



Health Survey for England 2015

Adult cigarette smoking

Published 14th December 2016

This report examines the prevalence of cigarette smoking among adults in England in 2015. It compares different population groups, by age, sex, income and region. It also looks at e-cigarette use and exposure to secondhand smoke.

Key findings

Variations in smoking prevalence

- 18% of adults in England were current smokers in 2015 (19% of men, 17% of women).
- There remains considerable variation by income: 29% of adults in the lowest income quintile were current smokers, almost three times as many as in the highest income quintile where 10% were current smokers.

Exposure to secondhand smoke

- Among non-smokers, 81% were not exposed to secondhand (environmental) tobacco smoke, as measured by undetectable levels of saliva cotinine. This is an increase from 2013, when 75% had undetectable saliva cotinine levels.
- Self-reported regular exposure to secondhand smoke was highest among those aged 16-24; over half of this group reported some exposure.

Use of e-cigarettes

- The proportion of adults who currently use e-cigarettes was 5% representing a small increase from HSE2013, when 3% of adults were current e-cigarette users. The prevalence of ever having used e-cigarettes was much higher among current smokers (40%). Only 1% of those who had never smoked had ever used an e-cigarette.

Contents

Key findings	1
This is a National Statistics publication	4
Introduction	5
Contents	5
Background	5
Cigarette smoking	5
Use of e-cigarettes (vaping)	5
Methods and definitions	6
Methods	6
Self-reported data	6
Cotinine	6
Definitions	7
Current smokers	7
Cotinine thresholds indicative of smoking	7
Exposure to secondhand smoke	7
Smoking status	8
Smoking status and cigarette consumption, by age and sex	8
Saliva cotinine levels indicative of smoking	8
Smoking status by region	9
Smoking status by income	9
Smoking status by longstanding illness	10
Cigarette consumption	11
Cigarette consumption, by age and sex	11
Cigarette consumption, by income	11
Age started smoking	11
Age started smoking, by age and sex	11
Age started smoking, by income	12
Intentions to give up smoking	13
Use of e-cigarettes	14
Exposure to secondhand (environmental) tobacco smoke	15
Self-reported exposure to secondhand smoke, by age and sex	15
Saliva cotinine levels among non-smokers	16
Discussion	17

Health Survey for England 2015: Adult cigarette smoking

Trends in smoking prevalence	17
Exposure to environmental (secondhand) smoke	17
Smoking and income inequality	18
The use of e-cigarettes	18
Future policy developments	18
Notes and references	19

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This report may be of interest to members of the public, policy officials, people working in public health and to commissioners of health and care services to see the prevalence of smoking.

Introduction

Contents

This chapter identifies the prevalence of smoking across different demographic groups in the general population in England in 2015, using both self-reported data and saliva cotinine, an objective measure of tobacco consumption and exposure. It includes new analyses on the age at which people started smoking and updates previous information on the use of e-cigarettes.

Detailed tables accompanying this report can be accessed via <http://digital.nhs.uk/pubs/hse2015>.

Background

Cigarette smoking

Cigarette smoking has been in long-term decline; the prevalence has fallen from 28% in 1998¹ to 19% in 2014.² However, tobacco use remains the leading cause of preventable illness and premature death in England and worldwide.³ Tobacco use contributed to around 21% of deaths in men and 13% of deaths in women aged over 35 in England in 2013.⁵

Smoking is the biggest contributor to health inequalities. It has been estimated that tobacco use accounts for around half of the difference in life expectancy between the richest and poorest groups.⁴ In 2013, around 35% of unemployed people were current smokers compared with 19% of those in employment, according to the Opinions and Lifestyle Survey.⁵

To tackle the health burden related to smoking, a series of laws have come into force in the past 15 years. This included a ban on tobacco advertising on billboards and in printed publications in 2003.⁶ In addition, tobacco displays at the point of sale have been prohibited in supermarkets and large shops since April 2012, and ceased in small shops from April 2015.⁷

To reduce exposure to the harmful effects of secondhand smoke, a smokefree law was implemented in July 2007, banning smoking in workplaces and enclosed public places.⁸ Since then, self-reported exposure to secondhand smoke per week has reduced from a mean of 7.2 hours for men and 5.2 hours for women in the first half of 2007 to 3.1 and 2.1 hours respectively in 2013.⁹

The most recent comprehensive government tobacco control strategy, *Healthy Lives, Healthy People: A tobacco control plan*, was published in 2011.¹⁰ This set out a five-year plan to reduce the harms of smoking, including a target to reduce adult smoking to 18.5% or less by the end of 2015, resulting in 210,000 fewer smokers.

Use of e-cigarettes (vaping)

In 2013, all adults were, for the first time in the Health Survey for England (HSE), asked questions on their use of electronic cigarettes¹¹ (also called vapourisers, or vaping).¹² In 2013, 3% of adults were current users of e-cigarettes.

There is a growing consensus that e-cigarettes are safer than tobacco cigarettes, since e-cigarettes contain no tobacco and thus no tar, with some estimating them to be around 95% safer,^{13,14} although the longer term effects of e-cigarettes have not been established. E-cigarettes may not be totally safe; there is emerging evidence that e-cigarettes emit ultrafine/fine particles in their vapour which can be damaging to the

lung.¹⁵ E-cigarettes also contain the chemical propylene glycol, which has been linked to eye, throat and respiratory irritation.¹⁶

The availability of e-cigarettes has given rise to considerable public health debate,¹⁷ including concerns that the co-use of e-cigarettes with tobacco may reinforce the smoking habit, or discourage cessation attempts. There is also concern over the uptake of e-cigarettes by non-smokers. However, this was rare, with 1% of never smokers having ever used e-cigarettes in HSE 2013.⁹ A recent Cochrane review of studies on e-cigarettes found evidence that e-cigarettes could help smokers quit or reduce tobacco consumption.^{14,18}

In 2015, when these data were collected, the sale of e-cigarettes was largely unregulated.

Methods and definitions

Methods

Self-reported data

Questions about cigarette smoking have been asked of adults aged 16 and over as part of the HSE series since its inception in 1991. In 2015, the interview collected information about the use of various tobacco products including cigarettes, cigars and, among men, pipes. Those who reported smoking cigarettes were asked to estimate their daily consumption of cigarettes.

The interview also covered participants' current and previous use of nicotine delivery products including nicotine chewing gum, lozenges, mini lozenges, patch, inhaler, inhalator, mouth spray, nasal spray and other non-tobacco nicotine products. Since 2013, information has also been collected on current and previous use of e-cigarettes as well.

All participants aged 16 and over were asked to estimate the total number of hours they were exposed to other people's smoke, and to state the locations where this occurred.

