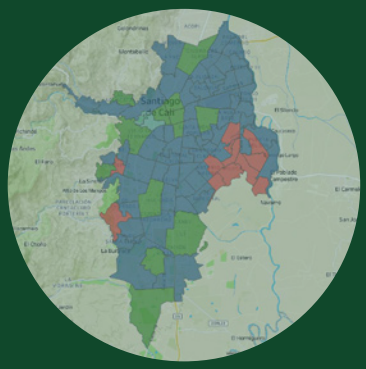
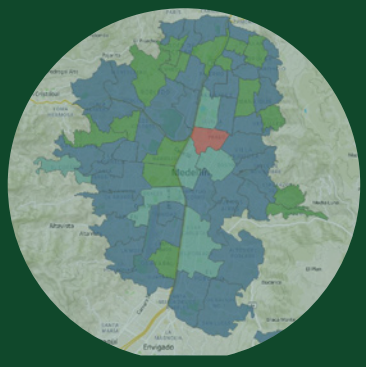
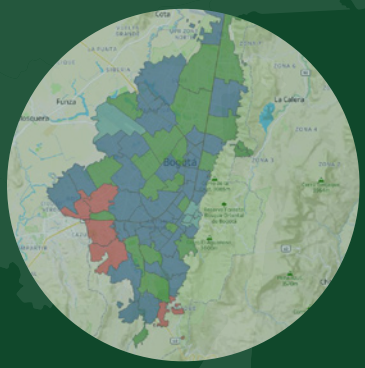
Measuring Cigarette Smuggling in Colombia

A Participatory Monitoring Study of Cigarette Packs' Characteristics (M3C-COL) **in five cities**







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Anaís | PROESA | Universidad ICESI | Universidad del Rosario | Facultad de Economía | TABACONOMÍA

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The authors declare that they have no relationships with, nor have they received payments or support from, companies that manufacture or market tobacco products, their parent companies, affiliates, or subsidiaries. Additionally, they have not received funding from organizations or foundations predominantly supported by such companies, nor from individuals, groups, or organizations representing the tobacco industry's interests.

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Introduction

Colombia ratified the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) in 2008 (WHO, 2003; approved by Law 1109 of 2006 and enacted by Decree 2871 of 2008). This ratification signified the State's commitment to adopting effective strategies for reducing cigarette and tobacco product consumption. Among these strategies, the implementation of selective taxes on tobacco products stands out as a highly cost-effective approach. Such taxes aim to raise prices, thereby reducing affordability and consumption (WHO, 2017; WHO, 2021).

Given the proven effectiveness of tobacco taxes in curbing consumption, the tobacco industry actively seeks to obstruct or reverse their proper implementation (Maani et al., 2022). A common argument advanced by the industry is that higher taxes fuel illicit trade in tobacco products (Gilmore et al., 2015). This argument is frequently employed on a global scale by the industry and is supported by the direct or indirect funding of illicit trade studies characterized by methodological deficiencies (Ross, 2015). Consequently, these studies tend to overstate the extent of illicit market penetration (Drope et al., 2022; Gallagher et al., 2018).

In Colombia, studies funded directly by the tobacco industry, such as Tovar's (2021), and indirectly through entities like INVAMER's research on Illicit cigarettes, commissioned by the National Federation of Departments (FND for its acronym in Spanish) (FND & INVAMER, 2022), have raised concerns due to conflicts of interest. Notably, the FND receives funding from Phillip Morris International (Cuestión Pública, 2021), compromising the objectivity and representativeness of these studies. Independent assessments have revealed significant discrepancies, with industry-sponsored estimates of illicit trade penetration far exceeding unbiased findings (Maldonado et al., 2018; 2020). Moreover,

independent studies evaluating the ex-post impact of tax increases (Gallego et al., 2020) have contradicted industry predictions, demonstrating that the substantial increases in illicit trade forecasted by industry-backed research did not materialize.

Despite these conflicts of interest and quality concerns, the tobacco industry in Colombia has successfully propagated its studies through the media, local authorities, and discussions within Congress (Cuestión Pública, 2021). This dissemination aims to impede the effective implementation of tobacco excise taxes and related governance measures that would bolster their impact on public health, government revenues, and overall economic development.

Monitoring and gathering data on cross-border cigarette trade, particularly illicit flows, is crucial for combating the illicit trade of tobacco products (WHO, 2013). The Participatory Monitoring Study of Cigarette Packs' Characteristics in Colombia (M3C-COL) aims to provide recent and unbiased evidence on several fronts: (1) the extent of illicit trade within Colombia's cigarette market, (2) variations in the penetration of illicit trade across cities with the highest number of smokers, and (3) key characteristics distinguishing licit and illicit cigarettes in Colombia. This research utilizes the pack collection methodology applied to a sample in Bogotá, Cali, Cartagena, Cúcuta, and Medellín— cities representing 56.1% of Colombia's smokers. This approach directly measures illicit tobacco trade by physically examining discarded pack features (Stoklosa et al., 2020). To ensure impartiality, the study received funding from Bloomberg Philanthropies, obtained approval from Universidad Icesi's Ethics Committee (approval act No. 572), and involved researchers with reported no conflicts of interest related to the tobacco industry.

Advancing the fight against illicit tobacco trade necessitates ongoing monitoring efforts (WHO, 2013) to gain deeper insights into the problem's intricacies. Consequently, this study contributes significantly to understanding Colombia's illicit cigarette trade by employing the discarded pack methodology, a novel approach for independent measurements in the country. Another notable aspect of this research is its participatory nature, engaging volunteer citizens—primarily young people—from fieldwork to analysis stages. This inclusive approach empowers citizens to address this issue, fostering commitment and awareness among a population directly impacted by the epidemic. Consequently, this initiative contributes to democratizing information.

The study adds to the literature on discarded cigarette packs conducted in other middle and low-income countries sharing comparable trade structures to Colombia, such as Argentina (Pizzaro et al., 2021, 2022), Bangladesh (Abdullah et al., 2020), Mexico (Sáenz de Miera & Reynales, 2019; Sáenz de Miera, 2021), Brazil (Szklo et al., 2020), and Ecuador (Villacrés & Salgado, 2021). The study was developed in adherence to recommendations outlined by Stoklosa et al. (2020) to ensure maximum comparability with previous research efforts. Subsequent sections provide detailed descriptions of specific methodological decisions and present the study's findings and conclusions.

Collection and classification.

Methodology

The study's conceptual framework revolves around illicit trade in tobacco products, defined by the Protocol to Eliminate Illicit Trade in Tobacco Products as "***Any practice or conduct prohibited by law and which relates to production, shipment, receipt, possession, distribution, sale or purchase"*** of tobacco products (WHO, 2013). Various methodologies have emerged within this framework (Merriman, 2001; Ross, 2015; Stoklosa, 2020; Yurekli, 2018), including gap analysis, price threshold analysis, and pack analysis. The latter can involve methods such as smoker surveys and discarded pack collection.

Regardless of the chosen methodology, specific standards ensure the quality of illicit trade estimates (Ross, 2015): (i) peer review; (ii) transparent reporting of study funding sources and absence of potential conflicts of interest among funders; (iii) adherence to a solid theoretical foundation; (iv) transparency and replicability; (v) consideration of result generalizability; (vi) utilization of objective criteria; (vii) accurate definition of measurement parameters; (viii) independent classification of products as licit or illicit by researchers and/or laboratories; (ix) reporting results with consideration of sample statistical properties and/or underlying assumptions; (x) validation of estimates against existing literature and diverse methodological approaches; (xi) acknowledgment of both the scope and limitations of the chosen methodology.

This study estimates the illicit cigarette trade in Colombia for 2023, using the discarded pack analysis method. The unit of analysis is a discarded pack, understood as a pack that is visible in a public space, on the ground, or in garbage cans found in such spaces. The variable to be estimated is the penetration of the illicit cigarette trade, defined as the share of illicit cigarette packs in the total number of cigarette packs consumed in Colombia. This study was designed under the aforementioned standards to guarantee the quality of the estimates.

2.1 Sample design

The sample design leveraged existing data on smokers in Colombia to obtain information on discarded packs as the unit of analysis, given the absence of spatial distribution information for packs. The study employed a representative sample of smokers across five cities in Colombia, incorporating data on their consumption intensity. To ensure comparability, the study selected the same five cities as previous independent studies (Maldonado et al., 2018, 2020), collectively representing 56.14% of the country's smokers. Further details of the sample design are elaborated below.

2.1.1 Universe

To estimate the number of smokers per municipality, data from the most recent National Study of Psychoactive Substance Consumption (ENCSPA for its acronym in Spanish) in 2019 (DANE, 2020) was utilized. The cities chosen for the study include Bogotá, with 843,660 smokers (64.9%); Medellín, with 230,485 (17.7%); Cali, with 147,773 (11.4%); Cartagena, with 43,212 (3.3%); and Cúcuta, with 34,685 (2.7%). Together, smokers in these five cities constitute the study's universe.

With the study universe established, efforts were made to approximate the spatial distribution of smokers within these cities to facilitate the geographical placement of discarded packs.

2.1.2. Spatial distribution of smokers

Due to the limitations of publicly available ENCSPA microdata, which only allow disaggregation at the municipal level, we utilized information from the 2018 National Population and Housing Census (CNPV for its acronym in Spanish) and the 2021 National Geostatistical Framework (MGN for its acronym in Spanish) to estimate the spatial distribution of smokers. This approach enabled us to create a detailed spatial distribution of the population (by urban blocks), leveraging the most current and comprehensive data available in the country. However, since the census data does not directly capture tobacco consumption information, we needed to develop a model to link the distribution of smokers to the spatial distribution of the population.

Following a methodology similar to that of Szklo et al. (2020), we employed a logistic regression model to predict the likelihood of smoking based on specific socioeconomic variables. These variables—level of education, occupation, marital status, socioeconomic stratum, age, and household size—were used both for matching purposes and as explanatory factors in the model. The subsequent section describes the logistic regression model used to estimate the spatial distribution of smokers within each city.

Utilizing the ENCSPA data, a logistic regression analysis (Greene, 2002) was performed to model the likelihood of individuals smoking versus not smoking (dependent variable) using the aforementioned socioeconomic variables as predictors, as outlined in the equations presented below.

$$P(Y=0) = \frac{\ell^{\beta X}}{1 + \ell^{\beta X}},$$

where $Y = 0$ if the person does not smoke and

$$\beta X = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_K X_K,$$

where β is each of the regression coefficients and corresponds to the explanatory variables of the model.

The estimation process involves deriving regression coefficients for variables that explain the likelihood of a person not smoking (individuals who smoke are then calculated as one minus this probability). Subsequently, coefficients with a p-value exceeding 10% are excluded from the matching with the census data. This estimation is carried out independently for each city (see results in annex 1).

For each city, the coefficients obtained are applied to the CNPV database in conjunction with the MGN urban blocks. This approach allows us to determine the probability of an individual being a smoker (F) within each city (C), district (L), and urban block (M).

Consequently, we obtain information on the expected number of smokers at the block level across the five cities within our study universe. Based on this distribution of smokers across the cities, we construct sampling units known as clusters.

2.1.3 Sampling unit

To create sampling units or clusters, we used the political-administrative division of district within each city, combined with disaggregation at the block level. Districts within each city were further subdivided into three or four areas to introduce greater variability among sampling units. However, we avoided overly fine divisions within each district to maintain sufficient numbers of smokers per cluster and minimize variance.

Cluster divisions were executed by aggregating blocks while preserving neighborhood boundaries to account for potential socioeconomic variation across neighborhoods, which was crucial for the smoking distribution model. Clusters were oriented cardinal-wise (north, south, east, west) for consistency.

