



**CENTRE FOR PRIMARY
CARE RESEARCH**

ASSESSING ILLICIT CIGARETTE TRADE IN ZAMBIA



Zambia Primary Data Collection for the Tobacco Control Data Initiative (TCDI)

Quantitative Study REPORT

July 2023

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Please note that the information and views set out in this report are those of the authors and do not reflect opinion of the Parties to the WHO Framework Convention on Tobacco Control (WHO FCTC), the Parties to the Protocol to Eliminate Illicit Trade in Tobacco Products (the Protocol), or the Secretariat of the WHO FCTC and its Protocols.

LIST OF CONTRIBUTORS

ZAMBIA SURVEY INVESTIGATORS AND REPORT CONTRIBUTORS

- Prof. Fastone M. Goma – Centre for Primary Care Research (CPCR), Lusaka, Zambia
- Dr Cosmas Zyambo – School of Public Health, University of Zambia, Lusaka, Zambia
- Dr Masauso M. Phiri – School of Medicine, University of Zambia & CPCR, Lusaka, Zambia
- Mr Richard Zulu - Centre for Primary Care Research, Lusaka, Zambia
- Mr Webby Mwamulela - Centre for Primary Care Research, Lusaka, Zambia

UNIVERSITY OF CAPE TOWN- RESEARCH UNIT ON THE ECONOMICS OF EXCISABLE PRODUCTS

- Hana Ross

DEVELOPMENT GATEWAY: AN IREX VENTURE

TOBACCO CONTROL DATA INITIATIVE- ZAMBIA TEAM

- Mbaita Maka- TCDI Zambia Country Lead and Data Analyst
- Aminata Camara Badji- TCDI West and Central Africa Coordinator
- Seember Joy Ali- TCDI Nigeria Country Lead
- Sharon Ogolla- TCDI Associate Consultant
- Noreen Dadirai Mdege- Consultant/ TCDI Research Coordinator

EXECUTIVE SUMMARY

Background

Tobacco use in Zambia is on the rise, with increasing prevalence and deaths related to tobacco use. According to data from 2017, the rate of tobacco use in Zambia was 15.8%, while the rate of smoking tobacco cigarettes specifically was 12.3%. The latest Demographic Health Surveys conducted in Zambia indicate that the prevalence of tobacco use has been rising, particularly among males, from 15% in 2000-2001 to 19% in 2018. The country ratified the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) [1] and has implemented tax laws and official tax stamps to combat the illegal trade of cigarettes [2,3]. [4] The WHO FCTC recognizes that tax and price policies are effective in reducing tobacco consumption, but the presence of illicit trade weakens their effectiveness [4]. The Protocol to Eliminate Illicit Trade in Tobacco Products (ITP) adopted by the WHO FCTC in 2012, yet to be ratified by Zambia requires parties to implement effective measures against all forms of illicit trade in tobacco products. The study aims to estimate the extent of illicit cigarette trade in Zambia and replicates the approach developed by John and Ross (2018) and Abdullah et al., (2020) [5].

Method

A cross-sectional observational study was conducted to estimate the prevalence of illicit cigarette consumption in Zambia, using empty cigarette packs as evidence. The empty cigarette packs were collected from retailers and the streets/bins in 25 districts, including 9 border districts and 16 non-border districts, covering all 10 Provinces, which were further stratified as either urban or rural. A total of 58 field staff were recruited, including 25 supervisors and 33 research assistants, and were trained for data collection. The collection of empty cigarette packs was limited to markets located within a 1 km radius of the CBDs of each district, and each cigarette pack was examined for features such as brand name, flavour, cigarette size, pack size, local or imported, country of origin, manufacturer, the presence of textual health warning, compliance of the textual health warning in English, presence of tax stamp, and duty-free stamps. A cigarette pack was deemed illicit if it lacked any or all the following: a textual health warning in English stating "TOBACCO IS HARMFUL TO HEALTH," and a tax stamp from ZRA. Packs meeting the first two criteria were considered illicit if they had a duty-free stamp obtained from an unauthorized retailer, while packs with duty-free stamps found on the streets or in bins were considered legal for the study due to the inability to determine their place of purchase.

Data from Kobo Toolbox was exported as an Excel sheet and analysed using Stata version 17 after ensuring its cleanliness and consistency. The analysis estimated the distribution and proportion of illicit cigarette packs in each province and district, based on sources, brand names,

and specific criteria such as health warnings and tax stamps, revealing the extent of tax evasion and the proportion of illicit cigarettes consumed in Zambia.

Results

The study analysed a sample of 118,344 cigarette packs in Zambia with 96,986 (82.0%) packs and 21,358 (18.0%) packs collected from retailers and from streets/bins, respectively. Out of the total 118,344 packs collected, 1792 (1.5%) did not have a Textual Health Warning, 343 (0.3%) packs did not have a Textual Health Warning in English, 1490 (1.3%) had duty-free stamps even though they were purchased from retail outlets that were not duty-free shops, and, lastly, 11,939 (10.1%) packs of the total did not have a ZRA stamp. Out of the total packs, 14,428 (12.2%) were deemed illicit; 12.4% (1792) had no Textual Health Warning; 2.4% (343) had a Textual Health Warning that was not in English; 82.7% (11,939) had No ZRA Stamp and 10.3% (1490) had a Duty-free stamp with some brands were deemed illicit based on more than one criterion. The prevalence of illicit packs varied across different regions and districts. Western province had the highest proportion of illicit cigarette packs, with 1,260 packs (32%) out of a total of 3,936 packs collected, closely followed by Lusaka with the second highest proportion of illicit cigarette packs at 24.6% (11,233 out of the 45,652 packs collected). Sesheke district had the highest proportion of illicit cigarette packs, accounting for 41% of the total, followed closely by Shibuyunji in Lusaka province with 40%. The illicit proportion for border districts was 5% (1,897 out of 37,671 packs), while this was 15.5% (12,531 out of 80,673 packs) for non-border districts. Urban districts had an illicit proportion of 15.3% (10,876 out of 70,961 packs collected from these urban districts). In contrast, for rural districts this was 7.5% (3,552 illicit packs out of the collective total of 47,383 packs collected from those districts).

Conclusion & Recommendations

According to our knowledge, this is the first study to estimate the extent of the illicit cigarette trade in Zambia by collecting empty cigarette packs from a nationally representative sample. The data indicates a notable issue of illicit cigarette trade in Zambia, particularly concerning tax evasion within the cigarette market. This not only results in revenue loss for the government but also poses health risks to smokers, as these illicit cigarette packs may not adhere to the necessary health and safety regulations. To summarize, the data reveals that 12.2% of cigarette packs being sold in Zambia are illicit. The significant prevalence in certain provinces, notably Western and Lusaka, underscores the importance of intensifying efforts to combat the illegal sale of cigarettes.

We recommend that Zambia consider ratifying and implementing the WHO Protocol on Illicit Tobacco Trade (ITP) to counter the supply of illicit cigarettes. Ratification of the ITP would lead to the adoption of a track and trace (T&T) system, if not already implemented, to ensure that taxes

are collected on all legally supplied packs in the market. It would also enable customs officers to use a powerful monitoring tool to detect counterfeit and smuggled cigarettes, a strategy that has been successfully implemented in other areas with promising results in dealing with illicit cigarette trade.

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INTRODUCTION

Background

Global tobacco use is staggering; in 2019, over 1.1 billion people smoked tobacco and consumed an estimated 7.4 trillion cigarettes-equivalent of tobacco [6]. In 2017, 15.8% of Zambians used tobacco and 12.3% smoked cigarettes [7]. The most recent Demographic Health Surveys in Zambia suggest that the prevalence of tobacco use has been increasing, especially among males, from 15% in 2000-2001 to 19% in 2018 [8–11]. From 1990 to 2020, tobacco-related deaths in Zambia increased from an estimated 3,000 per year (43 per 100,000) to 7,142 per year (45 per 100,000) [12].

Zambia ratified the World Health Organization Framework Convention on Tobacco Control (WHO FCTC) in 2008 to address the health and economic consequences of tobacco use [13,14]. Article 6 of the WHO FCTC recognizes that tax and price policies are one of the most effective means of influencing demand for and consumption of tobacco products. However, the presence of illicit trade of tobacco products on the market weakens the effectiveness of pricing and taxation strategies implemented to promote tobacco control, which consequently leads to an increase in tobacco products accessibility and affordability [15].

Based on data from 36 countries, the recent global estimates suggest that illicit trade in cigarettes accounted for an estimated 11.2% of the total number of cigarettes consumed globally between 2010 and 2018. The general capacity of tax administration authorities and levels of governance is one of the determinants of the extent of tax evasion. Countries that struggle with tax compliance, in general, are likely to experience high levels of illicit trade.

