

Original Investigation

# Smokeless Tobacco Supply Chain in South Asia: A Comparative Analysis Using the WHO Framework Convention on Tobacco Control

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## Abstract

**Introduction:** Most South Asian countries are signatories to the WHO Framework Convention for Tobacco Control (FCTC). However, there is little information on the extent to which FCTC standards are effectively implemented for controlling smokeless tobacco (SLT)—used by over 250 million people in the region. We assessed the feasibility of a novel approach based on interviewing the key actors of SLT supply chain and analyzing its findings using standards set by FCTC.

**Methods:** Using a snowball-sampling technique, we interviewed point-of-sale vendors, wholesale retailers, manufacturers, raw-tobacco retailers, and farmers involved in the supply chain of SLT in Bangladesh, Nepal, and Pakistan. Using a structured-questionnaire, participants were asked about their customer profiles; product types; marketing practices; suppliers; profit margins, awareness and adherence to legislation.

**Results:** We recruited 72% (130/180) of all supply chain actors approached. Findings indicate several loopholes in the existing taxation, regulatory, and inspection systems. A significant proportion of smuggled and counterfeit SLT products are available in the market. Most SLT products are sold without recommended warnings, information on their ingredients, and manufacturers' details. There appear to be no restrictions on sale of SLT products to minors. On the other hand, there are also several incentives built-in the supply chain that makes tobacco farming, SLT manufacturing, and its sale a profitable business.

**Conclusions:** Our novel approach to study SLT control was successful in identifying and interviewing actors involved in its supply chain. The analysis using FCTC could provide valuable information to policy makers and enable them to effectively regulate SLT products.

## Introduction

Smokeless tobacco (SLT) consists of a diverse range of products containing tobacco, placed in the mouth or nose but not burned at the time of use.<sup>1</sup> In South and Southeast Asia, SLT products are

either custom-made (prepared by users or vendors) or manufactured at both a small (cottage industry) and large industrial scale (multi-national companies). SLT use is particularly common in South and Southeast Asia.<sup>2</sup> A quarter of adults in Bangladesh and India, and a fifth in Nepal and Pakistan, use SLT.<sup>3</sup> Being considered as part

of their cultural heritage and family tradition, SLT has social and cultural acceptance among South Asians.<sup>4</sup> The habit is taken up at a young age as most families equate it to confectionary.<sup>5</sup> Peer pressure, family approval, medicinal use (for dental pain), easy access,<sup>6</sup> low price, and lack of regulation contributes to its widespread use.<sup>7</sup>

Besides nicotine, SLT products contain several carcinogens including Tobacco Specific Nitrosamines.<sup>8,9</sup> The carcinogenic propensity of SLT products used in South and Southeast Asia is high and is enhanced further by the addition of areca nut (another carcinogen),<sup>10</sup> and increases with longer duration and higher amounts of daily use. The addition of alkaline substances such as ashes, calcium hydroxide (slaked lime), and sodium carbonate, raises the pH and enables rapid absorption of nicotine, thereby enhancing its addictive properties.<sup>11</sup> Compared to nontobacco users, SLT users have a higher risk of mouth (relative risk [RR] = 4.9 in India; RR = 2.8 in the United States), pharyngeal (RR = 2.2), and oesophageal (RR = 3.3 in India; RR = 4.0 in the United States) cancers,<sup>12</sup> as well as fatal myocardial infarction (RR = 2.2 in South Asia).<sup>13</sup>