Certain clusters were excluded based on safety concerns or the presence of foreign populations. Georeferenced homicide data (SIEDCO, 2022) were incorporated to identify clusters with outlier homicide rates, defined as figures 1.5 times higher than the interquartile range for each city. Local experts were consulted to identify and exclude areas with safety issues that could impede fieldwork. Additionally, clusters with high concentrations of tourists were excluded to prevent sampling biases, as international tourists are more likely to use cigarettes purchased abroad, not reflecting local consumption patterns. Some cluster pairs were merged if one had insufficient smokers, leading to excessive variance. Lastly, in Bogotá, the rural locality of Sumapaz was excluded as the study focused on urban areas.

The process of defining sampling units, known as clusters, and establishing exclusion criteria led to the creation of the sampling framework. This framework represents a list of clusters where smokers reside within each city. From this sampling framework, clusters were randomly selected for the collection of cigarette packs. The detailed list of these clusters is provided in Table 1.

Table 1. Number of districts and clusters in each city

			Excluded clusters			
City	**Total Districts**	**Total Clusters**	**Tourism/ Safety**	**Rural**	**Mergers**	**Final clusters**
Bogotá	20	80	11	4	4	61
Medellín	16	64	7	0	2	55
Cali	22	88	13	0	2	73
Cartagena	15	59	3	0	0	56
Cúcuta	10	38	4	0	0	34
Total		**329**	**38**	**4**	**8**	**279**

Source: own elaboration.

2.1.4 Sample size

Cluster sampling was employed to determine the sample size based on the sampling framework. It's important to note that in defining the sample size, and considering that the unit of analysis is a pack, an assumption was made that the probability of encountering a pack is equivalent to the probability of encountering a smoker. This assumption stems from the challenge of estimating the probability of encountering a pack directly, given the lack of spatial distribution data for packs. To establish this relationship, we assumed that smokers dispose of packs within their respective clusters. Thus, we used the spatial distribution of estimated smokers within clusters as a proxy. Additionally, based on the 2019 ECSPA data, we determined that the average daily consumption of cigarettes per smokers in any city does not exceed one pack per day.

This assumption of consumption intensity informs our estimation of the probability of encountering a pack. If smokers were to consume more than one pack per day, the probability of encountering a pack would exceed that of encountering a smoker. Therefore, the probability of encountering a pack in each city was calculated as the ratio of smokers to the total population.

This parameter—the probability of encountering a pack—is essential for calculating the sample size using the following formula:

$$n = DEFF \quad \frac{Nz^2pq}{(N-1)e^2 + z^2pq}$$

Where N is the population size (sample universe), z corresponds to the quantile of the standard normal distribution (for this study it is close to 1.96, corresponding to a confidence level of 95%), p is the probability of occurrence of the event (in this case of finding a pack), q is the probability of non-occurrence of the event, e is the sampling error (it varies between 3% and 5% depending on the city), and finally, $DEFF$ is a factor known as Design Effect, a necessity, given that a cluster design is used. This factor can be calculated as $V(P_{CLU}) \ / \ V(P_{MAS})$ which is the ratio between the variance of the design and the variance of a Simple Random Sampling (SRS) design. The formulas for these two variances are shown below:

$$V(P_{MAS}) = \frac{pq(N-n)}{nN}$$

$$V(P_{CLU}) = \frac{1}{N^2}\left\{M^2 \frac{M-m}{M} \frac{1}{m} \frac{1}{m-1} \sum_{i=1}^{m} (N_i p_i - \frac{1}{m} \sum_{i=1}^{m} (N_i p_i)^2 + \ldots \right.$$

$$\left. \ldots + \frac{M}{m} \sum_{i=1}^{m} N_i^2 \frac{N_i - n_i}{N_i} \frac{1}{n_i} \frac{1}{n_i - 1} (n_i p_i q_i) \right\}$$

Where N is the total population (smokers), M the number of total clusters, n the sample size, p_i y q_i the estimated probabilities of smoking or not smoking in the cluster i, N_i the size of the cluster population, and n_i the number of units to be sampled. It is worth noting that, because there is no information on the distribution of cigarette consumption according to the number of units per pack, it was assumed that all packs are of 10 units, so in the case of collecting packs of 20 or 18 units, these would be counted as two packs of 10 units. The results on sample size for each of the cities are described in Table 2.

Table 2. Clusters in sample and packs per cluster per city

City	Clusters included in the draw	Clusters selected by draw	Packs to be picked up by city	Packs to be picked up in the cluster	Total number of packs in the sample
Bogotá	61	20	419	21	420
Medellín	55	16	345	22	352
Cali	73	13	220	17	221
Cartagena	56	12	187	16	192
Cúcuta	34	12	193	16	192
Totals		**73**	**1.364**		**1.377**

Source: own elaboration.

The table above displays the number of clusters included in the sample for each city m_i and the specified number of units to be sampled within each cluster n_i (packs). The uniform selection of n_i packs per cluster ensures balanced representation across clusters with varying population sizes.

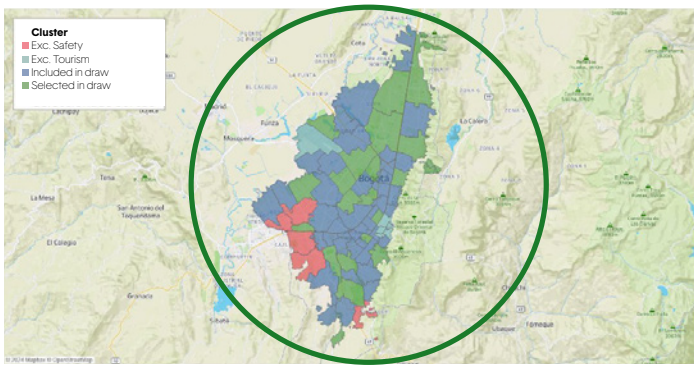
In summary, the sample size was determined for each city, defining the number of clusters to be visited and the minimum number of packs to be collected within each cluster. Specifically, the sample specifications are as follows: Bogotá requires 20 clusters with a minimum of 21 packs per cluster; Medellín entails 16 clusters with at least 22 packs per cluster; Cali involves 13 clusters each with a minimum collection of 17 packs; while Cartagena and Cúcuta both require 12 clusters with a minimum of 16 packs per cluster.

Following the establishment of the sample size, cluster selection was conducted using the Probability Proportional to Size (PPS) method within SAS software. Box 1 depicts maps illustrating cluster distributions within each city, categorizing clusters based on exclusion criteria (safety or tourism considerations), inclusion in the draw, and eventual selection for pack collection.

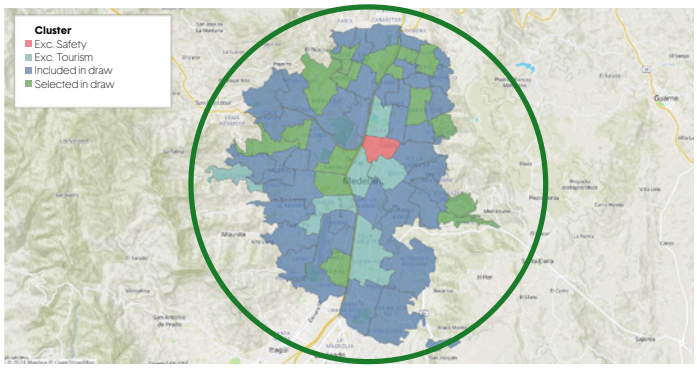
Box 1. Cluster distribution by city

1A. Bogotá
1B. Medellín
1C. Cali
1D. Cartagena
1E. Cúcuta

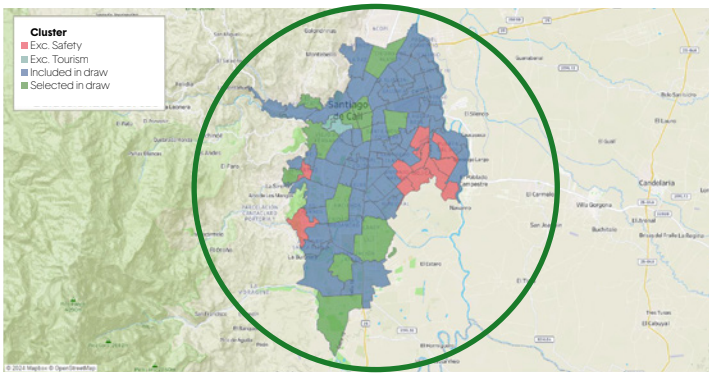
1A. Sample Design Clusters in **Bogotá**



1B. Sample Design Clusters in **Medellín**

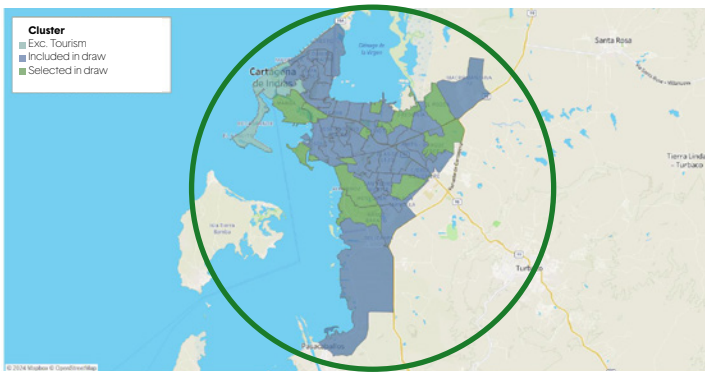


1C. Sample Design Clusters in **Cali**

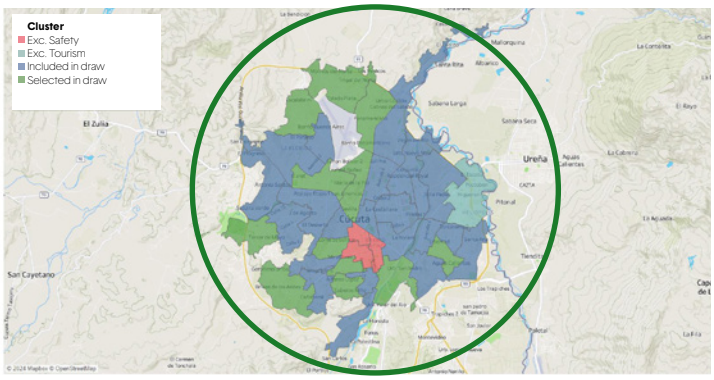


Box 1. Cluster distribution by city

1D. Sample Design Clusters in **Cartagena**



1E. Sample Design Clusters in **Cúcuta**



Source: Own elaboration.

