

# ILLICIT TRADE OF TOBACCO IN SOUTH-EAST ASIA REGION

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REGIONAL OFFICE FOR

**World Health  
Organization**  

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**South-East Asia**

Illicit trade of tobacco in South-East Asia Region

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## Regional Director's message

Tobacco use is the world's leading cause of avoidable premature mortality, reflecting its profound and detrimental health, socioeconomic and environmental effects. Currently, the South-East (SE) Asia Region has the highest average tobacco use prevalence rates among adults globally. Out of approximately 1245 million adult tobacco users globally, around 411 million (33%) reside in the Region. More significantly, over 280 million smokeless tobacco users, or 77% of the global total, and about 11 million adolescent tobacco users, or 30% of the global total, currently reside in the Region.

Increased consumption of tobacco, including smokeless tobacco and novel products, among youth across the Region is particularly worrisome. People who start using tobacco at an early age are more likely to develop a severe addiction to nicotine than those who start at a later age. For this reason, young people are often targeted by the tobacco industry with different tactics.

To effectively tackle this ongoing tobacco epidemic, both demand- and supply-side tobacco control measures are important, as is advocated by the WHO Framework Convention on Tobacco Control (WHO FCTC). Elimination of illicit trade in tobacco products is a key supply-side policy to reduce tobacco use to curb its health and economic consequences. Illicit trade undermines tobacco control policy by reducing the impact of key tobacco control measures like price and tax increases, thus also causing substantial losses in government revenues, as well as circumventing labelling and packaging requirements of tobacco products and other important demand reduction measures. The Protocol to Eliminate Illicit Trade in Tobacco Products (referred to as the Protocol) is an international treaty that expands on the obligations contained in Article 15 of the FCTC. It aims to provide a global framework of measures for countries to adopt in order to eliminate the illicit trade in tobacco products. Only two countries in the Region, India and Sri Lanka, are Parties to the Protocol at present.

Experience from many countries shows illicit trade can be successfully addressed even when tobacco taxes and prices are raised, resulting in increased tax revenues and reduced tobacco use. However, progress has been rather slow in the Region in combating illicit trade. Appropriate policies and tools are either not in place or often poorly implemented.

To facilitate the adoption of evidence-informed measures in the countries of the SE Asia Region to counter illicit trade in tobacco products, it is imperative to generate new and compile existing evidence on illicit trade in these products across the Region. Currently, evidence is



scarce on this aspect of tobacco control in the regional context, and this may be one of the reasons for the sluggish response at the governance level.

This research report sheds light on the updated evidence regarding illicit trade in tobacco in the SE Asia Region. The report observed substantial variation in illicit trade in tobacco among Member countries. It also notes that the common narrative of the tobacco industry – that higher tax would result in more illicit trade - turns out to be a myth for the Region.

I hope that this report will help support countries to leverage the compiled evidence and further strengthen the reinvigorated approach to tobacco control in the post-pandemic era.

A handwritten signature in black ink, appearing to read 'Saima Wazed', is positioned above the printed name and title.

Ms Saima Wazed  
Regional Director  
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## Introduction

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Tobacco use is recognized as a global public health problem killing nearly 8 million people annually (1). Globally, an estimated 8.71 million deaths and 229.77 million disability-adjusted life years (DALYs) were associated with tobacco use in 2019, with cardiovascular disease, neoplasms, and chronic respiratory diseases identified as the leading causes of mortality. Although there has been a historical decline in tobacco-related deaths from 1990 to 2019, mortality rates and the burden of disabilities have consistently remained higher in countries with low to middle incomes (2).

The WHO South-East Asia (SEA) Region, which is one of the largest consumers and producers of tobacco products, encounters 1.6 million deaths annually due to tobacco-related health complications (1). The prevalence of smokeless tobacco is still very high in this Region, and youth tobacco use is a source of deep concern (3). Consequently, the implementation of strict tobacco control strategies is imperative to accelerate the decline in the overall prevalence of tobacco use.

The illicit trade of tobacco also contributes significantly to the tobacco-related disease burden. The global estimate of the size of the illicit cigarette market is 11.6% (4). From a trade perspective, this translates to 657 billion sticks a year and approximately USD 40.5 billion in lost revenue globally. For low- and middle-income countries, eliminating the illicit trade would result in approximately USD 18.3 million in revenue, and from a health standpoint, it would save around 132,000 lives annually (4). While the volume of the illicit market has remained steady over time, overall cigarette consumption is declining. Consequently, the absolute size of the illicit trade market is shrinking as well (5).

Article 15 of the WHO Framework Convention on Tobacco Control (FCTC) emphasizes the illicit trade of tobacco as one of the measures to reduce the supply of tobacco products (6). Parties to this convention recognize that the elimination of illicit tobacco trade is crucial for tobacco control, and they commit to adopting recommended packaging policies to monitor and control the movement of illicit tobacco products, facilitating regional cooperation among the Parties (6). However, only two countries in South-East Asia Region—India and Sri Lanka—are the Parties of the Protocol.

The SEA Region plays a significant role in the global tobacco economy as a consumer and producer of large quantities of tobacco products. With a sizable tobacco consumer base generating significant tax revenues for the governments as well as engaging local workforce and farmers in employment, the tobacco industry has demonstrated strong influence in the tobacco policies (7–10). Furthermore, many countries of this Region lack the administrative capacity to sufficiently contain illicit tobacco trade (11), while local production of unregulated smokeless tobacco and bidis make it difficult to estimate the actual size of the illicit market. Yet, remarkable progress in implementing tobacco control measures has been observed, resulting in a decline rate of tobacco use in the SEA countries despite the averse policy environment created by the tobacco industry (8).

Evidence suggests that increasing tobacco taxes reduces affordability and thereby curbs consumption. Tax-induced affordability reduction contributes to a declining share of tobacco market size and reduces the demand for both legal and illicit tobacco products. Thus, taxation policies are expected to contribute to reducing the absolute size of the illicit tobacco market (5). However, policymakers often hesitate to adopt stricter measures for achieving more substantial outcomes due to various myths often propagated by tobacco companies. Additionally, many countries in the SEA Region have complex tobacco tax structures, with relatively low taxes levied on tobacco products.

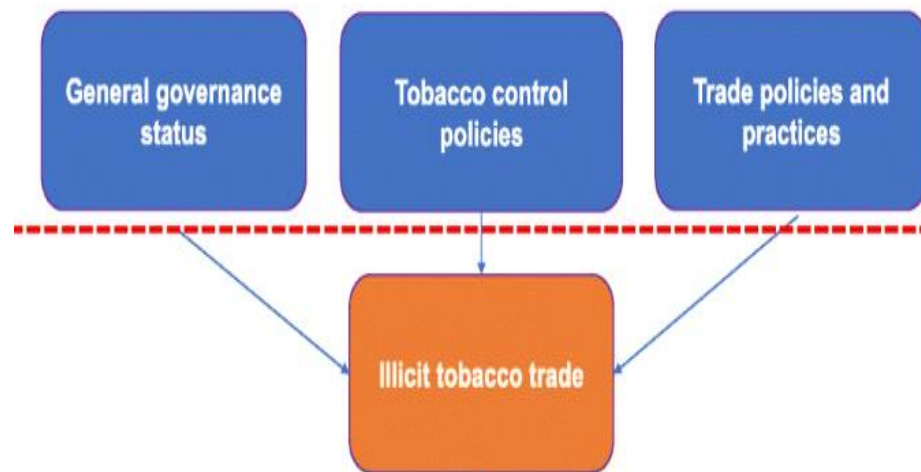
Illicit trade in tobacco products poses a serious threat to public health. Illicit trade increases the accessibility and affordability of tobacco products, fueling the tobacco epidemic and undermining tobacco control policies. It also causes substantial losses in government revenues, and at the same time contributes to the funding of transnational criminal activities (12). Despite the tobacco industry's claims, changes in illicit tobacco trade levels are very loosely connected with changes in tobacco



taxes. Increasing tobacco taxes does not necessarily lead to more tobacco smuggling, as demonstrated by multiple studies (13).

