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Original Investigation

# The Flavor Train: The Nature and Extent of Flavored Cigarettes in Low- and Middle-Income Countries

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## Abstract

**Introduction:** Flavors and depictions of flavors are attractive and facilitate initiation and use of tobacco products. However, little is known about the types of flavored products on the market, particularly in low- and middle-income countries. We describe the nature and extent of flavored cigarettes sold in nine low- and middle-income countries from four of the six World Health Organization (WHO) regions.

**Aims and Methods:** We employed a systematic protocol to purchase unique cigarette packs in Bangladesh, Brazil, China, India, Indonesia, Philippines, Russia, Thailand, and Vietnam. Packs were double coded for flavor descriptors and imagery using a standard codebook. Frequencies and crosstabs were conducted to examine the proportion of packs with flavor descriptors and/or flavor imagery, and flavor capsules, by country and by major manufacturer.

**Results:** Overall, 15.4% of the country-unique cigarette packs had flavor descriptors and/or imagery, representing a variety of flavors: menthol or mint (8.2%), “concept” descriptors (3.5%) (eg, Fusion blast), fruit or citrus (3.3%), beverages (1.4%), and others (1.4%). Flavor was mostly communicated using descriptors (15.2%), with flavor imagery being less common (2.2%). Flavor capsules were prevalent (6.2%), with almost half having “concept” descriptors. All major tobacco companies produced cigarettes with flavors, and with capsules.

**Conclusions:** A range of flavored cigarettes remain on the market in the low- and middle-income countries with the greatest number of smokers. This finding is particularly concerning given the appeal of flavored cigarettes among youth and their potential to circumvent country bans on flavored tobacco products if those laws are not sufficiently comprehensive. Laws addressing flavored tobacco products need to account for flavor capsules and concept descriptors.

**Implications:** While a number of countries have restricted flavors in tobacco products to reduce their appeal and attractiveness, a range of flavors continue to be on the market in low- and middle-income countries, putting people in these countries at increased risk for tobacco use and subsequent tobacco-caused death and disease. The presence of capsules and concept descriptors is particularly concerning given their appeal among youth and their potential to circumvent country bans on flavored tobacco products if those laws are not sufficiently comprehensive.

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## Introduction

Globally the sale of cigarettes has fallen over the last decade,<sup>1</sup> however, the tobacco industry markets flavored cigarettes around the world<sup>2</sup> and the sale of cigarettes with flavors and flavor capsules have gained inroads into both new and existing markets.<sup>3</sup> Flavors are additives that impart a distinct taste or aroma, including, but not limited to fruit, spice, herbs, alcohol, candy, menthol, or vanilla.<sup>4,5</sup> The use of flavored cigarettes varies between countries. For example, prevalence of use of menthol cigarettes has been found to range from 0.4% in Spain to 12.4% in the United Kingdom to 40.5% in the United States.<sup>6–8</sup> Flavor capsule cigarettes contain one or more small capsules within the filter tip which can be burst by squeezing them with one's fingertips.

Several studies have demonstrated how flavored cigarettes contribute to the appeal of smoking, and may serve to encourage uptake.<sup>9–12</sup> For example, the cooling, soothing, and analgesic effects of menthol can alleviate the harsh and irritating effects of tobacco, thereby encouraging their uptake as starter products.<sup>13–16</sup> In addition, flavors such as chocolate make tobacco products more palatable to novice smokers,<sup>11</sup> and may also encourage smoking.

Further, depictions of flavor on tobacco packaging can contribute to appeal.<sup>17–19</sup> Cigarettes with flavor descriptors and images such as menthol, vanilla, and cherry have been reported to have higher ratings on appeal and taste when compared with cigarettes with no flavor descriptors.<sup>17–19</sup> Tobacco industry documents reveal companies' knowledge of the susceptibility of young and novice smokers to the implied and explicitly stated benefits of flavored cigarettes, such as improved social acceptance enhanced by a pleasant aroma and taste, coupled with increased smoking pleasure.<sup>20,21</sup> Youth in particular are attracted to flavored tobacco products,<sup>21,22</sup> and have a greater preference for sweet flavors than adults.<sup>23,24</sup>