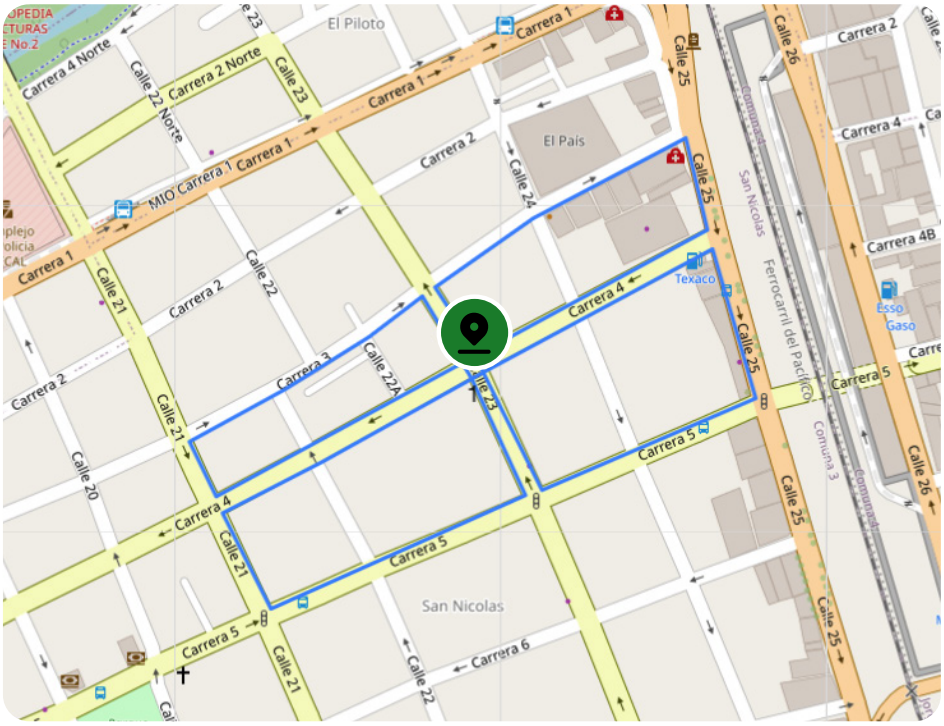
Once the sample clusters to be visited were selected, QGis (Open Source Geographic Information System) software was used to randomly select a point within each chosen cluster. Each selected point was used as the starting point for the cigarette collection routes.

2.1.5 Route design

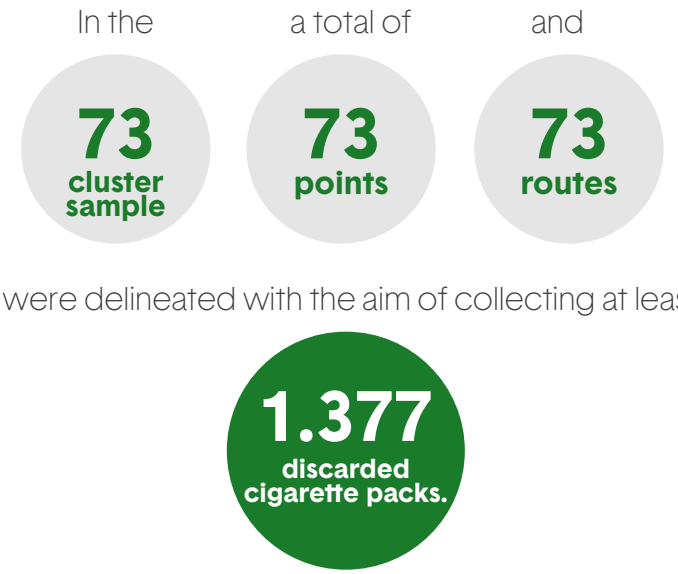
The routes were configured in a butterfly pattern, consisting of four quadrants originating from a central point, a methodology outlined in the Tobacconomics Illicit Trade Measurement Manual (Stoklosa et al., 2020) and previously applied in a study on illicit trade in Argentina (Pizarro et al., 2022). To determine the appropriate length of the routes, preliminary pilot tests were conducted prior to fieldwork, establishing a distance of 3 kilometers with an anticipated duration of approximately 2 hours for each route.

In QGIS, the routes were plotted using Google Road and Google Satellite layers. Verification ensured that the selected roads were public and accessible to pedestrians, while also confirming that the routes remained within the designated cluster associated with the starting point. Figure 1 illustrates a sample layout of one of these routes.

Figure 1. Routing example



Source: Own elaboration.



These packs constitute a representative sample of the cigarettes consumed by smokers across the five cities that comprise the study universe.

2.2 Fieldwork

The collection of discarded cigarette packs in the five cities was conducted between September and October 2023. The field operation engaged residents from these cities, who underwent training on the collection protocol, field operation procedures, and the use of the designated application for route monitoring.

Preparations before commencing fieldwork included assembling necessary materials for route implementation (e.g., collection bags, registration materials, biosafety kits) and developing a web application for real-time route tracking and execution recording. Prior to full deployment, a pilot test, multiple volunteer recruitment calls, and training sessions were conducted.

Volunteer recruitment targeted individuals interested in becoming "citizen scientists" and involved organizations such as the Scouts of Colombia, Junior Chamber International (JCI), the National Network of Young Environmentalists, students from the University of Antioquia, volunteers from the University of Rosario, PROESA, and the Fundación Anáas. The Colombian League Against

Cancer endorsed the initiative, providing equipment for fieldwork, and the teams prominently displayed the organization's badges while conducting their work.

2.2.1 Pilot test

A pilot test was conducted in the city of Cali, where separate teams implemented two distinct routes. Two members of the research team conducted real-time remote monitoring of these routes. This pilot phase served to validate the routes, assess travel times, understand field dynamics, test route monitoring mechanisms, and evaluate the practical use of materials.

Findings from the pilot test informed operational decisions, such as increasing the quantity and modifying the size of collection bags based on field observations and logistical considerations.

2.2.2 Sample pack collection

The routes were organized into teams comprised of at least two individuals, each assigned distinct roles: navigator and enumerator. The navigator's responsibilities included following the route using a printed map and documenting collected materials, with the option to contact route monitors if needed. Meanwhile, the enumerator focused on gathering and safely storing the cigarette packs.

During the sample collection process, all visible cigarette packs in public areas along the designated routes were collected. These packs could originate from two main sources: they could be found on the ground or in garbage cans on the street. Each pack was placed into individual plastic bags labeled with a unique code for traceability, indicating the city, route, and collection source (ground or garbage container). Packs were collected irrespective of their condition, whether damaged, wet, or contaminated with other substances.

Real-time monitoring of the routes was conducted via web application to ensure proper execution. Once the pack collection phase concluded, the material was transported to collection centers where pack-specific information was processed and recorded.

Enumerators collecting packs

2.2.3 Digitization

Following the completion of pack collection, field data was processed and digitized to create a database. The characteristics of each pack were recorded using the World Bank's Survey Solutions platform, capturing variables such as brand, sub-brand, health warning, and place of origin (refer to the comprehensive list in Annex 2).

Additionally, a meticulous photographic record was created for each individual pack, capturing images of all visible sides. If a pack's condition prevented photographing any of its sides, this circumstance was duly noted in the database. This comprehensive process marked the conclusion of field operations, resulting in a primary database containing primary information obtained from discarded pack collection across five cities nationwide.

Digitization

2.3 Analysis

2.3.1 Quality: Validation

To ensure data quality, a rigorous validation process was implemented for the information on the sample's pack characteristics. This validation was conducted by individuals who were not involved in the pack collection or digitization process to mitigate potential biases. During this phase, 100% of packs from each city were reviewed.

The packs were assigned randomly to validators for a more thorough review and error identification. During this process, each observation was checked against its corresponding set of photos to verify that the correct characteristics were recorded. The variables included in the validation process were brand, sub-brand, health warning, country of origin, the unique code assigned to the pack in the field, and the clarity and completeness of photographic records for each pack.

2.3.2 Classification

The information collected on each pack was cross-referenced with regulations issued by the Ministry of Health and Social Protection (MSPS), which issue packaging and labeling standards for tobacco products. This comparison established technical criteria to differentiate between packs associated with illicit trade and those compliant with current health regulations, and thus, classified as licit packs.

Packs were classified as licit or illicit based on two key criteria: (1) belonging to the list of brands approved for circulation by the MSPS Labeling and Packaging Committee, and (2) adherence to current health warning requirements. According to Colombian institutions and regulations, these criteria represent legal prerequisites for tobacco products to be legally marketed in the country. Brands and sub-brands, along with their design details, undergo an annual review by the Labeling and Packaging Committee. Companies are mandated to ensure that only approved pack versions are in circulation by July 21 of each year.

Additionally, the presence of the "***Imported for Colombia***" message, a mandatory requirement, and the specific barcode for cigarette marketing in the country were analyzed.

Consequently, an illicit pack is identified as one that fails to meet any of the aforementioned criteria—either by not corresponding to an MSPS-approved brand or lacking a compliant health warning as mandated in Colombia[1].

2.3.3 Estimation

To estimate the penetration of illicit trade based on the collected fieldwork sample, the sample design incorporates expansion factors for making statistical inferences about the universe (Berger & Casella, 2001).

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1 It should be noted that Colombian regulations do not contemplate the use of stamps or any other element to verify whether a pack has complied with tax requirements.

The estimator for the penetration of illicit cigarette trade in Colombia was formulated as the total number of classified illicit packs divided by the total collected packs in the sample, utilizing the expansion factors adjusted for the number of packs collected. This approach derives from a representative sample of smokers across five cities in Colombia. When combined with data on smokers' consumption patterns, this estimator allows for the estimation of monthly cigarette consumption—both licit and illicit. Based on the statistical robustness of the sample, estimates were calculated for the aggregate of the five cities and each city individually, employing weights that reflect market size for the national estimate.

The sample design incorporated various elements to guarantee the quality of the estimations and the use of objective criteria for the sample selection, including comparability with prior studies, coverage of primary consumption centers, sample representativeness, exclusion of clusters with significant international tourism or serious safety concerns, and the link between smokers and cigarette packs (Ross, 2015). Nonetheless, inherent methodological limitations exist that may introduce upward biases into the results, as discussed in the study limitations section.

Results

3.1 Pack collection results

During the field operation, a total of 4,557 discarded packs were collected, including packs of 10, 18, and 20 cigarettes. The 18 and 20-cigarette packs were counted as two packs of 10 each. This accumulation represents 3.3 times the original sample size of 1,377 packs. Moreover, the minimum pack collection requirement specified in the sample design was surpassed on all routes. Table 3 provides details on the sample sizes and packs collected for each city.

Table 3. Sample size and packs collected by city

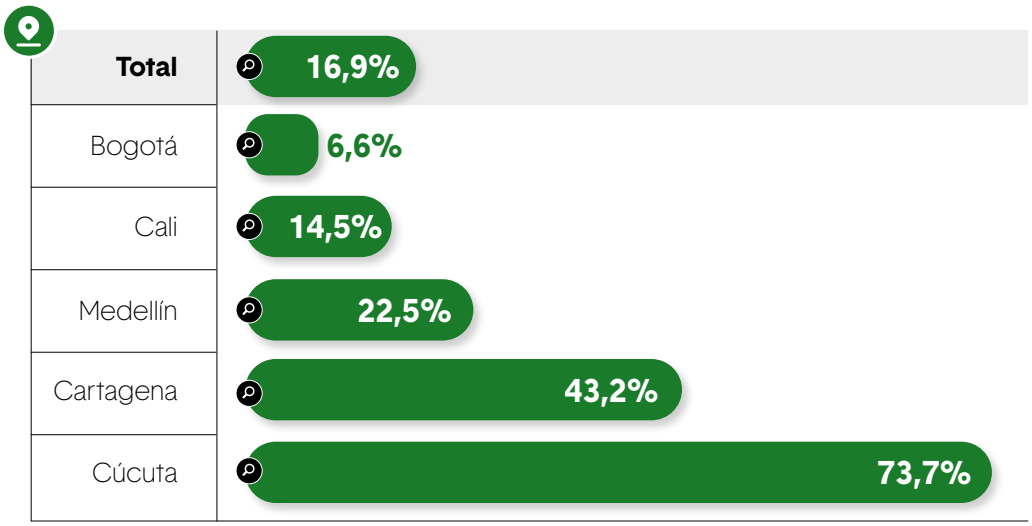
City	Sample size	Packs collected
Bogotá	420	1.245
Medellín	352	969
Cali	221	515
Cartagena	192	690
Cúcuta	192	1.138
Totals	**1.377**	**4.557**

Source: own elaboration.

