

**SMOKING IN ITALY IN 2015-2016 AMONG ADULTS AND YOUNG:  
PRVALENCE, TRENDS, ROLL-YOUR-OWN CIGARETTES AND  
ATTITUDES TOWARDS INCOMING REGULATION**

Alessandra LUGO<sup>1</sup>, Piergiorgio ZUCCARO<sup>2</sup>, Roberta PACIFICI<sup>2</sup>, Giuseppe GORINI<sup>3</sup>,  
Paolo COLOMBO<sup>4</sup>, Carlo LA VECCHIA<sup>5</sup>, Silvano GALLUS<sup>1</sup>

<sup>1</sup> Department of Epidemiology, IRCCS - Istituto di Ricerche Farmacologiche “Mario Negri”, Milan, Italy

<sup>2</sup> Department of Therapeutic Research and Medicines Evaluation, Istituto Superiore di Sanità, Rome, Italy

<sup>3</sup> Unit of Environmental and Occupational Epidemiology, Cancer Prevention and Research Institute (ISPO), Florence, Italy

<sup>4</sup> Istituto DOXA, Worldwide Independent Network/Gallup International Association (WIN/GIA), Milan, Italy

<sup>5</sup> Department of Clinical Sciences and Community Health, Università degli Studi di Milano, Milan, Italy

**Correspondence to:**

Alessandra Lugo, PhD

Department of Epidemiology

IRCCS - Istituto di Ricerche Farmacologiche “Mario Negri”

Via G. La Masa 19, 20156 Milan, Italy

tel: +390239014653 – fax: +390233200231

e-mail: [alessandra.lugo@marionegri.it](mailto:alessandra.lugo@marionegri.it)

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**ABSTRACT** (249 words)

**Background.** In 2016 an additional series of selective tobacco regulations came into force in Italy, which however did not affect tobacco price. To understand how Italians will welcome the new norms, we analysed data from our two most recent surveys among those we annually conduct on tobacco.

**Methods.** In 2015 and 2016 we conducted 2 representative cross-sectional studies focused on the new incoming tobacco legislation on a total sample of 6046 Italians aged  $\geq 15$  years.

**Results.** Overall, 21.4% of Italians (26.0% among men and 17.2% among women) were current smokers, showing a small but significant decrease in smoking prevalence since 2007 ( $p$  for trend=0.004). No change in smoking prevalence was observed over the last decade among the young (i.e., 15-24 years old; 20.1% in 2015-2016). Roll-your-own (RYO) cigarettes were the most frequent tobacco product for 8.3% of adult smokers and 19.7% of young smokers. According to the attitudes of Italians towards the new incoming regulations, 91.3% supported the smoking ban in cars in presence of minors, 90.2% a more stringent enforcement of the tobacco sales-to-minors regulation, 74.3% the introduction of shocking pictorial images on tobacco packs, and 63.2% the removal from the market of small cigarette packs, usually purchased by the young.

**Conclusions.** Smoking prevalence only marginally decreased over the last decade among adults, but did not decrease among the young. RYO tobacco is more and more used by adults and young. Before the entrance into force of the new norms, Italians substantially support them, particularly those targeting children.

**Keywords:** tobacco smoking; roll-your-own tobacco; smoke-free policy; young; cross-sectional survey; Italy

## INTRODUCTION

In 2005, Italy was the first large country to adopt a comprehensive tobacco legislation, banning smoking in all indoor workplaces and public places, including restaurants and bars [1]. The tobacco control scale (TCS) measures the country-specific tobacco control activity, based on the 6 main strategies (i.e., pricing policies, smoking bans, information campaigns, advertising bans, health warnings, and support for cessation) proposed by the World Bank as those that should be prioritized for a comprehensive tobacco control programme [2]. Various issues of the TCS showed how Italy, among other European countries, changed its ranking from 8 in 2006 to 10 in 2007, to 12 in 2010 up to 15 in 2013, showing therefore a decrease in the implementation rate of relevant tobacco control measures compared to other European countries [2-5]. This has been reflected by a levelling in the favourable trend of smoking prevalence observed in Italy over the last 5 decades [6]. In fact, overall smoking prevalence steadily declined from more than 35% in 1950s to less than 25% in 2006, but no appreciable additional decrease has been observed in men or women between 2007 and 2014 [6].

