74.3)	303 (21.6)	57 (4.1)
Children of smoking parents	2007	220 (32.0)	285 (41.5)	182 (26.5)
	2008	218 (33.7)	278 (43.0)	151 (23.3)
	2014	294 (51.0)	231 (40.0)	52 (9.0)

Significance of change in SHS exposure in ‘private’ spaces

- 3.34 Table 8 presents odds ratios and 95% confidence intervals from logistic regression models, examining change over time from 2008 to 2014, and associations of socioeconomic status (based on FAS score) with smoking in private spaces. These analyses show that all markers of childhood exposure to smoke in cars and homes declined significantly between 2008 and 2014.
- 3.35 These results were maintained when the sample was restricted to those children with at least one parent figure who smokes, indicating that substantial decreases in exposure to SHS in private spaces were reported by children living with smoking parents.
- 3.36 The likelihood of a child reporting exposure to SHS was significantly lower for children from more affluent families in relation to all measures of exposure except exposure to SHS in a car the previous day. All of these significant differences, except for whether children reported being in a car where somebody was smoking yesterday, were maintained when the sample was restricted to those children with at least one parent figure who smokes, though with odds ratios indicating smaller associations.

Table 8. Logistic regression models examining associations of year of data collection and socioeconomic status with exposure to smoke in private spaces

	Smoking allowed in cars (yes vs no)	Smoking in car yesterday	Smoking restriction in the home		Smoking in home yesterday	Parent figures smoke in the home		
			Partial	None		Father only	Mother only	Both parents
Whole sample								
N	2407	2987	2664	2664	2955	2836	2836	2836
Year	0.42 (0.33 to 0.54)	0.52 (0.38 to 0.72)	0.70 (0.59 to 0.83)	0.30 (0.20 to 0.43)	0.44 (0.36 to 0.53)	0.54 (0.42 to 0.70)	0.48 (0.36 to 0.64)	0.65 (0.49 to 0.86)
FAS	0.74 (0.68 to 0.80)	0.92 (0.83 to 1.02)	0.77 (0.72 to 0.83)	0.63 (0.57 to 0.71)	0.70 (0.65 to 0.75)	0.73 (0.67 to 0.81)	0.72 (0.65 to 0.79)	0.67 (0.62 to 0.73)
Children of smokers								
N	982	1303	1149	1149	949	1217	1217	1217
Year	0.41 (0.31 to 0.53)	0.49 (0.35 to 0.69)	0.59 (0.48 to 0.73)	0.26 (0.17 to 0.39)	0.42 (0.32 to 0.56)	0.45 (0.33 to 0.60)	0.38 (0.28 to 0.53)	0.52 (0.38 to 0.70)
FAS	0.87 (0.79 to 0.97)	1.07 (0.96 to 1.20)	0.82 (0.75 to 0.88)	0.70 (0.61 to 0.80)	0.82 (0.74 to 0.91)	0.88 (0.78 to 0.98)	0.86 (0.77 to 0.95)	0.79 (0.71 to 0.88)

Socioeconomic gradients in exposure to SHS in private spaces in 2007, 2008 and 2014

- 3.37 Socioeconomic gradients in a range of markers of exposure to SHS are presented in Figures 1-6 below. These figures show that at all three time-points, the percentages of children reporting that smoking was **not** allowed in their car (Figure 1), that smoking was **not** allowed in their home (Figure 2) and that neither parent figures smoked in the home (Figure 3), were all greater for children from more affluent families.
- 3.38 The percentage of children reporting that they were in a place where someone was smoking 'about every day' decreased with increased affluence.
- 3.39 Though for all variables, changes over time are apparent throughout the socioeconomic distribution, there is little evidence of widening or narrowing of inequality. Hence, while children's exposure to SHS has fallen substantially, socioeconomic inequalities remained.

Figure 1. Socioeconomic gradients in percentage of children reporting that smoking is not allowed in their family car in 2007, 2008 and 2014 (high FAS score=high affluence)

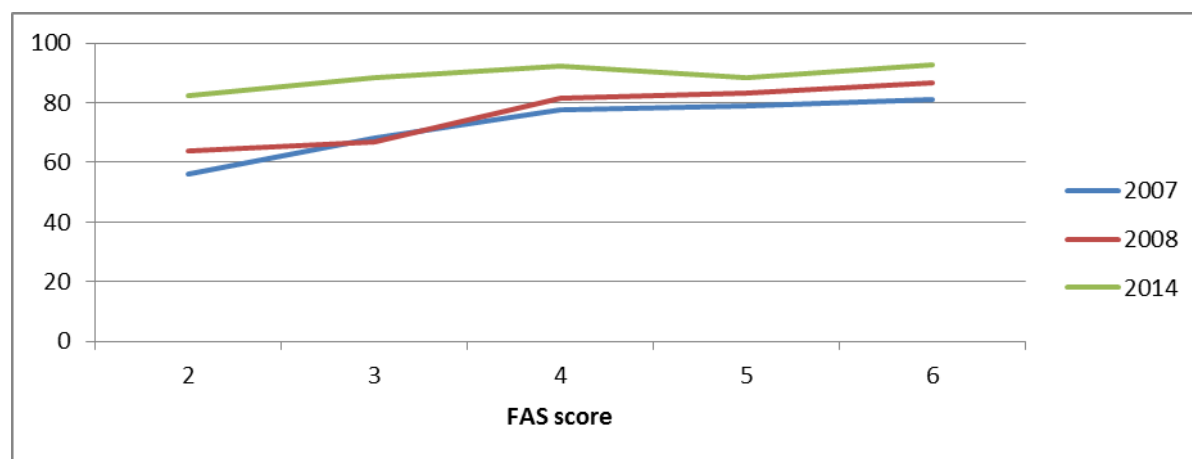


Figure 2. Socioeconomic gradients in percentage of children reporting that smoking is not allowed in their home in 2007, 2008 and 2014 (high FAS score=high affluence)

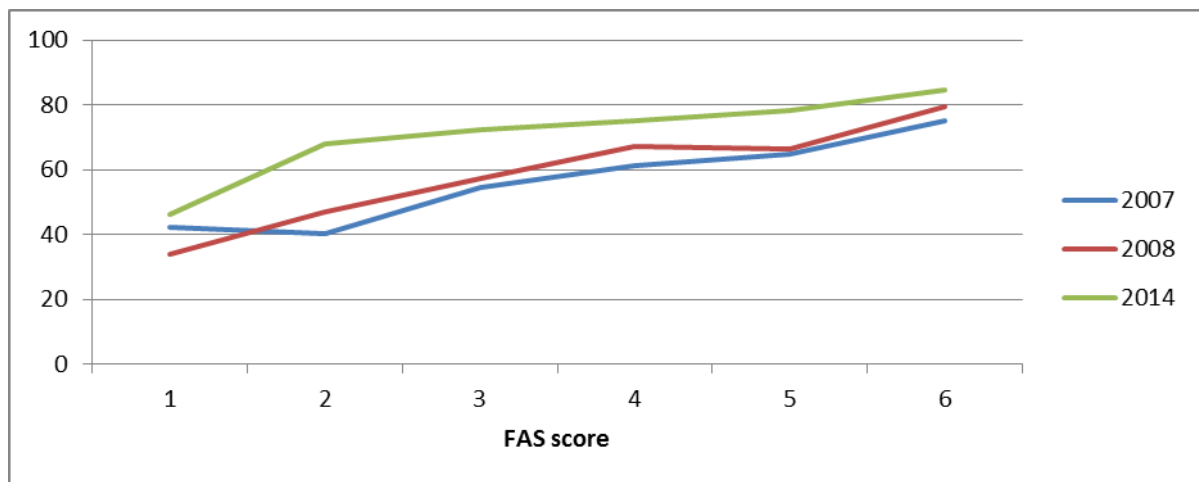


Figure 3. Socioeconomic gradients in parental smoking in the home in 2007, 2008 and 2014 (high FAS score=high affluence)

