



European Regulatory Science on Tobacco:
Policy implementation to reduce lung diseases

Cross-border Purchasing of Cigarettes among Smokers in Six European Countries: Findings from the EUREST-PLUS ITC Europe Surveys

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Background

- Tobacco taxation is one of the most effective policy tools governments can use to increase cigarette prices
- Increased cigarette prices:
 - Reduce consumption
 - Encourage smokers to quit
 - Prevent youth from starting to smoke
- Even though the European Union is a world leader in tobacco taxation policy, cigarette prices vary substantially across European countries.
- Average cigarette prices (2016):
 - Old EU Member States: €6.30/pack of 20
 - New EU Member States: €3.25/pack of 20
- Previous research indicates that EU smokers living near borders are more likely to purchase cigarettes outside their own country if those cigarettes are cheaper compared to smokers living in non-border areas

Study Objectives

The availability of lower-cost cigarettes in neighbouring jurisdictions provides price-sensitive smokers with economic incentives to purchase such alternatives

- Estimate the prevalence of cross-border purchasing of cheaper cigarettes in Germany (DE), Greece (GR), Hungary (HU), Poland (PL), Romania (RO) and Spain (ES)
- Test whether prevalence varies by residential location
 - Regions bordering lower-price countries
 - Regions bordering similar/higher price countries
 - Non-border regions
- Test whether average cigarette prices differed by type of purchase (cheaper out-of-country purchase vs. not)

The EUREST-PLUS ITC Europe Surveys

- Prospective longitudinal cohort design
- Nationally representative samples of ~1000 adult smokers (age 18+) in each country
- Multi-stage probabilistic sampling design:
 - Sampling strata: NUTS regions X degree of urbanization (NUTS level 1 in Germany, NUTS level 2 in other countries)
 - Primary sampling units: 100 enumeration areas in each stratum
 - Face-to-face computer assisted interviewing (CAPI)
- Wave 1: June 2016 – September 2016
- Post-stratification sampling weights
 - Estimates are representative of the population of smokers in each country
 - Bootstrap replication weights for variance estimation

Outcome Measures

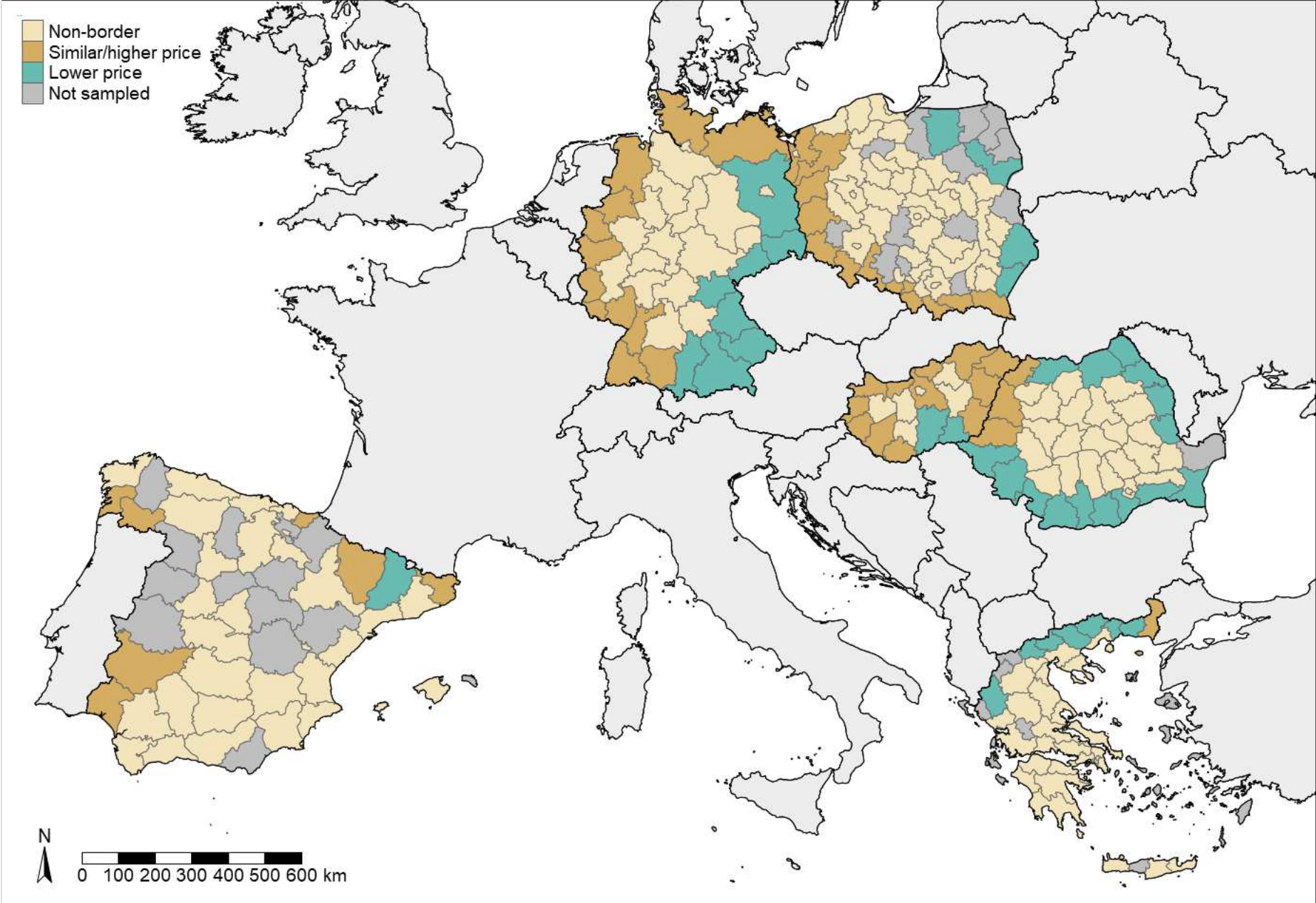
1. Purchase of cheaper cigarettes out-of-country cigarettes in the previous 6 months
 - “How often in the last 6 months have you bought cigarettes from outside your country but inside the EU?”
 - “How often in the last 6 months have you bought cigarettes outside the EU?”
 - Responses to both used to classify smokers as
 - Not having purchased out-of-country cigarettes
 - Making one purchase in the previous 6 months
 - Making more than one purchase
 - Smokers who purchased out-of-country were also asked the reason for their purchase
 - All smokers who made out-of-country purchases because they were cheaper were classified as having purchased cheaper out-of-country cigarettes in the previous 6 months