Apart from corporate tactics such as creating international pressure to open markets, lobbying with policymakers, government officials and politicians; the illicit tobacco narrative is one of the misleading arguments frequently used by the tobacco industry for preventing increased taxation of tobacco products. The narrative – although proven flawed in practice (11) – argues that increasing tobacco taxes will negatively impact the affordability and accessibility of tobacco products. This will result in an influx of cheap illicit tobacco products as a substitute. Moreover, several times the tobacco industry was found to be involved in generating inflated estimates of the size of the illicit market (14) to thwart increase in taxation, as they argue, the resulting inflow of illicit tobacco will translate into lost tax revenues for the government. Furthermore, many assumptions made about the nature and controlling policy of illicit tobacco may not hold true in practice for SEA Region (11). For example, illicit tobacco is usually found cheaper in high-income countries, thus inducing cheaper illicit tobacco consumption when taxes are imposed. Whereas, in low-income countries – having lower production cost and tax – illicit tobacco is most of the time priced higher than locally available brands and might as well be purchased as an item for indulgence (11,15). The evidence of undue influence goes as far as to prove the complicity of the industry players to take advantage of the illicit trade for their corporate gains (9).

Due to a lack of high-quality evidence, policymakers often buy into the tobacco industry's flawed argument that stricter tobacco control measures will increase illicit trade. This can slow down or halt the adoption of effective tobacco control policies. Therefore, to guide evidence-based tobacco control policy, it is essential to generate new and compile existing evidence on illicit trade so that policymakers in this Region can make better-informed and more effective policy decisions. This study aims to shed light on recent evidence regarding the illicit trade of tobacco in the SEA Region.



## Methodology

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One of the primary objectives of this study is to lay out the existing evidence –mostly published scientific literature – on illicit tobacco trade in the WHO SEA Region. For this, ten countries of the WHO SEA Region have been included in our analysis, which are: India, Bangladesh, Bhutan, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste. Similar studies have been published for Latin American countries (16). This study aims to contribute to the knowledge base by means of evidence synthesis on the said issue for the SEA Region.

To identify pertinent literature, we conducted internet searches using well-established literature databases. Our primary sources included Google Scholar, PubMed, and Web of Science. In executing these searches, we employed a combination of relevant terms such as "illicit trade," "illegal," "tobacco," and "cigarette" as keywords. Furthermore, we performed searches using individual country names as keywords and endeavored to identify regional studies involving multiple countries. Ultimately, we pinpointed a total of 18 studies with themes closely aligned with our research objectives. We have provided summaries of the methodologies and findings from these selected studies, which are presented in subsequent sections of this paper. Additionally, we have extracted information regarding the funding sources of these studies whenever available, recognizing that research funded by the tobacco industry tends to overstate the prevalence of illicit trade (14).

In addition to our literature search, we have employed the "gap analysis" method to assess the extent of illicit trade in this Region. It's important to acknowledge that using gap analysis in this Region may not provide a comprehensive view of illicit trade for several reasons. Firstly, in many countries within this Region, there exist informal or small-scale industries that produce local versions of cigarettes (such as bidis). These products often receive preferential treatment in terms of taxation or may operate outside the purview of government regulations. Consequently, they are not necessarily engaged in illicit trade due to government regulation; rather, they operate somewhat under the government's radar from the outset. However, it is worth noting that these products do contribute to national estimates of consumption, even though they may not be factored into production or taxation estimates.

Secondly, the quality of tax administration and tax collection data in this Region is often suboptimal, which can present challenges when attempting to make estimations. Therefore, while this study will provide some estimates using gap analysis for illustrative purposes, it will primarily rely on high-quality literature to offer more accurate and reliable estimates.





## Findings

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Evidence regarding illicit tobacco trade in each of the WHO SEA countries has been consolidated in the subsequent sections. Among the 10 WHO SEA countries considered in this study, four of them (Bhutan, Maldives, Myanmar, and Timor-Leste) did not have any noteworthy investigations into the illicit tobacco market.

The studies discussed in the following sections have employed diverse methods to examine the issue of illicit tobacco across different contexts. A summary table of these studies is available at the end of this section for reference.

## India

### *Evidence from literature review*

In India, a few attempts have been made to estimate the size of the illicit tobacco market. In 2017, researchers employed pack analysis method to study the cigarette market in four large and four small cities across India (17). Similar to many other low-income countries, single stick cigarette sale is the dominant mode of sale in India. It is estimated that, 75% of total cigarettes are sold as single stick (18). Considering this, a modified pack analysis approach was adopted, which examines the cigarette packs from the vendors. Analyzing over 11,000 cigarette packs from over 1700 retailers collected between August 2016 and November 2016 revealed that 2.73% of the packs were classified as illicit with the following criteria: (a) a duty-free sign; (b) no graphic health warnings; (c) no textual health warnings; or (d) no mention of 'price inclusive of all taxes' or similar text. Even though, out of the eight cities, Aizawl-a city nearing Myanmar and Bangladesh border-exhibited the most percentage of illicit packs (35.87%), two other bordering cities with similar characteristics showed no such trend in illicit tobacco share.

In India, industry estimate of illicit cigarette consumption has always been significantly higher than the independent published studies. In one industry report, estimates from Euromonitor was interpreted as one-fourth of the market share being illicit in India in 2019 (19,20). However, Euromonitor's data on illicit cigarette trade have been reported to be inconsistent (21).

In terms of other relevant studies, Welding K et al. investigated the sale of Gutka (a smokeless tobacco product banned in India) in rural and semi-urban areas in India in 2017. The Tobacco Pack Surveillance System (TPackSS) protocol was adopted to survey all available products in five states of India. Only 3% of available smokeless tobacco (ST) products were classified as illicit – having foreign or no health warning labels – in this study (22).

In a more recent study, Abdullah et al. investigate unique ST products from tobacco sellers in two purposively selected administrative areas (division/district) in India along with Bangladesh and Pakistan (23). The criteria to determine illicit ST products were based on country-specific legal requirements for ST packaging and labelling. Non-compliance with even one of the legal requirements was considered to render the ST product illicit. Implementing Tobacco Packs Surveillance System (TPackSS) unique pack sampling process, sample packs were collected from the randomly selected POS vendors in the sampling areas. This study reported over 90% of the ST did not meet the criteria to be considered licit. However, this study does not use a representative sample for country level inference, as the sample area was purposively selected for all the countries.

Additionally, in 2017, a multi-country study aimed to estimate the price difference in legal and illicit cigarettes in 14 low- and middle-income countries (LMICs) (15). The study used Tobacco Pack Surveillance System (TPackSS) 2013 data to record the census of available tobacco packs in 14 LMICs. The study finds that, in India illicit cigarettes tend to be more costly than legal cigarettes in

urban retail settings. Although 30% of the available cigarette brands were found to be illicit, they do not represent the market share of the brands as the method only collected unique packs of tobacco.

Taking on similar methods, another study investigated tobacco products in semi-urban and rural areas, comprising of localities with populations under 50,000 in five states of India (24). 382 unique tobacco products including cigarettes, smokeless tobacco and bidi were purchased from the sampling areas. Examination of the packs revealed that out of 71 unique cigarette packs, 10% of them were illicit. For smokeless tobacco and bidi, this figure is much less at 2% and 0%, respectively.

### ***Evidence from tax-gap analysis***

In 2020, an attempt was made to estimate the illicit cigarette consumption in India using tax gap analysis method (25). The total consumption was estimated from two rounds of Global Adult Tobacco Surveys (GATS) and tax paid consumption were estimated from government data of domestic cigarette production and sales. The study estimated the illicit cigarette consumption to be 5.6% in 2009-2010 period and 6% in 2016-2017 period. The results were similar to John & Ross (2018) (17).

## **Bangladesh**

### ***Evidence from literature review***

Published articles on illicit tobacco market share in Bangladesh is lacking, although a few studies were conducted having comparable themes. While comparing the retail price of legal and illicit cigarettes in urban areas, a census of available cigarette packs reported 70% - a rather high proportion – of the available brands fall into illicit category (15). However, this estimate does not represent the sales volume or the market share of illicit tobacco products. Another investigation of non-compliant packaging of smokeless tobacco products in India, Bangladesh and Pakistan reported that, in Bangladesh, 92% of the 107 unique smokeless tobacco products' packaging were non-compliant and hence deemed illicit (23). However, authors note that this study is not a nationally representative study and by analyzing only a set of unique tobacco products (cigarettes were not included) does not reveal the market shares of the respective products. Even though majority of the smokeless tobacco (88%) is produced domestically (26), in Bangladesh, lack of national policy regarding standardized packaging of smokeless tobacco might have inflated the prevalence of illicit products (27).

