Multidisciplinary Journal of Psychology and Sociology
Volume 12 Issue 2, April – June 2025
ISSN: 2995-3766
Impact Factor: 7.92
https://kloverjournals.org/index.php/ps

SMOKING CESSATION IN NIGERIA: PERSPECTIVES FROM SELF-REPORTED EXPERIENCES

Morris Alexander Dean
Geospatial Research Unit, the Olympus Consciousness Initiative
DOI:https://doi.org/10.5281/zenodo.15516655

Abstract: Smoking is the largest cause of preventable health problems and premature death worldwide, and about 80% of the world's 1.3 billion tobacco users live in low- and middle-income countries. Tobacco smoking prevalence in Nigeria was 10.4% and it is estimated that there are about 20 million active smokers in the country. This study investigated the spatial pattern of selfreported smoking in order to determine potential targets for smoking cessation campaigns in Nigeria, utilizing a nationally representative dataset. This was a crosssectional study aimed at investigating the spatial pattern of self-reported smoking as a means of determining where smoking cessation campaigns should be targeted in Nigeria, using spatial analysis and descriptive statistics to examine data from the first round of the Nigeria-National Survey on Drug Use and Health. The results indicated that over 80% of selfreported smokers were male, and young people aged 20-39 were majority (53.8%).
Crop farming (24.7%) was the dominant profession. Benue (10.0%), Bauchi (6.3%), and Edo (5.5%) States had the highest number of smokers, and Ekiti (1.6%), Kano (1.3%), and Jigawa (0.7%) States had the least numbers. Self-reported smokers in the country tended towards clustering (Moran *I*=.126), and whereas Benue State was the hot-spot of smokers in the country, Katsina, Kano, and Kaduna States formed the cold spot. This study identified the age range, the predominant occupation, and the location of most smokers in the country, making possible focused smoking cessation interventions. However, a one-size-fits-all smoking cessation policy might not work in the country given the heterogeneous distribution of smokers.

Keywords: Smoking cessation, Tobaccouse, Self-reported Smoking, Spatial analysis, Nigeria

Introduction

Smoking poses a significant public health hazard, leading to numerous preventable health problems and premature deaths worldwide. Approximately 80% of the world's 1.3 billion tobacco users reside in low- and middle-income countries (LMICs) (WHO, 2023). Tobacco-induced morbidity represents a substantial global health burden (Le Foll et al., 2022), contributing to various diseases such as cardiovascular diseases, respiratory diseases, different types of cancer, and reproductive complications (West, 2017).

In 2019, tobacco smoking prevalence in Nigeria was put at 10.4% (Adeloye et al., 2019). In 2015, the pooled mean cigarette consumption per person per day in the country was 10.1, accounting for 110 million cigarettes per day and over 40 billion cigarettes consumed (Adeloye et al., 2019). In a systematic

review of tobacco use among youths in the country, Oyewole et al. (2018) found that prevalence rates of tobacco smoking among Nigerian youths ranged from 0.2% to 32.5%.

Even though a significant number of smokers in Nigeria have attempted to quit smoking at some point (Ilesanmi et al., 2020), the country currently lacks nationally approved clinical guidelines for tobacco dependence treatment (Akande-Sholabi et al., 2021). In a systematic review of tobacco smoking cessation services in Africa, Ilesanmi et al. (2021) discovered that while 35.0% to 83.0% of healthcare workers frequently advised their patients to quit smoking, only 17.0% of them had specific guidelines for smoking cessation. Moreover, a mere 14.9% of healthcare workers actually assisted patients in the process of smoking cessation.

In a study (Vilane et al., 2022) that examined the socio-economic determinants of smoking cessation behavior among smokers in four African countries (Ethiopia, Kenya, Senegal and Tanzania) using data from the Global Adult Tobacco Survey (GATS) conducted between 2014-2018, previous quit attempts among smokers ranged from 39.6% to 53.7% across the four countries. While 7.6% to 15.8% tried to quit with assistance; 76.5% of current smokers in Ethiopia, 56.7% in Kenya, 63.3% in Tanzania and 50.4% in Senegal reported no intention to quit in the next 12 months of the study. Females, those in the poorest wealth index, the unemployed, and those without formal education, had significantly lower odds of previous quit attempts or intention to quit. Thus, socio-economic vulnerabilities compromise smoking cessation behavior in these countries, like in many LMICs. However, smoking cessation studies in Nigeria have largely focused on healthcare professionals (Nollen at al., 2004; Aina et al., 2009; Odukoya et al., 2016; Kuye at al., 2021; Akande-Sholabi et al., 2022).