In 2005, WHO negotiated an international treaty, Framework Convention on Tobacco Control (FCTC) to address the globalization of the tobacco epidemic.<sup>14</sup> Signed up by 180 countries so far, the articles of the Convention are designed to reduce tobacco demand (articles 6–14) and supply (articles 15–17). Since its introduction, several countries have seen a drastic reduction in the prevalence of cigarette smoking.<sup>15</sup> Most countries in South Asia are signatories to the FCTC, including Bangladesh, Nepal, and Pakistan, and have ratified their existing tobacco control policies accordingly. However, compared to cigarettes, SLT remains a neglected policy area in general. A recent policy gap analysis in four South Asian countries (Bangladesh, India, Nepal, and Pakistan) highlighted that for SLT, control policies were generally inadequate. Taxes were low and poorly administered. Other regulatory mechanisms were also either nonexistent or poorly implemented.<sup>16</sup> It is not surprising, therefore, that such products remain inexpensive and widely available to people in South Asia, including minors. The above analysis recommended developing a better understanding of the extent to which SLT products are currently manufactured, distributed, marketed, and sold in contrast with the standards set in FCTC. It was suggested that improving knowledge of the barriers encountered in regulating SLT production, distribution and sales, and of the opportunities for strengthening policies and regulatory mechanisms, could be of immense value to policy makers. With this backdrop, this study aims to understand the SLT supply chain, from manufacturing to product sale, to identify key factors that could improve compliance with FCTC articles. The study uses a novel approach, that is, supply chain analysis—carried out from the perspective of actors involved in SLT supply chain. In this article, we report our experience of using this approach in a feasibility study in three countries in South Asia.

## Methods

We carried out a small-scale questionnaire-based survey of the actors involved in the SLT supply chain in Bangladesh, Nepal, and Pakistan.

## Settings

In each country, the sampling frame consisted of administrative districts, purposively selected on the basis of high levels of consumption and wide scale production, distribution, and sale of SLT products. These included four districts (Kathmandu, Bhaktapur, Dhannusha, and Mahottori) in Nepal, three (Dhaka, Narayanganj, and Rangpur

in Bangladesh, and six (Attock, Islamabad, Mardan, Rajanpur, Rawalpindi, and Swabi) in Pakistan.

## Survey Participants

Primary participants were point-of-sale vendors (those selling SLT product [s] at their shops or kiosks). Secondary participants included wholesale retailers and manufacturers of SLT products (at least one) and also raw-tobacco retailers and tobacco farmers (Figure 1).

## Sampling Approach

We recruited eligible actors in two stages: primary participants (vendors) in the first stage and secondary participants in the second. In the absence of any detailed maps indicating relevant shops/kiosks and businesses, the following approach was used to identify participants: (1) the researcher team identified and approached all eligible vendors in the commercial parts of the study districts; (2) secondary participants were identified using a snowball-sampling approach based on the contact details of suppliers provided by primary participants; (3) further participants were identified by searching the internet and telephone directories, contacting relevant government departments, examining product packaging, and speaking to personal contacts. Consistent sampling approach was used in all three countries. Given that this was a feasibility study, no formal sample size calculation was carried out. However, we planned to recruit 25–50 actors (at least five primary actors) from each country. The respondents were the owner or manager of the business. Informed consent was obtained after providing verbal and written information about the study.

## Survey Instrument

We designed, translated, and field-tested a survey instrument as part of this study. The survey gathered data on supply channels, quantities sold, product popularity, prices, profit margins, and taxes. Further questions were included about supply chains, manufacturing, and farming to evaluate compliance with the FCTC articles (Table 1). Moreover, the questionnaire also included an observation checklist of the kiosk/shop and photographs of new SLT products sold and their packaging. The questionnaires were tailored for each type of actor in the supply chain and consistent across the three countries. Full questionnaires are available on request.

## Data Collection

A local survey team administered the survey instrument in local languages after receiving relevant training. The survey team identified participants and offered them flexible times (including evening and weekends) to complete the questionnaire—expected to take 45–90 minutes. With each survey, researchers also took field notes and responded to a set of self-assessment questions. These included:

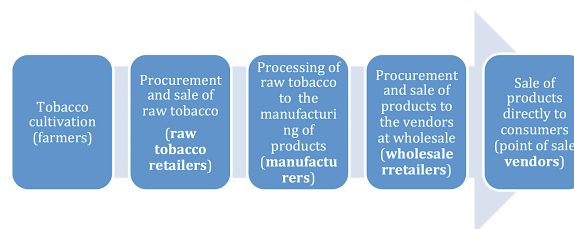


Figure 1. Actors involved in smokeless tobacco supply chain.