More recently, a pack analysis done with over 24,000 empty cigarette packets from retailers reported that in Bangladesh, majority of the cigarette market share is held by domestically produced cigarettes (28). An estimated 5.4% of the market share was identified as illicit tobacco according to the study and the most common reason for a package to be identified as illicit was the absence of tax stamps on the packaging. As for industry estimates, according to a technical report published by the World Bank, the share of illicit cigarette trade in Bangladesh is about 2% of total cigarettes sold in the market (29).

### ***Evidence from tax-gap analysis***

No published studies were found to be using the tax gap method to estimate illicit tobacco market size in Bangladesh. Our attempt to estimate this measure found only 3% of the market (around 8.6 billion BDT) to be illicit in 2020-2021. We collected official cigarette stick sales volume and tax revenue data from the National Board of Revenue (NBR) for the same fiscal year. Bangladesh has a tiered tax structure for manufactured cigarettes with a combination of supplementary duty (SD) and



value added tax (VAT). We estimated the duty owed to the government using the cigarette stick sales data from NBR, tax rate and average price of different tiered cigarettes (30). Then, we compared the duty owed with the duty actually paid similar to Koya et al. (31). Detail calculations are provided in the supplementary material. Our estimates are similar to the World Bank report (29).

## Indonesia

### *Evidence from literature review*

Few studies have shed light on the illicit tobacco trade in Indonesia. A study conducted a consumer survey in 2018 and estimated illicit trade with primary data from 1,440 respondents in six provinces of Indonesia (32). From over 1,100 cigarette packs collected, less than 2% were found to be illicit. A report, Asia Illicit Tobacco Indicator 2017, stated illicit consumption to be 9.7% of total consumption (33).

### *Evidence from tax-gap analysis*

In 2014, Ahsan et al. measured the magnitude of illicit cigarette trade using two methods (34). By assessing different surveys from 1995 through 2013, the authors estimated the difference between tax-paid sales and consumption of cigarettes. They measured the annual trade discrepancies from 1995 through 2012, that is the difference between exports recorded by trade partners and imports reported by Indonesia. Results showed that, illicit consumption was 17%, 9%, 11% and 8% in 2004, 2007, 2011 and 2013, respectively. Trade differences indicated that cigarettes were being smuggled into Indonesia for each year between 1995 and 2012. The value of illicit trade was estimated to be from less than \$1 million to close to \$50 million annually. Following similar methods of calculating the difference in sales and consumption, a more recent study updated the illicit trade estimates for the years 2007 through 2018 (35). Illicit cigarettes were the lowest at 5% of cigarette consumption in 2013 and 19% in 2018, which is much higher than other reported studies.

## Nepal

### *Evidence from literature review*

In Nepal, sales of single-stick cigarettes are prevalent, similar to India and Bangladesh. Considering this fact, a recent study surveyed the littered packs from retailers to estimate the extent of illicit cigarette market (36). From a day's loose cigarette sales, 4307 empty cigarette packs were collected from 1204 retailers of cigarettes. A cigarette pack was classified as illicit if it had at least one of the following features: (a) no authentic excise duty sticker, (b) no graphic health warning, (c) no mention of 'maximum retail price/MRP' and (d) no production date, name, address and trademark. The primary sampling units covered wide variety of locations including different rural/urban regions, geographic divisions, border/non-border to India, and tobacco factory locations.

The study found only 0.33% of the cigarette packs were illicit, which is lower than the estimates in the neighboring countries India and Bangladesh. This represents less than 1 in every 200 packs were illicit. In contrast, industry estimates suggest the same to be at least 25% (36).

### *Evidence from tax-gap analysis*

Estimates from a tax gap analysis for Nepal is not available in published literature. We estimated cigarette consumption for the year 2019 using STEPS 2019 survey. Cigarette price and tax

rate were extracted from WHO country profile. However, our attempt to estimate the illicit trade using tax gap method came to a halt due to lack of cigarette specific tax revenue data. We calculated tax owed from cigarettes to be around 9.9 billion NPR and tax collected from *all tobacco products* were reported to be 18.5 billion NPR in 2019. The remainder of 8.6 billion NPR worth of tax revenue may have come from other tobacco products. It is difficult to draw a strong conclusion about the magnitude of illicit trade from these data. Although, further investigation is warranted for more concrete evidence; however, the collected tax volume is large enough to somewhat reasonably rule out the possibility of a large illicit market of cigarettes in Nepal.

## Thailand

Attempts to estimate the size of illicit tobacco market are scarce in Thailand. Studies using pack analysis method or estimates from consumer survey are lacking in case of Thailand.

### *Evidence from tax-gap analysis*

A paper compared the tax-paid sales with tobacco consumption data and also analyzed trade discrepancies between 1991 and 2006 (37). Secondary survey data showed that for the mentioned time period, sales tax paid for cigarettes were higher than estimated consumption and therefore, it did not provide strong indication of tax avoidance. However, authors noted that, it is unlikely that Thailand had zero illicit cigarettes in its markets, rather it might be due to under-reporting of cigarette consumption figures or some other problem in the survey, which may have led the tax paid sales to exceed consumption. Hence, the authors declared the results from this method inconclusive.

The second method – examining trade discrepancies – revealed that Thailand consistently had higher recorded exports than recorded imports from 1991 to 2006 and 10% of cigarettes consumed in Thailand between 2004 and 2006 were illicit (37).

## Sri Lanka

### *Evidence from literature review*

In a research report published in 2018, an estimate of illicit cigarette market was derived for Sri Lanka (38). The study used both primary and secondary data and a mix of techniques, namely, empty pack survey, cigarette butt collection, test shopping, smoker survey and interviews with policymakers and relevant authorities to understand the illicit trade situation in Sri Lanka. Primary data was collected from six purposively selected districts which was supplemented by secondary data compiled from industry reports and government documents.

As per the cigarette butt survey and empty pack survey, illicit cigarettes accounted for 15.6% and 10.8% of the total cigarette consumption, respectively (38). Since, in Sri Lanka, over 85% of the cigarette sales are single-stick sales, the authors pointed out that the cigarette butt survey provided a more accurate scenario of the illicit cigarette market as whole pack sales were less likely to take place. In contrast, test shopping method, where enumerators are to visit shops and buy cigarette packs, only measured merely 3% of the 657 cigarette packs purchased from the sampling areas to be illicit. It was speculated in the report that perhaps due to illegal nature, sellers were reluctant to sell illicit cigarettes to unknown customers. However, findings from the smoker survey indicated that nearly 67% of the respondents could access illicit cigarettes from nearby shops or shops in town. Hence, the authors were in favor of the observational estimates from the empty pack survey and cigarette butt collection survey, results of which were similar to previous estimates of similar settings (38).

### ***Evidence from tax-gap analysis***

Our basic calculation of tax gap analysis for Sri Lanka refers to publicly available data such as GATS 2020 report for estimating cigarette consumption using prevalence, consumption rate and average price. Tax rates were extracted from WHO country profile and tax revenue data were collected from the Annual Report of the Ministry of Finance (39). Our calculation yields only 0.2% gap between tax owed and tax collected. However, due to under-reported consumption data and generalization of cigarette price and tax rates, this estimate may be accused of underestimation of the actual scenario. More rigorous efforts considering different cigarette tax brackets and representative measures of different categories of cigarette consumption would paint a more accurate picture.

## **Bhutan**

### ***Evidence from literature review***

Considerable amounts of smuggling and illicit sale of tobacco products emerged following the country's sales ban in 2004 (40). According to a report by the WHO Country Office in Bhutan (40), ambiguities in key provisions of the Tobacco Control Act may have contributed to difficulties in enforcement of the law. For example, while inspections by enforcement officers were commonplace, shopkeepers could claim that any tobacco was for self-consumption, taking advantage of the permissible quantity allowances. Additionally, shopkeepers often receive inspection information beforehand, enabling them to conceal tobacco products before enforcement authorities arrive (40).

There is a little data quantifying illicit trade in tobacco products in Bhutan but reports of illicit tobacco seizures may provide some insight into the scale of the problem. A newspaper article from 2021 describes increasing seizures of illicit tobacco in recent years, with 3.7 million tobacco products seized in 2018, increasing to 5.8 million in 2019, 14.1 million in 2020 and 11.9 million in just the first six months of 2021, although this may be due to increased enforcement activity.

