THE SOCIOECONOMICS OF TOBACCO USE IN THE SOUTHERN AFRICAN CUSTOMS UNION

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ABSTRACT

Tobacco consumption has long been a significant health concern. This is because it is one of the significant causes of premature death, as a result of various types of diseases that arise due to the use of both smoking and smokeless tobacco. Tobacco use has been found to be associated significantly with socioeconomic status, and particularly, tobacco use has been found to be higher amongst individuals with lower socioeconomic status. This paper studies the relationship between socioeconomic factors and tobacco consumption for men and women from countries in the Southern African Customs Union, using data from the Demographic and Health Surveys for Namibia, Lesotho and Swaziland; and the National Income Dynamics Study for South Africa. This paper finds that among both men and women, cigarette use is higher in urban areas, while the use of chewing tobacco, snuff, and pipes is generally higher in rural areas. Also, this paper finds that tobacco use is generally lower the higher the educational attainment, while the prevalence of tobacco use is found to be higher in the older age groups compared to the younger age groups.

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APPENDICES

1. INTRODUCTION

Tobacco consumption is a worldwide epidemic, which, if not put in check, has the potential to cause, and has already caused, millions of premature deaths. In fact, the most significant cause of premature deaths in developed countries was identified as tobacco use in the form of cigarette smoking (Lopez et al, 1994). According to The World Bank (1999:24), people in the United States who smoke are 20 times more likely to die due to cancer in middle age than people who do not smoke. Mathers and Loncar (2006) project that the number of deaths that result from tobacco use will be 6.4 million in 2015 and 8.3 million in 2030. These deaths are as a result of various types of diseases that occur due to tobacco use, for example lung cancer and cancer of the oral cavity, to mention but a few (IARC, 2012). The reasons individuals have for consuming tobacco span a wide range, however, past research has found that there is a significant relationship between socioeconomic factors and tobacco consumption; in particular, there is an inverse relationship between socioeconomic status and tobacco use (Jitnarin et al, 2011).

This paper studies the relationship between various socioeconomic factors and tobacco use for four of the countries belonging to the Southern African Customs Union (SACU), that is, Lesotho, Namibia, Swaziland and South Africa. Botswana is also part of the Southern African Customs Union, however there is no data available for this country that contains information on tobacco use; hence Botswana is not included in this study. The data are obtained from the Demographic and Health Surveys (DHS) for Lesotho (2009), Namibia (2006-7) and Swaziland (2006-7). For South Africa, the Wave 1 National Income Dynamics Study (NIDS 2008) data is used.

Lesotho is a small kingdom located in the Southern region of Africa. Lesotho is surrounded by South Africa, and the main economic activity carried out is subsistence farming, with the major products being sorghum, corn, wheat and livestock. The population of Lesotho was 1,876,633 based on the 2006 census, with a life expectancy of 41 years (MOHSW and ICF Macro, 2010). Namibia, on the other hand is located in the South-West of Africa. It is bordered by the Atlantic Ocean to the West, Botswana and Zimbabwe to the East, South

Africa to the South; and Angola and Zambia to the North. The population of Namibia was 1,830,330 based on the 2001 census, with a life expectancy of 48 years for males and 50 years for females (MoHSS and Macro International Inc, 2008).

Swaziland, like Lesotho, is a small kingdom located in the Southern region of Africa, with an agricultural base. It is bordered by South Africa to the North, West and South, and by Mozambique to the East (CSO and Macro International Inc, 2008). The population of Swaziland was 953,524 based on the 2007 census (United Nations, 2011). South Africa, as its name suggests, is located in the Southern part of Africa, and is bordered by Namibia, Botswana and Zimbabwe to the North, the Atlantic Ocean to the West, and the Indian Ocean, Swaziland and Mozambique to the East (Department of Health et al, 2007). The population of South Africa, as per the 2011 census was 51,770,560 (Statistics South Africa, 2012). The country maps for Lesotho, Namibia, Swaziland and South Africa are included in Appendix 1.

Restricting this study to the countries that belong to SACU makes it possible to have consistency in tobacco prices and environment across the countries studied, since belonging to the same customs union implies that the countries share similar tariff structures (Krugman and Obstfeld, 2009:239). The price of tobacco products plays a major role in influencing tobacco use and prevalence; and increases in the price of tobacco products is one of the effective ways of reducing demand for these products (IARC Handbooks of Cancer Prevention, 2011). Given that price is such a significant factor in tobacco use, and that the data used in the analysis carried out in this paper does not have price information, the consistency in the price of tobacco products across these four countries is necessary, as it enables the study of the other factors that influence tobacco use across these four countries, while holding price constant.

The main model that is used in this paper to study the relationship between socioeconomic factors and tobacco use is adapted from Pampel (2008), who used multinomial logistic regressions to study the socioeconomic patterns of tobacco use in 14 African countries, using data from the DHS. Pampel (2008) found that the use of cigarettes was highest among men who lived in urban areas, the less educated and men with occupations of a lower status. The same socioeconomic pattern was found for women, except with lower prevalence.

The research that has been carried out for African countries is not as accurate as that carried out for other countries, and the figures are not comparable across countries (Pampel, 2008). This paper therefore contributes to existing literature by looking at African countries and providing not only a better understanding of the prevalence as well as the socioeconomic patterns of tobacco use in Lesotho, Namibia, Swaziland and South Africa which have not been extensively studied in this regard, but also providing estimates that are comparable across these four countries. It is necessary that such a relationship be assessed, because in order for a country to set effective tobacco control policies, there needs to be precise knowledge not only of the factors that are related to tobacco consumption, but also how these factors are related to tobacco consumption. Also, according to Lopez et al (1994), prevalence is a good indicator of population exposure to the dangers of tobacco use, hence a better understanding of the prevalence of tobacco use has the potential to enable the implementation of more effective tobacco control measures. By putting in place effective tobacco control policies, a country can cut down on the number of deaths that arise as a result of tobacco use; for example, 800 000 deaths that could have been caused as a result of lung cancer were prevented in the United States over the period 1975 to 2000, thanks to effective tobacco control policies (American Cancer Society, 2013).

The rest of the paper is organised as follows: Section 2 provides more insight on the existing literature around the topic, while Section 3 explains the data, methods and analysis used in this paper. Section 4 gives the descriptive statistics of the data, as well as the prevalence of tobacco use in each of the four countries. Section 5 gives the regression results, and Section 6 includes the implications of the findings. Section 7 looks at the limitations of this study, and Section 8 gives the conclusion.

2. LITERATURE REVIEW

A number of authors have written on tobacco consumption in relation to socioeconomic factors, and the results obtained by these authors are indeed insightful. Jefferis et al (2003) carried out a study using British data, and found that socioeconomic background does influence smoking behaviour, and hence it is imperative that tobacco control policies acknowledge and take note of social pathways that lead to smoking. According to Crampton et al (2000) people in New Zealand who have no jobs, or low status jobs, and have limited material resources are more likely to smoke compared to their more fortunate counterparts. A similar finding was made by Peer et al (2009), who assert that there is an inverse relationship between income and smoking prevalence; and between education and smoking prevalence in South Africa. Steyn et al (2002) carried out similar research for South Africa in 1998 using DHS data and found that light smokers were more frequently individuals who were poor and less educated. Araujo et al (2011) carried out a study in Mozambique and also found that there was an inverse relationship between tobacco use and education, that is, tobacco use decreased with education level, both in women and in men. Pampel (2005) in his study on Malawi and Zambia using DHS data found that cigarette smoking is more common in the urban areas compared to rural areas, and found a negative association between cigarette smoking and education for both men and women. Among men, Pampel (2005) found that the employed are more likely to smoke cigarettes compared to the unemployed, but the opposite relationship exists for the women, whereby the employed are less likely to smoke cigarettes compared to the unemployed.

John et al (2012) carried out a study on Ghana, using DHS data and a logistic regression model to assess the relationship between tobacco use and a number of demographic and socioeconomic factors. John et al (2012) found that the prevalence of tobacco use was high amongst the poorer people and those with lower levels of education. Doku et al (2010) also carried out a study on adolescents in Ghana, and found that socioeconomic differences were present with regards to tobacco use, whereby those with low socioeconomic status had higher prevalence of tobacco use. Jitnarin et al (2011) studied Thai adults and also found that for men, the prevalence of cigarette smoking among those who had only basic education was 26.6%, while the prevalence of smoking among those who had higher education was much lower (14.7%); whereas women with basic education had a cigarette smoking prevalence of 3.2%, while women with higher education had a cigarette smoking prevalence of 0.6%.

It is important to note that not only is an understanding of the factors that affect tobacco consumption important, but awareness of the type of tobacco consumed also plays an important role in enabling a country to come up with effective policies to reduce tobacco consumption. Araujo et al (2011) found that the form of tobacco consumption differed across gender, whereby women consumed predominantly smokeless tobacco, whereas men consumed predominantly cigarettes. A similar finding was made by Flora et al (2009) who studied the case of Bangladesh, and assert that chewing tobacco is more common among females, whereas smoking is higher in males. Araujo et al (2011) also found that the prevalence of smokeless tobacco use was much higher in the older age groups, compared to the younger age groups, both for the men and women.

Panday et al (2003) assessed the determinants of smoking behaviour in adolescents in South Africa, and found that Black and Coloured adolescents are pressured into smoking by their peers, who also make it hard for them to quit smoking; while the White adolescents opt to smoke by choice. Senkubuge et al (2012) analysed medical students in South Africa and found that the prevalence of tobacco use differed by race, whereby the Whites had the highest cigarette smoking prevalence, while the Blacks had the highest smokeless tobacco use prevalence. The use of tobacco is therefore influenced by racial profile, as is also evidenced by Peer at al (2009) who find that in South Africa, White men are almost twice as likely to smoke cigarettes compared to Black men, while the Coloured and Indian men are more than twice as likely to smoke as the Black men. For the women in South Africa, Peer et al (2009) find a similar trend whereby the Coloured, Indian and White women are all more likely to smoke cigarettes compared to the Black women.

Peltzer (2009) carried out a study on school going children from six countries in Africa (Kenya, Namibia, Swaziland, Uganda, Zambia and Zimbabwe), using the frequency with which a person went hungry as a measure for poverty. Peltzer (2009) found that the prevalence of tobacco use for those who reported always going hungry (the poorer people) was almost twice that of those who reported never going hungry (the richer people). John at al (2012) also found that among the men and women in Ghana, tobacco use was higher among those in the lower wealth brackets. The use of tobacco is therefore also influenced by income levels.

Pampel (2008) in his study of 14 African countries using the DHS data also assessed the frequency of cigarette smoking with respect to various socioeconomic factors, and found that although the prevalence of cigarette smoking decreased with educational attainment, the frequency of cigarette smoking was high amongst the more educated men. This implies that even though a smaller proportion of educated men smoked cigarettes compared to uneducated men, those who did smoke cigarettes tend to smoke a higher number of cigarettes a day compared to the uneducated men who smoke cigarettes.

Smoking has long been a public health concern, more so in terms of shielding children and youth from the harms and negative effects of smoking (Henderson et al, 2013). Henderson et al (2013) carried out a survey on secondary school children in England and found that living with someone who smokes increased the odds of a student smoking as well. The use of tobacco, particularly smoking tobacco therefore not only affects the direct user, but also affects the people who are in the near surroundings of the smoker; hence exposure to secondhand smoke is something that public health bodies should be concerned about as well. This is not only because of the negative health effects it has, but also the fact that exposure to secondhand smoke increases the likelihood of a person smoking if they are frequently exposed to secondhand smoke. Henderson et al (2013) in their study found that compared to non-smokers, regular smokers were more likely to report being around other people who smoke. A similar finding was made by Peltzer (2003) who carried out a study on Black South African secondary school students and found that those who had a family member or peer who used tobacco were more likely to also be users of tobacco.

The literature therefore shows the extent of the problem that is tobacco use, and the adverse negative effects it has not only on the users of tobacco, but also on those that are surrounded by tobacco users. By understanding the socioeconomics of tobacco use in Lesotho, Namibia, Swaziland and South Africa, the adverse effects of tobacco use in these countries can be significantly reduced by implementing appropriate control measures based on the findings. In addition, there is no existing literature that studies the socioeconomics of tobacco use by type in the individual countries of the Southern African Customs Union and provides results that are comparable across the countries. This paper therefore contributes to the existing literature by doing so. The question that this paper intends to address, therefore, is ***"What are the socioeconomic patterns of tobacco use in the Southern African Customs Union?"***

3. DATA AND METHODS

3.1 Data Used

The data used is obtained from the Demographic and Health Survey (DHS) for Lesotho (2009), Namibia (2006-7) and Swaziland (2006-7). The DHS are household surveys that provide data on population, health and nutrition conditions of individuals in the surveyed households for various countries (The DHS Program, 2014). These surveys involve two stages of sampling, whereby the first stage involves a current sampling frame. This is a list of small administrative units with demarcated boundaries and whose population size is known; and it is normally the census enumeration areas (EAs). 300 to 500 of the EAs are then chosen from the sampling frame, with probability proportional to population size. In cases where the EAs are massive, they are further segmented into smaller units of 150 to 200 households, from which the sample can then be selected. The DHS surveys also include sample weights because the DHS samples are not always self-weighting. The sample weights are used to make the data representative of the whole population when carrying out analysis (ICF International, 2012).

The DHS data for Lesotho was collected between October 2009 and January 2010. The data contains 7624 women of 15 to 49 years old, and 3317 men of 15 to 59 years old. For Namibia, the data was collected between November 2006 and March 2007 and contains 9804 women of 15 to 49 years old, and 3915 men of age 15 to 49 years. For Swaziland, the survey was carried out between July 2006 and March 2007, and the data used contains 4987 women of 15 to 49 years old, as well as 4156 men of 15 to 49 years old.

The South Africa (2003) DHS is not publicly available, and hence could not be used to carry out any analysis. The data used for South Africa was therefore obtained from the Wave 1 National Income Dynamics Study (NIDS), which was carried out in 2008. The National Income Dynamics Study is a South African panel study that focuses on trying to better understand the changes in poverty, and also includes information on health, education, mortality, fertility, household characteristics, amongst other things (NIDS, 2014).

The NIDS Wave 1 survey was done using a stratified two-stage cluster sample design. The first stage involved choosing 400 primary sampling units (PSUs) from Stats SA's 2003

Master Sample of 3000 PSUs. A PSU consists of at least one EA, or more than one EA from the 2001 census when the initially selected EA was found to consist of less than 74 households. When compiling the Master Sample, 8 non-overlapping samples of dwelling units were drawn within each PSU, and these are known as clusters. Two such clusters in each PSU were then allocated to NIDS by Stats SA (Leibbrandt et al, 2009). The NIDS survey data contains data on the variables of interest in this paper, and hence it is possible to create a data set for South Africa that is comparable with the variables of interest in the DHS data sets for Lesotho, Namibia and Swaziland that are used in this paper. The National Income Dynamics Study also contains sample weights which make the data representative of the whole population (NIDS, 2014).

3.2 Measures

The methodology used to carry out the statistical analysis in this paper is similar to that adopted by Pampel (2008). Logistic regressions are used to model the relationship between the different types of tobacco use and some demographic and socioeconomic factors. Stata 2012 is the software that is used to carry out the statistical analysis in this paper.

The logistic regressions are run separately for the men and women. They are also run separately for the different types of tobacco use; that is, cigarettes, pipe, chewing tobacco, snuff and other tobacco. In addition, the regressions are carried out for each country separately, after which the data from the four countries is combined and regressions are run on the combined data set. The South African data only includes information on cigarette use, and does not include information on the use of snuff, chewing tobacco or pipes. South Africa is therefore excluded from the combined data set when running the regressions for pipes, chewing tobacco, snuff and other tobacco.