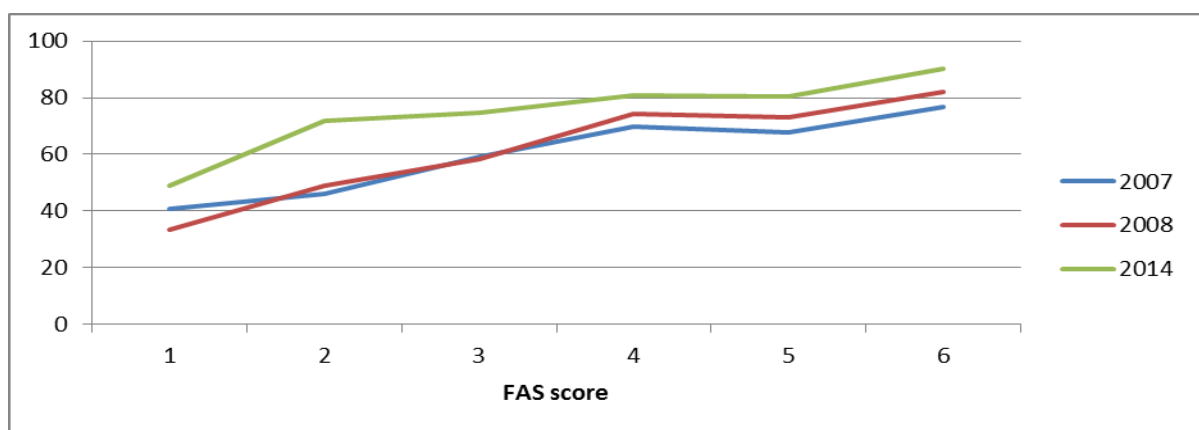


Figure 4. Socioeconomic gradients in percentage of children reporting being in a place where people were smoking 'about every day' in 2007, 2008 and 2014 (high FAS score=high affluence)

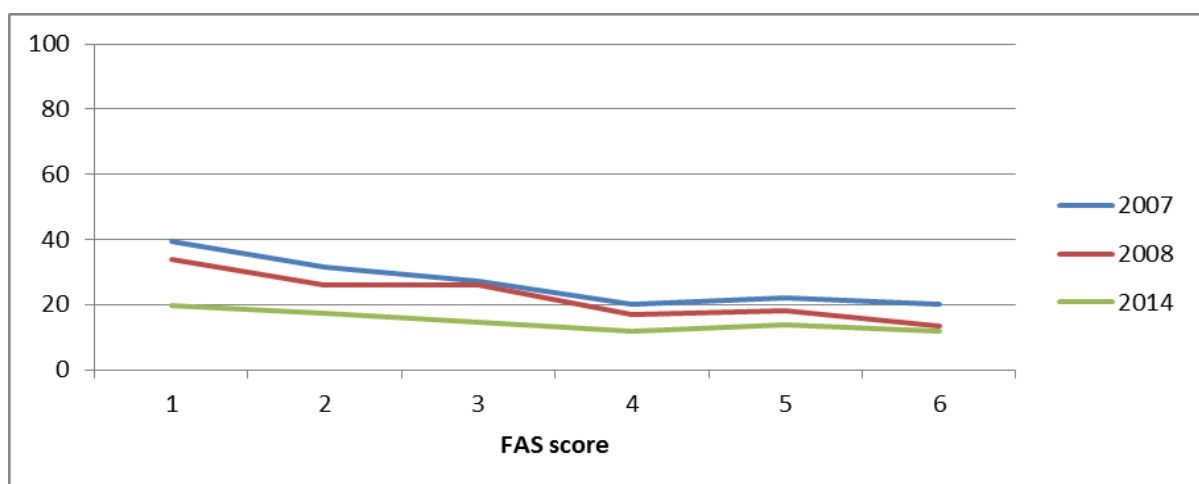


Figure 5. Socioeconomic gradients in percentage of children reporting exposure to SHS in a car at least sometimes by family affluence score (2014 only; high FAS score=high affluence)

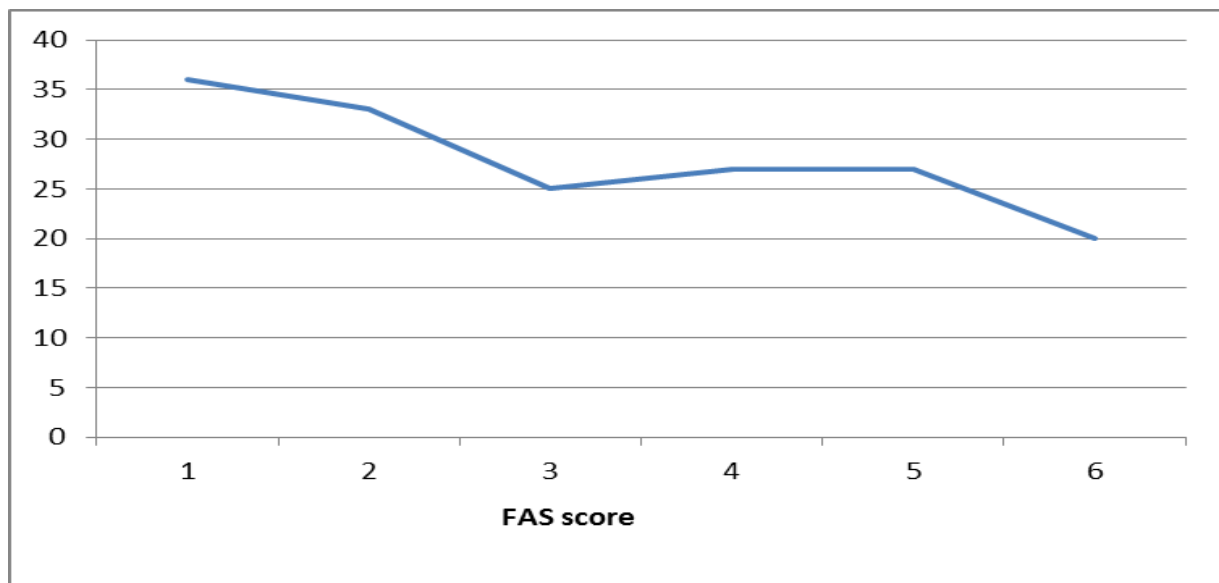
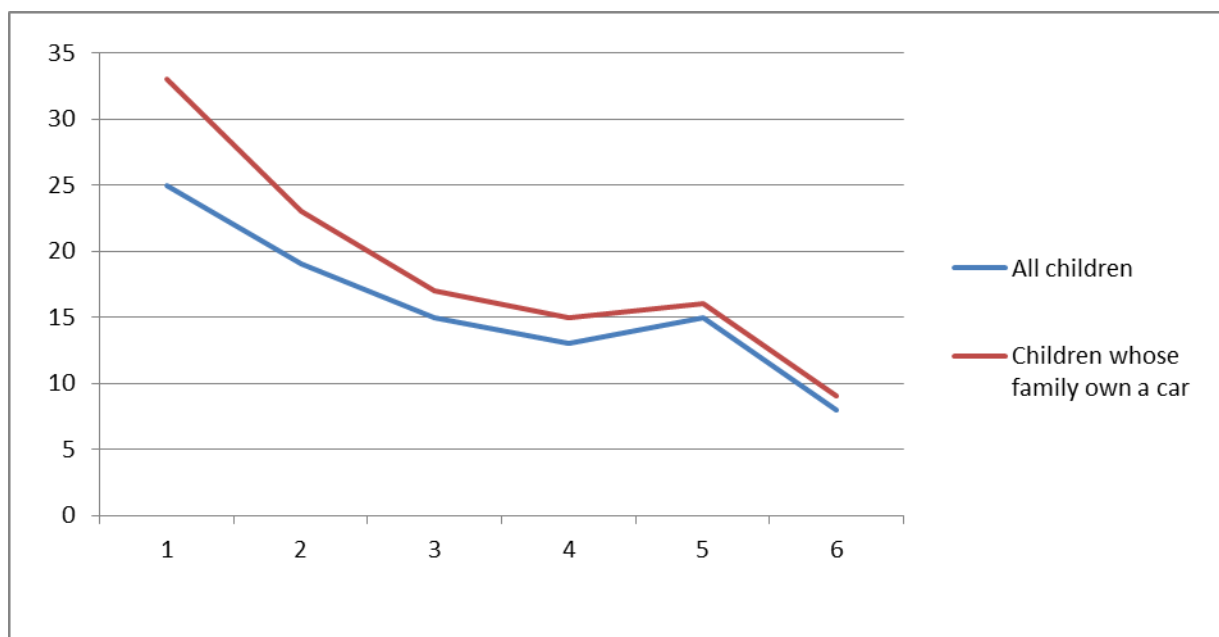


Figure 6. Socioeconomic gradients in percentage of children reporting that people sometimes smoke in their family car while they are inside it (2014 only; high FAS score=high affluence)



Children's perceptions of smoking prevalence in Wales

3.40 Table 9 describes the frequency and percentage of children perceiving each level of smoking prevalence in Wales. For the whole sample in 2014, 58% of children perceived that 'about a quarter' or 'hardly any' children of the same age

smoke, compared to 53% in 2008. Similar results were found when the sample was restricted to those children with at least one parent figure who smokes. Of this subsample, 56% of children perceived that ‘about a quarter’ or ‘hardly any’ children of the same age smoke, an increase from 47% in 2008.

