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Decrease in cross-border tobacco purchases despite intensification of anti-tobacco policies in France.

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Reference count: 41
Abstract

Background
Recently, France has intensified tobacco control policies which included gradual increase in tobacco products price and the introduction of plain packaging. However, there has been suggestion that cross-border tobacco purchases from neighbouring countries, with lower tobacco prices, will increase. We examine trends in cross-border tobacco purchases among smokers concurrent with the implementation of tobacco control measures between 2016 and 2017.

Methods
DePICT is a two-wave cross-sectional national telephone survey of French adults aged 18 to 64 years, which recruited a total of 2167 smokers (2016: n=1238; 2017: n=929). Data were weighted to be representative of the French adult population. The association between study wave and cross-country tobacco purchases was examined across study waves using a multivariable logistic regression model (adjusted ORs: OR_a (95% CI)).

Results
Less than half (38.5%) of smokers declared cross-border tobacco purchases in the last year, which were mostly done on occasional basis: 22.6% purchased tobacco cross-border once or twice yearly. In 2017, as compared with 2016, cross-border tobacco purchases by French smokers decreased (OR_a = 0.81 [0.68 - 0.98]). Other factors associated with cross-border tobacco purchases included sex, and driving distance to a border.

Conclusion
In France, the increase in tobacco products price and the introduction of plain packaging did not contribute to increasing rates of out-of-country purchases of tobacco products, probably due to the overall decrease in smoking levels. However, a harmonization of tobacco products prices and
plain packaging policies across Europe might further improve tobacco control throughout the continent.
INTRODUCTION

Despite a steady decline related to the gradual introduction of tobacco control measures, the prevalence of smoking remains high in Europe.[1] In France, after decades when smoking rates stagnated around 30%.[2] tobacco control policies were intensified with the National Smoking Reduction Programme (PNRT).[3,4] This programme includes a progressive increase in tobacco product prices, better coverage of nicotine replacement therapy products by the national health insurance system, a ban on smoking in parks, nationwide smoking cessation campaigns, as well as the introduction of standardised plain packaging with larger than previously health messages.[3,4] As of January 1st 2017, only plain packaging tobacco products are authorized for sale in France.[5] In parallel, there was an average increase in the price of tobacco products of 2.7% compared to 2016 (mainly roll your own (RYO) tobacco).[6] These measures have led to a sharp decrease in smoking prevalence, deemed as a great public health success.[7,8]

Increases in tobacco-related taxes and the introduction of plain packaging have been proven effective in modifying smoking-related behaviours: switch to cheaper tobacco products, reduction in tobacco consumption and higher smoking cessation levels.[9–13] However, some smokers try to circumvent these measures by using legal tax avoidance strategies, such as out-of-country tobacco purchases from neighbouring countries with cheaper tobacco products and this argument is frequently brought up by opponents of stricter anti-tobacco policies.

Across the EU, it is legal to buy and travel with up to 800 cigarettes (40 packs or 4 cartridges) in-between countries,[14] and more than 10% of smokers in France reported buying tobacco products in another EU country and 1-2% outside of the EU (2006-2008).[15] This may not be surprising considering that France is bordered by 7 countries: Belgium, Luxembourg, Germany, Switzerland, Italy, Spain and Andorra. In 2017, none of these countries had introduced plain tobacco packaging. Moreover, with the exception of Switzerland, the average price of a pack of manufactured cigarettes for the most frequently sold brands in 2016
was higher in France (7.00 euros),[16] than in all of those countries aside from Switzerland: ranging from 3.50 euros in Andorra,[17] to 6.32 euros in Belgium.[18–22] Applying current rules on the legal import of tobacco products (each person is limited to a maximum of 300 units from Andorra or 800 units from the other bordering countries),[14,23] the amount of money a person could save when buying a carton of cigarettes ranges from 27.20 euros in the purchase was made in Belgium to 86 euros if it was in Spain. For roll your own (RYO) tobacco products, equivalent figures for a box (limited to 400g per person from Andorra and 1000g from the other bordering countries) are 59 euros when buying in Andorra to 150.50 euros in Luxembourg. Naturally, these estimates do not take into account the cost of travel across the border, which varies with the distance travelled for persons travelling by car or train.

