

# Quitting behaviours and cessation methods used in eight European Countries in 2018: findings from the EUREST-PLUS ITC Europe Surveys

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**Background:** We examined quit attempts, use of cessation assistance, quitting beliefs and intentions among smokers who participated in the 2018 International Tobacco Control (ITC) Europe Surveys in eight European Union Member States (England, Germany, Greece, Hungary, the Netherlands, Poland, Romania and Spain).

**Methods:** Cross-sectional data from 11 543 smokers were collected from Wave 2 of the ITC Six European Country (6E) Survey (Germany, Greece, Hungary, Poland, Romania and Spain—2018), the ITC Netherlands Survey (the Netherlands—late 2017) and the Four Countries Smoking and Vaping (4CV1) Survey (England—2018). Logistic regression was used to examine associations between smokers' characteristics and recent quit attempts. **Results:** Quit attempts in the past 12 months were more frequently reported by respondents in the Netherlands (33.0%) and England (29.3%) and least frequently in Hungary (11.5%), Greece (14.7%), Poland (16.7%) and Germany (16.7%). With the exception of England (35.9%), the majority (56–84%) of recent quit attempts was unaided. Making a quit attempt was associated with younger age, higher education and income, having a smoking-related illness and living in England. In all countries, the majority of continuing smokers did not intend to quit in the next 6 months, had moderate to high levels of nicotine dependence and perceived quitting to be difficult. **Conclusions:** Apart from England and the Netherlands, smokers made few quit attempts in the past year and had low intentions to quit in the near future. The use of cessation assistance was sub-optimal. There is a need to examine approaches to supporting quitting among the significant proportion of tobacco users in Europe and increase the use of cessation support as part of quit attempts

## Introduction

Tobacco use is the leading preventable cause of death and disability in Europe and is responsible for enormous costs to publicly funded national health care systems.<sup>1</sup> Despite overall declines in smoking prevalence and increased quit ratios from 2006 to 2014 in many European Union (EU) Member States (MS), prevalence has remained stable since 2014, with over one-quarter (26%) of the EU population reporting smoking in 2017, while quit attempt rates have decreased from 2014 to 2017.<sup>2,3</sup> The World Health Organization (WHO) has set a global goal of a 30% reduction in tobacco use by 2025 and this is an identified priority of the WHO European region.<sup>4</sup>

Evidence-based smoking cessation treatments exist which can substantially increase smokers' chances of long-term smoking cessation compared with unaided quitting.<sup>5</sup> The most effective method is to use a combination of behavioural support and first-line quit smoking medication [such as varenicline or nicotine replacement therapy (NRT)].<sup>6,7</sup> While the majority of EU MS operates a national quitline and over one-third provide cost coverage of NRT and other cessation services, most continue to provide less than the recommended level of tobacco cessation support.<sup>1</sup> This is further evidenced by the low to moderate rates of use of evidence-based smoking cessation treatments that have been documented across many EU MS.<sup>8–10</sup>

The WHO Framework Convention on Tobacco Control (FCTC) Article 14 (Smoking Cessation) aims to increase access to and use of treatments for tobacco dependence to increase rates of quitting and ultimately reduce the demand for tobacco.<sup>11</sup> Monitoring trends in quitting behaviours are important to understand the extent to which progress is being made in achieving the goals of Article 14.<sup>12</sup> Similarly, understanding factors that are associated with quitting behaviours and use of tobacco treatments is important to inform future policy and practice, including tailoring interventions for target populations.

This paper examines quitting behaviours including quit attempts (successful or not), use of cessation support, quitting beliefs and intentions among current smokers and quitters from eight EU MS (Germany, Greece, Hungary, Romania, Poland, Spain, the Netherlands and England) participating in the European Regulatory Science on Tobacco: Policy Implementation to Reduce Lung Diseases (EUREST-PLUS) International Tobacco Control (ITC) Europe Surveys in 2018. We also examine factors associated with quitting behaviours including country of residence, comorbidity, nicotine dependence, depressive symptoms, socio-economic status, gender and age. The paper is a follow-up to the 2016 ITC EUREST-PLUS survey, reporting on data collected ~18 months later in each country.<sup>8</sup>

## Methods

### Data source and sampling

A cross-sectional analysis was conducted of data derived from nationally representative surveys of smokers conducted as part of the ITC Europe Surveys. Specifically, we analyzed data collected as part of Wave 2 of the ITC Six European Country (6E) Survey (Germany, Greece, Hungary, Poland, Romania and Spain), the ITC Netherlands Survey (the Netherlands) and the Four Countries Smoking and Vaping (4CV1) Survey (England). While the ITC surveys are longitudinal, this paper reports on cross-sectional data from Wave 2 (February–May 2018) of the ITC 6E survey as well as contemporaneous data from Wave 11 of the ITC Netherlands (NL11) Survey (November–December 2017) and Wave 2 of the 4CV1 Survey in England (February–July 2018). The previous waves of data collection were conducted in 2016 in each country. All participants were recruited into the ITC study as current cigarette smokers. In 2017/2018, we attempted to re-contact and interview all of the respondents from the 2016 ITC survey who had agreed to be re-contacted

(re-contact sample). Non-responders (ranging from 30 to 64% across countries) were replaced with the recruitment of new eligible cigarette smokers (replenishment sample) to maintain the targeted sample size in each country. The overall sample size for each of the MS were England ( $n=4260$ ), Germany ( $n=1010$ ), Greece ( $n=1010$ ), Hungary ( $n=1000$ ), the Netherlands ( $n=1256$ ), Poland ( $n=996$ ), Romania ( $n=1003$ ) and Spain ( $n=1008$ ). Further details are provided elsewhere on the methodology for the ITC 6E,<sup>13</sup> ITC NL11<sup>14,15</sup> and 4CV1<sup>16</sup> surveys.