Participants aged 25 and over were asked about their smoking behaviour within the face to face interview.¹⁹ For those aged 16 to 17, information about smoking was collected through a self-completion questionnaire, to offer participants more privacy by allowing them to reply without disclosing their smoking behaviour to other household members. At the interviewer's discretion, those aged 18 to 24 could answer the smoking questions either through the face to face interview or through the self-completion questionnaire. In 2015, 14% of adults aged 18 to 24 answered the smoking behaviour questions through the self-completion questionnaire.

Cotinine

Cotinine is a metabolite of nicotine. Cotinine levels in serum or saliva can provide an objective measure of smoking. It is generally considered to be the most useful of various biological markers that are indicators of personal tobacco use.²⁰ When analysed in a specialist laboratory, as is done for HSE, low levels are also a sensitive marker of exposure to other people's smoke.

For this survey, cotinine levels were measured using saliva. As part of the nurse visit, participating adults were asked about their smoking status at the time (which might have changed since the interview), and about use of nicotine delivery products in the last seven days, and were asked to provide a small saliva sample, which was

analysed for cotinine.¹⁹ An additional weight has been applied to the cotinine data to account for differential non-response to the saliva sample.²¹

Tables 15 and 16 show geometric mean cotinine values for self-reported and cotinine validated non-smokers aged 16 and over. Geometric means have been calculated as the distribution of saliva cotinine levels in non-smokers is very skewed, as so many have no detectable cotinine; geometric means take less account of extreme values that might distort the average or mean.^{21,22}

Definitions

Current smokers

Only 2% of all adults, including 1% of non-smokers of cigarettes, reported currently smoking cigars or pipes. The focus of this chapter is on cigarette use among adults, and cigar and pipe use is not considered in the definition of a current smoker.

Cotinine thresholds indicative of smoking

Cotinine has a half-life in the body of around 16-20 hours, which means that measurement of cotinine will detect regular tobacco use, but not occasional tobacco use if the last occasion was several days ago.²³ As in the HSE 2013 report, a threshold of 12ng/ml has been used as the cotinine cut-point indicative of personal smoking in populations with low smoking prevalence.^{20,24}

The prevalence of cotinine levels of 12ng/ml or more is shown for men and women to provide an objective measure of smoking in the population, and is analysed by self-reported smoking status. As in previous reports participants using nicotine delivery products were excluded from the definition of a valid cotinine assay when establishing cotinine levels attributable to tobacco smoking.

Exposure to secondhand smoke

Cotinine levels less than 12ng/ml can be indicative of occasional smoking, particularly if the participants reported they smoked cigarettes only occasionally. However, in almost all cases, cotinine levels less than 12ng/ml indicate exposure to environmental tobacco smoke, particularly if the participants reported that they did not currently smoke.^{20,25} Measurement of low levels of cotinine provides a useful measure to monitor levels of exposure to other people's smoke at both the population level and by sub-groups, as the only significant sources of detectable cotinine levels are personal tobacco use, nicotine delivery products, and breathing other people's tobacco smoke.²⁶

Smoking status

Smoking status and cigarette consumption, by age and sex

The prevalence of current smoking among all adults was 18%. Men were more likely than women to be current smokers (19% of men and 17% of women). Men were also less likely than women to have never been smokers (53% and 60% respectively). Current smoking was highest among younger age groups and declined with age.

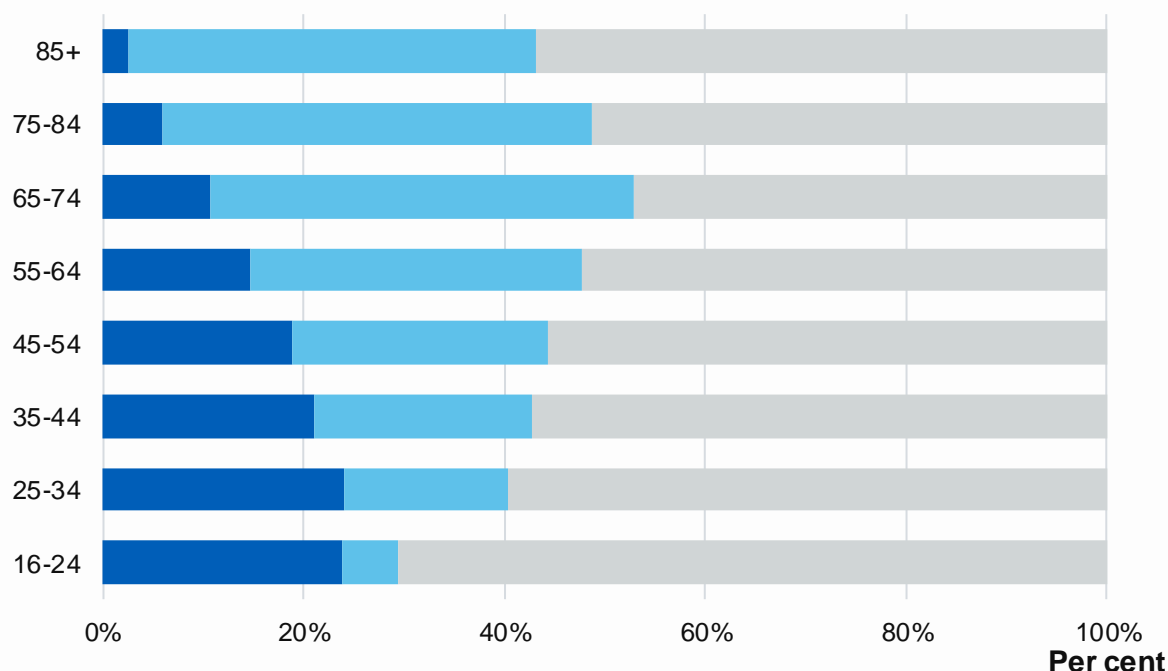
Figure 1, Table 1

Figure 1 Cigarette smoking status, by age

Base: Aged 16 and over

■ Current smoker ■ Ex-smoker ■ Never smoked

Age group



Source: NHS Digital

Saliva cotinine levels indicative of smoking

Saliva cotinine levels of 12ng/ml or above are indicative of current smoking. Among all adults, 18% had cotinine levels of 12ng/ml or above. As with self-reported smoking, the proportion of adults with cotinine levels of 12ng/ml was highest among younger age groups and declined with age.

The proportion of current smokers who had levels of cotinine above 12ng/ml was high (95%), confirming that smokers were broadly honest in reporting that they smoked. Among those who reported that they had never smoked cigarettes, very few had cotinine levels of 12ng/ml or above (2%), but this was higher among men (3%) than women (1%).

Table 14

Smoking status by region

Regional data are shown in the table as both observed and age-standardised estimates which take account of the different age distributions in the regions. The small variations in the smoking status of adults across regions were not statistically significant.