3.41 In relation to adult smoking, most children continued to substantially overestimate true prevalence, with only 14% of all children in 2014 (and only 9% of children with at least one smoking parent), estimating that a quarter or less of adults in Wales smoke.

Table 9. Frequency (and percentage) of children’s perceptions of smoking prevalence in Wales

			Nearly all	About three quarters	About half	About a quarter	Hardly any	I don’t know
Estimate of percentage of children of the same age smoke	All children	2007	35 (2.2)	83 (5.2)	220 (13.8)	371 (23.2)	422 (26.4)	467 (29.2)
		2008	27 (1.7)	65 (4.1)	207 (12.9)	365 (22.8)	492 (30.7)	445 (27.8)
		2014	26 (1.6)	49 (3.1)	132 (8.3)	323 (20.3)	607 (38.1)	455 (28.6)
	Children with at least one parent figure who smokes	2007	28 (3.6)	44 (5.7)	127 (16.3)	158 (20.3)	182 (23.4)	239 (30.7)
		2008	17 (2.3)	37 (5.0)	125 (16.8)	151 (20.3)	202 (27.2)	212 (28.5)
		2014	22 (3.3)	21 (3.1)	72 (10.8)	147 (22.0)	226 (33.9)	179 (26.8)
Estimate of percentage of adults who smoke	All children	2007	317 (19.8)	470 (29.3)	470 (29.3)	140 (8.7)	23 (1.4)	182 (11.4)
		2008	242 (15.1)	489 (30.5)	528 (33.0)	135 (8.4)	17 (1.1)	190 (11.9)
		2014	253 (15.9)	393 (24.6)	563 (35.3)	191 (12.0)	27 (1.7)	169 (10.6)
	Children with at least one parent figure who smokes	2007	216 (27.6)	225 (28.9)	191 (24.5)	45 (5.8)	8 (1.0)	95 (12.2)
		2008	175 (23.5)	240 (32.2)	215 (28.9)	40 (5.4)	3 (0.4)	72 (9.7)
		2014	167 (24.9)	191 (28.5)	192 (28.7)	50 (7.5)	8 (1.2)	62 (9.3)

Children’s intentions to take up smoking

3.42 Table 10 shows the frequency and percentage of children’s intentions to smoke in two years’ time.

3.43 Out of the whole sample, 0.7% of children reported that they probably or definitely would smoke compared to 96.4% who reported that they probably or definitely would not smoke in two years' time.

3.44 When restricted to the subsample of children with at least one parent who smokes, 1.4% of children reported that they probably or definitely would smoke compared to 94.2% who reported that they probably or definitely would not smoke in two years' time.

Table 10. Frequency (and percentage) of children's intentions to smoke in two years' time

		Definitely yes	Probably yes	Maybe / maybe not	Probably not	Definitely not
All children	2007	3 (0.2)	16 (1.0)	75 (4.7)	144 (9.0)	1366 (85.2)
	2008	4 (0.3)	16 (1.0)	62 (3.9)	172 (10.8)	1346 (84.1)
	2014	5 (0.3)	6 (0.4)	46 (2.9)	124 (7.8)	1411 (88.6)
Children with at least one parent figure who smokes	2007	3 (0.4)	13 (1.7)	56 (7.2)	88 (11.3)	621 (79.5)
	2008	4 (0.5)	13 (1.8)	43 (5.8)	96 (12.9)	587 (79.0)
	2014	3 (0.5)	6 (0.9)	30 (4.5)	77 (11.6)	549 (82.6)

E-cigarettes

Awareness and visibility of e-cigarettes

3.45 Overall, 67% (n=1014) of children reported that they had heard of e-cigarettes prior to the survey.

3.46 E-cigarettes were most commonly seen being used at bus stations (29% inside; 32% outside), train stations (24% inside, 27% outside) and cinemas (20% inside; 20% outside). Children also report seeing e-cigarettes used inside and outside leisure venues (15% inside; 23% outside), hospitals (14% inside; 19% outside) and inside GP surgeries (12% inside, 17% outside).

3.47 Overall, 17% (n=231) of children reported that one or more parent figure used e-cigarettes; substantially lower than the 39% (n=615) who reported that a parent figure used tobacco.

3.48 Among those children who reported that one or more parent figure used e-cigarettes, a large majority (n=168; 73%) reported that these parent figure(s)

were dual users, who also smoked tobacco. A smaller number (n=20; 9%) reported that while one parent figure used only e-cigarettes, the other smoked tobacco. Hence, the vast majority of children who reported that a parent figure modelled e-cigarette use reported that tobacco use was also modelled by the same parent figure, or by another parent figure.

Child e-cigarette use

- 3.49 Among children who reported having used tobacco, almost half (48%; n=10) also reported having tried e-cigarettes.
- 3.50 Among never smokers, 5% (n=77) reported that they had used an e-cigarette. Table 11 shows frequencies and percentages of e-cigarette use among never smokers, by demographic factors and parental smoking behaviour. Overall, 7% of male never smokers and 4% of female never smokers reported having used an e-cigarette.
- 3.51 The percentage of children reporting having used an e-cigarette increased sharply with parental smoking; 4% of those children whose parents did not smoke, 5% of those whose father smoked, 7% of those whose mother smoked, and 12% of those with two parent figures who smoked report having tried e-cigarettes.
- 3.52 For parental e-cigarette use, this gradient was somewhat steeper; 4% of children whose parents did not use e-cigarettes, 6% of those whose mother used e-cigarettes, 9% of those whose father used e-cigarettes and 19% of those whose mother and father both used e-cigarettes reported having tried e-cigarettes.
- 3.53 Among children whose parents used neither e-cigarettes nor tobacco 3% reported that they had used an e-cigarette, 5% of children with a parent who smoked but did not use e-cigarettes, 10% of children with a parent who used e-cigarettes but did not smoke and 12% of children with parent figures who used both.
- 3.54 Overall 6% (n=97) of children reported that at least one of their friends smoked tobacco. E-cigarette use was substantially higher among children who reported having friends who smoked, of whom 18% reported having tried e-cigarettes, compared to 5% of children who reported that they did not have friends who smoked.

Table 11. Frequencies and percentages of e-cigarette use among children reporting never having smoked a cigarette.

		Used e-cigarettes (if never smoked)
Sex	Boys	46 (6.5%)
	Girls	31 (4.1%)
Parent figures smoking	Neither	30 (3.5%)
	Mother only	10 (6.6%)
	Father only	10 (5.2%)
	Both	25 (11.7%)
Parent figure e-cigarette use	Neither	39 (3.5%)
	Mother only	5 (6.2%)
	Father only	7 (9.2%)
	Both	13 (18.6%)
Parent figure smoking and e-cigarette use	Neither	22 (2.9%)
	Smoke but not e-cigarette	17 (5.2%)
	E-cigarette but not smoke	4 (9.5%)
	Smoke and E-cigarette	21 (11.7%)
Has friends who smoke	Yes	14 (17.7%)
	No	62 (4.5%)

3.55 Table 12 presents odds ratios and 95% confidence intervals from binary logistic regression models examining associations of parental smoking, friends smoking, sex and family affluence with e-cigarette use.