Methods have been and continue to be developed by tobacco companies to facilitate a controlled delivery of the aroma and taste of flavors, for example, flavor capsules,<sup>25</sup> as well as threads inserted in cigarette filters that contain flavors.<sup>26</sup> Tobacco companies are also using "concept" descriptors to connote a taste, aroma, or sensation other than traditional characterizing flavors.<sup>27</sup> Concept descriptors are terms that imply that some type of flavor, sensation, taste, or aroma awaits the consumer (eg, Fusion blast).<sup>28</sup> Studies from multiple countries have found that flavor capsules contribute to the appeal, attractiveness, and preference for flavored cigarettes.<sup>25,29–32</sup>

Some countries have taken action to prevent flavors from promoting tobacco use.<sup>27</sup> Canada, Brazil, Ethiopia, Moldova, Turkey, and the 28 European Union member states have enacted policies banning the use of flavors including menthol in cigarettes<sup>27,33</sup>; two countries—the United States and Niger—ban flavored tobacco products but exclude menthol from the list of prohibited flavors.<sup>34,35</sup> Thailand restricts the use of descriptors on packs that connote a fragrance or flavor.<sup>36</sup> Subnational jurisdictions, such as states, provinces, and cities, have also taken a range of actions to restrict flavors in tobacco products, eg,<sup>37–44</sup>

To our knowledge, no data exist on the range and extent of flavored cigarettes in low- and middle-income countries. Therefore, here we describe the types of cigarette flavors being sold in nine low- and middle-income countries from four World Health Organization (WHO) regions. These findings can inform the development of effective tobacco flavor ban policies.

## Methods

Unique cigarette packs were purchased using a systematic protocol in nine countries: Bangladesh (2016), Brazil (2016), China (2017), India (2016), Indonesia (2015), Philippines (2016), Russia (2015), Thailand (2015), and Vietnam (2015). These countries were chosen because they were among the countries with the greatest number of smokers at the time the Tobacco Pack Surveillance System (TPackSS) study was initiated in 2012. At the time of data collection, only Thailand had a flavor policy in effect—it was prohibited for the pack to generate an aroma or flavor, or to include the terms "cool," "ice," "frost," "crisp," "fresh," "mint," "mellow," "rich," "aromatic," "special aroma," "or other words or statements describing fragrance or flavor that might encourage consumers to use such cigarettes..."<sup>36</sup>

The TPackSS study design has been described previously.<sup>45</sup> Briefly, we aimed to purchase every unique pack available for sale at the time of data collection. To accomplish this, we chose cities and neighborhoods with a view toward geographic and cultural diversity in each country. We went to the most populated city in each country and two (three for India, four for China) more that were in the top 10 most populated cities in the country. In these cities, we stratified neighborhoods by low, middle, and high socioeconomic status and went to four of each in each city. We identified a hub in each neighborhood and used a systematic walking protocol starting from the hub to identify vendors that represented the top venue types where people purchase their cigarettes (determined using Global Adult Tobacco Survey [GATS] and Euromonitor data). We purchased every unique pack encountered, with a unique pack defined as one that was different in any way from the packs we had already purchased, other than a difference in the health warning label image; for example, packs could differ by number and size of sticks, brand variant name, pack shape or size, etc. Purchased packs were shipped to our office in Baltimore, United States.

Two coders coded each pack for words and imagery that connoted a flavor, using a standard codebook.<sup>46</sup> There were three ways in which a pack could be determined to be a flavor pack: flavor descriptor, flavor imagery, or flavor capsule. Kreteks, clove cigarettes, were excluded from this analysis as they are predominately (83.8% in this sample) a product of Indonesia; they are the typical cigarette and not considered a flavored alternative.

Flavor descriptors were categorized as: mint or menthol, fruit or citrus, beverage, other characterizing flavor, or non-characterizing flavor. The beverage category included packs with images of coffee, alcoholic beverages, energy drinks, tea, and others. Other characterizing flavors included flavors such as "herbal," "ginseng," "dessert," "honey," and "rose," among others. Non-characterizing "concept" descriptors were those that are not generally considered flavors, but can connote a taste, aroma, or sensation other than tobacco-flavored<sup>27</sup>; they included terms such as "ice blast," "fresh," and "purple burst." Packs with descriptors such as "full flavor" or "traditional flavor" were not counted as flavored.

Flavor images were categorized as: mint or menthol, fruit or citrus, beverage, or other characterizing flavor. Beverage category was coded the same way as described above for descriptors. Other flavors included flavors such as caramel, vanilla, chocolate, cinnamon, or other spices.