## Measures

### Quit attempts

In the re-contact sample, current smoking status was assessed with the question 'Do you still smoke cigarettes or have you quit?', with the response options 'still smoke cigarettes', 'quit' and 'don't know'. All newly recruited (replenishment sample) participants were current smokers. Respondents who reported current smoking were asked: 'Have you ever tried to quit smoking? (yes/no)', with those who responded 'yes' subsequently asked: 'Have you made any attempts to stop smoking since we last spoke to you?' (re-contact sample) or 'Have you made an attempt to quit smoking in the last 18 months?' (replenishment sample) (yes/no). Respondents were asked to report the timeframe of their quitting/quit attempt, which was used to derive the proportion of quit attempts in the past 12 months. We categorized respondents as having made a quit attempt if they (i) reported being currently quit (successful quitters) or (ii) were current smokers who reported making a quit attempt in the previous 12 months (unsuccessful quitters). Unsuccessful quitters were asked 'How long did you stay smoke-free on your most recent quit attempt?' (<1 day, 1–6 days, 1–4 weeks, 1–6 months, 7–12 months, 13–18 months). Respondents who had made a quit attempt were also asked '[On your most recent quit attempt,] did you stop smoking suddenly or did you gradually cut down on the number of cigarettes you smoked?'

### Cessation support

Except for the Netherlands, all respondents who had tried to quit smoking in the past 12 months were asked: 'Which of the following products and services did you use as part of your last/current quit attempt?', with 'yes/no' responses for the following quitting methods: (i) NRT, such as patches, gum and mouth spray; (ii) other pharmacotherapy, including varenicline (Chantix or Champix), bupropion (Zyban or Wellbutrin) and cytosine (Desmoxan or Tabex); (iii) local stop-smoking services such as clinics, specialists, individual or group counselling, stop-smoking courses or behavior therapy; (iv) face-to-face advice from a doctor or other health care professional; (v) telephone/quitline services; (vi) apps or automated services on a mobile phone or tablet; (vii) the internet, i.e. a website about quitting smoking but not including mobile phone or tablet apps; (viii) pamphlets or brochures on how to quit; (ix) e-cigarette or vaping device; (x) heated tobacco product and (xi) other.

### Nicotine dependence, quitting intentions, self-efficacy and beliefs about quitting

This set of variables was assessed only among current smokers at the time of the survey. Nicotine dependence was assessed using the Heaviness of Smoking Index [HSI; low (0–1), moderate (2–4) and high (5, 6)].<sup>17</sup> Intention to quit smoking was assessed by: 'Are you planning to quit smoking...?'; with the response options: (i) within the next month, (ii) within the next 6 months, (iii) sometime in the future, beyond 6 months or (iv) not planning to quit. Self-efficacy was assessed by: 'If you decided to give up smoking completely in the next 6 months, how sure are you that you would succeed...?'; answered on a 5-point scale from 'not at all sure' to 'extremely sure'. Perceived difficulty of quitting was assessed in all countries except for England

using the question: 'How difficult would it be for you to quit smoking if you wanted to?', again answered on a 5-point scale from 'not at all difficult' to 'extremely difficult'. Beliefs about the health benefits of quitting smoking were assessed with the question 'How much do you think you would benefit from health and other gains if you were to quit smoking permanently in the next 6 months? (continuing smokers)/stay quit permanently? (quitters)'. Response options were not at all, slightly, moderately, very much and extremely.

### **Comorbidities, alcohol problems and depressive symptoms**

We assessed the presence of comorbidities using the question 'Are you currently being treated for, or do you have a current diagnosis for, any of the following?' [chronic pain, diabetes, cancer, heart disease, chronic lung disease (COPD, emphysema or chronic bronchitis), asthma and tuberculosis]. The same question was asked to determine the presence of 'alcohol problems'. Participants responded either yes, no or don't know. Respondents were classified as having a positive screen for depressive symptoms if they responded yes to at least one of the following three questions: (i) 'during the last 30 days, have you often been bothered by little interest or pleasure in doing things?' (yes/no), (ii) 'during the last 30 days, have you often been bothered by feeling down, depressed or hopeless?' (yes/no)<sup>18</sup> or (iii) 'are you currently being treated for, or do you have a current diagnosis for depression?' (yes/no). These variables were not assessed among respondents from the Netherlands.

### **Socio-demographic measures**

Data were collected on age, gender, education [low: primary, lower and middle (both prevocational secondary); moderate (secondary vocational, senior general secondary and pre-university) and high (higher professional or a university degree)] and income. Monthly household gross income was reported in the local currency.<sup>13</sup> Financial stress, a direct indicator of economic deprivation,<sup>19</sup> was assessed by: 'In the last 30 days, because of a shortage of money, were you unable to pay any important bills on time, such as electricity, telephone or rent bills?' (yes/no). Financial stress was not assessed among respondents in the Netherlands.