3.2 Estimated penetration of illicit cigarette trade in Colombia

The national estimator, representing the estimated proportion of packs identified as illicit trade in the cigarette market across the five cities, stands at 16.9%. Notably, there are significant variations in this estimator among the cities, as illustrated in Graph 1.

Graph 1. Proportion of total illicit trade for each city



Source: own elaboration.

The cities with the highest prevalence of illicit trade are Cúcuta and Cartagena. Previous research has consistently reported elevated levels of illicit trade in border cities (Rijo & Ross, 2018; Singh et al., 2023), such as Cúcuta, situated on the border with Venezuela in the northeast of the country. Similarly, Cartagena, positioned on the Caribbean coast and in proximity to areas associated with the circulation of products from the Special Customs Regime Zone of Maicao, Uribia, and Manaure (La Guajira), experiences similar challenges.

Given the diversity of results observed, it is crucial to assess the contribution of each city to the overall scenario. This analysis allows for a comprehensive understanding of illicit trade, not only at a local level but also systemically. To achieve this, city weights are computed based on the number of smokers (similar to the sample design approach). Table 4 displays the respective contributions of each city to the national indicator.

Table 4. Contribution of each city to the penetration of national illicit cigarette trade

City	Absolute Contribution to the Total (percentual points)	Relative Contribution to the Total
Bogotá	3,05%	18,4%
Medellín	8,83%	53,2%
Cali	0,96%	5,8%
Cartagena	1,31%	7,9%
Cúcuta	2,43%	14,6%
Total	**16,6%**	**100%**

Source: own elaboration.

The analysis reveals that Medellín and Bogota carry the highest weights due to their status as major consumption centers with the largest number of smokers nationwide. Consequently, the national estimator closely aligns with the estimators of these three prominent markets, as illustrated in Graph 1.

3.3 Characteristics of the packs

The M3C-COL sample design was not originally intended to provide statistical information for drawing conclusions about pack characteristics. However, this section presents key findings on these variables, which can serve as indicators of areas subject to monitoring using other relevant instruments for governmental institutions responsible for implementing the Framework Convention on Tobacco Control (FCTC). Additionally, these findings can inform the design of future studies and suggest hypotheses for exploration.

Table 5 illustrates the proportion of packs categorized as licit or illicit across three observed pack sizes: 10, 18, and 20. The licit pack market is predominantly represented by packs containing 10 cigarettes, whereas nearly all illicit packs are found in packs of 20 units. Notably, the sole 18-cigarette pack identified, Piel Roja, falls under the licit classification. Conversely, among the limited number of 10-cigarette packs classified as illicit is a Lucky Strike variant, which, due to its health warning and design, fails to meet the criteria for licit classification; the remaining illicit packs typically belong to brands commonly packaged in 20-unit formats.

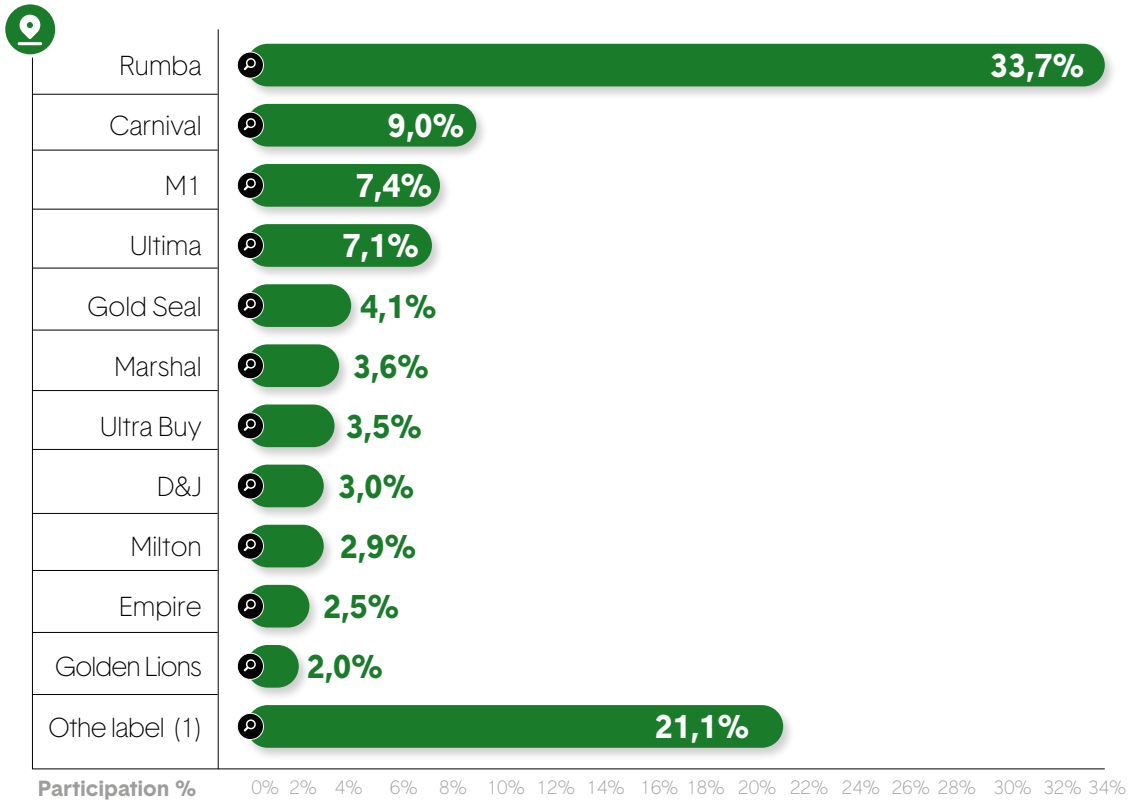
Table 5. Distribution of licit and illicit packs by pack size

Pack classification	10	18	20	Total
Total	66.5%	0.2%	33.3%	**100.0%**
Licit	79.8%	0.3%	20.0%	**100.0%**
Illicit	1.2%	0.0%	98.8%	**100.0%**

Source: own elaboration.

In addition to the clear distinction between the licit and illicit markets based on pack size, there is also a significant differentiation in the brands that dominate each market. Graph 2 and Graph 3 illustrate the distribution of each brand within the total number of illicit and licit packs, respectively. Notably, while only 8 cigarette brands are present in the licit market (including 31 sub-brands), the illicit market showcases 44 distinct brands. This suggests a notably greater brand variety within the illicit market, although the disparity diminishes when considering sub-brands.

Graph 2. Distribution of illicit cigarette brands



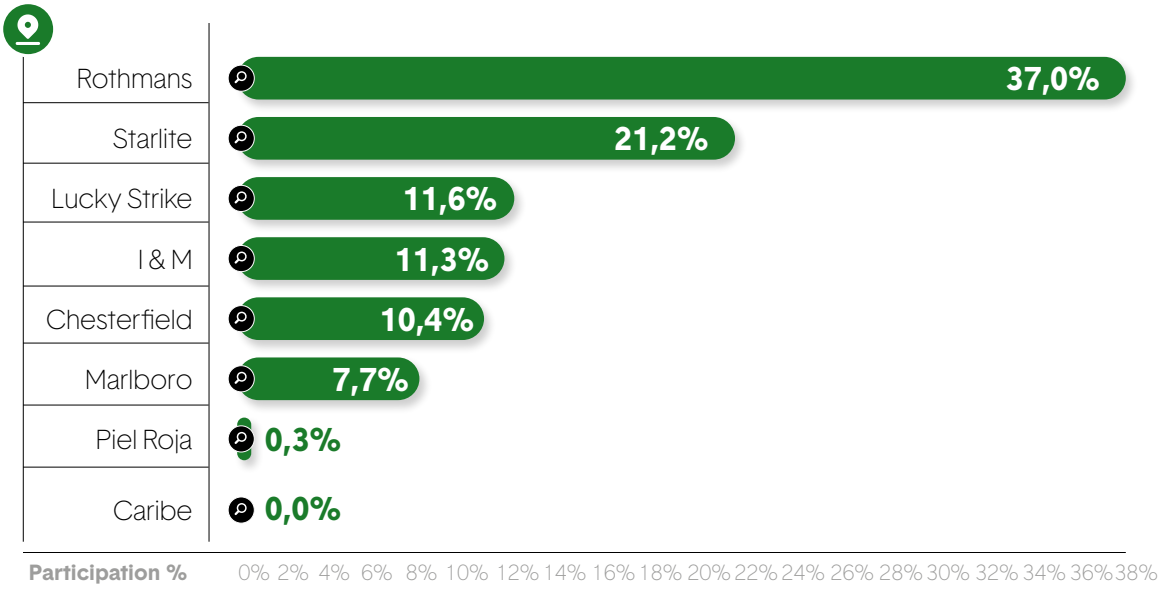
Source: own elaboration.
(1) Other brand: ACE, American Bison, Camel, Económicos, Elegance, Gold City, Grayson's, Maverick, Maxico, Mohawk, Mondeo, Montreal, Nashville, Palmetto, Pride, V5, Zon.

Graph 2 reveals that the Rumba brand commands roughly one-third of the illicit market share, with all other brands individually holding less than 10%. Furthermore, the top six brands collectively capture about two-thirds of the market. Despite "Other brands" representing 21.1% of the illicit market, the 33 sub-brands falling

under this category each contribute less than 2% individually. This underscores that despite brand diversity, the market is heavily concentrated in a select few. Notably, two observations of Lucky Strike and one of Marlboro were deemed illicit due to non-compliance with health regulations.

In the licit market, there are fewer brands compared to the illicit market, yet there is also significant concentration among a handful of brands. Approximately 60% of licit packs correspond to Rothmans or Starlite, while Lucky Strike, L&M, and Chesterfield each command a share of around 11%. Consequently, these five brands collectively dominate more than 90% of the licit market.

Graph 3. Distribution of licit cigarette brands in the sample



Source: own elaboration.

One notable observation from analyzing pack brands and sub-brands is the prevalence of flavor capsules, contrasting with the lesser occurrence of flavored cigarettes without capsules.[2] The growing presence of capsules in the market aligns with a strategy highlighted in a recent systematic review, which suggests that capsules enhance the smoking experience, making it more enjoyable and appealing (Kyriakos et al., 2023). Across the combined market,

2 Capsule cigarettes are cigarettes that have a component in the filter that can be pressed to modify the flavor. Cigarettes with one, two, and three capsules were found in M3C-COL.

approximately 18% of packs contain some type of capsule. This share drops to 1% in the illicit market but rises to 21.5% in the licit market. Table 6 presents the breakdown of packs containing sub-brands with flavoring capsules relative to the total number of packs per city and classification.

Table 6. Share of cigarette packs with flavor capsules.

City	Licit	Illicit	Total
Total	21.5%	1.0%	**18.0%**
Bogotá	21.1%	3.5%	**19.9%**
Cali	35.5%	0.0%	**30.3%**
Cartagena	65.7%	0.0%	**37.3%**
Cúcuta	46.3%	2.7%	**14.2%**
Medellín	16.3%	0.0%	**12.6%**

Source: own elaboration.

Another notable characteristic observed in certain packs is the inclusion of the term "***Duty-Free***" printed on the packaging, a practice aimed at creating the impression that the pack was purchased in a duty-free zone and therefore might be considered legal despite not complying with Colombian regulations. Importantly, none of the packs classified as licit display the "***Duty-Free***" label. Among illicit packs, however, it was challenging to ascertain the presence or absence of this label in 17.9% of cases due to the condition of the pack. If packs labeled as "***Duty Free***" were considered licit, the calculation of the illicit trade estimator would decrease by 2.7 percentage points, from 16.9% to 14.2%.

