Assessments of tobacco control policy instruments status and effectiveness in Africa; A systematic literature review

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Abstract

Background: Tobacco is one of the well-established industries in the world. Despite having some economic benefits, the industry has been for decades associated with environmental problems through deforestation, health related diseases that cause about 8 million mortality rates yearly, human rights violations and corruptions issues which are involved, World Health Organization formulated Framework Convention on Tobacco Control with the aim of controlling tobacco production and consumption, with countries from Africa being ones where its usage is increasing more.

Objectives: The main aim of this study was to find out the current status of tobacco control policies and its effectiveness in Africa.

Methods: This study was a systematic literature reviews that was conducted between the months of August and November 2020 through extracting data from the database of PubMed, Scopus, Google scholar and Research Gate. Only English articles were selected.

Results: Out of 910 papers retrieved only 17 papers from African countries were selected on the quality thesis after meeting the inclusion criteria. The results of the study showed that three governance resources were identified of Regulatory 64.70 % N=14 which had Smoke free environment, Advertisement bans, and cessation programs, economics 24.41% N=6 which were taxation's measures and informative 5.886% N=1 which were mass media campaigns. Further, Western African countries especially South Africa reported many pronouncements on smoke free environments and taxation measures. Mass media campaigns proved to be more effective policy as compared to others.

Conclusion: This study recommends that future research should be done on looking at the effectiveness of mixed policy instruments as compared to single application. Further, the researcher recommends the use of more informative policies in dealing with inelastic behaviors like those related to tobacco due to the addictive nature.

Highlights

i. Need to conduct more research on tobacco effectiveness by looking at the mixed instrument approach of policy rather than single instrument.

ii. Policy makers should use more informative approaches that increases civic education to the people in order to achieve more effectiveness of tobacco control.

iii. Policy implementers are mostly interested in implementation of the policies by looking at the operation rather than assessing their effectiveness.

iv. There is research desert on tobacco control policies effectiveness in most part of Africa regions especially in Northern and Eastern Africa.

Introduction

Tobacco industry is one of the well-established industries in the world which has been for decades seen as a source of employment and other social economic benefits to those involved and other people at large who happens to support it (Drope, Makoka, Lencucha, & Appau, 2016; Stoklosa et al., 2019; Xuelian, 2020). However, there is a debate on this, as it is also argued with vivid evidence that through the cultivation and consumption of tobacco, the industry has also brought a lot of direct and indirect pervasive negative impacts on almost all circles of human life, and also on other living and non-living things. For example, ecological and environmental related challenges that have a arisen through deforestation, health related problems through the consumption of tobacco end products like smoking cigarettes, social-human rights related challenges for special minority groups of women who are being mistreated in many farming estates and children who are being deprived of their rights to education by taking them in estates than being at schools whether in form of child labour or by merely wanting them to stay

there with their parents (Doe, J., & DeSanto, 2009; Hu & Lee, 2016; Kulkarni, 2017; Southeast Asia Tobacco Control Association, 2013).

Literature indicates that at least 8 million people die each and every year due to tobacco related activities, end products usage of which close to 80% of these tobacco users are from low and middle income countries of Africa and Middle East, where there is high consumptions rates of these tobacco related products (Ayo-Yusuf, Olufajo, & Agaku, 2014; Bennett et al., 2014; Vardavas & Nikitara, 2020; WHO-FCTC, 2020), with these pervasive impacts on human lives, it led even further to the declaration of tobacco as an epidemic by the World Health Organisation (WHO) on 15 March 2015 (Asamblea Mundial de la Salud, 2003; World Health Organisation, 2003). Furthermore, there is evidence that man-made driven climate change practices like continuous cutting down of trees, excessive pesticides usage, planting of only one crop, pollutions through curing tobacco and smoking etc. which are associated with tobacco practices brings about floods, droughts, unfavourable climate, dependence on one cash crop, are said to be some of the main factors that affects food security in recent times all across the world with developing economies being the most affected ones (Mayer, Gueorguieva, Ma, & White, 2019; Schleifer & Sun, 2020; WEF, 2020). Upon looking at all these facts, tobacco industry has for the past decade attracted the attention of global leaders to take necessary steps in order to control its production and consumption. As such, tobacco control policies in many economies have always been incumbent upon policy makers to formulate and implement sound policy instruments that would see the control of tobacco. This global attention was championed by the WHO in 2003 at its annual meeting in Geneva by formulating Framework Convention on Tobacco Control (FCTC) which acts as an agreement where individual member countries are legally bound to support the implementation and enforcement of the agreed policies on tobacco control (Adebiyi & Oluwafemi, 2017; Sanni, Hongoro, Ndinda, & Wisdom, 2018; WHO, 2000; World Health Organisation, 2003). WHO FCTC articles defined "tobacco control" as a range of supply, demand and harm reduction strategies that aim to improve the health of a population by eliminating or reducing their consumption of tobacco products and exposure to tobacco smoke (World Health Organisation, 2003).