Smoking status by income

The proportion of current smokers was higher among those with lower incomes, being three times as many as in the lowest income quintile (29%) compared with the highest (10%). The difference between the highest and lowest income quintiles was larger for men than women (22 and 17 percentage points respectively).

Figure 2, Table 3

Figure 2 Prevalence of current smoking, by equivalised household income and sex

Base: Aged 16 and over



Source: NHS Digital

Smoking status by longstanding illness

Adults with a limiting longstanding illness had the greatest proportion of current and ex-smokers (23% and 28%), compared with those with non-limiting or no longstanding illness.

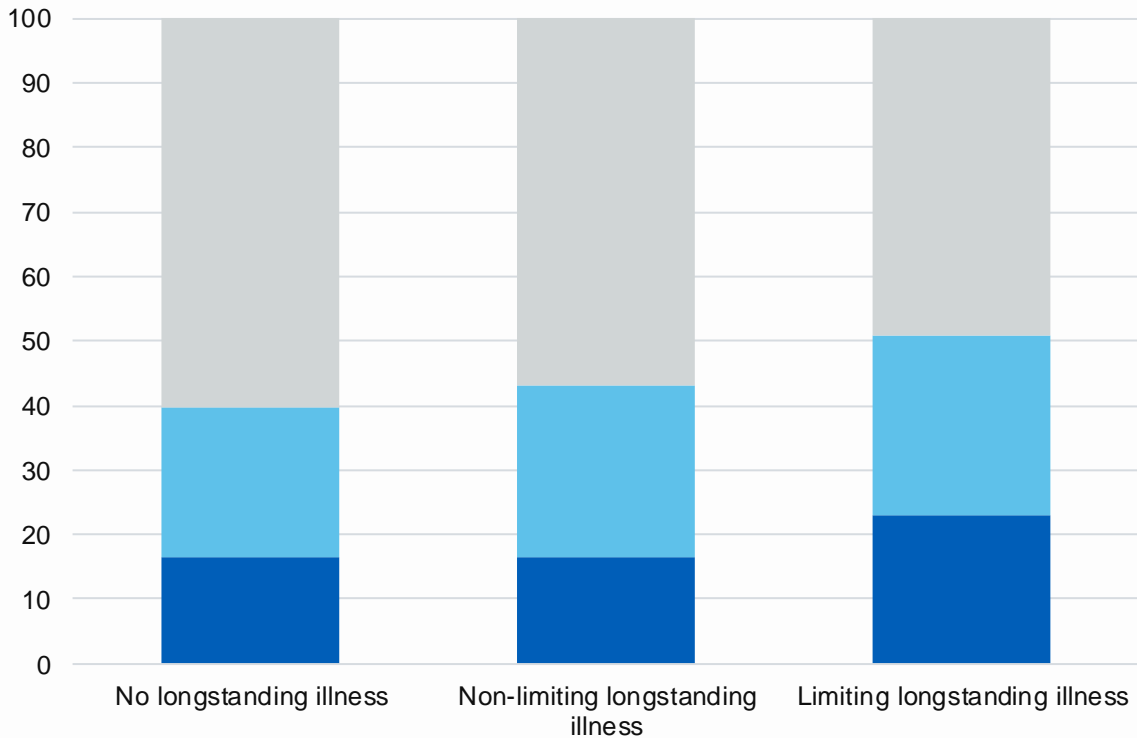
Figure 3, Table 4

Figure 3 Smoking status, by self-reported longstanding illness

Base: Aged 16 and over

■ Current smoker ■ Ex-smoker ■ Never smoked

Per cent



Source: NHS Digital

Cigarette consumption

Cigarette consumption, by age and sex

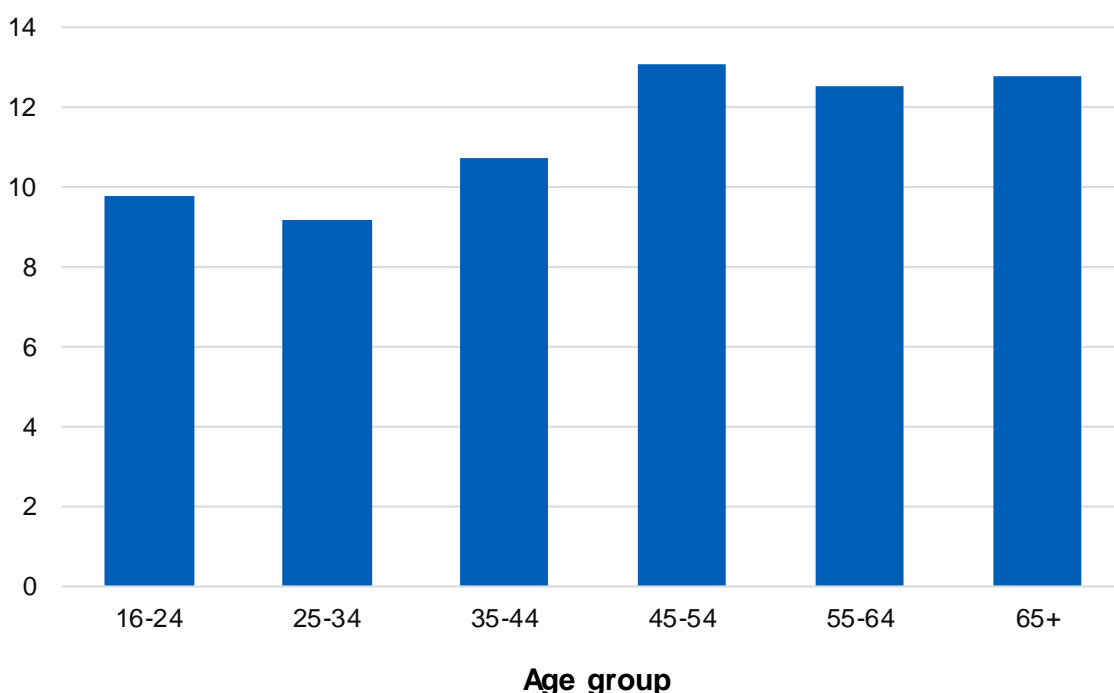
Among current smokers, the mean number of cigarettes smoked per day was higher for men (12.1 per day) than women (10.0 per day). The average number of cigarettes smoked per day tended to increase with age, peaking in the 45 to 54 age group.

Figure 4, Table 5

Figure 4 Mean number of cigarettes smoked per day, by age

Base: Current smokers aged 16 and over

Mean number of cigarettes



Source: NHS Digital

Cigarette consumption, by income

Among current smokers, cigarette consumption was greater in lower income quintiles. The average number of cigarettes smoked per day by current smokers in the fourth and lowest quintiles were 12.6 and 12.4 respectively, compared with 9.7 in the highest income quintile.