While geography is central to epidemiological study (Rezaeian et al., 2007), very few, if any, of the studies on smoking in Nigeria have adopted a spatial analysis approach (Onoh et al., 2021; Itanyi et al., 2020; Udokanma et al., 2021; Adeoye, 2022), which makes intervention effective by the identification of areas in need. Additionally, self-reported smoking has not been extensively studied in the country (Ozoh et al., 2014; Iloh & Collins, 2017). Self-reported smoking serves as a valuable tool for identifying potential tobacco-induced morbidities (Fu et al., 2019). It provides critical information that can guide targeted smoking cessation interventions and public health initiatives to reduce the impact of tobacco-induced diseases (Onor et al., 2017). The spatial analysis of smoking data can prove helpful in smoking cessation campaigns, as it can offer valuable insights into the distribution
and patterns of the phenomenon, informing policy development and evaluation
(Vallarta-Robledo et al., 2021), and where to concentrate interventions.

Vallarta-Robledo et al. (2021) assessed the spatial dependence of daily tobacco consumption and its spatial impact by individual and neighborhood socioeconomic determinants, as well as tobacco consumption facilities, both before and after smoke-free policy implementation, using self-reported data from the Bus Santé study. The study found that in Geneva, daily tobacco consumption was not randomly distributed. Tobacco retail density and smoking prevalence remain elevated in marginalized communities, underscoring the need for strategies to address these place-based disparities. Using hospital admission records of residents with a history of smoking, in their study on the variation of smokers and tobacco retailers in New Castle County, Delaware, Brooks and Siegel (2021) found that

current smokers experience greater tobacco retail exposure and clustering compared to former smokers. Examining the proximity of tobacco retailers to the city's public schools in Worcester, Massachusetts, Caywood (2017) found that those in low-income neighborhoods tend to have a greater number of tobacco sales outlets in the immediate area than schools in more affluent neighborhoods; and proximity to tobacco sales outlets is a known factor in smoking rates for both adults and children. In linking cigarette smoking data from the 2012 Behavioral Risk Factor Surveillance System (BRFSS) Selected Metropolitan Area Risk Trends (SMART) dataset to seven social and physical environmental characteristics from several county datasets, Caraballo et al. (2019) identified a significant association between adult cigarette smoking and countylevel social and physical environmental factors. Utilizing baseline data from a home intervention study involving 139 children (8–17 years) with asthma in Baltimore City, Kaviany et al. (2023) identified 1331 tobacco outlets in the city. On average, there were six tobacco outlets within a 500 m radius of each participant's home. The increased density of tobacco outlets was associated with higher levels of bedroom air nicotine and serum cotinine, adversely affecting the health of asthmatic children in the neighborhoods.

All these studies have contributed to tobacco control efforts in the identified cities, but none is based in an LMIC. Hence, this study employed spatial analysis methods to investigate the spatial pattern of selfreported smoking in order to determine potential targets for smoking cessation campaigns in Nigeria, utilizing a nationally representative dataset.

Methods

Study area

Nigeria is situated on the western coast of Africa, boasting a diverse geography and a population exceeding 230 million people (WHO, 2022). It stands as the most populous country in Africa, comprised of 36 states and a Federal Capital Territory (FCT). As of 2019, it has a tobacco smoking prevalence of 10.4% (Adeloye et al., 2019), which
translates to over 20 million active smokers.

Survey sampling technique

The data for this study were extracted from the first round of the Nigeria National Survey on Drug Use and Health (NNSDUH) (NBS, 2021)). The survey was conducted by the National Bureau of Statistics (NBS) and the Centre for Research and Information on Substance Abuse (CRISA), with technical support from the United Nations Office on Drugs and Crime (UNODC) and funding from the European Union (EU). It marked the first comprehensive nationwide drug-use survey in the country, divided into three parts: The National Household Survey on Drug Use and Health (NHSDUH), the National Survey on Problem Drug Use (NSPDU), and the Key Informant Survey (KIS). Covering all 36 states of the Federation and the FCT, the survey interviewed 38,850 households spread across rural and urban areas for NHSDUH, 9,344 problem drug users for NSPDU, and 2,787 individuals for the KIS. Nevertheless, it is regrettable that no new NNSDUH has taken place since, denying the country up-to-date comprehensive nationwide data on drug-use.