While it is reported that there is coordination by the police in southern districts of Bhutan with counterparts on the other side of the border, monitoring and controlling illicit tobacco along the border remains difficult. There is an absence of a designated customs check points when entering the country, and there is insufficient enforcement capacity along the border to check vehicles for tobacco. In addition, there is a lack of other resources such as scanners, restricting the ability of customs officials to detect tobacco products at the frontier (40).

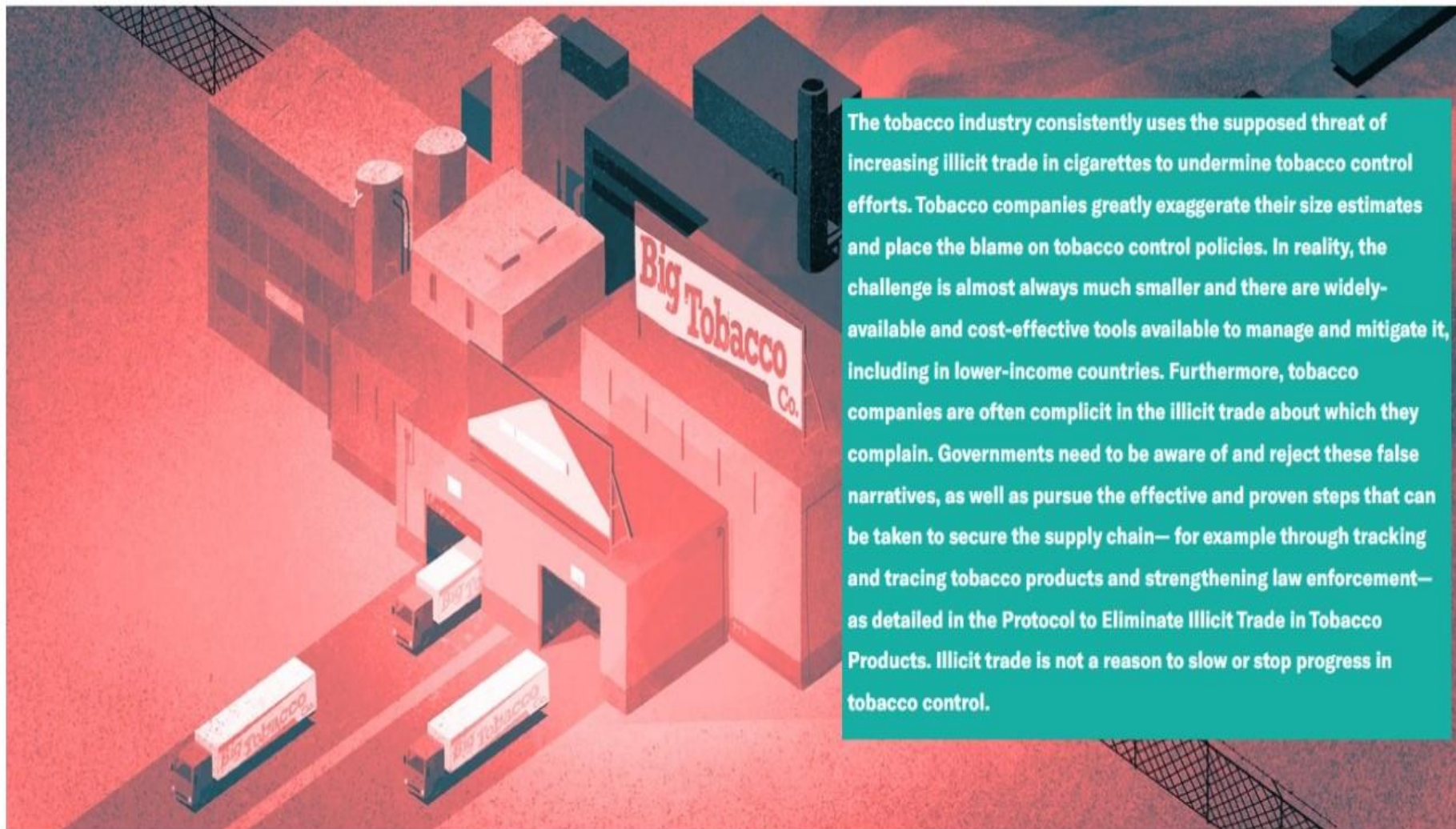
Joint inspections are organized annually by BCNA with officials from other responsible inspection agencies, including the police, the Department of Revenue and Customs and the Ministry of Health. In 2019, this joint inspection resulted in the collection of more than BTN 130,000 in fines for illegal possession and seized more than 5,400 cigarettes and more than 400 packets of chewing tobacco (40).

Bhutan has yet to join the Protocol to Eliminate Illicit Trade in Tobacco Products. Doing so would be an important step in Bhutan's efforts to eliminate the problem of illicit tobacco. The Protocol supplements the WHO FCTC as a comprehensive tool to guide action towards the elimination of illicit trade in tobacco products and strengthened international cooperation.

### ***Evidence from tax-gap analysis***

To estimate the size of the illicit market, we resorted to STEPS 2019 for Bhutan; it is the latest survey with publicly available report collecting tobacco consumption data. Our estimation revealed, with a prevalence of 10.10%, around 72 million cigarette sticks were consumed in 2019. With a reported average price of 12.5 BTN for a single stick, it totals around 897.4 million BTN

worth of cigarette sales. Interestingly, in 2019, Bhutan could not generate much revenue against this consumption as tobacco sale was officially banned in that period. As personally imported cigarettes were allowed in the country for 100% import duty, STEPS 2019 reported 51.3% of respondents to state that people usually bought smoked tobacco products from outside of Bhutan and purchase from within Bhutan was reported by 29.3% respondents (STEPS 2019, Bhutan). Hence, around a third of these 72 million cigarettes can be considered as illicit. It brings a powerful insight that straight up tobacco ban was not effective in Bhutan; rather, the government lost large sums of tax revenues. However, in 2021, the tobacco ban was lifted in Bhutan with 100% sales tax reinstated in 2022 (41). Lack of availability of more recent data limits us from undertaking an analysis of the current scenario.



The tobacco industry consistently uses the supposed threat of increasing illicit trade in cigarettes to undermine tobacco control efforts. Tobacco companies greatly exaggerate their size estimates and place the blame on tobacco control policies. In reality, the challenge is almost always much smaller and there are widely-available and cost-effective tools available to manage and mitigate it, including in lower-income countries. Furthermore, tobacco companies are often complicit in the illicit trade about which they complain. Governments need to be aware of and reject these false narratives, as well as pursue the effective and proven steps that can be taken to secure the supply chain— for example through tracking and tracing tobacco products and strengthening law enforcement— as detailed in the Protocol to Eliminate Illicit Trade in Tobacco Products. Illicit trade is not a reason to slow or stop progress in tobacco control.



# Summary of literatures

*Table 1: Literature Summary*

Study	Country	Method	Findings	Funding Source	Limitations
<b>John &amp; Ross, 2018</b>	India	Cigarette pack analysis. Collected cigarette packs from a day's single-cigarette sales directly from cigarette vendors in four large and four small cities.	Size of illicit cigarette market share estimated to be 2.73%.	The Campaign for Tobacco Free Kids.	Data collected from only four metro cities, limiting country representativeness; retailers' intention to hide illicit packs may introduce bias; small sampling area may not properly identify illicit cigarette selling hotspots; street hawkers, dealers and other means of distribution was not accounted for in this study; the method could not identify tax evaded cigarette packs with all features of legal packaging; primarily this method accounted for loose sell of cigarette sticks only.
<b>Euromonitor International, 2022</b>	India	N/A	Illicit cigarettes account for one-fourth of the market in India.	N/A	Not clear about methodology; Euromonitor data was reported to be inconsistent in other studies.
<b>Welding et al., 2022</b>	India	Unique smokeless tobacco (ST) packets were purchased using TPackSS protocol in 25 semi-urban and rural areas in five Indian states.	Of the available unique smokeless tobacco products, 3% were classified as illicit, having a foreign or no health warning labels (HLW) as opposed to having Indian labels.	Bloomberg Philanthropies' Bloomberg Initiative to Reduce Tobacco Use	Studies smokeless tobacco and excludes cigarettes; does not estimate the market share of illicit products, rather conducts a census of available unique products.
<b>Abdullah et al., 2023</b>	India, Bangladesh, Pakistan	For each of the three countries, two administrative areas were purposively selected. Then unique ST products were collected from tobacco sellers. Non-compliance with at least one country-specific legal criteria was considered to classify the product as illicit.	For India and Bangladesh, 92.2% and 92.6% of the ST products were classified as illicit. In Pakistan no classification was made due to the absence of country-specific legal requirements.	National Institute for Health Research (NIHR)	Only considers smokeless tobacco products; purposively selected study area does not account for national estimates; does not estimate market share of the products.
<b>Brown et al., 2017</b>	14 LMICs including: Bangladesh, India, Indonesia and Thailand,	TPackSS data collection was conducted in 2013. With this a census of available tobacco products were collected for each of the country to analyze their price and legal status. Presence of health warnings and indications of tax payment was taken as the criteria for identifying illicit packs.	For Bangladesh, India and Thailand, 70%, 30% and 48% of the uniquely available cigarette products were classified as illicit, respectively. No illicit pack was found in Indonesia.	Bloomberg Initiative to Reduce Tobacco Use	Does not explore illicit tobacco trade; do not report market share of illicit products and only conducts a census of uniquely available products.
<b>Welding et al., 2021</b>	India	Using TPackSS protocol, unique tobacco products were purchased from semi-urban and rural areas in five states of India. Data were the used for analyzing the tobacco product market. Products not intended for the Indian market, that is with a foreign or no HWL were considered illicit.	Of the collected unique tobacco products, 2% of ST products and 10% of cigarette packs were classified as illicit.	Bloomberg Initiative to Reduce Tobacco Use	Results do not represent market share of the brand or illicit trade estimates.