**Table 1.** A Framework for the Survey Instrument

FCTC articles	Topics in the survey instrument
(Article 6) price & taxation	Sales (volume and value), prices, profits, and taxes (amount and type) on SLT products bought
(Article 9) regulating tobacco products contents	Licensing requirements, regular testing, and measurement of contents of SLT products
(Article 10) regulating tobacco products disclosures	Labels showing manufacturers or importers contact details and contents and any inspections
(Article 11) packaging & labeling	Packaging (external & internal) and labeling (in local languages) of all products for: any falsified health claims or trivialization of hazardous nature of ingredients; health warnings; and ingredients printed on labels
(Article 12) education & awareness	Awareness of relevant legislation, standards, and their obligations
(Article 13) tobacco advertising, promotion and sponsorship	Visible advertising outside/inside shops; product display, promotions offered to customers, promotions offered by suppliers, popular brands, and customer profile
(Article 15) illicit trade	Types of suppliers, importers, manufactures, labels indicating manufacturers and importers address and countries in which to be sold, counterfeit products
(Article 16) sale to and by minors	Shop assistant/ customer profile, barriers/restriction on sales
(Article 17) support for economically viable alternatives	Motivation for selling, importing, and manufacturing products; motivation for growing and selling tobacco, and other viable alternatives to trading, manufacturing or farming tobacco

FCTC = Framework Convention for Tobacco Control; SLT = smokeless tobacco.

experience of recruiting participants (eg, approaches that worked well/less well; participants queries and concerns; and reasons for refusing to participate) and of administering the survey (including facilitators/barriers to completing the questionnaire; and questions participants struggled with or were reluctant to answer).

### Data Analysis

Our primary analysis assessed whether it would be feasible to conduct a definitive study using our proposed methods. For this, we used progression criteria, as follows: (1) at least 50% of the approached participants agreeing to take part in the study and (2) at least five interviews completed with each type of actor in the supply chain in each country (vendors, wholesale retailers, manufacturers, raw-tobacco retailers, and farmers). The secondary analysis included descriptive statistics, including response frequencies, cross tabulations, and mean values, for supply chain variables.

### Results

We describe the feasibility of the methods and utility of the information gathered as follows.

#### Participants' Recruitment

We recruited 72% (130/180) of all eligible actors in the study ranging from 65% (34/52) in Nepal to 81% (46/57) in Pakistan (Table 2). We were also successful in recruiting at least 15 actors from each category (five in each country) ranging from 30 vendors to 21 manufacturers.

Most point-of-sale vendors were identified through visiting commercial areas in the study districts. For other actors, a snowball-sampling method was only partially successful. While almost all vendors and retailers provided geographical whereabouts of their suppliers, specific contact details were mostly missing, making it difficult to trace these businesses. The manufacturers were particularly difficult to pin down as several operated through intermediate

suppliers called “dealers” and often had no clear display signs at their premises. Searches using internet, telephone directories, and government records for registered business were also unsuccessful in most cases. For example, we could only find one in six manufacturers in Nepal when tracked using addresses registered in “Company of Registrar Database.” Similarly, several identified manufacturers in Bangladesh were not even registered. Approaching actors through personal contacts proved a useful strategy, particularly for tracking down wholesale retailers and farmers. A revised diagram, describing the SLT supply chain (Supplementary Figure 1), shows a more complex relationship than a linear one perceived earlier (Figure 1).