Outcome Measures

2. Self-reported cigarette prices

- Smokers reported prices paid for last purchase in local currency units (converted to Euros)
- Prices reported as price per carton, pack, or loose roll-your-own (RYO) tobacco
- Smokers also reported total quantity of cigarettes purchased
- Price for total purchase converted to price/pack of 20 cigarettes
- Prices for loose tobacco were computed assuming 0.75g of loose tobacco was equivalent to 1 factory-made (FM) cigarette

EUREST-PLUS ITC Europe Surveys: Sampled regions and cigarette prices in neighbouring countries.



Statistical Analysis

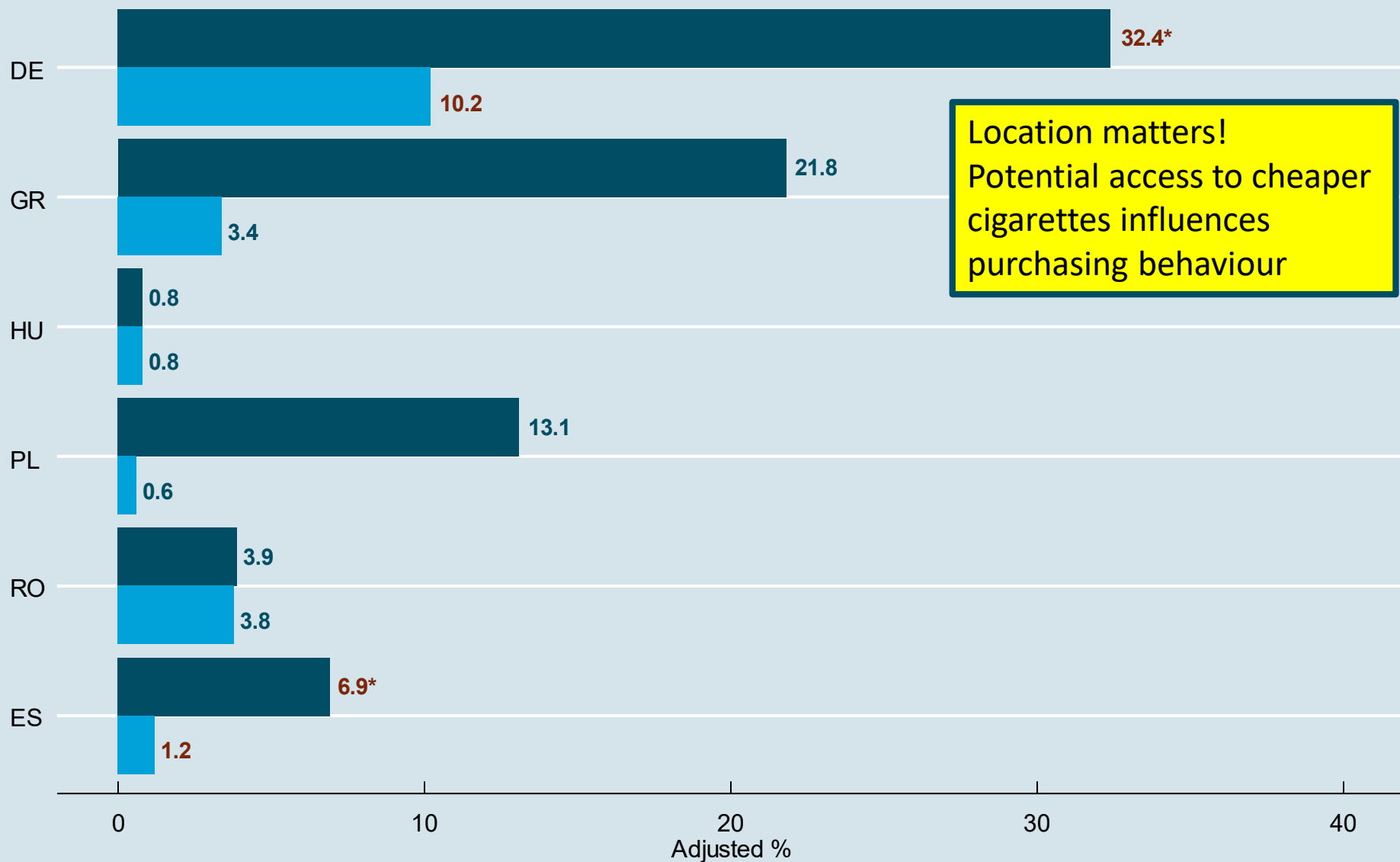
- Weighted descriptive statistics:
 - Any out-of-country purchase in previous 6 months (once, \geq once)
 - Cheaper out-of-country purchases
- Logistic regression to estimate:
 - Adjusted prevalence of purchasing cheaper out-of-country cigarettes by country and residential location (tested country X location interaction) after controlling for sociodemographic (e.g., age, sex, income, education) and smoking behavior (e.g., cigarettes/day)