### **Statistical analysis**

Descriptive statistics were calculated for each country and presented as percentages and 95% confidence intervals (95% CIs). As done in all ITC surveys, all statistics presented were weighted to ensure estimates represented the population of smokers in each country. Calibration of the weights was done according to estimated total smokers by age and sex, but in addition, we considered NUTS region and degree of urbanization.<sup>13</sup> We performed stratified analyses using chi-squared statistics to examine the characteristics of respondents who made a quit attempt of 24 h or longer in the previous 12 months compared with those who did not make a quit attempt. Logistic regression was used to examine differences between respondents who made a quit attempt in the previous 12 months and those who did not, stratified by country. Univariate analyses were performed in a first step. Multivariable logistic regression analyses were then conducted to examine factors associated with quit attempts in the past 12 months of varying duration (>24 h; >1 and >6 months), including the independent variables comorbidity, depression and alcohol problems and socio-economic variables found to be significant in univariate analyses (gender, age, country, education and income). The Netherlands was not included in the logistic regression analyses due to the unavailability of data for several covariates (comorbidities, alcohol problems, depressive symptoms and financial stress). Data were analyzed with SPSS 24.0 using the Complex Samples package to account for the complex sampling design. Missing data were excluded on a case-by-case basis.

## **Results**

### **Quitting behaviour**

The overall sample consisted of 10 884/11 543 (94.1%) current smokers and 685/11 543 (5.9%) respondents who were currently quit. Quit attempts (successful or not) in the past 12 months were reported most frequently by respondents in the Netherlands (33.0%) and England (29.3%) and least frequently by respondents in Hungary (11.5%) and Greece (14.7%) (table 1). There was also large variation across MS in the proportion of respondents who had ever made a quit attempt, with England (75.4%) and the Netherlands (78.0%) reporting the highest rates (table 1). By comparison, approximately half of respondents in Greece (45.1%) and Hungary (50.6%) had ever attempted to quit.

### **Cessation support**

With the exception of England, the majority of recent quit attempts made by respondents was unaided (table 2). E-cigarettes were the most widely used quit aid in England (51.7%), Greece (26.3%) and Germany (15.0%) with lower rates reported in the other countries. Other less frequently reported forms of support were smoking cessation services, apps, the Internet and quitlines, with respondents from England and Germany consistently reporting the highest rates of use of these forms of cessation support.

### **Heaviness of smoking, quitting intentions, self-efficacy, perceived difficulty and importance**

The majority of current smokers reported moderate levels of nicotine dependence (table 3). Smokers from Greece, Hungary, Romania and Poland reported higher levels of nicotine dependence. Greece was the only country sampled with greater than 10% of smokers categorized as highly dependent (15.9%). Continuing smokers in all countries reported low rates of self-efficacy to quit. Approximately, half of smokers believed that it would be 'very' or 'extremely' difficult to quit, with lowest rate reported among respondents from Spain (41.2%).

### **Characteristics of individuals who made a quit attempt in previous 12 months**

Stratified analysis with chi-squared statistics examined characteristics of those who made a quit attempt in the past 12 months (Supplementary table S1). Quit attempts were more frequently reported among younger (<24 years of age) respondents, and respondents who did not screen positive for depression. Higher education and the presence of health-related comorbidities were associated with making a quit attempt in the past 12 months, however, these associations were not present in all countries. In England and Germany, females were significantly more likely to have made a quit attempt.

Among current smokers, individuals who made a quit attempt in the past 12 months had lower nicotine dependence and reported believing that one would benefit from health and other gains if one was to quit smoking permanently 'very much/extremely', compared with those who did not make a quit attempt.

The results of the multivariable logistic regression analyses are reported in table 4. Younger age was associated with having made a quit attempt regardless of its duration, with smokers aged 40+ consistently significantly less likely to have tried to quit than the reference group of 18–24 years old. Respondents from England were more likely to make >24-h quit attempts and >1 month quit attempts than respondents from other countries (except for Spain for the latter). Higher education and household income was positively associated with making a short-term quit attempt but not with quit attempts of longer duration. The presence of a smoking related comorbidity was associated with making a quit attempt of shorter