The logistic regression used in the analysis for the separate countries is as stated in equation 1 below:

$$P(Tob = 1|Age, Age^2, Res, Educ, Occ, Rel) = \Lambda(\beta_0 + \beta_1 Age + \beta_2 Age^2 + \beta_3 Res + \beta_4 Educ + \beta_5 Occ + \beta_6 Rel) \quad (1)$$

Where *Tob* is a dummy variable indicating whether or not a person consumes the type of tobacco being assessed; *Age* is age in single years and $Age^2$is the square of age in single years; *Res* is a dummy variable specifying whether the individual lives in an urban or rural area; *Educ* is a categorical variable containing the highest level of education achieved; *Occ* is a categorical variable containing occupation; and *Rel* is a categorical variable containing religious affiliation. The age quadratic term is included in the model to account for the quadratic trend that tobacco use has with age, that is, tobacco use increases with age, reaches a peak, and then decreases with age. The presence of a quadratic trend is seen by looking at the prevalence of tobacco use across the age groups, whereby prevalence increases with age group, then beyond a certain age group, the prevalence of tobacco use starts to decrease. By including the age quadratic term, it is possible to calculate the peak age at which tobacco use will stop increasing with age, and start decreasing with age. This peak age is referred to as the turning point of age.

The logistic regression used in the analysis of the combined data from the four countries is similar to that stated in equation 1, however it also includes dummy variables for the countries, with Swaziland being the base case. In addition to the country dummies, interaction terms for each country are included, whereby the country dummies are interacted with the independent variables in the model.

For the countries assessed, the analysis is restricted to men and women of age 15 to 49 years. Also, in order to have a consistent number of observations in each country, observations with missing values for any of the variables of interest were dropped. The final data used for analysis therefore contains 2988 men and 7621 women from Lesotho, 3899 men and 9779 women from Namibia, 4149 men and 4977 women from Swaziland, and 4649 men and 6499 women from South Africa.

The education categorical variable has 4 categories which are as follows: 1 is the reference category and it includes the people who have no schooling; 2 refers to those whose highest educational attainment is completing primary school; 3 includes those whose highest level of education is secondary school; and 4 includes those who have obtained post-secondary qualifications. The occupation categorical variable also has 4 categories, which are as follows: 1 is the reference category and it includes the people who are not working; 2 refers to the agricultural self-employed workers and employees (agriculture); 3 includes the

household, domestic, service and skilled/unskilled manual workers (service-manual); and 4 includes the professionals, technicians, clerical and sales workers (non-manual). The religion categorical variable has 3 categories which are as follows: 1 is the reference category and it includes those with no religion, and those from traditional, local and other religions, as well as Muslims; 2 includes Catholics; 3 refers to Protestants. Islam is not given its own category because of the extremely small number of Muslims in the data. Also, for South Africa, there was no distinction between Catholics and Protestants; all Christians were placed in the same category. Therefore when the four data sets are combined, religion is categorised as: 1 is the reference category as described on the previous page; 2 refers to Christians.

3.3 Analysis

Prior to running the logistic regression model shown in equation 1, the descriptive statistics as well as the prevalence of tobacco use are calculated for each country in order to get a better understanding of the data. The descriptive statistics as well as the prevalence of tobacco use are calculated using sample weights in order to make the statistics representative of the whole population. The descriptive statistics show the proportion of the population belonging to each category of the independent variables, whereas the prevalence of tobacco use shows the proportion of people that use tobacco in a particular category.

Multicollinearity is also tested for using the Variance Inflation Factor (VIF). With the exception of *Age and* Age^2, the VIF values for the independent variables are all below 10, indicating that multicollinearity is not a problem. The VIF values for *Age* and Age^2 are above 10, however this high level of multicollinearity is expected given that Age^2 is the square of *Age*. With regards to the dataset of women from Namibia, the VIF values for religion are slightly greater than 10 (approximately 11), indicating that multicollinearity might be a problem in this case. Religion is therefore not included as an independent variable when running the regression for women from Namibia.

The logistic regression model depicted in equation 1 gives adjusted odds ratios as the statistical output. In addition, the 95% confidence interval as well as the p-value are included in the output tables in Section 5. The Chi-square test is also carried out to determine whether

the logistic regression model as a whole fits significantly better than a model with no independent variables.

4. DESCRIPTIVE STATISTICS AND TOBACCO PREVALENCE

4.1 Descriptive Statistics

This section gives the descriptive statistics in relation to the variables of interest in this paper for each of the four countries. The descriptive statistics are obtained by using the sampling weights in order to make the results representative of the population.

4.1.1 Lesotho

The mean age of men is 27 years. Referring to Table 1, the age group with the highest number of men is in the 15-19 age group (27.8%), and the least are in the 45-49 age group (6.4%). The majority of the men reside in rural areas (71.9%). Approximately half of the men obtained primary education (48.8%), and 34.1% obtained secondary education. 31.8% of men are not working, with 34.8% working in agriculture related occupations.

The mean age amongst the women is 28 years, and the age trend is similar to that of the men. More than half the women live in rural areas (66.3%). 46.6% of the women obtained primary education, and 46.4% obtained secondary education; while 5.8% obtained post-secondary education. Only 1.1% have no education. Also, more than half the women are not working.

Table 1: Descriptive Statistics for Men and Women aged 15-49 years from Lesotho

	Men (n = 2988)		Women (n = 7621)	
	n	Weighted %	n	Weighted %
Age				
15-19	838	27.8	1,840	23.4
20-24	631	21.1	1,555	20.4
25-29	462	15.4	1,203	16.3
30-34	370	13.2	960	12.9
35-39	282	9.7	755	10.0
40-44	204	6.5	663	8.6
45-49	201	6.4	645	8.4
Residence				
Rural	2313	71.9	5,646	66.3
Urban	675	28.1	1,975	33.7
Education				
No school	393	11.2	114	1.1
Primary	1494	48.8	3,863	46.6
Secondary	955	34.1	3,276	46.4
Post-Secondary	146	5.9	368	5.8
Occupation				
Not Working	936	31.8	4,285	54.9
Agriculture	1143	34.8	951	9.9
Service-Manual	662	24.2	1,367	21.2
Non-Manual	247	9.2	1,018	14.0
Religion				
Other	348	10.2	583	7.0
Catholic	1217	42.4	3,217	42.6
Protestant	11423	47.4	3,821	50.2

The 'Other' Religion category contains Seventh Day Adventists, Muslims, Other Christians, those with no religion, and those whose response was 'other'.
For women, in addition to the above, the 'Other' religion category contains Methodists.

4.1.2 Namibia

Table 2 shows the descriptive statistics for both men and women from Namibia. Looking at the men first, the mean age is 28 years, with the largest group being the 15-19 age group (23.3%), and the smallest group being in the 45-49 age group (6.0%), depicting a similar trend as Lesotho. In terms of education, only 7.8% obtained post-secondary education, while 54.6% obtained secondary education. 37.4% of the men have a service-manual occupation, whereas 32.2% are not working. 11.7% have a non-manual occupation, and 18.7% work in agriculture related occupations. Most of the men are Protestants (70.6%), with 26.4% being Catholics.

The women depict similar trends as in Lesotho, whereby the largest age group is 15-19 years (22.9%), and the smallest age group is 45-49 years (7.0%), with the mean age being 28 years. Also, half the women reside in rural areas (51.4%).

Only 7.0% of the women obtained post-secondary schooling; the majority obtained secondary schooling (61.5%). Compared to the men, a higher percentage of women are in non-manual occupations (26.5%). Similar to the men, the majority of the women are Protestants (77.2%).

Table 2: Descriptive Statistics for Men and Women aged 15-49 years from Namibia

	Men (n = 3899)		Women (n = 9779)	
	n	Weighted %	n	Weighted %
Age				
15-19	906	23.3	2199	22.9
20-24	738	19.1	1873	19.0
25-29	676	17.9	1558	16.6
30-34	562	15.0	1417	14.5
35-39	417	10.3	1074	10.7
40-44	348	8.4	948	9.5
45-49	252	6.0	710	7.0
Residence				
Rural	2231	49.8	5390	51.4
Urban	1668	50.2	4389	48.6
Education				
No school	404	9.2	772	6.6
Primary	1184	28.3	2611	24.9
Secondary	2079	54.6	5838	61.5
Post-Secondary	232	7.8	558	7.0
Occupation				
Not Working	1270	32.2	4679	47.3
Agriculture	866	18.7	899	8.9
Service-Manual	1,360	37.4	1,659	17.3
Non-Manual	403	11.7	2,542	26.5
Religion				
Other	101	3.0	167	1.8
Catholic	1152	26.4	2170	21.0
Protestant	2646	70.6	7442	77.2

The 'Other' Religion category contains those with no religion, and those whose response was 'other'.

4.1.3 Swaziland

The men have a mean age of 26 years, and looking at Table 3, there is a similar age trend as Namibia and Lesotho. Also similar to Lesotho, the majority of the men reside in rural areas (71.6%). Almost half the men have obtained secondary education (49.1%), and in contrast to Lesotho and Namibia, only 7.6% have no schooling.

The mean age amongst the women is 28 years, and a similar age trend as in Namibia and Lesotho exists. Half the women obtained secondary education, while only 7.4% hold post-secondary qualifications. Similar to Lesotho, more than half the women are not working (56.6%); and in contrast to Lesotho and Namibia, a small proportion of the women work in agriculture related occupations (3.8%).

Table 3: Descriptive Statistics for Men and Women aged 15-49 years from Swaziland

	Men (n = 4149)		Women (n = 4977)	
	n	Weighted %	n	Weighted %
Age				
15-19	1257	31.9	1264	25.6
20-24	878	21.4	1026	21.0
25-29	637	15.0	730	14.6
30-34	446	10.3	628	12.3
35-39	395	8.9	506	10.1
40-44	284	6.5	440	8.8
45-49	252	6.1	383	7.7
Residence				
Rural	2711	71.6	3437	73.3
Urban	1438	28.4	1540	26.7
Education				
No school	331	7.6	412	8.1
Primary	1427	34.9	1633	32.7
Secondary	2014	49.1	2536	51.9
Post-Secondary	377	8.3	396	7.4
Occupation				
Not Working	1770	44.5	2762	56.6
Agriculture	467	9.5	210	3.8
Service-Manual	1,284	31.6	1,078	21.9
Non-Manual	628	14.5	927	17.8
Religion				
Other	3090	74.7	3351	67.4
Catholic	204	5.1	243	4.7
Protestant	855	20.2	1383	28.0

The 'Other' Religion category contains Traditional religion, Charismatics, Zionists, the Apostolic Sect, Muslims, those with no religion, and those whose response was 'other'.

4.1.4 South Africa

The mean age for the men is 30 years, with a similar age trend as in the other three countries; as depicted in Table 4. Unlike the other three countries, the majority of the men reside in urban areas (63.3%). Unlike the other three countries, more than half of the men are not working (57.3%), with only 10.0% being in non-manual occupations.

Table 4: Descriptive Statistics for Men and Women aged 15-49 years from South Africa

	Men (n = 4649)		Women (n = 6499)	
	n	Weighted %	n	Weighted %
Age				
15-19	1,133	18.4	1,194	15.7
20-24	885	17.9	1,254	17.4
25-29	679	16.2	949	16.6
30-34	559	15.9	793	15.4
35-39	505	13.1	817	13.8
40-44	464	9.8	752	10.6
45-49	424	8.7	740	10.5
Residence				
Rural	2,350	36.7	3,323	37.7
Urban	2,299	63.3	3,176	62.3
Education				
No school	883	15.6	1,173	13.0
Primary	2,550	51.5	3,592	53.7
Secondary	890	22.7	1,228	22.3
Post-Secondary	326	10.3	506	11.0
Occupation				
Not Working	2,972	57.3	4,987	73.3
Agriculture	211	2.5	104	0.8
Service-Manual	1,128	30.3	866	13.9
Non-Manual	338	10.0	542	12.2
Religion				
Other	1161	25.3	822	12.6
Christian	3,488	74.7	5,677	87.4

The 'Other' Religion category contains Jews, Muslims, Hindu, African Traditional Spiritual belief and those whose response was 'other'.

The trends amongst the South African women closely follow those amongst the men, with the only exception being that the highest proportion of the women are in the 20-24 age group (17.4%). The mean age for the women is also 30 years. About three quarters of the women are not working and only 12.2% work in non-manual occupations, with a very small proportion of the women working in agriculture related occupations (0.8%).

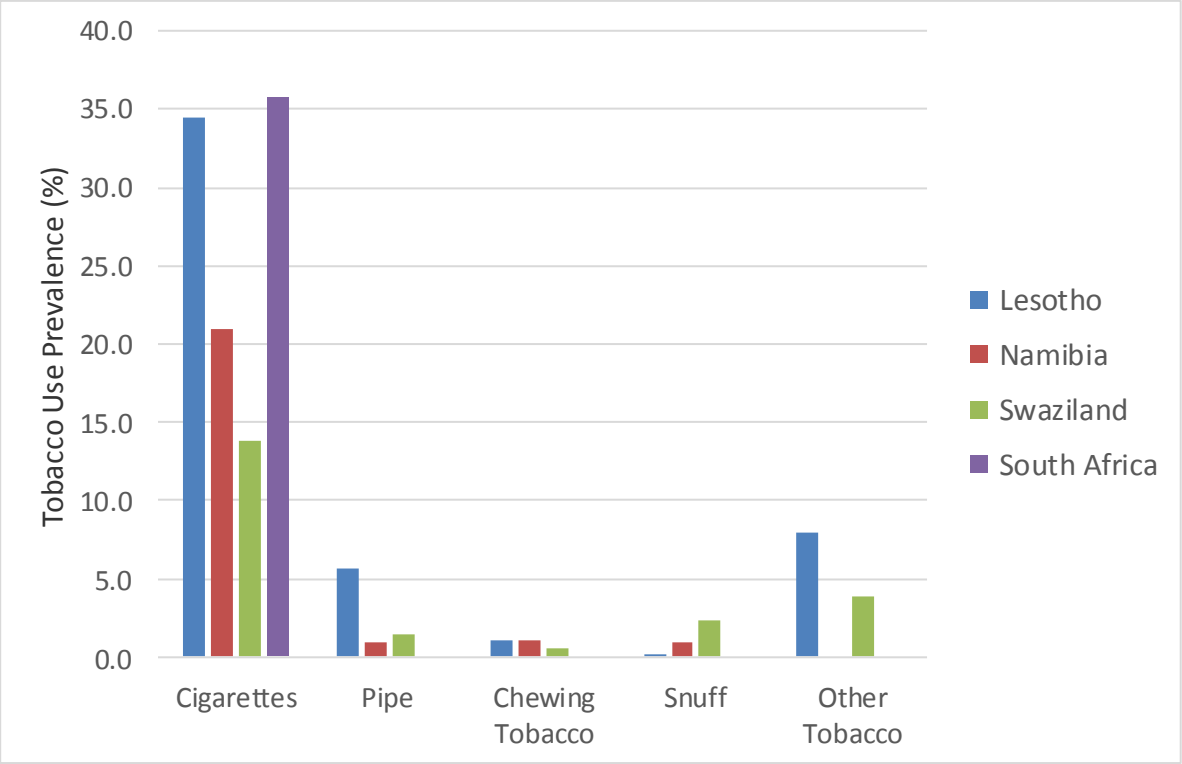
4.2 Tobacco Use Prevalence

An understanding of the prevalence of tobacco use in each of the categories of the variables of interest is essential, as it reveals which categories have high tobacco prevalence, hence enabling a more focused approach in combatting tobacco use. In this section, the results are presented in the form of bar graphs for the various types of tobacco use in order to make it easier to carry out cross-country comparison. The detailed tables showing tobacco use prevalence in Lesotho, Namibia, Swaziland and South Africa are included in Appendix 2. With regards to the women, emphasis is placed on cigarette smoking and snuff use since the prevalence of pipe smoking, chewing tobacco and other tobacco use are generally low.

Looking at Figure 1, it can be seen that with regards to the men, South Africa has the highest cigarette use prevalence, while Swaziland has the lowest. In addition, Lesotho has the highest pipe, chewing tobacco and other tobacco use prevalence, while Swaziland has the highest snuff use prevalence.