 - Main effect model to examine the overall association between residential location and purchasing cheaper out-of-country cigarettes
- Linear regression:
 - Average pack prices by country and (a) purchase type (cheaper vs not) and (b) type smoked (FM vs RYO) controlling for covariates
- Analysis conducted using SUDAAN (V11.0.1) to account for complex sampling design and sampling weights

Results

	DE (n=1003) %	GR (n=1000) %	HU (n=1000) %	PL (n=1006) %	RO (n=1001) %	ES (n=1001) %
Male	50.5	<u>54.4</u>	52.1	47.4	<u>58.0</u>	<u>54.4</u>
18-24	8.8	6.1	5.9	<u>7.2</u>	<u>11.0</u>	<u>11.7</u>
25-39	28.2	25.5	28.2	<u>34.0</u>	<u>30.0</u>	<u>31.2</u>
40-54	33.8	38.3	35.7	27.9	32.1	32.3
≥ 55	29.2	30.1	30.2	30.9	27.0	24.9
Low income	30.5	18.0	17.9	17.2	22.6	27.1
Moderate income	34.6	52.5	29.0	35.1	46.6	26.8
High income	<u>25.6</u>	9.8	22.2	15.3	25.0	<u>6.8</u>
Income not reported	9.3	19.7	<u>31.1</u>	<u>32.4</u>	5.9	<u>39.4</u>
Non-border region	48.7	90.0	36.2	69.6	53.9	87.0
Similar/higher price region	31.4	1.0	53.9	20.8	8.0	12.0
Lower price region	19.9	9.0	9.9	9.6	38.1	1.0
Smokers RYO exclusively	10.8	25.6	<u>44.4</u>	7.0	1.0	17.3

Purchase of cheaper out-of-country cigarettes by location (2016)