Africa is not only a continent that has a lot of major tobacco producing countries like Zimbabwe, Malawi, Zambia, Mozambique, South Africa etc., but also a major market for tobacco products especially cigarettes (Ali et al., 2012; Blecher & Ross, 2013; Davies, 2003). Despite the intervention by the WHO to reduce the tobacco epidemic not all the tobacco producing countries are members to the WHO FCTC. For example, some countries in Africa like Malawi, South Sudan and Eretria have not yet signed nor ratified to this call despite being major producing and consuming countries (FCA, 2020). However, literatures indicates that much as some countries are not part of the FCTC still there is some level of tobacco control policies being applied directly or indirectly either by Non-Governmental Organisations (NGOs) or the governments departments in these said countries (Bennett et al., 2014; Brenya, 2012; Drope, 2011). In Africa, just like other continents, for the countries that are members of the FCTC agreement have formulated tobacco control policies based on guidance from the laid down articles of the FCTC number 1-23 which are being implemented and enforced differently in each country according to their respective political will and other social economics factors (Drope, 2011; Reddy et al., 2013; World Health Organisation, 2003).

Studies on tobacco control policies have been conducted for decades in all regions of Africa with some major reasons for attracting this high scholarly attention being, having major producing countries, major market base for tobacco end products, and also heavily negatively affected by it (Blecher & Ross, 2013; Drope, 2011). These studies have tackled all tobacco control policies, however, with the majority of the instruments focusing on economic polices like taxations (Abedian & Jacobs, 2001; Blecher, 2015; Mapa-Tassou et al., 2018) and regulatory like smoke free environments (Borland, 99AD; Owusu-Dabo, Lewis, McNeill, Gilmore, & Britton, 2011; Robertson et al., 2018). Literature indicates that the application of such policies and researches have been facing some difficulties in many setup due to the social economic benefits attached to the product and the involvement of politicians in the industry who are also in policy makers (Drope, 2011). Much as they have been trend which has provided an in-depth literature, these studies have put much emphasis on the formulation of the tobacco control and the implementation of those policies part or aspects (Robertson et al., 2018) rather than looking on their effectiveness when applied individually as an instrument or by combination of different instruments on a broader geographical area.

In this study we aimed at finding the current status and effectiveness of tobacco control policy instruments or tools in Africa, whereby, also trying to look at the factors that have contributed to their effectiveness by comparing the regional geographical boundaries, thus, by doing so, this paper will try to fill the research gap which is currently existing in the literature. we have

focused on Africa continent where the majority of the countries are developing, depend on agricultural activities for their GDP, food security etc. and evidenced not only to be among the largest producers of tobacco but also consumers who are heavily affected by its pervasive negative impacts (Blecher & Ross, 2013; Olutosin A. Otekunrin, Otekunrin, Momoh, & Ayinde, 2019; Olutosin Ademola Otekunrin, Otekunrin, Sawicka, & Ayinde, 2020; Sanni et al., 2018; Vellios, Ross, & Perucic, 2018).

In order to achieve the aim, this study was guided by the following research questions.

i. What are the current identifiable policy instruments being formulated and implemented in Africa?

ii. What are the factors that lead to the effectiveness of tobacco control in Africa?

iii. Which is the most effective policy instrument in fighting tobacco control in Africa?

iv. Which is the most effective way of policy instrument when applied?

Materials And Methods

3. 1 Research Variables

3.1.1 Dependent variable

Effectiveness is put as a dependent variable in this research. An effective instrument was defined as an instrument that was able to meet or achieve the goal on which it was formulated, implemented and enforced (Bemelmans-Videc, Rist, & Vedung, 1998; Howlett, 1991; Mees et al., 2014) i.e. an instrument that was able to demonstrate the ability to reduce tobacco consumption and exposure of tobacco smoke as defined by WHO FCTC articles 1-24 (World Health Organisation, 2003). On the other hand, a policy instrument was therefore regarded ineffective if it failed to meet this definition. Measurement on effectiveness was done by using a scale of 0-2, any report that portrayed a policy instrument that indicated an ability of an ineffective report was given a 0= (ineffective) point, any report showing a partial effectiveness was given a 1= (partial effective) point, while any report indicating effectiveness of policy instrument was given a 2=(effective) point.

3.1. 2 Independent variables

Literature indicates that policy instruments can be formulated, implemented and enforced by either Governmental or NGOs based on the one who is overlooking it (Bemelmans-Videc et al., 1998; Klaus Jacob, Peter King, 2019), this study regarded those policies led by the government and other non-governmental organisation to be part of the independent variables. Further, a policy instrument can be categorized into three groups, firstly being legal in nature if it restricts or allows behaviours options, economic in nature if it involves the cost-benefits of the options and communicative in nature if it involves informing about different options (Bemelmans-Videc et al., 1998; HOOD, 2007; Howlett, 1991; Mees et al., 2014). There are many characteristics of a policy instrument that could facilitate or hinder its effectiveness when it is being applied, some being; i) the aim of the instrument, ii) spatial orientation of an instrument, iii) the actors involved in the instrument, iv) strategy used to promote the instrument, and v) how the instrument is being applied either singular or mixed (Lee, den Uyl, & Runhaar, 2019).

3.2 Study design and protocol

This study was conducted systematically by reviewing the literature from peer reviewed social science journals databases. A first literature search was done in the first week of the month of September 2020 and final search was conducted in the last week of October 2020 by following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for conducting systematic literature reviews (Moher, Liberati, Tetzlaff, & Altman, 2009; Munir, Kuganda, & Basry, 2020) (*See Supplementally Appendix A1*).