The survey employed a two-stage cluster sampling design. In the first stage, 70 enumeration areas (EAs) were chosen in each of the 36 states and the FCT—giving a total of 2,590 EAs across the country. For the second stage of selection, 15 housing units (HUs) were selected per EA and one household (HH) interviewed from each HU. If an HU has more than one HH, the KISH GRID method was used to determine the household to interview. Overall, 1050 HHs were interviewed in each state, and a total of 38,850 HHs were interviewed countrywide.

To account for potential issues with noncoverage in the selected EAs, the following measures were taken: 1) Five additional EAs were designated for each state in case of any necessary replacements; 2) Communication with the supervisor and State officer occurred before any replacements were made; and 3) Replacements were implemented if an EA was inaccessible or located in a high-risk area (i.e., a conflict or crisis area).

While the specific inclusion criteria to select participants were: 1) selecting households from all 36 states and the FCT, ensuring representation from both urban and rural areas, 2) only respondents aged 15 years and older were eligible to participate in the survey, and 3) participants had to provide informed consent to be included in the study, the exclusion criteria was: 1) individuals who were not permanent residents of the selected households were debarred from participation, and 2) individuals younger than 15 years were not included in the survey.

The questionnaires used in the NNSDUH were pilot-tested in 480 households across the six geopolitical zones of the country, selecting one state from each zone. The pilot testing phase included two levels of training: The Training of Trainers (TOT) and the Training of Field Staff/Enumerators (TOE). This approach was designed to ensure the effectiveness and reliability of the data collection process, thereby enhancing

the quality of the survey. Although specific percentages of the population involved in the pilot testing were not provided, the number of households covered was sufficient to facilitate adequate planning for the survey and the finalization of the survey instrument.

Even though the exact sample size calculation formula is not provided, the NHSDUH's sample size was meticulously calculated to ensure comprehensive coverage, statistical reliability, and relevance for policy-making, reflecting the complexity of drug use issues in Nigeria. A sample size of 38,850 households was chosen to ensure adequate representation of both urban and rural populations. A large sample size was necessary to capture the diversity of drug use patterns across different demographic groups, including variations by gender, age, and socio-economic status. A larger sample size increases the statistical power of the survey, allowing for more precise estimates of drug use prevalence and enabling the detection of differences across subgroups within the population. The large sample size was crucial for formulating effective drug policies and interventions tailored to specific groups.

Data analysis

This was a cross-sectional study using data from the first round of the Nigeria National Survey on Drug Use and Health. All respondents who answered the question "Do you currently smoke/use tobacco?" in the affirmative were extracted from the NHSDUH section of the survey (NBS, 2021). They were then stratified based on Gender, Age Group, Marital Status, Literacy, Educational Level, Employment, and

Job Types. The percentage of self-reported smokers for each of the 36 states of the country and the FCT was determined and mapped.

The Moran's test was employed to investigate the spatial dependence of smoking at the state level. The test generates a statistic (*I*) ranging between -1 and 1 (Anselin, 1995). A global Moran's statistic of 1 indicates perfect positive spatial autocorrelation, while values between 0 and 1 suggest that the phenomenon being considered is clustered. A statistic of 0 implies that the data is randomly distributed, while -1 indicates negative spatial autocorrelation; and, to determine the significance of the statistic, a simple hypothesis test to calculate a z-score and its associated p-value is done (Abdulhafedh, 2017; Brunsdon & Comber (2015). To ascertain whether smokers are geographically clustered in the country, the local Moran statistic and the percentage smoker variable were centered about their individual means and reclassified, resulting in two new variables. Utilizing the method and codes provided by Brunsdon & Comber [34], these two variables were combined to create data quadrants. These quadrants were then mapped to reveal the types of relationships each state shares with its neighbors. These relationships could be classified as follows: insignificant (no clusters), low-low (states with low values surrounded by other states with equally low values), low-high (states with low values surrounded by states with high values), high-low (states with high values surrounded by
other states with low values), or high-high (states with high values surrounded by other states with equally high values) (Brunsdon & Comber, 2015).