In 2016 a new tobacco legislation, transposing the Directive 2014/40/EU, was introduced in Italy. The main norms of the law included the following restrictions: i) the extension of a smoking ban to selected outdoor areas and to private cars when children or pregnant women are present; ii) a stricter enforcement of the tobacco sales-to-minors regulation; iii) the introduction of pictorial health warning on cigarette packs; and iv) the ban from the market of 10-cigarette packs or packs of roll-your-own (RYO) tobacco weighting less than 30 grams (i.e., small cigarette/tobacco packs, frequently purchased by young smokers) [7]. The new law is therefore intended to further decrease the social acceptability of tobacco smoking, to reduce it among younger generations and second hand smoking (SHS) exposure among children.

In order to understand how Italians will welcome the new norms, we analysed data from the two most recent surveys (immediately before the adoption of the legislation) on tobacco, including specific questions on tobacco on the young and on the attitudes towards this new legislation.

## METHODS

Since 2001, in collaboration with DOXA, the Italian branch of the Worldwide Independent Network/Gallup International Association (WIN/GIA), we annually conduct companion cross-sectional studies on smoking. Each of these is based on samples of around 3000 subjects, representative of the general Italian population aged 15 years and over, in terms of sex, age, geographic area and socio-economic characteristics [6]. For the present analysis, we considered data from the two most recent surveys, conducted in February-April 2015 (i.e., 2015 survey) and December 2015-February 2016 (i.e., 2016 survey). The overall sample consisted of 6046 individuals (2897 men and 3149 women; 3046 in 2015 and 3000 in 2016).

Survey participants were selected through a representative multistage sampling. The first stage was used to select municipalities in all of the 20 Italian regions. Thus, taking as criteria two characteristics, region and size of municipality. For both surveys, we identified 110 municipalities, representative of the Italian universe of municipalities. In the second stage, in each municipality, an adequate number of electoral wards was randomly extracted. In the third stage, individuals were randomly sampled from electoral rolls, within strata defined by sex and age group. For adolescents aged 15-17 years, we used the same sampling approach for the first two stages. According to the third stage, adolescents, whose names are not included in the electoral lists, were selected by means of 'quota' method (by sex and exact age). In the phase of processing the data, statistical weights were also generated to assure representativeness of the Italian population aged 15 years or over.

*Ad hoc* trained interviewers conducted interviews using a structured questionnaire in the context of a computer-assisted personal in-house interview (CAPI). Besides general information on socio-demographic characteristics, data were collected on smoking status (never, ex-, and current smokers) and number of cigarettes smoked per day. Ever smokers (current and ex-smokers) were participants who had smoked 100 or more cigarettes in their lifetime. Ex-smokers were participants who had quit smoking since at least one year, and current smokers were individuals continuing smoking or having stopped since less than 1 year.

Prevalent use and occasional use of roll-your-own (RYO) cigarettes were investigated since 2011 and assessed through the following questions: “Which type of tobacco product do you most frequently consume?” and “Which other type of tobacco products do you consume, even occasionally?” Besides RYO cigarettes, possible answers included manufactured cigarettes, pipe, cigars, cigarillos, and smokeless tobacco. Any use of different tobacco products was built as the sum of prevalent and occasional use.

In the 2016 survey, all participants were asked about their attitudes towards selected measures introduced in the incoming Italian regulation on tobacco, including: i) the extension of smoking ban in private vehicles in the presence of minors and pregnant women, ii) the increase of fines to tobacco retailers selling cigarettes to minors, iii) shocking pictorial images on cigarette packs, and iv) the removal from the market of 10-cigarette packs and of small RYO tobacco packs (i.e., 30 grams). Each answer had a structured four-item score (i.e., strongly in favour, moderately in favour, moderately against and strongly against).