In investigating their potential origin, a list of brands has been identified that bear the "***Duty-Free***" label but are not typically sold in duty-free zones, or that are distributed by marketers based in the Colon Free Zone in Panama. These brands include Carnival, D&J, and Rumba. If these brands are excluded from consideration, the reduction in the overall indicator of illicit trade penetration would be less significant, decreasing by 1.2 percentage points from 16.9% to 15.7%. This suggests that packs featuring this characteristic may not significantly influence the illicit trade indicator in the Colombian market.

Despite the above, Table 7 presents the distribution of packs with and without the "***Duty-Free***" label categorized by country of origin, which could provide insights into the marketing channels used for these products. Notably, only illicit packs feature the "***Duty-Free***" label, so Table 7 exclusively pertains to this type of pack. Excluding the "***Not Observable***" category for country of origin, packs with the "***Duty-Free***" label predominantly originate from Korea, Germany, and the United Arab Emirates (UAE). The United States represents the fourth largest source of packs with this label.

Table 7. Packs that include or not include the ***"Duty-Free" label*** by country of origin

Country of origin	Includes "*Duty-Free*" label	Does not include "*Duty Free*" label	"*Duty Free*" not observed	Total
Germany	16.8%	2.0%	1.0%	4.2%
Brazil	0.0%	0.4%	0.0%	0.3%
China	0.0%	4.5%	0.0%	3.0%
Korea	27.9%	0.0%	3.8%	5.1%
Mexico	0.0%	0.0%	0.1%	0.0%
Paraguay	0.0%	1.4%	0.2%	0.9%
Switzerland	0.2%	1.5%	0.0%	1.0%
UAE	13.5%	3.3%	3.3%	4.9%
USA	7.9%	31.3%	14.0%	24.6%
Vietnam	0.1%	3.1%	0.5%	2.1%
Not Observable	33.5%	52.5%	77.1%	53.7%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: own elaboration.

Another relevant result is the differences in the distribution by country of origin of licit and illicit cigarette packs for each of the study cities described in Table 8. In general, as with the brands, it can be seen that licit cigarette packs have fewer countries of origin than the illicit market, but both markets are concentrated in a few countries of origin. The licit market is mainly comprised of packs from Brazil (30.3%), Mexico (28.7%), and Chile (24.9%). More than half of the packs of the illicit market could not be categorized by country of origin, in most cases because

it is not reported on the pack, and in other few cases, due to the condition of the packaging; however, among the observable characteristics is that, at the general level, the country of origin with the highest concentration is the United States, in the rest of the countries it is estimated a share of less than 6%.

Another notable finding concerns the differences in the distribution of licit and illicit cigarette packs by country of origin across each of the study cities, detailed in Table 8. Generally, similar to the trends observed with brands, licit cigarette packs originate from fewer countries compared to the illicit market. However, both markets exhibit concentration from a select few countries of origin. In the licit market, a significant portion of packs originate from Brazil (30.3%), Mexico (28.7%), and Chile (24.9%). Conversely, over half of the packs in the illicit market could not be categorized by country of origin, often due to missing information on the packaging or packaging condition. Notably, among the observable characteristics, the United States emerges as the primary country of origin, with a notable concentration, while other countries contribute less than a 6% share each to the illicit market.

Table 8. Country of origin of licit and illicit cigarette packs by city

Country of origin	Bogotá	Cali	Cartagena	Cúcuta	Medellín	Total
Licit						
Brazil	18.5%	28.2%	24.5%	38.0%	47.5%	**30.3%**
Mexico	19.0%	49.0%	46.1%	6.4%	38.1%	**28.7%**
Chile	44.8%	1.8%	9.1%	43.0%	1.6%	**24.9%**
Honduras	0.6%	0.3%	0.3%	0.5%	0.7%	**0.6%**
Trinidad and Tobago	0.2%	1.5%	0.4%	2.3%	0.1%	**0.3%**
Not observable	16.9%	19.3%	19.7%	9.8%	12.0%	**15.2%**
Subtotal Licit	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Illicit						
USA	12.6%	42.3%	5.5%	7.4%	34.3%	**24.6%**
Korea	0.0%	0.0%	53.7%	3.3%	0.8%	**5.1%**
UAE	6.1%	15.6%	0.0%	19.9%	0.0%	**4.9%**
Germany	10.3%	0.0%	0.0%	15.8%	0.0%	**4.2%**

Country of origin	Bogotá	Cali	Cartagena	Cúcuta	Medellín	Total
Illicit						
China	15.9%	2.2%	0.0%	0.0%	0.0%	**3.0%**
Vietnam	0.0%	0.0%	0.0%	14.7%	0.0%	**2.1%**
Switzerland	0.0%	2.5%	0.4%	3.2%	0.7%	**1.0%**
Paraguay	0.0%	8.5%	0.4%	0.0%	0.8%	**0.9%**
Brazil	1.5%	0.0%	0.0%	0.0%	0.0%	**0.3%**
Mexico	0.0%	0.0%	0.0%	0.2%	0.0%	**0.0%**
Not observable	53.6%	29.0%	40.0%	35.6%	63.4%	**53.7%**
Subtotal Illicit	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: own elaboration.

Table 8 illustrates significant variations among cities in terms of aggregate market performance. In the licit market, Cali leads with the highest proportion of cigarette packs originating from Mexico, followed by Cartagena and Medellín, whereas Cúcuta has a lower share at 6.4%. Conversely, in Bogotá and Cúcuta, most cigarette packs originate from Chile.

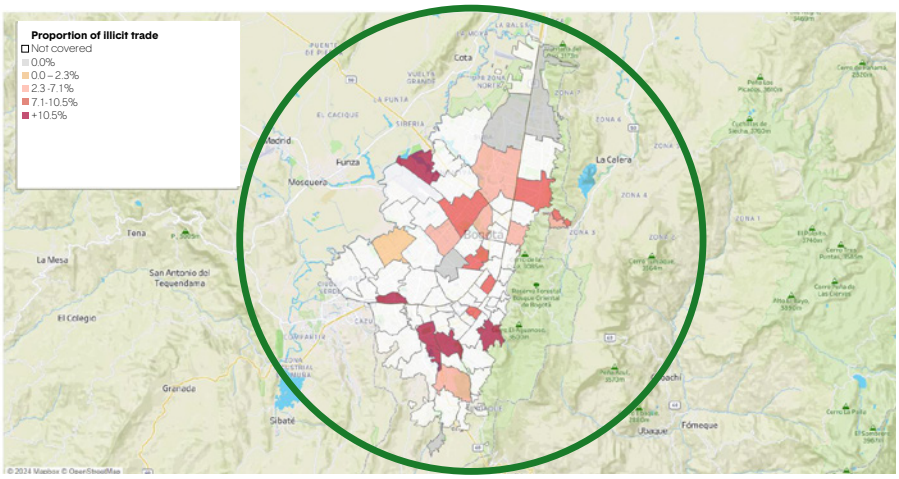
Regarding the illicit market, Bogotá stands out as the city with the most packs originating from China, whereas in Cúcuta, the UAE emerges as the primary source due to the prevalence of the D&J brand. More than half of illicit packs in Cartagena originate from Korea, and in Cali, illicit packs from the United States nearly double the share of this country in terms of aggregate figures. For detailed distribution of brands by country of origin in each city, refer to Annexes 3.a. and 3.b.

Lastly, Box 2 features maps depicting the proportion of illicit trade within city clusters. Notably, peripheral clusters generally exhibit higher illicit trade presence, aligning with the broader structural challenge posed by border cities and institutional weaknesses in territorial control over peripheral and border areas.

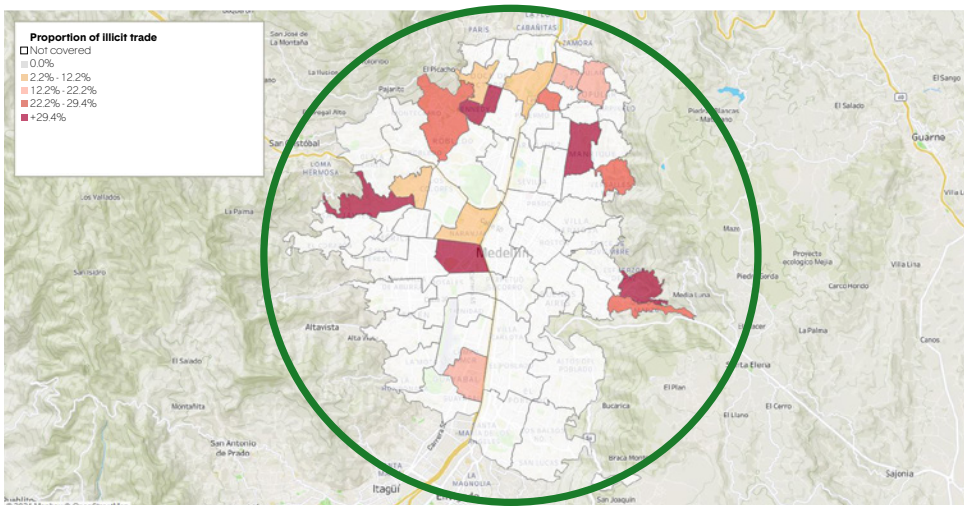
Box 2. Proportion of Illicit trade by cluster covered