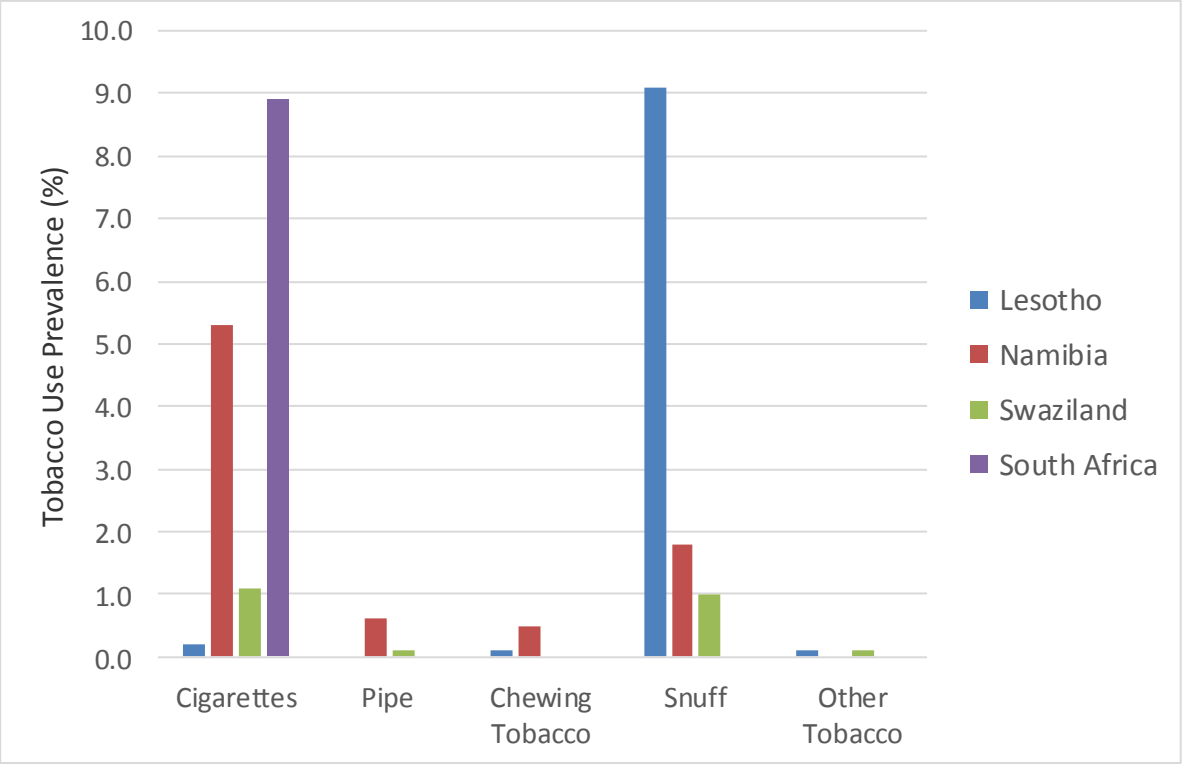
Looking at the women, Figure 2 shows that the highest prevalence of cigarette smoking is in South Africa, while for pipes and chewing tobacco, the highest prevalence is in Namibia. The women in Lesotho have a relatively much higher prevalence of snuff use compared to the women from the other countries, and compared to the men in Lesotho. With the exception of snuff use in Lesotho, overall, the women have a lower prevalence of tobacco use compared to the men.

Figure 1: Tobacco Use Prevalence for Men aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa



There is no data on pipe, chewing tobacco, snuff and other tobacco use in South Africa.
There is no data on other tobacco use in Namibia.

Figure 2: Tobacco Use Prevalence for Women aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa



There is no data on pipe, chewing tobacco, snuff and other tobacco use in South Africa. There is no data on other tobacco use in Namibia.

From Figure 3 it can be seen that Lesotho and South Africa have the highest prevalence of cigarette smoking by men across all the age categories, while Swaziland has the lowest prevalence. With regards to the use of pipes, Lesotho has the highest prevalence across all age categories, while Namibia has the lowest (Figure 4). Figure 5 shows that in most of the age groups (15-19, 20-24, 25-29, 30-34, 35-39), the use of chewing tobacco is highest in Lesotho. In the 40-44 and 45-49 age group, chewing tobacco use is highest in Namibia. Looking at snuff use in Figure 6, the men in Swaziland have the highest prevalence across all age categories compared to the men in Lesotho and Namibia. The men in Lesotho have the lowest snuff prevalence across all age categories. The use of all types of tobacco is generally lowest among the 15-19 age group, with the exception of snuff use.

Figure 3: Cigarette Smoking Prevalence by Age Category for Men aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa

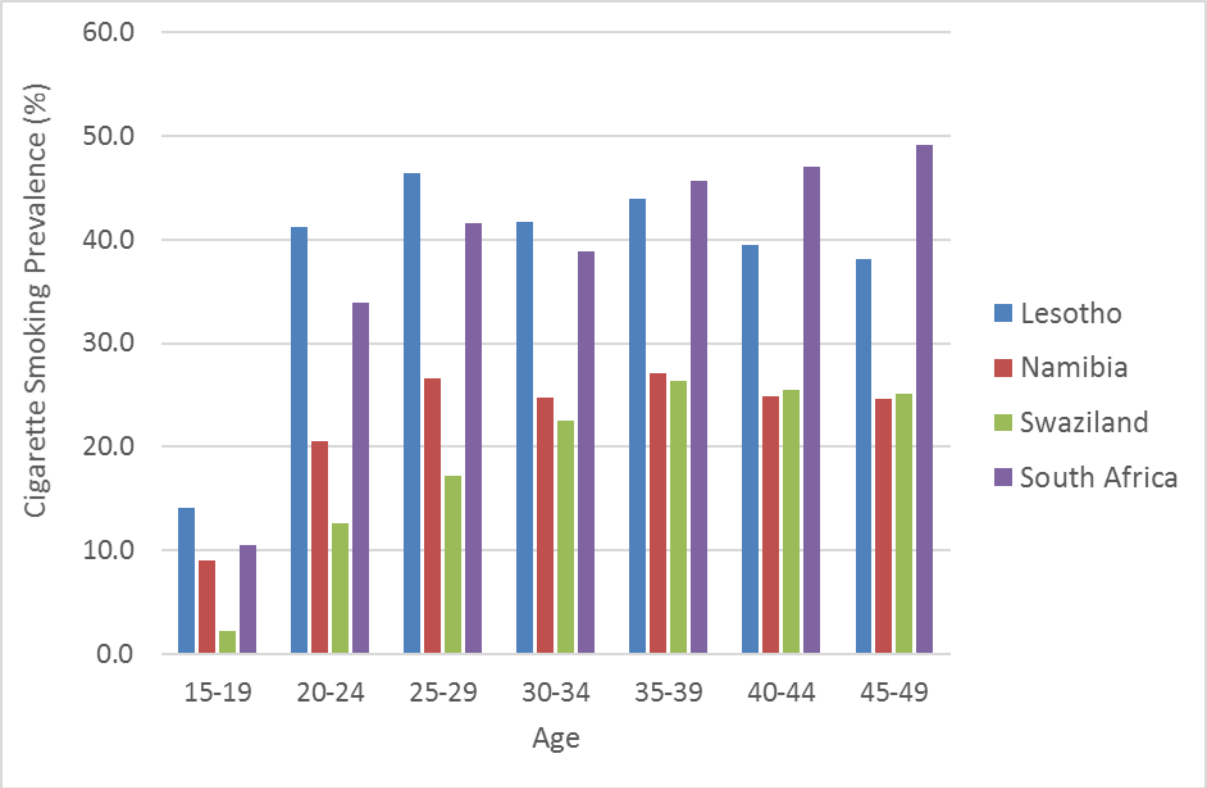


Figure 4: Pipe Smoking Prevalence by Age Category for Men aged 15-49 years from Lesotho, Namibia and Swaziland

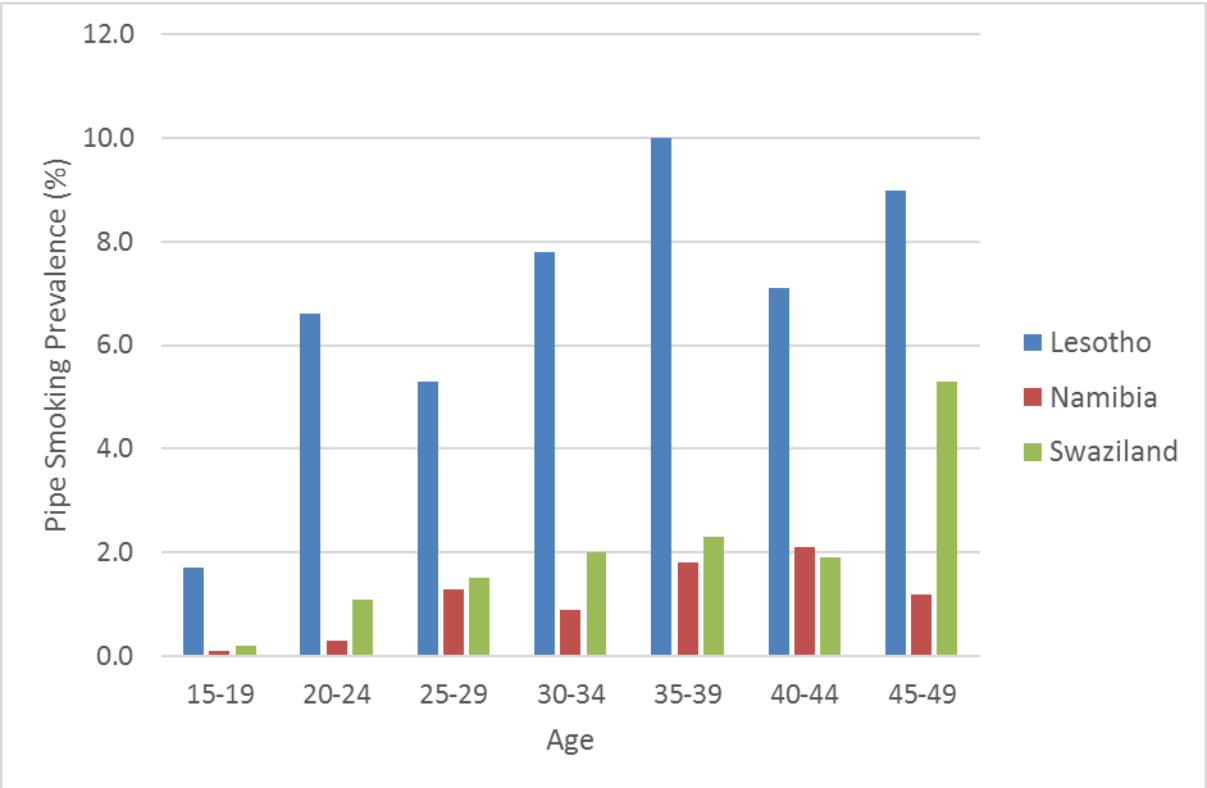


Figure 5: Chewing Tobacco Use Prevalence by Age Category for Men aged 15-49 years from Lesotho, Namibia and Swaziland

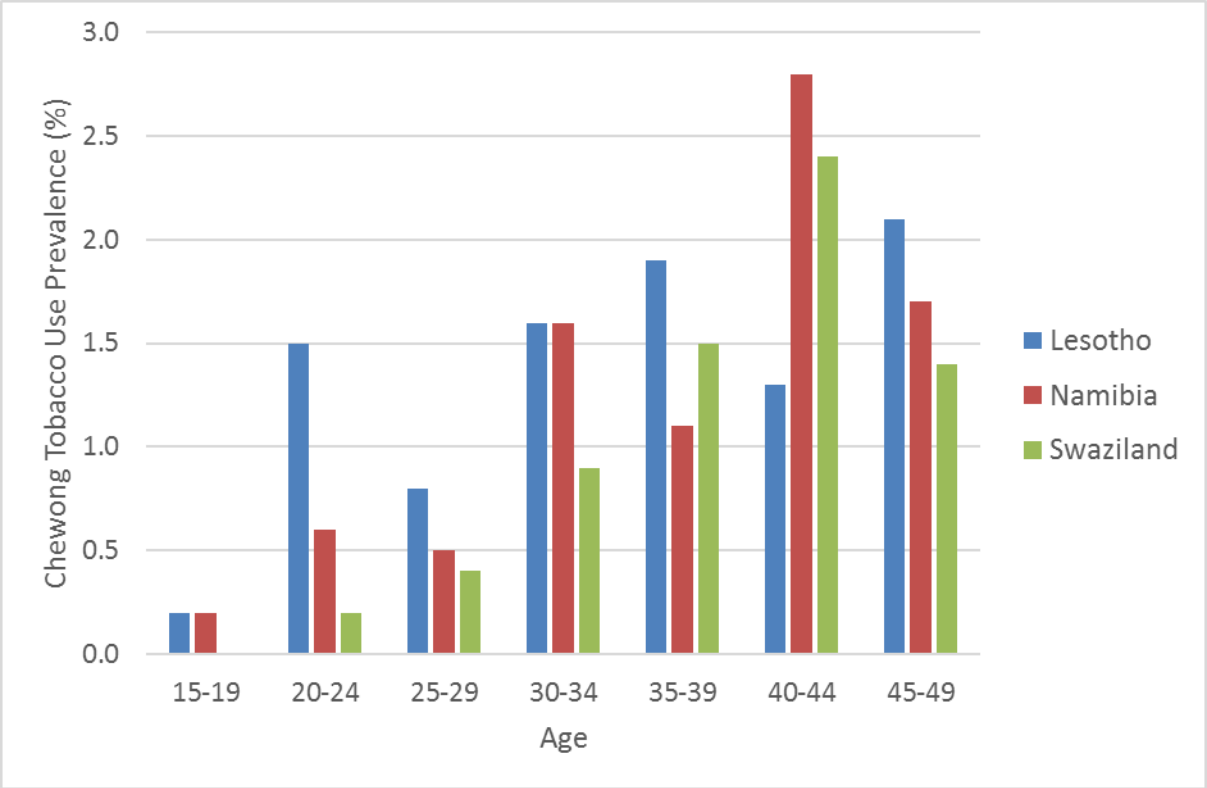
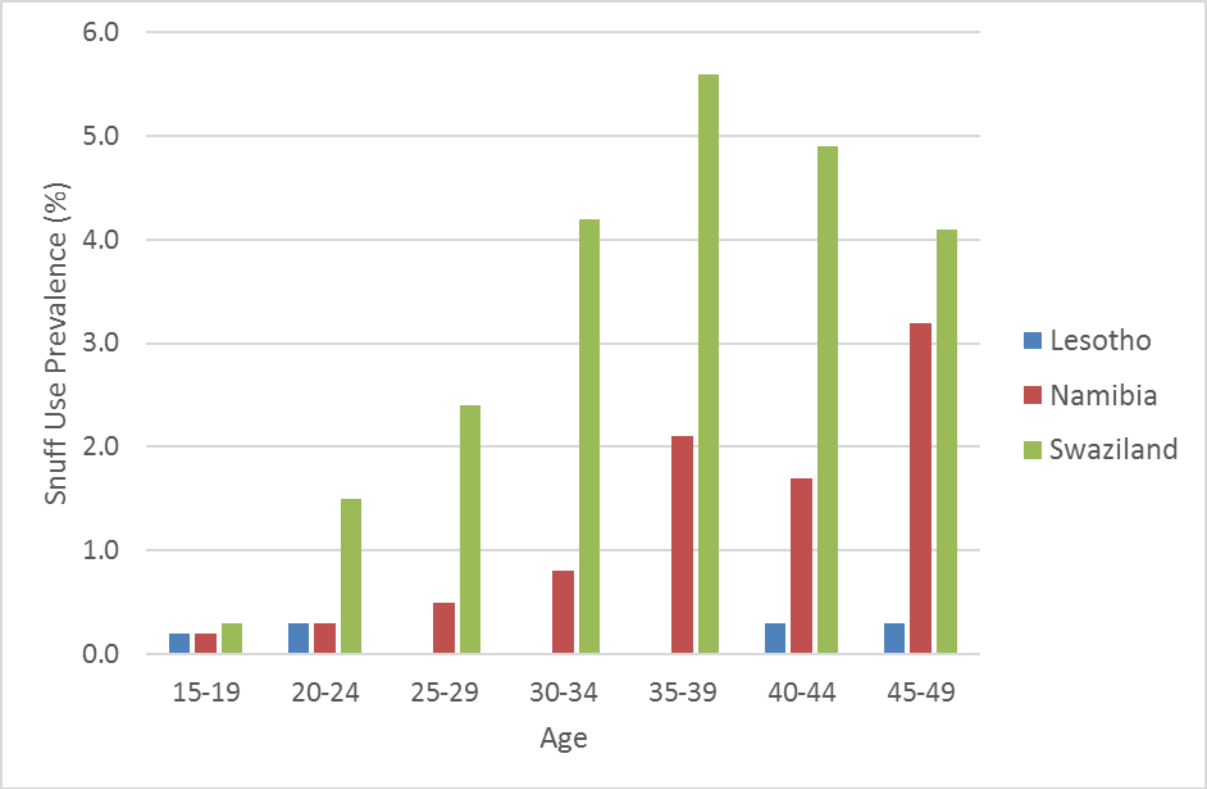


Figure 6: Snuff Use Prevalence by Age Category for Men aged 15-49 years from Lesotho, Namibia and Swaziland



Among the women, cigarette smoking prevalence is highest in South Africa across all age groups, except the 15-19 age group, followed by Namibia, as illustrated in Figure 7. Lesotho has the lowest prevalence of cigarette smoking across all age groups. With regards to snuff use, women in Lesotho have the highest prevalence across all age groups compared to women in the other three countries. The women in Swaziland have the lowest prevalence of snuff use across all the age groups.