Table 6

Age started smoking

Age started smoking, by age and sex

In general, among current and ex-smokers aged 25 and over, men had started smoking at a younger age than women. Around 38% of men had started smoking aged 15 or under, compared with 33% of women. From 1933 until 2007, it was illegal to sell cigarettes to children under the age of 16; after that the minimum age was increased to 18.²⁷

The age at which participants started smoking also varied differently for men and women. The proportion of women who started smoking before they were 16 was lowest among those aged 65 or over (24%).

Among men, the proportion who had smoked before they were 16 was lowest among the youngest age groups, peaking in the 45 to 64 age groups (42%).

Note that there is an increasing risk of recall error among older age groups and therefore some caution is needed when interpreting these results.

Table 7

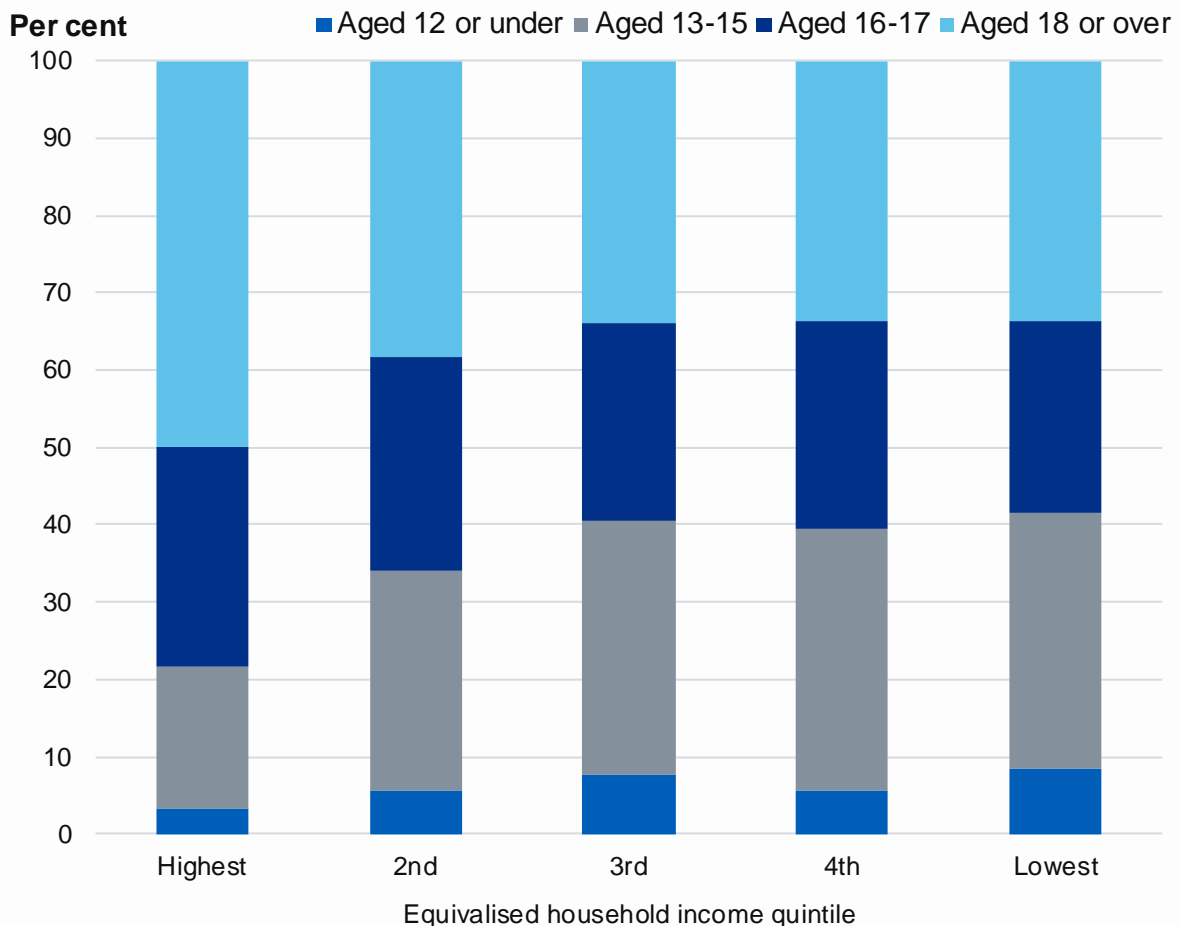
Age started smoking, by income

Current and ex-smokers in the lowest income quintile were the most likely to have started smoking at a younger age. In the lowest income quintile 8% had started smoking aged 12 or under, compared with 3% in the highest income quintile. About two in five in the lowest income quintile had started smoking aged 15 or under (42%), compared with one in five (22%) in the highest income quintile.

Figure 5, Table 8

Figure 5 Age started smoking, by equivalised household income

Base: Current and ex-smokers aged 25 and over



Source: NHS Digital

Intentions to give up smoking

Among current smokers, men were less likely than women to want to give up smoking. 43% of men agreed with one of the two statements indicating they did not want to stop smoking compared with 38% of women. The percentage of adults who did not want to stop smoking was highest among older smokers: 63% of those aged 65 and over did not want to stop smoking.