2A. Bogotá
2B. Medellín
2C. Cali
2D. Cartagena
2E. Cúcuta

2A. Proportion of Illicit trade by cluster: - **Bogotá**

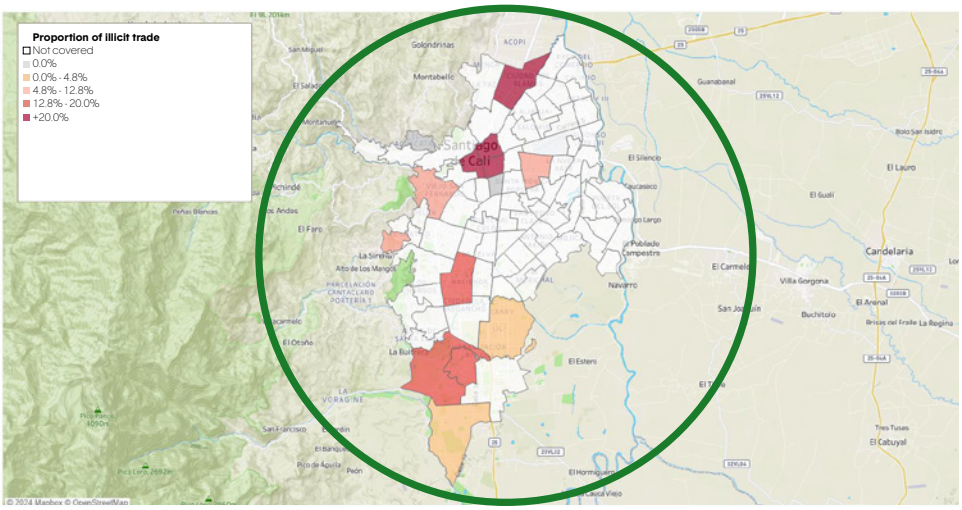


2B. Proportion of Illicit trade by cluster: **Medellín**

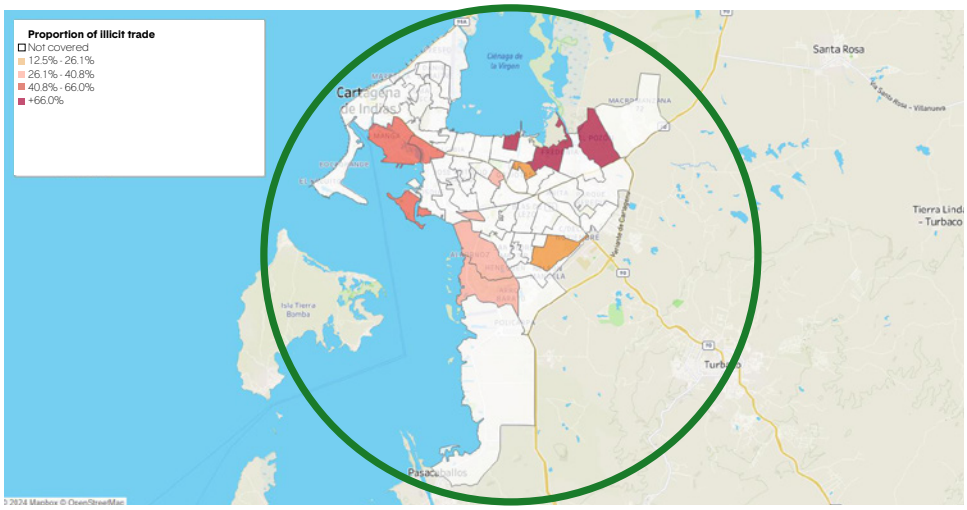


Box 2. Proportion of Illicit trade by cluster covered

2C. Proportion of Illicit trade by cluster: **Cali**

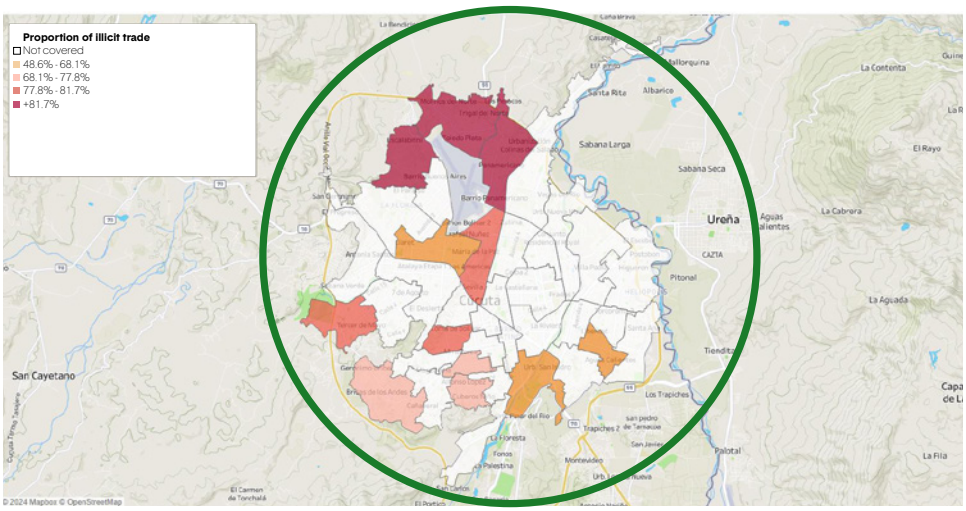


2D. Proportion of Illicit trade by cluster: **Cartagena**



Box 2. Proportion of Illicit trade by cluster covered

2E. Proporción de comercio ilícito en cada clúster recorrido - **Cúcuta**



Source: own elaboration.

Limitations

The M3C-COL study design aimed to mitigate biases to the extent possible; however, certain limitations exist. While the study comprehensively covers the major market within the selected five cities, it does not provide insights into illicit trade penetration in smaller or medium-sized markets, nor does it extend to rural areas. It is worth noting that illicit trade studies typically do not encompass all cities or rural regions due to the high costs associated with geographic dispersion.

Another potential limitation relates to tourism and international migration. Cigarette packs purchased by tourists in other countries and consumed in Colombia contribute to the market for packs that do not comply with Colombian regulations but could be considered legal, as could be the case of those bought in duty-free zones. The study methodology does not differentiate packs sourced from these zones versus others. To address this bias, clusters with significant international tourism were excluded from the sample design. However, it is still possible that some cigarette

packs purchased from these outlets were misclassified as illicit trade, suggesting that the estimate is conservative and represents an upper bound of the estimator.

Compared with previous studies, the measurement based on pack collection in this study may yield higher estimates than surveys targeting smokers directly. Nonetheless, research by Saenz de Miera et al. (2021) in Mexico, Szklo et al. (2020) in Brazil, and Villacrez and Salgado (2021) in Ecuador—contexts similar to Colombia—indicate that estimates of illicit trade penetration at the pack level versus the individual level are largely consistent. Thus, if any bias exists, it is likely marginal, as evidenced by the absence of significant differences in the illicit trade indicator when "***Duty-Free***" packs are considered licit.

Furthermore, due to the study's nature, all observable pack information was collected; however, the proposed sample design does not allow for statistically representative conclusions on market characteristics such as brand distribution, country of origin, and the prevalence of cigarettes with capsules. Therefore, the results concerning these variables should be interpreted as indicative rather than definitive.

Conclusions and recommendations

This study presents the latest independent estimate of illicit cigarette trade penetration in Colombia's main consumption centers. The estimate for 2023 is 16.6%, revealing significant heterogeneity among cities, with Bogotá—the largest consumption center—reporting the lowest estimate at 6.6%, while Cúcuta shows the highest at 73.6%. A comparison with industry-funded studies in Colombia indicates a notable bias toward overestimating illicit trade penetration, consistent with findings from prior studies (Maldonado et al., 2017), reflecting a regional (Drope et al., 2022) and global trend (Gallagher et al., 2018).

Although the estimate reflects an increase compared to previous independent measurements, data on apparent consumption and prevalence of cigarette use

in Colombia demonstrate a sustained decline over time in the cigarette market (WHO, 2024), which could contribute to an increased penetration of contraband despite a decrease in illicit pack volumes. This trend is consistent with international evidence indicating stable global illicit cigarette trade penetration, suggesting a potential decrease in absolute trade volume (Paraje, Stoklosa, Blecher, 2022).

In terms of policy recommendations, the study suggests there is a problem with illicit cigarette trade in Colombia and emphasizes the urgent need for effective measures to combat it. This would require advancing the effective measures outlined in the World Health Organization's Protocol for the Elimination of Illicit Trade in Tobacco Products (WHO, 2013).

Protocol for the Elimination of Illicit Trade in Tobacco Products

The illicit trade in tobacco products poses a significant public health challenge, as it undermines policies aimed at reducing consumption. It is also a national security concern, contributing to the financing of transnational organized crime.

To address this issue, the Conference of the Parties to the WHO Framework Convention on Tobacco Control (FCTC) established an intergovernmental body in 2007 to negotiate a protocol for the elimination of illicit trade in tobacco products[4]. The Protocol came into force in 2018 and currently has 68 States Parties, including seven from Latin America[5]. While Colombia signed the Protocol in 2013, it has not yet become a Party, as the text is still awaiting approval by Congress at the time of this publication.

4 The mandate to develop effective actions against illicit trade in tobacco products stems from Article 15 of the FCTC. This was further reinforced during the 2012 Conference of the Parties in Seoul, where a call was made for all FCTC States Parties to join the new treaty.

5 Consulted in the United Nations treaty repository. Parties in the region are: Brazil, Costa Rica, Ecuador, Nicaragua, Panama, Paraguay, and Uruguay.

The Protocol includes seven key elements

which will allow for the strengthening of illicit trade controls in Colombia.

1. **Ensure maximum transparency in interactions with the tobacco industry,** in line with the irreconcilable conflict between the interests of this industry and public health objectives.

2. The commitment to close cooperation between the parties, **which includes the exchange of information and coordinated actions to strengthen law enforcement,** such as mutual administrative assistance and reciprocal judicial support.

3. **The adoption of measures to control the supply chain,** up to the distribution of products intended for the final consumer. Notably, Article 8 on tracking and tracing mandates the use of unique, indelible, visible, and invisible markings on cigarette packs and cartons to ensure the required information is available to help authorities in tracking and tracing tobacco products.

4. **The application of the principle of due diligence,** which is required for all participants in their commercial relationships.

5. **The establishment of controls** in free trade zones and special economic zones.

6. **Strengthening the criminal consequences of illicit activities** related to the trade of tobacco products, including financial penalties.

7. **Cooperation between countries:** Parties must collaborate to exchange information, investigate illicit activities, and enhance border control measures. The Global Information-Sharing Focal Point, as outlined in Article 8, will enable quick access to information from other States on various aspects of illicit trade. The commitment to close cooperation between parties includes information sharing and coordinated actions to strengthen law enforcement, such as mutual administrative assistance and reciprocal judicial support.

The FCTC Secretariat also provides a portal with reference materials on the Protocol.

Consequently, Colombia's next crucial step is to ratify the protocol for eliminating illicit trade in tobacco products, presenting it to the Executive for debate and approval by Congress. The country must progress toward addressing this problem by implementing strategies outlined in the Protocol (WHO, 2013), including adopting additional measures to control the tobacco product supply chain, enhancing cooperation with other signatory countries to improve regulation enforcement, facilitating information exchange, strengthening competent authorities and services, and providing technical assistance and capacity building to combat illicit trade effectively.

Regarding the role of cigarette excise tax dynamics in smuggling, it is worth noting that the real price of cigarettes in Colombia has remained stable from 2018 to 2023 due to minimal tariff adjustments. However, further detailed studies are needed to understand the evolution of this phenomenon. Independent global studies have identified governance weaknesses, regulatory frameworks, social acceptance of illicit trade, and informal distribution networks as key determinants of tobacco product illicit trade (World Bank Group, 2019). The variation in illicit trade penetration between Colombian cities with uniform tax rates confirms that tax and price are not fundamental determinants of illicit cigarette trade in Colombia.

In parallel to implementing protocol strategies, Colombia should enhance the design and increase the excise tax rate on tobacco products, as this is the most cost-effective measure to reduce cigarette demand. The anticipated gains in public health and development are substantial (Maldonado et al., 2022), and Colombia remains far from achieving average regional and global prices (Chaloupka et al., 2021), as it fails to adequately address the costs of the smoking epidemic (Warner, 2013). Reducing cigarette demand to minimum levels is imperative to eliminate illicit consumption in Colombia.

1. Event attendees
2. Work team and partner organizations
3. Ms. Yuliana Valbuena, Deputy Director of Non-communicable Diseases of the Ministry of Health and Social Protection.
4. From left to right: Mr. Paul Rodríguez U. del Rosario, Mr. Norman Maldonado Proesa, and Mr. Javier Deaza, Fundacion Anaás.
5. Mr. Miguel Gómez Martínez, Dean, School of Economics, Universidad del Rosario.
6. Scouts of Colombia Volunteers
7. Citizen Scientist Volunteer, María Antonia Higuita.

