



## Short Communication

## E-cigarette use and support for banning e-cigarette use in public places in the European Union

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## ABSTRACT

We investigated the factors associated with support for banning e-cigarette use in public places in the European Union (EU) and how this varies by socio-demographic determinants, use of tobacco, ever use of e-cigarettes and their perceived harm. Data are from the representative Special Eurobarometer for Tobacco survey performed in 2014 ( $n = 27,801$ ) in 28 EU member states. Analyses were conducted separately by tobacco use status (never, current, and former smokers) and e-cigarette experimentation status. 70.9% of never smokers, 63.1% of former smokers and 45.7% of current smokers in the EU supported a ban on the use of e-cigarettes in public places. In all groups, support for banning e-cigarettes in public places was lower among those who had experimented with e-cigarettes (adjusted odds ratios (aOR) 0.43 vs. 0.50 vs. 0.61, among never, current and former smokers respectively) and higher among those who perceived e-cigarettes as harmful (aORs 2.49 vs 2.35 vs. 2.40, among never, current and former smokers respectively). 40.5% of those who had experimented with e-cigarettes supported a ban on use in public places, although levels of support were lower among those who started using e-cigarettes in order to circumvent existing smoking bans (aOR 0.54, 95% Confidence Interval 0.45–0.64). Bans of e-cigarette use in public places in Europe have high levels of public support even among former and current tobacco smokers, although this does vary across population groups. As legislators consider approaches to e-cigarette use, public opinion is likely to become more important to the passing and enforcement of any legislation.

## 1. Introduction

Public support for tobacco control legislation is a key component of both population and political support for and in ensuring that enacted legislation is enforceable (IARC, 2009; Arnott et al., 2007). Regulators have a variety of instruments at their disposal to protect public health, as described in the World Health Organization's Framework Convention for Tobacco Control (FCTC), including restrictions on advertising, banning smoking in public places and tax increases (Organization WH, 2003). The regulation of tobacco smoking in public places has been a cornerstone of the FCTC and is now implemented in many countries globally (Hyland et al., 2012). There are questions over whether any such legislation should apply to e-cigarettes and a variety of approaches exist worldwide (Chapman et al., 2016; Bauld et al., 2016; Pisinger and Døssing, 2014; Institute for Global Tobacco Control, 2015). Recent

research has found a decrease in support for allowing their use in public places in the UK and the US (Brose et al., 2016; Tan et al., 2015), with previous studies indicating that support for banning their use was associated with smoking status and perceptions of harm from e-cigarettes (Kolar et al., 2014; Mello et al., 2016). Nationally representative and comparable data across European Union Member States (EU MS) is lacking and can help to inform potential national legislation as well as the debate more widely (Filippidis et al., 2016; Eastwood et al., 2015). In the EU, the recent Tobacco Product Directive (TPD) regulates many aspects of tobacco control policy, although individual member states have discretion over whether to implement clean air laws (Directive 2001/37/EC, n.d.).

In light of this, the aims of this study are to investigate the factors associated with support for banning e-cigarette use in public places and how this varies by socio-demographic factors, tobacco use status, ever

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use of e-cigarettes and perceived harmfulness of e-cigarettes, across all 28 EU member states.

## 2. Methods

### 2.1. Data source

We conducted secondary analyses of data from wave 82.4 (November–December 2014) of the Eurobarometer survey collected in 28 EU member states. A multi-stage sampling design was employed in order to collect samples representative of the population aged  $\geq 15$  years, both at an EU and at the member state level. Face-to-face interviews were used to record self-reported data on tobacco use and socio-demographic characteristics; all interviews were conducted at participants' homes and in the local language. The total number of participants was 27,801. Descriptive results of the surveys are presented in the official Eurobarometer report (Special Eurobarometer 429, 2015).

### 2.2. Measures

All participants were asked to state if they would be in favour or opposed (or don't know) to banning the use of electronic cigarettes in environments where smoking is prohibited. In order to focus on support for the policy and in line with previous work those opposed and those who responded "don't know" were classified as "not in favour" (Agaku et al., 2015).

### 2.3. Tobacco smoking

All participants were asked "Regarding smoking cigarettes, cigars or a pipe, which of the following applies to you?". Responses were "You currently smoke" (i.e. current smokers); "You used to smoke but you have stopped" (i.e. former smokers); and "You have never smoked" (i.e. never smokers).