Ethical approval

This study made use of a secondary dataset in the public domain. Thus, there was no need for formal ethical approval. Nevertheless, the National Health Research Ethics Committee of Nigeria (NHREC) granted approval for the NHSDUH (Approval Numbers

Results

Table 1:

NHREC/01/01/2007-18/05/2016) and the
NSPDU and the KIS (Approval Numbers NHREC/01/01/2007-20/03/2017).All participants interviewed were requested to provide verbal informed consent before the commencement of the study. Participation in the survey was completely voluntary, and participants were not obliged to answer all of the questions if they do not wish, and were at liberty to end the interview at any point.

Socio-demographic characteristics of smokers

Characteristics	Categories	Cases	%
Gender	Male	1176	84.1
	Female	212	15.2
Age Group	18-19	73	5.2
	20-29	325	23.2
	30-39	428	30.6
	40-49	295	21.1
	50-59	188	13.4
	60-69	79	5.6

Marital Status	Married Monogamous	844	60.3
	Married Polygamous	122	8.7
	Informal Union	4	0.3
	Divorced	17	1.2
	Separated	32	2.3
	Widow(er)	25	1.8
	Never Married	344	24.6
Literacy	Yes	861	61.5
	No	538	38.5
Educational Level	Below Primary	26	1.9
	Primary	179	12.8
	JSS	94	6.7
	Voca/Comm	14	1.0
	SSS	391	27.9
	NCE/OND/Nursing	89	6.4
	Bachelors/HND	50	3.6
	Masters	2	0.1
	PhD/MD/Professional	0	0.0
	Others	16	1.1
Employment	Full time	820	58.6
	Part time	146	10.4
	Irregular	199	14.2
	Not working	234	16.7
Job Types	Own Business	335	23.9
	Civil Servant	91	6.5
	Private Sector Crop Farming	76	5.4
		345	24.7
	Livestock/Poultry	98	7.0
	Fish Farming	19	1.4
	Rent Farmer	141	10.1
	Others	61	4.4

NB: Voca/Comm = Vocational /Commercial, JSS = Junior secondary school, SSS = Senior secondary school, NCE = National certificate of education, OND = Ordinary national diploma, HND = Higher national diploma, MD = Medical doctor

The socio-demographic characteristics of the respondents who reported smoking are described in Table 1: 84.1% were male; the majority were in their thirties (30.6%) and twenties (23.2%); 60.3% were monogamously married; 61.5% were literate; the majority had completed SSS (27.9%); 58.6% were full-time employees; and 24.7% were crop farmers.

Multidisciplinary Journal of Psychology and Sociology
Volume 12 Issue 2, April – June 2025
ISSN: 2995-3766
Impact Factor: 7.92
https://kloverjournals.org/index.php/ps

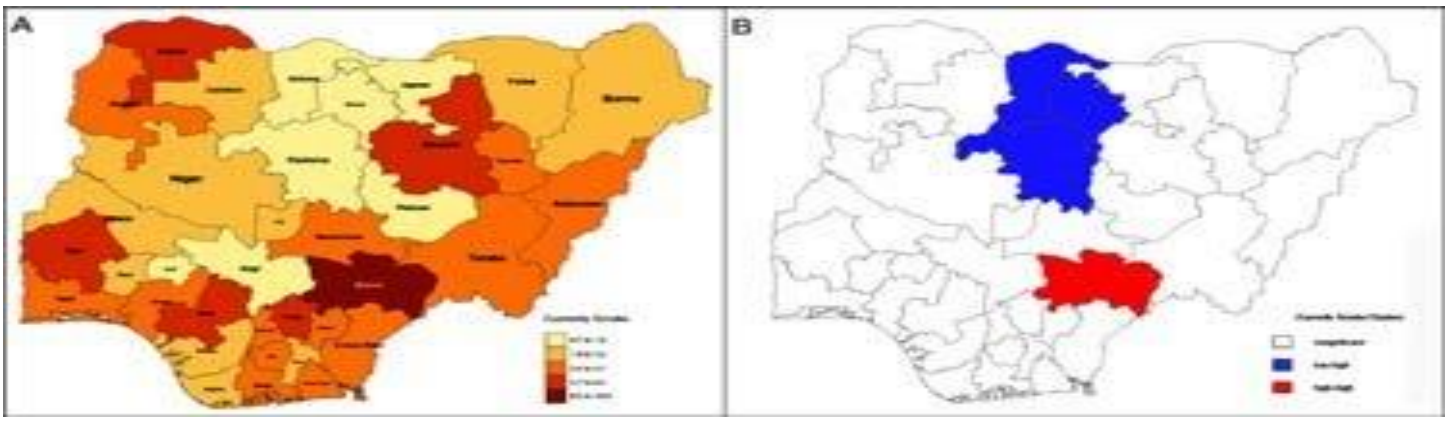

Figure 1: Map of Nigeria showing: A) Distribution of smokers and B) Hot- and cold-spots