### ***Data analysis***

Descriptive statistics were used to describe main results, including percent prevalence, and the corresponding 95% confidence intervals (CI), for categorical variables, and mean and standard deviation (SD) for continuous ones. To evaluate the trend in smoking prevalence, we considered data conducted in companion surveys since 2007, and to evaluate the trend in RYO use we considered data since 2011 [6]. We estimated the odds ratios (OR) and corresponding 95% CIs, overall and separately for men and women, for being current smokers vs. non-smokers (never and ex-smokers combined), using unconditional multiple logistic regression models after adjustment for sex, age, level of education, geographic area and survey year. All the analyses were performed with SAS version 9.4 statistical package (SAS Institute, Cary, NC, USA).

## **RESULTS**

In 2015, 67.1% of Italian adults described themselves as never smokers, 12.1% as ex-smokers, and 20.8% as current smokers (24.8% of men and 17.1% of women; **Table 1**).

Corresponding estimates for 2016 survey were 64.5%, 13.5% and 22.0% (27.3% among men and 17.2% among women). The average daily number of cigarettes per smoker was 13.4 (SD: 6.4) in 2015 (14.5 among men and 12.0 among women) and 13.5 (SD: 6.4) in 2016 (14.1 among men and 12.7 among women).

**Table 2** shows the trend in smoking prevalence among the general Italian population aged  $\geq 15$  years and among the young (i.e., aged 15-24 years) over the last decade. Prevalence of current smokers significantly decreased from 22.8% in 2007-2008 to 21.4% in 2015-2016 ( $p=0.004$ ) in the overall population, and from 18.6% to 17.2% ( $p=0.002$ ) among women, while no significant change in smoking prevalence has been observed among men (27.2% in 2007-2008 and 26.0% in 2015-2016). Among the young, a significant decline in smoking prevalence has been observed in boys (from 27.5% to 21.9%;  $p=0.037$ ), but not in girls (16.7% in 2007-2008 and 18.2% in 2015-2016) nor in the overall population of young adults (22.2% in 2007-2008 and 20.1% in 2015-2016). Smoking prevalence among minors (i.e., aged  $<18$  years) was 4.2% in 2007-2008, 4.8% in 2011-2012, and 5.6% in 2015-2016 (4.8% in 2015 and 6.5% in 2016; data not shown in tables).

**Table 3** shows overall and sex-specific ORs for current smokers vs. non-smokers. Women were less frequently current smokers than men (OR: 0.61; 95% CI: 0.54-0.69). According to age, smoking prevalence was highest among adults aged 25-44 years (OR: 1.48; 95% CI: 1.20-1.83 compared to Italians younger than 25 years) and lowest among the elderly (OR: 0.43; 95% CI: 0.33-0.56 for  $\geq 65$  years). According to level of education, a significant inverse trend in smoking prevalence was observed overall (OR: 0.64; 95% CI: 0.52-0.97 for high vs. low level of education) and in men (OR: 0.53; 95% CI: 0.40-0.70), but not in women. No specific pattern was found according to geographic area overall and in men, while women from central Italy were significantly less likely to be current smokers than those from northern Italy (OR: 0.75; 95% CI: 0.58-0.98). No significant changes in smoking prevalence were observed in 2016 as compared to 2015.

**Figure 1** shows the trend in the prevalence of Italian adult and young current smokers using RYO cigarettes as the most frequent tobacco product consumed over the period 2011-2016. Among adults, prevalent RYO use increased from 3.4% in 2011 to 7.2% in

2015, up to 9.4% in 2016 (i.e., relative increase by 176%). This prevalence increased from 5.8% in 2011 to 11.7% in 2016 among men, and from 0.3% in 2011 to 6.0% in 2016 among women (data not shown in figures). Prevalent RYO use among the young increased from 9.2% in 2011 to 19.3% in 2016 (i.e., relative increase by 110%; **Figure 1**). Any use of RYO cigarettes increased from 6.0% in 2011 to 17.0% in 2015, up to 18.6% in 2016 among adult current smokers, and from 19.9% in 2011 to 36.9% in 2015 among young smokers, and was 33.7% in 2016 (data not shown in figures).