Article 15 of the World Health Organization Framework Convention on Tobacco Control (WHO-FCTC) requires Parties to the Convention to implement effective measures against all forms of illicit trade in tobacco products including smuggling, illicit manufacturing, and counterfeiting. The WHO-FCTC adopted the Protocol to Eliminate Illicit Trade in Tobacco Products (ITP) in 2012 to combat illicit trade in tobacco products by securing the supply chain with measures such as track and trace systems [16]. It also covers licensing, due diligence, and issues related to Internet- and telecommunication-based sales, duty free sales, and free zones and international transit. However, Zambia is not yet a signatory to the ITP.

In Zambia, the Zambia Revenue Authority (ZRA) has implemented official tax stamps to combat the illegal trade of cigarettes. The country's tax laws for cigarette products and the Public Health law are relevant to this measure. Under the Zambian tobacco tax law, importers and/or distributors of cigarettes must be registered in accordance with section 108A of the Customs and Excise Act and Regulation 106B of the Customs and Excise (General) Regulations, as well as the Customs and Excise (Cigarette Tax Stamp) Rules. This law stipulates that all local cigarette manufacturers, distributors, or importers must affix tax stamps in compliance with the guidelines set forth by the Minister of Finance. The manufacturer, importer, or distributor is responsible for ensuring that all cigarette packets are affixed with stamps before importation, distribution, or sale in Zambia. A cigarette tax stamp is a physical stamp that is affixed to cigarette packs to indicate that the required taxes have been paid. In Zambia, the cigarette tax stamp is a rectangular sticker that is usually placed on the top or bottom of the cigarette pack. The cigarette tax stamp in Zambia typically features the Zambian coat of arms, which includes an eagle, a pickaxe, a hoe, and a shield. The coat of arms is surrounded by the words "Republic of Zambia" and the year that the stamp was issued. The cigarette tax stamp also includes a unique code that is used to track the movement of the cigarette pack from the manufacturer to the retailer. This code is usually a combination of letters and numbers that is printed in black ink on a white background. The tax stamps are placed beneath the cellophane of the paper cigarette pack, and the cellophane can be removed without damaging the stamp (Figure 1). The cigarette tax stamp in Zambia ensures that the required taxes on cigarettes are paid, and to help prevent the illegal trade of cigarettes. The stamp allows authorities to easily identify cigarettes that have been smuggled into the country or sold without the proper taxes being paid.

To obtain cigarette tax stamps in Zambia, the ZRA Commissioner General must be consulted for the requisition of both locally manufactured and imported cigarettes. Manufacturers, importers, and distributors are responsible for ensuring that all cigarette packets have tax stamps affixed prior to distribution or sale. Tax stamps are potential revenue due to the government and are accounted for through regular reconciliation statements submitted by manufacturers, distributors, or importers. Damaged stamps are submitted with the reconciliation statement or within 15 days. Failure to submit a reconciliation statement results in an assessment of duties and a debt to the government. This whole cigarette tax system is managed by ZRA [17].



Figure 1 A Cigarette pack showing a ZRA tax stamp.

However, the International Tobacco Control Zambia (ITC) study conducted in 2014 found that 22% of cigarette packs didn't have tax stamps or any indication that a tax stamp was present. It's important to note that the sample size used in the study was small, with only 64 and 75 cigarette packs collected and analysed in Waves 1 and 2, respectively, so the results cannot be generalized [18].

In Zambia, health warnings were made mandatory on tobacco packages in January 1993 according to The Public Health (Tobacco) Regulations, 1992. The required warning is the text-only warning in English: "Warning: Tobacco is Harmful to Health." In 2008, the regulation was amended to enforce the text-only warning on both sides of the package and to improve the legibility of the text warning [19]. However, no study has yet evaluated the extent of the text-only health warning on cigarette packs in Zambia. The purpose of this study is to estimate the

proportion and extent of illicit cigarette trade in Zambia comprehensively looking at both compliance with tax regulations and health warning labels on the cigarette packs. The study replicated the approach developed by John and Ross (2018) and Abdullah et al., (2020) [5] in collaboration with Development Gateway and University of Cape Town teams to measure the extent of illicit cigarette consumption in Zambia.

RESEARCH QUESTION, AIMS AND OBJECTIVES

Research Question

Both the quantitative and qualitative data collected in this study aimed to answer the following question:

- What is the extent of illicit cigarette trade in Zambia?

More specifically the study sought to address the following research questions for the illicit tobacco trade in Zambia:

- (i) What proportion of cigarettes consumed in Zambia are illicit?
- (ii) What is the extent of tax evasion in Zambia?

Aim and Objectives

1. Aim

The aim of the study is to explore the extent of illicit cigarette trade in Zambia.

2. Specific Objectives

- (1) To determine the proportion of illicit cigarettes consumed in Zambia.
- (2) To determine the extent of tax evasion in Zambia

METHODOLOGY

Study Design

This was an observational cross-sectional study based on empty cigarette packs. We obtained the packs from two sources: retailers and the streets during our survey, which took place from 03 November to 02 December 2022. Since the sale of single cigarette sticks is not prohibited by Zambian law and is highly prevalent, we approached retailers and street vendors and requested that we collect empty cigarette packs which they keep after selling all the sticks in the pack. Additionally, empty packs are frequently observed on the streets, near garbage bins, waste dumps, and kiosks, providing a second source of empty cigarette packs for the study. This method of obtaining empty packs utilized observational techniques, thereby avoiding the potential biases from self-reported data.



Figure 2 Zambian map by provinces and neighbouring countries

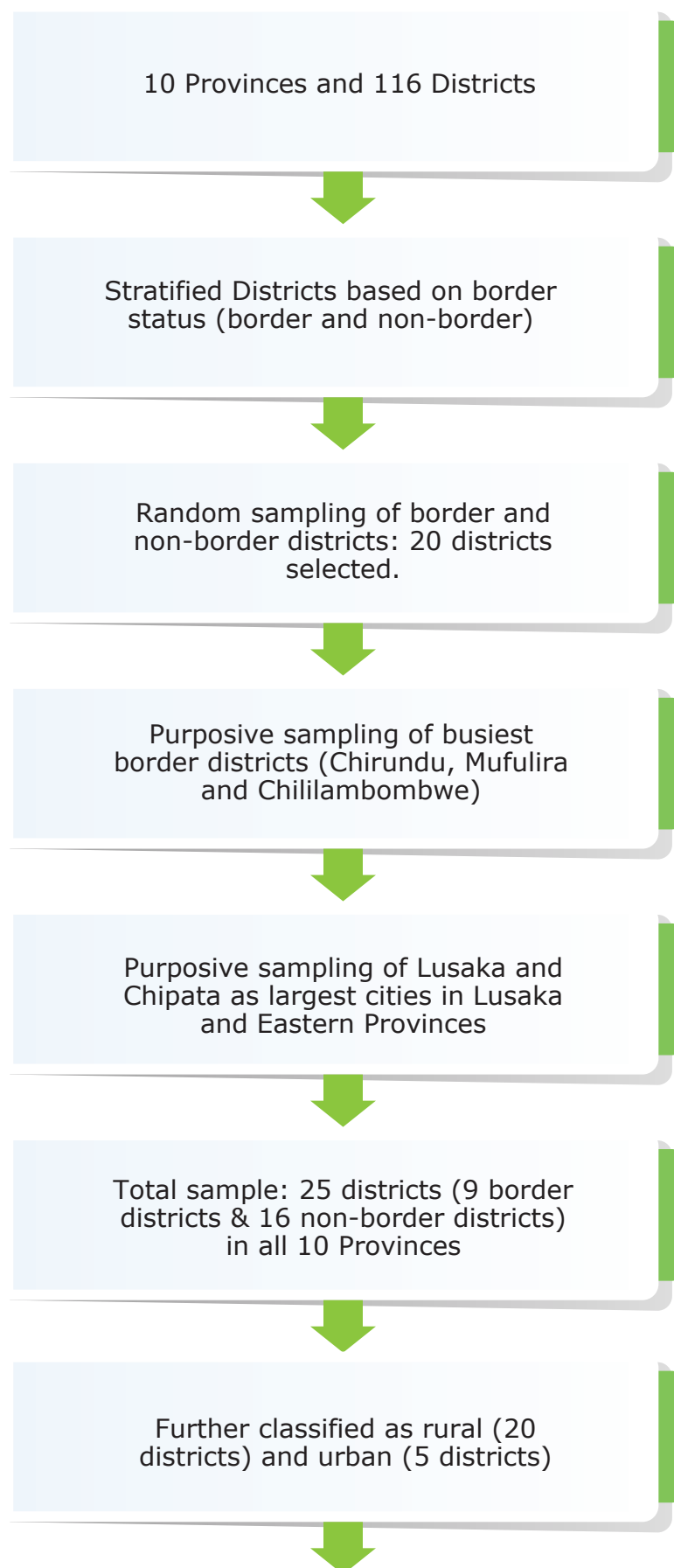


Figure 3 Sampling procedure in the selection of the districts

Study Sites and Sampling Design

Zambia is divided into 10 provinces and 116 districts. Zambia also has large international land borders with eight neighbouring countries (Figure 2). From each of the ten provinces in Zambia, we stratified the districts into border and non-border districts. A border district was defined as a district with a formal border linking Zambia to one of its neighbouring countries. We randomly selected 20 districts to be included in the study. We also purposely added the following busiest commercial border districts that had not been randomly selected to our sample: Chililabombwe and Mufulira districts which border with the Democratic Republic of Congo, and Chirundu district bordering with Zimbabwe. We also purposely included two districts with big cities, Lusaka and Chipata, to the sample. Thus, a total of 25 districts which included 9 border districts and 16 non-border districts in all 10 Provinces were selected for this study. The selected 25 districts were further classified as either urban or rural. Urban districts were defined as those falling under municipalities, while those outside municipalities were considered rural. Using this criterion, we identified 5 urban districts and 20 rural districts (see flowchart in Figure 2). Within each district, we selected the central business district (CBD) and identified the main market within the CBD as the starting point for data collection.