**Table 1** Quitting behavior and intentions to quit by country in 2018 (weighted results)

Quit outcome	n	England, % (95% CI)	n	Germany, % (95% CI)	n	Greece, % (95% CI)	n	Hungary, % (95% CI)	n	Netherlands, % (95% CI)	n	Poland, % (95% CI)	n	Romania, % (95% CI)	n	Spain, % (95% CI)
Ever tried to quit																
Yes	3212	75.4 (73.4–77.2)	628	61.5 (54.0–64.1)	460	45.1 (40.4–49.9)	521	50.6 (45.9–55.3)	963	78.0 (75.0–80.6)	589	58.9 (53.5–64.1)	659	65.9 (61.2–70.4)	704	69.1 (63.1–74.5)
No	1005	24.6 (22.8–26.6)	382	38.5 (33.7–43.6)	550	54.9 (50.1–59.6)	477	49.4 (44.7–54.1)	290	22.0 (19.4–25.0)	401	41.1 (35.9–46.5)	343	34.1 (29.6–38.8)	304	30.9 (25.5–36.9)
Quit attempt in past 12 months																
Yes	1531	31.9 (29.9–33.9)	186	18.4 (14.9–22.6)	157	16.5 (14.3–18.8)	127	13.4 (10.7–16.8)	485	37.6 (34.2–41.0)	179	18.8 (14.9–23.4)				
No	2729	68.1 (66.1–70.1)	822	81.6 (77.4–85.1)	853	83.5 (81.2–85.7)	873	86.6 (83.2–89.3)	771	62.4 (59.0–65.8)	817	81.2 (76.6–85.1)				
Quit attempt in past 12 months (>24 h) <sup>a</sup>																
Yes	1396	29.3 (27.3–31.2)	168	16.7 (13.4–20.6)	138	14.7 (12.6–17.0)	107	11.5 (8.9–14.7)	422	33.0 (29.8–36.4)	159	16.7 (12.9–21.2)	241	23.0 (19.7–26.7)	254	22.0 (18.6–25.9)
No	2864	70.7 (68.8–72.7)	840	83.3 (79.4–86.6)	872	85.3 (83.0–87.4)	893	88.5 (85.3–91.1)	834	67.0 (63.6–70.2)	837	83.3 (78.8–87.1)	762	77.0 (73.3–80.3)	753	78.0 (74.1–81.4)
Duration of most recent quit attempt <sup>a</sup>																
<1 day	119	7.6 (5.9–9.7)	13	6.8 (3.3–13.2)	17	10.1 (5.8–17.1)	12	9.6 (4.5–19.3)	2	0.6 (0.1–2.2)	16	10.3 (5.9–17.5)	40	13.8 (9.1–20.3)	29	13.7 (9.2–20.0)
1–6 days	416	27.2 (24.0–30.8)	38	22.5 (14.2–33.8)	33	27.2 (20.6–34.9)	28	24.9 (15.1–38.3)	96	22.6 (18.0–28.1)	94	27.9 (20.9–36.1)	94	32.6 (26.1–39.8)	46	14.4 (10.1–20.0)
1–4 weeks	569	36.6 (33.0–40.4)	53	27.7 (19.7–37.4)	30	17.3 (11.3–25.4)	28	26.7 (17.4–38.6)	129	31.5 (26.0–37.6)	44	21.9 (15.0–30.7)	47	17.7 (11.5–26.2)	59	21.9 (14.4–31.9)
1–6 months	315	21.6 (18.2–24.1)	37	22.0 (16.1–29.3)	30	18.2 (11.8–27.0)	22	17.0 (11.0–25.4)	123	29.1 (23.9–35.0)	41	24.6 (18.5–31.8)	44	15.2 (11.1–20.5)	73	22.7 (17.0–29.5)
7–12 months	60	4.3 (3.1–5.8)	21	10.2 (6.1–16.7)	22	13.2 (8.5–19.9)	11	7.4 (4.2–12.9)	53	13.7 (9.9–18.8)	14	8.3 (3.9–16.8)	25	9.9 (6.5–14.9)	41	12.1 (8.3–17.3)
13–18 months	36	3.3 (2.2–4.9)	19	10.8 (6.2–18.2)	23	14.0 (8.9–21.4)	18	14.4 (8.6–23.0)	6	2.4 (0.9–6.4)	17	7.0 (4.1–11.7)	31	10.9 (6.8–17.0)	35	15.3 (10.2–22.2)
Approach used in most recent quit attempt <sup>a</sup>																
Stopped suddenly	758	56.6 (52.8–60.3)	125	68.5 (59.6–76.3)	92	62.0 (51.6–71.4)	86	69.4 (57.4–79.3)	321	76.1 (70.5–80.8)	123	66.5 (56.3–75.3)	211	74.3 (67.6–80.0)	207	72.2 (63.8–79.3)
Cut down gradually	718	43.4 (39.7–47.2)	61	31.5 (23.7–40.4)	64	38.0 (28.6–48.4)	41	30.6 (20.7–42.6)	108	23.9 (19.2–29.5)	55	33.5 (24.7–43.7)	73	25.7 (20.0–32.4)	77	27.8 (20.8–36.2)
Intention to quit (among those still smoking)																
Within 1 month	491	9.0 (7.8–10.3)	26	2.9 (1.6–5.0)	11	1.1 (0.5–2.6)	19	2.1 (1.2–3.4)	59	6.2 (4.6–8.3)	12	1.1 (0.6–2.1)	46	4.8 (3.3–6.8)	39	3.9 (2.6–5.8)
Within 6 months	1004	22.9 (21.0–24.9)	72	7.4 (5.4–10.0)	43	4.2 (2.9–6.1)	85	9.5 (7.2–12.4)	214	19.7 (16.8–23.0)	83	9.2 (6.3–13.3)	84	7.9 (5.9–10.6)	93	9.0 (6.2–12.9)
Beyond 6 months	1195	30.8 (28.8–32.9)	449	47.6 (42.5–52.7)	267	26.2 (22.3–30.4)	165	16.9 (13.5–20.8)	466	38.8 (35.3–42.3)	250	25.7 (21.9–29.9)	337	37.4 (32.9–42.1)	237	27.4 (23.5–31.7)
No plan/do not know	1397	37.3 (35.2–39.4)	399	42.2 (36.4–48.1)	625	68.5 (63.7–72.9)	680	71.6 (68.8–76.0)	394	35.4 (32.0–38.9)	603	63.9 (58.0–69.4)	451	49.9 (45.0–54.9)	517	59.7 (53.7–65.5)

a: Analyses include respondents reporting successful or unsuccessful quit attempt.