Previous studies showed that smokers living near a border are more likely to buy tobacco products across the border if they are cheaper.[24,25] However, it is not yet known whether the introduction of plain tobacco packaging and the gradual increases in the price of tobacco such as implemented in France, lead smokers to buy more frequently from abroad, whether it is by crossing the border with the purpose of buying tobacco, or on another work-related or personal occasion. Further, tobacco-related behaviours are reportedly marked by sex-differences,[26,27] which have resulted in a call for systematic gender analysis in studies on tobacco control policies and smoking behaviour.[28]

The present study examines changes in cross-border purchases of tobacco products in relation to the intensification of tobacco control.
METHODS

DePICT: Study design, settings and participants
Data come from the DePICT (Description des Perceptions, Images, et Comportements liés au Tabagisme) repeated cross-sectional survey, which took place in two waves one year apart: between the end of August and mid-November 2016 (wave 1, n = 4456) and beginning of September and end of November 2017 (wave 2, n = 4114). Trained interviewers from a polling company (MV2) recruited participants from randomly generated telephone lists using a computer-assisted telephone interviewing (CATI) system. Landline and mobile phone numbers were called up to 30 times and one French-speaking adult, aged between 18 and 64, was randomly selected from each household using the Kish method. The study sample was based on a simple random sampling of households and individuals within households. A second polling company (CDA) was responsible for monitoring and auditing data collection procedures. DePICT was approved by the ethical review committee of the French National Institute of Health and Medical Research (INSERM, CEEI-IRB 00003888). Only regular (at least one cigarette/day) and occasional smokers (less than one cigarette/day) participating in the two study waves (n=2167) were included (non-smokers and former smokers, n = 6303, were excluded).

Main outcome: cross-border tobacco purchases
Participants were asked about their smoking status – those who responded that they were regular or occasional smokers were asked how many times they bought cigarettes or roll your own (RYO) tobacco products abroad in the preceding 12 months (never, once or twice, 3 to 9 times, 10 to 20 times, more than 20 times). Answers were dichotomized to create the outcome variable (at least one out-of-country tobacco purchase in the preceding 12 months (yes vs. no)).
Other covariates

Covariates included factors linked with smoking behaviour such as socio-demographic characteristics, as well the driving distance from a border:

- **Socio-economic characteristics:** age categorized in 4 groups (18-24, 25-34, 35-49 and ≥ 50 years), sex (male or female), educational level (< high school diploma, ≤two year higher education degree and ≥ three year higher education degree), living circumstances (living alone, with a non-smoker, or with a smoker), and country of birth (France or other country).

- **Participants’ smoking habits:** the number of cigarettes smoked per day, and cannabis use in the preceding year [8] (yes or no).

- **Distance from a border:** each participant reported the postal code of their regular residence. We calculated the shortest driving distance to the nearest border using Google Maps, with the hypothesis that smokers living near a border were more likely to buy tobacco from abroad as it is easier for them to cross the border to a neighbouring country. Driving distances were preferred to straight line distances because they reflect more accurately the paths smokers take if they want to buy cheaper tobacco across the border (Belgium, Luxembourg, Germany, Italy, Spain and Andorra). We excluded Switzerland because tobacco is not cheaper there than in France and if several driving distances were possible, we used the nearest. For each smoker, several driving distances were calculated between the coordinates of the postal code of their residence (National Institute of Statistic and Economic Studies (INSEE) database)[29] and the different routes crossing the borders to the neighbouring country. Participants were classified into 5 categories according to the smallest driving distance from a border: <100, 100 to 199, 200 to 299, ≥ 300 km from a border, or living in the Greater Paris region (defined by the postal codes), which corresponds to Paris and its suburbs. Even though smokers living in the Greater Paris region are more than 300 km from a border, they were studied separately because compared to the general population, they tend to have higher educational level and are more
likely to be working and to be born abroad, and are therefore more likely to travel for work-related or personal reasons.[30] The driving distances were cross-checked to ensure each smoker were correctly classified in their respective driving distance range.