3.3 Search strategy and data sources

On search strategy and data sources, the study relied on data that was searched and retrieved from the database of PubMed, Elsevier Scopus and Web of Science by using a combination of the keywords of 'tobacco control policies in Africa', 'tobacco policy control instruments', 'tobacco control policy tools. The researchers on special case intentionally revisited PubMed database because of the nature of our current study topic which related to health and environment protection in nature, and that the quality of the papers indexed on this database is high. Two independent researchers (Mr. GNCM and Mr. GRD) checked the references list of selected studies that were retrieved to ensure that were not only clearly relevant to the topic, but also that we have included all the up to date literatures from the notable scholars, The first criterion was year of publication which ranged from 1986 to 2020, thereafter the collection was subject to screening by language so that only papers published in English were considered (*see supplementally Appendix A2*).

3. 4 Eligibility criteria and article or study Selection

For an article to be included in the final qualitative synthesis, it was supposed to meet the following criteria: i) the article should be written in English language, ii) the article should concern the application of tobacco control policy instrument or tool either through Government or Non-Government perspective, iii) the article should have a geographical area of within in Africa or composed developing country in Africa, iv) the article should either be concerned with tobacco production or consumption, v) the article should not be a duplicate of another (this was managed through using Mendeley software). Lastly all articles that could not meet these criteria, conference papers which were not peer-reviewed, and others that just expounded on the formulation of policy instruments were excluded in the final qualitative synthesis.

3. 5 Risk of bias and quality assessment

The risk of bias and quality assessment for each source included in this study was conducted by two independent researchers' (Mr. GNCM and Mr. GRD) using modified Newcastle Ottawa quality assessment scale for included studies applied and used by other researchers in the field (Anthony & Lin, 2018) *(See table 1 submitted as separately as supplement)*. Furthermore, to enhance the quality and reduce the biasness of the results other two impartial researchers (Dr. WX and Ass. Prof. MR) crosschecked the work of the first two researchers and necessary corrections were made to enhance the quality of the paper after some discussions.

Table 1: Modified Newcastle–Ottawa Quality Assessment Scale for included studies

3. 6 Data extraction and coding

On data extraction, this article modified the frameworks of assessing policy instruments effectiveness applied in other areas of studies by adding other elements found on effective policy assessment handbooks (Klaus Jacob, Peter King, 2019; Lee et al., 2019; Sanni et al., 2018). As such, there was a predesigned excel sheet form which was used to extract the data from the selected literatures. Based on the framework of assessing the effectiveness of instruments the characteristics of the data extracted were the following: authors details, year of the study, country/geographical application, aim of the study, the target of the policy instrument, the enforcer of the policy instrument, results of the instrument. Any country reporting on the policy instrument was given a single point on the type, nature, region and effectiveness of the instrument reported.

3. 7 Data analysis

After the extractions of the data from the retrieved literatures, data was captured and entered into the excel sheet where all the descriptive data were analysed to produce frequency table and graphs where necessary in order to represent the findings of the study. All discrepancies found at this stage were also rectified by a third researcher (Miss. SY).

Results

4.1 Number of studies

Firstly, about 910 studies were mined from the databases after an initial search of the literature. A total number of 775 records were screened after the removal of the duplicates using Mendeley software, of which 646 were excluded for not meeting the inclusion criteria upon looking at the abstract during the initial review. Further a total number of 129 were checked for eligibility from which 110 records were excluded with reasons, making only 19 studies after meeting the inclusion criteria. meet the inclusion criteria into the quality synthesis (**See figure 1**).

4.2 Study Characteristics

4.2.1 Governance resources and study overview

On governance resource type, after the analysis of the results it was shown that out of the 17 studies included in the quality thesis about 64.70 % (N=11) policy reported were based on regulatory (Atiba, Olubodun, & Odukoya, 2020; Ayo-Yusuf et al., 2014; Ayo-Yusuf, Olutola, & Agaku, 2016; Little & Van Walbeek, 2018; Owusu-Dabo et al., 2011; Radwan et al., 2012; Robertson et al., 2018; Talley, Masyn, Chandora, & Vivolo-Kantor, 2017; Winkler, Lan, & Becher, 2015), were based on Economics 29.41% (N=5) (Abedian & Jacobs, 2001; Berthet Valdois et al., 2019; Blecher, 2015; Cheyip, Nelson, Ross, & Murray, 2007; Nargis et al., 2016; Tingum, Mukong, & Mdege, 2020) and lastly 1 report was based on Informative 5.88% (N=1) (Cheyip et al., 2007) (*see Table 2 and Figure 2*).

4.2.1.2 Reported policies instruments

On specific reported instruments the results show that the following are the instruments that have been reported are: i) Smoke free environment policies, ii) Cessation programmes policies, iii) Advertising bans policies, iv) Taxation polices, v) Mass media campaign polices (**See figure 2**).

4.1.2 Regional distributions of reports

On regional distributions out of the 5 instruments identified in 17 studies it was found that about 5.88% (N=1) were from Egypt in the Northern part of Africa, 47.05% (N=8) were reported from South Africa and Botswana from the Southern Africa, about 23.52% (N=4) were reported from Gambia, Nigeria, and a survey of (Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Mali, Mauritania, Niger, Nigeria, Senegal and Sierra Leone) in from Western part Africa, about 11.76% (N=2) were reported from Uganda and Mauritius which is from Eastern side of Africa and lastly about 5.88% (N=1) were from a survey that comprised 29 African countries (**See figure 3**).