Study	Country	Method	Findings	Funding Source	Limitations
World Bank, 2019	Bangladesh	N/A	Industry estimates suggest, illicit trade incidence is only 2% of the market.		No published paper is cited. Results are based on industry estimates.
Huque et al., 2022	Bangladesh	Cigarette pack analysis. From 80 different areas from all across the country, retailers were approached to collect nearly 23,207 empty cigarette packs, and another 1,156 packs were collected as littered from the streets. The packs were analyzed and classified based on the country's legal criteria.	An estimated 5.4% of the market share was identified as illicit tobacco according to the study and the most common reason for a package to be identified as illicit was the absence of tax stamps on the packaging.	N/A	Results are reported in a newspaper article and not a peer-reviewed journal; vendors' intention to hide illicit packs may introduce bias; street hawkers, dealers and other means of distribution was accounted for in this study.
Kartika et al., 2019	Indonesia	Illicit trade was estimated by observing cigarette packs from the survey respondents. Face-to-face consumer survey was conducted in 2018 in six provinces of Indonesia.	From over 1,100 cigarette packs collected from survey respondents, less than 2% were found to be illicit.	University of Illinois at Chicago's (UIC) Institute for Health Research and Policy	Around 10% of the respondents did not have cigarette packs on them during the survey.
Oxford Economics, 2017	Indonesia	Empty pack survey.	Illicit consumption was estimated to be 9.7% in 2017.	Philip Morris International	Results are based on industry estimates and not peer-reviewed.
Shakya et al., 2023	Nepal	Cigarette pack analysis. Collected packs from 1 day's single-cigarette sales directly from retailers.	Only 0.33% of the cigarette packs were classified as illicit.	Cancer Research UK	Retailers' intention to hide illicit packs may introduce bias; street hawkers, dealers and other means of distribution was not accounted for in this study; the method could not identify tax evaded cigarette packs with all features of legal packaging; this method overlooks the sale of whole packs of cigarettes.
Morais et al., 2018	Sri Lanka	Primary data collection methods included: littered empty pack survey, cigarette butt collection, test shopping and smoker survey in six purposively selected districts.	Cigarette butt survey and empty pack survey estimated illicit cigarettes to be 15.6% and 10.8% of the total cigarette consumption, respectively.	N/A	Sri Lanka mostly has single-stick cigarette sales and littered pack survey may underestimate the results.

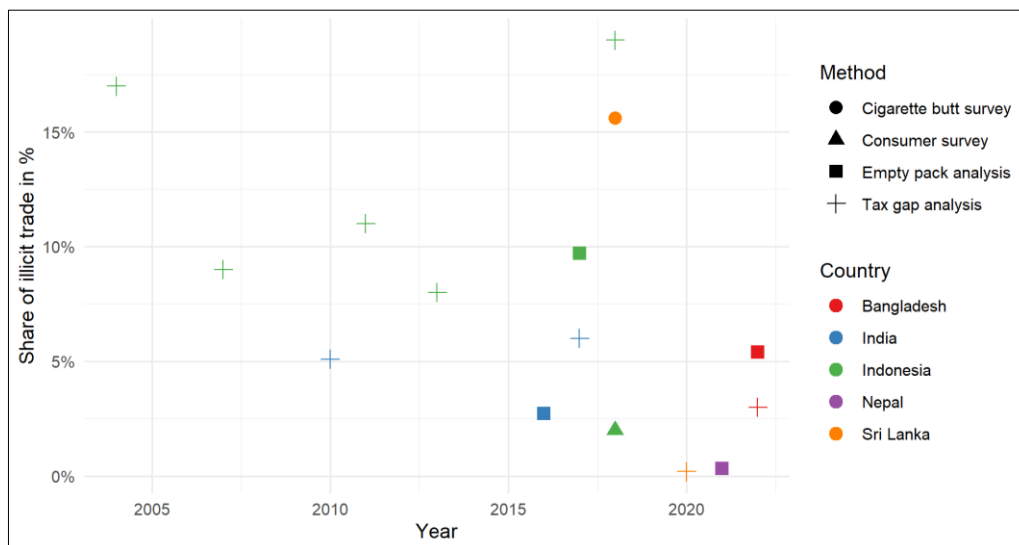
**Table 2: Summary of tax gap analysis**

Study	Country	Method	Findings	Funding Source	Limitations
Goodchild et al., 2020	India	Tax-gap analysis. Illicit cigarette consumption was defined as the difference between total and legal consumption. Consumption was collected from Global Adult Tobacco Surveys from 2009-2010 and 2016-2017. Government of India data on domestic cigarette production and trade was used for calculating legal consumption.	Illicit cigarette consumption for 2009-2010 and 2016-2017 was estimated at 5.1% and 6.0% of the market, respectively.	N/A	Consumption data from smoker survey may have underreported estimates; does not shed light on the source of illicit cigarettes; accuracy of government data.
Ahsan et al., 2014	Indonesia	Two methods were used: a) Tax gap analysis, the difference between tax-paid sales and consumption of cigarettes by assessing different surveys from 1995 through 2013, b) Measuring the annual trade discrepancies, with export and import data from 1995 through 2012.	Illicit consumption was estimated 17%, 9%, 11% and 8% in 2004, 2007, 2011 and 2013 respectively. Trade differences indicated that cigarettes were being smuggled into Indonesia for each year between 1995 and 2012.	Fogarty International Center or the National Institutes of Health	Consumer survey may under-report cigarette consumption and potentially overestimate the size of illicit market; gap analysis method is unable to reliably identify the source of illicit cigarettes.
Kasri et al., 2021	Indonesia	Illicit trade was estimated as the discrepancy between legal cigarette sales and domestic consumption derived from secondary data for 2007 through 2018.	Illicit cigarettes were the lowest at 5% of cigarette consumption in 2013 and 19% in 2018.	Universitas Indonesia grant (Hibah UI) RAK	Analysis used different sources of cigarette consumption data for different years which may be inconsistent; consumer surveys may under-report cigarette consumption.
Pavananunt, 2011	Thailand	Tax gap analysis and trade discrepancy analysis with secondary data between 1991 and 2006.	Trade discrepancies revealed 10% of cigarettes consumed in Thailand between 2004 and 2006 to be illicit. Tax gap analysis did not produce a reliable estimate.	Fogarty International Centre (FIC); National Cancer Institute (NCI) and Tobacco Control Research and Knowledge Management Center (TRC), Mahidol University	Underreporting of both prevalence and intensity of smoking in secondary survey data negated tax gap analysis results; incompleteness of import export data may introduce difficulty in illicit trade estimate.
Authors' calculation	Bangladesh (2020-2021)	Tax gap analysis. Measured the difference between duty owed and duty paid from government data of cigarette sales and collected revenue for 2020-2021.	Tax gap was estimated to be around 3%.		Accuracy of government data on cigarette sales may undermine actual consumption.
Authors' calculation	Sri Lanka (2020)	Tax gap analysis. Cigarette consumption and sales value was estimated from GATS 2020 survey. Under a single tax rate, extracted from WHO country report, we calculated the duty owed from cigarette sales. Tax revenue data was taken from the Ministry of Finance.	Only 0.2% tax gap is present in our analysis.		Using a single generalized tax rate may have distorted the results. Consumption estimates may be underreported in surveys.