**Figure 2** shows the proportion of current and non-smokers supporting the main measures introduced in the new Italian incoming regulation. In 2016, the proportion of Italians moderately to strongly in favour of the extension of smoking bans in private vehicles in presence of minors or pregnant women was 91.3% (87.3% among current and 92.4% among non-smokers;  $p<0.001$ ). Italian adults supporting a more stringent enforcement of the tobacco sales to minors regulation were 90.2% (86.2% among current and 91.3% among non-smokers;  $p<0.001$ ), those in favour of shocking pictorial images on cigarette packs were 74.3% (50.0% among current and 80.9% among non-smokers;  $p<0.001$ ), and those supporting the removal from the market of 10-cigarette packs or small RYO tobacco packs were 63.2% (31.1% among current and 72.6% among non-smokers;  $p<0.001$ ).

## DISCUSSION

Over the last decade, we observed a significant, though limited, decrease in smoking prevalence among Italian adults but not among the young, where it remained over 20%. Surprisingly, we did not observe a decline among minors, not even after 2013, when the Italian government increased the minimum age of purchasing tobacco products from 16 to 18 years [6].

Our findings on adults are in broad agreement with those from the last Eurobarometer report, showing for Italy a smoking prevalence of 21% [8]. In that report, the overall smoking prevalence among the young (15-24 years) substantially decreased from 29% in 2012 to 25% in 2014 [8]. We do not observe such a decline in Italy over the last few years.

We found that 5.6% of minors aged 15-17 years considered themselves as current smokers. This estimate is similar to those provided by ISTAT in 2015 for adolescents aged 14-17 years (6.8%) [9] and by the Global Youth Tobacco Survey (GYTS) in 2014 for students aged 13-15 years (7.6% of adolescents having smoked cigarettes on  $\geq 20$  of the past 30 days) [10]. The estimates for at least an occasional cigarette consumption (i.e., any use during the past 30 days) are even less reassuring: the 2014 GYTS study found a prevalence of 23% [10], and a pan-European school-based survey conducted in 2015 on students aged 15-16 years found a prevalence of 37%, which represented the highest adolescent smoking prevalence in Europe [11]. Our study confirms therefore that still a non-negligible proportion of minors has access to cigarettes, despite the ban of cigarette sales to minors [6]. Already in 2013-2014 more than 80% of Italian customers had never seen a tobacco retailer refusing to sell cigarettes to minors or requesting their identification or age [6]. The lack of enforcement of the legislation was also evident from the latest GYTS study [10], where 38% of smokers aged 13-15 years reported to obtain cigarettes from legal tobacco stores, and only 36% of smokers experienced a refusal in their attempts to buy cigarettes, despite the Italian legislation bans tobacco sales to this young population since 1935 [12]. It is not a surprise therefore to observe an extremely high support to further enforce tobacco sales-to-minor legislation, in terms of increasing fines to tobacco retailers selling cigarettes to minors.

We confirm an increasing trend in RYO cigarette use in Italy among the overall adult population and particularly among the young [6,13]. Today, one out of five young smokers use RYO cigarettes as the most frequent tobacco product consumed. Our finding is consistent with the increasing trend in RYO cigarette use observed in several European countries, including the UK [14,15], France [14], Germany [14,16] and Spain [17,18], and in the USA [19-21], as a consequence of the 2008 economic crisis [18].

An Italian survey conducted in 2011-2012 showed that only less than 80% of smokers driving a car in presence of children avoided to smoke inside the vehicles [22]. This confirmed data from an observational study based on direct inspections of smoking in road vehicles conducted in northern Italy in 2008, showing a non-negligible proportion of children exposed to second-hand smoke in cars [23]. With this study, we confirm in 2016 the high support (i.e., more than 90%) already observed in 2011-2012 [22] of the



Italian population, including smokers, towards a total smoking ban in cars in presence of minors (or pregnant women). A similarly high support for such a ban was observed in the UK in 2015, shortly before the entrance into force of the legislation banning smoking in cars carrying children (85% of adults and 74% of smokers) [24,25].