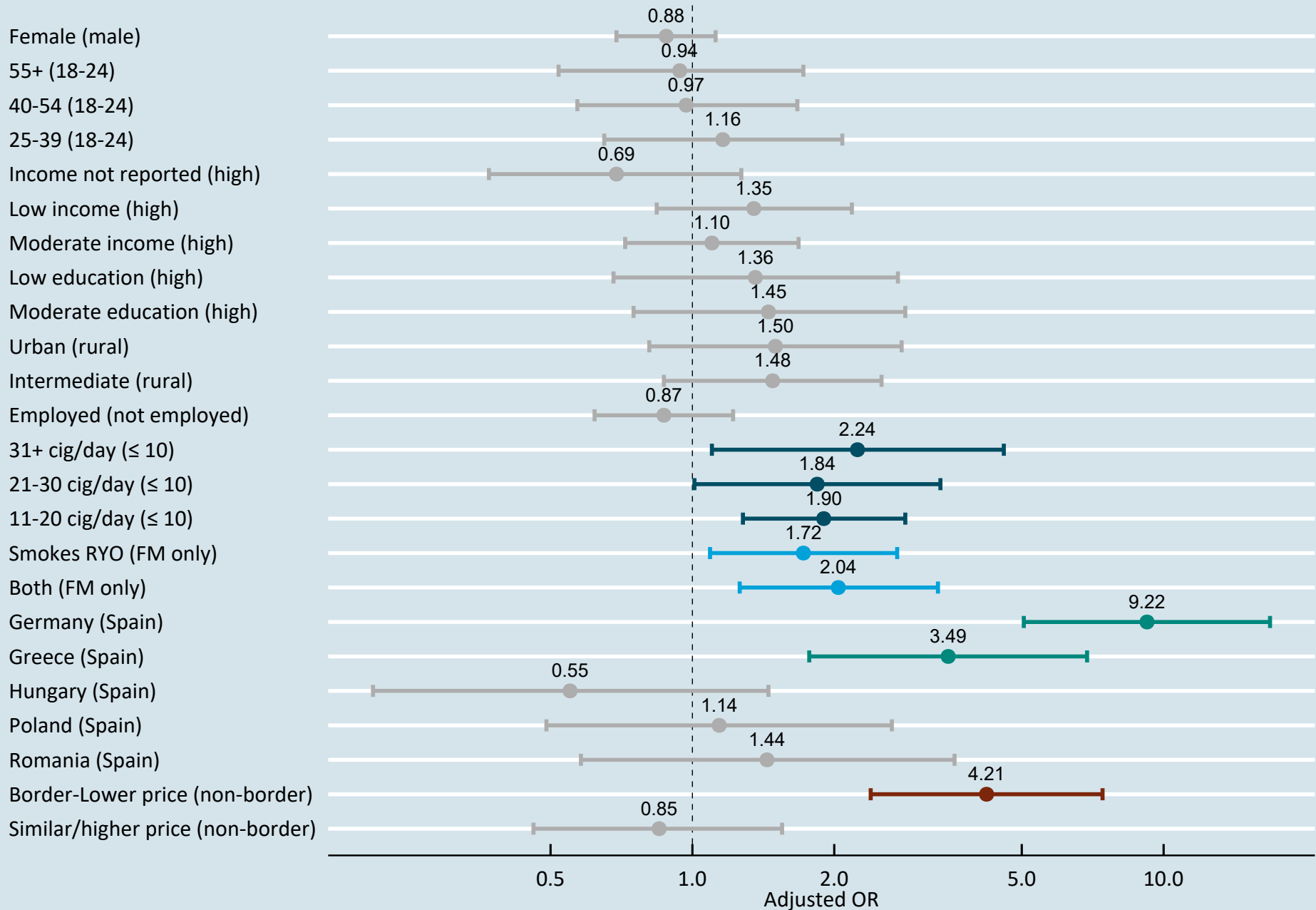
■ Borders lower-price country ■ Other regions



Location matters!
Potential access to cheaper cigarettes influences purchasing behaviour

Model-based adjusted percentages controlling for covariates
*p < 0.01 after Bonferroni correction