Study	Country	Method	Findings	Funding Source	Limitations
Authors' calculation	Bhutan (2019)	Using STEPS 2019 survey data, cigarette consumption for 2019 was estimated. We calculated 897.34 million BTN worth of cigarette sales in 2019. We assume a large portion of this volume is illicit as in 2019 cigarette sales was banned in Bhutan (although, personally imported cigarettes were allowed for a 100% import duty).	Illicit tobacco was highly prevalent in 2019 while the tobacco ban was in effect.		Measuring the actual share of illicit cigarettes is difficult because we could not separate personally imported tax-paid cigarettes from truly illicit ones.
Authors' calculation	Nepal (2019)	Using STEPS 2019 estimates, we calculated cigarette consumption and sales volume in Nepal. Tax rate were extracted from WHO country profile. Tax revenue <i>for all tobacco products</i> could be collected from the Annual Report of the Inland Revenue Department.	Estimation of illicit cigarette share could not be possible due to aggregated tobacco tax revenue data. However, based on the surplus between duty owed and duty collected, we presume that share of illicit cigarettes could not be much higher than the estimates from other countries of this region.		Incomplete tax revenue data limits the estimation of illicit cigarette market share.

## Visualization of summary results

Finally, to complement the summary table, from a visualization of the illicit tobacco trade estimates from the SEA Region countries discussed in this paper, we observe that most estimates fall around or below 10%.



**Figure 1: Estimates of illicit tobacco trade in the SEA Region**

## Discussion and conclusion

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In this study, our objective was to gather evidence regarding the extent of illicit tobacco trade in the Southeast Asia (SEA) Region. We conducted an extensive literature review, compiling findings related to the illicit tobacco trade and, when possible, conducted a basic tax-gap analysis to estimate the size of the illicit market.

Based on our findings, it is evident that the prevalence of illicit tobacco trade is generally not alarmingly high in most SEA countries. In the majority of cases, the illicit market size remains below 10%. Furthermore, when we specifically examine cigarettes, which are subject to strict regulations and higher taxes in most SEA countries, we find that the prevalence of illicit trade is quite low. This contradicts the common narrative put forth by tobacco companies that higher taxes would inevitably lead to increased illicit trade. In the context of the SEA Region, this notion appears to be a myth.

However, it is worth noting that these estimates do not result from a standardized estimation technique. Instead, studies have employed different methods in different settings and have been conducted at different time periods. Several studies used TPackSS to survey cigarette packs, while others employed discarded pack surveys from vendors in settings where the use of single-stick cigarettes is prevalent. Additionally, some studies did not aim to estimate the size of the illicit market but instead observed available unique tobacco products to measure the proportion of illicit brands among all available unique tobacco products. This creates difficulties in terms of comparability of results among different countries or even within a single country in a Region.

Regarding comparable results, tax-gap analysis, which estimates illicit tobacco by utilizing secondary data from cigarette sales and tax revenue, could provide a more consistent approach. However, we could only find published tax-gap analysis estimates for a handful of countries in the SEA Region. Few tobacco industry estimates of illicit market share also surfaced in our investigation; however, none of them were very transparent about their methodology and data sources.

Our analysis also revealed an absence of consistent efforts to monitor illicit tobacco over time. Interestingly, no government initiative to regularly monitor the trends of the illicit tobacco market has been observed for any country, even though Parties to the WHO Framework Convention on Tobacco Control (FCTC) have agreed to do so according to FCTC Article 15.4 (6).

Another important observation was the lack of focus on duty-free tobacco importations. By definition, as in definition from the illicit tobacco measure toolkit (42), duty-free tobacco is not considered an illicit product. However, according to WHO FCTC Article 6.2, Parties must take action to prohibit or restrict the importation of duty-free cigarettes. Without proper restrictive policies and monitoring in place, a large volume of cigarettes may enter the market, resulting in lost tax revenues for the government.

## Policy recommendations

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The findings of the study can guide future research and policy making efforts in the area of illicit tobacco trade, and we recommend the following:

1. All countries in the SEA Region should actively monitor and collect data on illicit tobacco. Our findings highlight that not all countries have up-to-date measures of illicit tobacco trade in the SEA Region. Although it is mentioned in WHO FCTC Article 15.4, it seems that Parties of the FCTC from the SEA Region are not upholding this commitment. In this case, national tobacco control authorities of each country may take the lead in conducting these studies with cooperation from other national agencies. Given that illicit tobacco pertains to inter-country trade, cooperation from relevant regional, sub-regional, and international intergovernmental organizations is also warranted to eliminate illicit tobacco, as suggested in WHO FCTC Article 15.6.
2. To address the lack of estimates of illicit tobacco, countries should focus on legislative, administrative, and executive capacity building for monitoring illicit tobacco. In the SEA Region, countries may lack the administrative capacity and resources to monitor illicit tobacco trade effectively. Therefore, countries need to invest in capacity building for law enforcement agencies to enhance their ability to combat illicit tobacco trade effectively. This includes training on detection techniques, border control, and intelligence sharing. Future research should explore different countries' capacity to precisely monitor and report illicit trade and provide recommendations accordingly.
3. Comprehensive national studies should be conducted regularly by each country to estimate the size and nature of the illicit tobacco market. Our findings suggest a lack of nationally representative studies. These studies should also be periodically updated to track changes over time. Since the establishment of tobacco surveillance programs has been agreed upon by the Parties of WHO FCTC according to Article 20.2, a cost-effective approach could be to integrate data collection tools for estimating illicit tobacco into existing periodic tobacco surveillance efforts, such as the Global Adult Tobacco Survey (GATS) and the Global Youth Tobacco Survey (GYTS), to tap into economies of scale.
4. Efforts should be made to develop a standardized method for measuring the extent of the illicit tobacco market share. Significant variation was observed in the methods used to estimate the extent of illicit tobacco trade, making it challenging to make direct comparisons between countries. Some countries rely on cigarette pack analysis, while others use tax gap analysis or a combination of methods. The standard protocol should comprehensively address and consider different country settings (such as the prevalence of single-stick sales) that can be replicated to monitor changes in the illicit tobacco market over time across countries. One such toolkit is available, compiling different methods used in studies for estimating illicit tobacco, along with their pros and cons (42). This can serve as a starting point for developing a single standard protocol, which may combine different techniques while incorporating new innovative methods, enabling more accurate cross-country comparisons.
5. National-level tobacco-related data should be collected and made accessible in a separate repository for researchers and policymakers. There should be a platform for improved data sharing and collaboration among countries in the Region to exchange information on illicit trade trends, methods, and enforcement efforts, as suggested in WHO FCTC Article 20.
6. A standardized indicator or index is needed to measure a country's level of effort and subsequent progress in combating illicit tobacco trade. This would help identify effective interventions that result in meaningful impacts. All Parties to the WHO FCTC have agreed to



take measures stated in FCTC Article 15 to combat illicit tobacco, but the lack of a uniform index makes it challenging to assess a country's performance in compliance with the FCTC clause. The Global Tobacco Industry Interference Index, which measures governments' policy efforts against tobacco industry interference, can serve as an example of such an index (43).

7. Future research efforts should rigorously study the association between taxation and illicit trade in SEA Region countries. To reduce cigarette consumption, taxation and pricing policies have been accepted as effective tools by the Parties of the WHO FCTC, according to Article 6. Cigarette taxation has seen a positive trend in the SEA Region over the years. However, existing studies report relatively low levels of illicit tobacco share in this Region. Although several studies have shown the positive relationship between taxation and illicit tobacco to be spurious, further research should generate firm evidence specifically for the SEA Region to settle the debate.
8. Our analysis revealed that duty-free tobacco purchases are not included in illicit tobacco studies, even though governments are not collecting revenue from these sales. Moreover, WHO FCTC Parties have agreed to prohibit or restrict duty-free tobacco purchase policies in Article 6.2. Future research efforts can focus on estimating the size, health impact, and lost revenue from duty-free cigarette sales in the SEA Region.
9. Illicit trade is substantially affected by cross-border illegal trade. Hence, it is crucial that parties share the tobacco export-import information among themselves to better track the extent and trajectory of the illicit trade. This regional collaboration can ensure quality data availability and better policy-making against illicit trade.
10. Tobacco industry interference has been extensively documented, and researchers should continue to shed light on the industry's efforts to undermine tobacco control policies. In the case of illicit tobacco, the industry often exaggerates the size of the illicit tobacco market in their reports in an attempt to undermine taxation policies. While we did not find many industry-funded estimates for the SEA Region in our search, we observed a few reporting significantly higher estimates, as previously exposed. To counter this, research should aim to verify these results and debunk any falsehoods presented by the tobacco industry.
11. Finally, future research efforts in the field of illicit tobacco trade should focus on studying market dynamics, consumer behavior, and the effectiveness of policy measures. This will enable the development of evidence-based policies aimed at effectively reducing illicit trade.

