

**Voluntary home smoking ban: prevalence, trend and determinants in Italy**

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## **ABSTRACT**

To investigate voluntary home smoking bans, we analysed five nationally representative surveys on 15,175 adults conducted in Italy in 2011-2015. Overall, 61% of Italians (69% of non-smokers and 32% of current smokers) adopted a complete home smoking ban. Although families with children more frequently live in smoke-free homes, still the majority of current smokers living with children admit smoking inside their homes. Complete home smoking bans are substantially increasing in Italy, and an acceleration of this trend is expected with the 2016 implementation of a new tobacco control legislation aimed at decreasing the social acceptability of smoking.

**Keywords:** home smoking ban, second-hand smoke, tobacco control legislation, smoke-free home, Italy

## **INTRODUCTION**

Second-hand smoke (SHS) exposure has been found to be carcinogenic for humans, and has been associated with several adverse health effects, including heart disease and respiratory disorders. Approximately 10% of all deaths attributable to tobacco smoking are due to SHS exposure among non-smokers.<sup>1</sup>

Over the last two decades, in order to reduce SHS exposure, several countries introduced comprehensive tobacco control legislations.<sup>2</sup> Italy was the first large country to adopt such a legislation in 2005, banning smoking in all indoor workplaces and in indoor public places, including restaurants and bars.<sup>3</sup> The implementation of the smoking ban had several favourable consequences, including a substantial decline in SHS exposure<sup>4</sup>, in smoking prevalence and intensity, and in hospital admission for tobacco-related diseases,<sup>2,3</sup> The adoption of the smoking bans has also led to a steady decrease in the social acceptability of smoking and, consequently, an increase in the number of smoke-free homes.<sup>5,6</sup> Despite that, in 2010 a relatively high proportion of Italian non-smokers, particularly among the young, was still exposed to SHS in private houses.<sup>4</sup>

In order to evaluate the prevalence and determinants of a voluntary home smoking ban in Italy, we analysed data from five recent surveys on smoking.

## **METHODS**

Data were collected through face-to-face surveys annually conducted in Italy between 2011 and 2015. Each year, the overall sample consisted of approximately 3000 individuals, representative of the general Italian population aged  $\geq 15$  years, in terms of age, sex, geographic area and socio-economic characteristics. For the present analyses, the total sample included 15,175 Italian individuals aged  $\geq 15$  years. Adults were selected through a representative multistage sampling to

assure representativeness of the Italian population. Adolescents aged 15–17 years were chosen by means of a ‘quota’ method (by sex and exact age).

*Ad hoc* trained interviewers used a structured questionnaire in the context of a computer-assisted personal in-house interview (CAPI). Besides general information on socio-demographic characteristics and smoking habits, a question on voluntary home smoking ban was formulated as follows: “Are your guests free to smoke in your house?” Possible answers were: i) they are free to smoke everywhere [i.e., no home smoking ban]; ii) they can smoke only in selected indoor places, including the bathroom or kitchen [i.e., partial home smoking ban]; and iii) they cannot smoke inside [i.e., complete home smoking ban].

The odds ratios (OR) and the corresponding 95% confidence intervals (CI) for partial and for complete home smoking ban vs. no home smoking ban were estimated using polytomous logistic regression models after adjustment for sex, age, level of education, geographic area, marital status, smoking status, and survey year.

## RESULTS

Over the period 2011-2015, 21.5% (95% CI: 20.8%-22.1%) of Italian adults did not adopt a home smoking ban, 17.4% (95% CI: 16.8%-18.0%) implemented a partial, and 61.1% (95% CI: 60.4%-62.0%) a complete home smoking ban, with a significant increasing trend among the proportion of homes adopting a complete ban, from 57.1% (95% CI: 55.4%-58.9%) in 2011 to 66.0% (95% CI: 64.4%-67.7%) in 2015 (p for trend <0.001) (**Table 1**).