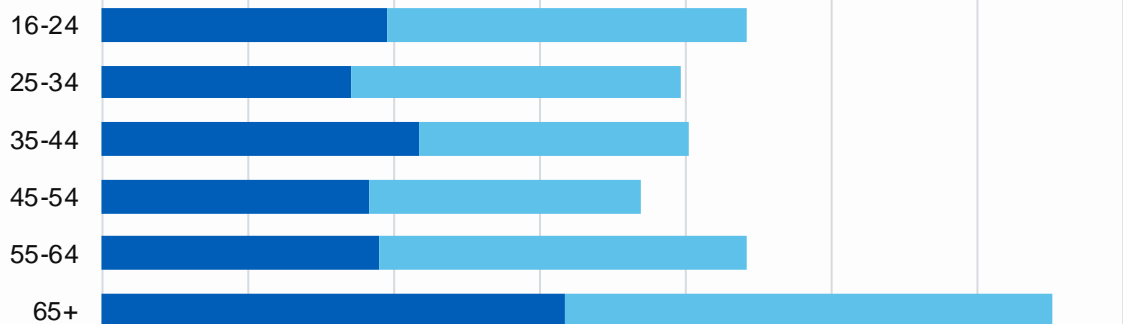
Figure 6, Table 9

Figure 6 Proportion of smokers not intending to stop, by age and sex

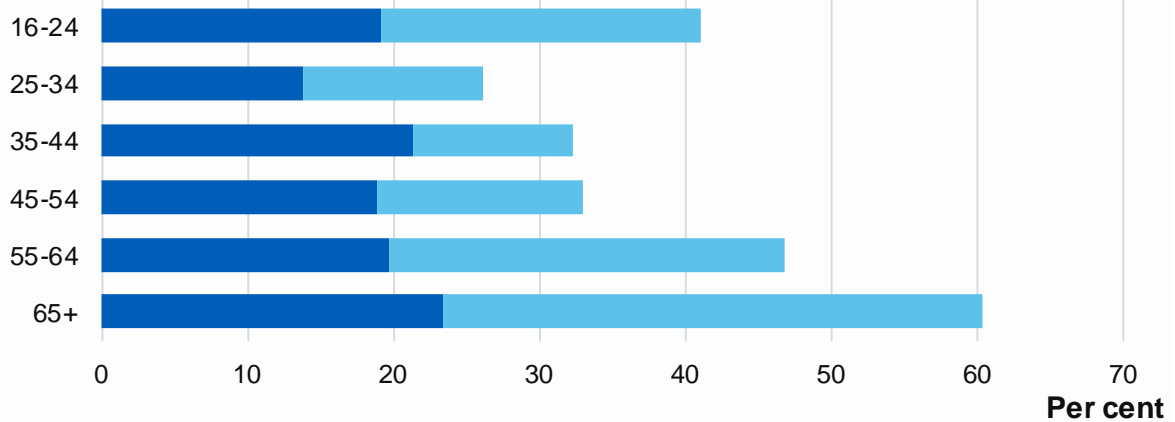
Base: Current smokers aged 16 and over

Age group

Men



Women



Source: NHS Digital

Use of e-cigarettes

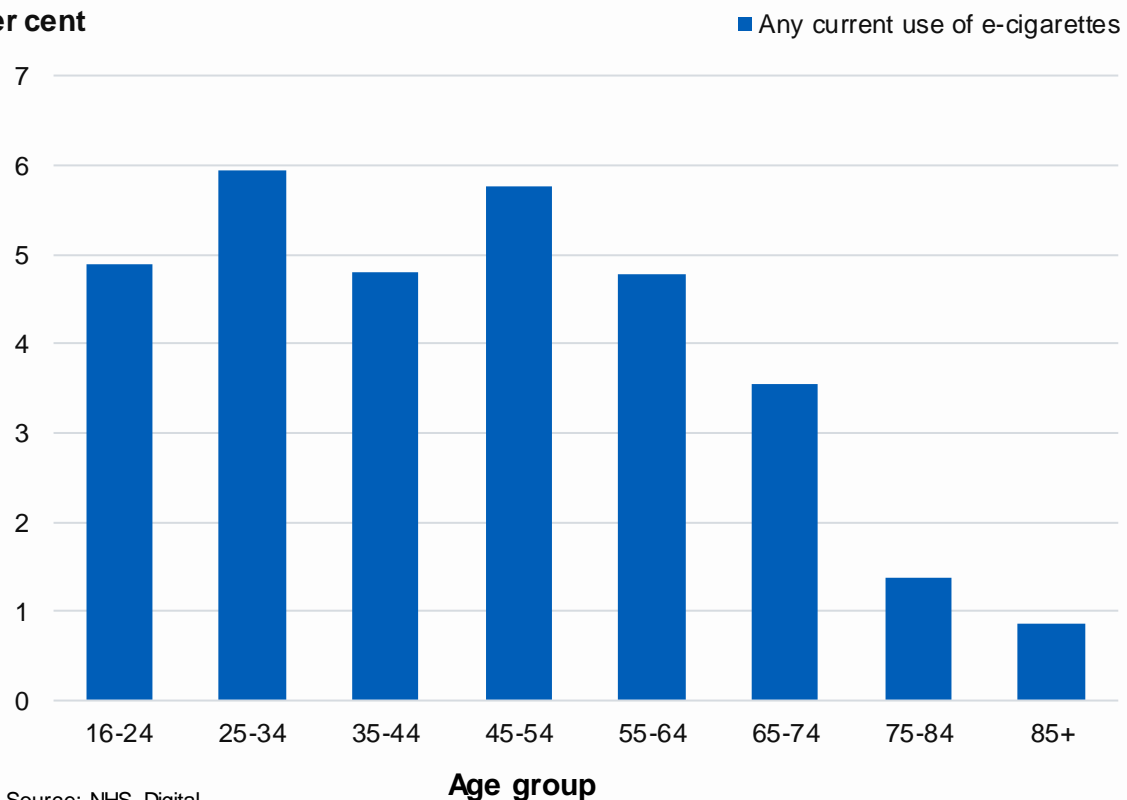
5% of adults were current users of e-cigarettes. This was statistically significantly higher than in HSE2013, when 3% of adults were current users of e-cigarettes. Adults in the oldest age group were the least likely to be current users of e-cigarettes. There were no statistically significant differences by sex.

Figure 7, Table 10

Figure 7 Prevalence of current use of e-cigarettes, by age

Base: Aged 16 and over

Per cent



Source: NHS Digital

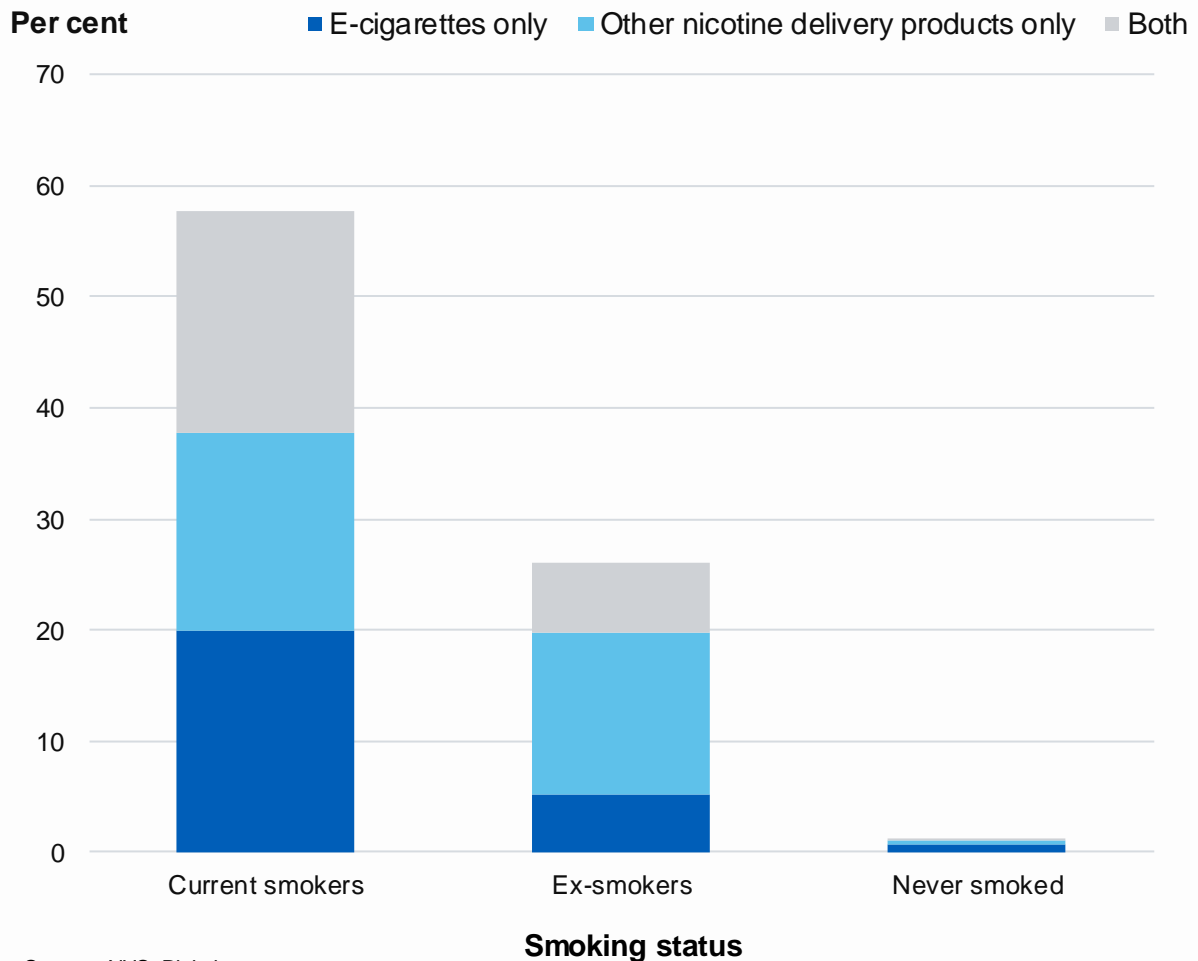
About one in nine (11%) of all adults had used an e-cigarette in the past or currently. This was statistically significantly higher than in HSE2013, when 9% of adults had ever used an e-cigarette.