**Table 2** Use of cessation support during most recent quit attempt (weighted results)

Variable	England, % (95% CI), N = 1482	Germany, % (95% CI), N = 185	Greece, % (95% CI), N = 157	Hungary, % (95% CI), N = 127	Poland, % (95% CI), N = 179	Romania, % (95% CI), N = 284	Spain, % (95% CI), N = 285
Any cessation support <sup>a</sup>	64.1 (60.2–67.7)	36.1 (27.1–46.2)	44.0 (33.8–54.7)	27.0 (17.8–38.7)	19.1 (13.7–26.1)	16.0 (11.7–21.5)	21.1 (15.6–28.0)
Any first-line medication	30.6 (27.3–34.2)	14.4 (8.9–22.4)	5.4 (2.5–11.4)	10.9 (5.3–21.3)	8.6 (5.2–14.1)	8.6 (6.6–13.1)	9.3 (5.9–14.4)
NRT	23.8 (20.8–27.2)	13.7 (8.6–21.2)	5.1 (2.3–11.3)	10.1 (4.6–20.9)	6.2 (3.2–11.7)	7.5 (4.6–11.9)	7.1 (4.2–11.7)
Varenicline	6.4 (5.0–8.3)	2.7 (0.7–10.1)	1.0 (0.2–4.8)	2.1 (0.8–5.9)	3.2 (1.8–5.7)	1.6 (0.6–4.0)	2.7 (1.2–5.8)
Bupropion	2.6 (1.6–4.0)	0.8 (0.1–5.5)	0 (0–0)	0 (0–0)	1.7 (0.5–5.5)	0.5 (0.1–1.9)	0.1 (0–0.4)
Smoking cessation service	6.8 (5.0–9.1)	1.7 (0.6–4.7)	0 (0–0)	2.4 (0.43–14.8)	2.3 (0.9–6.0)	0.7 (0.2–2.3)	2.6 (1.0–6.6)
Face-to-face advice from a health care professional	7.5 (5.8–9.7)	9.7 (5.0–17.8)	7.4 (3.5–15.1)	11.5 (5.4–22.9)	7.9 (4.7–12.9)	1.5 (0.7–3.1)	8.3 (5.1–13.2)
Quitline	2.1 (1.5–3.1)	2.6 (0.7–8.6)	0.6 (0.1–4.4)	0.0 (0.1–6.2)	1.1 (0.2–4.9)	1.3 (0.4–4.5)	0 (0–0)
Apps	6.2 (4.5–8.5)	4.2 (1.5–11.0)	0.0 (0–0)	1.3 (0.3–4.8)	0.8 (0.2–3.0)	0.4 (0.1–1.5)	0.9 (0.3–3.2)
Internet	10.2 (8.3–12.6)	6.7 (3.1–13.7)	0.7 (0.1–4.8)	2.6 (0.6–10.4)	1.8 (0.6–4.8)	1.7 (0.7–4.1)	0.3 (0–2.0)
Printed materials	4.6 (3.2–6.3)	6.9 (3.6–13.1)	2.1 (0.7–6.5)	5.8 (1.9–16.3)	4.3 (2.1–8.4)	1.0 (0.3–2.8)	2.5 (0.9–6.6)
E-cigarette or vaping device	51.7 (47.5–55.9)	15.0 (9.7–22.3)	26.3 (18.9–37.8)	6.6 (3.3–12.7)	5.0 (2.3–10.2)	3.4 (1.8–6.2)	3.0 (1.5–5.7)
Heated tobacco product	1.0 (0.5–1.9)	0.7 (0.1–4.8)	11.9 (4.8–20.9)	2.0 (0.5–8.7)	2.1 (0.8–5.4)	1.8 (0.6–4.9)	0.2 (0.0–1.2)

Data presented for all respondents who reported making a quit attempt in previous 12 months.

a: Any cessation support = respondent has used one or more of the available cessation support listed in the table.