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Annexes

Annex 1. Logistic regression model to predict the likelihood of being a smoker

TOTAL FOR FIVE CITIES	(1)	(2)	(3)
VARIABLES	All ages	<=19 years	>19 years
Men	0.0814***	0.0696***	0.0859***
	(0.00544)	(0.0106)	(0.00633)
Age expressed in five-year periods	-0.00106	0.0532***	-0.00183
	(0.00119)	(0.0128)	(0.00147)
Stratum	0.000311	0.0112**	-0.00270
	(0.00249)	(0.00480)	(0.00289)
Dummy = 1 if there is at least one minor in the household	-0.0233***	-0.0126	-0.0172**
	(0.00672)	(0.0129)	(0.00791)
Dummy = 1 if there is at least one person over 65 in the household	-0.0186***	-0.00569	-0.0203**
	(0.00707)	(0.0142)	(0.00815)
Household size by category = 1, 1 person [Base].			
Household size by categories = 2, 2-4 people	-0.0128	-0.0383	-0.0114
	(0.00912)	(0.0249)	(0.0102)
Household size by categories = 3, 5-7 people	-0.0103	-0.0465*	-0.00638
	(0.0120)	(0.0275)	(0.0141)
Household size by categories = 4, 8+ people	0.0344	-0.0179	0.0419
	(0.0258)	(0.0416)	(0.0319)
Occupation: Employed [Base]			
Occupation: Unemployed	0.0160*	0.0797***	0.0111
	(0.00907)	(0.0242)	(0.00977)
Occupation: School	-0.0980***	-0.0592***	-0.0473
	(0.00588)	(0.0133)	(0.0322)
Occupation: Higher Education	-0.0478***	-0.0401***	-0.0220
	(0.0109)	(0.0134)	(0.0236)
Marital status: Single [Base]			
Marital status: Unmarried /living together	-0.00742	0.00533	-0.0172*
	(0.00787)	(0.0152)	(0.00936)
Marital status: Married	-0.0483***	-0.0502**	-0.0564***
	(0.00771)	(0.0256)	(0.00897)
Marital status: Widowed, separated or divorced	0.0117	0.0611*	0.00758
	(0.00930)	(0.0346)	(0.0104)
Observations:	14,362	3,064	11,298
Log-likelihood	-4888	-807.3	-4053
chi2	515.3	221.9	320.1
p	0	0	0
Standard error in parenthesis *** p<0.01, ** p<0.05, * p<0.1			

BOGOTÁ	(4)	(5)	(6)
VARIABLES	All ages	<=19 years	>19 years
Men	0.0905***	0.0887***	0.0936***
	(0.00930)	(0.0192)	(0.0107)
Age expressed in five-year periods	-0.00681***	0.0894***	-0.00969***
	(0.00214)	(0.0245)	(0.00258)
Stratum	-0.00494	-0.00500	-0.00615
	(0.00510)	(0.0119)	(0.00571)
Dummy = 1 if there is at least one minor in the household	-0.0200*	-0.0121	-0.00688
	(0.0116)	(0.0242)	(0.0135)
Dummy = 1 if there is at least one person over 65 in the household	-0.0233*	-0.0202	-0.0226
	(0.0130)	(0.0294)	(0.0147)
Household size by category = 1, 1 person [Base].			
Household size by categories = 2, 2-4 people	-0.0199	-0.0391	-0.0210
	(0.0161)	(0.0475)	(0.0178)
Household size by categories = 3, 5-7 people	-0.0203	-0.0557	-0.0164
	(0.0210)	(0.0520)	(0.0244)
Household size by categories = 4, 8+ people	0.0888	0.00950	0.122*
	(0.0561)	(0.0965)	(0.0701)
Occupation: Employed [Base]			
Occupation: Unemployed	0.0149	0.115***	0.00791
	(0.0163)	(0.0442)	(0.0173)
Occupation: School	-0.118***	-0.0470*	-0.0569
	(0.0102)	(0.0270)	(0.0598)
Occupation: Higher Education	-0.0591***	-0.0343	-0.0154
	(0.0187)	(0.0260)	(0.0417)
Marital status: Single [Base]			
Marital status: Unmarried /living together	-0.00984	0.00803	-0.0264*
	(0.0136)	(0.0280)	(0.0160)
Marital status: Married	-0.0691***		-0.0806***
	(0.0135)		(0.0156)
Marital status: Widowed, separated or divorced	0.0158	0.0566	0.0115
	(0.0172)	(0.0654)	(0.0190)
Observations:	5,555	1,151	4,393
Log-likelihood	-2134	-378.6	-1735
chi2	243.7	98.82	177.2
p	0	0	0
Standard error in parenthesis *** p<0.01, ** p<0.05, * p<0.1			

MEDELLÍN	(7)	(8)	(9)
VARIABLES	All ages	<=19 years	>19 years
Men	0.0721***	0.0727***	0.0750***
	(0.0103)	(0.0193)	(0.0120)
Age expressed in five-year periods	0.00424*	0.0356	0.00388
	(0.00226)	(0.0229)	(0.00284)
Stratum	-0.00829*	0.0169**	-0.0150***
	(0.00436)	(0.00705)	(0.00520)
Dummy = 1 if there is at least one minor in the household	-0.0463***	-0.0389*	-0.0405***
	(0.0129)	(0.0226)	(0.0154)
Dummy = 1 if there is at least one person over 65 in the household	-0.0123	0.0391*	-0.0219
	(0.0130)	(0.0231)	(0.0152)
Household size by category = 1, 1 person [Base].			
Household size by categories = 2, 2-4 people	-0.00601	-0.0250	8.68e-05
	(0.0158)	(0.0364)	(0.0178)
Household size by categories = 3, 5-7 people	0.0141	-0.0110	0.0197
	(0.0228)	(0.0431)	(0.0268)
Household size by categories = 4, 8+ people	0.0402	-0.0602	0.0851
	(0.0528)	(0.0532)	(0.0703)
Occupation: Employed [Base]			
Occupation: Unemployed	0.0271	0.0510	0.0321*
	(0.0166)	(0.0398)	(0.0189)
Occupation: School	-0.0883***	-0.0390	-0.0608
	(0.0145)	(0.0257)	(0.0516)
Occupation: Higher Education	-0.0448**	-0.0421*	-0.0164
	(0.0220)	(0.0215)	(0.0464)
Marital status: Single [Base]			
Marital status: Unmarried /living together	-0.00453	0.0504	-0.0218
	(0.0152)	(0.0351)	(0.0177)
Marital status: Married	-0.0308**	-0.00619	-0.0412**
	(0.0143)	(0.0609)	(0.0164)
Marital status: Widowed, separated or divorced	0.0243	0.133	0.0199
	(0.0177)	(0.0988)	(0.0198)
Observations:	4,337	906	3,431
Log-likelihood	-1577	-215.4	-1345
chi2	152.1	67.01	91.36
p	0	6.68e-09	0
Standard error in parenthesis *** p<0.01, ** p<0.05, * p<0.1			

CALI	(10)	(11)	(12)
VARIABLES	All ages	<=19 years	>19 years
Men	0.0953***	0.117***	0.0934***
	(0.0138)	(0.0417)	(0.0147)
Age expressed in five-year periods	-0.00462	0.0197	-0.00337
	(0.00285)	(0.0451)	(0.00319)
Stratum	0.000658	0.0179	-0.000817
	(0.00578)	(0.0185)	(0.00606)
Dummy = 1 if there is at least one minor in the household	0.00137	0.0708	-0.0114
	(0.0159)	(0.0510)	(0.0171)
Dummy = 1 if there is at least one person over 65 in the household	0.0150	0.0126	0.0112
	(0.0163)	(0.0483)	(0.0173)
Household size by category = 1, 1 person [Base].			
Household size by categories = 2, 2-4 people	-0.0131	-0.201	0.00164
	(0.0247)	(0.129)	(0.0233)
Household size by categories = 3, 5-7 people	-0.0364	-0.257*	-0.0127
	(0.0300)	(0.133)	(0.0312)
Household size by categories = 4, 8+ people	0.0705	0.0656	0.0383
	(0.0735)	(0.235)	(0.0729)
Occupation: Employed [Base]			
Occupation: Unemployed	-0.00739	0.0588	-0.0190
	(0.0185)	(0.0677)	(0.0186)
Occupation: School			
Occupation: Higher Education	0.0164	-0.00404	0.00204
	(0.0371)	(0.0500)	(0.0600)
Marital status: Single [Base]			
Marital status: Unmarried /living together	0.0386**	-0.0312	0.0519***
	(0.0188)	(0.0506)	(0.0196)
Marital status: Married	-0.0160		-0.00525
	(0.0179)		(0.0175)
Marital status: Widowed, separated or divorced	0.0393*	0.0536	0.0488**
	(0.0215)	(0.106)	(0.0213)
Observations:	1,952	271	1,675
Log-likelihood	-548.7	-87.94	-453.7
chi2	75.99	20.91	64.98
p	6.23e-11	0.0518	6.66e-09
Standard error in parenthesis. *** p<0.01, ** p<0.05, * p<0.1			

CARTAGENA	(13)	(14)	(15)
VARIABLES	All ages	<=19 years	>19 years
Men	0.0701***	0.0539	0.0833***
	(0.0158)	(0.0378)	(0.0195)
Age expressed in five-year periods	0.00431	0.0169	0.00600
	(0.00291)	(0.0434)	(0.00373)
Stratum	0.000614	-0.00799	0.00177
	(0.00613)	(0.0216)	(0.00742)
Dummy = 1 if there is at least one minor in the household	0.0171	-0.0329	0.0249
	(0.0182)	(0.0564)	(0.0221)
Dummy = 1 if there is at least one person over 65 in the household	-0.0275	-0.0962*	-0.0247
	(0.0170)	(0.0581)	(0.0204)
Household size by category = 1, 1 person [Base].			
Household size by categories = 2, 2-4 people	-0.0361		-0.0336
	(0.0343)		(0.0380)
Household size by categories = 3, 5-7 people	-0.0283		-0.0227
	(0.0386)		(0.0440)
Household size by categories = 4, 8+ people	0.0259		0.0421
	(0.0572)		(0.0714)
Occupation: Employed [Base]			
Occupation: Unemployed	0.0311	0.158**	0.0121
	(0.0237)	(0.0731)	(0.0247)
Occupation: School	-0.0511***		0.0800
	(0.0117)		(0.121)
Occupation: Higher Education	-0.0389*	-0.00242	
	(0.0221)	(0.0330)	
Marital status: Single [Base]			
Marital status: Unmarried /living together	-0.0247	-0.0294	-0.0334
	(0.0213)	(0.0342)	(0.0298)
Marital status: Married	-0.0431*		-0.0550*
	(0.0221)		(0.0301)
Marital status: Widowed, separated or divorced	0.0142	0.138	0.00711
	(0.0257)	(0.0985)	(0.0332)
Observations:	1,251	169	946
Log-likelihood	-239.8	-28.69	-200.9
chi2	59.98	18.57	39.89
p	1.19e-07	0.0693	0.000144
Standard error in parenthesis. *** p<0.01, ** p<0.05, * p<0.1			

CÚCUTA	(16)	(17)	(18)
VARIABLES	All ages	<=19 years	>19 years
Men	0.112***	0.0650	0.124***
	(0.0204)	(0.0468)	(0.0235)
Age expressed in five-year periods	0.000589	0.0379	0.00336
	(0.00373)	(0.0472)	(0.00464)
Stratum	-0.0125	0.0271	-0.0250*
	(0.0108)	(0.0231)	(0.0129)
Dummy = 1 if there is at least one minor in the household	-0.0199	-0.0180	-0.0153
	(0.0219)	(0.0604)	(0.0245)
Dummy = 1 if there is at least one person over 65 in the household	-0.0206	-0.0388	-0.0105
	(0.0223)	(0.0628)	(0.0249)
Household size by category = 1, 1 person [Base].			
Household size by categories = 2, 2-4 people	0.0129	-0.0101	0.0154
	(0.0254)	(0.0737)	(0.0281)
Household size by categories = 3, 5-7 people	0.0409	0.0457	0.0353
	(0.0370)	(0.103)	(0.0408)
Household size by categories = 4, 8+ people	-0.0337	0.0278	
	(0.0425)	(0.132)	
Occupation: Employed [Base]			
Occupation: Unemployed	0.00485	0.00485	0.00180
	(0.0291)	(0.0885)	(0.0308)
Occupation: School			
Occupation: Higher Education	-0.0674***	-0.0937**	
	(0.0212)	(0.0366)	
Marital status: Single [Base]			
Marital status: Unmarried /living together	-0.0150	-0.0628	-0.00153
	(0.0237)	(0.0413)	(0.0282)
Marital status: Married	-0.0343	0.0592	-0.0305
	(0.0243)	(0.148)	(0.0267)
Marital status: Widowed, separated or divorced	0.0358	0.0770	0.0457
	(0.0333)	(0.164)	(0.0353)
Observations:	1,020	189	803
Log-likelihood	-264.6	-49.94	-208.3
chi2	56.04	14.44	49.28
p	2.65e-07	0.344	8.42e-07
EStandard error in parenthesis. *** p<0.01, ** p<0.05, * p<0.1			