Since 2000, following the example of Canada, several countries (i.e., 77 in 2014) introduced pictorial images on cigarette packs [26,27]. During the last few years, growing literature investigated whether pictorial health warnings may be a useful tool to control tobacco. Although the issue is still debatable [28], some recent studies, including a randomized clinical trial [29], a meta-analysis [30], and a systematic review [31], found that pictorial warnings had a favourable effect on changing smoking behaviours of both current smokers (e.g., to quit smoking and to forgo cigarettes) [29,30] and non-smokers (e.g., to avoid smoking initiation) [30], being more effective than text-only warnings [30,31]. In our study we found that more than 80% of non smokers, but only 50% of smokers, supported the introduction of pictorial warnings on cigarette packs.

In a previous investigation we observed that in Italy the use of 10-cigarette packs was specific for the young population of smokers [13]. Thus, the measures included in the present legislation determining the removal by commerce of small tobacco packs, such as 10-cigarette packs or packs of RYO tobacco weighting less than 30 grams, will likely undermine the affordability of cigarettes among young generations who are more responsive to cigarette prices. In the present study we observe a relatively low support of the implementation of this measure among current smoker.

Limitations of the study include those inherent to the cross-sectional study design, including in particular possible misreporting and information biases. The sample size was computed to derive frequency outcomes with a satisfactorily small standard error, but was not able to provide accurate estimates when analysing specific subpopulations. Thus, findings on the young, and particularly on minors (around 100 for each survey), may be imprecise. The strengths of this study include the face-to-face survey design and the national representativeness of the sample. Moreover, the annual collection of data using the same sampling methodology and a similar sample size allowed us to observe time trends for smoking prevalence and other endpoints.

## *Conclusions*

Smoking prevalence is not decreasing among the young and, surprisingly, not even among minors. RYO tobacco is more and more used by the young population. After a decade where no relevant tobacco control measure was implemented and no substantial decrease in smoking prevalence in the young was reported, a new tobacco law, transposing an EU directive, at last in 2016 came into force in Italy. This legislation aims at reducing social acceptability of smoking, tobacco smoking among the young and SHS exposure among children. Italians substantially support the new norms, particularly those targeting children. Still, there is a lack of interventions aimed at increasing tobacco tax and consequently price, which represent the most effective strategy to reduce tobacco use [32-34]. Moreover, fiscal measures to reduce or eliminate price differences between combustible cigarette and RYO tobacco are needed in order to make the latter products less affordable to young individuals [18].

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**Table 1** - Percent distribution (%), and corresponding 95% confidence intervals (CI), of smoking habits in the Italian population aged  $\geq 15$  years, overall and by sex. Italy, 2015-2016.

Smoking status	2015 survey; % (95% CI)			2016 survey; % (95% CI)		
	Total	Men	Women	Total	Men	Women
Never smokers	67.1 (65.4-68.7)	58.9 (56.4-61.4)	74.6 (72.4-76.7)	64.5 (62.8-66.2)	55.9 (53.4-58.5)	72.4 (70.1-74.6)
Ex-smokers	12.1 (11.0-13.3)	16.3 (14.4-18.2)	8.3 (6.9-9.7)	13.5 (12.2-14.7)	16.8 (14.8-18.7)	10.4 (8.9-12.0)
Current smokers	20.8 (19.4-22.3)	24.8 (22.6-27.0)	17.1 (15.3-19.0)	22.0 (20.6-23.5)	27.3 (25.0-29.6)	17.2 (15.4-19.1)
Mean cigarettes/day (SD)	13.4 (6.4)	14.5 (6.9)	12.0 (5.2)	13.5 (6.4)	14.1 (6.8)	12.7 (5.8)
<i>Total number of participants</i>	<i>3046</i>	<i>1460</i>	<i>1586</i>	<i>3000</i>	<i>1437</i>	<i>1563</i>

SD: standard deviation

**Table 2** – Trend in smoking prevalence (%) in the Italian population aged  $\geq 15$  years and among the young, overall and by sex. Italy, 2007-2016.