3.56 In univariate models, children were more likely to report e-cigarette use if they reported that parent figures used e-cigarettes (either solely or in conjunction with smoking). Where parent figures smoked tobacco but did not use e-cigarettes, children were not significantly more likely to have used an e-cigarette.

3.57 Children who reported having friends who smoked were almost 5 times as likely to report having used an e-cigarette, while boys and children from less affluent families were also more likely to have used an e-cigarette. In multivariate models however, only parental e-cigarette use (either solely or in conjunction with smoking) and friends' smoking remain significant predictors of having used an e-cigarette.

Table 12. Odds ratios and 95% confidence intervals from logistic regression analyses of e-cigarette use and future smoking intention among 10-11 year old never smokers

		E-cigarette use		Future smoking intention		
		Univariate models	Multivariate model (n=1280)	Univariate models	Multivariate model without e-cigarettes (n=1299)	Final model (n=1280)
Parents smoke / use e-cigarettes	E-cigarettes only	3.56 (1.15 to 11.06)	3.32 (1.08 to 10.17)	1.95 (0.79 to 4.83)	1.32 (0.46 to 3.83)	1.15 (0.39 to 3.63)
	Tobacco only	1.85 (0.93 to 3.69)	1.62 (0.79 to 3.30)	2.61 (1.69 to 4.05)	2.12 (1.35 to 3.32)	2.09 (1.30 to 3.44)
	Both	4.51 (2.29 to 8.89)	3.40 (1.73 to 6.69)	2.49 (1.46 to 4.24)	2.09 (1.20 to 3.65)	1.88 (1.07 to 3.31)
Friends smoking	Yes	4.53 (2.37 to 8.65)	5.25 (2.62 to 10.55)	5.22 (3.18 to 8.57)	4.05 (2.27 to 7.22)	3.40 (1.86 to 6.22)
Sex	Girls	0.61 (0.38 to 0.98)	0.76 (0.46 to 1.26)	0.58 (0.41 to 0.84)	0.63 (0.43 to 0.94)	0.66 (0.44 to 0.97)
FAS		0.82 (0.68 to 0.99)	0.90 (0.75 to 1.09)	0.83 (0.73 to 0.94)	0.87 (0.75 to 1.00)	0.87 (0.75 to 1.00)
E-cigarette use	Yes	-	-	4.28 (2.52 to 7.28)		3.21 (1.66 to 6.23)

E-cigarette use and intentions to smoke tobacco

3.58 Overall, among never smokers, 98% (n=1423) reported that they will probably not, or definitely not, smoke in two years. However, among never smoking children who reported having used an e-cigarette, this declined to 86% (n=66), (compared to 98% (n=1357) among those who had not tried an e-cigarette).

3.59 Among never smoking children who reported having used an e-cigarette, few stated that they probably or definitely will smoke in 2 years. However, children who had used an e-cigarette were substantially less likely to report that they *definitely* would not smoke in 2 years, and more likely to report that they *probably* will not or might smoke in 2 years' time. Hence, having used an e-cigarette is associated with weaker anti-smoking intentions.

Table 13. Percentage of never smoking children reporting each level of intention to smoke by whether or not they had used an e-cigarette

	Definitely not	Probably not	Maybe, maybe not	Probably yes	Definitely yes
All never smoking children	1318 (90.3)	105 (7.2)	31 (2.1)	5 (0.3)	1 (0.1)
Children who had not used an e-cigarette	1262 (91.3)	95 (6.9)	22 (1.6)	3 (0.2)	1 (0.1)
Children who had used an e-cigarette	56 (72.7)	10 (13.0)	9 (11.7)	2 (2.6)	0 (0.0)

- 3.60 In univariate models, intentions to smoke were significantly greater among children whose parents smoked tobacco and used e-cigarettes, among children who reported having friends who smoked, and among boys. Never smoking children, who reported having used e-cigarettes, reported substantially higher intentions to smoke.
- 3.61 In a multivariate model including all variables except e-cigarette use, all significant associations remained, though associations of parental and friends' smoking were reduced.
- 3.62 Where e-cigarette use was added into the model, associations declined further, with the odds ratio for parental smoking becoming non-significant. The association of e-cigarette use with future smoking intentions was substantially stronger after adjustment for parental and friends smoking and demographic variables.

4 Discussion

Main findings – smoking in cars and homes

- 4.1 The proportion of children who report that smoking is allowed in their family car and home fell substantially between 2008 and 2014. The percentage reporting that smoking is allowed in their car has halved, while the percentage of children living in smoke-free homes has increased from less than two thirds, to almost three quarters.
- 4.2 While in 2008 a clear majority of children who lived with a parent who smoked reported that smoking was allowed in their home (Moore et al. 2012), half report that their home is smoke free in 2014. It has also become increasingly rare to allow completely unrestricted smoking throughout the home. Overall, one in 25 children, including one in 11 children with a parent who smokes, report that smoking was allowed throughout their home; less than half the proportions observed in 2008.
- 4.3 Hence, the denormalisation of smoking in front of children observed immediately after introduction of smoke-free legislation (Jarvis et al. 2011) appears to have continued. Indeed, among parents who smoke, there is no longer a clear norm for smoking to take place in the home.
- 4.4 However, while these trends are encouraging, substantial proportions of children still report exposure to SHS in cars and homes. One in five children with a parent who smokes reports that smoking is allowed in their car, while two in five report partial restrictions on smoking in the home, rather than full restrictions.
- 4.5 Furthermore, while exposure has declined across the socioeconomic spectrum, with no evidence of widening inequality, most markers of SHS exposure continue to be significantly higher among children from poorer families.
- 4.6 Less affluent adults are more likely to smoke, and may face greater barriers to quitting smoking (Reid et al. 2010). Hence, children from poorer families are exposed to more smoke in part due to higher smoking rates among poorer adults. However, socioeconomic patterning remained where limited to children with parent figures who smoke, indicating that smokers from poorer families were also more likely to allow smoking in their cars and homes than smokers

from more affluent families. Smoking in private spaces continues to represent a mechanism in the intergenerational reproduction of health inequalities.

- 4.7 While efforts continue to promote adoption of smoking restrictions in the home through voluntary means, a number of previous surveys have indicated that the majority of adults support introduction of legislation banning smoking in cars carrying children (Thomson and Wilson 2009; Hitchman et al. 2011; Roberts and Kawol 2014).
- 4.8 This study indicates support for such a ban from children themselves, with a large majority indicating that smoking in cars carrying children should not be allowed. Indeed, although fewer children who reported that smoking was allowed in their family car agreed with proposed legislation, a clear majority of these children felt that smoking in cars carrying children should be banned.

Main findings - e-cigarette use

- 4.9 Among 10-11 year old children in Wales, the proportion who have tried an e-cigarette is three times higher than the proportion who have used tobacco. Hence, data are consistent with concerns, supported by emerging international research, that e-cigarette use appears to represent a new form of early experimentation with nicotine use (Dutra and Glantz 2014).
- 4.10 In addition, consistent with international findings, most children who report that parents use e-cigarettes report that they were 'dual users'. That is, their parents use e-cigarettes as well as, rather than as a substitute for, tobacco (Pearson et al. 2012).
- 4.11 Consistent with a body of research showing associations of parental modelling of smoking with uptake of tobacco (Leonardi-Bee et al. 2011b), e-cigarette use is also substantially more common among children with parents who used e-cigarettes. However, where parents smoke tobacco though do not use e-cigarettes, children are not significantly more likely to have used e-cigarettes.
- 4.12 Hence, this study provides no evidence that children use e-cigarettes as a means of mimicking adult smoking in the absence of parental e-cigarette use. It is possible that children whose parents use e-cigarettes have relatively easy access to them, and that imitating this behaviour is seen by children as a safer form of experimentation than smoking a cigarette. While no measure of how many of the children's friends use e-cigarettes was included, e-cigarette use is

also substantially greater among children who report having at least one friend who smokes tobacco.

4.13 Before and after adjusting for demographic factors and normative variables, a strong association of e-cigarette use with weaker anti-smoking intentions was observed in this study.

4.14 It is important to note that even among those who have used an e-cigarette, a large majority say that they will not smoke within the next two years. However, a substantially larger proportion of e-cigarette users appear open to the prospect of starting smoking within the next two years.