#### Data Collection

Researchers were successful in persuading eligible participants to enroll in the study. However, this was not without its challenges. In many cases, respondents required reassurances that the research team had no links with the regulatory authorities. Refusal rates were highest among wholesale retailers and manufacturers, often stating “lack of time,” “closing business,” and “not understanding the study” as the common reasons. Refusal rates were lower among those approached through “local” contacts or reassured that other similar businesses had also participated in the study. Signing written consent forms was an issue for many respondents and in these cases verbal consents were obtained in front of a witness. Surveying at business premises meant that interviews were constantly interrupted by customers. However, participants afraid of losing business were not keen to be interviewed elsewhere. As a consequence, most interviews lasted longer than anticipated (Table 1). Obtaining sales, prices, and profits for individual products was particularly time consuming. Many respondents were reluctant to respond to direct questioning related to taxation and licensing. However, the data completeness was high with only few instances of missing data. This was achieved by researchers being flexible and offering to comeback at a later date, their ability to speak the local dialect, and being from the local area.

**Table 2.** Identification and Recruitment of Participants

Actors & countries	Recruitment rates % (recruited/eligible)	Time taken per interview in minutes, mean (range)	Resources required (person days)	Progression criteria achieved (Yes/No)
<b>Vendors</b>				
Bangladesh	100 (10/10)	70 (40–120)	3	Yes
Nepal	71 (10/14)	72 (30–125)	3	Yes
Pakistan	76 (10/13)	64 (45–135)	6	Yes
<b>Wholesale retailers</b>				
Bangladesh	53 (10/19)	110 (55–145)	4	Yes
Nepal	41 (7/17)	55 (35–75)	5	Yes
Pakistan	76 (10/13)	81.8 (40–135)	5	Yes
<b>Manufacturers</b>				
Bangladesh	59 (10/17)	85 (55–105)	4	Yes
Nepal	60 (6/10)	79 (27–105)	4	Yes
Pakistan	66 (6/9)	8.5 (50–110)	4	Yes
<b>Raw-tobacco retailers</b>				
Bangladesh	71 (10/14)	65 (50–80)	3	Yes
Nepal	100 (5/5)	93 (80–105)	2	Yes
Pakistan	91 (10/11)	66 (55–80)	6	Yes
<b>Farmers</b>				
Bangladesh	100 (10/10)	45 (35–80)	3	Yes
Nepal	100 (6/6)	88 (75–105)	2	Yes
Pakistan	91 (10/11)	68.5 (55–75)	6	Yes
<b>All actors</b>				
Bangladesh	70 (50/71)	75 (35–145)	17	Yes
Nepal	65 (34/52)	77 (30–125)	16	Yes
Pakistan	81 (46/57)	71.7 (40–135)	27	Yes

## Key Findings

This is a feasibility study; however, a synthesis of the key findings are presented here using FCTC articles as an analytical framework (Table 3).

### Article 6—Price and Taxation

In Bangladesh, most manufactures (9/10) reported paying value added tax and supplementary duty on SLT products. Similarly, in Nepal, most wholesale retailers (5/7), manufacturers (4/6) and all raw-tobacco retailers reported paying value added tax, excise duty and nonspecific government taxes, respectively. In Pakistan, most manufacturers (5/6) and all raw-tobacco retailers (10/10) reported paying sales tax on the weight of tobacco leaf bought and sold. Most respondents were able to provide details on the amount of taxes, their rates, types and the revenue collecting authority. No taxes were paid by the participating farmers or point-of-sale vendors in all three countries.