of smokers

While there was no distinct pattern in the distribution of self-reported smokers in the country (Figure 1A), Benue (10.0%), Bauchi (6.3%), and Edo (5.5%) had the highest number of smokers, whereas Ekiti (1.6%), Kano (1.3%), and Jigawa (0.7%) had the fewest. Self-reported smokers were somewhat clustered (I=.126) in the country, although not statistically significant (ρ=.061). Katsina, Kano, and Kaduna States in the north formed a cold spot for smokers, while Benue State, located almost in the center of the country, was the hot-spot for smokers in Nigeria (Figure 1B).

Discussion

This study investigated the spatial pattern of self-reported smoking in Nigeria, using a nationally representative dataset, in order to determine places for targeted comprehensive cessation campaigns.

Most self-reported smokers in the country were in their 20s and 30s, corroborating earlier studies such as that of Oyewole et al. (2018), which posited that tobacco smoking poses a significant burden to Nigerian youths, and that of Aniwada et al. (2018), which stated that predictors of cigarette use in Nigeria included being in the age group of 25-34 years. Therefore, for any smoking cessation intervention effort to be effective in the country, it must target individuals in their 20s and 30s. Targeting this age group by implementing educational campaigns and prevention programs that address the specific factors influencing youth smoking, such as peer pressure and social norms, apart from encouraging cessation, will also discourage new young would-be smokers from taking to the habit.

The concentration of states with low smokers in the north of the country contradicts the findings of Aniwala et al. (2018), which suggested that living in the north was a predictor of cigarette use. Although both studies utilized nationally representative datasets, the likely explanation for the disparity in findings could be attributed to differences in the study period. Aniwala et

al. (2018) utilized the 2013 NDHS, whereas this study used the 2016-2017 NHSDUH. Since both datasets relied on self-reported data, further research is necessary to confirm the true prevalence of cigarette use in the north. This clarification is crucial for adopting an appropriate smoking cessation intervention.

Crop farmers comprised almost a quarter of the study population, aligning with previous research indicating elevated smoking rates among farmers. Tobacco-Free Life (2016) reported that based on data covering the period between 2004 and 2010, smoking rates among agricultural workers slightly surpassed those in the general population. This suggests that there is a pressing need for smoking cessation interventions within the farming occupation, especially considering the country's ongoing efforts to involve young people in agriculture as a means of gainful engagement for its burgeoning youth population (Akinyomade, 2023). The country should consider integrating smoking cessation programs into agricultural health services, focusing on the unique challenges faced by farmers. Given the significant population in the agricultural sector and the likelihood that many individuals are illiterate or less educated, the country should embark on strong and aggressive advocacy regarding the harmful health implications of tobacco smoking among farmers.

Figure 1A provides a clear depiction of the disparity in self-reported smoking across the county, corroborating earlier studies (Brooks et al., 2021; Caywood, 2017).

This highlights states (Benue, Bauchi, Edo, Enugu, Sokoto, and Oyo) with the highest number of smokers. One of the benefits of this analysis is the need for further studies to determine conditions specific to each identified region, which can eventually help inform appropriate policies. Evident from the heterogeneous distribution of smokers is that a one-size-fits-all smoking cessation policy is unlikely to succeed in the country. The 36 states and the FCT have been categorized into 5 groups (Figure 1A), laying the groundwork for developing specific policies to address each group. Such an initiative will significantly contribute to the country's efforts to effectively combat tobacco use. Thus, concerned authorities can allocate resources effectively to implement focused smoking cessation interventions.