4.15 Hence, data are consistent with a hypothesis that children use e-cigarettes to imitate behaviours of parents and peers, and offer tentative support for the 'gateway' hypothesis (that use of e-cigarettes may act as a pathway into later smoking behaviour).

Strengths and limitations

4.16 Strengths of this study include its large nationally representative sample. The 2014 survey successfully recruited two-thirds of the schools who took part in the earlier CHETS Wales study, and achieved a sample with no significant demographic differences. Hence, differences between survey years can be confidently attributed to change over time, rather than sampling errors.

4.17 While no saliva samples were collected in 2014, for all self-reported indicators of SHS exposure, objective indicators of SHS exposure were consistent with children's reports in 2007/08. Hence, reductions in self-reports of SHS exposure can be confidently assumed to reflect meaningful reductions in SHS exposure. There is, however, currently no objective means of validating children's reports of e-cigarette use.

4.18 This study is among the first to report on the prevalence and patterning of e-cigarette use in a large nationally representative sample of primary school-aged children in a UK country, and to our knowledge, the first to examine associations of e-cigarette use with future smoking intentions.

4.19 However, the cross sectional design precludes cause and effect conclusions. For example, while findings are consistent with a hypothesis that e-cigarette use increases children's intention to smoke, it is possible that intention to smoke

drives e-cigarette use rather than the other way around. That is, children may use e-cigarettes because they think they might want to take up smoking soon.

- 4.20 Finally, we were only able to demonstrate associations with behavioural intention, which is by no means a perfect predictor of future behaviour (Sheeran 2002).

Implications

Smoking in private spaces

- 4.21 To coincide with the publication of the key findings from this study, the Welsh Government announced that it will ban smoking in cars carrying children, citing the substantial proportion of children with parents who smoke who still report being exposed to smoke in cars.
- 4.22 Further research is needed to understand effects of this legislation on children's SHS exposure and socioeconomic inequalities in child health outcomes, including emphasis on understanding enforcement and compliance.
- 4.23 In addition, there is a need for sustained attention to understanding how to further reduce smoking in the main location in which children continue to be exposed to SHS; the home.
- 4.24 Further reducing childhood SHS exposure, while eliminating socioeconomic inequality, will likely require a combination of efforts to help parents to successfully quit smoking, and to encourage those who continue to smoke not to do so in the home.

Childhood e-cigarette use

- 4.25 It is premature to be making firm policy recommendations on the basis of the emerging and underdeveloped evidence base surrounding childhood e-cigarette use. At present, debates on both sides of the current divide are presented with far greater conviction than the evidence base can support.
- 4.26 Our findings point to a need to carefully balance harm reduction arguments, which are posed as a justification for limiting regulation of e-cigarettes (and remain contingent on further evidence that e-cigarettes are successfully used as substitutes for tobacco), against accumulating evidence of dual use by adults, and use among children who would not otherwise be smoking tobacco.

- 4.27 The primary implications of this study relate to a need for further research into children's e-cigarette use. Exploring whether it is possible to develop methods to validate children's reports of e-cigarette use is a priority to provide greater confidence in the prevalence estimates obtained from surveys.
- 4.28 While we were not able to definitively demonstrate that e-cigarette use leads to uptake of smoking, research adopting longitudinal designs is clearly needed to understand the direction of the associations observed, as well as whether e-cigarette use is followed by subsequent uptake of tobacco.
- 4.29 Should future longitudinal research suggest that childhood e-cigarette use represents an early warning sign that active smoking may follow, moves toward greater regulation of e-cigarettes, in terms of their advertising and visibility, may be justified.

5 Research team

The core research team were staff/students at the Centre for the Development and Evaluation of Complex Interventions for Public Health Improvement (DECIPHer) unless indicated. Investigators: Graham Moore, Jo Holliday and Laurence Moore (MRC/CSO Social and Public Health Sciences Unit, University of Glasgow). Project manager: Nilufar Ahmed. Research assistants: Elen Jones, Julie Hayward, Sophia Lewis, Hannah Littlecott, Gillian Sulley. Administrative assistants: Natalie Richards and Kim Sheppard.

6 References

- Abrams, D. et al. 2014. Statement from specialists in nicotine science and public health policy.
- Adda, J. and Cornaglia, F. J. 2006. *The Effect of Taxes and Bans on Passive Smoking. IZA Discussion Paper No. 2191*. [Online]. Available at: Available at SSRN: <http://ssrn.com/abstract=919963> [Accessed: March].
- Akhtar, P. C. et al. 2007. Changes in child exposure to environmental tobacco smoke (CHETS) study after implementation of smoke-free legislation in Scotland: national cross sectional survey. *BMJ* 335(7619), p. 545.
- Akhtar, P. C. et al. 2009. Smoking restrictions in the home and secondhand smoke exposure among primary schoolchildren before and after introduction of the Scottish smoke-free legislation. *Tobacco control* 18(5), pp. 409-415.
- Aktan, A. et al. 2014. 129 public health and medical authorities from 31 countries write WHO DG Chan urging evidence-based approach to ecigs.
- Belanger, M. et al. 2008. Nicotine dependence symptoms among young never-smokers exposed to secondhand tobacco smoke. *Addictive Behaviors* 33(12), pp. 1557-1563.
- Bialous, S. A. and Sarma, L. 2014. Electronic cigarettes and smoking cessation: a quandary? *The Lancet* 383(9915), pp. 407-408.
- British Medical Association Board of Science. 2011. *Smoking in vehicles: A briefing from the Board of Science*. British Medical Association,.
- Bullen, C. et al. 2013. Electronic cigarettes for smoking cessation: a randomised controlled trial. *The Lancet* 382(9905), pp. 1629-1637.
- Cheng, K.-W. et al. 2011. Association between smokefree laws and voluntary smokefree-home rules. *American journal of preventive medicine* 41(6), pp. 566-572.
- Currie, C. et al. 2008. Researching health inequalities in adolescents: The development of the Health Behaviour in School-Aged Children (HBSC) Family Affluence Scale. *Social Science & Medicine* 66(6), pp. 1429-1436.
- Department of Health and Committee on the Medical effects of Air Pollutants. 1997. *Handbook on air pollution and health*. London: The Stationery Office.
- Dutra, L. M. and Glantz, S. A. 2014. Electronic cigarettes and conventional cigarette use among US adolescents: a cross-sectional study. *JAMA pediatrics*.
- Etter, J. F. 2010. Electronic cigarettes: a survey of users. *BMC public health* 10(1), p. 231.
- Freeman, B. et al. 2008. Banning smoking in cars carrying children: an analytical history of a public health advocacy campaign. *Australian and New Zealand journal of public health* 32(1), pp. 60-65.

- Gartner, C. E. and Hall, W. D. 2012. Is the socioeconomic gap in childhood exposure to secondhand smoke widening or narrowing? *Tobacco Control*.
- Glover, M. et al. 2011. Driving kids to smoke? Children's reported exposure to smoke in cars and early smoking initiation. *Addictive behaviors* 36(11), pp. 1027-1031.
- Goniewicz, M. L. et al. 2014. Levels of selected carcinogens and toxicants in vapour from electronic cigarettes. *Tobacco control* 23(2), pp. 133-139.
- Grana, R. A. et al. 2014. Electronic Cigarettes. *Circulation* 129(19), pp. e490-e492.
- Hitchman, S. C. et al. 2011. Support and correlates of support for banning smoking in cars with children: findings from the ITC Four Country Survey. *The European Journal of Public Health* 21(3), pp. 360-365.
- Ho, S. Y. et al. 2010. Comprehensive smoke-free legislation and displacement of smoking into the homes of young children in Hong Kong. *Tobacco Control* 19(2), pp. 129-133.
- Holliday, J. et al. 2009. Changes in child exposure to secondhand smoke after implementation of smoke-free legislation in Wales: a repeated cross-sectional study. *BMC Public Health* 9(1), p. 430.
- Hopkinson, N. S. et al. 2014. Respiratory health professionals call on MPs to vote to ban smoking in cars with children. *BMJ: British Medical Journal* 348.
- Hsu, R. et al. 2013. An observational study of retail availability and in-store marketing of e-cigarettes in London: potential to undermine recent tobacco control gains? *BMJ Open* 3(12).
- Hyland, A. et al. 2012. Smoke-free air policies: past, present and future. *Tobacco Control* 21(2), pp. 154-161.
- Jarvie, J. A. and Malone, R. E. 2008. Children's secondhand smoke exposure in private homes and cars: an ethical analysis. *American Journal of Public Health* 98(12), pp. 2140-2145.
- Jarvis, M. J. et al. 2011. Impact of smoke-free legislation on children's exposure to secondhand smoke: cotinine data from the Health Survey for England. *Tobacco Control*.
- Leatherdale, S. T. et al. 2008. Youth exposure to smoking in the home and in cars: how often does it happen and what do youth think about it? *Tobacco control* 17(2), pp. 86-92.
- Leonardi-Bee, J. et al. 2011a. Exposure to parental and sibling smoking and the risk of smoking uptake in childhood and adolescence: a systematic review and meta-analysis. *Thorax* 66(10), pp. 847-855.
- Leonardi-Bee, J. et al. 2011b. Exposure to parental and sibling smoking and the risk of smoking uptake in childhood and adolescence: a systematic review and meta-analysis. *Thorax*.