Effective track and trace system with secure excise stamps is crucial to control illicit tobacco trade



## References

1. Tobacco Control in the South-East Asia Region [Internet]. [cited 2023 Jul 10]. Available from: <https://www.who.int/southeastasia/health-topics/tobacco/tobacco-control-in-the-south-east-asia-region>
2. He H, Pan Z, Wu J, Hu C, Bai L, Lyu J. Health effects of tobacco at the global, regional, and national levels: results from the 2019 global burden of disease study. *Nicotine Tob Res.* 2022;24(6):864–70.
3. Organization WH. WHO global report on trends in prevalence of tobacco use 2000–2025. 2021;
4. Joossens L, Merriman D, Ross H, Raw M. How eliminating the global illicit cigarette trade would increase tax revenue and save lives. *Paris Int Union Against Tuberc Lung Dis.* 2009;10.
5. Paraje G, Stoklosa M, Blecher E. Illicit trade in tobacco products: recent trends and coming challenges. *Tob Control.* 2022;31(2):257–62.
6. WHO. WHO framework convention on tobacco control. WHO Regional Office for South-East Asia; 2004.
7. Hopkinson NS, McKee M, Reddy KS. Tobacco industry lobbying undermines public health in Asia. Vol. 350, *BMJ. British Medical Journal Publishing Group*; 2015.
8. Gupta PC, Puntambekar N, Assunta M. South Asia's evolving tobacco hydra: moving from quandary to hope. *Tob Control.* 2022;31(2):142–5.
9. Collin J, LeGresley E, MacKenzie R, Lawrence S, Lee K. Complicity in contraband: British American Tobacco and cigarette smuggling in Asia. *Tob Control.* 2004;13(suppl 2):ii104–11.
10. Gilmore AB, Fooks G, Drope J, Bialous SA, Jackson RR. Exposing and addressing tobacco industry conduct in low-income and middle-income countries. *Lancet.* 2015;385(9972):1029–43.
11. Siddiqi K, Arora M, Gupta PC. Common assumptions in tobacco control that may not hold true for South-East Asia. *Lancet Reg Heal Asia.* 2023;8.
12. WHO. Protocol to eliminate illicit trade in tobacco products. 2013;
13. Gallien M, Occhiali G. No smoking gun: tobacco taxation and smuggling in Sierra Leone. *Tob Control.* 2022;
14. Chen J, McGhee SM, Townsend J, Lam TH, Hedley AJ. Did the tobacco industry inflate estimates of illicit cigarette consumption in Asia? An empirical analysis. *Tob Control.* 2015;24(e2):e161–7.
15. Brown J, Welding K, Cohen JE, Cherukupalli R, Washington C, Ferguson J, et al. An analysis of purchase price of legal and illicit cigarettes in urban retail environments in 14 low- and middle-income countries. *Addiction.* 2017 Oct 1;112(10):1854–60.
16. Drope J, Rodriguez-Iglesias G, Stoklosa M, Szklo A. Recent evidence on the illicit cigarette trade in Latin America. *Rev Panam Salud Pública.* 2022;46:e111.
17. John RM, Ross H. Illicit cigarette sales in Indian cities: findings from a retail survey. *Tob Control.* 2018 Nov 1;27(6):684–8.
18. Lal P, Kumar R, Ray S, Sharma N, Bhattacharya B, Mishra D, et al. The Single Cigarette Economy in India--a Back of the Envelope Survey to Estimate its Magnitude. *Asian Pac J Cancer Prev.* 2015;16(13):5579–82.
19. The Tobacco Institute of India. Illegal Cigarette Trade [Internet]. 2022 [cited 2023 Jul 2]. Available from: <https://www.tiionline.org/industry-issues/illegal-trade/>
20. Illegal cigarettes account for one-fourth of market. *The Economic Times* [Internet]. 2020 [cited 2023 Jul 4]; Available from: <https://economictimes.indiatimes.com/industry/cons-products/tobacco/illegal-cigarettes-account-for-one-fourth-of-market-report/articleshow/79022325.cms>
21. Blecher E, Liber A, Ross H, Birckmayer J. Euromonitor data on the illicit trade in cigarettes. *Tob Control.* 2015 Jan 1;24(1):100–1.
22. Welding K, Saraf S, Iacobelli M, Smith KC, Puntambekar N, Gupta PC, et al. Beyond Gutka: Evidence of Illegal Smokeless Tobacco in Rural and Semi-urban Areas in India. *Nicotine Tob Res.* 2022 Apr 28;24(6):929–32.
23. Abdullah SM, Huque R, Siddiqi K, Kanaan M, Huque S, Ullah S, et al. Non-compliant packaging and illicit smokeless tobacco in Bangladesh, India and Pakistan: findings of a pack analysis. *Tob Control* [Internet]. 2023 May 4 [cited 2023 Jul 2];0:tobaccocontrol-2021-057228. Available from: <https://tobaccocontrol.bmj.com/content/early/2023/05/03/tc-2021-057228>
24. Welding K, Iacobelli M, Saraf S, Smith KC, Puntambekar N, Gupta PC, et al. The Market for Bidis, Smokeless Tobacco, and Cigarettes in India: Evidence From Semi-Urban and Rural Areas in Five States. *Int J Public Health.* 2021;66:1604005.
25. Goodchild M, Valavan T, Sinha P, Tullu FT. Estimating illicit cigarette consumption using a tax-gap approach, India. *Bull World Health Organ.* 2020 Oct 10;98(10):654.
26. Siddiqi K, Scammell K, Huque R, Khan A, Baral S, Ali S, et al. Smokeless Tobacco Supply Chain in South Asia: A Comparative Analysis Using the WHO Framework Convention on Tobacco Control. *Nicotine Tob Res.* 2016 Apr 1;18(4):424–30.
27. Naznin E, Wynne O, George J, Denham AMJ, Hoque ME, Milton AH, et al. Smokeless tobacco policy in