Survey years	Total ( $\geq 15$ years); current smokers (%)				Young (15-24 years); current smokers (%)			
	N	Total	Men	Women	N	Total	Boys	Girls
2007-2008	6092	22.8	27.2	18.6	837	22.2	27.5	16.7
2009-2010	6233	23.6	26.4	21.0	739	20.9	21.4	20.3
2011-2012	6167	21.7	25.3	18.4	723	18.6	18.4	18.9
2013-2014	6052	21.1	25.5	17.0	690	19.9	21.7	18.0
2015-2016	6046	21.4	26.0	17.2	697	20.1	21.9	18.2
p for trend		0.004	0.487	0.002		0.503	0.037	0.773

**Table 3** – Odds ratios\* (OR) of current smokers vs non-smokers (never and ex-smokers), and corresponding 95% confidence intervals (CI), according to selected characteristics. Italy 2015-2016.

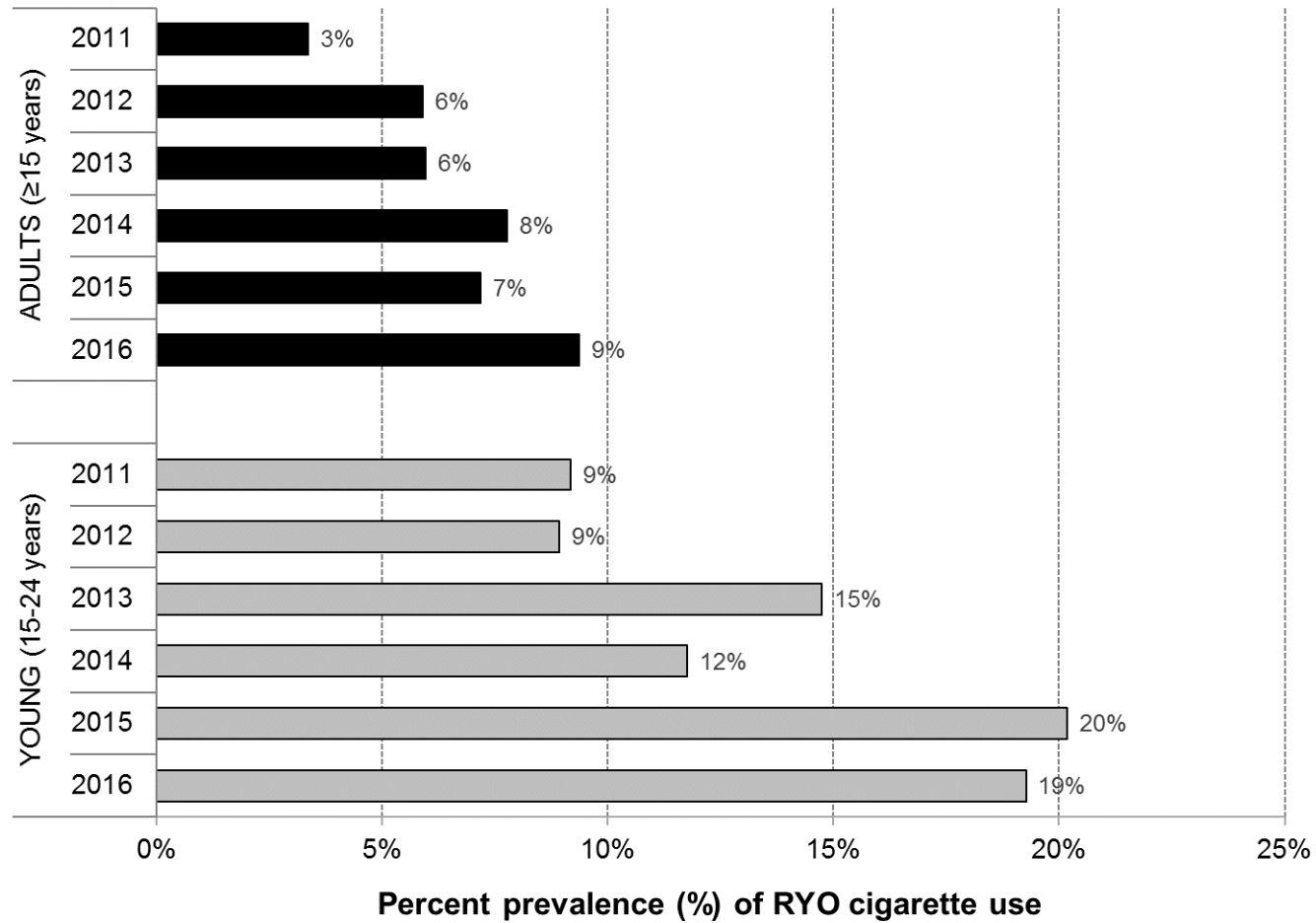
	N	Total		Men		Women	
		%	OR (95% CI)	%	OR (95% CI)	%	OR (95% CI)
Total	6046	21.4	-	26.0	-	17.2	-
Sex							
Men	2896	26.0	1 <sup>^</sup>	-	-	-	-
Women	3150	17.2	<b>0.61 (0.54-0.69)</b>	-	-	-	-
Age (years)							
<25	697	20.1	1 <sup>^</sup>	21.9	1 <sup>^</sup>	18.2	1 <sup>^</sup>
25-44	1907	27.1	<b>1.48 (1.20-1.83)</b>	31.2	<b>1.60 (1.20-2.13)</b>	23.0	1.32 (0.97-1.81)
45-64	1955	24.3	1.22 (0.98-1.51)	28.8	<b>1.34 (1.00-1.79)</b>	20.1	1.09 (0.79-1.50)
≥65	1487	10.9	<b>0.43 (0.33-0.56)</b>	16.4	<b>0.56 (0.40-0.80)</b>	6.8	<b>0.31 (0.21-0.46)</b>
p for trend			<b>&lt;0.001</b>		<b>&lt;0.001</b>		<b>&lt;0.001</b>