4.1.3 Country distribution of studies

On country distribution, out of the 17 reports identified, the results shows that Egypt reported only about 5.88 % (N=1) policy instrument of smoke free, South Africa reported 44.11% N=7.5 of all four policies (with 0.5 having done in Botswana and South Africa in one report), Botswana reported 2.94 % (N=0.5) (shared with SA on a singular report) of advertising bans, Gambia reported 5.88% (N=1) of taxes control policies, Nigeria reported 11.76% (N=2) of smoke free environment, a survey of Western countries (Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Mali, Mauritania, Niger, Nigeria, Senegal and Sierra Leone) which are from Western part Africa reported 5.88 % (N=1) of cessation programme, Uganda reported 11.76 % (N=2) of smoke free environment control policy, Mauritius reported 5.88% (N=1) of taxes control polices and lastly about 5.88% (N=1) were from a survey that comprised of 29 African countries (Southern Africa: Namibia, Swaziland, South Africa and Lesotho. West Africa: Burkina Faso, Ghana, Mauritania, Niger, Senegal, Togo, Guinea Bissau and Sierra Leone. Central Africa: Democratic Republic of the Congo (Kinshasa), Republic of the Congo, Central African Republic (Bangui) and Cameroon (Central District). Eastern Africa: Djibouti, Somalia (Somaliland), Malawi, Uganda, Eritrea, Seychelles, Mauritius, Rwanda and Zimbabwe (Harare), Northern Africa: Morocco, Tunisia, Libya and Sudan) of cessation programme control policies (*see figure 4*).

4.2 Tobacco instruments effectiveness

4.2.1 Effectiveness when using one polices instrument

While assessing the effectiveness of the reported policies instruments when used single the results indicate that smoke free environment policy were 13% effective, about 63% were partially effective and 25% were ineffective, On cessation programmes, it is indicated that about 50% were effective while the reaming 50% were partially effective, on taxation polices its indicated that about 60% were effective, 20% were partially effective and 20% were ineffective, furthermore, on mass media campaign it shows that the policy was 100% effective, and lastly on advertising bans the results shows that all reports reported 100% effective (*see figure 6 and 7*).

4.2.2 Effectiveness when used mixed

While assessing the effectiveness of the policy instrument when they are being applied in a mixed way, with other policies in order to achieve the common goal within a particular time, the results show that free smoke environment reported 100% effective, cessation program reported 50% effective and 50% partially effective, taxation reported 100% effective, mass media campaign reported 100% effective and lastly advertising bans reported 100% effective (**See figure 7**).

Discussion

The primary objective of this research was to find out the current status of tobacco control policies reported and its effectiveness in Africa. By September 2020 in Africa there were only 3 countries that have not ratified and signed the WHO FCTC policies, however, in one way or another literature indicates that in each and every country including those that are not signatories neither ratified, there are at least a certain element of tobacco control regulation applied either by governments or NGO's directly or indirectly due to the external forces like decline in tobacco demands, coming from the countries that have already signed and ratified the WHO FCTC agreement (FCA, 2020).

Our review found out that the main leading actors of the policy instruments formulation, implementations and enforcement are governments bodies and NGOs associated with health, human rights, environmental etc. i.e. those having interest in tobacco control and its impacts. This is reasonable and in agreements with the procedures laid down by WHO FCTC for the registration of partners in fighting tobacco epidemic (FCA, 2020; WHO-FCTC, 2020). By looking at the nature of the policies this review further found out that the policies identified are usually planned on timeframe of long-term basis that mostly are applied at a national geographical level targeting those that are either participating or not, in the production of tobacco, its consumption, either both. These policies are applied with the main aim of protecting the environments, health and social economic. On governance resources it is found that the majority of the policy instruments are regulatory in nature, i.e. those that include implementations of smoke free environments and cessations programmes which are measures taken by the government with the application of rules to guide the tobacco production and consumption, this is not a surprise, as the tobacco control involves the top level management decisions within the government who are members of the WHO FCTC that are legally obliged to report on their implementations and adherence of the policies at each WHO FCTC meetings as decided from time to time. Furthermore, this study has found that there is also much emphasis on promotion of the smoke free environments because there has been increasing reports about the increasing numbers of mortality rate due to second hand smoking in the world, as such, these concerns have put much pressure on policy makers to increase awareness and implementations of policies that would help not only to reduce second hand smoke effects but also the total cessation of tobacco consumptions (Kaleta, Polanska, & Usidame, 2015; WHO-FCTC, 2020; World Health Organisation, 2003). On the other hand, this study also found out that some countries use economic governance resources of taxation and informative means such as mass media and advertising bans. However, with few studies being reported on taxation measures, it is highlighted that these measures are being applied indirectly to reduce the consumption of tobacco products where the national governments are increasing taxation on the manufacturers of tobacco related products which at the end reduces the volumes of tobacco end products being produced and consumed like cigarettes, however this has not proved to be an effective way in many ways because of the inelasticity of tobacco products due to addiction habits by users and as such, the tobacco manufacturing companies are evading these taxes by shifting the burden on the consumers (Adeniji, 2019; Čizmović, Laković, Popović, & Mugoša, 2018; Otañez, Mamudu, & Glantz, 2007).