The study was conducted in Mumbwa and Serenje in the Central province, Chililabombwe, Kitwe, Mufulira, and Ndola in the Copperbelt province, Chadiza, Chipata, and Katete in the Eastern province, Mwense and Nchelenge in the Luapula province, Luangwa, Lusaka, and Shibuyunji in the Lusaka province, Isoka and Nakonde in the Muchinga province, Chavuma and Mufumbwe in the North-West province, Mbala and Nsama in the Northern province, and Chirundu, Livingstone, andimba in the Southern province, as well as Mwandi and Sesheke districts in the Western province (Table 1).

Data Collection

Fifty-eight (58) field staff were recruited, including 25 supervisors and 33 research assistants (RAs), with a minimum of two from each sample district. However, due to the size of Lusaka and Copperbelt provinces, each had four additional research assistants. Each district had one supervisor and at least one research assistant. Supervisors were required to have a minimum qualification of a bachelor's degree, while research assistants needed to have a minimum qualification of a General Certificate of Education (GCE) after completing grade 12. To maintain uniformity in training, all research assistants were gathered at a central location in Lusaka for a

Table 1 Province and districts in the sample, area type and border status

Province & District	Area type	Border Status
Central		
Mumbwa	Rural	Non-border
Serenje	Rural	Non-border
Copperbelt		
Chililabombwe	Rural	Border
Kitwe	Urban	Non-border
Mufulira	Rural	Border
Ndola	Urban	Non-border
Eastern		
Chadiza	Rural	Non-border
Chipata	Urban	Border
Katete	Rural	Border
Luapula		
Mwense	Rural	Non-border
Nchelenge	Rural	Non-border
Lusaka		
Luangwa	Rural	Non-border
Lusaka	Urban	Non-border
Shibuyunji	Rural	Non-border
Muchinga		
Isoka	Rural	Non-border
Nakonde	Rural	Border
North-West		
Chavuma	Rural	Non-border
Mufumbwe	Rural	Non-border
Northern		
Mbala	Rural	Border
Nsama	Rural	Non-border
Southern		
Chirundu	Rural	Border
Livingstone	Urban	Border
Zimba	Rural	Non-border
Western		
Mwandi	Rural	Non-border
Sesheke	Rural	Border

three-day training session. The first two days consisted of classroom instruction on the data collection process, including recruitment of retailers, collection of empty cigarette packs from the retailers and streets/bins, and entering data in the questionnaire programmed on the tablets. On the third day, a field pre-test was conducted in Chongwe district in Lusaka province. Afterward, the field staff were deployed to their respective districts on the fourth day.

The field work began successfully on November 6th and 7th, 2022, with the mapping of main markets in each district and a subsequent listing exercise of the primary retailers in the area. Before any field work began, we made courtesy calls to key gatekeepers, including Provincial Administration Officers, Permanent Secretaries, District Commissioners, District Health Directors, Zambia Police Commands, Town Clerks/Council Chairpersons, ZRA Senior Officials, and Market/Bus Terminus Chairpersons. The key gatekeepers responded overwhelmingly positively and pledged support within their jurisdictions to ensure the research team's successful field implementation.

The collection of empty cigarette packs was limited to markets located within a 1 km radius of the CBDs of each district. From each CBD, empty cigarette packs were collected from two sources: from tobacco retailers and streets/bins. The collection of empty packs from the streets/bins began from the centre of the CBD and explored all the streets/bins within a radius of approximately 1 km. This was done throughout the day. Retailers, on the other hand, were approached and requested to give their empty cigarette packs to the research assistants. The participating retailer had to meet the following inclusion criteria:

- Retailers within a 1 km radius of the CBD central market pinpoint
- Retailers who consented to be part of the study and supply empty packs.
- Retailers who were stationed in one place (and not mobile)

The exclusion criteria for retailers were:

- Retailers positioned in places which posed danger to the Research Assistants
- Retailers who could not give consent.

After explaining the aim of the study, the research assistants obtained written consent from the participating retailers. The research assistants distributed pre-labelled bags to each retailer during their morning pack collection rounds and requested them to place all empty cigarette packs for the day inside. Bags with empty packs were retrieved in the evening. Along with providing the

empty packs, the retailers also answered questions about the source of their cigarettes and their selling prices.

Each empty cigarette pack was placed in a plastic bag with a colour code that distinguished it based on the source of collection (retailer or street/bin) with additional information of the geographical location. Each pack was examined for features such as brand name, flavour, cigarette size, pack size, local or imported, country of origin, manufacturer, the presence of textual health warning, compliance of the textual health warning in English, presence of ZRA tax stamp, and a duty-free stamp. These data were entered using ODK data collection tool and exported to Excel.

A cigarette pack was considered illicit if it did not have any or all the following features:

- a. Textual health warning i.e., “TOBACCO IS HARMFUL TO HEALTH”
- b. Textual health warning in English
- c. A tax stamp from ZRA (A cigarette pack was considered tax compliant if it had a valid tax stamp)
- d. Over and above the criteria above, a cigarette pack was considered illicit even if it met the first two (a & b) criteria if it had a duty-free stamp but was collected from a retailer who is not authorized to sell duty-free cigarettes. For packs collected from the streets or bins that displayed duty free stamps, we could not determine where the packs were purchased and therefore, we considered them legal for purposes of the study.

Data Management

Data was primarily collected using Tablets using Kobo Toolbox¹. Kobo Toolbox is a free and open-source platform for field data collection that works both online and offline. Field staff were assigned a tablet at the beginning of the field period. Tablets were stored in the work bag of the field staff person when not in use during the workday. Research assistants ensured that participants' anonymity was maintained. Only a unique identification (ID) number on the questionnaires/data collection tools and any electronic database identified study participants. The entered data was cleaned/validated and backed up daily on a secure cloud storage system as described on “Data Security” and on an external hard drive.

¹ <https://support.kobotoolbox.org/welcome.html>

Data Access

Specified key research personnel were added to the server to have real-time access to the data coming into the server. A dashboard was provided on the key monitoring indicators to show progress on the data collection process as well as on key indicators in the data itself. Data could be exported to various formats such as Excel, SPSS, and csv files for analysis.

Data Quality

For data quality purposes, at the end of each data collection day, the RAs handed over the tablets to their supervisors to check the quality of the work. Upon satisfaction with the data collected, i.e., all the fields in the questionnaires were filled, supervisors uploaded the data to the server. The research team monitored the data being uploaded on the server, checking that the data was of acceptable quality. Spot-check field monitoring visits were also conducted to ensure that the data collectors were following the guidelines on collection of empty packs from retailers. The research team also visited some of the recruited retailers in some of the districts to validate some of the data collected by the research assistants. To ensure consistency during the data collection process, a pre-tested field guideline was followed. This included weekly communication between the research team and field staff members, mapping out the survey area, identifying central points for data collection, administering the questionnaire, labelling the samples, and entering the data. By following this guideline, we sought to maintain data quality and avoid inconsistencies during data collection.

Data Analysis

The data was exported from Kobo Toolbox as an Excel sheet and analysed using Stata version 17. Prior to analysis, the data was cleaned and prepared by checking for missing or incorrect data, ensuring the consistency of entered data, cross-checking with field staff in cases of missing information, and validating the information against a sample of empty packs collected during fieldwork and brought to the research offices. We estimated the distribution of empty packs collected from each province and district based on the source (whether from retailers or streets/bins) and cigarette brand names. The proportion of illicit cigarette packs was estimated for each province and district, cigarette brand name, and based on the source of the cigarette packs. Additionally, the proportion of illicit packs was calculated based on specific criteria, including whether the packs had a textual health warning, whether the warning was in English,

and whether the pack had a duty-free stamp or a ZRA tax stamp. The frequencies were reported as numbers and percentages. Based on the above analysis plan, the proportion of cigarettes consumed in Zambia are illicit was estimated. The extent of tax evasion in Zambia was determined by focusing on the proportion of cigarette packs that did not have a ZRA tax stamp or had a duty-free stamp but was obtained from a retailer that is not authorised to sell duty-free cigarettes.