- Lund, A. K. 1986. Voluntary seat belt use among U.S. drivers: geographic, socioeconomic and demographic variation. *Accid Anal Prev* 18(1), pp. 43-50.
- Marisa, d. A. et al. 2013. Promotion of electronic cigarettes: tobacco marketing reinvented? *BMJ* 347.
- Martin, J. et al. 2006. Observed smoking in cars: a method and differences by socioeconomic area. *Tobacco control* 15(5), pp. 409-411.
- McCarthy, M. 2013. New York City votes to ban e-cigarettes from public places. *BMJ: British Medical Journal* 347.
- McCarthy, M. 2014. E-cigarette companies target youth, US congressional study finds. *BMJ: British Medical Journal* 348.
- Mons, U. et al. 2013. Impact of national smoke-free legislation on home smoking bans: findings from the International Tobacco Control Policy Evaluation Project Europe Surveys. *Tobacco Control* 22(e1), pp. e2-e9.
- Moore, G. F. et al. 2012. Socioeconomic inequalities in childhood exposure to secondhand smoke before and after smoke-free legislation in three UK countries. *Journal of Public Health* 34(4), pp. 599-608.
- Moore, G. F. et al. 2011. Socioeconomic patterning in changes in child exposure to secondhand smoke after implementation of smoke-free legislation in Wales. *Nicotine & Tobacco Research* 13(10), pp. 903-910.
- Öberg, M. et al. 2011. Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries. *The Lancet* 377(9760), pp. 139-146.
- Pawson, R. et al. 2011. Myths, facts and conditional truths: What is the evidence on the risks associated with smoking in cars carrying children? *Canadian Medical Association Journal* 183(10), pp. E680-E684.
- Pearson, J. L. et al. 2012. e-Cigarette Awareness, Use, and Harm Perceptions in US Adults. *American Journal of Public Health* 102(9), pp. 1758-1766.
- Phillips, R. et al. 2007. Smoking in the home after the smoke-free legislation in Scotland: qualitative study. *bmj* 335(7619), p. 553.
- Reid, J. L. et al. 2010. Socioeconomic disparities in quit intentions, quit attempts, and smoking abstinence among smokers in four western countries: findings from the International Tobacco Control Four Country Survey. *Nicotine & Tobacco Research* 12(suppl 1), pp. S20-S33.
- Roberts. C. and Kawol. K. 2014. *Smoking in Cars Carrying Children: monitoring public attitudes, November 2013 update*. Cardiff: Welsh Government.
- Scientific Committee on Tobacco and Health. 2004. *Update of evidence of health effects of secondhand smoke*. London: Department of Health.

Semple, S. et al. 2012. Secondhand smoke in cars: assessing children's potential exposure during typical journey conditions. *Tobacco Control* 21(6), pp. 578-583.

Sendzik, T. et al. 2009. An experimental investigation of tobacco smoke pollution in cars. *Nicotine & Tobacco Research* 11(6), pp. 627-634.

Sheeran, P. 2002. Intention—behavior relations: A conceptual and empirical review. *European review of social psychology* 12(1), pp. 1-36.

Simons-Morton, B. G. and Farhat, T. 2010. Recent findings on peer group influences on adolescent smoking. *The journal of primary prevention* 31(4), pp. 191-208.

Thomson, G. and Wilson, N. 2009. Public attitudes to laws for smoke-free private vehicles: a brief review. *Tobacco control* 18(4), pp. 256-261.

World Health Organization. 2005. *WHO Framework Convention on Tobacco Control*. Geneva: WHO Document Production Services.

First of all, thank you for helping us with this important survey.

HELLO

We promise that your answers will only be looked at by the university research team and by no-one else.

There is no need to write your name on the questionnaire.

Please take your time, read each question carefully and answer as honestly as you can. Remember, it's not a test - so there are no right or wrong answers.

For most questions, you'll be asked to tick the box that best fits your answer, like this:

- ¹ ☒ Yes
² ☐ No

For some, you will be asked to circle a number from 1 to 5 that best describes what you think, like this:

Agree	1	2	3	4	5	Disagree
-------	---	---	---	---	---	----------

Please choose one answer for each question or part of a question, unless we ask you otherwise. If it is difficult to choose just one answer, please think about what is true most of the time.

After you have filled it in, you can put it in the envelope we've given you and seal it.

Thanks again and happy ticking!

First, we'd like you to tell us a little about yourself, your family and where you live.

1 Are you a boy or a girl?

☐

Boy

☐

Girl

2 What Year are you in?

☐

Year 5

☐

Year 6

3 What month were you born?

☐

Jan

☐

Feb

☐

Mar

☐

Apr

☐

May

☐

June

☐

July

☐

Aug

☐

Sept

☐

Oct

☐

Nov

☐

Dec

4 What year were you born?

☐

2001

☐

2002

☐

2003

☐

2004

☐

2005

5 Think of the home where you live all or most of the time.

Now, tick ALL of the adults who live there.

☐

Mother

- 2 ☐ Father
- 3 ☐ Stepmother (or father's partner)
- 4 ☐ Stepfather (or mother's partner)
- 5 ☐ Grandmother
- 6 ☐ Grandfather
- 7 ☐ I live in a foster home or children's home
- 8 ☐ Someone else: *please write it down*
-

6 Do you have your own bedroom for yourself?

- 1 ☐ No
- 2 ☐ Yes

7 Does your family own a car, van or truck?

- 1 ☐ No
- 2 ☐ Yes, one
- 3 ☐ Yes, two or more



8 Are people allowed to smoke in your car, van or truck?

-
- 1 ☐ Yes
- 2 ☐ No
- 3 ☐ I don't know
- 4 ☐ Don't have a family car, van or truck

9

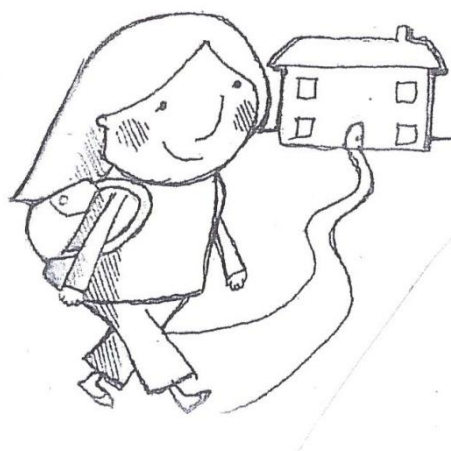
How often do people smoke in your car, van or truck WHEN YOU ARE INSIDE IT?

- 1 ☐ *About every day*
- 2 ☐ *Sometimes*
- 3 ☐ Never
- 4 ☐ I don't know
- 5 ☐ Don't have a family car, van or truck

10

During the past 12 months, how many times did you travel away on holiday with your family?

- 1 ☐ Not at all
- 2 ☐ Once
- 3 ☐ Twice
- 4 ☐ More than twice



11

How many computers (including laptops and tablets, *not* including game consoles and smartphones) does your family

own?

1 ☐

None

2 ☐

One

3 ☐

Two

4 ☐

More than two

12 Would you say your health is.....?

1 ☐

Excellent

2 ☐

Good

3 ☐

Fair

4 ☐

Poor



These next questions are about smoking.
Remember; try to be as honest as you can. All the answers you give will remain private – we won't tell anyone what you write.