**Statistical analyses**

For both study waves, data were weighted based on the probability of being selected through the Kish method (ratio of the number of eligible individuals to the number of telephone lines in the household), and to match the structure of the French population in 2016 with respect to sex, age, education, region of residence and smoking experimentation, using data from the National Institute of Statistics and Economic Studies (INSEE) and the National Health Survey. [2] Multivariable logistic regression models were implemented in SAS version 9.4 to examine the relationship between study wave (2017 vs. 2016) and participants’ likelihood of cross-border tobacco purchases, while adjusting for socio-demographic characteristics and other potential confounders. All the analyses were weighted using the “weight” option in SAS. We used the “normalize” statement in the “weight” option in our final models to rescale the inflation weights so that they sum up to the actual sample size. Sensitivity analysis were also carried out without the weights.

**Testing for interactions**

In a separate model, we tested for statistical interactions between study wave and distance to the nearest border. In another analysis we also tested an interaction between study wave and sex. Stratified analyses were carried out when the interaction term was statistically significant.
RESULTS

Table 1 presents descriptive statistics of smokers included in the analysis according to study wave. 38.5% of smokers reported at least one cross-border tobacco purchase in the last 12 months (41% in 2016 vs 35.2% in 2017), with only 15.9% of smokers reporting purchasing tobacco across the border more than twice in the last year.

Intensification of tobacco control policies and cross-border tobacco purchases

In bivariate analyses, in 2017 smokers were less likely to purchase tobacco from abroad than in 2016 (OR = 0.85 [0.71 - 1.01]). This association was statistically significant (OR$_a$ = 0.81 [0.68 - 0.98]) after adjusting for covariates in multivariate analysis (Table 2).

Other factors associated with cross-border tobacco purchases

Other factors linked with cross-border tobacco purchase in adjusted analysis included age (18-24 years vs. 50 years or more OR$_a$ = 2.45 [1.82 - 3.29], 25-34 years vs. 50 years or more OR$_a$ = 2.02 [1.53 - 2.66]), 35-49 years vs. 50 years or more OR$_a$ = 1.39 [1.08 - 1.79]); educational level (< high school diploma vs. ≥ three year higher education degree OR$_a$ = 0.68 [0.51 - 0.92], ≤ two year higher education degree vs. ≥ three year higher education degree OR$_a$ = 0.71 [0.53 - 0.96]), and country of birth (foreign country vs. France OR$_a$ = 2.02 [1.49 - 2.74]). Further, independently of survey wave (pooled effect), driving distance to a border was also associated with our main outcome. Those living closer to a border as well as those living in the Greater Paris region had a significantly higher odds of purchasing cigarettes abroad at least once compared to those living more than 300 km from a border. The likelihood of cross-border tobacco purchases increased as the distance from a border decreased (OR$_a$GreaterParis = 1.32 [95% CI 1.02 - 1.71], OR$_a$200-299 Km = 1.47 [1.05 - 2.04], OR$_a$100-199 Km = 2.04 [1.53 - 2.72], OR$_a$<100 Km = 3.98 [3.02 - 5.25]).
Testing for interactions, and stratified analyses

The interaction between study wave and distance from a border in relation to cross-border tobacco purchases was statistically significant (p < 0.0001). In multivariate analyses stratified on the distance from a border, (Figure 1) the decrease in cross-border tobacco purchases between 2016 and 2017 was only observed among participants living 100-199 Km (OR_a = 0.57 [0.33 - 0.97]) and 200-299 Km (OR_a = 0.50 [0.25 - 0.99]) from a border.

The interaction between study wave and sex in multivariate analysis was also statistically significant. In sex-stratified multivariate analyses, the decrease in cross-border tobacco purchases was only observed in men (OR_a = 0.59 [0.45 - 0.78]) (Figure 1).

Sensitivity analyses without the weights were also statistically significant and showed the same result trends as the weighted analyses (results not shown).

DISCUSSION

Key findings

The intensification of tobacco control measures in France between 2016 and 2017, which resulted in a decrease in smoking rates, was not linked to an increase, but instead linked to a decrease in cross-border tobacco purchases. This trend appeared strongest in participants who were not living near a border, and who were male. Participants living nearest to a border with a country where tobacco prices are lower were most likely to report cross-border tobacco purchases and least likely to change behaviour after the intensification of tobacco control policies. Though, it cannot be claimed that these measures are solely responsible for this decrease, our findings suggest that strengthening anti-tobacco measures in France did not lead
smokers to increase their purchases of cigarettes abroad, which is reassuring. Nevertheless, more harmonized anti-tobacco policies in the EU, particularly in terms of price, could help curtail smoking rates across different countries.