**Table 3** Nicotine dependence, self-efficacy and perceived difficulty of quitting among current smokers, by country

Variable	England, % (95% CI)	Germany, % (95% CI)	Greece, % (95% CI)	Hungary, % (95% CI)	Netherlands, % (95% CI)	Poland, % (95% CI)	Romania, % (95% CI)	Spain, % (95% CI)
Nicotine dependence <sup>a</sup>	n = 3695	n = 830	n = 932	n = 924	n = 1086	n = 888	n = 899	n = 857
Low	36.1 (33.9–38.4)	26.8 (22.8–31.3)	17.2 (14.5–20.4)	13.6 (10.7–17.2)	35.6 (32.0–39.3)	20.1 (16.1–24.8)	16.5 (13.3–20.2)	33.0 (28.0–38.6)
Medium	58.1 (55.8–60.4)	66.4 (60.9–71.4)	66.9 (62.8–70.7)	80.9 (77–84.3)	60.3 (56.6–64.0)	71.1 (66.9–75.0)	75.4 (71.4–79.1)	62.0 (57.3–66.4)
High	5.7 (4.8–6.9)	6.8 (4.5–10.2)	15.9 (13.2–19.0)	5.5 (3.9–7.7)	4.1 (2.9–5.8)	8.8 (6.7–11.4)	8.1 (5.7–11.3)	5.0 (3.1–7.9)
Self-efficacy	n = 3868	n = 940	n = 947	n = 920	n = 1,025	n = 892	n = 887	n = 858
Not at all sure	36.2 (34–38.4)	29.6 (25.6–33.9)	45.9 (40.3–51.6)	43.3 (38.7–48.0)	38.9 (35.3–42.7)	46.5 (40.3–52.8)	33 (28.9–37.3)	20.9 (16.5–26.3)
Slightly sure	20.4 (18.7–22.3)	28.9 (24.9–33.2)	34.8 (30.6–39.2)	19.4 (16.7–22.3)	39.1 (35.4–43.0)	18.7 (15.4–22.5)	29.1 (25.5–32.9)	42.4 (36.6–48.4)
Moderately sure	27.5 (25.5–29.7)	24.9 (21.5–28.7)	13.2 (10.2–16.9)	25.7 (21.6–30.3)	13.9 (11.5–16.7)	27.3 (22.3–32.9)	20.8 (17.4–24.7)	21.0 (17.0–25.7)
Very sure	9.7 (8.4–11.1)	12.1 (9.9–14.8)	4.5 (3.1–6.6)	8.4 (6.3–11.1)	3.5 (2.4–5.0)	3.7 (2.3–5.9)	12.4 (9.6–16)	7.7 (4.8–12.3)
Extremely sure	6.2 (5.2–7.4)	4.5 (2.5–7.8)	1.5 (0.9–2.6)	3.2 (2.0–5.1)	4.5 (3.1–6.4)	3.8 (2.1–6.9)	4.7 (3.4–6.5)	7.9 (5.7–10.8)
Perceived difficulty of quitting <sup>a</sup>		n = 942	n = 848	n = 927	n = 1076	n = 924	n = 896	n = 881
Not at all difficult	–	5.7 (3.9–8.3)	4.5 (3.3–6.3)	5.1 (3.5–7.3)	3.2 (2.3–4.5)	4.3 (2.3–7.8)	10.3 (7.9–13.2)	4.0 (2.8–5.6)
Slightly difficult	–	12.3 (10.0–15.1)	16.2 (13.2–19.8)	15.0 (11.9–18.7)	20.6 (17.8–23.7)	16.9 (13.6–20.9)	15.8 (12.5–19.8)	24.1 (20.0–28.8)
Moderately difficult	–	29.5 (26.2–32.9)	26.2 (22.0–30.9)	27.9 (23.5–32.8)	26.1 (22.9–29.5)	28.8 (23.6–34.7)	25.7 (21.9–29.9)	30.7 (26.3–35.6)
Very difficult	–	38.2 (33.7–42.9)	32.6 (28.5–37)	24.6 (21.2–28.5)	21.4 (18.4–24.7)	27.9 (23.7–32.5)	28.6 (25.0–32.4)	26.5 (21.5–32.2)
Extremely difficult	–	14.2 (11.4–17.7)	20.4 (16.3–25.3)	27.3 (22.9–32.4)	28.7 (25.4–32.3)	22.0 (17.3–27.6)	19.6 (15.7–24.2)	14.7 (11.3–18.8)

a: Variable not included in the England survey.

and longer durations. A positive screen for depression was associated with making a quit attempt of greater than 24 h but this relationship was no longer present when looking at quit attempts of longer duration.

## Discussion

We documented large variation in the proportion of respondents who made a quit attempt across countries. Importantly, across all countries the majority of smokers reported that they did not make an attempt to quit smoking in the previous 12 months. A second important finding of the study is the large proportion of smokers who reported they have never tried to quit smoking. Furthermore, the majority of smokers reported they do not intend to quit smoking in the next 6 months. Respondents also reported moderate to high levels of nicotine dependence, low levels of self-efficacy to quit and perceived quitting to be difficult. These findings may offer insight into the plateau in the rate of the decline in smoking prevalence in Europe.<sup>12</sup> Strategies for motivating quit attempts and increasing self-efficacy are required to engage larger numbers of smokers in quitting. Such strategies are identified in the FCTC and include strengthening policy-level interventions such as pricing strategies

and smoke-free public spaces as well as public education. They also include greater involvement from the health care community in advising and supporting quitting among smokers.

Findings suggest a large proportion of those who attempt to quit do so unaided. With the exception of England, very low rates of quit smoking medication use were reported. There is low use of counselling-based services such as quitlines and local stop smoking services. E-cigarettes were the most popular self-reported quitting aid in England and Greece, with much lower rates reported in other countries. It is noteworthy that over half of quit attempts in England, where e-cigarette use has been supported by the government and several public health bodies, are made with the help of e-cigarettes, demonstrating the relationship between e-cigarette use and a receptive regulatory environment.