Ethical Considerations

The primary principles of good ethical practice such as autonomy, justice, beneficence, and non-maleficence were maintained during the study. We were conscious that retailers could have concerns that the research may negatively impact their business, and interviewers could feel uncomfortable during the interaction with retailers. We adopted multiple measures to mitigate these concerns. Firstly, all potential retailers were provided with information regarding the project and written consent was obtained prior to data collection. Secondly, retailers were reassured that all information collected during the study would be confidential by maintaining anonymity and a commitment to ensuring the privacy of study participants throughout the research process. Thirdly, field staff were trained on techniques for handling conflict, threats, abuse, or compromising situations. Fourthly, the retailers were told that they could withdraw from the study at any point without undue consequences. We specifically train RAs to ask questions in a non-judgmental manner and not to put any pressure on the respondents if they show signs of reluctance in answering one or more questions. Our data collection team was respectful to the retailers and avoided interference with the normal flow of business. Interviewers only proceeded with interviewing when the retailers were not dealing or in the vicinity of customers. Retailers who consented to participate in the study were reimbursed K50 for the time spent collecting the empty packs. Ethics approval was obtained from the University of Zambia Biomedical Research Ethics Committee (UNZABREC) and permission to conduct the study was obtained from the National Health Research Authority (NHRA). Courtesy calls and introductory letters were written to ZRA offices, District Commissioners of each district, and the Police Head Quarters.

RESULTS

Country-wise Distribution of Empty Cigarette Packs

Table 2 presents data on the quantity of cigarette packs obtained from retailers and street bins in different provinces and districts in Zambia. In total, 118,344 packs were collected, with 96,986 (82.0%) packs and 21,358 (18.0%) packs retrieved from retailers and from streets/bins respectively.

In terms of provincial pack collection, Lusaka province had the highest number of packs, 45,652 (38.6%), followed by Copperbelt at 22,418 (18.9%), Southern province 13,582 (11.5%) and the least was Northern province with 2,644 (2.23%). Other provinces with relatively fewer cigarette packs included Muchinga 4,556, (3.85%), North-Western 4,510 (3.81%), Luapula 4,029 (3.4%), and Western 3,936 3.32%).

When we examined the packs collected by district, Lusaka had the highest number of collected cigarette packs, with 42,598 (35.9%) followed by Kitwe; 7469 (6.31%) then Ndola; 6479 (5.47%). The lowest district in collection of the packs was Kasama accounting for only 883 (0.75%). Notably, the number of cigarette packs obtained from street bins [21,358 (18.0%) packs] was significantly lower than those collected from retailers [96,986 (82.0%) packs]. This discrepancy could be attributed to the "Keep Zambia Clean, Green, Healthy Campaign" program, which has facilitated the cleaning and collection of most discarded packs by waste management companies [8]. Additionally, retailers often sell cigarettes as individual sticks [1], leading to the storage of empty packs in their stores rather than smokers disposing of them in the streets or bins.

Table 2 Packs obtained by region and sources.

Province & District	Retailer n (%) *	Street/Bin n (%) *	Total n (%) #
Central	2987 (85.5)	505 (14.5)	3492 (2.95)
Mumbwa	2209 (90.7)	226 (9.3)	2435
Serenje	778 (73.6)	279 (26.4)	1057
Copperbelt	19379 (86.4)	3038 (13.6)	22418 (18.9)
Chililabombwe	3179 (87.7)	445 (12.3)	3625
Kitwe	7164 (95.9)	305 (4.1)	7469(6.31)
Mufulira	3347 (69.1)	1498 (30.9)	4845
Ndola	5689 (87.8)	790 (12.2)	6479 (5.47)
Eastern	10067 (74.4)	3459 (25.6)	13526 (11.4)
Chadiza	902 (70.2)	382 (29.8)	1284
Chipata	7438 (79.7)	1891 (29.3)	9329 (7.90)
Katete	1727 (59.3)	1186 (40.7)	2913
Luapula	3567 (88.5)	462 (11.5)	4029 (3.40)
Mwense	2578 (98.0)	52 (2.0)	2630
Nchelenge	989 (70.7)	410 (29.3)	1399
Lusaka	39545 (86.6)	6107 (13.4)	45652 (38.6)
Luangwa	771 (43.4)	1005 (56.6)	1776 (1.50)
Lusaka	37637 (88.4)	4961 (11.6)	42598 (35.9)
Shibuyunji	1137 (89.0)	141 (11.0)	1278
Muchinga	2990 (65.6)	1566 (34.4)	4556 (3.85)
Isoka	967 (79.5)	250 (20.5)	1217
Nakonde	2023 (60.6)	1316 (39.4)	3339
North-West	3321 (73.6)	1189 (26.4)	4510 (3.81)
Chavuma	1618 (63.5)	932 (36.5)	2550
Mufumbwe	1703 (86.9)	257 (13.1)	1960
Northern	2017 (76.3)	627 (23.7)	2644 (2.23)
Mbala	1481 (84.1)	280 (15.9)	1761
Nsama	536 (60.7)	347 (39.3)	883 (0.75)
Southern	10478 (77.1)	3104 (22.9)	13582 (11.5)
Chirundu	3276 (76.9)	983 (23.1)	4259
Livingstone	4079 (80.2)	1007 (19.8)	5086
Zimba	3123 (73.7)	1114 (26.3)	4237
Western	2635 (66.9)	1301 (33.1)	3936 (3.32)
Mwandi	987 (69.5)	434 (30.5)	1421
Sesheke	1648 (65.5)	867 (34.5)	2515
Total	96986 (82.0)	21358 (18.0)	118344

Footnote: * Row %; #Column %

Table 3 presents data obtained from exit interviews conducted with retailers, providing information on their numbers and the percentage they represent in each province or district in Zambia. This data offers valuable insights into the cigarette retail landscape in the country. Of the total number of retailers recruited in the study (3308), Lusaka province stood out with the highest number of retailers, totalling 1,662, which accounted for 50.2%. This finding aligns with expectations, considering that Lusaka district serves as the capital and largest city of the country, with a higher population density. Conversely, provinces like Northern (66; 2.0%) and North-West (71; 2.15%) encompass smaller districts like Chavuma (16; 0.48%) and Nsama (17; 0.51%), exhibited a limited number of retailers. These figures indicate a concentration of retailers in urban provinces such as Lusaka, Copperbelt, and Eastern, while the more rural provinces had a lower retailer presence.

Table 3 Distribution of retailers by Province and District

Province/District	Retailers (n)	(%)
Central	125	3.78%
Mumbwa	55	1.66%
Serenje	70	2.12%
Copperbelt	269	8.13%
Chililabombwe	96	2.90%
Kitwe	67	2.03%
Mufulira	52	1.57%
Ndola	54	1.63%
Eastern	279	8.43%
Chadiza	26	0.79%
Chipata	70	2.12%
Katete	183	5.53%
Luapula	100	3.02%
Mwense	64	1.93%
Nchelenge	36	1.09%
Lusaka	1662	50.24%
Luangwa	51	1.54%
Lusaka	1575	47.61%
Shibuyunji	36	1.09%
Muchinga	204	6.17%
Isoka	46	1.39%
Nakonde	158	4.78%
North-west	71	2.15%
Chavuma	16	0.48%
Mufumbwe	55	1.66%
Northern	66	2.00%
Mbala	49	1.48%
Nsama	17	0.51%
Southern	419	12.67%
Chirundu	252	7.62%
Livingstone	130	3.93%
Zimba	37	1.12%
Western	113	3.42%
Mwandi	43	1.30%
Sesheke	70	2.12%
Total	3308	100.00%

Table 4 presents information on the number of retail outlets in Zambia and their respective percentages gathered from the Retailer Exit Interviews. The retail outlets are divided into four categories: Bar/Nightclub (stores where they sell alcoholic beverages), Brickstore (local stores made of brick and mortar), Kiosk/Tuntemba (like a tea cart or makeshift store), and Other (sources included a friend, a street vendor). According to the table, the largest category of retailers is Kiosk/Tuntemba, comprising a total of 2,105 outlets, which accounts for 63.63% of all retailers visited during the study in Zambia. The second largest category is Brickstores, with 517 outlets, representing 15.63% of all retailers. The Bar/Nightclub category had the fewest retailers, with only 203 outlets, making up 6.14% of the total. The Other category, which encompasses retailers not classified in the other three categories, consists of 483 outlets, representing 14.60% of all retailers.

Table 4 Categories of Retailers in Zambia

Retail Outlet	No. of Retailers	(%)
Bar/Nightclub	203	6.14%
Brickstore	517	15.63%
Kiosk / Tuntemba	2105	63.63%
Other	483	14.60%
Total	3308	100.00%

Table 5 displays the distribution of empty cigarette packs collected by retailers and street/bin vendors in Zambia, categorised by brand. Among the brands, Rothmans emerged as the most popular, with 48,172 packs, accounting for 40.7% of the total of 118,344 packs. Following closely behind was Stuyvesant, with 15,534 packs (13.1%), while wish had 12,641 packs obtained (10.7%), and Pall Mall had 11,734 packs (9.92%). Other brands yielded a smaller number of empty packs, with Consulate and Camel having the least representation, comprising 0.01% and 0.001% of the total of 118,344 packs, respectively.