The proportion that had ever used e-cigarettes was highest among current smokers (40%). Just 1% of adults who had never smoked had ever used an e-cigarette.

Figure 8, Table 11

Figure 8 Prevalence of ever using e-cigarettes and/or other nicotine delivery products, by smoking status

Base: Aged 16 and over



Exposure to secondhand (environmental) tobacco smoke

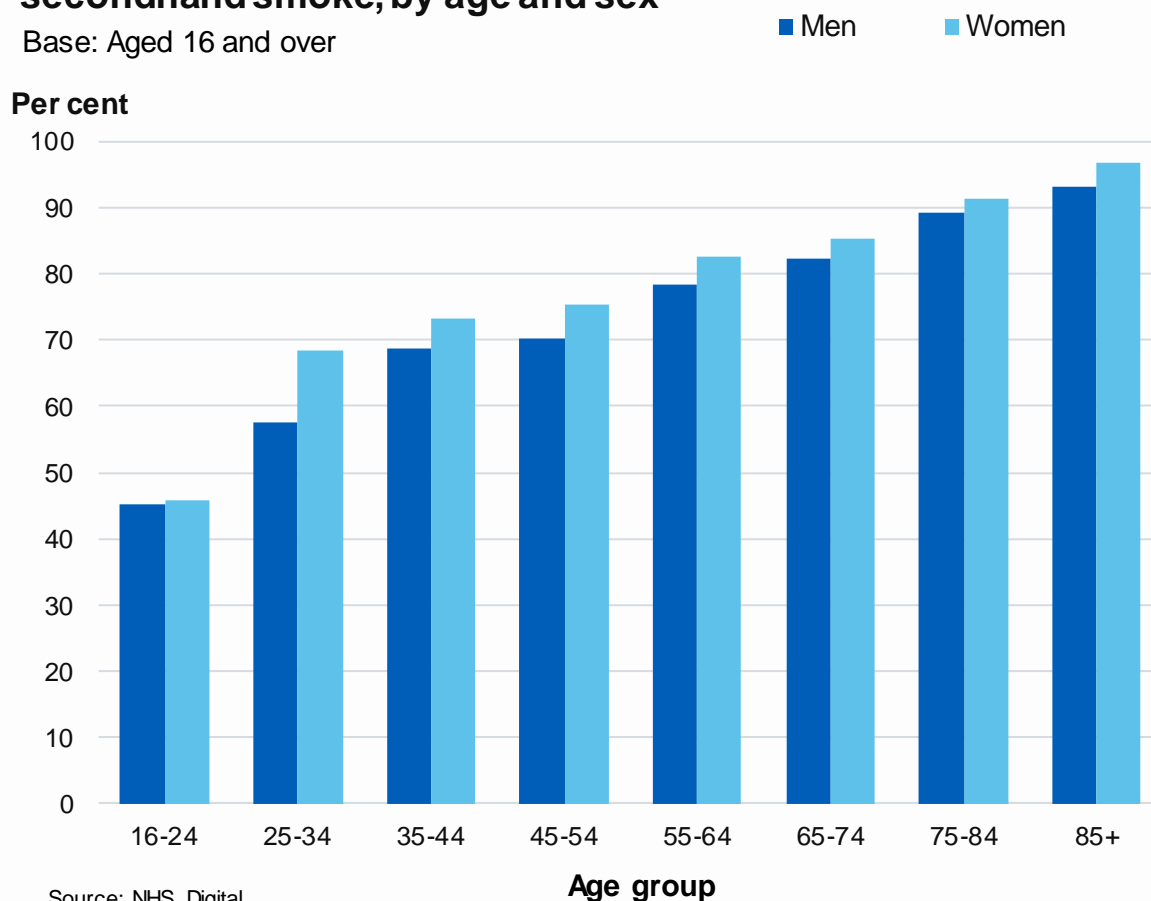
Self-reported exposure to secondhand smoke, by age and sex

72% of adults reported that they were not regularly exposed to secondhand smoke. Younger adults were more likely to be exposed to secondhand smoke than older adults. Fewer than half (45%) of those aged 16 to 24 had reported no exposure. Men were less likely to report no regular exposure to secondhand smoke than were women (69% and 74% respectively).

Figure 9, Table 12

Figure 9 Prevalence of reporting no exposure to secondhand smoke, by age and sex

Base: Aged 16 and over



Source: NHS Digital

Adults were most likely to be exposed to secondhand smoke in outdoor smoking areas of pubs/restaurants/cafes; this location was reported by a higher percentage of men (18%) than women (14%). Locations of exposure to other people’s smoke were also patterned by age, with higher proportions of adults aged 16 to 24 reporting exposure to secondhand smoke in the three most reported locations.