Interpretation

Our finding indicating a decrease in cross-border tobacco purchases after the implementation of comprehensive tobacco measures such as increase in tobacco prices and introduction of plain packaging is rather surprising. The tobacco industry often argues that these types of measures encourage tax evasion and avoidance among smokers, including tobacco purchases cross-border, in duty-free shops or on the Internet.[31,32] Nevertheless, these claims have previously been rebuked.[33] For example in Australia, the introduction of plain packaging did not increase illicit tobacco sales.[34] In France, the implementation of anti-tobacco measures has been accompanied by a decreasing in the social acceptance of smoking, an increase in the fear of the health consequences of smoking [8] and a decrease in smoking levels,[7] which could explain the decrease in out-of-country purchases we observed. Our study contributes to this existing literature by showing that the enforcement of existing anti-smoking measures did not lead to an increase in out-of-country purchases of tobacco products among smokers in France even though France is bordered by countries where tobacco products are cheaper. However, as previous studies showed, the proximity of a neighbouring country with cheaper tobacco products is linked with higher risk of out of country purchases.[35]

One interesting result is that even if male smokers were more likely to purchase tobacco cross-border overall compared to women, they were also more sensitive to new policies and decreased out-of-country purchases of tobacco products, but not women. This is consistent with previous studies showing that female smokers are less responsive to antismoking measures such as price increases.[36]
Limitations

Our study has several limitations which need to be mentioned. First, our study was framed as a survey on smoking-related perceptions and behaviours, which may have increased the likelihood of selection bias among smokers. However, to limit this possibility, we statistically weighted all analyses to render the data and results representative of adults living in France, including in terms of smoking patterns. Second, it is possible that some of the responses are affected by recall bias; nonetheless, this bias should be comparable between the two study waves. Further, we only investigated cross-country tobacco purchases that are legal, which should limit desirability bias. However, the smuggling of tobacco products is estimated to be modest (smuggled and counterfeit cigarette consumption now accounts for 8.7% of total EU consumption in 2017 [37]) compared to legal cross-border purchasing, which amounts to up to 14-20% of legal tobacco sales in 2008,[38] while in 2017 it was estimated to be 11.5% in 2017 (12.3% in 2016).[37,39] In our study, it is not known whether tobacco product purchases were made by smokers crossing the border on purpose, or whether smokers were on holidays or business in a foreign country when they made the purchase, which should be investigated in future studies. Furthermore, while it is reassuring that these measures did not lead to an increase in cross-border tobacco purchases, it is not possible to attribute the decrease in purchases solely to these measures as there may be other factors that we have not measured that can play a role. While there was an inflation of 1% between 2016 and 2017, with a 10.3% increase in the prices of gasoline,[6] an increase in travel was nevertheless observed, with 74.8% of the total population travelling in 2017 (74.0% in 2016) and an average of 5.6 travels per person (4.9 in 2016).[40] yielding 25,167 travels for personal reasons and 3,888 for professional purposes were conducted in 2017, as compared to respectively 23,544 and 2,938 in 2016.[40] So, the decrease in purchases from a foreign country cannot be attributed to a decrease in travels of the French population.
Implications

According to the tobacco industry, tobacco control measures such as increases in taxes and plain packaging lead to higher rates of tobacco smuggling and cross-country purchases.[41] However, data from France continues to show a decrease in smoking rates as a consequence of comprehensive tobacco measures, including a drop in out-of-country tobacco purchases. These results as well as previous studies suggest that most smokers buy cigarettes out of the country only once or twice during the year, probably during their holidays.[35] These comprehensive measures are having a positive impact in terms of tobacco control, though smokers living near a border are more still likely to buy tobacco from another country compared to those living far from a border.[35] A harmonization of prices of tobacco products and plain packaging policies across Europe might further improve tobacco control throughout the continent.
What this paper adds

What is already known on this subject?