We identified capsules by first examining the pack and sticks to identify any indication (either imagery and words) of a capsule. If there was an indication of a capsule, we cut open the filter of one cigarette in the pack to determine whether a capsule was present.

Flavor capsules were categorized as: mint or menthol, other characterizing flavor, non-characterizing flavor, or unknown flavors. Other characterizing flavor and non-characterizing flavor were defined as described above for descriptors. Unknown was selected for packs without any flavor descriptor on the pack, but where a capsule was indicated.

We conducted frequencies and crosstabs to examine the proportion of packs with flavor imagery or flavor descriptors, and flavor capsules, by country and by major manufacturer: Philip Morris International (PMI), British American Tobacco (BAT), Japan Tobacco International (JTI), KT&G, and China National Tobacco Company (CNTC). Major manufacturers were identified by available brand owner information and pack inspection.

## Results

There are a variety of flavors available on the market in the nine low- and middle-income countries, depicted with descriptors and/or imagery: mint or menthol (8.2%), fruit or citrus (3.3%), beverages (1.4%), concept descriptors (3.5%), and other flavors (1.4%), including spice, dessert, herb, and floral flavors (Table 1). Examples of packs with different flavors are shown in Figure 1. These flavors were presented mostly with descriptors (15.2% of the packs in the sample had flavor descriptors), and some had imagery (2.2% of the packs in the sample had flavor-related images).

Cigarettes with flavor capsules were also prevalent in the overall sample: 6.2% of the packs had flavor capsules, and over half of these had concept descriptors (3.2%).

There were differences between countries in the types of flavors available and their prominence within our samples of unique packs. The countries with the highest proportion of unique packs with flavor descriptors and/or imagery were the Philippines (51.9%), India (29.3%), and Vietnam (19.3%). These were the same countries that had the highest proportion of unique packs that were menthol or mint flavored (Philippines [42.6%], India and Vietnam [12.0%]); Brazil (11.5%) also had at least one in 10 unique packs that were menthol or mint flavored. Fruit and citrus were also common flavors of cigarettes, particularly in India (13.0%); Bangladesh (4.5%),

Vietnam (4.0%), and Russia (3.6%) also had a higher proportion than average of unique packs with fruit and citrus flavors. The proportion of unique packs with beverage flavors was highest in China (2.0%), Russia (2.0%), and the Philippines (1.9%). Concept descriptors were most prominent in the Philippines (10.2%) and India (7.6%).

Capsule cigarettes accounted for the largest proportion of unique packs in the Philippines (21.3%, with half of these being menthol flavored), India (14.1%; with over half being menthol flavored), Brazil (9.9%), and China (7.9%). In China, 11.4% of capsule packs were menthol or mint flavored; 51.9% had concept descriptors, 20.2% had “other” flavors, and 19% had no indication of the flavor of the capsule. Of note, Thailand also had a higher than average proportion of unique packs with capsules (7.4%), with half of these having concept descriptors, over a third having menthol or mint flavor, and about a quarter having no indication of the flavor of the capsule.

All major tobacco companies produced cigarettes with flavors and with capsules, across the nine countries (Table 2). Almost one in three KT&G packs (30.8%) had flavor terms or imagery, compared with about one in five for PMI (21.2%), about one in eight for BAT (13.7%) and JTI (13.6%), and about one in 13 for the CNTC (7.9%). Most of this flavor communication was with descriptors; only KT&G (6.7%) and CNTC (3.3%) packs also had flavor imagery. The predominant flavors produced by KT&G were fruit or citrus, beverages, and concept descriptors. PMI, JTI, and BAT mostly had menthol or mint flavors, and CNTC had a broad mix of flavors.

All five major tobacco companies also produced cigarette packs with flavor capsules. About one sixth of KT&G packs (15.4%) had capsules, over half of them with a concept descriptor and almost 25% with an “other” flavor. The BAT capsule packs (10.1%) also predominantly had concept descriptors, but also featured menthol or mint and concept descriptors. Almost three quarters of the PMI capsule packs had concept descriptors; the remainder were menthol or mint. The JTI capsule packs were mostly menthol or mint, but also featured concept descriptors, while the CNTC packs were predominantly “other” flavors, but also featured “unknown” flavors and concept descriptors.