Figure 7: Cigarette Smoking Prevalence by Age Category for Women aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa

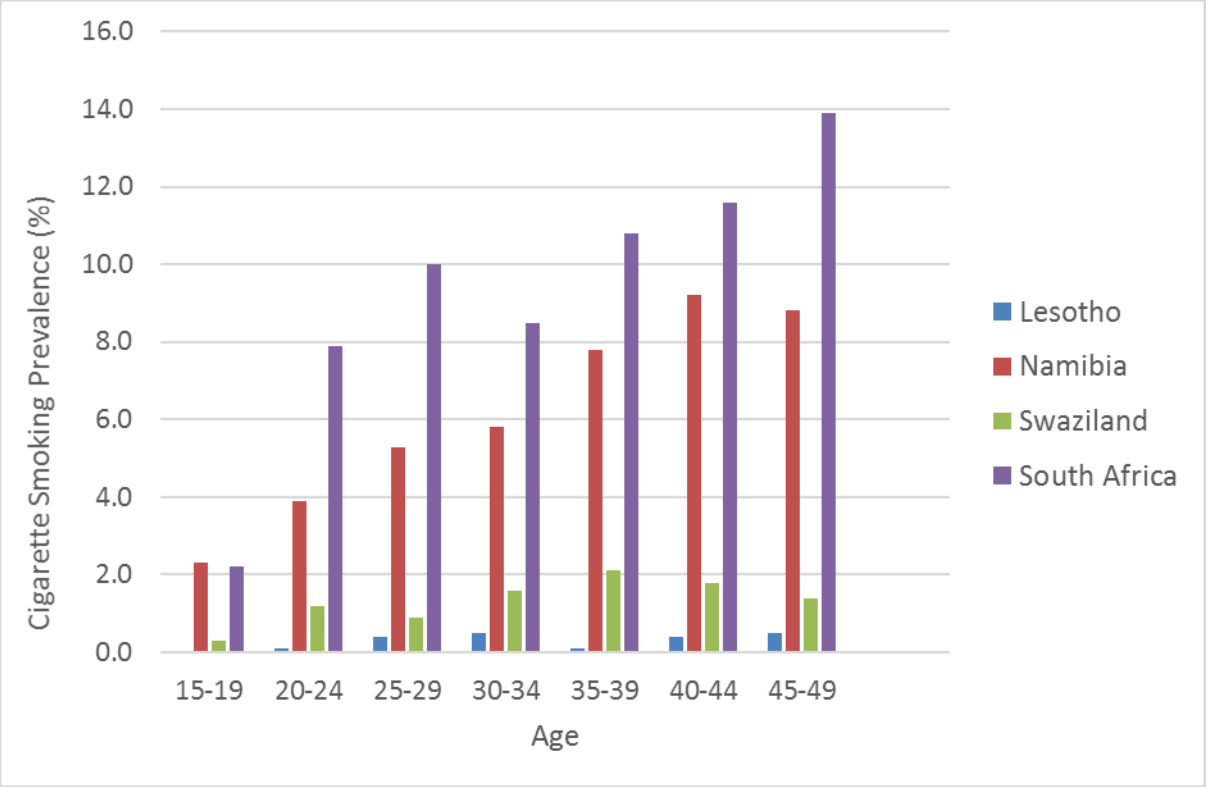


Figure 8: Snuff Use Prevalence by Age Category for Women aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa

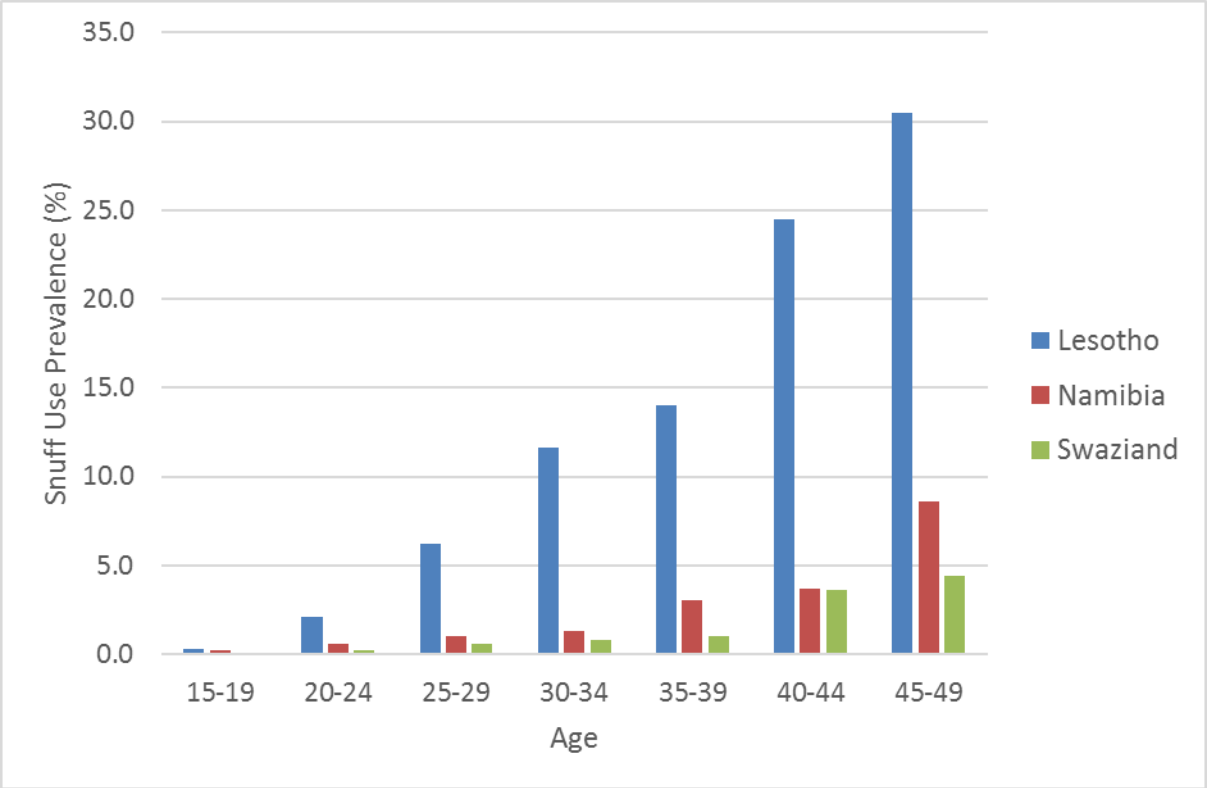


Figure 9: Cigarette Smoking Prevalence by Residential Area for Men aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa

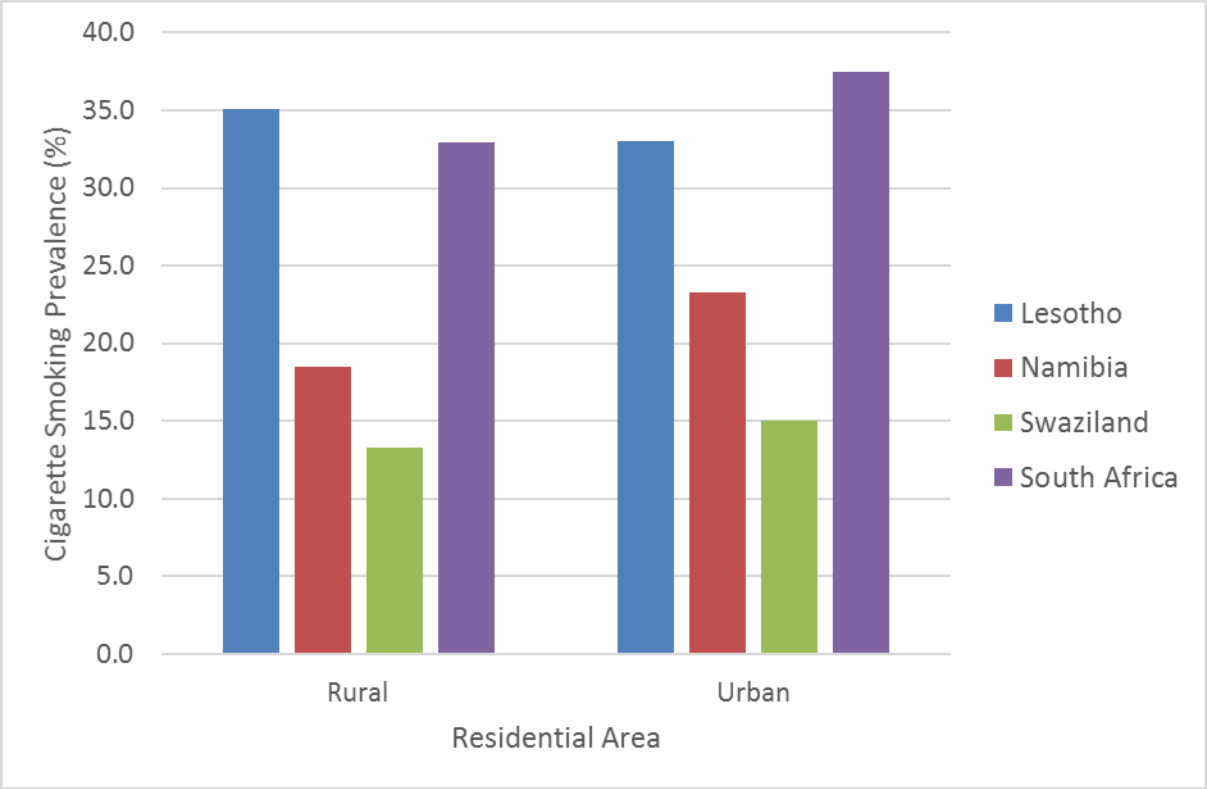


Figure 10: Pipe, Chewing Tobacco, Snuff and Other Tobacco Use Smoking Prevalence by Residential Area for Men aged 15-49 years from Lesotho, Namibia and Swaziland

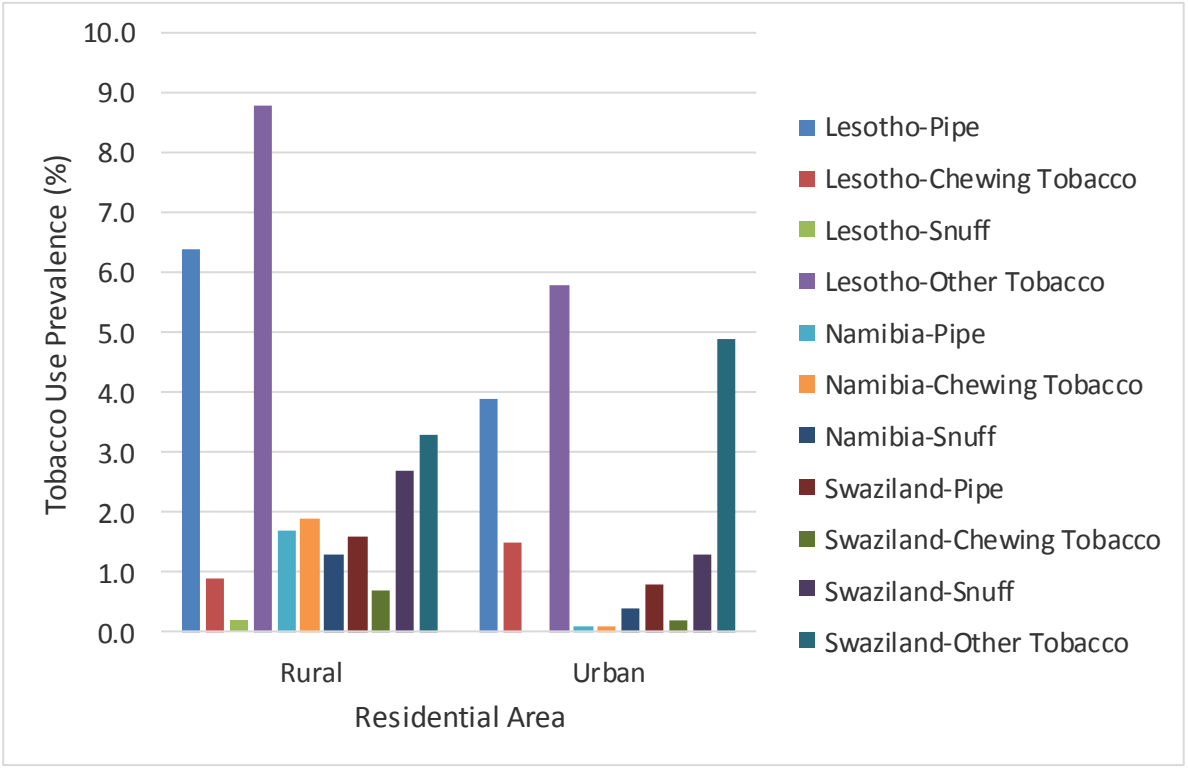
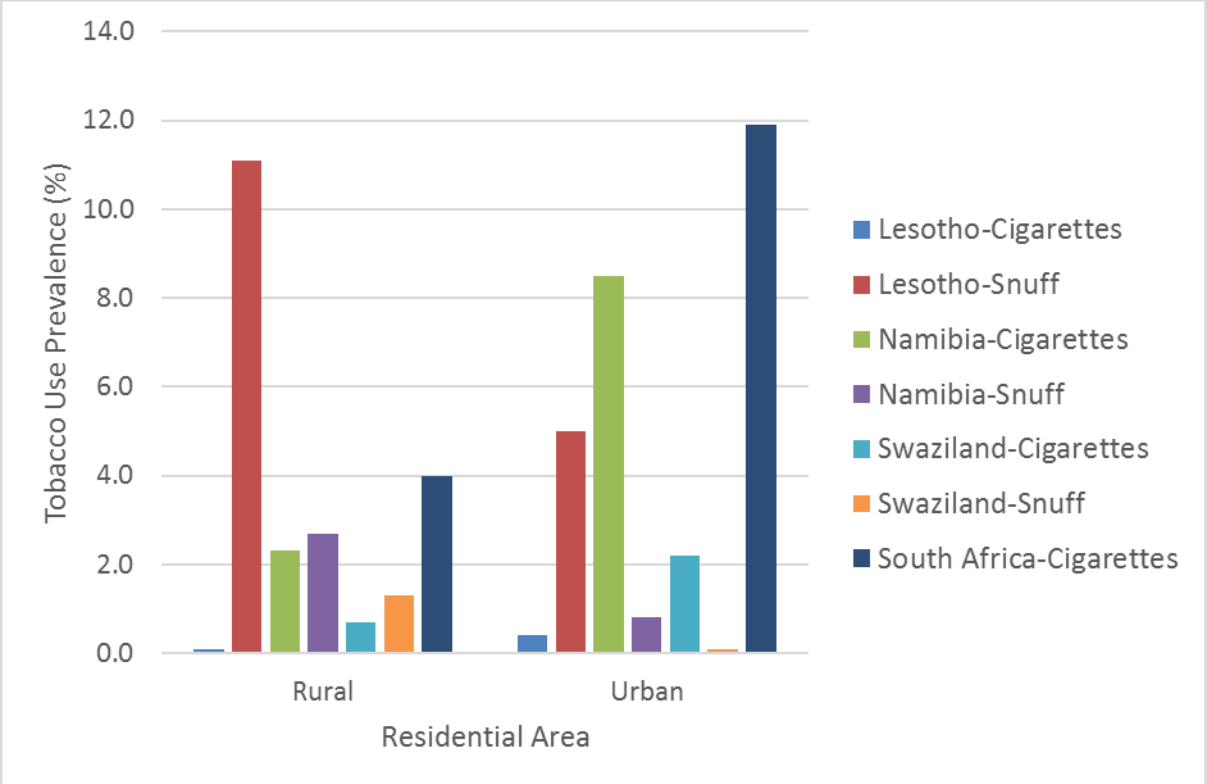


Figure 11: Cigarette Smoking and Snuff Use Prevalence by Residential Area for Women aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa



There is no data on pipe, chewing tobacco, snuff and other tobacco use in South Africa.