Annex 2 List of variables for digitization of packs

Variable	Response
General data	
City	Bogotá
	Cali
	Cartagena
	Cúcuta
	Medellín
Coder code	Text
Route code	Text
Mark date and time	Current time
Pack Code	Text
Collection site	
Type of collection point	On the ground
	In the garbage
Pack data	
What is the condition of the pack?	Good condition
	Only the cover or the warning is not visible.
	Wet but legible (brand or warning)
	Poor condition or mixed with debris, but legible (brand or warning)
	Illegible (it is not possible to distinguish the brand or warning)
Which of the following features does the pack have? (You can check more than one)	No graphic warning, or text only
	Graphic warning image (30% box)
	Graphic warning image (50% or more)
	Text in English or other language (other than the brand name)
	Does it mention any flavor
	Flavor capsule information
	Standardized or flat pack
	Includes label "***Imported to Colombia***".
	Expiration date
	Biohazard (fecal matter, fungi, insects)

Brand	List of brands
What is the warning on the pack?	Warnings
How many cigarettes are in the box?	10
	20
	Another
What country does the pack come from (check on the side)?	Colombia
	Chile
	Brasil
	Paraguay
	Trinidad y Tobago
	México
	Another
	It is not possible to know
Photographs	
Photo of front side	
Photo of back side	
Photo of side with origin information	
Photo of opposite side	
Photo of top	
Photo of bottom side	

Pack characteristics	
The pack displays the following characteristics (more than one option is possible)	Only text or does not display graphic warning
	Health warning size is 30% of pack surface
	Health warning size is 50% or more of pack surface

Annex 3. Country of origin of packs per city and brand

City and brand / Country of origin	Chile	Brazil	Trinidad and Tobago	Mexico	Honduras	Not observable	Total
Total	**24.9%**	**30.3%**	**0.3%**	**28.7%**	**0.6%**	**15.2%**	**100.0%**
Bogotá	**44.8%**	**18.5%**	**0.2%**	**19.0%**	**0.6%**	**16.9%**	**100.0%**
Chesterfield	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
L&M	0.7%	0.0%	0.0%	85.7%	0.0%	13.6%	100.0%
Lucky Strike	0.0%	72.5%	1.4%	12.1%	1.6%	12.3%	100.0%
Marlboro	0.0%	0.9%	0.0%	78.4%	0.0%	20.7%	100.0%
Piel Roja	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
Rothmans	64.9%	11.0%	0.0%	5.4%	0.6%	18.2%	100.0%
Cali	**1.8%**	**28.2%**	**1.5%**	**49.0%**	**0.3%**	**19.3%**	**100.0%**
Caribe	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
Chesterfield	0.0%	0.0%	0.0%	81.3%	0.0%	18.7%	100.0%
L&M	0.0%	0.0%	0.0%	80.0%	0.0%	20.0%	100.0%
Piel Roja	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
Rothmans	26.7%	54.5%	6.5%	0.0%	0.0%	12.3%	100.0%
Starlite	4.8%	63.1%	0.0%	0.0%	0.0%	32.1%	100.0%
Cartagena	**9.1%**	**24.5%**	**0.4%**	**46.1%**	**0.3%**	**19.7%**	**100.0%**
Chesterfield	0.0%	0.0%	0.0%	76.7%	0.0%	23.3%	100.0%
L&M	0.0%	0.0%	0.0%	88.9%	0.0%	11.1%	100.0%
Lucky Strike	0.0%	73.4%	1.2%	1.7%	0.9%	22.8%	100.0%
Marlboro	0.0%	0.0%	0.0%	60.3%	0.0%	39.7%	100.0%
Piel Roja	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
Rothmans	60.4%	15.1%	0.0%	0.0%	0.0%	24.5%	100.0%
Cúcuta	**43.0%**	**38.0%**	**2.3%**	**6.4%**	**0.5%**	**9.8%**	**100.0%**
L&M	0.0%	0.0%	0.0%	50.0%	0.0%	50.0%	100.0%
Lucky Strike	0.0%	79.7%	6.7%	1.6%	1.5%	10.5%	100.0%
Marlboro	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Piel Roja	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
Rothmans	66.9%	17.3%	0.0%	6.8%	0.0%	9.0%	100.0%

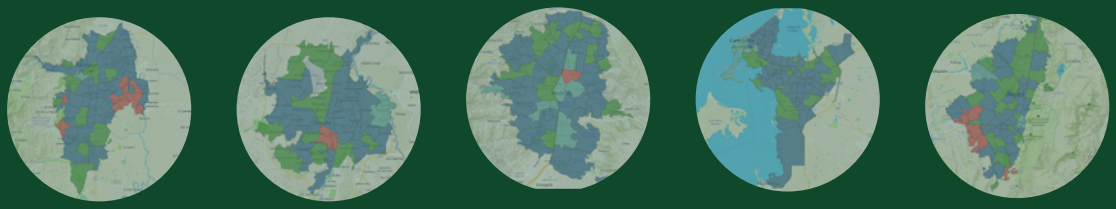
City and brand / Country of origin	Chile	Brazil	Trinidad and Tobago	Mexico	Honduras	Not observable	Total
Total	**24.9%**	**30.3%**	**0.3%**	**28.7%**	**0.6%**	**15.2%**	**100.0%**
Medellín	**1.6%**	**47.5%**	**0.1%**	**38.1%**	**0.7%**	**12.0%**	**100.0%**
Chesterfield	0.0%	0.0%	0.0%	85.6%	0.0%	14.4%	100.0%
L&M	0.0%	0.0%	0.0%	97.3%	0.0%	2.7%	100.0%
Lucky Strike	0.0%	72.1%	3.6%	0.0%	17.7%	6.6%	100.0%
Marlboro	0.0%	0.0%	0.0%	82.8%	0.0%	17.2%	100.0%
Rothmans	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Starlite	3.1%	83.9%	0.0%	0.2%	0.0%	12.8%	100.0%

Annex 3.a. Country of origin of licit cigarette packs by city and brand

City and brand / Country of origin	USA	Korea	UAE	Ger-many	China	Viet-nam	Switzer-land	Para-guay	Brazil	Mexico	Not observable	Total
Total	**24.6%**	**5.1%**	**4.9%**	**4.2%**	**3.0%**	**2.1%**	**1.0%**	**0.9%**	**0.3%**	**0.0%**	**53.7%**	**100.0%**
Bogotá	**12.6%**	**0.0%**	**6.1%**	**10.3%**	**15.9%**	**0.0%**	**0.0%**	**0.0%**	**1.5%**	**0.0%**	**53.6%**	**100.0%**
Camel	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Gold Seal	0.0%	0.0%	12.4%	48.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	39.5%	100.0%
Lucky Strike	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	67.3%	0.0%	32.7%	100.0%
M1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Marshal	17.8%	0.0%	0.0%	0.0%	82.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Maverick	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Monarch	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Rumba	88.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.9%	100.0%
Cali	**42.3%**	**0.0%**	**15.6%**	**0.0%**	**2.2%**	**0.0%**	**2.5%**	**8.5%**	**0.0%**	**0.0%**	**29.0%**	**100.0%**
Not observable	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Elegance	0.0%	0.0%	79.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.0%	100.0%
Gold City	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Grayson's	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
M1	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Maxico	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	34.8%	0.0%	0.0%	0.0%	65.2%	100.0%
Record	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%

City and brand / Country of origin	USA	Korea	UAE	Germany	China	Vietnam	Switzerland	Paraguay	Brazil	Mexico	Not observable	Total
Total	**24.6%**	**5.1%**	**4.9%**	**4.2%**	**3.0%**	**2.1%**	**1.0%**	**0.9%**	**0.3%**	**0.0%**	**53.7%**	**100.0%**
Royal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Rumba	90.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.2%	100.0%
Silver Elephant	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Ultima	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Ultra Buy	66.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	33.8%	100.0%
V5	33.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	66.2%	100.0%
Cartagena	**5.5%**	**53.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.4%**	**0.4%**	**0.0%**	**0.0%**	**40.0%**	**100.0%**
Carnival	0.0%	61.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	38.4%	100.0%
Marlboro	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Marshal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Palmetto	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Record	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
Rumba	56.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	43.9%	100.0%
Ultra Buy	39.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	60.3%	100.0%
Cúcuta	**7.4%**	**3.3%**	**19.9%**	**15.8%**	**0.0%**	**14.7%**	**3.2%**	**0.0%**	**0.0%**	**0.2%**	**35.6%**	**100.0%**
Not observable	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
American Bison	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Carnival	0.0%	77.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	22.9%	100.0%
D&J	0.0%	0.0%	60.7%	31.3%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	7.2%	100.0%
Denver	0.0%	0.0%	69.7%	20.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.9%	100.0%
Economicos	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
Empire	0.0%	0.0%	0.0%	0.0%	0.0%	83.9%	0.0%	0.0%	0.0%	0.0%	16.1%	100.0%
Fisher	0.0%	0.0%	45.4%	14.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	40.3%	100.0%
Gold City	12.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	88.0%	100.0%
Gold Seal	0.0%	0.0%	72.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	27.4%	100.0%
Golden Lions	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Jaisalmer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Maxico	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	84.5%	0.0%	0.0%	0.0%	15.5%	100.0%
Mondeo	0.0%	0.0%	73.9%	19.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.4%	100.0%
Party	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Pine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Real	0.0%	0.0%	1.2%	59.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	39.4%	100.0%
Rumba	34.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	65.6%	100.0%
Ultra Buy	75.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	24.2%	100.0%

City and brand / Country of origin	USA	Korea	UAE	Ger-many	China	Viet-nam	Switzer-land	Para-guay	Brasil	Mexico	Not observable	Total
Total	**24.6%**	**5.1%**	**4.9%**	**4.2%**	**3.0%**	**2.1%**	**1.0%**	**0.9%**	**0.3%**	**0.0%**	**53.7%**	**100.0%**
Medellín	**34.3%**	**0.8%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.7%**	**0.8%**	**0.0%**	**0.0%**	**63.4%**	**100.0%**
ACE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
American Bison	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Carnival	0.0%	28.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	71.6%	100.0%
Elegance	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Gold City	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	100.0%
Ibiza	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Maxico	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Milton	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Mohawk	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Montreal	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Nashville	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Native	80.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	19.1%	100.0%
President	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Pride	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Record	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
Rumba	31.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	69.0%	100.0%
Ultima	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Ultra Buy	23.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	76.3%	100.0%
Zon	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%



Anáas (Anaas) Tejiendo Sinergias | PROESA | Universidad ICESI Tu futuro a otro nivel | Universidad del Rosario | Facultad de Economía | Tabaconomía Universidad Adolfo Ibáñez