**Table 1.** Flavor Descriptors, Imagery, and Capsules on Cigarette Packs, by Country of Purchase<sup>a</sup>

	Overall (n = 2132)	BD (n = 222)	BR (n = 131)	CN (n = 738)	India (n = 92)	INDO (n = 81)	PH (n = 108)	RU (n = 502)	TH (n = 108)	VN (n = 150)
Percent flavor descriptors and/or imagery, overall	15.4%	11.3%	14.5%	13.1%	29.3%	11.1%	51.9%	10.4%	13.9%	19.3%
Menthol or mint	8.2%	4.5%	11.5%	5.7%	12.0%	8.6%	42.6%	3.2%	8.3%	12.0%
Fruit or citrus	3.3%	4.5%	0%	2.6%	13.0%	1.2%	1.9%	3.6%	2.8%	4.0%
Beverages	1.4%	0%	0%	2.0%	0%	1.2%	1.9%	2.0%	0%	0.7%
“Concept flavor” descriptor	3.5%	2.3%	6.1%	4.1%	7.6%	2.5%	10.2%	0.8%	4.6%	2.0%
Other flavor	1.4%	0.9%	0%	2.3%	0%	1.2%	0%	1.4%	0%	1.3%
Prevalence of capsules, overall	6.2%	3.2%	9.9%	7.9%	14.1%	2.5%	21.3%	0.8%	7.4%	3.3%
Menthol or mint	1.7%	0.5%	4.6%	0.9%	8.7%	1.2%	10.2%	0%	2.8%	0%
“Concept flavor” descriptor	3.2%	2.3%	6.1%	4.1%	6.5%	1.2%	9.3%	0.2%	3.7%	2.0%
Other flavor	0.7%	0.5%	0%	1.6%	0%	0%	1.9%	0%	0%	0%
Unknown flavor	0.9%	0%	0.8%	1.5%	0%	0%	0.9%	0.6%	1.9%	1.3%

The country acronyms used are as follows: Bangladesh (BD), Brazil (BR), China (CN), Indonesia (INDO), Philippines (PH), Russia (RU), Thailand (TH), and Vietnam (VN).

<sup>a</sup>The percentages for the flavor categories in each cell often sum to more than the “percent flavor descriptors and/or imagery, overall” because some packs had flavors in more than one category.



**Figure 1.** Examples of cigarette packs with menthol or mint, fruit, beverage, and “concept” descriptor flavors. Brand names are redacted as required by the journal. Full photos can be found at <https://globaltobaccocontrol.org/tpackss/pack-search/pack/6557/lm-brazil-w2-02>; <https://globaltobaccocontrol.org/tpackss/pack-search/pack/9806/blue-seal-viet-nam-w2-02>; <https://globaltobaccocontrol.org/tpackss/pack-search/pack/8731/esse-russian-federation-w2-07>; <https://globaltobaccocontrol.org/tpackss/pack-search/pack/9972/marlboro-philippines-w2-20>.

**Table 2.** Flavor Descriptors, Imagery, and Capsules on Cigarette Packs, by Cigarette Company<sup>a</sup>

	PMI (n = 302)	BAT (n = 335)	JTI (n = 236)	KT&G (n = 104)	CNTC (n = 509)
Percent flavor terms and/or imagery, overall	21.2%	13.7%	13.6%	30.8%	7.9%
Menthol or mint	19.5%	8.4%	12.3%	8.7%	1.8%
Fruit or citrus	0.0%	0.6%	0.0%	10.6%	1.8%
Beverages	0.0%	0.0%	0.8%	9.6%	1.6%
“Concept flavor” descriptor	7.6%	5.7%	1.7%	9.6%	1.0%
Other flavor	0.0%	0.0%	0.0%	0.0%	3.1%
Prevalence of capsules, overall	9.9%	10.1%	6.4%	15.4%	4.1%
Menthol or mint	3.3%	2.4%	3.8%	0.0%	0.2%
“Concept flavor” descriptor	7.3%	5.7%	1.7%	9.6%	1.0%
Other flavor	0.0%	0.3%	0.0%	3.8%	2.0%
Unknown flavor	0.0%	2.4%	1.3%	1.9%	1.2%

BAT = British American Tobacco, CNTC = China National Tobacco Company, JTI = Japan Tobacco International, PMI = Philip Morris International.

<sup>a</sup>The percentages for the flavor categories in each cell often sum to more than the “percent flavor descriptors and/or imagery, overall” because some packs had flavors in more than one category.

