Cigarette health warning label compliance in Nigeria: A multi-city observational study

Oluwatomi F. Owopetu[1], Olubunmi Oladeinde[2], Joshua O. Esan[3], Michael Iacobelli[4], Israel Agaku[5], Akindele O. Adebiyi[6]

ABSTRACT

INTRODUCTION Tobacco remains the world's leading preventable cause of death, with the majority of tobacco-caused deaths occurring in low- and middle-income countries. The first global health treaty, the Framework Convention on Tobacco Control (FCTC), outlines a set of policy initiatives that have been demonstrated as effective in reducing tobacco use. Article 11 of the FCTC focuses on using the tobacco package to communicate tobacco-caused harms; it also seeks to restrict the delivery of misleading information on the pack about the product.

The objective of his study is to establish a surveillance system for tobacco packs in Nigeria to assess pack compliance with in-country health warning label requirements. The Tobacco Pack Surveillance System (TPackSS) monitors whether required health warnings on tobacco packages are being implemented as intended and identifies pack designs that might violate the communication of harm-related information and undermine the impact of the country's tobacco packaging laws.

METHODS Tobacco cigarette packs were collected in three cities in 2019–2020. The intention was, to the extent possible, to construct a census of 'unique' pack presentations available for purchase in Nigeria. We implemented the TPackSS standardized Protocol for acquiring packs from 36 diverse neighborhoods across three cities. At the time of purchase, data on the price and place of acquisition of each pack were recorded. We photographed packs, coded, and archived them. Each pack was coded for compliance according to the current health warning label laws. Each pack was coded by two independent coders consistently. We routinely measured intercoder reliability and only retained variables for which a good level of reliability was achieved.

RESULTS Across the three cities in Nigeria, the team collected 90 tobacco packs. Overall, 77% of packs evaluated for HWL compliance complied with all the relevant common indicators of HWL compliance. There was a 92% compliance with the location of the HWL (e.g. top or bottom of pack, front or back panel) with in-country requirements. Of the four compliance indicators, the size of the HWL (the minimum required coverage) showed the lowest compliance (31%) (i.e. the HWL was too small on most of the packs). Label elements (such as color contrast or content of warnings) showed 85% compliance overall.

CONCLUSIONS The analysis of the packs showed various levels of compliance with Health Warning Label provisions for Nigeria. Periodic evaluations are required to ensure that minimum requirements are met.

AFFILIATION
1 Department of Community Medicine, University College Hospital, Ibadan, Nigeria
2 Department of Community Medicine, Faculty of Public Health, University of Ibadan, Ibadan, Nigeria
3 Nigeria Tobacco Control Alliance, Nigeria
4 Department of Health, Behavior and Society, Institute for Global Tobacco Control, Johns Hopkins Bloomberg School of Public Health, Baltimore, United States
5 Department of Oral Health Policy and Epidemiology, Harvard School of Dental Medicine, Boston, United States
6 Department of Community Medicine, College of Medicine, University College Hospital, Ibadan, Nigeria

CORRESPONDENCE TO
Oluwatomi F. Owopetu. Department of Community Medicine, University College Hospital, Ibadan, Nigeria.
E-mail: oluwatomifunbi@gmail.com
ORCID ID: https://orcid.org/0000-0002-0921-5337

KEYWORDS
tobacco, cigarette packs, health warning labels, compliance, Nigeria

Received: 6 April 2021
Revised: 23 October 2021
Accepted: 19 March 2023

Published by European Publishing on behalf of the European Network for Smoking and Tobacco Prevention (ENSP).
© 2023 Owopetu O. F. et al. This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License. (https://creativecommons.org/licenses/by/4.0/)

INTRODUCTION

In 2004, Nigeria signed the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC). Nigeria subsequently ratified the Protocol in 2005[1]. Article 11 of the World Health Organization FCTC makes provisions for the packaging and labelling of tobacco products. However, the tobacco industry continues to use cigarette packs to retain consumers and attract new ones[1]. This phenomenon is more pronounced in parts of developing countries where enforcements are relatively weak, and the industry focuses its subtle marketing[2]. Research has shown that health warnings on cigarette brands aid in quitting, decrease initiation attempts, and reduce the appeal to younger people[2]. Nigeria introduced the implementation of compliance with specified standards for cigarette packaging in 2017, following the National Tobacco Control Act, signed into law in 2015[3]. The tobacco industry, as such, is responsible for altering its products' packaging to meet the current national and WHO FCTC standards.