On regional comparisons, this review found out that Southern African countries of South Africa and Botswana filed the majority of policy reports especially in South Africa with taxes measures and free smoke environment being the ones on the lead. These results agree with many results that identified high problems of smoking related diseases in South Africa which could have attracted attentions of the many scholars (Ayo-Yusuf et al., 2014; Little & Van Walbeek, 2018; Mamudu et al., 2018). However, it can also be argued that since Botswana and South Africa share border they could as well share cultural values, trade and other relationships to some extent. This could foster behaviours transfers from one country to another like that of smoking leading to register this high number of reports as being one of the areas that are also negatively affected. The review found that there was not much reports in Northern and Eastern African countries with only 1 in Egypt an 2 in Uganda and Mauritius respectively, this could be explained with lack of scholars attention in the region due to many reasons such as low tobacco production and other political instability (Shuriye & Ajala, 2016), while on the part of the Western Africa region, Nigeria registered many policies reports as compared to any other country with many also on smoke free environments, Nigeria being one of the fastest economic growing country which has also have a rapid growing populations has attracted many scholars to research on issues of health and economy within and outside Africa, further, our study agrees with other study that found out that South Africa and Nigeria are the leading countries in having many scholarly literature on tobacco control followed by Nigeria since 1968 to 2017 (Mamudu et al., 2018).

In terms of policy effectiveness this review found out that mass media campaigns and advertising bans were most effective policies when applied singularly even when mixed, the effectiveness of mass media campaigns and advertising of bans could be explained to the fact that its informative in nature, which mainly aims at civic educating people on the dangers of the tobacco related products, these results of the review are in agreements with economics' policy's instruments in reducing consumptions of inelastic related products like tobacco, alcohol drugs etc. (Čizmović et al., 2018; Sawicka, Otekunrin, Skiba, Bienia, & Ćwintal, 2020; Tingum et al., 2020), furthermore, cessations programs have indicated that they had equal level of effectiveness and partially effectiveness when applied on singular or mixed, this equal levels could be a reason upon many factors that are relative to each country like political stability, the political will of the country even the way the citizen are perceiving the policy instruments. Lastly, taxation policies and smoke free environment policies had some nature of ineffective due to the reasons that they are economic and regulative in nature that are easily manipulated by the external factors, for example, in terms of taxation many manufacturing companies tends to shield or override the tax measures by shifting the tax burden of the tobacco to the final consumers who are the end users of tobacco related products like cigarettes, who are left with no options but to buy them even though the prices are raised as many of them are having addiction behaviours or habit which are associated, as a results the main aim of the governments in implementing the taxation measures and smoke free environments is being underscored as only a small margin is able to reduce the consumption of tobacco. It is clear in this study that the mixing of the policy instruments helps to achieve greater effectiveness as its shown that all the majority of the policies were able to achieve the aimed while mixed, these results agrees with many results that advised the mixed approach in policy instruments to achieve effectiveness (HOOD, 2007; Klaus Jacob, Peter King, 2019; Lee et al., 2019).

5.1 Limitations

This study had also some limitations just like any other systematic reviews. Firstly, this review only captured articles written in English, but in Africa there are some countries that are French and Portuguese speaking which means that some of their studies that could have add value to this research were excluded, nonetheless, the number of studies in other languages could be insignificant as many scholars worldwide have started to abstract and write in English. Secondly, this study relied mainly on four databases of PubMed, Scopus and web of science when collecting the data, and this confinement could exclude some of the studies not indexed in these databases, hence giving a limited focus to the number of studies included in the review. Lastly, because this study only aimed at peer reviewed social science nature articles which are assumed to be of high quality, we did not include the search of grey materials that could have also been great resource for this review.

Conclusion

In conclusion, it's a clear fact that in Africa almost all countries are involved in activities that could lead in the reduction of tobacco production and consumption due to the clears negatives consequences that are associated with tobacco industry like health, environmental, social-economical. However, this review highlights that they are still need to be done in Africa when it comes to the effectiveness of the tobacco control policies as not many researches are being done on this area; many are just concentrating on programmes that look at the implementation but not looking at how well effective they are.

We recommend future research to be done on assessing effectiveness of the mixtures of different policy instruments as compared to the application of single instruments, further, we give recommendations to the policy makers to put more efforts on those measures that are informative in nature which give civic educations to the people as they proved to be more effective than other policies due to the inelasticity of tobacco users.