Table 5 Distribution and Source of Collected Cigarette packs by brand name in Zambia.

Brand Name	Retailers (%) *	Street/bin (%) *	Total (100%)	% of all packs#
Rothmans	39320 (81.6)	8852 (18.4)	48172	40.7
Stuyvesant	13343 (85.9)	2191 (14.1)	15534	13.1
Wish	9838 (77.8)	2803 (22.2)	12641	10.7
Pall Mall	10130 (86.3)	1605 (13.7)	11735	9.9
Chelsea	7222 (89.6)	836 (10.4)	8058	6.8
Super Match	3711 (76.4)	1144 (23.6)	4855	4.1
Safari	3393 (71.3)	1369 (28.7)	4762	4.0
Other	2055 (86.2)	329 (13.8)	2384	2.0
Pacific Blue	1813 (89.4)	214 (10.6)	2027	1.7
Zark	1312 (81.3)	302 (18.7)	1614	1.4
Life	1017 (66.7)	507 (33.3)	1524	1.3
Liberty	933 (63.5)	536 (36.5)	1469	1.2
Pegasus	1037 (87.1)	154 (12.9)	1191	1.0
Viking	1032 (96.0)	43 (4.0)	1075	0.9
Guards	351 (50.5)	344 (49.5)	695	0.6
Dunhill	301 (83.8)	58 (16.2)	359	0.3
Time Change	162 (79.0)	43 (21.0)	205	0.2
Extra Royal	0 (0)	26 (100)	26	0.02
Consulate	14 (100)	0 (0)	14	0.01
Camel	2 (50.0)	2 (50.0)	4	0.001
Total (%)	96986 (82.0)	21358 (18.0)	118344 (100)	100

Footnote: * Row %; #Column %

Proportion of Illicit Cigarette Packs

Table 6 displays the frequency and percentage of legal and illicit cigarette packs by province and district in Zambia. As stated in methodology section, a cigarette pack was deemed illicit if it lacked any or all of the following: a textual health warning in English stating "TOBACCO IS HARMFUL

TO HEALTH," and a tax stamp from ZRA; however, packs meeting the above criteria would still be considered illicit if they had a duty-free stamp obtained from an unauthorized retailer, while packs with duty-free stamps found on the streets or in bins were considered legal for the study due to the inability to determine their place of purchase. The presented proportions of illicit is based on a combined criteria of all the above. Any cigarette pack that lacked any of these was deemed illicit.

Utilizing the defined criteria for identifying illicit cigarette packs as described above, the analysis was based on a sample of 118,344 cigarette packs which showed that 12.2% (14,428) of the packs collected were illicit while the rest 87.8% were classified as legal. Notably, there was significant variation observed in the prevalence of illicit packs across different regions in the country.

Western province had the highest proportion of illicit cigarette packs, with 1,260 packs (32%) out of a total of 3,936 packs collected. Lusaka province followed closely with the second highest proportion of illicit cigarette packs. Out of the 45,652 packs collected in the province, 11,233 packs (24.6%) were found to be illicit. Several other provinces also had notable proportions of illicit packs. Luapula province reported an illicit proportion of 18% (724 out of a total of 4,029 packs). The Southern province had 5.6% (760 packs) of its 13,582 packs classified as illicit. In the Central province, 3.4% (120 packs) out of 3,492 packs were found to be illicit. Lastly, the Northern province had 1.5% (40 packs) of its 2,644 packs identified as illicit.

Examining the district-level data, Sesheke district stood out as having the highest proportion of illicit cigarette packs. Out of a total of 2,515 packs, 1,021 were deemed illicit, accounting for 41% of the total. Following closely were a few other districts with notable proportions of illicit packs. Shibuyunji in Lusaka province had 40% of its 1,278 packs classified as illicit. Mwense district had 27% of its 2,630 packs deemed illicit, amounting to 709 packs. In Lusaka district, 25% of all 42,598 packs were illicit. Finally, in Mwandi district, 17% of the 1,421 packs were found to be illicit.

Among the nine (9) border districts, a total of 1,897 packs were classified as illicit, which represents 5.0% of the 37,671 total packs collected from those districts. On the other hand, in non-border districts, there were 12,531 illicit cigarette packs, accounting for 15.5% of the total 80,673 packs collected.

When considering urban districts such as Chipata, Kitwe, Livingstone, Lusaka, and Ndola together, the proportion of illicit packs was 15.3% (out of the total of 70,961 packs collected from these urban districts, 10,876 were deemed illicit). In contrast, rural districts accounted for a total of 7.5%, with 3,552 illicit packs out of the collective total of 47,383 packs collected from those districts.

Table 6 Frequency and proportion of licit and illicit cigarette packs by province and districts (total 118,344 packs)

Province/District	Retailer legal *	Retailer legal (%)	Retailer Illicit *	Retailer Illicit (%)	Street/Bin legal *	Street/Bin legal (%)	Street/Bin Illicit (%) *	All Legal (%) *	All Illicit (%) *	Total n Packs
Central	2881 (96.5)		106 (3.5)		491 (97.2)		14 (2.8)	3372 (96.6)	120 (3.4)	3492
Mumbwa	2123 (96.1)		86 (3.9)		212 (93.8)		14 (6.2)	2335 (95.9)	100 (4.1)	2435
Serenje	758 (97.4)		20 (2.6)		279 (100.0)		0 (0.0)	1037 (98.1)	20 (1.9)	1057
Copperbelt	19291 (99.5)		88 (0.5)		3034 (99.9)		4 (0.1)	22325 (99.6)	92 (0.4)	22417
Chililabombwe ^{&}	3155 (99.2)		24 (0.8)		444 (99.8)		1 (0.2)	3599 (99.3)	25 (0.7)	3624
Kitwe ⁺	7118 (99.4)		46 (0.6)		302 (99.0)		3 (1.0)	7420 (99.3)	49 (0.7)	7469
Mufulira ^{&}	3347 (100.0)		0 (0.0)		1498 (100.0)		0 (0.0)	4845 100)	0 (0.0)	4845
Ndola ⁺	5671 (99.7)		18 (0.3)		790 (100.0)		0 (0.0)	6461 (99.7)	18 (0.3)	6479
Eastern	9943 (98.8)		124 (1.2)		3459 (100.0)		0 (0.0)	13402 (99.1)	124 (0.9)	13526
Chadiza	862 (95.6)		40 (4.4)		382 (100.0)		0 (0.0)	1244 (96.9)	40 (3.1)	1284
Chipata ^{&,+}	7376 (99.2)		62 (0.8)		1891 (100.0)		0 (0.0)	9267 (99.3)	62 (0.7)	9329
Katete ^{&}	1705 (98.7)		22 (1.3)		1186 (100.0)		0 (0.0)	2891 (99.2)	22 (0.8)	2913
Luapula	2845 (79.8)		722 (20.2)		460 (99.6)		2 (0.4)	3305 (82.0)	724 (18.0)	4029
Mwense	1869 (72.5)		709 (27.5)		52 (100.0)		0 (0.0)	1921 (73.0)	709 (27.0)	2630
Nchelenge	976 (98.7)		13 (1.3)		408 (99.5)		2 (0.5)	1384 (98.9)	15 (1.1)	1399
Lusaka	29393 (74.3)		10152 (25.7)		5026 (82.3)		1081 (17.7)	34419 (75.4)	11233 (24.6)	45652
Luangwa	758 (98.3)		13 (1.7)		994 (98.9)		11 (1.1)	1752 (98.6)	24 (1.4)	1776
Lusaka ⁺	27944 (74.2)		9693 (25.8)		3961 (79.8)		1000 (20.2)	31905 (74.9)	10693 (25.1)	42598
Shibuyunji	691 (60.8)		446 (39.2)		71 (50.4)		70 (49.6)	762 (59.6)	516 (40.4)	1278
Muchinga	2964 (99.1)		26 (0.9)		1559 (99.6)		7 (0.4)	4523 (99.3)	33 (0.7)	4556
Isoka	941 (97.3)		26 (2.7)		250 (100.0)		0 (0.0)	1191 (97.9)	26 (2.1)	1217