Health Warning Labels (HWLs) are an important component of any comprehensive tobacco control program. The effectiveness of HWLs on tobacco packs is well documented: they increase knowledge of the harms of tobacco[4,5], increase intentions to quit and quit attempts among smokers[6-10], prevent relapse in former smokers[8,11], and prevent youth smoking initiation, although some studies show mixed results[12]. In comparison to text-only warnings, pictorial warnings are also more likely to be noticed[5,6,10,13,14], more effective in educating the public about the dangers of smoking[13-15], and increase quit intention[5,10,13,15-17].

Globally, there are variations in tobacco packaging and labelling requirements by country. At least 53 countries now require pictorial HWLs that cover 30% of the principal display areas of a pack[18]. Australia has implemented plain packaging with health warnings that cover 75% of the front of the pack and 90% of the back[18]. Nepal implemented pictorial warnings that cover 90% of the front and back of the pack[18]. Some Parties to the FCTC only meet minimal requirements – for 2011. Also, compliance with this varies across different tobacco product brands and within and between countries[2]. It is especially important to investigate compliance with country HWL requirements as tobacco companies are responsible for complying with HWL policies, unlike legislation regarding smoke-free places which is the responsibility of facility owners. Non-compliance with HWL best practices can result in poorer knowledge about the dangers of tobacco use, reduced quitting behaviors, and increased smoking initiation. Given that compliance with HWL practices is key to achieving the ultimate health goals of policy interventions, our research aimed to examine compliance with HWL requirements in Nigeria. While many countries have been able to monitor compliance with warning labels and packaging over time, Nigeria is yet to have such a review, hence the present study. This study aims to review the status of cigarette warning label compliance in three of the most populated cities in Nigeria across different neighborhoods (low-, middle- and high-income), using the Johns Hopkins School of Public Health (JHSPH) TPackSS methodology. The study also aims to describe pack design features that may violate the packaging laws in Nigeria. The study results will provide valuable compliance information, an assessment of the current disparities, and offer evidence-based recommendations for moving forward.

METHODS

We used a systematic protocol to collect packs and code HWLs[19]. Cigarette packs were purchased between December 2019 and January 2020. According to the TPackSS methods, to maximize the diversity of the sample of packs, we chose the most populous city and two other cities from the top 10 populous cities in Nigeria (considering geographical location, ethnicity, and religion). In all, 12 neighborhoods were selected from each of the three cities, for a total of 36 neighborhoods in the country of Nigeria. We deployed a mix of local and national sources, including census data, to create a sampling frame of high-, middle- and low-SES areas for each city. The 12 neighborhoods equally represented high-, middle-, and low-SES neighborhoods, 4 of each per city sampled. The Protocol required purchasing unique packs in one store in each of the 36 neighborhoods per country (fully described in the protocol paper for the study). At the first store in the first city, one of every unique cigarette pack was purchased. In each subsequent neighborhood, we purchased any unique packs that we had not yet

purchased. In total, we purchased 90 unique packs.

All of the 90 cigarette packs purchased had an HWL. To assess the compliance of each cigarette pack's HWL with country requirements, we adapted a codebook based on Nigeria's requirements regarding cigarette HWLs online from (http://globaltobaccocontrol.org/tpackss/resources).

We also reviewed FCTC Article 11 Guidelines[20] and compared countries' requirements for HWLs with those required and recommended by the FCTC implementation guidelines. Terms such as each Party 'shall adopt/shall require' or 'should mandate/should address' or 'should prohibit/should prevent' were interpreted as a requirement, whereas 'should consider' was interpreted as a recommendation. We looked at requirements and recommendations for health warning label location, size, use of pictorials and color, message content, language, and banning of misleading descriptors. For Nigeria, the requirements for the HWLs are: 1) for them to be in rotation, large, clear, visible, and legible; 2) should be ≥50% of the principal display areas but shall be ≥30% of the principal display areas; and 3) may be in the form of or include pictures or pictograms.