The presence of a smoking-related comorbidity was also associated with quitting in the last 12 months, including quit attempts of greater than 6 months in duration, as would be expected if smoking-related illness motivates quitting. Our study found that individuals who screened positive for depression were more likely to make an attempt to quit smoking in the past 12 months; however, this relationship was no longer present when looking at quit attempts lasting greater than 1 month in duration. Consistent with our data, the

**Table 4** Multivariable logistic regression analyses of factors associated with making quit attempts of varying duration in the past 12 months

Variable	Duration of last quit attempt					
	>24 h		>1 month		>6 months	
	aOR (95% CI)	P	aOR (95% CI)	P	aOR (95% CI)	P
Gender						
Female	1.0		1.0		1.0	0.008
Male	0.94 (0.83–1.06)	0.282	0.91 (0.77–1.08)	0.267	0.72 (0.56–0.92)	
Age						
18–24	1.0		1.0		1.0	
25–39	0.80 (0.65–0.99)	0.043	1.00 (0.75–1.32)	0.986	1.73 (1.11–2.70)	0.016
40–54	0.64 (0.52–0.78)	0.000	0.87 (0.67–1.13)	0.293	1.26 (0.81–1.97)	0.300
55+	0.61 (0.50–0.75)	0.000	0.94 (0.72–1.23)	0.662	1.74 (1.13–2.66)	0.011
Country						
England	1.0		1.0		1.0	
Germany	0.57 (0.43–0.74)	0.000	0.81 (0.56–1.18)	0.276	1.29 (0.80–2.09)	0.299
Greece	0.50 (0.42–0.61)	0.000	0.77 (0.56–1.05)	0.093	1.31 (0.84–2.04)	0.231
Hungary	0.46 (0.35–0.61)	0.000	0.57 (0.40–0.80)	0.001	1.12 (0.69–1.82)	0.656
Poland	0.59 (0.44–0.79)	0.000	0.73 (0.55–0.98)	0.037	1.00 (0.60–1.65)	0.988
Romania	0.74 (0.59–0.93)	0.089	0.93 (0.68–1.29)	0.674	1.77 (1.15–2.71)	0.009
Spain	0.95 (0.74–1.22)	0.706	1.44 (1.07–1.93)	0.015	2.45 (1.60–3.75)	0.000
Education						
Low	1.0		1.0		1.0	
Moderate	1.20 (1.05–1.37)	0.008	1.31 (1.09–1.58)	0.003	1.22 (0.94–1.59)	0.140
High	1.33 (1.11–1.59)	0.002	1.46 (1.14–1.87)	0.003	1.35 (0.91–2.01)	0.137
Not reported	1.04 (0.58–1.89)	0.891	0.68 (0.29–1.59)	0.378	0.86 (0.24–3.03)	0.815
Household income						
Low	1.0		1.0		1.0	
Moderate	1.25 (1.05–1.48)	0.013	1.07 (0.84–1.36)	0.579	1.36 (0.97–1.91)	0.076
High	1.42 (1.16–1.72)	0.001	1.31 (1.00–1.73)	0.051	1.40 (0.95–2.05)	0.087
Not reported	0.88 (0.70–1.10)	0.260	1.08 (0.80–1.45)	0.614	1.20 (0.77–1.88)	0.426
Comorbidity <sup>a</sup>						
No	1.0		1.0		1.0	
Yes	1.47 (1.26–1.72)	0.000	1.47 (1.20–1.82)	0.000	1.68 (1.29–2.17)	0.000
Positive screen for depression						
No	1.0		1.0		1.0	
Yes	1.46 (1.26–1.69)	0.000	1.07 (0.87–1.30)	0.527	0.81 (0.59–1.12)	0.197
Alcohol problems						
No	1.0		1.0		1.0	
Yes	0.91 (0.58–1.43)	0.683	0.88 (0.52–1.50)	0.647	1.26 (0.55–2.91)	0.590

Sample size: >24 h, n = 2837/10 287; >1 month, n = 1126/10 287 and >6 months, n = 447/10 287. Netherlands was not included in the analyses as a result of the unavailability of data for co-variables (financial stress, comorbidities, alcohol problems, positive screen for anxiety and depression) examined.

aOR, adjusted odds ratio; 95% CI, 95% confidence interval.

a: Comorbidities = are you currently being treated for, or do you have a current diagnosis for, any of the following? [chronic pain, diabetes, cancer, heart disease, chronic lung disease (COPD, emphysema or chronic bronchitis), asthma and, tuberculosis].

presence of depression has been linked to higher nicotine dependence, lower rates of quitting, greater difficulty with quitting and higher rates of relapse.<sup>20,21</sup> Our data add to the body of literature regarding the importance of supporting this high-risk group using tailored evidence-based quit smoking support, both behavioural and pharmacological.