### Articles 9 and 10—Product Regulation and Disclosure

In Bangladesh, most wholesale retailers (8/10) and all manufacturers are required to have a license and are regularly inspected only to check their licenses. All wholesale retailers and manufacturers in Nepal reported licensing requirements to sell and manufacture SLT products. However, few wholesale retailers (3/7) and manufacturers (2/6) had inspections from the regulator authority. On the other hand, most point-of-sale vendors (8/10) had such inspections. These were limited to checking the presence of health warnings, tax payments, name and address of the manufacturers, and product expiry dates. None of these inspections involved regular testing or measurement of contents of SLT products or checking labeling for ingredients. In Pakistan, none of the point-of-sale vendors, wholesale retailers and most

manufactures (5/6) were aware of any requirements for a license to sell or manufacture their products. Only a few point-of-sale vendors (1/10) and manufacturers (2/6) reported being inspected by regulatory authorities to check their products and any sales tax receipts.

### Article 11—Packaging and Labeling

In Bangladesh, we identified 43 different SLT products from participating vendors including 15 Zarda, five Gul, two Gutkha, and two other chewing tobacco products. Fifty-three percent products had a written health warning, and only 6% had a pictorial warning image (mouth cancer). Out of those with a health warning, 44% had low visibility due to very small font, 22% had warning in English only, 11% had these tactfully hidden in the packaging, and 11% had misleading information, for example, a Gutkha brand with a label saying “Jarda is injurious to health.” 11.8% products had a label saying “not suitable for children.” 41.2% products printed ingredients on their labels, of which only 57% mentioned “tobacco” as an ingredient. In Nepal, we identified 38 SLT products from participating vendors consisting of 11 Gutkha, 19 Khaini, and two loose tobacco brands. While all products contained at least a small written health warning, 60% had a warning image (picture of scorpion in most cases), and only 13.5% products contained a pictorial image (mouth cancer). None of the products contained the manufacturer’s full address or their ingredients labeled. There were also several products belonging to the same brand with mismatch in labels indicating the possibility of counterfeit products. In Pakistan, 22 different products were identified, consisting of two Gutka, one Khaini, five Naswar (packed in clear packets with a sticker displaying product name only), and 14 loose tobacco brands packed and sealed in tins. Sixty-eight percent products contained written health warning, 81% had manufacturers

**Table 3.** Key Findings

Key questions	Bangladesh	Nepal	Pakistan
Who paid tax on SLT?	Manufacturers (9/10)	Wholesale retailers (5/7); manufacturers (4/6); raw-tobacco retailers (10/10)	Manufacturers (5/6); raw-tobacco retailers (10/10)
Who is required to have a license?	Wholesale retailers (8/10); manufacturers (10/10)	Wholesale retailers (7/7); manufacturers (6/6)	None
What proportion of SLT products has health warning and image of mouth cancer?	Health warning (53%); pictorial warning (6%)	Health warning (60%); pictorial warning (13.5%)	Health warning (68%); pictorial warning (0%)
Who is aware of relevant legislation, standards and their obligations?	None	Vendors (1/10); manufacturers (2/6)	None
How are the SLT products advertised and promoted?	Product display & incentives offered to vendors & wholesale retailers by SLT manufacturers and farmers by cigarette manufacturers	Product display & incentives offered to vendors & wholesale retailers by SLT manufacturers, and to manufacturers by raw-tobacco retailers and farmers	Product display & incentives offered to vendors & wholesale retailers by SLT manufacturers and to manufacturers by raw-tobacco retailers
What proportion of SLT products are smuggled and counterfeited?	12% products are made in India and 87% products did not carry manufacturers' full address	12% products are made in India and none carried manufacturers' full address	27% products are made in India and none carried manufacturers' full address
Do vendors restrict selling SLT products to minors?	No	No	No
What are the incentives for selling and manufacturing SLT products?	Small capital investment, quick return, stable demand, and low-risk	Profitable business, job security, products in demand, self-governance	High demand, small investment required, good income, rapid turnover, secure employment

SLT = smokeless tobacco.

address and 63% had ingredients mentioned. None of these products had any image warning or list of ingredients on the label.