Global Adult Tobacco Survey (GATS) and Euromonitor country-level data were assessed in advance to identify the type of vendors where consumers purchase tobacco packs. Cigarette sales in Nigeria are mainly via the following channels: kiosks, street vendors, supermarkets, hotels, restaurants, and bars/clubs[4]. These four types of tobacco vendors were purposively selected based on their consumer purchasing and product distribution ranking among vendor types in the country. In the three cities, the first vendor visited was selected from a middle socioeconomic status (SES) neighborhood. Within each neighborhood, data collectors identified a 'hub' (transit center, major shopping center, source of commerce, etc.) where they first travelled to. Data collectors followed the TPackSS vendor selection and walking protocol. In the case that unique packs were not found at the first vendor, data collectors visited up to four vendors in each neighborhood until at least one unique pack was found. The neighborhoods visited in the three states in Nigeria are shown in Supplementary file Table 1.

Two coders used the codebook to independently code each pack that had an HWL in the current rotation from the city in which the pack was purchased (n=90) for health warning compliance. Any discrepancies between coders were resolved by a third coder. Our team measured packs with standardized rulers, and we rounded-off measurements to the nearest millimeter (mm). We had mostly the exact measurements, a difference of 1 mm was averaged for discrepancies, and when higher, we involved a third reviewer. Quality checks were also done to ensure the accuracy of entered data, especially the measurements.

We applied up to four common indicators for HWL compliance that were relevant for Nigeria based on in-country regulations: 1) health warning location (top, bottom, front, and/or back); 2) health warning size (percent coverage); 3) health warning elements (e.g. text color, background color, borders); and 4) health warning text size. We assessed compliance with each applicable indicator. We also determined a summary measure of compliance: an HWL was determined to be compliant overall if it was compliant with all applicable indicator measures. To estimate the level of inter-rater reliability for the binary variables, we assessed percent agreement as well as the prevalence-adjusted and bias-adjusted kappa (PABAK) statistic to account for the low prevalence of our binary outcomes[21-23]. For the continuous variables, including height and width of the pack and warning label area, and height of warning text, to the millimeter (mm), we used percent agreement[24]. We used descriptive statistics to examine the nature and extent of HWL compliance.

We assessed compliance by SES of the neighborhood, pack shape, stick count, parent company (three major transnational parent companies), and brand family (the five brands with

Table 1. Health warning label compliance by the indicator (%), by city, 2020

Site	Compliance with all four indicators	Location	Size	Label elements	Text
Overall (Nigeria)	77	92	31	85	97
Ibadan	66	100	38.9	100	100
Kano	75	100	28	81	91
Lagos	69	75	25	75	100

the highest frequency in our sample). All analyses were conducted using Microsoft Excel. To determine if there was bias introduced into our compliance estimates due to the Protocol that required a large purchase at the first store – which often occurred in a high SES neighborhood – we used Pearson's chi-squared tests to assess statistically significant differences.

Data collection tools

The TPackSS codebooks and manuals on health warning compliance and pack features were used to guide data collection.

Training of team members

Research assistants for the project were trained using the TPackSS codebooks, coding manuals, field selection protocols, and vendor walking protocols. They were trained for five days.

RESULTS

Inter-rater reliability

The reliability of the coders' assessments was excellent. For the binary variables, the average percent agreement was 99% and the average PABAK was 0.98. The average agreement for continuous variables was 74% with a range 66–88%.

Compliance

A total of 69 (76.7%) of the packs in our sample were manufactured by the top four multinational tobacco parent companies (Supplementary file Table 2).