### 2.4. E-cigarette use

E-cigarette use was assessed with the question "Regarding the use of electronic cigarettes or any similar electronic devices (e-shisha, e-pipe), which of the following statements applies to you?" with responses "You currently use electronic cigarettes or similar electronic devices (e.g. e-shisha, e-pipe)"; "You used them in the past, but no longer use them"; "You tried them in the past but no longer use them"; "You have never used them"; and "Don't know". The first response was considered as an indication of current use, while any of the first three responses was considered experimentation with e-cigarettes (Filippidis et al., 2016).

### 2.5. Perceptions of e-cigarette harm

Participants were asked "In recent years electronic cigarettes or e-cigarettes have been increasingly marketed in Europe. Do you think that they are harmful or not to the health of those who use them?" Participants could respond "yes"; "no"; and "don't know". These were utilised as three separate categories.

### 2.6. Reasons for e-cigarette use

Participants who had experimented with e-cigarettes were asked "How important was each of the following factors for starting e-cigarettes? 1. To be able to smoke in places where tobacco smoking is not allowed; 2. To stop or reduce tobacco smoking; 3. You considered them attractive, cool or fashionable". For each factor, responses included important ("very important"; "fairly important"); not important ("not very important"; "not at all important"); or "don't know".

### 2.7. Socio-demographic data

Data on the participants' age (15–24; 25–39; 40–54; and  $\geq 55$  years), sex (male; female), age at which they stopped full-time education: ( $\leq 15$ ; 16–19 and  $\geq 20$  years old) and their difficulties to pay bills during the last twelve months (almost never/never; and from time to time/most of the time) - the latter as a proxy of socioeconomic status, were also collected.

### 2.8. Statistical analysis

Descriptive results are presented as % with 95% confidence intervals (CI) and logistic regression models are presented as adjusted odds ratios (aOR) with 95% CI.

We used a two-level (country and individual) logistic regression model, which accounts for clustering of responses within each country. Models were adjusted for age; sex; area of residence; education and difficulty to pay bills, with analyses stratified by smoking status (current, former, and never smokers). Models were further adjusted for perceived harmfulness of e-cigarettes. All descriptive results have been obtained with the use of survey weights provided in the Eurobarometer dataset.

As those who have used e-cigarettes may have different characteristics to never users, the analysis was also performed on the subsample of participants who had reported experimentation with e-cigarettes. In these regressions, Model 1 adjusted for socio-demographic independent variables, while Model 2 further adjusted for perceived harmfulness of e-cigarettes and for reasons to start using e-cigarettes.

All analyses additionally included chi-squared tests for trends in associations by age group and educational qualifications.

## 3. Results

The sample characteristics are shown in Supplementary Table 1 and Supplementary Table 2 shows tobacco and e-cigarette use as well as support for a ban on the use of e-cigarettes in public places by individual country.

70.9% of never smokers, 63.1% of former smokers and 45.7% of current smokers supported a ban on the use of e-cigarettes in public places (Table 1). Those who perceived e-cigarettes to be harmful were more likely to be in support of banning e-cigarette use in public places (aOR: 2.49 vs. 2.35, vs. 2.40 for never, current and former smokers respectively) while respondents who had experimented with e-cigarettes were less likely to support a ban on e-cigarette use in public places (aOR: 0.43 vs. 0.61, vs. 0.50 for never, current and former smokers respectively).

Among those who reported experimenting with e-cigarettes ( $n = 2456$ ) 40.5% were in support of the measure (Table 2). In Model 1 there was a statistically significant trend with age, with younger respondents less likely (e.g. for those aged 15–24 vs. those aged  $\geq 55$  years, aOR 0.65, 0.60–0.71) to support the measure. Men were also less likely than women (aOR 0.80, 0.76–0.84) to support this ban. In Model 2 after additionally adjusting for the reported reasons for starting using e-cigarettes and perceptions of harm, only associations with age persisted. Ever e-cigarette users who perceived e-cigarettes to be harmful were more likely to support this measure than those who did not (aOR 2.05, 1.69–2.48). Moreover, respondents who started using e-cigarettes in order to circumvent smoking bans were less likely to support such a ban (aOR 0.54, 0.45–0.64).

## 4. Discussion

This analysis of data representative of adults in 28 EU Member States has shown that levels of support for banning the use of e-cigarettes in public places were highest among never smokers, and support for a ban was associated with perceptions of e-cigarette harm.

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