### Comparison with previous research

Our results are similar to those reported for Wave 1 EUREST-PLUS ITC Europe Surveys in 2016.<sup>8</sup> One exception is the reduction in the reported rate of past 12 month quit attempts observed in England in 2018 (31.9%) compared with 2016 (46.3%). This trend is broadly consistent with other longitudinal surveys, which have also documented a decline in rates of quitting in the UK, with the 2017 Eurobarometer survey reporting 26% of UK respondents quit in the past year and a decline of 6% since 2014.<sup>2,3,22</sup> It is possible that other factors, such as differences in the cross-sectional sample characteristics, may also contribute to the large decline documented between the 2016 and 2018 of the ITC surveys. Relative to Wave 1 data, we documented higher rates of medication use in all countries. Use of e-cigarettes as part of the most recent quit attempt was lower in 2018 than in 2016, except for England, Germany and Greece, in

which rates were similar. Our results are generally consistent with data from the 2017 Eurobarometer surveys conducted in 27 EU MS, which found two thirds of respondents who attempted to quit smoking did so unaided.<sup>9</sup> We documented slightly higher quit attempts for respondents in Hungary, Poland, Romania and Spain relative to that reported by the 2017 Eurabarometer with comparable data for other countries.<sup>9</sup> Secondary analyses of the Eurobarometer data have used rank on the Tobacco Control Scale (TCS),<sup>23</sup> a tool to classify countries according to their tobacco control policies, to examine the relationship between comprehensive tobacco control policy and quit attempt rates and use of cessation supports.<sup>2,9</sup> A strong relationship between TCS rank and rates of quitting and use of cessation support has been documented.<sup>2,9</sup> While the present study observed a similar trend for countries which were ranked very high (England) or very low (Greece) on the TCS, the TCS rank was not consistent across other countries in terms of predicting rates of quitting.

### Strengths and limitations

The strengths of this study include a large sample size from eight EU MS, the examination of an extensive number of measures and the use of validated assessment tools. Our study also has several

limitations. First, the cross-sectional design of the study allows us to identify associations but prevents us from identifying causal relationships. Second, our study relies on self-report data, which might be subject to reporting bias. The study sample includes individuals who reported using tobacco in the past 2 years and as such is reflective of recent quitters and current tobacco users, thus potential recall bias is unlikely. We report on 2018 data from a longitudinal study, which included recruitment of new smokers (replenishment sample). There were differences in the retention rates across countries with the Netherlands, Spain and Germany retaining more than 70% of the sample, compared with less than 50% in other countries.<sup>13</sup> It is possible that the differences in retention rates have resulted in selection bias with more ex-smokers included in countries with higher retention rates.

### *Implications for policy, practice and research*

EU MS vary widely in the prevalence of tobacco use, the availability and use of quit smoking support and their tobacco control regulatory environment (e.g. pricing, smoke-free policy, advertising and promotion of tobacco products). More frequent quitting and higher use of quit smoking support takes place in countries such as England, which have made significant progress in tobacco control policy and have long-standing well-developed cessation systems (coverage for quit smoking medications, campaigns and local stop smoking services). This reinforces the need for population-based strategies to encourage smokers to consider quitting, as demand for cessation services in the other countries surveyed is only likely to increase over time with increasing public education and the implementation of strategies to denormalize smoking.<sup>10</sup>

Among smokers who attempt to quit, the vast majority returned to active smoking within the first few weeks, which is consistent with previous research.<sup>24</sup> Withdrawal symptoms are at their peak during the first month following quitting smoking and are often the reason smokers fail in this early period.<sup>5</sup> Most smokers reported moderate to high levels of nicotine dependence (with large country-level variation) and thus may have experienced difficulty with withdrawal symptoms. Individuals with higher nicotine dependence are most likely to benefit from the use of available first-line quit smoking medications and more intensive counselling interventions.<sup>5</sup> Research has shown there is a lack of knowledge and awareness among smokers regarding the efficacy of available quit smoking medications and counselling support.<sup>25,26</sup> Additionally a strong preference among smokers for quitting using 'will power' alone has been documented.<sup>25,26</sup> Addressing these beliefs and gaps in knowledge may also be an important target for increasing rates of medication use and counselling.

## Conclusions

Except for England and the Netherlands, few respondents in the EU MS surveyed made quit attempts in the past year, while those who were currently smoking typically did not intend to quit in the near future and perceived quitting to be difficult. The use of quit smoking supports among those attempting to quit remains sub-optimal in most countries, with behavioural support in particular rarely used. There is a need to examine approaches to supporting quitting among the significant proportion of tobacco users in Europe and increase the use of cessation support as part of quit attempts. Continued efforts to support the consistent application of strong tobacco control policies across EU MS are needed to reduce the large country-level variation observed.

## Supplementary data

[Supplementary data](#) are available at *EURPUB* online.

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## Ethics approval

The survey protocols and all materials, including the survey questionnaires, were cleared for ethics by the ethics research committee at the University of Waterloo (Ontario, Canada), and ethics committees in Germany (Ethikkommission der Medizinischen Fakultät Heidelberg), in Greece (Medical School, University of Athens—Research and Ethics Committee), in Hungary (Medical Research Council—Scientific and Research Committee), in Poland (State College of Higher Vocational Education—Committee and Dean of the Department of Health Care and Life Sciences), in Romania

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## Key points

- In 2018, except for England and the Netherlands, smokers in European Union (EU) Member States (MS) had made few quit attempts in the past year, had low intention to quit in the near future and perceived quitting to be difficult.
- The use of quit smoking support among those attempting to quit remains sub-optimal in most countries.
- In England, Greece and Germany, e-cigarettes were the most frequently used cessation support used in recent quit attempts.
- There is a need to examine approaches to motivate and support quitting among the significant number of tobacco users in Europe and increase the use of cessation support as part of quit attempts.
- Continued efforts to support the consistent application of strong tobacco control policies across EU MS are needed to reduce the large country-level variation observed.

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