Overall, 77% of the packs evaluated for HWL compliance complied with all the relevant common indicators of HWL compliance (Table 1). There was a 92% compliance of the location of the HWL (e.g. top or bottom of pack, front or back panel) with the country requirements. Of the four compliance indicators, the size of the HWL (the

Table 2. Comparison of FCTC Article 11 Guidelines requirements and recommendations to country requirements

	Ibadan	*Kano*	*Lagos*
Location requirements			
Front and back	Yes	Yes	Yes
Opening does not damage and conceal HW	Yes	Yes	Yes
HW location recommendations			
HW messages on all panels and inserts/onsets	Partly	Partly	Partly
HW messages not obstructed by other required markings	Yes	Yes	Yes
Size requirements			
Should be ≥50% but shall be ≥30% of the PDA	Partly	Partly	Partly
Text of HW bold, legible font size	Yes	Yes	Yes
Size recommendations			
30–50% coverage of PDA	Yes	Yes	Yes
Color requirements			
Contrasting colors for the background of text for text-based elements of warning	Yes	Yes	Yes
Message content requirements			
HW message addresses different issues related to tobacco use, in addition to harmful health effects (e.g. cessation, addictiveness, etc.)	No	No	No
Language requirements			
HW appear in the principal language or languages	Yes	Yes	Yes
Misleading/deceptive packaging requirements			
Packaging must not promote terms, signs that create a false impression that the product is less harmful than others	Partly	Partly	Partly
Prevent display of expiry dates	No	No	No

PDA: principal display area. Yes: all packs from the city comply. No: no pack in the city complied. Partly: some packs from the city complied.

minimum required coverage) showed the lowest compliance (31%) (i.e. the HWL was too small on most of the packs). Label elements (such as color contrast or content of warnings) showed 85% compliance overall. For labels that specified a text size, compliance was high (97%). There was no statistically significant difference in compliance by the SES neighborhood in each city. There was no statistically significant difference in compliance by pack shape (traditional, wide, or narrow style packs). We had more than one pack shape, wide packs (width to height ratio of 3:2) were less likely to be compliant than traditional packs (width to height ratio of approximately 2:3).

Compliance by parent companies varied. Packs with the highest compliance were those by British American Tobacco and KTG in Lagos. While in Ibadan, packs with the highest HWL compliance were those from PMI, Gulbahar, Oriental GT, and JT international. Compliance with health warning labels varied across the three cities (Table 1) and this was statistically significant.

Additional compliance-related issues

Nigeria has very detailed requirements (Table 2) for their HWLs, but on some packs they were not strictly adhered to. There were also differences in text warning size, font, and formatting across packs. We observed differences in aspect ratios which affected how the picture warnings appeared on the packs. Some warnings were written in English, others in local languages.

Compliance by initial store

Compliance was not different for packs purchased in the first store compared to packs purchased in all other stores in the country.

DISCUSSION

Our findings suggest that cigarette manufacturers are often not fulfilling all their obligations regarding HWLs on cigarette packs. Compliance with HWL requirements varied across cities. That compliance varies by city may be due in part to the country's ability to enforce its laws more generally or the level of tobacco industry interference in a country. There was high compliance for the location of the warning, but, overall, few of the HWLs on the cigarette met Nigeria's size requirements. This is concerning, especially given the preponderance of the evidence that HWLs are more effective when they are bigger[16]. Compliance was not different for packs purchased in the first store compared to packs purchased in all other stores in the country. This suggests that the estimates of compliance were not influenced by choice of the index store. Further, overall compliance varied by parent company and brand family. Few packs manufactured by KT&G were compliant, but even BAT – which had the overall highest compliance – produced packs that were not fully compliant. While some of these non-compliant packs may be counterfeit, it is up to the manufacturers to protect their brands.

Countries need to monitor regularly whether manufacturers are adhering to HWL requirements and hold manufacturers accountable when they do not. While HWLs must comply with their country's requirements to maximize the public health impacts of HWLs, high compliance with policies that involve inadequate requirements is also a key issue to be addressed. At minimum, Nigeria should enforce compliance with in-country requirements and strengthen a surveillance system for tobacco products. Moving to higher coverage and pictorial warnings would also better inform people in Nigeria about the danger of tobacco products.