Province/District	Retailer legal *	Retailer legal (%)	Retailer Illicit *	Retailer Illicit (%)	Street/Bin legal *	Street/Bin Illicit (%) *	All Legal (%)*	All Illicit *	Total n Packs
Nakonde ^{&}	2023 (100.0)		0 (0.0)		1309 (99.5)	7 (0.5)	3332 (99.8)	7 (0.2)	3339
North-West	3280 (98.8)		41 (1.2)		1188 (99.9)	1 (0.1)	4468 (99.1)	42 (0.9)	4510
Chavuma	1613 (99.7)		5 (0.3)		932 (100.0)	0 (0.0)	2545 (99.8)	5 (0.2)	2550
Mufumbwe	1667 (97.9)		36 (2.1)		256 (99.6)	1 (0.4)	1923 (98.1)	37 (1.9)	1960
Northern	1978 (98.1)		39 (1.9)		626 (99.8)	1 (0.2)	2604 (98.5)	40 (1.5)	2644
Mbala ^{&}	1468 (99.1)		13 (0.9)		280 (100.0)	0 (0.0)	1748 (99.3)	13 (0.7)	1761
Nsama	510 (95.1)		26 (4.9)		346 (99.7)	1 (0.3)	856 (97.0)	27 (3.0)	883
Southern	9942 (94.9)		536 (5.1)		2880 (92.8)	224 (7.2)	12822 (94.4)	760 (5.6)	13582
Chirundu ^{&}	2793 (85.3)		483 (14.7)		773 (78.6)	210 (21.4)	3566 (83.7)	693 (16.3)	4259
Livingstone ^{&} ,	4038 (99.0)		41 (1.0)		994 (98.7)	13 (1.3)	5032 (99.0)	54 (1.0)	5086
Zimba	3111 (99.6)		12 (0.4)		1113 (99.9)	1 (0.1)	4224 (99.7)	13 (0.3)	4237
Western	1915 (72.7)		720 (27.3)		761 (58.5)	540 (41.5)	2676 (68.0)	1260 (32.0)	3936
Mwandi	816 (82.7)		171 (17.3)		366 (84.3)	68 (15.7)	1182 (83.0)	239 (17.0)	1421
Sesheke ^{&}	1099 (66.7)		549 (33.3)		395 (45.6)	472 (54.4)	1494 (59.0)	1021 (41.0)	2515
Total	84432 (71.3)		12554 (10.6)		19484 (16.5)	1874 (1.6)	103916 (87.8)	14428 (12.2)	118344

Footnote: *Row %; [&]border towns

When examining the illicit proportions based on the source of collection (retailers or street/bins), out of the 96,986 packs collected from the retailers, 12,554 packs, accounting for approximately 13%, were illicit. Among the packs collected from the streets/bins, out of 21,358 packs, 1,874 packs, making up 9% of the total, were illicit.

Western and Lusaka provinces had the highest proportions of illicit cigarettes from retailers, with rates of 27.3% and 25.7% respectively. Luapula province followed closely behind, with 20.2% of all the collected packs being illicit. When considering districts, Shibuyunji in Lusaka province had the highest proportion of illicit cigarettes at 39.2%, closely followed by Sesheke district in the Western province with 33.3% of all packs being illicit. Mwense (in Luapula province) and Lusaka district had the third and fourth highest proportions, at 27.5% and 25.8% respectively. Among the packs collected from the street/bins, Sesheke had the highest proportion of illicit cigarettes at 54.4%, followed by Shibuyunji at 49.6%. The other two districts with noticeably higher proportions of illicit cigarettes from the same source were Chirundu and Lusaka districts, with rates of 21.4% and 20.2% respectively.

Table 7 presents the prevalence of illicit cigarette brands based on different criteria, including the presence of a textual health warning, textual health warning in English, duty-free stamp, and ZRA tax stamp. Out of the total 118,344 packs collected, 1792 (1.5%) did not have a Textual Health Warning. Additionally, of the total, 343 (0.3%) did not have a Textual Health Warning in English. Furthermore, out of the total 188,344 packs, 1490 (1.3%) had duty-free stamps, despite being purchased from retail outlets that were not duty-free shops. Lastly, 11,939 (10.1%) of the total packs did not have a ZRA stamp.

Of all the illicit packs (14,428) collected, 12.4% (1792) had no Textual Health Warning; 2.4% (343) had a Textual Health Warning that was not in English; 82.7% (11,939) had No ZRA Stamp and 10.3% (1490) had a Duty-free stamp. Some brands were deemed illicit based on more than one criterion. The most notable brand with no Textual Health Warning was Liberty (manufactured by Copper Leaf Tobacco). The label did not comply with the Zambia Public Health Statutory Instrument, which mandates a textual health warning stating, "Tobacco is harmful to health." Instead, the textual health warning on the Liberty cover read: "WARNING: DO NOT SMOKE NEAR CHILDREN" as shown in Figure 4. However, Liberty cigarette packs had ZRA stamps and were mostly sold in Sesheke, Western Province, a district sharing borders with Namibia, Botswana, and Zimbabwe. The "Other" brands also had a significant number of packs that did

not comply with this requirement, with many of these brands originating from India and China. Additionally, it should be noted that most of these warnings were not in English.

Table 7 Compliance of cigarette brands based on criterion.

Brand	Textual Health Warning		Textual Health Warning in English		Duty-free stamp ^a		ZRA Stamp		Combined (n=118,344)	
	No (%) *	Yes (%) *	No (%) *	Yes (%) *	No (%) *	Yes (%) *	No (%) *	Yes (%) *	All Legal (%) *	All Illicit (%) *
Camel	2 (50.0)	2 (50.0)	2 (50.0)	2 (50.0)	2 (100)	0 (0.0)	2 (50.0)	2 (50.0)	2 (050)	2 (50)
Consulate	0 (0.0)	14 (100)	0 (0.0)	14 (100.0)	14 (100)	0 (0.0)	0 (0.0)	14 (100)	14 (100)	0 (0.0)
Extra Royal	0 (0.0)	26 (100)	0 (0.0)	26 (100)	0 (0.0)	0 (0.0)	0 (0.0)	26 (100)	26 (100)	0 (0.0)
Time Change	3 (1.5)	202 (98.5)	3 (1.5)	202 (98.5)	162 (100)	0 (0.0)	151 (73.7)	54 (26.3)	54 (26.3)	151 (73.7)
Dunhill	0 (0.0)	359 (100)	0 (0.0)	359 (100)	286 (95.0)	15 (5.0)	18 (5.0)	341 (95.0)	341 (95)	18 (5.0)
Guards	0 (0.0)	695 (100)	0 (0.0)	695 (100)	349 (99.4)	2 (0.6)	2 (0.3)	693 (99.7)	691 (99)	4 1.0)
Viking	0 (0.0)	1075 (100)	0 (0.0)	1075 (100)	1032 (100)	0 (0.0)	1 (0.1)	1074 (99.9)	1,074 (98)	1 (2.0)
Pegasus	0 (0.0)	1191 (100)	0 (0.0)	1191 (100)	1020 (98.4)	17 (1.6)	5 (0.4)	1186 (99.6)	1,169 (98.2)	22 (1.8)
Liberty	1469 (100)	0 (0.0)	0 (0.0)	1469 (100)	922 (98.8)	11 (1.2)	0 (0.0)	1469 (100)	0 (0.0)	1,469 (100)
Life	4 (0.3)	1520 (99.7)	4 (0.3)	1520 (99.7)	1017 (100)	0 (0.0)	156 (10.2)	1368 (89.8)	1,368 (89.7)	156 10.3)
Zark	7 (0.4)	1607 (99.6)	7 (0.4)	1607 (99.6)	1310 (99.8)	2 (0.2)	708 (43.9)	906 (56.1)	904 (56)	710 (44)
Pacific Blue	2 (0.1)	2025 (99.9)	11 (0.5)	2016 (99.5)	1813 (100)	0 (0.0)	99 (4.9)	1928 (95.1)	1,928 (95)	99 (5.0)
Other	118 (4.9)	2266 (95.1)	133 (5.6)	2251 (94.4)	1992 (96.9)	63 (3.1)	1968 (82.6)	416 (17.4)	410 (17.2)	1,974 (82.8)
Safari	39 (0.8)	4723 (99.2)	39 (0.8)	4723 (99.2)	3388 (99.9)	5 (0.1)	75 (1.6)	4687 (98.4)	4,681 (98.3)	81 (1.7)
Super Match	18 (0.4)	4837 (99.6)	18 (0.4)	4837 (99.6)	3359 (90.5)	352 (9.5)	7 (0.1)	4848 (99.9)	4,478 (98.2)	377 (1.7)
Chelsea	0 (0.0)	8058 (100)	0 (0.0)	8058 (100)	6811 (94.3)	411 (5.7)	8058 (100)	0 (0.0)	0 (0.0)	8,058 (100)
Pall Mall	26 (0.2)	11709 (99.8)	22 (0.2)	11713 (99.8)	10082 (99.5)	48 (0.5)	81 (0.0)	11654 (99.3)	11,601 (98.8)	134 (1.2)
Wish	36 (0.3)	12605 (99.7)	36 (0.3)	12605 (99.7)	9818 (99.8)	20 (0.2)	353 (2.8)	12288 (97.2)	12,268 (97)	373 (3.0)
Stuyvesant	22 (0.1)	15512 (99.9)	22 (0.1)	15512 (99.9)	13073 (98.0)	270 (2.0)	63 (0.4)	15471 (99.6)	15,201 (97.9)	333 (2.1)
Rothmans	46 (0.1)	48126 (99.9)	46 (0.1)	48126 (99.9)	39046 (99.3)	274 (0.7)	192 (0.4)	47980 (99.6)	47,706 (99)	466 (1.0)
Total	1792 (1.5)	116552 (98.5)	343 (0.3)	118001 (99.7)	95496 (98.5)	1490 (1.5)	11939 (10.1)	106405 (89.9)	103,916 (87.8)	14,428 (12.2)

Footnote: *Row %; ^aAll cigarette packs from retailer that had a duty-free stamp are considered illicit and are therefore excluded from the calculation of legal packs. For cigarette packs collected from the street/bin that had a duty-free stamp, we do not know whether they were purchased locally or abroad and are therefore considered legal/illicit and included in the calculation of legal packs



Figure 4 Image of Liberty having a non-compliant textual health warning.