#### Article 12—Education and Awareness

None of the actors reported being aware of any new tobacco legislation in the last 3 years in Bangladesh. In Nepal, only one (10%) of the SLT vendors; none of the wholesale retailers; and two (33.3%) of the manufacturers reported being aware of any new tobacco legislation. In Pakistan, none of the vendors, wholesale retailers or manufacturers were aware of any relevant tobacco control legislation.

#### Article 13—Tobacco Advertising, Promotion, and Sponsorship

In Bangladesh, dry tobacco leaf, Jarda, and Gul were reported being popular in terms of quantity of sale. Vendors openly displayed SLT products both inside and outside the shops. Vendors or manufacturers generally did not offer advertising materials and promotions. Discount on bulk procurement and easy payment methods were the major incentives provided by the wholesale retailers and manufacturers. Farmers received a variety of incentives including cash in kind, seeds, fertilizer, insecticides, technical advice, and agricultural equipment from tobacco industries. In Nepal, product display was also the main way of advertising for point-of-sale vendors (9/10). Many manufacturers (4/6), raw-tobacco retailers (4/5), and farmers (6/6) offered discounts to their customers for either bulk buying, paying in cash, purchasing items on a regular basis, or paying on time. Other incentives included entry into a prize draw and gifts. Product display was also the main advertisement tool for point-of-sale vendors (10/10). In Pakistan, most point-of-sale vendors (7/10), wholesale retailers (6/10), and manufacturers (5/6) reported a considerable increase in their customer numbers especially among younger generation with paan containing loose tobacco being the most popular

product. Concession on bulk buying was the key incentive offered by manufacturers wholesale and raw-tobacco retailers.

#### Article 15—Illicit Trade

In Bangladesh, 88% of the SLT products sold by vendors were produced locally while the rest were imported. Only 13% of the local products contained manufacturer's full address. In Nepal, five brands were identified that had more than one type of packaging, with a further three brands having a manufacturer's name that looked similar but was spelt differently. None of the manufacturers printed their full address on the packet, with five listing Indian locations. One wholesale retailer reported that he sometimes bought SLT from a supplier near to the border area and did not face any problems, with the supplier also visiting his shop once or twice a year to deliver new products. A raw-tobacco retailer who bought tobacco from abroad reported crossing the border to buy it, but explained that he did not go the "direct way." In Pakistan, six out of 22 products readily available in the market carried an Indian address on their labels. Such products, smuggled across the border were openly displayed on the counter both by the vendors and wholesale retailers.

#### Article 16—Sales Restrictions

We did not find any children selling SLT products during data collection. However, there were no restrictions on sale of SLT products to minors in Bangladesh. There were also no restrictions on the volume of products sold to one person at any one time. In Nepal, some of the point-of-sale vendors (3/10) also admitted selling SLT products to minors. In Pakistan, some point-of-sale vendors (2/10) and wholesale retailers (4/10) admitted selling SLT products to minors. They justified their position by saying that these products were meant for women who couldn't come to the shops themselves and therefore sent their children to purchase on their behalf.



### Article 17—Support for Economically-Viable Alternatives

In Bangladesh, SLT was reported as a profitable business. The vendors, wholesale retailers and manufacturers reported a rise in demand in the last 5 years. Small capital investment, quick return, stable demand, low risk of business, and availability of products were the major incentives for selling SLT. One of the main reasons reported for tobacco cultivation was a high return on tobacco as compared to other crops. In Nepal, participants described a variety of benefits of selling SLT/raw-tobacco, with the most common reason being that they made a profit/earned a living. Many manufacturers, raw-tobacco retailers and farmers referred to job security as a benefit, while other responses included high demand and the ability to govern their own business. In Pakistan, a small start-up cost, low investment to stock, and high demand were some of the incentives to sell SLT products. The wholesale retailers, manufacturers, and raw-tobacco retailers reported SLT being a good source of income and employment. For farmers, high demand, good return on investment, and rapid crop turnover were the key incentives.