Strengths and limitations

A key strength of the study is the large number and diverse range of packs assessed for HWL compliance across the largest cities in Nigeria. The study is novel and relevant in Nigeria yet has some limitations, including the potential for inconsistencies in data capture and entry. While we used a rigorous and systematic protocol to purchase cigarette packs, our sampling strategy aimed to maximize the diversity of the packs obtained. Thus, the compliance rates we present here are for a diverse sample of unique packs and do not necessarily translate to compliance for the brands most often purchased or consumed in Nigeria. Also, the packs were bought in three populous cities in Nigeria; HWL compliance in other cities or rural areas might be different. Lastly, the systematic Protocol to purchase cigarette packs was used to maximize the diversity of packs obtained within a country and may be different from the diversity of packs that are

available within other neighborhoods with the same SES and in other states in Nigeria.

CONCLUSIONS

The analysis of the packs showed various levels of compliance with Health Warning Label provisions for Nigeria. Periodic evaluations are required to ensure that minimum requirements are met.

REFERENCES

1. Egbe CO, Bialous SA, Glantz S. Framework Convention on Tobacco Control Implementation in Nigeria: Lessons for Low- and Middle-Income Countries. Nicotine Tob Res. 2019;21(8):1122-1130. doi:10.1093/ntr/nty069
2. Cigarette Package Health Warnings and Interest in Quitting Smoking — 14 Countries, 2008–2010. MMWR Morb Mortal Wkly Rep. 2011;60(20):645-651. Accessed December 2, 2020. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6020a2.htm
3. Ezeamalu B. Nigeria introduces 9 new regulations to limit tobacco use (FULL LIST). The Premium Times, Nigeria. June 1, 2017. Accessed September 2, 2020. https://www.premiumtimesng.com/news/top-news/232735-nigeria-introduces-9-new-regulations-to-limit-tobacco-use-full-list.html?tztc=1
4. Hammond D, Fong GT, McNeill A, Borland R, Cummings KM. Effectiveness of cigarette warning labels in informing smokers about the risks of smoking: findings from the International Tobacco Control (ITC) Four Country Survey. Tob Control. 2006;15(Suppl 3):iii19-25. doi:10.1136/tc.2005.012294
5. Kennedy RD, Spafford MM, Behm I, Hammond D, Fong GT, Borland R. Positive impact of Australian 'blindness' tobacco warning labels: findings from the ITC four country survey. Clin Exp Optom. 2012;95(6):590-598. doi:10.1111/j.1444-0938.2012.00789.x
6. Hammond D, Fong GT, McDonald PW, Cameron R, Brown KS. Impact of the graphic Canadian warning labels on adult smoking behaviour. Tob Control. 2003;12(4):391-395. doi:10.1136/tc.12.4.391
7. Azagba S, Sharaf MF. The effect of graphic cigarette warning labels on smoking behavior: evidence from the Canadian experience. Nicotine Tob Res. 2013;15(3):708-717. doi:10.1093/ntr/nts194
8. White V, Webster B, Wakefield M. Do graphic health warning labels have an impact on adolescents' smoking-related beliefs and behaviours? Addiction. 2008;103(9):1562-1571. doi:10.1111/j.1360-0443.2008.02294.x
9. Fathelrahman AI, Omar M, Awang R, et al. Smokers' responses toward cigarette pack warning labels in predicting quit intention, stage of change, and self-efficacy. Nicotine Tob Res. 2009;11(3):248-253. doi:10.1093/ntr/ntn029
10. Borland R, Yong HH, Wilson N, et al. How reactions to cigarette packet health warnings influence quitting: Findings from the ITC four-country survey. Addiction. 2009;104(4):669-675. doi:10.1111/j.1360-0443.2009.02508.x
11. Partos TR, Borland R, Yong HH, Thrasher J, Hammond D. Cigarette packet warning labels can prevent relapse: findings from the International Tobacco Control 4-Country policy evaluation cohort study. Tob Control. 2013;22(e1):e43-e50. doi:10.1136/tobaccocontrol-2011-050254
12. Noar SM, Francis DB, Bridges C, Sontag JM, Ribisl KM, Brewer NT. The impact of strengthening cigarette pack warnings: Systematic review of longitudinal observational studies. Soc Sci Med. 2016;164:118-129. doi:10.1016/j.socscimed.2016.06.011
13. Li J, Grigg M. New Zealand: new graphic warnings encourage registrations with the quitline. Tob Control. 2009;18(1):72. doi:10.1136/tc.2008.027649
14. Thrasher JF, Hammond D, Fong GT, Arillo-Santillán E. Smokers' reactions to cigarette package warnings with graphic imagery and with only text: a comparison between Mexico and Canada. Salud Publica Mex. 2007;49(Suppl 2):S233-S240. doi:10.1590/s0036-36342007000800013
15. Elton-Marshall T, Xu SS, Meng G, et al. The lower effectiveness of text-only health warnings in China compared to pictorial health warnings in Malaysia. Tob Control. 2015;24 (Suppl 4):iv6-iv13. doi:10.1136/tobaccocontrol-2015-052616
16. Thrasher JF, Rousu MC, Hammond D, Navarro A, Corrigan JR. Estimating the impact of pictorial health warnings and "plain" cigarette packaging: evidence from experimental auctions among adult smokers in the United States. Health Policy. 2011;102(1):41-48. doi:10.1016/j.healthpol.2011.06.003
17. Kees J, Burton S, Andrews JC, Kozup J. Understanding how graphic pictorial warnings work on cigarette packaging. J Public Policy Mark. 2010;29(2):265-276. doi:10.1509/jppm.29.2.265
18. COMPARE COUNTRIES. Tobacco Control Laws. Accessed January 4, 2020. https://www.tobaccocontrollaws.org/legislation/compare-countries?policy=packaging-labeling&countries=australia,nepal
19. Smith K, Washington C, Brown J, et al. The Tobacco Pack Surveillance System:A Protocol for Assessing Health Warning Compliance, Design Features, and Appeals of Tobacco Packs Sold in Low- and Middle-Income Countries. JMIR Public Health Surveill. 2015;1(2):1-14. doi:10.2196/publichealth.4616
20. Guidelines for Implementation of Article 11. WHO Framework Convention on Tobacco Control. January 1, 2013. Accessed October 23, 2022. https://fctc.who.int/who-fctc/overview/treaty-instruments/packaging-and-labelling-of-tobacco-products
21. Cohen J. A coefficient of agreement for nominal