Regarding brands having a duty-free stamp and collected from retailers, Super Match had the highest proportions of duty-free stamps on it (9.5% of 3,711 packs of the brand), Chelsea (5.7% of 7,222 packs of the brand), and Dunhill (5.0% of 301 packs of the brand). For cigarette packs collected from the street/bins that had a duty-free stamp, it is unknown whether they were purchased locally or abroad, and thus they are considered legal and included in the calculation of legal packs. However, the brands categorized as "Other," had the highest proportion of packs with duty-free stamps, accounting for 61% of the total (200 out of 327 packs) being considered illicit. The remaining two brands had lower proportions of illicit packs. Wish had 3.6% (101 out of 2,803 packs) deemed illicit, while Super Match had a proportion of 1.4% (16 out of 1,144 packs collected) classified as illicit.

Regarding the criterion of having a ZRA tax stamp, 11,939 packs, accounting for 10.1% of all packs, did not comply with this requirement. The brand most observed without tax stamps was Chelsea (Figure 5), with 100% of all packs of this brand not complying. Chelsea cigarettes are manufactured by the Chelsea Tobacco Company, a global tobacco brand. Although the country of origin was not explicitly stated, the cigarettes being sold in Zambia were said to have been

imported from Zimbabwe. However, it is worth noting that Chelsea is one of the brands not registered for importation by the ZRA. Most Chelsea packs were obtained from retailers, primarily sold in Lusaka district at COMESA market. The “Other” brands (See Appendix 1) had approximately 83% of all packs failing to meet the tax law requirement. Bharath Special Beedies from India had the highest proportion of illicit packs among the “Others” cigarette brands. This brand is manufactured by an Indian Company Bharath Beedi Works. As with the Chelsea brand, most of the empty cigarette packs were collected from COMESA Market in Lusaka district. Time Change followed with 73.7% of all its packs lacking a ZRA stamp, and Zark had about 44% of all its packs without a ZRA tax stamp. Among the overall illicit proportion of 12.2%, the lack of a ZRA tax stamp contributed the most with 10.1 percentage points, while non-compliance with the textual health warning, textual health warning in English and having a duty-free stamp only contributed 2.1 percentage points to the overall illicit proportion.



Figure 5 Image of Chelsea without a ZRA tax stamp

Table 8 provides data on the sales of various cigarette brands in Zambia, focusing on both legal and illicit cigarettes packs from the two main sources. Among the listed brands, some had no recorded legal sales from retail outlets but had illicit packs collected from retailers. For example, Extra Royal shows no legal sales at retail outlets, but 26 cigarettes packs were sold illicitly from retailers. Other brands had a mixture of legal and illicit sales. Time Change, for instance, had 54 legally sold cigarettes at retail outlets, representing 33.3% of its sales, while 108 cigarettes were collected as illicit packs on the street, accounting for 66.7% of the total. Dunhill had most legal packs collected from retailers, with 94.0% legal packs from retail outlets and only 6.0% illicit packs from the same source. However, Zark had a relatively balanced distribution, with 52.0% of its cigarette packs being legal from retailers and 48.0% of the packs being illicit.

The most concerning data relates to brands such as Chelsea, Liberty, and Stuyvesant, which indicate a significant prevalence of illicit cigarette packs. Chelsea brand cigarette packs had no legal sales at retail outlets but recorded 7,222 illicit packs collected from the streets/bins. Liberty

had a similar pattern, with no legal packs from retail outlets but 933 illicit packs collected from the streets/bins. Stuyvesant had 13,016 legal cigarette packs collected from retailers with 327 illicit packs from the same.

Overall, the data from the table highlights the substantial issue of illicit cigarette trade in Zambia. It suggests that some brands have a significant proportion being sold illicitly. The distribution of illicit packs from retailers and streets/bins is uneven, with the higher proportions being the cigarette packs collected from retailers.

Table 8 Compliance of cigarette brands based on Source of packs.

Brand	Retail				Street				Combined				
	Legal (n)	Legal %*	Illicit (n)	Illicit %*	Legal (n)	Legal %*	Illicit (n)	Illicit %*	All Legal (n)	All Legal %*	All Illegal (n)	All Illegal %*	Total (n)
Camel	0	0.0%	2	100.0%	2	100.0%	0	0.0%	2	50.0%	2	50.0%	4
Consulate	14	100.0%	0	0.0%	0	0.0%	0	0.0%	14	100.0%	0	0.0%	14
Extra Royal	0	0.0%	0	0.0%	26	100.0%	0	0.0%	26	100.0%	0	0.0%	26
Time Change	54	33.3%	108	66.7%	0	0.0%	43	100.0%	54	26.3%	151	73.7%	205
Dunhill	283	94.0%	18	6.0%	58	100.0%	0	0.0%	341	95.0%	18	5.0%	359
Guards	348	99.1%	3	0.9%	343	99.7%	1	0.3%	691	99.4%	4	0.6%	695
Viking	1,031	99.9%	1	0.1%	43	100.0%	0	0.0%	1,074	99.9%	1	0.1%	1,075
Pegasus	1,015	97.9%	22	2.1%	154	100.0%	0	0.0%	1,169	98.2%	22	1.8%	1,191
Liberty	0	0.0%	933	100.0%	0	0.0%	536	100.0%	0	0.0%	1,469	100.0%	1,469
Life	1,012	99.5%	5	0.5%	356	70.2%	151	29.8%	1,368	89.8%	156	10.2%	1,524
Zark	682	52.0%	630	48.0%	222	73.5%	80	26.5%	904	56.0%	710	44.0%	1,614
Pacific Blue	1,742	96.1%	71	3.9%	186	86.9%	28	13.1%	1,928	95.1%	99	4.9%	2,027
Other	201	9.8%	1,854	90.2%	209	63.5%	120	36.5%	410	17.2%	1,974	82.8%	2,384
Safari	3,319	97.8%	74	2.2%	1,362	99.5%	7	0.5%	4,681	98.3%	81	1.7%	4,762
Super Match	3,348	90.2%	363	9.8%	1,130	98.8%	14	1.2%	4,478	92.2%	377	7.8%	4,855
Chelsea	0	0.0%	7,222	100.0%	0	0.0%	836	100.0%	0	0.0%	8,058	100.0%	8,058
Pall Mall	10,000	98.7%	130	1.3%	1,601	99.8%	4	0.2%	11,601	98.9%	134	1.1%	11,735

Wish	9,511	96.7%	327	3.3%	2,757	98.4%	46	1.6%	12,268	97.0%	373	3.0%	12,641	10.7
Stuyvesant	13,016	97.5%	327	2.5%	2,185	99.7%	6	0.3%	15,201	97.9%	333	2.1%	15,534	13.1
Rothmans	38,856	98.8%	464	1.2%	8,850	100.0%	2	0.0%	47,706	99.0%	466	1.0%	48,172	40.7
Total (N)%	84,432	71.3%	12,554	10.6%	19,484	16.5%	1,874	1.6%	103,916	87.8%	14,428	12.2%	118,344	100

Footnote: *Row %; #Column %

Table 9 summarises the prices of cigarette packs obtained from retailers by brand obtained from the retailer exit interviews. The most expensive brand based on the wholesale price per pack was Dunhill (36.00 ZMW and 2.50 ZMW per stick), followed by Pall Mall (17 ZMW), Stuyvesant (16 ZMW), and Zark (15.00 ZMW). The cheapest brands were Chelsea, Guards, and Super Match (8 ZMW). The most popular brand, Rothmans sold for 10 ZMW per pack at wholesale price and sales for 1 ZMW per stick or 20 ZMW per pack at retail price.