## Discussion

This feasibility study has been successful in meeting its progression criteria and recruiting almost three quarters of all actors approached for interviewing. Using FCTC as an analytical framework shows that national legal provisions to implement FCTC are not effectively implemented in general. This is either due to their inadequacies or due to insufficient clarity in FCTC guidance required to deal with some of the observed problems specific to the SLT supply chain. Furthermore, it has shown the potential of highlighting who in the supply chain is currently taxed and regulated and how. It has given an indicative proportion of smuggled and counterfeit SLT products in the market and the extent to which these are sold without specified health warnings, information on the ingredients, and manufacturers contact details. The study has also indicated how SLT products are advertised, what incentives are built-in within the supply chain and the presence of any sale restrictions.

Our study has some limitations. Any intelligence gathered on the basis of self-reporting raises concerns about its validity. Given that producing, selling, marketing, and consuming SLT is not a taboo in South Asia, the responses, however, are likely to be closer to the truth. We had relatively small sample sizes within each category of the survey respondents. This limits the external validity of our findings as well as precludes us from drawing any definitive conclusions. However, despite being a small pilot, our analysis has highlighted the nature and extent of different levers, which can be utilized to strengthen SLT control within the supply chain. It would be now possible to progress to a definitive study and visualize the potential value of information extracted using our proposed approach.

Previous studies in South Asia (Bangladesh and India) have studied compliance to FCTC articles primarily through surveying populations.<sup>17</sup> This approach is very useful in studying the effect of health warnings on tobacco packaging, taxation policies, comprehensive ban on tobacco advertising, promotion, and sponsorship, and smoke-free policies on current or future tobacco consumers. However, it is less useful in understanding the mechanisms and effect of non-compliance with the FCTC articles designed to influence demand and supply through regulating contents and disclosure of tobacco products, and illicit trade and sales to minors, which are particularly relevant to SLT. It also does not identify the points at which the relevant FCTC articles are either ambiguous or not complied by

within the tobacco supply chain. This will be relevant for assessing compliance to tobacco advertising, promotion, and sponsorship and tax administration. It also does not allow an understanding of barriers to and discovering opportunities for effective implementation of FCTC articles from the supply chain perspective. Therefore, certain aspects of FCTC, highly relevant to SLT, can only be studied through tobacco supply chain. Our study presents a novel approach to study SLT control and using FCTC as an analytical framework to discover ways to improve its implementation.

Based on our learning from this study, we would make several amendments to the design, methods, and questionnaires of a definitive study. These include: (1) recruiting a new category of actors known as “dealers” who supply SLT products to wholesale retailers; (2) selecting study sites that reflect not just high volumes of SLT sales, but also manufacturing and farming; (3) recruiting vendors from a variety of settings, that is, street hawkers, grocers, and paan kiosks; (4) using community gatekeepers and personal contacts as well as snowballing techniques to recruit; and (5) always using interviewers that can speak the local dialect and preferably from the local area.

Overall, the study was successful in identifying and interviewing actors involved in the supply chain of SLT. With an improved recruitment strategy and refined questionnaires, we can now progress to a definitive study, which could provide valuable intelligence to policy makers to enable them to effectively regulate SLT products.

## Supplementary Material

Supplementary Figure 1 can be found online at <http://www.ntr.oxfordjournals.org>

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## Declaration of Interests

None declared.

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KS conceived the idea, developed study protocol, analyzed data, and wrote the first draft of the manuscript. KS contributed to the study protocol, developed study tools, collected and analyzed the data, contributed and approved the manuscript. RH contributed to the study tools, collected and analyzed the data, contributed and approved the manuscript. AK contributed to the study tools, collected the data, contributed and approved the manuscript. SB contributed to the protocol and study tools, contributed and approved the manuscript. SA reviewed the study tools, contributed and approved the manuscript. IW reviewed the protocol and study tools, and contributed and approved the manuscript. KS confirms that he had full access to all the data in the study and had final responsibility for the decision to submit for publication.

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