Table 13

Saliva cotinine levels among non-smokers

Detectable saliva cotinine levels among current non-smokers²⁸ generally indicates exposure to secondhand smoke. Conversely, undetectable levels indicate no exposure. Cotinine values are shown as geometric means for self-reported, cotinine-validated non-smokers aged 16 and over (see Methods and Definitions, above, for an explanation of geometric means).

Measures of saliva cotinine and self-reported data indicated a similar pattern of exposure to secondhand smoke across age groups., About eight in ten had undetectable cotinine levels (81%). This was higher among older adults. Similarly, geometric mean cotinine was highest among those aged 16 to 24 (0.09ng/ml) and decreased across age groups, being lowest among those aged 65 to 74 (0.06ng/ml).

Table 15

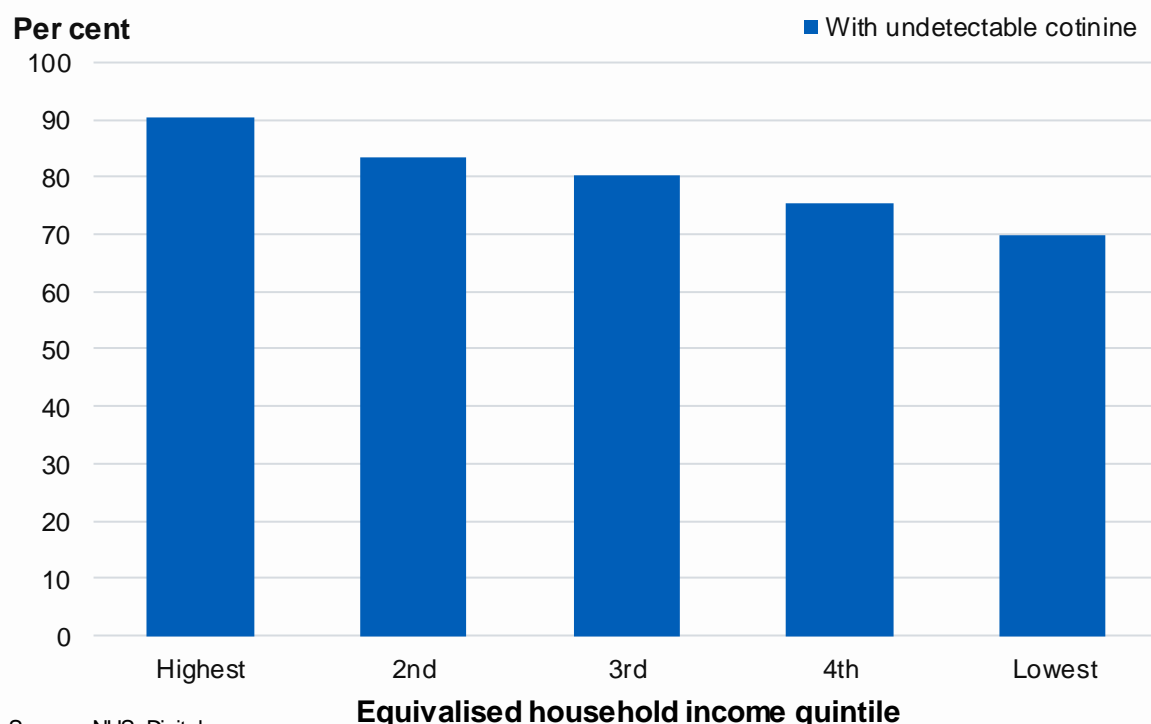
The proportion of non-smokers with undetectable cotinine was higher among those in higher income quintiles, as Figure 10 shows. Correspondingly, geometric mean

cotinine was lowest in the highest income quintiles (0.06ng/ml) and was highest in the lowest income quintile (0.09ng/ml).

Figure 10, Table 16

Figure 10 Prevalence of undetectable cotinine, by equivalised household income

Base: Cotinine validated non-smokers aged 16 and over



Source: NHS Digital

Discussion

Trends in smoking prevalence

The prevalence of current smoking among all adults was 18%. Hence the government has reached its five-year target of reducing smoking levels to 18.5% or less by the end of 2015.¹⁰ This is largely accounted for by a recent fall among men, where the proportion of current smokers was 19% in 2015, the lowest level found in the past 15 years. For women, the prevalence has stayed the same (17%) since 2013.²

Future years’ survey data will be needed to assess whether the reduction in current smoking among men is an ongoing trend or a chance blip due to random variation. Among women, the prevalence of being a current smoker remaining at the same level across three years suggests that levels are stabilising rather than declining.

Exposure to environmental (secondhand) smoke

The proportion of non-smokers who were not exposed to environmental smoke continues to rise. Among non-smokers, 81% had undetectable cotinine levels), which is an increase from the last report in HSE 2013 where 75% had undetectable cotinine levels.⁹ Correspondingly, the geometric mean among all non-smokers, indicating the extent of exposure to environmental smoke, was lower (0.07ng/ml) than in HSE 2013 (0.08ng/ml). Since the smokefree legislation was implemented in 2007, a fall in geometric mean cotinine levels among non-smokers has been noted in each successive HSE report.^{9,29,30,}

However, there remain variations in exposure to environmental smoke by age and income. Those aged 16 to 24 were the most likely to be exposed to others' smoke. Fewer non-smokers in the lowest income quintile (70%) had undetectable cotinine levels than in the highest quintile (90%), and the geometric mean cotinine levels among non-smokers were 0.03ng/ml higher in the lowest quintile compared with the highest income quintile.

Smoking and income inequality

Smoking behaviour varied markedly by income, demonstrating social inequalities in smoking. The proportion of those in the lowest income quintile who were current smokers was three times as many as in the highest income quintile. Among current smokers, cigarette consumption was also highest in the lowest income quintile. These inequalities are likely to have begun from an early age. Current and ex-smokers in the lowest income quintile had started smoking at a younger age, on average, than those in the highest income quintile. Smoking dependence in adulthood is likely to be reinforced when there is a higher consumption of cigarettes during childhood and adolescence; this also increases risk of tobacco-related morbidity and mortality.^{31,32,33}

The use of e-cigarettes

5% of all adults (aged 16 and over) were current users of e-cigarettes; this was higher among younger adults. This represents a small increase from HSE 2013 (3%).⁹ However, the proportion of current smokers who have ever used e-cigarettes has increased markedly. Around four in ten (40%) current smokers in HSE 2015 had ever used e-cigarettes, compared with three in ten (29%) in HSE 2013. The prevalence of ever using e-cigarettes among those who had never smoked remained rare (1%).

Future policy developments

A new tobacco control plan is being considered by the government to be drawn up sometime in the future,³⁴ to replace the last five-year strategy which has come to an end. Any new tobacco-control plan will build upon current legislation that has come into force more recently, including standardised packaging for cigarettes and hand rolling tobacco.³⁵ In October 2015, smoking in cars with children and adolescents under the age of 18 became illegal, as did selling e-cigarettes to those aged under 18.³⁶ As from May 2016, all new packs manufactured are required to be in a mandatory dull brown colour; have specified text for branding or variant; and larger health warning images.