For these questions 'smoking' does not include using E-Cigarettes. These are electronic versions of cigarettes which do not give off smoke, but could still be harmful to use.

13 Have you ever smoked tobacco?

(At least one cigarette, cigar or pipe)

☐ ¹ Yes

☐ ² No

14 How often do you smoke tobacco at present?

☐ ¹ Every day

☐ ² At least once a week, but not every day

☐ ³ Less than once a week

☐ ⁴ I do not smoke

15 How many cigarettes do you usually smoke in a week?

(If you do not smoke, please write 0 (zero) cigarettes a week)

I smoke..... cigarettes a week

16 **When did you last have a cigarette?**
(At least one cigarette, cigar or pipe)

- 1 ☐ *Today*
- 2 ☐ *Yesterday*
- 3 ☐ *In the last week*
- 4 ☐ *More than 1 week ago*
- 5 ☐ *I do not smoke*



17 **Do you think that you will smoke in two years time?**

- 1 ☐ Definitely yes
- 2 ☐ Probably yes
- 3 ☐ Maybe, maybe not
- 4 ☐ Probably not
- 5 ☐ Definitely not

18 **Are you allowed to smoke at home if you want to?**

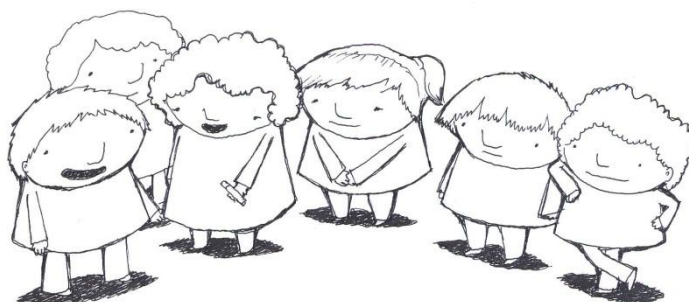
- 1 ☐ Yes
- 2 ☐ No
- 3 ☐ I don't know

19 Do any of the following people smoke?
(please tick **ONE** box for each person)

	<i>Smokes every day</i>	<i>Smokes sometimes</i>	<i>Does not smoke</i>	<i>I don't know</i>	<i>Don't have or see this person</i>
Father	☐	☐	☐	☐	☐
Mother	☐	☐	☐	☐	☐
Stepfather (or mother's partner)	☐	☐	☐	☐	☐
Stepmother (or father's partner)	☐	☐	☐	☐	☐
Your best friend	☐	☐	☐	☐	☐

20 How many of your friends smoke?

- ☐ Most of them
- ☐ About half of them
- ☐ Some of them
- ☐ None of them
- ☐ I don't know



21 How many people of your age do you think smoke in Wales?

- 1 ☐ Nearly all of them
- 2 ☐ About three quarters
- 3 ☐ About half
- 4 ☐ About a quarter
- 5 ☐ Hardly any
- 6 ☐ I don't know

22 How many adults do you think smoke in Wales?

- 1 ☐ Nearly all of them
- 2 ☐ About three quarters
- 3 ☐ About half
- 4 ☐ About a quarter
- 5 ☐ Hardly any
- 6 ☐ I don't know

23 How much do you agree or disagree that adults should be allowed to smoke in front of children?

- 1 ☐ *Strongly agree*
- 2 ☐ *Agree*
- 3 ☐ *Don't mind*
- 4 ☐ *Disagree*
- 5 ☐ *Strongly disagree*

- 24 People have different attitudes about smoking in cars. We'd like to know what you think about smoking in cars.

Please read the statement and circle the number that best describes what you think, where,

1 = strongly agree and 5 = strongly disagree

There should be a complete ban on smoking in cars	1	2	3	4	5
---	---	---	---	---	---

Smoking should be banned in cars carrying children under 16	1	2	3	4	5
---	---	---	---	---	---

I don't mind when people smoke around me when travelling in a car together	1	2	3	4	5
--	---	---	---	---	---

- 25 How much, if at all, do you think smoking while driving increases the risk of having a road accident?

Not at all 1 2 3 4 5 A great deal

- 26 How much do you agree or disagree that breathing in other people's cigarette smoke is bad for health?

1 ☐ Strongly agree

2 ☐ Agree

3 ☐ Don't mind

4 ☐ Disagree

5 ☐ Strongly disagree

- 27 How much, if at all, do you think breathing in smoke when travelling in a car, affects the health of non-smokers?

Not at all 1 2 3 4 5 A great deal

The next section is about where you might see people smoking or spend time with people who are smoking

28 How often are you in a place where people are smoking?

- 1 ☐ *About every day*
- 2 ☐ *Sometimes*
- 3 ☐ *Never*
- 4 ☐ *I don't know*

29 How often are you in a car, truck or van where people are smoking?

- 1 ☐ *About every day*
- 2 ☐ *Sometimes*
- 3 ☐ *Never*
- 4 ☐ *I don't know*

30

How often, if ever, do you travel in a car, van or truck?

- 1 ☐ Every day
- 2 ☐ Most days
- 3 ☐ 2 or 3 days a week
- 4 ☐ About once a week
- 5 ☐ About once a fortnight
- 6 ☐ About once a month
- 7 ☐ Less than once a month
- 8 ☐ Never
- 9 ☐ I don't know

Think about where you live most or all of the time

31

How often do people smoke outside your home (for example, in the garden, on the front step)?

- 1 ☐ About every day
- 2 ☐ Sometimes
- 3 ☐ Never
- 4 ☐ I don't know



32 Is smoking allowed inside your home (where you live all or most of the time)?

- 1 ☐ No, smoking is not allowed at all
- 2 ☐ Smoking is allowed in certain areas only
- 3 ☐ Smoking is allowed anywhere in our home
- 4 ☐ Smoking is only allowed on special occasions in our home
- 5 ☐ I don't know

33 How often do the following people smoke in your home (where you live all or most of the time)? (please tick **ONE** box for **EACH** person)

	<i>Smokes in the home every day</i>	<i>Sometimes smokes in the home</i>	<i>Does not smoke in the home</i>	<i>I don't know</i>	<i>Don't have or see this person</i>
Father	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Mother	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Stepfather (or mother's partner)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Stepmother (or father's partner)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Other people you live with (for example, brother, sister, aunt, grandad)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

Your best friend

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

Other people who
come to your home

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

34 Yesterday, how much time did you spend inside your home
(where you live all or most of the time)?

1 ☐

None

2 ☐

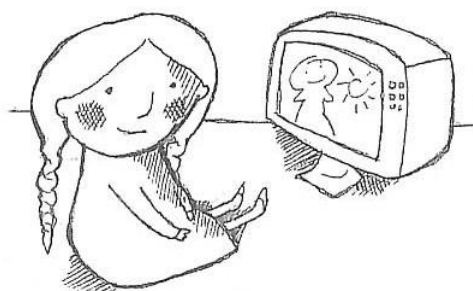
Less than 1 hour

3 ☐

1-3 hours

4 ☐

More than 3 hours



35 While you were inside your home yesterday was anyone
smoking there?

1 ☐

I wasn't at home yesterday

2 ☐

There was no-one smoking there

3 ☐

Yes, someone was smoking there

4 ☐

I don't know

36 Yesterday, how much time did you spend in a car?

1 ☐

None

2 ☐

Less than 1 hour

3 ☐

1-3 hours

4 ☐

More than 3 hours

37 **While you were in a car yesterday was anyone smoking there?**

- 1 ☐ I wasn't in a car yesterday
- 2 ☐ There was no-one smoking there
- 3 ☐ Yes, someone was smoking there
- 4 ☐ I don't know

38 **How often are you driven to school?**

- 1 ☐ Three or more times a week
- 2 ☐ Once or twice a week
- 3 ☐ Once or twice a month
- 4 ☐ A few times a year
- 5 ☐ Never

39 **Yesterday, how much time did you spend in someone else's home?**

- 1 ☐ None
- 2 ☐ Less than 1 hour
- 3 ☐ 1-3 hours
- 4 ☐ More than 3 hours

40 **While you were in someone else's home yesterday, was anyone smoking there?**

- 1 ☐ I wasn't in someone else's home yesterday
- 2 ☐ There was no-one smoking there
- 3 ☐ Yes, someone was smoking there
- 4 ☐ I don't know

41 **How do you feel when people smoke around you, for example in the same room or car?**

- 1 ☐ I mind a lot
- 2 ☐ I mind a bit
- 3 ☐ I don't mind very much
- 4 ☐ I don't mind at all

42

How often do the following people smoke in your family car, van or truck when you are inside it? (please tick **ONE** box for **EACH** person)

	<i>Smokes in the car</i>	<i>Does not smoke in the car</i>	<i>I don't know</i>	<i>Don't have or see this person</i>	<i>Don't have a car</i>
Father	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Mother	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Stepfather (or mother's partner)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Stepmother (or father's partner)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Other family members	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Friends of family members	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Other people	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

43

How often do you see teachers or other adults smoking
outside on school grounds?