scales. Educ Psychol Meas. 1960;20(1):37-46. doi:10.1177/001316446002000104
22. Byrt T, Bishop J, Carlin JB. Bias, prevalence, and kappa. J Clin Epidemiol. 1993;46 (5):423-429. doi:10.1016/0895-4356(93)90018-V
23. Lantz CA, Nebenzahl E. Behavior and interpretation of the kappa statistic: resolution of the two paradoxes. J Clin Epidemiol. 1996;49(4):431-434. doi:10.1016/0895-4356(95)00571-4
24. Krippendorff K. Estimating the reliability, systematic error, and random error of interval data. Educ Psychol Meas. 1970;30(1):61-70. doi:10.1177/001316447003000105

AKNOWLEDGMENTS
We acknowledge the Johns Hopkins Institute for Tobacco Control that has made available their tobacco pack surveillance methods and tools easily accessible for use worldwide.

CONFLICTS OF INTEREST
The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none was reported.

FUNDING
There was no source of funding for this research.

ETHICAL APPROVAL AND INFORMED CONSENT
Ethical approval and informed consent were not required for this study.

DATA AVAILABILITY
The data supporting this research are available from the authors on reasonable request.

PROVENANCE AND PEER REVIEW
Not commissioned; externally peer reviewed.

AUTHORS' CONTRIBUTIONS
OFO: conceptualized the study and wrote the first draft. OO, JOE and OFO were involved in data collection, entry, and analysis. MI, IA and AOA made inputs from the conceptualization phase, reviewed the drafts, and made corrections. All authors approved the final manuscript.