Declarations

Ethics approval and consent to participate

N/A

Consent for publication

All authors give consent for the publication

Availability of data and materials

All data is provided by the authors

Competing interest

The authors declare no competing interest

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Authors Contribution

Conceptualization of the framework: Dr. WXL & GNCM; Data Collection: GRD&SY; Analysis and synthesis: All authors, Writing: GNCM & Dr. WXL, Final editing: Dr. WXL & Ass. Prof. MDR

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Tables

Table 1: *Modified Newcastle-Ottawa quality assessment scale for included studies*

Author details	Study design	Selection Representative-ness of the sample	Sample size	Non-respondents	Ascertainment of exposure	Comparability based on design and analysis	Outcome Assessment of the outcome	Statistical test	Total score
(1)	Cross sectional	+	+		+	+	+	+	6
(2)	Social Attitude Survey	+	+		+		+	+	5
(3)	Cross sectional	+	+		+	+	+	+	6
(4)	SA GYTS 2011	+	+	+	+	+	+	+	8
(5)	Two stage cluster	+	+	+	+	+	+		6
(6)	A census	+	+	+			+	+	5
(7)	Interviews	+	+		+	+	+		4
(8)	Stratified survey design	+	+	+	+	+		+	6
(9)	Global School Personnel Survey	+	+	+	+	+	+	+	8
(10)	WHO reports	+	+	+	+	+	+	+	8
(11)	Smoking Annual Survey	+	+		+	+	+	+	7
(12)	Global Youth Tobacco Survey	+	+	+	+	+	+	+	8

Author (year)	Design	Selection Representative-ness of the sample	Sample size	Non-respondents	Ascertainment of exposure	Comparability based on design and analysis	Outcome Assessment of the outcome	Statistical test	Total score
(13)	Trend data-(SCO) Simulation Modelling	+			+	+	+	+	5
(14)	Trend analysis	+	+	+			+	+	5
(15)	Case Study	+	+		+	+	+	+	6
(16)	Annual time series	+			+	+	+	+	5
(17)	Case study at macroeconomic level	+	+	+	+			+	

È = 1 point

Points threshold: Very Good Studies: 9-10 points

Good Studies: 7-8 points

Satisfactory Studies: 5-6 points

Unsatisfactory Studies: 0 to 4 points

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Table 2: Showing total reports reported

Governance Resource	Instruments	Frequency	Percent %
Regulatory	Smoke Free Environment/policies	8	47.05
	Cessations Programs	2	11.76
	Advertising bans	1	5.88
Economic	Taxes	5	29.41
Informative	Mass Media Campaign	1	5.88
	n	17	100

Source: Author computed data

Table 3: Study characteristics

Author details	Governance resource	Policy instrument	Country	Timeframe	Target geographic level	Aim of the instrument	Leading actor in implementation	Target actor of the instrument
(1)	Regulatory	Smoke free	Nigeria	Short term	Individual	Social, Health	Government	Students, Patients
(2)	Regulatory	Smoke free	South Africa	Long term	National	Social, Health	Government	Consumers
(3)	Regulatory	Smoke free	Uganda	Short Term	Sector	Social, Health	Government	Consumers
(4)	Regulatory	Smoke free	South Africa	Short Term	Sector	Social Health	Government	Students
(5)	Regulatory	Smoke free/cessation	Ghana	Long term	National	Environmental	Governmental	Individuals Country citizens
(6)	Regulatory	Smoke free	Egypt	Long term	National	Social Health	Government	Patients & Individuals
(7)	Regulatory	Smoke free	Uganda	Long Term	National	Social Health	Government	Individuals Patients
(8)	Regulatory	Smoke free	South Africa	Long Term	National	Social Health	Government	Individuals
(9)	Regulatory	Cessation program	29 African countries	Long term	National	Social, Health & Environmental	Governments	Consumers, Manufactures & Students etc
(10)	Regulatory	Cessation Program	West African countries	Long Term	National	Social, Health	Government	Consumers
(11)	Regulatory	Advertising Bans	Botswana & South Africa	Short Term	National	Social, Health	Government	Students
(12)	Informative	Mass media campaign/Taxes	South Africa	Short Term	National	Social, Health	Government	Students, Manufactures & Consumers
(13)	Economic	Taxation	South Africa	Short Term	National	Social, heath & economic	Government	Manufactures, Consumers
(14)	Economic	Taxation	Mauritius	Long Term	National	Social, Health & Environment	Government	Consumers, Manufactures
(15)	Economic	Taxation	South Africa	Long Term	National	Economic, Health	Government	Consumers, Manufactures
(12)	Economic	Taxation	South Africa	Short Term	National	Social, Health & Economics	Government	Consumers, Manufactures
(16)	Economic	Taxation	South Africa	Long Term	National	Economic, Social & Health	Government	Consumer
(17)	Economics	Taxation	Gambia	Short Term	National	Economic	Government	Manufactures