In recent years, the sale of e-cigarettes has been largely unregulated. From May 2016, the Tobacco Products Directive (TPD) introduced new regulations for e-cigarettes and their nicotine refill containers.¹⁴ These include minimum standards for safety; displaying information so that consumers can make informed choices; and protecting children from using e-cigarettes.

Notes and references

- ¹ Department of Health. *Smoking kills: a White Paper on tobacco*. DH, London, 1998. www.gov.uk/government/uploads/system/uploads/attachment_data/file/260754/4177.pdf
- ² NatCen Social Research, UCL (University College London). *Health Survey for England: Trend Tables 2015*. NHS Digital, Leeds, 2016. <http://digital.nhs.uk/hse2015trend>
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- ⁷ Action on Smoking and Health. *Advertising and Promotion*. ASH, London, 2012. www.ash.org.uk/current-policy-issues/advertising-and-promotion
- ⁸ Bauld L. *The Impact of Smokefree legislation in England: Evidence Review*. Department of Health, London, 2011. www.gov.uk/government/uploads/system/uploads/attachment_data/file/216319/dh_124959.pdf
- ⁹ Ng Fat L. *Adult Cigarette smoking*. Chapter 8 in Craig R, Mindell J (eds). *Health Survey for England 2013*. Health and Social Care Information Centre, Leeds, 2014.
- ¹⁰ Department of Health. *Healthy lives, Healthy People: A tobacco control plan for England*. DH, London, 2011. www.gov.uk/government/publications/the-tobacco-control-plan-for-england
- ¹¹ E-cigarettes deliver nicotine that is vapourised and inhaled from a liquid form via a battery-powered device that simulates cigarette smoking. Some are designed to resemble ordinary cigarettes. Once sucked on, a sensor is activated which heats the liquid within the e-cigarette to create a vapour that delivers nicotine to the individual.
- ¹² E-cigarettes are sometimes referred to as vapourisers or electronic nicotine delivery systems (ENDS).
- ¹³ Goniewicz M L, Knysak J, Gawron M et al. Levels of selected carcinogens and toxicants in vapour from electronic cigarettes. *Tobacco Control* 2013;**10**:133-139.
- ¹⁴ McNeill A, Brose LS, Calder R, et al. *E-cigarettes: an evidence update. A report commissioned by Public Health England*. Public Health England, London 2015. www.gov.uk/government/uploads/system/uploads/attachment_data/file/457102/E-cigarettes_an_evidence_update_A_report_commissioned_by_Public_Health_England_FINAL.pdf
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- ¹⁶ Vardavas CI, Anagnostopoulos N, Kougias M et al. Short-term pulmonary effects of using an electronic cigarette: impact on respiratory flow resistance, impedance, and exhaled nitric oxide. *Chest* 2012;**141**:1400-1406.
- ¹⁷ *Simon Chapman on e-cigarettes: the best and the worst case scenarios for public health*. BMJ Group Blogs, 2014. blogs.bmj.com/bmj/2014/03/14/simon-chapman-on-e-cigarettes-the-best-and-the-worst-case-scenarios-for-public-health/
- ¹⁸ McRobbie H, Bullen C, Hartmann-Boyce J et al. *Electronic cigarettes for smoking cessation and reduction*. *Cochrane Database of Systematic Reviews* 2014:**12**
- ¹⁹ Participants were also asked at the nurse visit about current smoking status and about current use of any nicotine delivery product. Results presented in the tables relating to self-reported smoking status, cigarette consumption, or use of nicotine delivery products are based on the answers given at the initial interview. For tables presenting results on cotinine, current smoking status is based on information given at the nurse visit, since this was when the saliva sample was taken. In these tables, ex-smokers (used to smoke cigarettes regularly) and never smokers (never smoked cigarettes regularly) were distinguished by combining 'non-smokers' at the nurse visit with information on smoking status as reported at the earlier interview.
- ²⁰ Jarvis M, Fidler J, Mindell J et al. Assessing smoking status in children, adolescents and adults: cotinine cutpoints revisited. *Addiction* 2008;**103**:1553-1561.
- ²¹ Full details are provided in Health Survey for England 2015 Methods and documentation, available at <http://digital.nhs.uk/pubs/hse2015>
- ²² Geometric means have been presented for non-smokers as their cotinine data have a very skewed distribution: there are large numbers of extremely low values and a small number of very high values. Using the arithmetic mean is not appropriate as this can be distorted with such a distribution. The geometric mean is an average calculated by multiplying the cotinine values and taking the nth root, where n is the number of values. The geometric mean takes the outliers with very high values into account by estimating the typical value (or central tendency) of the set of data. Confidence intervals around the estimate are presented rather than standard errors.

- ²³ Fidler J, Jarvis M, Mindell J et al. *Nicotine intake in English smokers: distribution and demographic correlates*. *Cancer Epidemiology and Biomarkers Prevalence*. 2008;**17**:3331-3336.
- ²⁴ The previous saliva cotinine threshold of 15ng/ml was established over 20 years ago on a non-representative sample of smokers and non-smokers (source: Jarvis M, Tunstall-Pedoe H, Feyerabend C et al. *Comparison of tests used to distinguish smokers from nonsmokers*. *American Journal of Public Health* 1987;**77**:1435-1438). Cotinine cut-points depend on both the level of smoking and of secondhand exposure in the population. They are therefore country specific and need to be re-evaluated as smoking prevalence changes. A reduction in the level of smoking and secondhand exposure was thought to have influenced the reduction in the optimal cut-point to detect personal use of tobacco.
- ²⁵ Jarvis M, Feyerabend C, Bryant A et al. Passive smoking in the home: plasma cotinine concentrations in non-smokers with smoking partners. *Tobacco Control* 2001;**10**:368-374.
- ²⁶ Jarvis M. Dietary nicotine: Won't mislead on passive smoking. *BMJ*. 1994;**308**:61-62.
- ²⁷ Public Health, England and Wales. *The Children and Young Persons (Sale of Tobacco etc) .Order 2007*. The Stationary Office. London, 2007. www.legislation.gov.uk/ukSI/2007/767/contents/made
- ²⁸ Non-smokers were cotinine-validated; meaning only self-reported never smokers or ex-smokers at the time of the nurse visit with saliva cotinine levels less than 12ng/ml, the cut-point indicative of smoking, were included.
- ²⁹ Wardle H, Mindell J. 'Adult Cigarette smoking'. Chapter 6 in Craig R, Shelton N (eds). *Health Survey for England 2007. Knowledge, attitudes and behaviour*. The Health and Social Care Information Centre, Leeds, 2008
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