- Bangladesh: A stakeholder study of compatibility with the World Health Organization's Framework Convention on Tobacco Control. *Drug Alcohol Rev.* 2021 Jul 1;40(5):856–63.
28. Huque R, Abdullah S, Shashi NA, Hasan T. Illicit tobacco & industry interference in Bangladesh. *The Financial Express* [Internet]. 2022 [cited 2023 Jul 2]; Available from: <https://thefinancialexpress.com.bd/views/views/illicit-tobacco-industry-interference-in-bangladesh-1644416355>
  29. Trade CIT. A Global Review Of Country Experiences. World Bank URL <https://www.worldbank.org/en/topic/tobacco/publication/confronting-illicit-tobacco-trade-a-global-review-of-country-experiences>. 2019;
  30. Bangladesh Network for Tobacco Tax Policy B. IMPACT OF PRICE AND TAX CHANGES IN THE NATIONAL BUDGET ON THE WHOLESALE AND RETAIL PRICES OF TOBACCO PRODUCTS (CIGARETTE AND BIDI): A CROSS SECTIONAL SURVEY. 2020.
  31. Koya RK, Branston JR, Gallagher AWA. Measuring Malaysia's Illicit Tobacco Trade: An Excise Tax Gap Analysis. *J Illicit Econ Dev.* 2022;4(1).
  32. Kartika W, Thaariq RM, Ningrum DR, Ramdhaningrum H, Martha LF, Budiantoro S. The Illicit Cigarette Trade in Indonesia. *Perkumpulan PRAKARSA*; 2019.
  33. Oxford Economics. Asia Illicit Tobacco Indicator 2017: Indonesia [Internet]. 2017. Available from: [https://illicittobacco.oxfordeconomics.com/media/OXFO5877\\_Indonesia\\_2018\\_Report.pdf](https://illicittobacco.oxfordeconomics.com/media/OXFO5877_Indonesia_2018_Report.pdf)
  34. Ahsan A, Wiyono NH, Setyonaluri D, Denniston R, So AD. Illicit cigarette consumption and government revenue loss in Indonesia. *Global Health.* 2014 Nov 19;10(1):1–8.
  35. Kasri RA, Ahsan A, Wiyono NH, Jacinda AR, Kusuma D. New evidence of illicit cigarette consumption and government revenue loss in Indonesia. *Tob Induc Dis.* 2021;19.
  36. Shakya S, Lamichhane A, Karki P, Gurung JK, Singh Pradhan PM. Extent of illicit cigarette sales in Nepal: findings from a retail survey. *Tob Control* [Internet]. 2023 Apr 6;0:1–7. Available from: <https://tobaccocontrol.bmj.com/content/early/2023/04/06/tc-2022-057619>
  37. Pavananunt P. Illicit Cigarette Trade in Thailand. *Southeast Asian J Trop Med Public Health* [Internet]. 2011 [cited 2023 Jul 2];42(6):1531. Available from: <https://pubmed.ncbi.nlm.nih.gov/23509212/>
  38. Morais SN, Colombage SS, Wickramasinghe CN. A Baseline Study on The Illicit Cigarette Market And The Resulting Tax Implications for Sri Lanka [Internet]. 2018 [cited 2023 Jul 3]. Available from: [https://www.researchgate.net/publication/334761899\\_A\\_BASELINE\\_STUDY\\_ON\\_THE\\_ILLICIT\\_CIGARETTE\\_MARKET\\_AND\\_THE\\_RESULTING\\_TAX\\_IMPLICATIONS\\_FOR\\_SRI\\_LANKA](https://www.researchgate.net/publication/334761899_A_BASELINE_STUDY_ON_THE_ILLICIT_CIGARETTE_MARKET_AND_THE_RESULTING_TAX_IMPLICATIONS_FOR_SRI_LANKA)
  39. Ministry of Finance Sri Lanka. Annual Report 2020.
  40. WHO. The Big Ban: Bhutan's journey towards a tobacco-free society. 2020;
  41. Aneja K, Gopal S. Bhutan reverses sales ban on tobacco. 2023.
  42. Stoklosa M, Paraje G, Blecher E. A toolkit on measuring illicit trade in tobacco products. Chicago Univ Illinois. 2020;
  43. Assunta M. Global tobacco industry interference index 2020. 2020;

## Supplementary materials

### Tax gap analysis

#### Bangladesh

For the fiscal year 2020-2021, all the monetary amounts are in BDT.

**Table S1: Tax gap analysis – Bangladesh, 2020-21**

<b>Tier</b>	<b>No. of sticks sold, N<sup>1</sup></b>	<b>Avg price of a single stick, P<sup>2</sup></b>	<b>Total sales, S = N*P</b>	<b>Tax rate, T<sup>1</sup></b>	<b>Revenue Owed, A = S*T</b>	<b>Revenue received, B<sup>1</sup></b>	<b>Tax gap, G = A-B</b>
Premium	5,792,474,600	13.5	78,198,407,100	81%	63,340,709,751	59,091,780,080	4,248,929,671
High	5,683,472,320	10.2	57,971,417,664	81%	46,956,848,308	43,979,064,883	2,977,783,425
Med	6,045,470,600	6.3	38,086,464,780	81%	30,850,036,472	30,237,785,424	612,251,048
Low	53,982,853,528	3.9	210,533,128,759	73%	153,689,183,994	152,840,418,235	848,765,760
<b>Total</b>					<b>294,836,778,525</b>	<b>286,149,048,622</b>	<b>8,687,729,903</b>

<sup>1</sup> National Board of Revenue; <sup>2</sup> Economic Research Bureau & BTNPP (30)

Tax gap = (8,687,729,903 / 294,836,778,525) \* 100% = **2.95%**

## Sri Lanka

**Table S2: Cigarette consumption in Sri Lanka, 2020**

<b>Population, Z<sup>1</sup></b>	<b>Prevalence of cigarette smoking, C<sup>2</sup></b>	<b>Number of smokers, S = Z*C</b>	<b>Avg no of cigarette stick consumption (daily), D<sup>2</sup></b>	<b>Yearly cigarette sticks consumption, N = S*D*356</b>
21,919,000	6.20%	1,358,978	4	1,984,107,880

<sup>1</sup> World Bank; <sup>2</sup> GATS 2020

**Table S3: Tax gap analysis – Sri Lanka, 2020, monetary values are in LKR**

<b>Yearly cigarette stick consumption, N</b>	<b>Avg price of a stick, P<sup>1</sup></b>	<b>Total Sales, S=N*P</b>	<b>Tax Rate, T<sup>2</sup></b>	<b>Revenue owed, A</b>	<b>Revenue received, B<sup>3</sup></b>	<b>Tax gap, G = A-B</b>
1,984,107,880	61.89	122,796,436,693	77%	94,553,256,254	94,383,000,000	170,256,254

<sup>1</sup> GATS 2020; <sup>2</sup> WHO Country Profile; <sup>3</sup> Ministry of Finance, Sri Lanka

Tax gap =  $(170,256,254 / 94,553,256,254) * 100\% = 0.2\%$



## Bhutan

**Table S4: Cigarette consumption in Bhutan, 2019**

<b>Population, Z<sup>1</sup></b>	<b>Prevalence of cigarette smoking, C<sup>2</sup></b>	<b>Number of smokers, S = Z*C</b>	<b>Avg no of cigarette stick consumption (monthly), M<sup>2</sup></b>	<b>Yearly cigarette sticks consumption, N = S*M*12</b>
535,278	10.10%	54,063	111.1	72,076,896

<sup>1</sup> World Bank; <sup>2</sup> STEPS 2019

**Table S5: Tax gap analysis – Bhutan, 2019, monetary values are in BTN**

<b>Yearly cigarette stick consumption, N</b>	<b>Avg price of a stick, P<sup>1</sup></b>	<b>Total Sales, S=N*P</b>	<b>Tax Rate, T<sup>2*</sup></b>	<b>Revenue owed, A</b>	<b>Revenue received, B</b>	<b>Tax gap, G = A-B</b>
72,076,896	12.45	897,357,350	-	-	-	-

<sup>1</sup> STEPS 2019; <sup>2</sup> WHO Country Profile;

\*Tobacco sale was banned in Bhutan in 2019, however, personally imported tobacco products were allowed for 100% tax. In our analysis, given the available information, we were unable to separate illicit cigarette consumption from personally imported tax-paid cigarettes.

## Nepal

**Table S6: Cigarette consumption in Nepal, 2019**

<b>Population, Z<sup>1</sup></b>	<b>Prevalence of cigarette smoking, C<sup>2</sup></b>	<b>Number of smokers, S = Z*C</b>	<b>Avg no of cigarette stick consumption (monthly), M<sup>2</sup></b>	<b>Yearly cigarette sticks consumption, N = S*M*12</b>
18,227,535	14.80%	2,697,675	151	4,888,187,426

<sup>1</sup> World Bank; <sup>2</sup> STEPS 2019

**Table S7: Tax gap analysis – Nepal, 2019; monetary values are in NPR**

<b>Yearly cigarette stick consumption, N</b>	<b>Avg price of a stick, P<sup>1</sup></b>	<b>Total Sales, S=N*P</b>	<b>Tax Rate, T<sup>2</sup></b>	<b>Revenue owed, A<sup>3</sup></b>	<b>Revenue received, B<sup>4</sup></b>	<b>Tax Surplus, G = B-A *</b>
4,888,187,426	7.56	37,028,019,753	27%	9,997,565,333	18,545,776,000	8,548,210,667

<sup>1</sup> STEPS 2019; <sup>2</sup> WHO Country Profile; <sup>3</sup> Only for cigarettes; <sup>4</sup> For all tobacco products

\*We observe a tax surplus as ‘Revenue received’ amount is the tax collected from all tobacco products and not only cigarettes. With the absence of a tax gap and moreover the surplus of 8.5 bn worth of tax revenue, we may reasonably assume that the share of illicit cigarette in Nepal is not substantial and may fall with the estimates of other countries in SEA Region.