Education							
Low	2211	19.9	1 <sup>^</sup>	27.3	1 <sup>^</sup>	13.7	1 <sup>^</sup>
Intermediate	2930	23.2	<b>0.84 (0.72-0.97)</b>	26.5	<b>0.73 (0.59-0.89)</b>	19.9	1.01 (0.80-1.27)
High	905	19.4	<b>0.64 (0.52-0.79)</b>	21.3	<b>0.53 (0.40-0.70)</b>	17.6	0.79 (0.58-1.08)
p for trend			<b>&lt;0.001</b>		<b>&lt;0.001</b>		0.193
Geographic area							
Northern Italy	2763	22.2	1 <sup>^</sup>	26.1	1 <sup>^</sup>	18.7	1 <sup>^</sup>
Central Italy	1207	19.9	0.86 (0.73-1.02)	25.4	0.95 (0.76-1.20)	15.0	<b>0.75 (0.58-0.98)</b>
Southern Italy and islands	2076	21.2	0.89 (0.76-1.03)	26.4	0.97 (0.80-1.17)	16.5	0.81 (0.65-1.00)
Survey year							
2015	3046	20.8	1 <sup>^</sup>	24.8	1 <sup>^</sup>	17.2	1 <sup>^</sup>
2016	3000	22.1	1.09 (0.96-1.24)	27.3	1.17 (0.99-1.38)	17.2	1.00 (0.83-1.21)

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

<sup>^</sup>Reference category.



**Figure 1** - Trends in prevalence (%) of use of roll-your-own (RYO) cigarettes as the most frequent tobacco product consumed, among Italian adult (aged  $\geq 15$  years) and young (aged 15-24 years) smokers. Italy, 2011-2016.



**Figure 2** – Percent prevalence (%) of current and non-smokers (never and ex-smokers) supporting selected measures introduced in the new Italian incoming regulation. Italy, 2016.