• Tobacco control policies, including increases in taxes and plain packaging, were recently intensified in France, and resulted in a decrease in smoking rates.

• France is bordered by several countries where tobacco products are significantly cheaper.

Important gaps in knowledge:

• It has been argued that increases in taxes and plain packaging implementation would result in increases in cross-border tobacco purchases.

What this study adds:

• After the intensification of tobacco control policies in France, we report a decrease in the rates of cross-border tobacco purchases in 2017 compared to 2016

• Our results suggest that decrease in overall smoking rates, also translates into lower cross-border tobacco purchases

Declarations of interests

The authors declare no conflict of interest.

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# Tables

Table 1. Characteristics of study participants depending on the waves of survey: Chi square test and ANOVA. Nationally representative DePICT study, France, 2016 & 2017, N=2167

<table>
<thead>
<tr>
<th>Variables</th>
<th>Wave 1, 2016 (n = 1238)</th>
<th>Wave 2, 2017 (n = 929)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>39.7 (SD = 12.8)</td>
<td>43.1 (SD = 12.8)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Sex: Female</td>
<td>612 (49.4%)</td>
<td>432 (46.5%)</td>
<td>0.1763</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td>0.3587</td>
</tr>
<tr>
<td>&lt; high school diploma</td>
<td>458 (37.0%)</td>
<td>341 (42.7%)</td>
<td></td>
</tr>
<tr>
<td>≤2 year higher education degree</td>
<td>499 (40.3%)</td>
<td>354 (36.7%)</td>
<td></td>
</tr>
<tr>
<td>≥ 3 year higher education degree</td>
<td>281 (22.7%)</td>
<td>234 (45.4%)</td>
<td></td>
</tr>
<tr>
<td>Living situation</td>
<td></td>
<td></td>
<td>0.4570</td>
</tr>
<tr>
<td>Live alone</td>
<td>464 (37.5%)</td>
<td>345 (37.1%)</td>
<td></td>
</tr>
<tr>
<td>Live with non-smoker</td>
<td>366 (29.6%)</td>
<td>296 (31.9%)</td>
<td></td>
</tr>
<tr>
<td>Live with smoker</td>
<td>408 (33.0%)</td>
<td>288 (31.0%)</td>
<td></td>
</tr>
<tr>
<td>Born in a foreign country</td>
<td>113 (9.1%)</td>
<td>86 (9.3%)</td>
<td>0.9176</td>
</tr>
<tr>
<td>Number of cigarettes/day</td>
<td>12.0 (SD = 9.9)</td>
<td>11.5 (SD =9.0)</td>
<td>0.2047</td>
</tr>
<tr>
<td>Smoked cannabis in the last year</td>
<td>344 (27.8%)</td>
<td>215 (23.1%)</td>
<td>0.0145</td>
</tr>
<tr>
<td>Driving Distance from border</td>
<td></td>
<td></td>
<td>0.0253</td>
</tr>
<tr>
<td>&lt; 100 km</td>
<td>167 (13.5%)</td>
<td>136 (14.6%)</td>
<td></td>
</tr>
<tr>
<td>100 - 199 km</td>
<td>150 (12.1%)</td>
<td>119 (12.8%)</td>
<td></td>
</tr>
<tr>
<td>200 - 299 km</td>
<td>116 (9.4%)</td>
<td>72 (7.8%)</td>
<td></td>
</tr>
<tr>
<td>&gt; 300 km</td>
<td>559 (45.2%)</td>
<td>461 (49.6%)</td>
<td></td>
</tr>
<tr>
<td>Greater Paris</td>
<td>246 (19.9%)</td>
<td>141 (15.2%)</td>
<td></td>
</tr>
<tr>
<td>Bought tobacco abroad</td>
<td></td>
<td></td>
<td>0.0488</td>
</tr>
<tr>
<td>Never</td>
<td>730 (59.0%)</td>
<td>602 (64.8%)</td>
<td></td>
</tr>
<tr>
<td>Once or twice</td>
<td>302 (24.4%)</td>
<td>188 (20.2%)</td>
<td></td>
</tr>
<tr>
<td>3 to 9 times</td>
<td>116 (9.4%)</td>
<td>80 (8.6%)</td>
<td></td>
</tr>
<tr>
<td>10 to 20 times</td>
<td>39 (3.2%)</td>
<td>34 (3.7%)</td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Changes in cross-border tobacco purchases after the intensification of tobacco control policies (adjusted Odds Ratios and 95% Confidence Intervals). Nationally representative DePICT study, France, 2016 & 2017, n = 2167.