Table 9 Cigarette brands with the Manufacturers and prices

Brand Name	Manufacturers/Distributors	Wholesale price (ZMW)* /pack	Retail price (ZMW)/pack	Cost per stick (ZMW)
Camel	Japan Tobacco International Leaf	N/A	N/A	N/A
Chelsea	Chelsea Tobacco Company (Unregistered by ZRA)	8.00	20.00	1.00
Consulate	British American Tobacco (Zambia) Plc		20.00	1.00
Dunhill	British American Tobacco (Zambia) Plc	36.00	49.00	2.50
Extra Royal	British American Tobacco (Zambia) Plc	5.50	10.00	0.50
Guards	Roland Imperial Tobacco Company Limited	8.00	10.00	0.50
Liberty	Copper Leaf Tobacco Company	9.00	13.00	0.50
Life	Roland Imperial Tobacco Company Limited	9.00	12.00	0.60
Pacific Blue	Picton Management Company	9.00	14.00	0.50
Pall Mall	British American Tobacco (Zambia) Plc	17.00	24.50	1.00
Rothmans	British American Tobacco (Zambia) Plc	10.00	20.00	1.00
Safari	British American Tobacco (Zambia) Plc	10.00	24.00	1.00
Stuyvesant	British American Tobacco (Zambia) Plc	16.00	23.60	1.00
Super Match	Burundi Tobacco Company	8.00	11.30	0.50
Time Change	ZARK Cigarettes	12.50	22.00	1.00
Viking	Unknown	9.00	12.67	0.50
Wish	Mango Investments Tobacco Limited	8.50	12.98	0.50
Zark	ZARK Cigarettes	15.00	22.42	1.00

Footnote: *1 USD = 18 ZMW

DISCUSSION

Discussion

This study aimed to investigate the extent of illicit cigarette trade in Zambia by analysing quantitative data collected from empty cigarette packs. The specific objectives included determining the proportion of illicit cigarettes consumed in Zambia and assessing the level of tax evasion in the country. The data is nationally representative and captured the regional variations in illicit cigarette trade across Zambia. The study analysed a sample of 118,344 cigarette packs in Zambia and found that 12.2% of them were illicit. The prevalence of illicit packs varied across different regions and districts. Western province had the highest proportion of illicit packs at 32%, followed by Lusaka province at approximately 25%. Shesheke district within the Western province had the highest proportion of illicit packs at 41%. Border districts accounted for 5% of illicit cigarettes, while non-border districts accounted for 15%. Urban districts had a higher proportion of illicit packs (15%) compared to rural districts (7.5%). Illicit cigarettes were found both in retailers (approx. 13%) and in street/bins (9%). Western and Lusaka provinces had the highest proportions of illicit cigarettes from retailers at 27.3% and 25.7% respectively. Sesheke district had the highest proportion of illicit cigarettes from street/bins at 54.4%.

The study found that 1.5% of the cigarette packs analysed did not comply with the requirement of a textual health warning, with the Liberty brand being a notable offender. Around 0.3% of the packs had warnings in languages other than English, and many of the non-compliant brands originated from India and China. Furthermore, out of the overall 1,886 packs with a duty-free stamp on it, 79% (1,490) of these were obtained from retailers while the rest (396) were collected from the streets/bins. Out of the total number of packs (118,344), the proportion of illicit from this criterion was 1.5% of the packs had a duty-free stamp, mainly obtained from retailers within the country. Chelsea brand had the highest proportion of packs without tax stamps, and most Chelsea packs were sold in Lusaka district, particularly at COMESA market. Non-compliance with the ZRA tax stamp requirement accounted for 10.1% of the packs, with the Chelsea and "Other" brands being the main offenders. Among all the factors contributing to the illicit proportion of 12.2%, the lack of a ZRA tax stamp was the most significant.

There was a difference in the proportion of illicit cigarettes depending on the source: 82% of all the packs collected were from retailers and the rest from streets/bins. Illicit brands and packs were more prevalent among packs obtained from retailers (12.9%) compared to those collected from streets/bins (8.8%). A plausible reason for fewer packs being collected from the streets could

be due to the Keep Zambia clean campaign has significantly reduced litter on the streets, potentially contributing to a decrease in the number of packs.

Our illicit estimates are comparable to the global and lower-income countries' proportions of illicit cigarette tobacco trade. According to Joossens et al. (2010), available estimates of illicit cigarette trade vary between countries from 1% to about 40–50% of the market, 11.6% globally, 16.8% in low-income, and 9.8% in high-income countries. Whereas we had an overall proportion of illicit cigarettes of 12.2%, our estimates are notably lower than those of South Africa, which reported an illicit trade market of between 30% (5% under-reporting) and 34% (10% under-reporting) [2]. A similar study to ours was conducted in Ethiopia with a significantly smaller sample size of 6,438 empty cigarette packs collected from retailers and from the streets. Approximately 81.1% of the packs were legitimate products and the remaining 18.9% were illicit products. However, unlike our finding of a higher proportion of illicit packs among those collected from retailers when compared to those from the streets, the proportion of illicit packs was 19.6% (95 CI: 18.6, 20.7) among the packs collected in the street compared to 15.2% (95 CI: 13.1, 17.4) among packs collected from retailers [20].

More narrowly and specific to illicit cigarette trade, cigarette packs are identified as illicit if there is evidence that tax was not paid [21]. The prevalence of tax evasion/avoidance was 10.1% based on the cigarette packs that did not have a ZRA tax stamp. This estimate is more credible and representative than the one reported by the ITC – Zambia of 22% (based on a sample of 75 packs [22]) due to a more representative and larger sample size from our study. The market share of illicit cigarettes is lower than that reported in South Africa of approximately 30% based on pricing of cigarette brands [2,3]. Although our estimates are lower than that in the region, if left unchecked, may increase in proportion resulting in loss of revenue for the government and potential public health risk in the increase of smoking prevalence due to cheap cigarettes.

Strengths and Limitations

One of the major strengths of this study is its ability to generalise the results at a country level. The data was collected in a nationally representative manner, encompassing both border and non-border districts, urban and rural areas, different market conditions, and including the largest cities in Zambia. The sample size of 118,344 empty cigarette packs is sufficiently large for statistical power and making inferences. Additionally, this study provides the first contribution to understanding illicit cigarette trade in Zambia and identifies the key brands most notorious for such trade. It also highlights the locations where these illicit cigarettes are predominantly sold and emphasizes that tax evasion is the primary contributor to this trade. However, the relatively short

period of pack collections may have resulted in missing critical information on illicit trade. We couldn't determine whether there are differences in illicit cigarette trade from month to month or certain periods of the year such as during festivities in December. Moreover, we were unable to fully determine whether packs obtained from the streets or bins with a duty-free stamp were genuinely purchased from duty-free shops. Therefore, they were considered legal. Due to limitations in our methodology, we were unable to classify certain packs as illicit when the packaging indicated one brand while the cigarette sticks inside were of a different kind. For instance, we found several Rothmans packs containing Safari cigarette sticks.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

The data indicates a potential issue of illicit cigarette trade in Zambia, particularly concerning tax evasion within the cigarette market. This could result in potential revenue loss for the government if left unchecked and poses health risks to smokers, as these illicit cigarette packs may not adhere to the necessary health and safety regulations. They are also likely to be cheap and affordable thereby increasing the prevalence of smoking in the country. To summarise, the data reveals that 12.2% of cigarette packs being sold in Zambia are illicit. The significant prevalence in certain provinces, notably Lusaka, underscores the importance of intensifying efforts to combat the illegal sale of cigarettes.

Recommendations

It is essential for the Zambia Revenue Authority to take strict actions to curb tax evasion in the cigarette market to protect both public health and government revenue. The hotspots were clearly seen to be in Lusaka and the culprit brands have been identified to be mostly Chelsea and some illicit brands sold in Lusaka markets.

It is also imperative that the Ministries of Health and Local Government take keen interest in ensuring that the packaging of the cigarette brands have the correct warning labels that correctly sensitises the public of the harms and dangers of tobacco smoking. This also presents an opportunity to have a comprehensive tobacco control bill that will help regulate tobacco use.

Smoking rates are quite high due to low prices of cigarettes and the ability of retailers to sell single sticks. We therefore recommend the relevant authorities to ban the sale of single sticks of cigarettes and increase taxes to help reduce smoking which is a major risk factors for non-communicable diseases.

To safeguard both public health and the government's fiscal objectives, it's crucial to regularly monitor the scale of the illicit cigarette market in Zambia and take suitable measures to control it. The existence of illegal cigarettes in the market undermines these objectives, making it imperative to stay vigilant and take necessary actions.

We recommend that Zambia consider ratifying and implementing the WHO Protocol on Illicit Tobacco Trade (ITP) to counter the supply of illicit cigarettes. Ratification of the ITP would lead to the adoption of a track and trace (T&T) system, to ensure that taxes are collected on all legally

supplied packs in the market. It would also enable customs officers to use a powerful monitoring tool to detect counterfeit and smuggled cigarettes, a strategy that has been successfully implemented in other areas with promising results in dealing with illicit cigarette trade.

Lastly, the government should consider increasing tobacco taxes to generate higher revenues while also making cigarettes less affordable and addressing the public health burden of tobacco use. Contrary to common belief, evidence suggests that tax increases are not the reason for the presence of illicit trade, but rather weak law enforcement.

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