Source: Author computed results

## Author details

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Figures
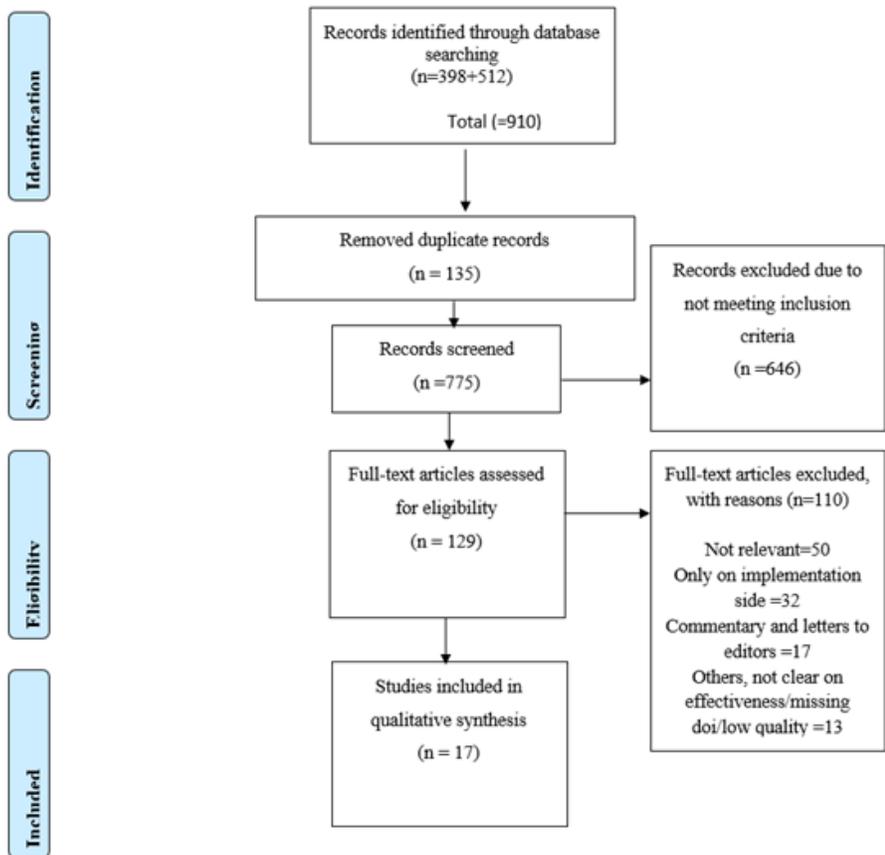
Figure 1

Shows PRISMA 2009 Flow diagram of methodological framework Source: Author computed data using PRISMA diagram (adapted from PRISMA Group) (Moher et al., 2009)
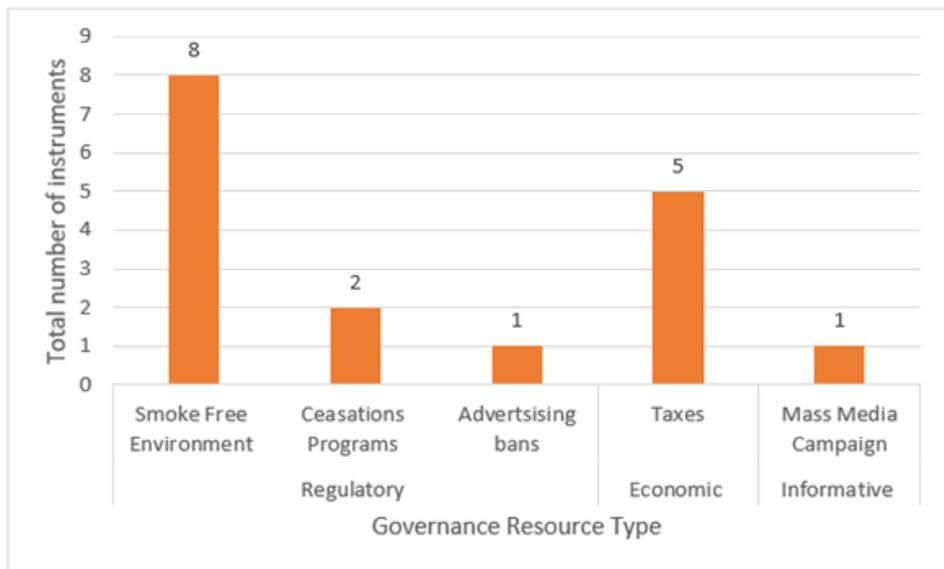
Figure 2

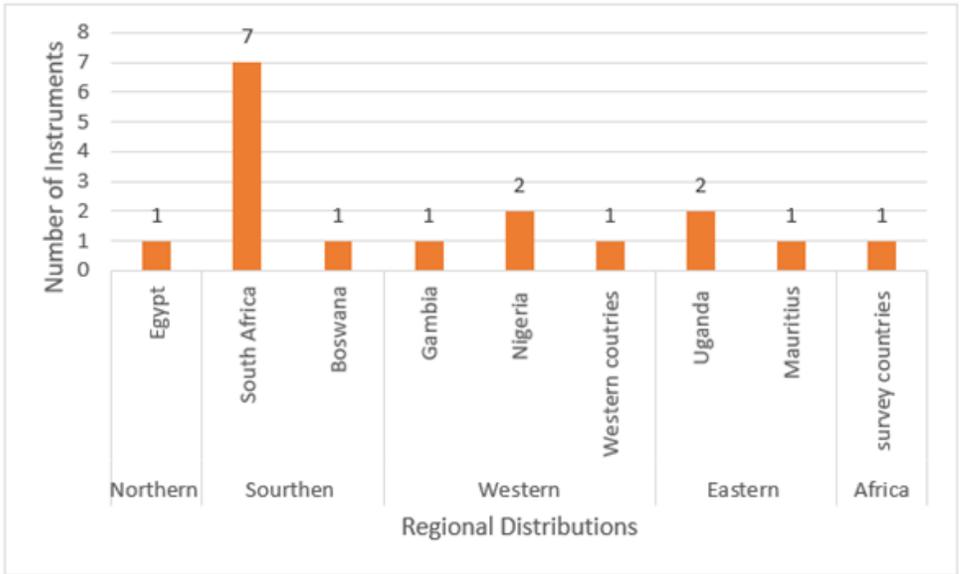Types of governance resources and instruments reported Source: Author computed data