Odds of purchasing cheaper out-of-country cigarettes

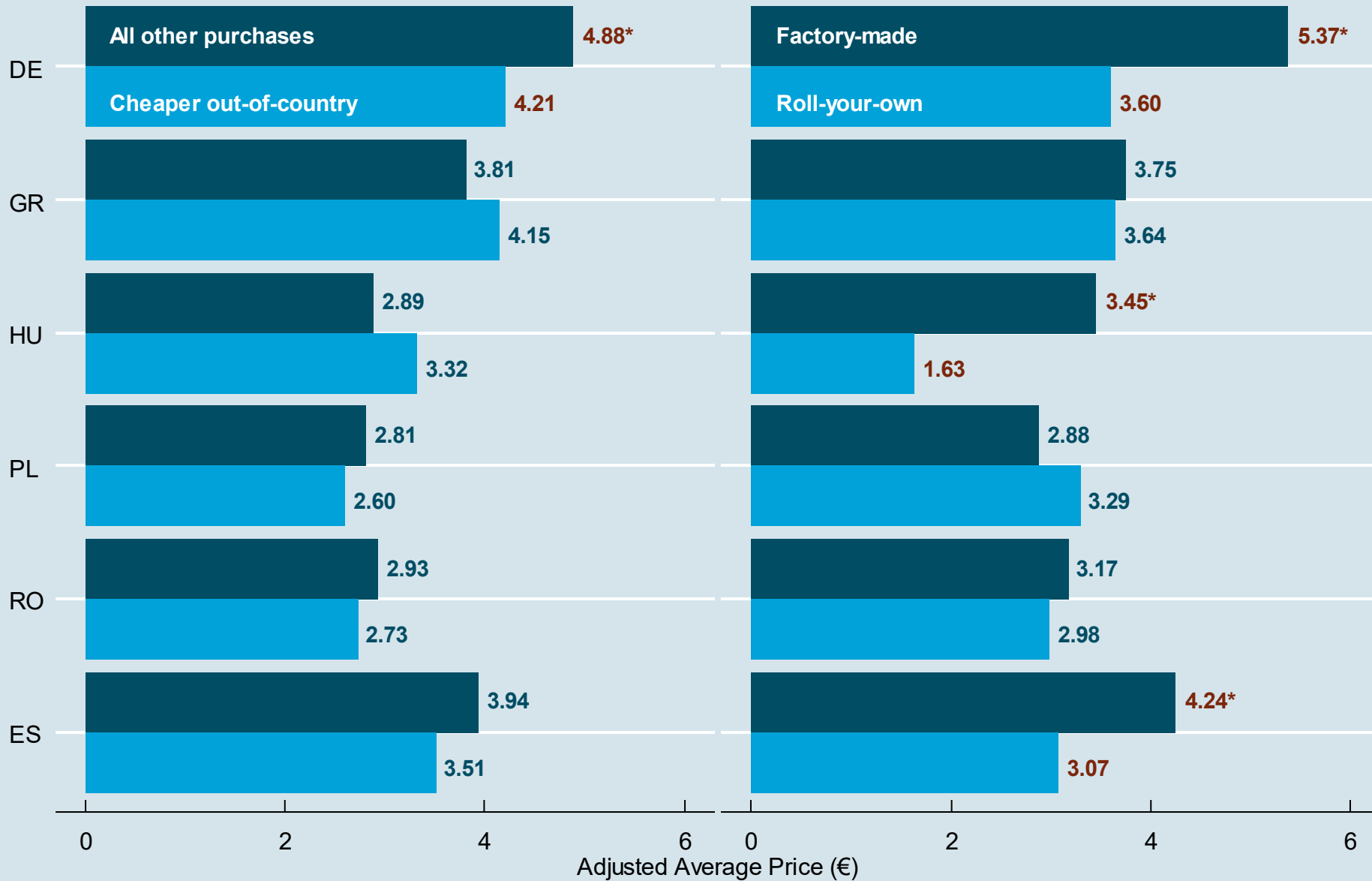


Logistic model also controlled for time-to-first cigarette and intentions to quit (not shown)

Average price paid (€) per pack of 20 cigarettes (2016)

Purchase Type

Type Smoked



Model-based average self-reported prices (marginal means) adjusted for covariates

*p < 0.01 after Bonferroni correction

Summary

- Prevalence of purchasing of cheaper cross-border cigarettes is rare
- Prevalence varies by country
 - Most common in Germany (15%)
 - Least common in Hungary (1%)
- Important differences in cross-border purchasing by residential location:
 - 32% of German smokers from regions bordering lower-cost countries
 - 10% of all other German smokers
 - Similar (but not significant) effects in Greece and Poland
 - Across all countries, smokers living in areas neighboring lower-cost countries had 4.2 times greater odds of making cheaper cross-border purchases compared to smokers living in other areas
- A large percentage of Hungarian smokers smoke RYO cigarettes and pay significantly less for those cigarettes

Access to lower-cost cigarettes, by location or type smoked (FM vs RYO), influences cigarette purchasing behaviours

Conclusions

- Price-sensitive smokers have access to, and purchase cheaper cigarettes from, other European countries having lower cigarette prices
 - In 2016, the average price of cigarettes was €6.00/pack in Germany, vs €3.38 in Poland, €3.11 in the Czech Republic and €5.00 in Austria
 - Price differentials between countries provide economic incentives for smokers to purchase cheaper cross-border cigarettes
- Tax harmonization policies that minimize these differentials can eliminate sources of lower-cost alternatives
- Prices should also be equalized across products (i.e., RYO vs FM cigarettes). This is important in countries such as Hungary, where a large percentage of smokers use roll-your-own cigarettes

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