No significant difference according to sex was observed in the adoption of a complete vs. no home smoking ban. A significant inverse trend was observed according to age (p<0.001), while a direct one according to level of education (p<0.001). Compared to never, current smokers were less likely to adopt a complete home smoking ban (OR=0.15; 95% CI: 0.13-0.16). Smoke-free homes were

more frequent in married (OR=1.87; 95% CI=1.65-2.11), widowed (OR=1.51; 95% CI: 1.24-1.83), and divorced/separated individuals (OR=1.28; 95% CI: 1.03-1.58), as compared to single ones. Adoption of complete home smoking ban increased with a larger number of family members (p for trend <0.001) and was higher in families with children aged 0-5 years (OR=1.68; 95% CI: 1.44-1.96) or children aged 0-14 years (OR=2.17; 95% CI: 1.90-2.49). The proportion of smoke-free homes among Italians having a child aged 0-5 years was 68.5% overall, 80.6% in non-smokers and 54.8% in current smokers. The corresponding estimates among those having a child aged 0-14 years were 71.1% overall, 78.1% in non-smokers and 48.0% in current smokers. Estimates for partial vs. no home smoking ban were consistent with those for complete vs. no home smoking ban according to age, education, smoking status, number of family members and presence of children. Moreover, women were more likely to have a partial home smoking ban than were men (OR=1.12; 95% CI: 1.01-1.25).

## **DISCUSSION**

We found an increasing trend in the adoption of voluntary smoking bans in Italian homes. Overall, 61% of Italian adults adopted a complete home smoking ban. This finding is in broad agreement with at least three pan-European surveys conducted between 2008 and 2010 that showed that the prevalence of a complete home smoking ban in Italy ranged between 59% and 64%.<sup>7-9</sup> Current smokers most frequently allowed smoking in their homes. Thus, two thirds non-smokers (i.e., never or former smokers) but only one third current smokers adopted a complete voluntary home smoking ban.

In agreement with most previous studies,<sup>2,5,10</sup> in our survey the proportion of smoke-free homes increased over time, in the absence of a decrease in smoking prevalence and in the absence of the implementation of new tobacco control regulations over the observed period. Subsequent waves of

the Health Survey for England conducted on 37,038 children showed that their exposure to SHS in homes substantially declined between 1998 and 2012, with continuing progress since the implementation of smoke-free legislation in 2007.<sup>10</sup> Similarly, surveys on adults in Italy after the adoption of a comprehensive smoking ban in 2005 found a 13.6% increase in the number of smoke-free homes in only 2 years (i.e., between 2006 and 2008).<sup>5</sup> Another study revealed a continuing favourable pattern in the following period, although at a slower rate (i.e., by 16.3% among smokers and 6.4% among non-smokers) between 2008 and 2012.<sup>6</sup> With a 15.6% increase in 4 years, we confirm this trend. Nevertheless, this trend is still substantial. This further confirms that smoking restrictions in public venues is unrelated with increased smoking prevalence in private venues, but, on the contrary, it reduces, in both the short-term and the long-term, the social acceptability of smoking and consequently the prevalence of smoking in private venues.<sup>2,8</sup>

In agreement with previous research, barriers to a complete smoking ban include low education,<sup>2,7,8</sup> households with a small number of people<sup>7</sup> and never married status.<sup>2,9</sup> By contrast, living with children increases the odds of having a complete home smoking ban.

Today, more than 80% of non-smokers, but also the majority of current smokers who have a child aged 0-5 years, do not allow smoking in their homes. These favourable patterns may further improve in the near future as a consequence of a new Italian legislation on tobacco that came into force in February 2016, including several restrictions that are likely to further decrease the social acceptability of tobacco smoking. According to our findings, still 2.4 million children (i.e., 29% of Italian children aged 0-14 years) are potentially exposed to SHS at home. Thus, the new Italian legislation could be further combined with the promotion of national mass-media campaigns, following the example of the Scottish Government which recently set a target of halving (from 12% to less than 6%) the number of children exposed to SHS in Scottish homes by 2020.

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**Competing interests** None declared.

## **KEYPOINTS**

- A high proportion of Italian non-smokers is still exposed to second-hand smoke in private houses.
- More than two out of three Italian non-smokers and one out of three current smokers have smoke-free houses.
- Smoke-free homes are substantially increasing in Italy, and an acceleration of this trend is expected with the 2016 implementation of a new tobacco control legislation aimed at decreasing the social acceptability of smoking.



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**Table 1** – Odds ratios\* (OR) and corresponding 95% confidence intervals (CI) for complete or partial voluntary home smoking ban vs. no home smoking ban, according to selected characteristics. Italy 2011-2015.