Among both the men and women, the prevalence of cigarette smoking is higher in the urban areas compared to the rural areas in each country, with an exception of the men in Lesotho as illustrated in Figures 9 and Figure 11. With regards to the use of pipes, chewing tobacco and snuff by men (Figure 10), prevalence is higher in the rural areas compared to the urban areas in each country, with the exception of Lesotho, where the use of chewing tobacco is higher in the urban areas. For women, the prevalence of snuff use in higher in the rural areas compared to the urban areas.

Figure 12: Cigarette Smoking Prevalence by Highest Level of Education Attained for Men aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa

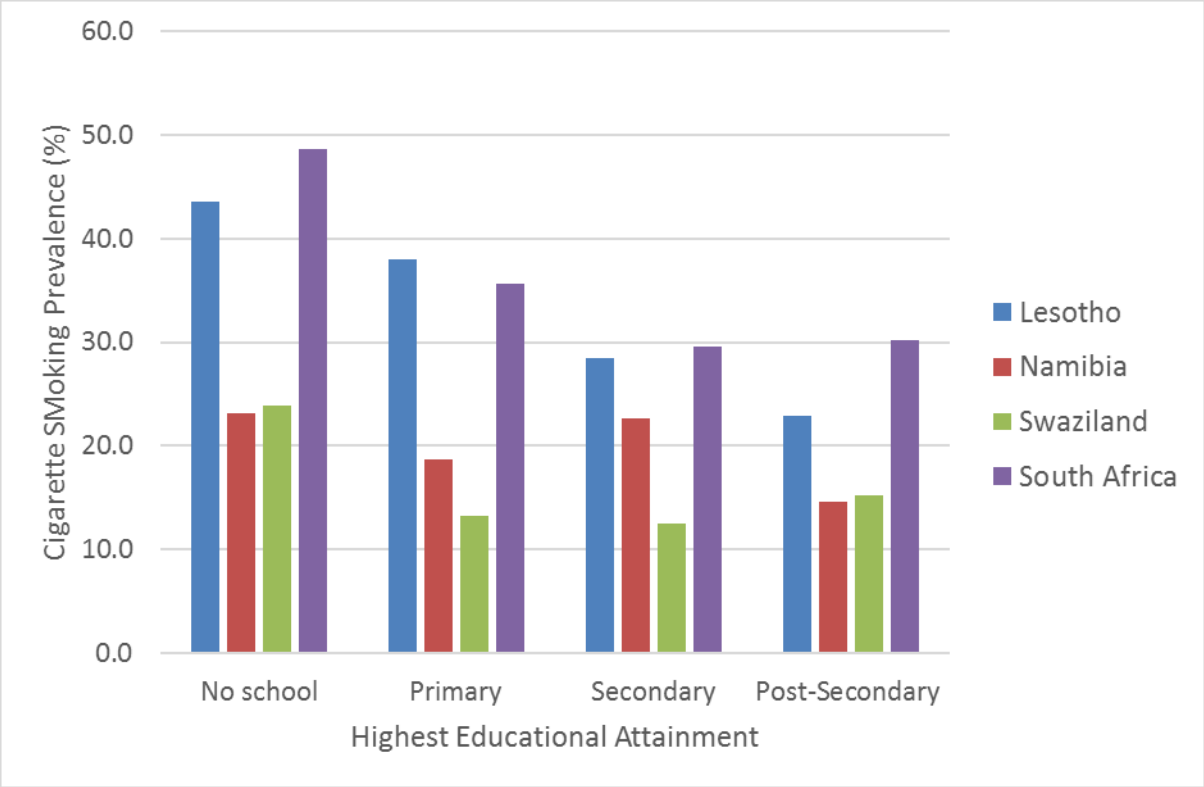


Figure 12 shows that overall, the prevalence of cigarette smoking is lower among the educated men compared to the uneducated men. A similar trend exists for the smoking of pipes, the use of chewing tobacco and snuff among men in Lesotho, Namibia and Swaziland as shown in Figure 13, Figure 14 and Figure 15 respectively. The use of pipes by men in Lesotho who have obtained a post-secondary qualification, however. is higher compared to those who have only obtained a secondary qualification. Also, the use of chewing tobacco by men in Lesotho whose highest educational qualification is primary school, is higher compared to those with no education.

Looking at the women, the trend of cigarette smoking prevalence with educational attainment, as shown in Figure 16, is different compared to the men. For South Africa and Swaziland, the women with post-secondary education have a higher cigarette smoking prevalence compared to those who have achieved lower qualifications, and those with no schooling. For Lesotho, the prevalence of cigarette smoking increases with educational attainment, and the women with no schooling do not smoke cigarettes. For Namibia, the educated women have a lower prevalence of cigarette smoking compared to the uneducated women. With regards to snuff use among the women, the trend is similar to that found among the men, whereby the prevalence decreases with educational attainment, as shown in Figure 17.

Figure 13: Pipe Smoking Prevalence by Highest Level of Education Attained for Men aged 15-49 years from Lesotho, Namibia and Swaziland

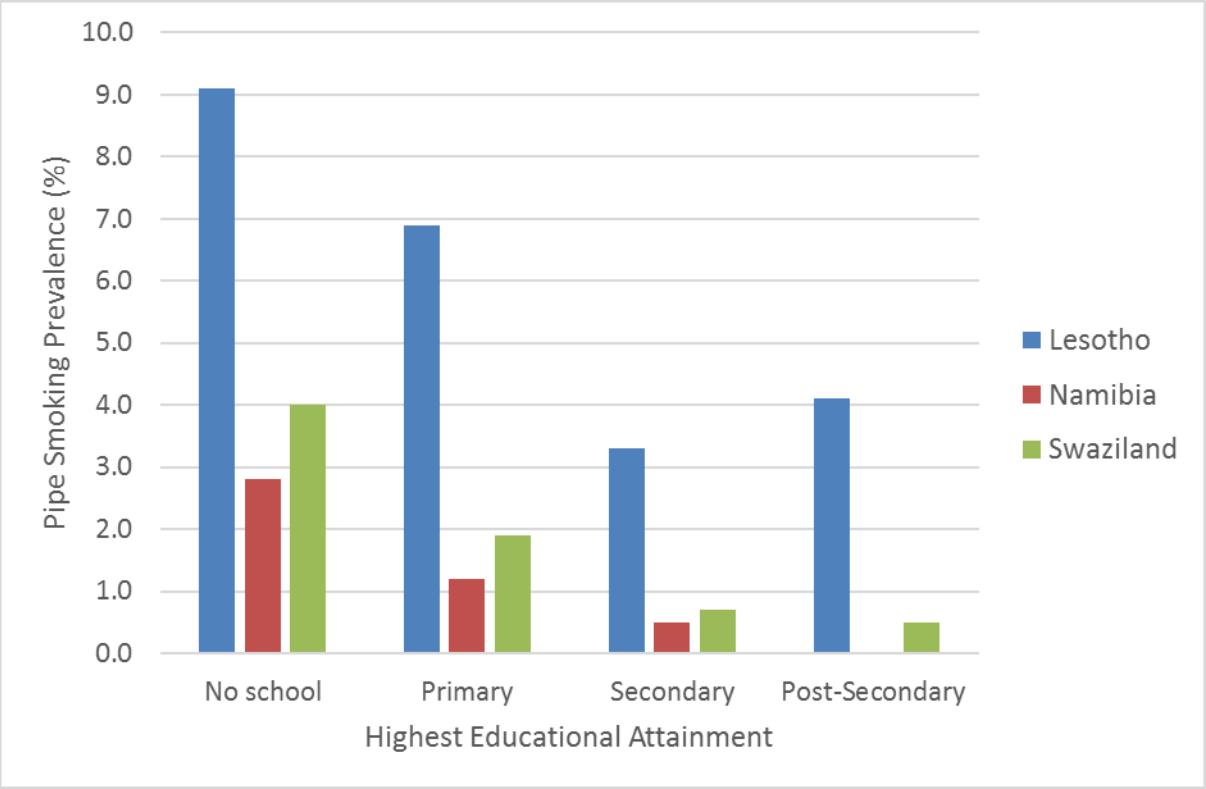


Figure 14: Chewing Tobacco Use Prevalence by Highest Level of Education Attained for Men aged 15-49 years from Lesotho, Namibia and Swaziland

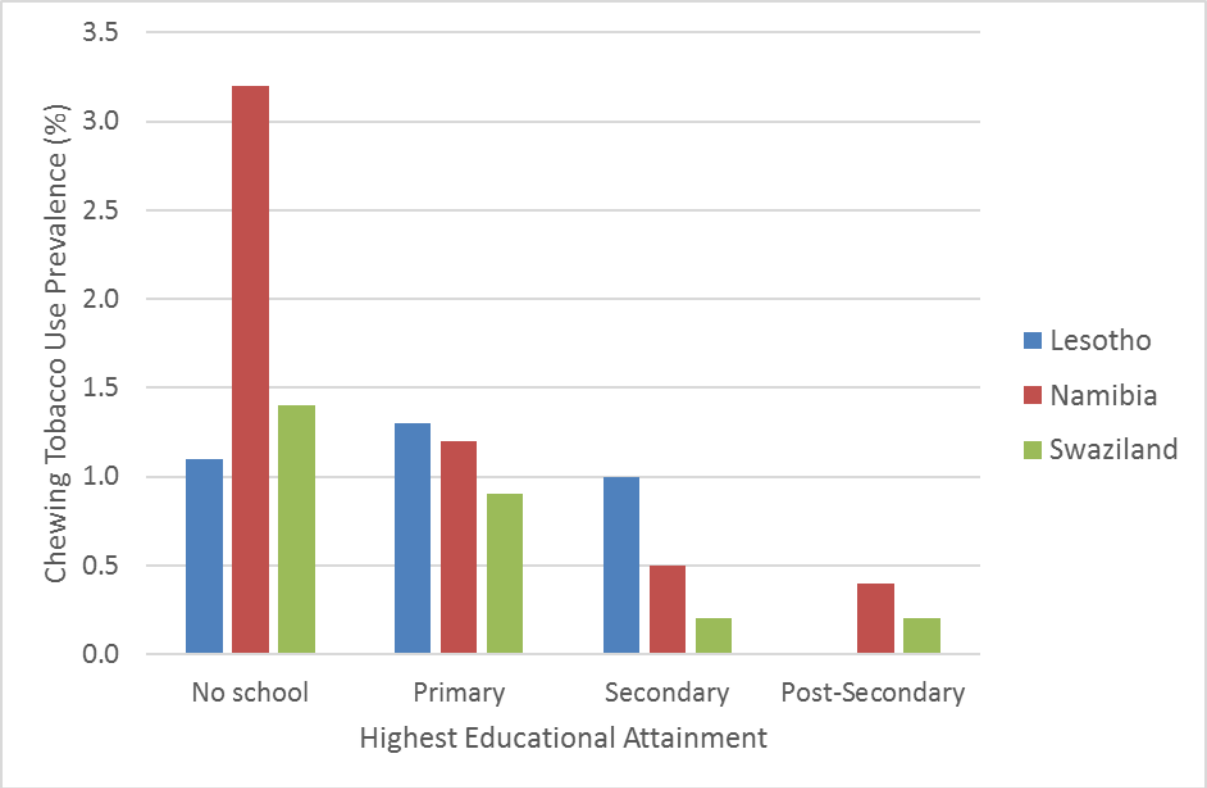


Figure 15: Snuff Use Prevalence by Highest Level of Education Attained for Men aged 15-49 years from Lesotho, Namibia and Swaziland

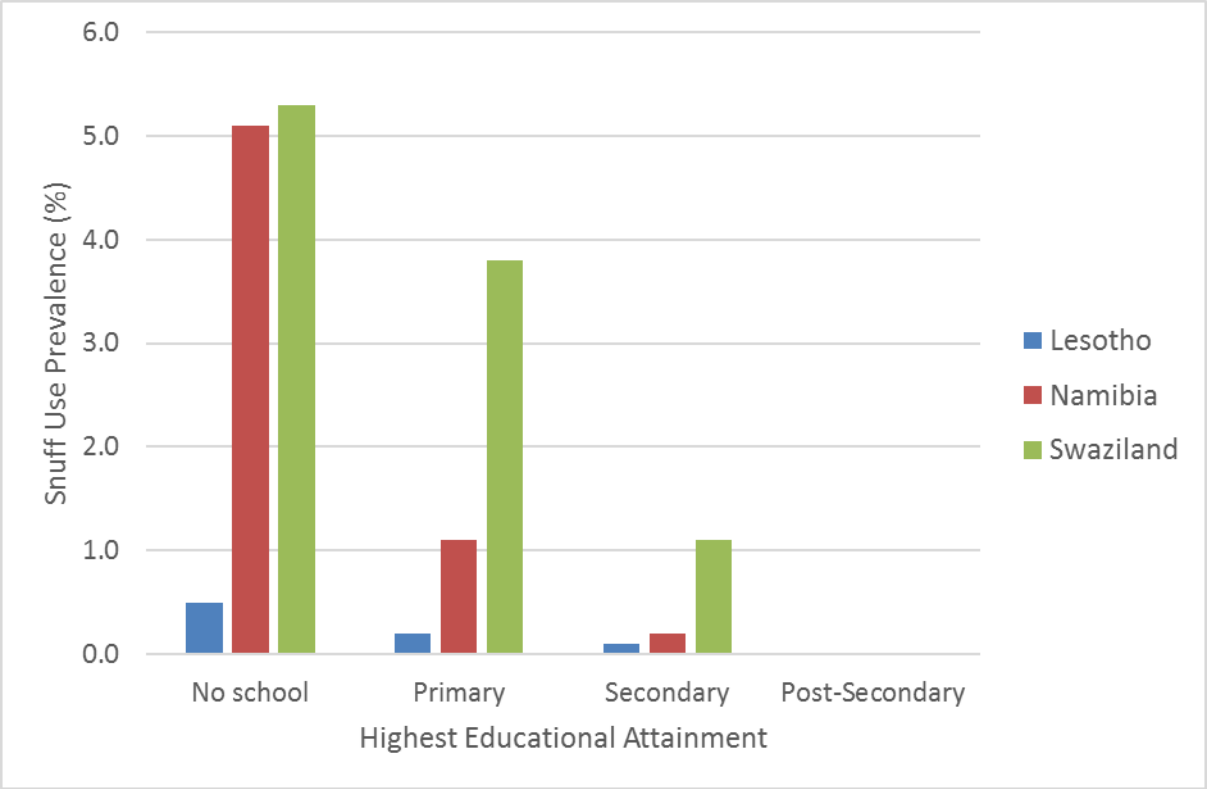


Figure 16: Cigarette Smoking Prevalence by Highest Level of Education Attained for Women aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa

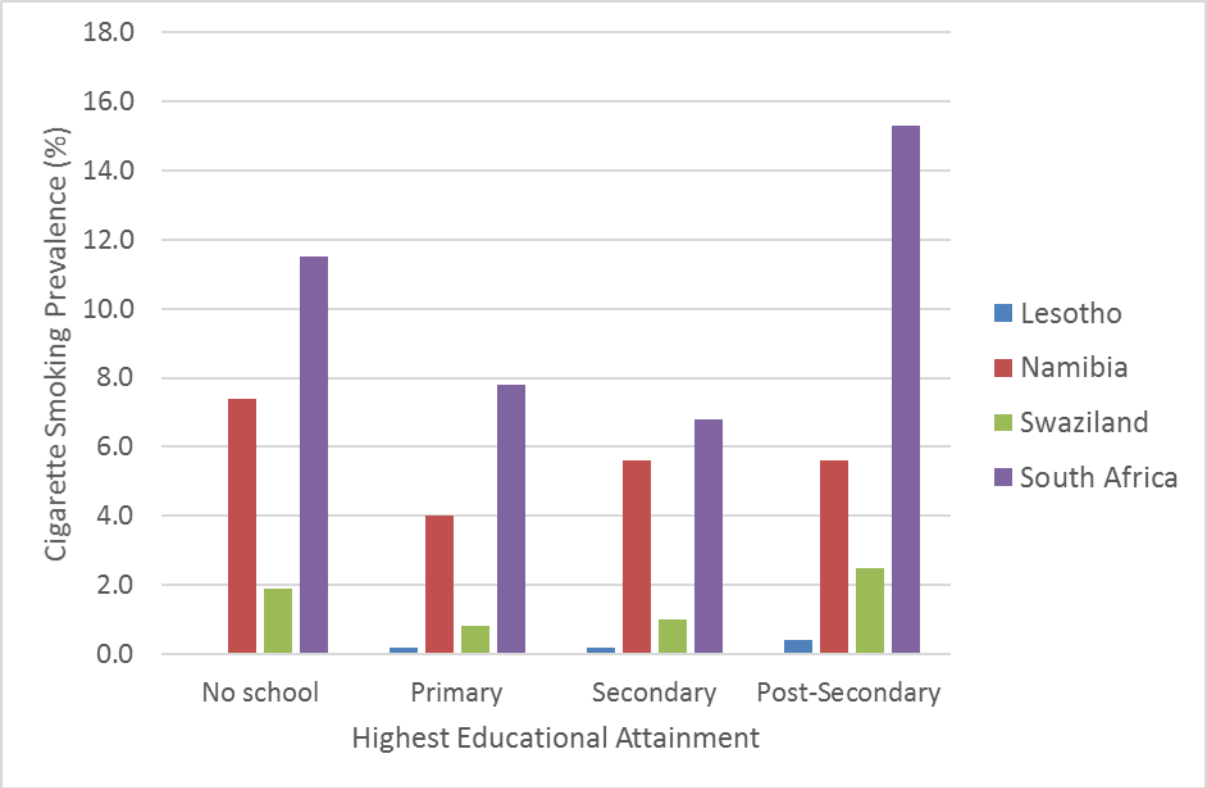


Figure 17: Snuff Use Prevalence by Highest Level of Education Attained for Women aged 15-49 years from Lesotho, Namibia and Swaziland

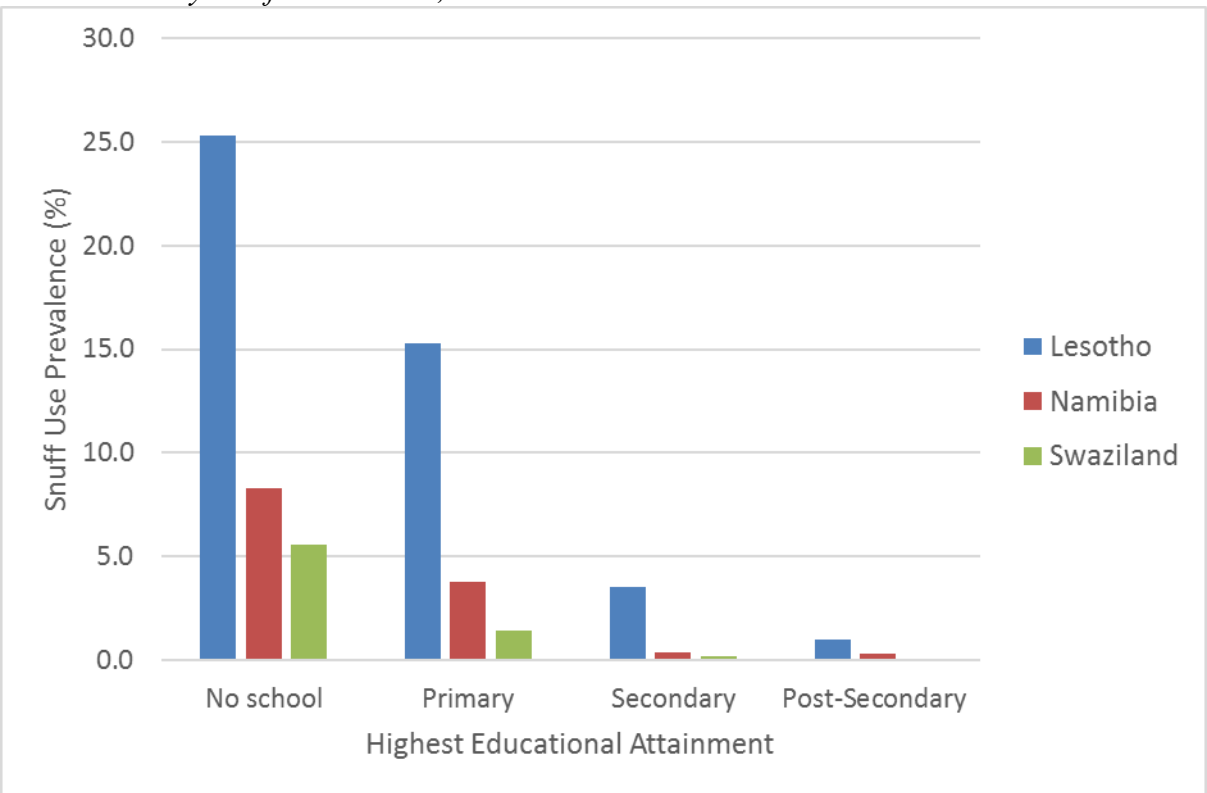


Figure 18: Cigarette Smoking Prevalence by Occupation for Men aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa

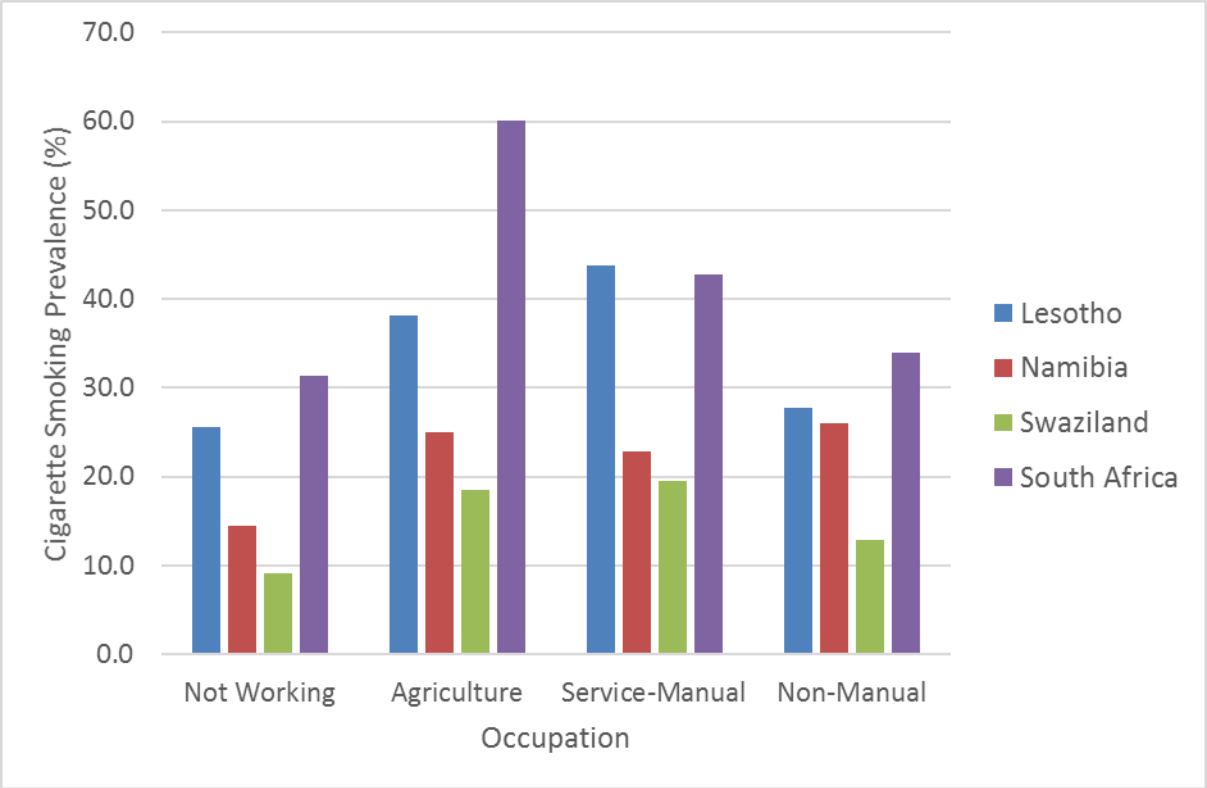


Figure 19: Pipe Smoking Prevalence by Occupation for Men aged 15-49 years from Lesotho, Namibia and Swaziland

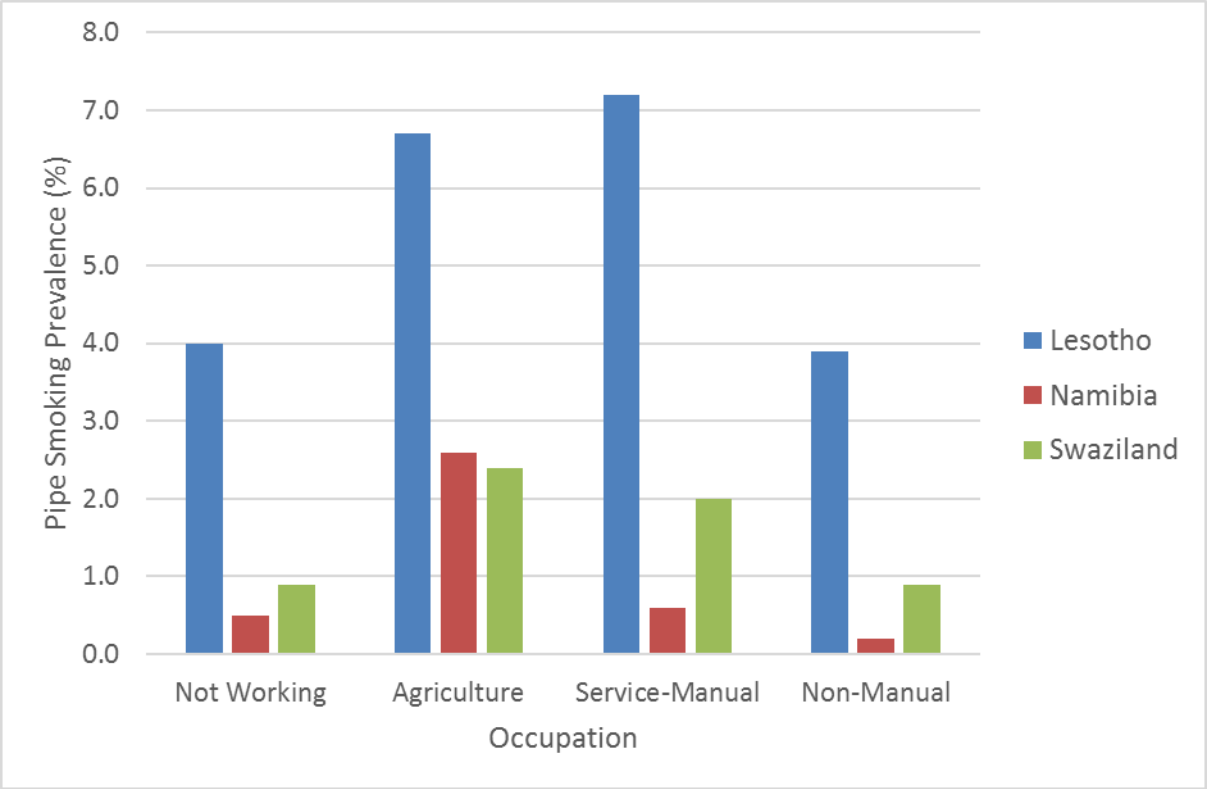


Figure 20: Chewing Tobacco Use Prevalence by Occupation for Men aged 15-49 years from Lesotho, Namibia and Swaziland

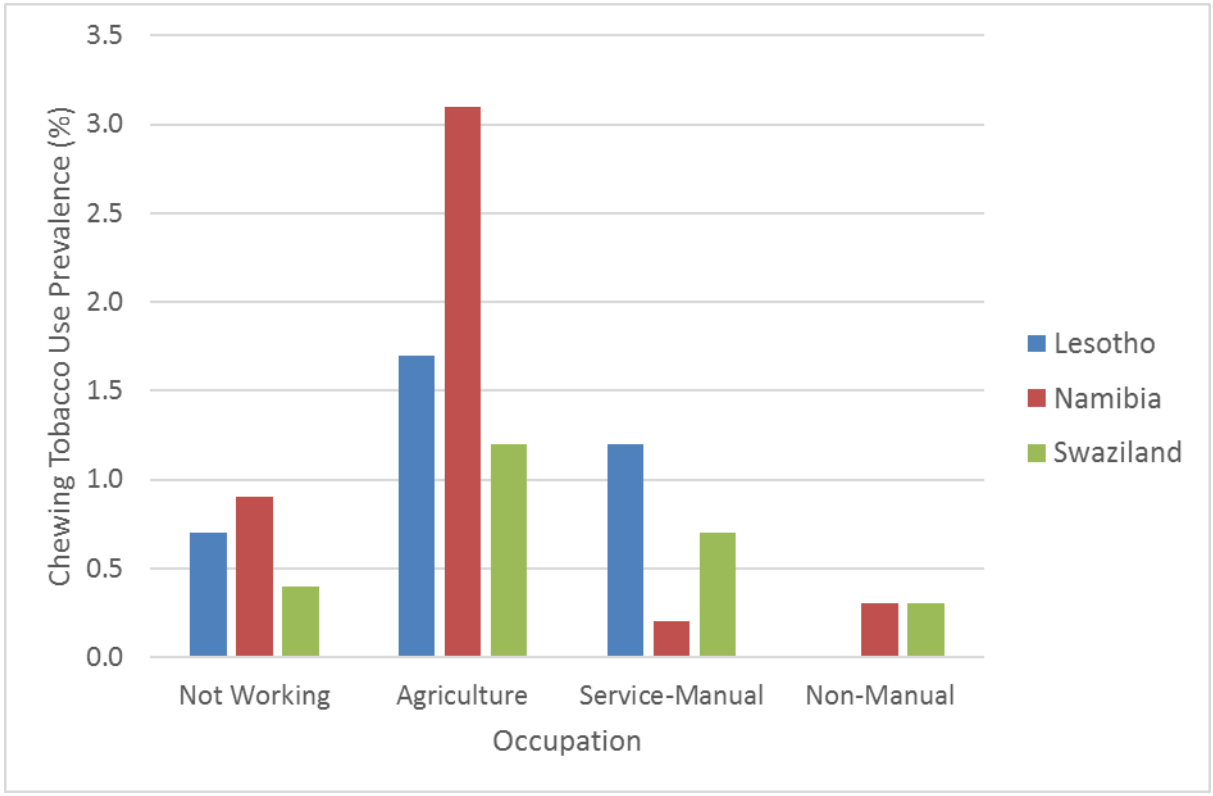
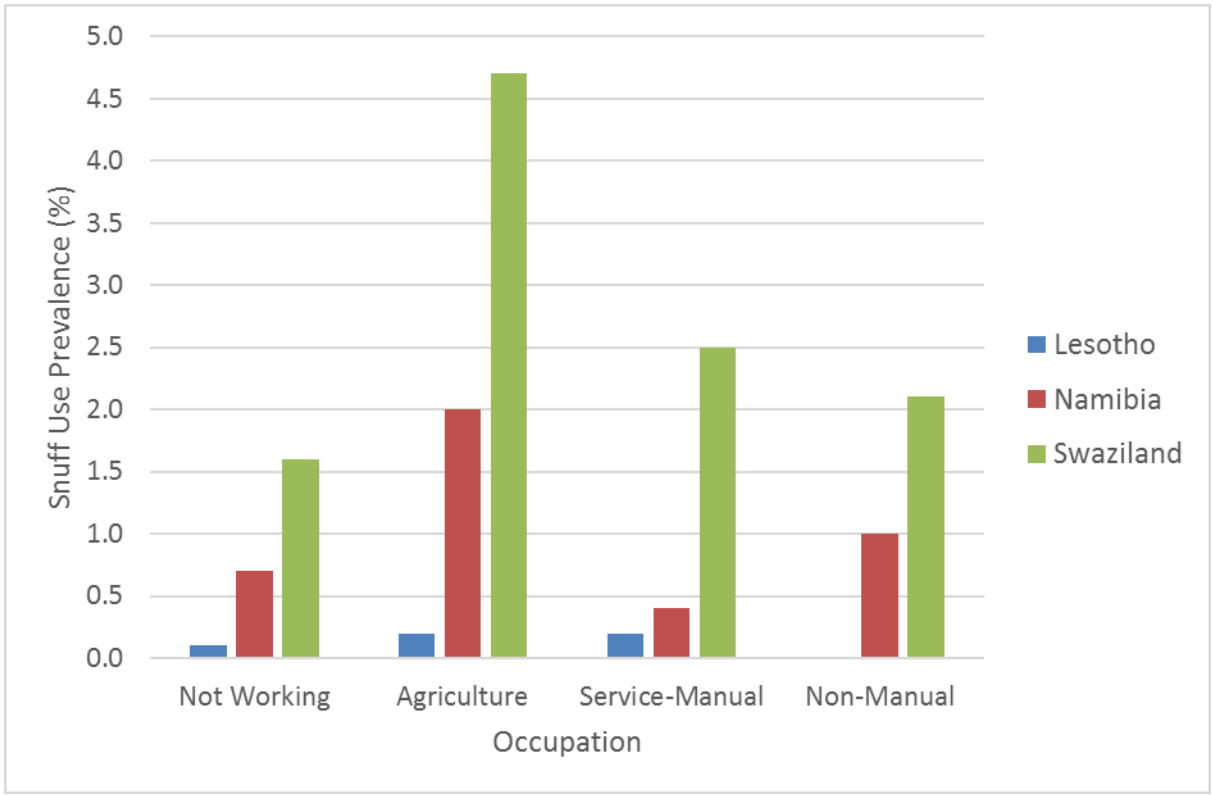