Figure 3
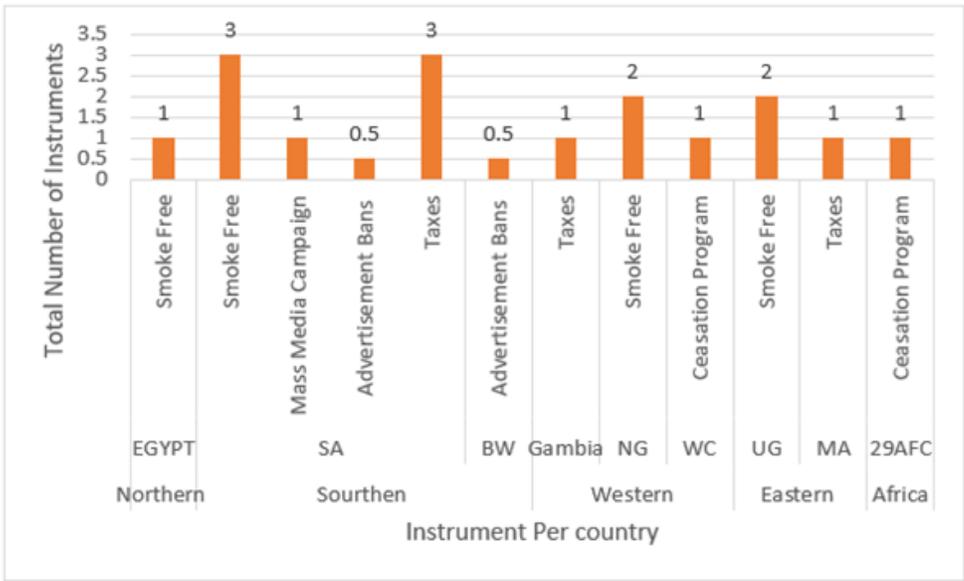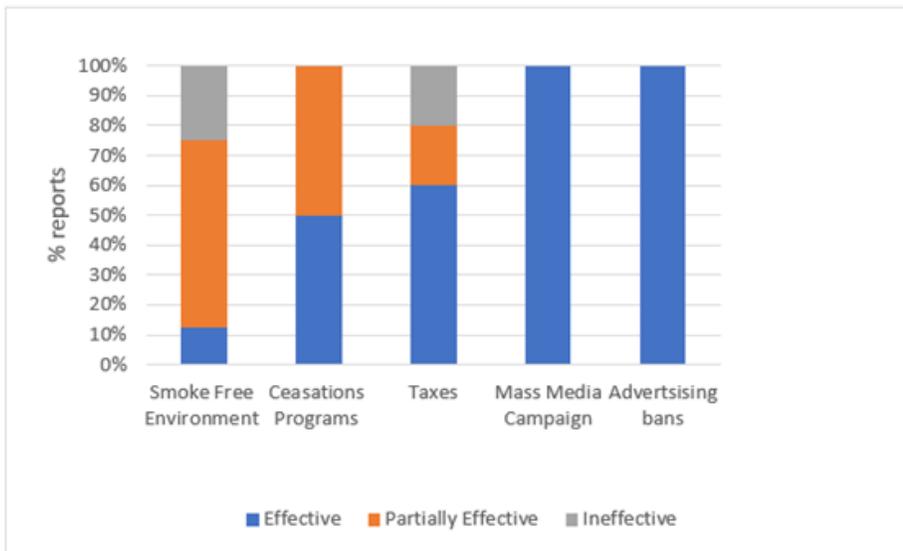
Regional comparisons Source: Author computed data

Figure 4

Instruments per country Source: Author computed data

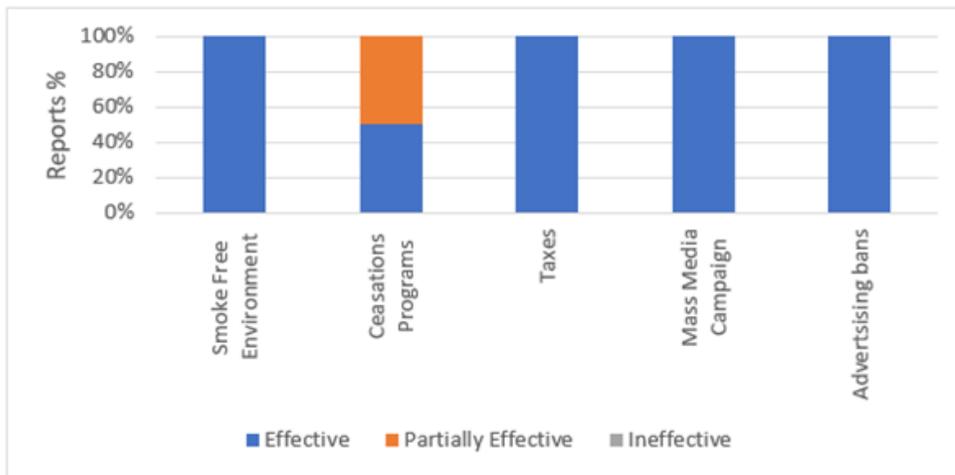Image not available with this version

Figure 5

was not provided with this version

Figure 6

Reported effectiveness when used single Source: author computed data

Figure 7

Reported of effectiveness when mixed Source: Author computed data

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