Similar to the findings of Vallarta-Robledo et al. (2021), this study reveals that smokers exhibit space dependency, identifying Benue State as the hot-spot for smoking in Nigeria. This might not be unconnected with the predominant occupation of the people of the state, farming, with "Food Basket of the Nation" as the state's slogan. This corroborates the affinity between farming and smoking (TFL, 2016). Hence, smoking cessation efforts in Nigeria requires giving Benue State a special attention given that the majority of the people in the state are not likely to change their occupation soon. Special methods need to be developed to discourage young people in the state from taking to smoking, while actively engaging the current smokers to quit, providing appropriate incentives where necessary.

Apart from public awareness campaigns about the dangers of smoking, the Benue State needs to enforce strict advertising restrictions, especially in rural areas where most farming communities are located. Additionally, tobacco taxes might be significantly increased to make the product less accessible to a large percentage of the population.

Strengths and limitations

The strength of this study lies in utilizing a dataset that represents the entire country, rendering it one of the first to examine smoking at a national level. Another strength is the application of spatial analysis, which not only identified variations in distribution but also highlighted states in need of immediate intervention. Nevertheless, a limitation is the potential lack of accuracy in self-reported smoking data, as some individuals may be inclined to deny their smoking habits. Also, there is no explicit mention of a power analysis for sample size calculation; however, the substantial sample size suggests that considerations for adequate representation and statistical reliability were taken into account during the planning phase.

Conclusion

Most smokers in Nigeria are in their 20s and 30s. The states with low percentages of smokers were concentrated in the north of the country. Crop farmers constituted the largest occupational group in the study population. Benue State was identified as the hot-spot of smoking in Nigeria and, thus, requires a focused smoking cessation intervention. Overall, the country needs to do more to discourage new smokers, while encouraging current smokers to quit. A one-size-fits-all smoking cessation policy might not work in the country, given the heterogeneous distribution of smokers.

The findings of this study have broad implications for public health strategies across Africa. By understanding local contexts and implementing tailored interventions, countries can enhance their public health responses to tobacco use and ultimately reduce smoking-related

morbidity and mortality. Most African countries share similar demographic trends and may benefit from educational campaigns and prevention programs that specifically address factors influencing youth smoking. Given the heterogeneous composition of many African countries, analyzing regional differences in smoking prevalence can help tailor interventions that respect local customs and address specific barriers to cessation.

Countries on the continent also have significant populations in the agricultural sector and should consider integrating smoking cessation programs into agricultural health services. Comprehensive tobacco control policies should be prioritized across Africa, including taxation on tobacco products, advertising restrictions, and public awareness campaigns about the dangers of smoking.

Conflicts of interest

No potential conflict of interest was reported by the author.

Funding

There is no funding associated with the work featured in this article.

Ethical approval

Not applicable

References

Abdulhafedh, A. (2017). A novel hybrid method for measuring the spatial autocorrelation of vehicular crashes: Combining Moran's index and Getis-Ord Gi* statistic. *Open Journal of Civil Engineering*, *7*(2), 208-221. doi:10.4236/ojce.2017.72013

Adeloye, D., Auta, A., Fawibe, A., Gadanya, M., Ezeigwe, N., Mpazanje, R. G., ... & Adewole, I. F. (2019). Current prevalence pattern of tobacco smoking in Nigeria: a systematic review and meta-analysis. *BMC Public Health*, *19*, 1-14. doi:10.1186/s12889-019-8010-8

Adeoye, I. A. (2022). Alcohol consumption and tobacco exposure among pregnant women in Ibadan, Nigeria. *BMC psychiatry*, *22*(1), 570. doi:10.1186/s12888-022-04210-9

Aina, B. A., Onajole, A. T., Lawal, B. M., & Oyerinde, O. O. (2009). Promoting cessation and a tobacco free future: willingness of pharmacy students at the University of Lagos, Nigeria. *Tobacco Induced Diseases*, *5*, 1-8. doi:10.1186/1617-9625-5-13

Akande-Sholabi, W., & Adebisi, Y. A. (2021). Toward pharmacy-based smoking cessation services in Nigeria: Knowledge, perception and practice of community pharmacists. *Population Medicine*, *3*. doi:10.18332/popmed/131262

Akande-Sholabi, W., & Adebisi, Y. A. (2022). Promoting cessation and a tobacco free future: knowledge and attitude of pharmacy students regarding smoking cessation in a Nigerian university. *Malaysian Journal of Pharmaceutical Sciences*, *20*(1), 13-24. doi:10.21315/ mjps2022.20.1.2

Akinyomade, A. (2023). The Nigerian Government explores collaborations to address agricultural challenges. https://www.iita.org/news-item/the-nigerian-government-explorescollaborations-to-address-agricultural-challenges/.