Figure 21: Snuff Use Prevalence by Occupation for Men aged 15-49 years from Lesotho, Namibia and Swaziland



The prevalence of cigarette smoking among men and women in Lesotho, Namibia and Swaziland is higher among the employed compared to the unemployed, as shown in Figure 18 and Figure 22 respectively. The same trend applies to the smoking of pipes among men (Figure 19), with the exception of Namibia, where the lowest prevalence of pipe smoking is with the non-manual workers. In Namibia and Swaziland, the men employed in agricultural related occupations have the highest prevalence of pipe smoking. In Lesotho, the men employed in service-manual occupations have the highest prevalence of pipe smoking.

Looking at chewing tobacco in Figure 20, the men employed in agricultural occupations have the highest prevalence of chewing tobacco use in the three countries, while overall, the men employed in non-manual occupations have the lowest prevalence of chewing tobacco use. Similar to chewing tobacco, the men employed in agricultural occupations have the highest prevalence of snuff use, as shown in Figure 21. For snuff use among women, the employed women have a higher prevalence compared to the unemployed, as illustrated in Figure 23. For Lesotho and Namibia, the women employed in agricultural occupations have the highest prevalence of snuff use, while for Swaziland, the highest prevalence is among the service-manual workers.

Figure 22: Cigarette Smoking Prevalence by Occupation for Women aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa

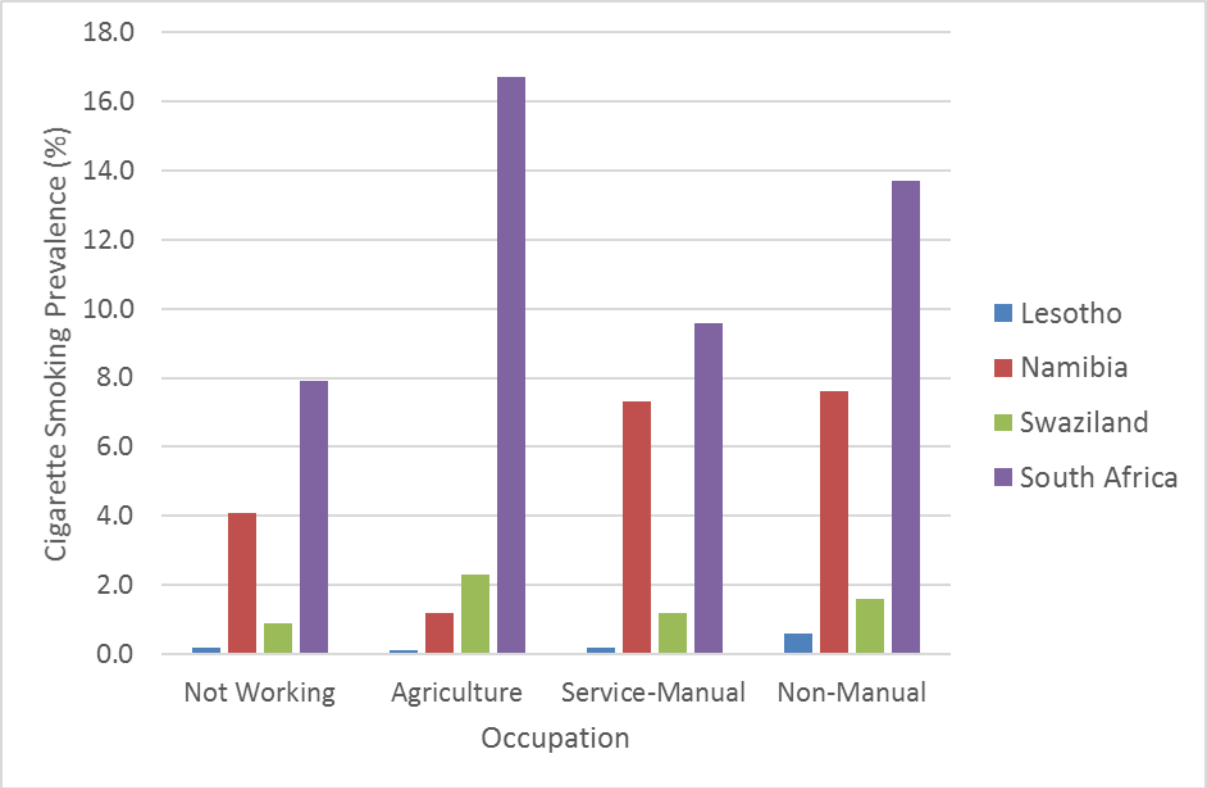
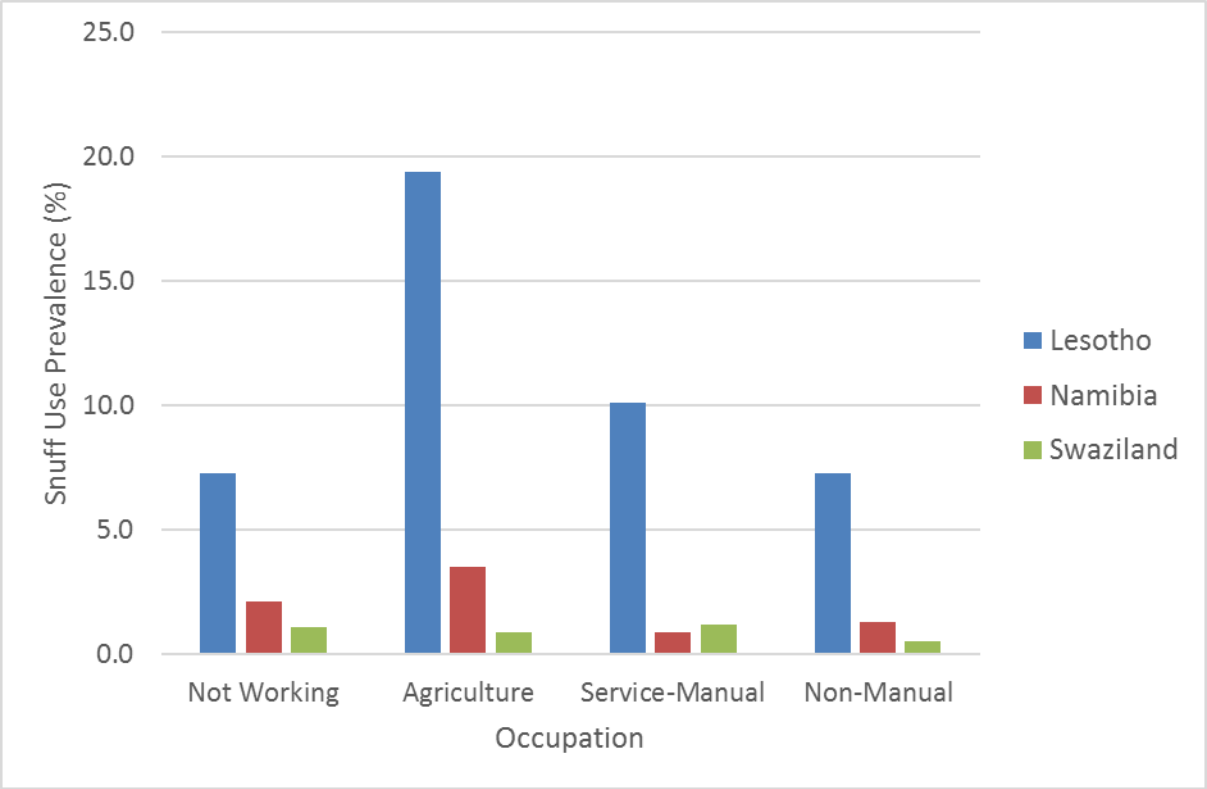


Figure 23: Snuff Use Prevalence by Occupation for Women aged 15-49 years from Lesotho, Namibia and Swaziland



5. REGRESSION RESULTS

The regression model shown in equation 1 is run separately for men and women, and separately for each of the four countries. The logistic regression of tobacco use is run for each type of tobacco (cigarettes, pipe, chewing tobacco, snuff and other tobacco) for men; however for women (with the exception of Namibia), due to the low prevalence of tobacco use, regressions are run only for cigarette and snuff use. As depicted in equation 1, the independent variables include age in single years, a quadratic term for age in single years, a dummy variable for urban/rural location, a categorical variable depicting the highest level of education attained, a categorical variable depicting occupation, as well as a categorical variable depicting religious affiliation. The data from the four countries is then combined and the regression is run for cigarette use. For the use of pipes, chewing tobacco and snuff, the data from all the countries, with an exception of South Africa, is combined and the regression model is run. The Chi-square test of overall significance of the model was carried out for each logistic regression, and in every case the p-value was less than 1% indicating that the model as a whole, in each regression, fit significantly better than a model with no independent variables.

5.1 Lesotho

For the men in Lesotho, the results are shown in Table 5, while Table 6 shows the results for the women. For men, the regression for snuff is not carried out due to the low prevalence of snuff use. For both men and women, the use of tobacco increased with age, but at a decreasing rate. This implies that tobacco use increases with age, reaches a peak (maximum) age, after which tobacco use decreases with age. This relationship is significant for the use of cigarettes, pipes, and other tobacco for men; while for women, it is significant for the use of snuff. The turning point for men is 34 years for cigarettes, 40 years for pipes and 33 years for other tobacco. The turning point for women is 49 years for the use of snuff.

For cigarette, pipe and other tobacco use among men, a negative relationship exists with educational attainment, whereby men who obtained secondary education were 29% less likely to smoke cigarettes compared to those who are uneducated, and men with post-secondary education were 62% less likely to smoke cigarettes compared to the uneducated.

Also, men with secondary education were 42% less likely to use pipes and 36% less likely to use other tobacco compared to uneducated men; and men with post-secondary education were 74% less likely to use other tobacco compared to uneducated men. A negative relationship also exists for women between snuff use and educational attainment. Women with primary education were 39% less likely to use snuff compared to those who are uneducated, while those with secondary education were 80% less likely to use snuff compared to the uneducated. In addition, women with post-secondary schooling were 96% less likely to use snuff compared to those with no schooling.

No clear cut relationship exists between tobacco use and occupation for both men and women. Men who work in agricultural occupations and service-manual occupations were more likely to smoke cigarettes compared to the unemployed (OR=1.35 and OR=1.49 respectively); and more likely to use other tobacco compared to the unemployed (OR=1.98 and OR=1.61 respectively). Women who work in agricultural occupations were 1.48 times as likely to use snuff compared to the unemployed.

The use of cigarettes by both men and women was higher in the urban areas, however this relationship was not statistically significant. The use of chewing tobacco and other tobacco by men was lower in urban areas, however this relationship was not statistically significant either. The men in urban areas were 44% less likely to smoke pipes compared to those in rural areas, while the women in urban areas were 43% less likely to use snuff compared to those in rural areas.

Table 5: Regression Output for Men aged 15-49 years from Lesotho (n=2988)

	Cigarettes		Pipe		Chewing Tobacco		Other Tobacco	
Independent Variables	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Age	1.40 (1.32-1.49)	0.00	1.26 (1.12-1.41)	0.00	1.13 (0.88-1.45)	0.34	1.33 (1.20-1.48)	0.00
Age^2	0.995 (0.994-0.996)	0.00	0.997 (0.995-0.999)	0.00	0.999 (0.995-1.003)	0.62	0.996 (0.994-0.997)	0.00
Residence								
Rural	1.00		1.00		1.00		1.00	
Urban	1.04 (0.84-1.30)	0.70	0.56 (0.35-0.92)	0.02	1.95 (0.81-4.68)	0.14	0.84 (0.55-1.27)	0.40
Education								
No school	1.00		1.00		1.00		1.00	
Primary	0.99 (0.78-1.26)	0.95	1.00 (0.68-1.49)	0.98	2.08 (0.68-6.34)	0.20	1.32 (0.90-1.93)	0.16
Secondary	0.71 (0.54-0.93)	0.02	0.58 (0.35-0.97)	0.04	2.15 (0.60-7.66)	0.24	0.64 (0.39-1.04)	0.07
Post-Secondary	0.38 (0.23-0.63)	0.00	0.47 (0.15-1.47)	0.19	-		0.26 (0.08-0.93)	0.04
Occupation								
Not Working	1.00		1.00		1.00		1.00	
Agriculture	1.35 (1.10-1.66)	0.01	1.10 (0.75-1.62)	0.63	2.34 (0.88-6.18)	0.09	1.98 (1.36-2.89)	0.00
Service-Manual	1.49 (1.17-1.89)	0.00	1.26 (0.81-1.96)	0.30	1.38 (0.47-4.09)	0.56	1.61 (1.04-2.50)	0.03
Non-Manual	0.92 (0.64-1.32)	0.65	0.61 (0.27-1.38)	0.23	-		1.21 (0.60-2.44)	0.60
Religion								
Other	1.00		1.00		1.00		1.00	
Catholic	1.11 (0.85-1.44)	0.44	0.82 (0.51-1.32)	0.42	0.70 (0.27-1.82)	0.46	0.79 (0.52-1.22)	0.29
Protestant	0.98 (0.76-1.27)	0.89	0.92 (0.58-1.46)	0.73	0.50 (0.19-1.33)	0.17	0.92 (0.61-1.39)	0.70

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
The 'Other' Religion category contains Seventh Day Adventists, Muslims, Other Christians, those with no religion, and those whose response was 'other'.