## Discussion

Cigarette packs that depict flavors with descriptors and/or imagery were available for sale in all nine low- and middle-income countries assessed, and especially in the Philippines, India, and Vietnam, countries that account for 19.5% of the global smokers when the TPackSS was initiated.<sup>47–49</sup> Further, a broad range of flavors were found on the market. Despite Thailand’s comprehensive flavor ban that attempts to prohibit even concept descriptors, the tobacco industry is violating and circumventing Thailand’s flavor ban by using flavor capsules.

We found concept descriptors on the market in all countries except Bangladesh. Concept descriptors are those that do not directly name or depict a fruit, food, beverage, or spice, but the packaging of the tobacco product nonetheless denotes a taste, aroma, or sensation for the cigarette other than being tobacco-flavored—such as “Ibiza Sunset,” “Velvet Fusion Blast,” and “Crystal Blue”; it is ambiguous as to what these might taste or smell like. The use of concept descriptors is not new<sup>50</sup>; a review of concepts used to promote flavored

tobacco products in the early 2000s reported the use of descriptors such as “creamy indulgent flavor,” “smooth fusion,” and promotional brands with terms such as “bayou-blast.”<sup>2</sup>

It is important to note that the sample of country-unique packs, by design, is not reflective of the market share of each pack in that country. Unfortunately, data on market share at the level of unique brand variants are not available in any of the countries in this study. Further, the sample examined for this analysis included all unique packs that we purchased in the country, whether or not they had a current health warning label from the country of purchase with the result that some of the packs in our sample were illegally sold. Given that manufacturers were identified based on brand owner information and pack inspection, it is possible, though unlikely, that some packs could be counterfeits. While packs in the sample were all unique for each country, data from across the countries could include duplicate packs (the same brand and brand variant).

In their attempt at developing a library of flavors used in tobacco products, Krusemann et al. grouped flavors into eight categories:



fruit, spice, herb, alcohol, menthol, sweet, floral, and miscellaneous (bread, butter, cheese, etc.).<sup>51</sup> These groupings were not all well suited for our samples from the nine low- and middle-income countries so instead we used only five categories: menthol or mint, fruit or citrus, beverage, concept descriptor, and other. The prominence of different flavor types does vary by market, as demonstrated across the nine countries in this study. Strengths of this study are the inclusion of packs from nine different countries across four WHO regions and the use of rigorous, standardized protocols to identify retailers, purchase packs, and code packs.

Moving forward, it is important to continue to monitor the nature and extent of flavored cigarettes given their appeal—especially among young people, and including concept descriptors and capsules—and their consequent contribution to tobacco product use initiation, in order to inform policies to reduce the extensive burden of tobacco use.

Evidence from Mexico demonstrates that tobacco companies spike their concept descriptor cigarettes with flavor chemicals in addition to menthol.<sup>28</sup> It is therefore important that jurisdictions that are seeking to protect their residents' health by prohibiting flavored tobacco products address concept descriptors and capsules in any such policy. This can be challenging in practice because there are unlimited images, terms and combinations of terms that could be used. One could analyze tobacco products for the presence of chemicals known to have flavor properties, eg, <sup>51-53</sup> or employ people trained to detect the flavors through the sense of smell.<sup>5</sup> But these are time intensive approaches that require resources and strong regulatory processes, which may not be available in all low- and middle-income countries. An alternate approach is to prohibit the presence of all additives that have flavoring properties or that enhance flavor,<sup>27</sup> as well as terminology or images on packs and in marketing that might denote a taste, aroma, or sensation other than tobacco-flavored. Plain and standardized packaging of tobacco products can be complementary to a flavor ban when packaging is not allowed to include descriptors, even in the name of the product, that could be interpreted to refer to a flavor, concept descriptors, or capsule.

## Supplementary Material

A Contributorship Form detailing each author's specific involvement with this content, as well as any supplementary data, are available online at <https://academic.oup.com/ntr>.

## Funding

This work was supported by a grant to the Johns Hopkins Bloomberg School of Public Health under Bloomberg Philanthropies' Bloomberg Initiative to Reduce Tobacco Use.

## Declaration of Interests

None declared.

## Acknowledgments

We thank all of our in-country collaborators for their expertise and assistance with data collection (names of collaborating organizations can be found at <https://globaltobaccocontrol.org/tpackss/about>). We also thank

Stephanie Ng, Adami Osho, Kara Robinson, Deana Tremble, Rebecca Lesser, and Mustafa Sakib for coding the tobacco packs for design features and marketing appeals.

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