Aniwada, E. C., Uleanya, N. D., Ossai, E. N., Nwobi, E. A., & Anibueze, M. (2018). Tobacco use: prevalence, pattern, and predictors, among those aged 15-49 years in Nigeria, a secondary data analysis. *Tobacco induced diseases*, *16*. doi:10.18332/tid/82926

Anselin, L. (1995). Local indicators of spatial association—LISA. *Geographical analysis*, *27*(2), 93-115. doi:10.1111/j.1538-4632. 1995.tb00338.x

Brooks, M. M., Siegel, S. D., & Curriero, F. C. (2021). Characterizing the spatial relationship African Journal of Alcohol & Drug Abuse: Volume 12

between smoking status and tobacco retail exposure: Implications for policy development and evaluation. *Health & place*, *68*, 102530. doi: 10.1016/j.healthplace.2021.102530 Brunsdon, C. & Comber, L. (2015). *An Introduction to R for Spatial Analysis and Mapping*. SAGE Publications Ltd.

Caraballo, R. S., Rice, K. L., Neff, L. J., & Garrett, B. E. (2019). Peer Reviewed: Social and Physical Environmental Characteristics Associated with Adult Current Cigarette Smoking. *Preventing Chronic Disease*, *16*. doi:10.5888/pcd16.180373

Caywood T. M. (2017) Public Health Applications of GIS: A Spatial Analysis of Tobacco Sales and Violations for the Worcester Division of Public Health. International Development, Community and Environment (IDCE). 165. https://commons.clarku.edu/idce_masters_ papers/165

Fu, S. S., Melzer, A. C., Fabbrini, A. E., Rice, K. L., Clothier, B., Nelson, D. B., ... & Partin, M. R. (2019). Association of invitation to lung cancer screening and tobacco use outcomes in a VA demonstration project. *Preventive Medicine Reports*, *16*, 101023. doi: 10.1016/j. pmedr.2019.101023

Ilesanmi O.S., Omode P.K., Babalola O.M., Iken O. (2020). Realities and Cessation Experiences of Tobacco Smokers in Ibadan, Oyo State Nigeria. *Journal of Experimental Research*. 2020;8(2) https://www.er-journal.com/articles.php?id=499

Ilesanmi, O. S., Agwai, V. I., & Afolabi, A. A. (2021). A systematic review of tobacco smoking cessation services in Africa: Practices and challenges faced by healthcare workers. *Journal of Ideas in Health*, *4*(2), 371-379. doi: 10.47108/jidhealth.Vol4.Iss2.119 Iloh, G. U. P., & Collins, P. I. (2017). Awareness of health effects of exposure to secondhand smoke from cigarettes: A cross-sectional

study of never-smoked adult primary care patients in Eastern Nigeria. *Avicenna journal of medicine*, *7*(04), 164-170. doi: 10.4103/ajm.ajm_23_17

Itanyi, I. U., Onwasigwe, C. N., Ossip, D., Uzochukwu, B. S., McIntosh, S., Aguwa, E. N., ... & Ezeanolue, E. E. (2020). Predictors of current tobacco smoking by adolescents in Nigeria: Interaction between school location and socioeconomic status. *Tobacco induced diseases*, *18*. doi:10.18332/tid/117959

Kaviany, P., Senter, J. P., Collaco, J. M., Corrigan, A. E., Brigham, E., Wood, M., ... & McCormack, M. (2023). Spatial analysis of tobacco outlet density on secondhand smoke exposure and asthma health among children in Baltimore City. *Tobacco control*, *32*(5), 607613. doi:10.1136/tobaccocontrol-2021-056878

Kuye, O. F., Olagundoye, O., Ladeji, A. M., Olajide, M. A., Aborisade, A., Adejobi, A. F., ... & Olaitan, A. (2021). Perception and Attitude of Maxillofacial Surgeons towards in-Clinic Counselling on Tobacco Cessation in Tertiary Hospitals in Nigeria. *health*, *2*, 10. African Journal of Alcohol & Drug Abuse: Volume 12 doi:10.52403/ijhsr.20211023

Le Foll, B., Piper, M. E., Fowler, C. D., Tonstad, S., Bierut, L., Lu, L., ... & Hall, W. D. (2022). Tobacco and nicotine use. *Nature Reviews Disease Primers*, *8*(1), 19. doi:10.1038/ s41572-022-00346-w

National Bureau of Statistics (NBS). (2021). National Survey on Drug Use and Health 2016-2017, First Round. https://www.nigerianstat.gov.ng/nada/index.php/catalog/64.