	N	No home smoking ban (%)	Partial home smoking ban (%)	OR* for <b>partial</b> vs no home smoking ban (95% CI)	Complete home smoking ban (%)	OR* for <b>complete</b> vs no home smoking ban (95% CI)
Total	15,175	21.5	17.4	-	61.1	-
Survey year						
2011	3063	25.1	17.8	<b>1<sup>^</sup></b>	57.1	<b>1<sup>^</sup></b>
2012	3070	23.0	18.9	1.12 (0.95-1.31)	58.1	1.07 (0.94-1.21)
2013	2966	20.1	17.7	<b>1.23 (1.05-1.45)</b>	62.2	<b>1.36 (1.19-1.56)</b>
2014	3037	20.5	17.1	1.16 (0.99-1.37)	62.5	<b>1.35 (1.19-1.55)</b>
2015	3038	18.6	15.3	1.15 (0.97-1.36)	66.0	<b>1.58 (1.38-1.81)</b>
p for trend				0.072		<b>&lt;0.001</b>
Sex						
Men	7291	23.1	17.4	<b>1<sup>^</sup></b>	59.5	<b>1<sup>^</sup></b>
Women	7884	19.9	17.4	<b>1.12 (1.01-1.25)</b>	62.7	1.05 (0.96-1.15)
Age (years)						
<25	1750	22.3	17.7	<b>1<sup>^</sup></b>	60.0	<b>1<sup>^</sup></b>
25-44	4984	19.4	19.7	<b>1.27 (1.05-1.54)</b>	60.9	1.08 (0.92-1.27)
45-64	4834	23.0	17.4	0.93 (0.75-1.16)	59.6	<b>0.72 (0.60-0.86)</b>
≥65	3607	21.9	14.0	0.87 (0.68-1.11)	64.1	<b>0.64 (0.53-0.78)</b>
p for trend				<b>0.004</b>		<b>&lt;0.001</b>
Education						
Low	6023	24.1	13.9	<b>1<sup>^</sup></b>	62.0	<b>1<sup>^</sup></b>
Intermediate	6895	20.4	18.9	<b>1.62 (1.43-1.84)</b>	60.7	<b>1.21 (1.09-1.34)</b>
High	2257	17.7	22.0	<b>2.14 (1.81-2.54)</b>	60.3	<b>1.34 (1.16-1.55)</b>
p for trend				<b>&lt;0.001</b>		<b>&lt;0.001</b>
Smoking status						
Never smoker	9930	15.1	15.4	<b>1<sup>^</sup></b>	69.5	<b>1<sup>^</sup></b>
Current smoker	3250	43.8	24.2	<b>0.51 (0.46-0.58)</b>	32.0	<b>0.15 (0.13-0.16)</b>
Ex-smoker	1995	16.7	15.7	1.02 (0.86-1.22)	67.6	0.92 (0.80-1.06)
Marital status						
Single	4321	24.3	19.6	<b>1<sup>^</sup></b>	56.1	<b>1<sup>^</sup></b>
Married	8767	19.1	16.8	<b>1.35 (1.17-1.56)</b>	64.1	<b>1.87 (1.65-2.11)</b>
Widowed	1344	24.1	12.6	0.98 (0.76-1.27)	63.3	<b>1.51 (1.24-1.83)</b>
Divorced/Separated	743	27.3	19.7	1.18 (0.91-1.52)	53.0	<b>1.28 (1.03-1.58)</b>
Number family members						
1	2391	26.5	17.8	<b>1<sup>^</sup></b>	55.7	<b>1<sup>^</sup></b>
2	4107	22.2	16.2	0.93 (0.76-1.13)	61.6	1.15 (0.98-1.35)
3	3866	22.3	17.6	0.96 (0.79-1.17)	60.1	<b>1.25 (1.06-1.47)</b>
4	3333	17.9	17.3	1.06 (0.86-1.31)	64.8	<b>1.61 (1.35-1.93)</b>
5 or more	1478	17.4	19.5	1.20 (0.94-1.54)	63.1	<b>1.73 (1.40-2.13)</b>
p for trend				<b>0.037</b>		<b>&lt;0.001</b>
Presence of children aged 0-5 years						
No	13,334	22.4	17.5	<b>1<sup>^</sup></b>	60.1	<b>1<sup>^</sup></b>
Yes	1841	14.8	16.7	<b>1.28 (1.07-1.54)</b>	68.5	<b>1.68 (1.44-1.96)</b>
Presence of children aged 0-14 years						
No	12,084	23.5	17.8	<b>1<sup>^</sup></b>	58.6	<b>1<sup>^</sup></b>
Yes	3091	13.4	15.6	<b>1.29 (1.09-1.52)</b>	71.1	<b>2.17 (1.90-2.49)</b>

\*ORs were estimated using polytomous logistic regression models after adjustment for sex, age, level of education, geographic area, marital status, smoking status, and survey year. Estimates in bold are statistically significant at 0.05 level.

^Reference category.