1 ☐

About every day

2 ☐

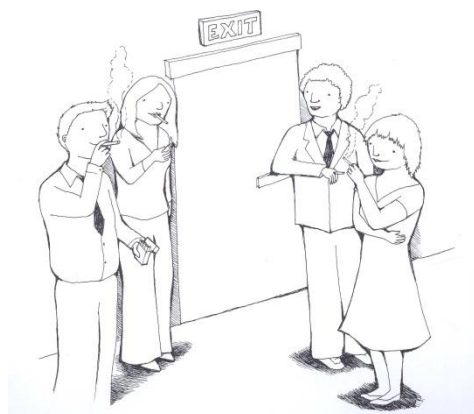
Sometimes



- 3 ☐ Never
- 4 ☐ I don't know

44 How often do you see people smoking in the street outside buildings (for example, outside pubs, restaurants or offices)?

- 1 ☐ About every day
- 2 ☐ Sometimes
- 3 ☐ Never
- 4 ☐ I don't know



45 Thinking about the last month, how often have you seen people smoking outside of or near the entrance of the following places?

	<i>Regularly</i>	<i>Occasionally</i>	<i>Never</i>	<i>Haven't been to this place in the last month</i>
Leisure facilities (For example swimming pools and sports clubs)	1 ☐	2 ☐	3 ☐	4 ☐
The doctors surgery	1 ☐	2 ☐	3 ☐	4 ☐
The hospital	1 ☐	2 ☐	3 ☐	4 ☐
Bus stations	1 ☐	2 ☐	3 ☐	4 ☐

Train stations



Cinema



These next questions are about asthma

46 Has the doctor ever told you that you have asthma?

1 ☐ Yes

2 ☐ No

3 ☐ I don't know

47 Have you had any wheezing or whistling in your chest in the last 12 months?

1 ☐ Yes

2 ☐ No

3 ☐ I don't know

48 In the last 12 months, has your chest sounded wheezy during or after exercise?

1 ☐ Yes

2 ☐ No



³ ☐ I don't know

49 In the last 12 months, have you had a dry cough at night, other than when you had a cold or a chest infection?

¹ ☐ Yes

² ☐ No

³ ☐ I don't know

50 In the last 12 months, have you been to a doctor or hospital because of wheezing?

¹ ☐ Yes

² ☐ No

³ ☐ I don't know



51 Have you got a cough or cold at the moment?

¹ ☐ Yes

² ☐ No

³ ☐ I don't know

52 Do you use an inhaler for asthma?

¹ ☐ Yes

² ☐ No

³ ☐ I don't know

53 **Yesterday**, did you have any of the following?
(please tick **ONE** box for **each** line)

	<i>Yes</i>	<i>No</i>	<i>I don't know</i>
<i>Red or sore eyes</i>	1 ☐	2 ☐	3 ☐
<i>Runny or sore nose</i>	1 ☐	2 ☐	3 ☐
<i>Cough, wheezing or tightness of chest</i>	1 ☐	2 ☐	3 ☐

54 **Yesterday**, did you need to use an asthma inhaler?

1 ☐ *Yes*

2 ☐ *No*

3 ☐ *I don't know*

4 ☐ *I don't use an inhaler*

55 Imagine these are rooms in the home **where you live all or most of the time**. Do people sometimes smoke in these rooms? (please tick **ALL** the rooms where people sometimes smoke)

1 ☐ *Kitchen*

2 ☐ *Lounge or living room*

3 ☐ *My bedroom*

- 4 ☐ *Other bedrooms*
- 5 ☐ *Toilet or bathroom*
- 6 ☐ *Other rooms (please say which)*

.....

In 2012, the Welsh Government started a campaign to encourage adults not to smoke in their car ('Fresh Start Wales'), particularly when children are in it.

56 Had you heard of this campaign before today?

- 1 ☐ Yes
- 2 ☐ No
- 3 ☐ I don't know

57 How much do you agree or disagree that this campaign is a good idea?

- 1 ☐ Strongly agree
- 2 ☐ Agree
- 3 ☐ Don't mind
- 4 ☐ Disagree
- 5 ☐ Strongly disagree

58 Had you heard of E-cigarettes before today? (Remember E-cigarettes are electronic versions of cigarettes which do not give off smoke, but can still be harmful to use)

- 1 ☐ Yes
- 2 ☐ No
- 3 ☐ I don't know
-

These final questions are about E-Cigarettes. These are electronic versions of cigarettes which don't give off smoke, but can still be harmful to use.

And remember to be as honest as you can. All the answers you give will remain private - we won't tell anyone what you write.

59 Have you ever used an E-Cigarette?

- 1 ☐ Yes, once
- 2 ☐ Yes, more than once
- 3 ☐ No

60 Do you know anyone who uses an E-Cigarette?

	<i>Uses an E- Cigarette every day</i>	<i>Uses an E- Cigarette sometimes</i>	<i>Does not use an E- Cigarette</i>	<i>I don't know</i>	<i>Don't have or see this person</i>
Father	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Mother	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Stepfather (or mother's partner)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Stepmother (or father's partner)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Your best friend	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

Any other family members

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

Any friends of family members

1 ☐

2 ☐

3 ☐

4 ☐

5 ☐

61 Does anyone use an E-Cigarette in a house while you are in it?

1 ☐

Yes, occasionally

2 ☐

Yes, more than once a week

3 ☐

No

62 Does anyone use an E-Cigarette in a car while you are in it?

1 ☐

Yes, occasionally

2 ☐

Yes, more than once a week

3 ☐

No



63 In the last month, how often have you seen people using E-Cigarettes inside the following places?

Regularly

Occasionally

Never

Haven't been to this place in the last month

Leisure facilities
(For example swimming pools and sports clubs)

1 ☐

2 ☐

3 ☐

4 ☐

The doctors surgery

1 ☐

2 ☐

3 ☐

4 ☐

The hospital	1	2	3	4
Bus stations	1	2	3	4
Train stations	1	2	3	4
Cinema	1	2	3	4

64 In the last month, how often have you seen people using E-Cigarettes outside the following places?

	<i>Regularly</i>	<i>Occasionally</i>	<i>Never</i>	<i>Haven't been to this place in the last month</i>
Leisure facilities (For example swimming pools and sports clubs)	1	2	3	4
The doctors surgery	1	2	3	4
The hospital	1	2	3	4
Bus stations	1	2	3	4
Train stations	1	2	3	4
Cinema	1	2	3	4

WELL DONE, YOU HAVE FINISHED!

**WERE THERE ANY QUESTIONS YOU MEANT TO
GO BACK AND COMPLETE? PLEASE CHECK THAT
YOU HAVE FILLED IN EVERY QUESTION THAT
YOU WERE ASKED TO.**

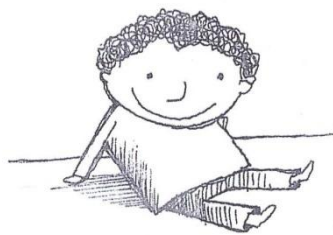


**DON'T FORGET TO PUT YOUR FINISHED QUESTIONNAIRE
IN THE ENVELOPE PROVIDED.**

THANK YOU FOR YOUR HELP!!

CHANGES IN CHILD EXPOSURE TO
ENVIRONMENTAL TOBACCO SMOKE
WALES 2

CHETS Wales 2



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