Nollen, N. L., Adewale, S., Okuyemi, K. S., Ahluwalia, J. S., & Parakoyi, A. (2004). Workplace tobacco policies and smoking cessation practices of physicians. *Journal of the National Medical Association*, *96*(6), 838. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2568351/pdf/jnma00175-0110.pdf

Odukoya, O. O., Poluyi, E. O., Aina, B., Ejekam, C., & Faseru, B. (2016). Pharmacist-led smoking cessation: The attitudes and practices of community pharmacists in Lagos state, Nigeria. A mixed methods survey. *Tobacco Prevention & Cessation*, *2*(January). doi: doi.org/10.18332/tpc/61546

Onoh, I., Owopetu, O., Olorukooba, A. A., Umeokonkwo, C. D., Dahiru, T., & Balogun, M. S. (2021). Prevalence, patterns and correlates of smokeless tobacco use in Nigerian adults: An analysis of the Global Adult Tobacco Survey. *Plos one*, *16*(1), e0245114. doi: 10.1371/ journal. pone.0245114

Onor, I. O., Stirling, D. L., Williams, S. R., Bediako, D., Borghol, A., Harris, M. B., ... & Sarpong, D. F. (2017). Clinical effects of cigarette smoking: epidemiologic impact and review of

pharmacotherapy options. *International journal of environmental research and public health*, *14*(10), 1147. doi:10.3390/ijerph14101147

Oyewole, B. K., Animasahun, V. J., & Chapman, H. J. (2018). Tobacco uses in Nigerian youth: A systematic review. *PloS one*, *13*(5), e0196362. doi: 10.1371/journal.pone.0196362 Ozoh, O. B., Dania, M. G., & Irusen, E. M. (2014). The prevalence of self-reported smoking and validation with urinary cotinine among commercial drivers in major parks in Lagos, Nigeria. *Journal of Public health in Africa*, *5*(1). doi:10.4081/jphia.2014.316

Rezaeian, M., Dunn, G., St Leger, S., & Appleby, L. (2007). Geographical epidemiology, spatial analysis and geographical information systems: a multidisciplinary glossary. *Journal of Epidemiology & Community Health*, *61*(2), 98-102. doi:10.1136/jech.2005.043117 Tobacco Free Life (TFL). (2016). Smoking and agriculture: The toll of tobacco on farmers and the planet. Tobacco. Accessed https://tobaccofreelife.org/resources/smokingagriculture/. August 10, 2024.

Udokanma, E. E., Ogamba, I., & Ilo, C. (2021). A health policy analysis of the implementation of the National Tobacco Control Act in Nigeria. *Health Policy and Planning*, *36*(4), 484492. doi:10.1093/heapol/czaa175

Vallarta-Robledo, J. R., Sandoval, J. L., De Ridder, D., Ladoy, A., Marques-Vidal, P., African Journal of Alcohol & Drug Abuse: Volume 12

Humair, J. P., ... & Guessous, I. (2021). Spatial clusters of daily tobacco consumption before and after a smoke-free policy implementation. *Health & Place*, *70*, 102616. doi: 10.1016/j. healthplace.2021.102616

Vilane, Z. G., Kodali, P. B., & Thankappan, K. R. (2022). Effect of socioeconomic status on smoking cessation behavior in selected African countries: Secondary analysis of Global Adult Tobacco Survey data (2014–2018). *Plos one*, *17*(9), e0274746. doi: 10.1371/journal. pone.0274746

West, R. (2017). Tobacco smoking: Health impact, prevalence, correlates and interventions. *Psychology & health*, *32*(8), 1018-1036. doi:10.1080/08870446.2017.1325 890

World Health Organization (WHO). (2022). Report on malaria in Nigeria 2022. https:// www.afro.who.int/countries/nigeria/publication/report-malaria-nigeria-2022.

World Health Organization (WHO). (2023). Tobacco. Retrieved from https://www.who.int/ news-room/fact-sheets/detail/tobacco Accessed August 10, 2024.