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratios</th>
<th>95% Confidence Interval</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bivariate analysis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave: 2017 vs 2016</td>
<td>0.85</td>
<td>0.71</td>
<td>1.01</td>
</tr>
<tr>
<td><strong>Multivariable adjusted analysis</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wave: 2017 vs 2016</td>
<td>0.81</td>
<td>0.68</td>
<td>0.98</td>
</tr>
<tr>
<td><strong>Distance to nearest border</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100 km vs &gt;300 km</td>
<td>3.98</td>
<td>3.02</td>
<td>5.25</td>
</tr>
<tr>
<td>100-199 km vs &gt;300 km</td>
<td>2.04</td>
<td>1.53</td>
<td>2.72</td>
</tr>
<tr>
<td>200-299 km vs &gt;300 km</td>
<td>1.47</td>
<td>1.05</td>
<td>2.04</td>
</tr>
<tr>
<td>Greater Paris vs &gt;300 km</td>
<td>1.32</td>
<td>1.02</td>
<td>1.71</td>
</tr>
<tr>
<td><strong>Sex: Female vs Male</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.92</td>
<td>0.77</td>
<td>1.11</td>
<td>0.4028</td>
</tr>
<tr>
<td><strong>Educational Level</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; high school diploma vs ≥ 3 year higher education degree</td>
<td>0.68</td>
<td>0.51</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>--------------------------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>≤ 2 year higher education degree vs ≥3 year higher education degree</td>
<td>0.71</td>
<td>0.53</td>
<td>0.96</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>18-24 vs ≥ 50</td>
<td>2.45</td>
<td>1.82</td>
<td>3.29</td>
</tr>
<tr>
<td>25-34 vs ≥ 50</td>
<td>2.02</td>
<td>1.53</td>
<td>2.66</td>
</tr>
<tr>
<td>35-49 vs ≥ 50</td>
<td>1.39</td>
<td>1.08</td>
<td>1.79</td>
</tr>
<tr>
<td>Number of cigarettes/day:</td>
<td></td>
<td></td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>10-19 vs &lt; 10</td>
<td>1.73</td>
<td>1.38</td>
<td>2.17</td>
</tr>
<tr>
<td>≥ 20 vs &lt; 10</td>
<td>1.55</td>
<td>1.21</td>
<td>1.97</td>
</tr>
<tr>
<td>Born in a foreign country: yes vs no</td>
<td>2.02</td>
<td>1.49</td>
<td>2.74</td>
</tr>
<tr>
<td>Living conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone vs with non-smoker</td>
<td>1.35</td>
<td>1.06</td>
<td>1.70</td>
</tr>
<tr>
<td>With smoker vs with non-smoker</td>
<td>2.27</td>
<td>1.78</td>
<td>2.90</td>
</tr>
<tr>
<td>Cannabis in the last year: yes vs no</td>
<td>1.23</td>
<td>0.99</td>
<td>1.53</td>
</tr>
</tbody>
</table>
Figure 1. Changes in out-of-country tobacco purchases after the intensification of tobacco control policies: adjusted analyses stratified on the driving distance to the nearest border, and sex (adjusted Odds Ratios and 95% Confidence Intervals). Nationally representative DePICT study, France, 2016 & 2017, n = 2167.

The odds ratios compare the odds of cross-border purchasing in 2017 vs 2016 for each distance band and for both sexes.

*Adjusted on: sex, age, educational level, wave, number of cigarettes smoked per day, country of birth, cannabis use in the last 12 months, living conditions (living alone, with a non-smoker, or with a smoker).

**Adjusted on: age, educational level, wave, number of cigarettes smoked per day, country of birth, cannabis use in the last 12 months, living conditions (living alone, with a non-smoker, or with a smoker), and driving distance.