Table 6: Regression Output for Women aged 15-49 years from Lesotho (n=7621)

	Cigarettes		Snuff	
Independent Variables	OR (95% CI)	p-value	OR (95% CI)	p-value
Age	1.30 (0.82-2.04)	0.26	1.47 (1.36-1.59)	0.00
Age^2	0.997 (0.991-1.004)	0.43	0.996 (0.995-0.997)	0.00
Residence				
Rural	1.00		1.00	
Urban	2.43 (0.78-7.62)	0.13	0.57 (0.45-0.73)	0.00
Education				
No school	-		1.00	
Primary	1.00		0.61 (0.39-0.95)	0.03
Secondary	1.54 (0.48-4.99)	0.47	0.20 (0.12-0.32)	0.00
Post-Secondary	1.92 (0.30-12.36)	0.49	0.04 (0.02-0.13)	0.00
Occupation				
Not Working	1.00		1.00	
Agriculture	0.65 (0.08-5.58)	0.69	1.48 (1.19-1.83)	0.00
Service-Manual	1.11 (0.29-4.17)	0.88	1.02 (0.82-1.28)	0.84
Non-Manual	1.04 (0.25-4.35)	0.96	0.91 (0.70-1.19)	0.50
Religion				
Other	1.00		1.00	
Catholic	0.50 (0.10-2.61)	0.41	1.19 (0.86-1.64)	0.30
Protestant	0.65 (0.14-3.11)	0.59	1.17 (0.85-1.60)	0.35

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
The 'Other' Religion category contains Seventh Day Adventists, Muslims, Other Christians, Methodists, those with no religion, and those whose response was 'other'.

5.2 Namibia

Looking at Table 7, the use of cigarettes, pipes and snuff among men in Namibia increase at a decreasing rate with age, and these relationships were statistically significant. The turning point for cigarette use was 37 years, while that for the use of pipes was 38 years, and that for snuff use was 40 years. For all four types of tobacco, men in urban areas were less likely to use tobacco compared to men in rural areas, however this is statistically significant only for the use of pipes (OR = 0.08) and chewing tobacco (OR = 0.12). Men with a primary education were less likely to use any of the four types of tobacco, compared to men with no schooling. This relationship is significant for the use of snuff, with an odds ratio of 0.30. Also, men with secondary education were less likely to use snuff (OR = 0.09) compared to men with no schooling. For cigarette use, men with post-secondary education were 56% less likely to use cigarettes compared to men with no schooling, and this was statistically significant.

For cigarette use, employed men were more likely to use cigarettes than men who are not working, and each of these relationships is significant (OR = 1.63 for Agriculture; OR = 1.21 for Service-Manual; OR = 1.42 for Non-Manual). A man who works in agriculture was more than twice as likely to use a pipe as a man who is not working. Catholics and Protestants were over 50% less likely to use cigarettes compared to other religions.

Table 7: Regression Output for Men aged 15-49 years from Namibia (n=3899)

	Cigarettes		Pipe		Chewing Tobacco		Snuff	
Independent Variables	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Age	1.27 (1.19-1.35)	0.00	1.70 (1.25-2.30)	0.00	1.31 (1.01-1.69)	0.04	1.48 (1.06-2.06)	0.02
Age^2	0.997 (0.995-0.999)	0.00	0.993 (1.988-0.998)	0.00	0.997 (0.993-1.001)	0.11	0.995 (0.990-1.000)	0.05
Residence								
Rural	1.00		1.00		1.00		1.00	
Urban	0.99 (0.83-1.18)	0.90	0.08 (0.02-0.36)	0.00	0.12 (0.03-0.53)	0.01	0.71 (0.28-1.80)	0.47
Education								
No school	1.00		1.00		1.00		1.00	
Primary	0.97 (0.74-1.27)	0.81	0.75 (0.24-1.65)	0.48	0.63 (0.28-1.39)	0.25	0.30 (0.14-0.64)	0.00
Secondary	1.17 (0.90-1.52)	0.24	0.76 (0.34-1.70)	0.50	0.45 (0.19-1.08)	0.08	0.09 (0.03-0.26)	0.00
Post-Secondary	0.44 (0.28-0.69)	0.00	-		0.44 (0.05-3.86)	0.46	-	
Occupation								
Not Working	1.00		1.00		1.00		1.00	
Agriculture	1.63 (1.29-2.04)	0.00	2.17 (0.95-4.95)	0.07	1.27 (0.59-2.73)	0.54	1.34 (0.53-3.38)	0.54
Service-Manual	1.21 (0.97-1.51)	0.09	1.06 (0.40-2.85)	0.90	0.50 (0.18-1.40)	0.19	0.75 (0.26-2.17)	0.59
Non-Manual	1.42 (1.05-1.92)	0.02	1.03 (0.21-5.02)	0.97	0.30 (0.03-2.60)	0.27	1.88 (0.51-6.90)	0.34
Religion								
Other	1.00		1.00		1.00		1.00	
Catholic	0.51 (0.33-0.81)	0.00	1.26 (0.27-5.74)	0.77	0.67 (0.14-3.21)	0.62	0.83 (0.17-4.00)	0.82
Protestant	0.54 (0.35-0.84)	0.01	0.58 (0.13-2.67)	0.49	0.78 (0.17-3.49)	0.74	0.71 (0.15-3.26)	0.66

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
The 'Other' Religion category contains those with no religion, and those whose response was 'other'.

Table 8 shows the regression results for women. With the exception of pipes, tobacco use among women increases with age, at a decreasing rate. This relationship is statistically significant for cigarettes and snuff use. Women in urban areas were twice as likely to use cigarettes compared to women in rural areas, whereas women in urban areas were 46% less likely to use snuff compared to those in rural areas. Overall, there is a significant negative relationship between tobacco use and education level, whereby women who have obtained primary and secondary schooling were less likely to use cigarettes (OR = 0.60 for primary; OR = 0.66 for secondary), a pipe (OR = 0.25 for primary; OR = 0.06 for secondary), chewing tobacco (OR = 0.28 for primary; OR = 0.03 for secondary) or snuff (OR = 0.60 for primary; OR = 0.14 for secondary), compared to women who have no schooling. Also, women who have obtained post-secondary education were 58% less likely to smoke cigarettes compared to women who have not obtained any education, and they were also 94% less likely to use snuff compared to women who have obtained no education.

Generally, employed women were less likely to use tobacco compared to the unemployed. Women working in agriculture were 71% less likely to smoke cigarettes and 65% less likely to smoke a pipe compared to the unemployed. Women working in service-manual occupations were 46% less likely to use snuff compared to the unemployed. In addition, women in non-manual occupations were 95% less likely to smoke a pipe and use chewing tobacco compared to the unemployed.

Table 8: Regression Output for Women aged 15-49 years from Namibia (n=9779)

	Cigarettes		Pipe		Chewing Tobacco		Snuff	
Independent Variables	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Age	1.15 (1.07-1.24)	0.00	1.03 (0.86-1.24)	0.73	1.08 (0.89-1.30)	0.44	1.30 (1.14-1.49)	0.00
Age^2	0.999 (0.998-1.000)	0.01	1.000 (0.997-1.003)	0.93	1.000 (0.997-1.003)	0.85	0.997 (0.995-0.999)	0.01
Residence								
Rural	1.00		1.00		1.00		1.00	
Urban	2.00 (1.65-2.44)	0.00	0.65 (0.35-1.19)	0.16	1.05 (0.61-1.81)	0.85	0.54 (0.37-0.77)	0.00
Education								
No school	1.00		1.00		1.00		1.00	
Primary	0.60 (0.44-0.83)	0.00	0.25 (0.14-0.43)	0.00	0.28 (1.17-0.46)	0.00	0.60 (0.43-0.83)	0.00
Secondary	0.66 (0.48-0.89)	0.01	0.06 (0.03-0.13)	0.00	0.03 (0.01-0.08)	0.00	0.14 (0.09-0.22)	0.00
Post-Secondary	0.42 (0.26-0.68)	0.00	-		-		0.06 (0.01-0.25)	0.00
Occupation								
Not Working	1.00		1.00		1.00		1.00	
Agriculture	0.29 (0.16-0.50)	0.00	0.35 (0.14-0.90)	0.03	0.52 (0.23-1.18)	0.12	0.86 (0.57-1.30)	0.49
Service-Manual	0.89 (0.68-1.15)	0.36	0.57 (0.24-1.36)	0.21	0.77 (0.36-1.67)	0.51	0.54 (0.31-0.93)	0.03
Non-Manual	0.97 (0.78-1.22)	0.82	0.45 (0.21-0.98)	0.05	0.48 (0.23-1.00)	0.05	0.74 (0.50-1.09)	0.13

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
The 'Other' Religion category contains those with no religion, and those whose response was 'other'.

5.3 Swaziland

Table 9 shows the regression results for men from Swaziland, and Table 10 shows the results for the women. With regards to age, the men in Swaziland depict a similar trend as in Namibia and Lesotho, whereby the use of all the types of tobacco increases with age, but at a decreasing rate; and this relationship is significant. The turning point was 39 years for cigarette use, 46 years for pipe use, 44 years for chewing tobacco, 37 years for snuff use and 34 years for the use of other tobacco. Women from urban areas were 3 times as likely to smoke cigarettes as women from rural areas, however both men and women from urban areas were less likely to use snuff compared to their rural counterparts (OR=0.57 for men and OR=0.38 for women). Also, men in rural areas were 52% less likely to smoke a pipe compared to those in rural areas.

For cigarettes, pipes and other tobacco, a negative relationship exists between the use of tobacco and educational attainment for men. A man with secondary education was 70% less likely to use a pipe and 62% less likely to use snuff compared to a man with no education. A man with post-secondary education was 70% less likely to use other tobacco compared to a man with no education. Educated women were also less likely to use snuff compared to the uneducated women (OR=0.33 for primary and OR=1.10 for secondary).

For cigarette smoking and use of chewing tobacco, employed men were less likely to use these types of tobacco in comparison to men who are not working. A non-manual worker was 43% less likely to smoke cigarettes compared to men who are not working. A woman employed in agriculture was 67% less likely to use snuff compared to an unemployed woman. A Protestant man or woman was less likely to use tobacco compared to the Other religion category.

Table 9: Regression Output for Men aged 15-49 years from Swaziland (n=4149)

Independent Variables	Cigarettes		Pipe		Chewing Tobacco		Snuff		Other	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Age	1.51 (1.39-1.63)	0.00	1.31 (1.05-1.62)	0.02	1.65 (1.14-2.40)	0.01	1.79 (1.48-2.17)	0.00	1.47 (1.27-1.70)	0.00
Age^2	0.995 (0.994-0.996)	0.00	0.997 (0.993-1.000)	0.07	0.994 (0.989-1.000)	0.04	0.992 (0.989-0.995)	0.00	0.994 (0.992-0.997)	0.00
Residence										
Rural	1.00		1.00		1.00		1.00		1.00	
Urban	0.90 (0.73-1.10)	0.29	0.48 (0.24-0.95)	0.04	0.43 (0.15-1.22)	0.11	0.57 (0.34-0.96)	0.04	1.19 (0.84-1.69)	0.32
Education										
No school	1.00		1.00		1.00		1.00		1.00	
Primary	0.91 (0.67-1.25)	0.58	0.81 (0.40 -1.64)	0.56	2.01 (0.65-6.24)	0.23	1.23 (0.70-2.16)	0.47	0.97 (0.55-1.71)	0.93
Secondary	0.82 (0.60-1.13)	0.22	0.30 (0.13-0.70)	0.01	0.78 (0.21-2.98)	0.72	0.38 (1.92-0.74)	0.00	0.95 (0.54-1.66)	0.85
Post-Secondary	0.74 (0.48-1.16)	0.19	0.34 (0.08-1.45)	0.15	0.58 (0.05-6.48)	0.66	-		0.30 (0.11-0.83)	0.02
Occupation										
Not Working	1.00		1.00		1.00		1.00		1.00	
Agriculture	0.89 (0.65-1.24)	0.50	1.07 (0.44-2.60)	0.88	0.88 (0.27-2.87)	0.83	1.08 (0.58-2.01)	0.82	1.13 (0.64-2.01)	0.67
Service-Manual	0.97 (0.76-1.25)	0.84	1.20 (0.60-2.40)	0.61	0.66 (0.25-1.77)	0.42	0.63 (0.36-1.08)	0.10	1.35 (0.87-2.10)	0.18
Non-Manual	0.57 (0.41-0.80)	0.00	0.64 (0.20-2.02)	0.45	0.64 (0.15-2.81)	0.56	1.07 (0.51-2.23)	0.86	0.90 (0.49-1.67)	0.74
Religion										
Other	1.00		1.00		1.00		1.00		1.00	
Catholic	1.90 (1.33-2.73)	0.00	2.31 (0.86-6.16)	0.10	-		0.45 (0.11-1.88)	0.27	1.55 (0.83-2.90)	0.17
Protestant	0.63 (0.48-0.84)	0.00	0.55 (0.19-1.58)	0.27	0.23 (0.03-1.79)	0.16	0.14 (0.03-0.59)	0.01	0.01 (0.26-0.80)	0.01

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
The 'Other' Religion category contains Traditional religion, Charismatics, Zionists, the Apostolic Sect, Muslims, those with no religion, and those whose response was 'other'.

Table 10: Regression Output for Women aged 15-49 years from Swaziland (n=4977)

	Cigarettes		Snuff	
Independent Variables	OR (95% CI)	p-value	OR (95% CI)	p-value
Age	1.21 (0.97-1.49)	0.08	1.30 (0.99-1.70)	0.06
Age^2	0.998 (0.995-1.001)	0.19	0.998 (0.994-1.001)	0.23
Residence				
Rural	1.00		1.00	
Urban	3.00 (1.69-5.31)	0.00	0.38 (0.15-0.998)	0.05
Education				
No school	1.00		1.00	
Primary	0.64 (0.25-1.64)	0.35	0.33 (0.18-0.61)	0.00
Secondary	0.66 (0.26-1.66)	0.38	0.10 (0.04-0.26)	0.00
Post-Secondary	1.13 (0.37-3.47)	0.83	-	
Occupation				
Not Working	1.00		1.00	
Agriculture	1.09 (0.36-3.34)	0.88	0.23 (0.05-1.01)	0.05
Service-Manual	0.63 (0.30-1.30)	0.21	0.71 (0.37-1.36)	0.30
Non-Manual	0.65 (0.31-1.39)	0.27	0.63 (0.21-1.88)	0.41
Religion				
Other	1.00		1.00	
Catholic	4.36 (2.19-8.70)	0.00	2.02 (0.58-6.98)	0.27
Protestant	0.92 (0.47-1.78)	0.79	0.08 (0.01-0.58)	0.01

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
The 'Other' Religion category contains Traditional religion, Charismatics, Zionists, the Apostolic Sect, Muslims, those with no religion, and those whose response was 'other'.

5.4 South Africa

Table 11: Regression Output for Men (n=4649) and Women (n=6499) aged 15-49 years from South Africa

	Men		Women	
Independent Variables	OR (95% CI)	p-value	OR (95% CI)	p-value
Age	1.46 (1.38-1.54)	0.00	1.16 (1.09-1.24)	0.00
Age^2	0.995 (0.994-0.996)	0.00	0.998 (0.997-0.999)	0.00
Residence				
Rural	1.00		1.00	
Urban	1.54 (1.34-1.77)	0.00	3.52 (2.91-4.27)	0.00
Education				
No school	1.00		1.00	
Primary	0.70 (0.59-0.84)	0.00	0.57 (0.46-0.70)	0.00
Secondary	0.44 (0.35-0.55)	0.00	0.31 (0.23-0.42)	0.00
Post-Secondary	0.29 (0.21-0.40)	0.00	0.34 (0.23-0.50)	0.00
Occupation				
Not Working	1.00		1.00	
Agriculture	1.73 (1.28-2.35)	0.00	3.53 (2.17-5.75)	0.00
Service-Manual	1.24 (1.05-1.45)	0.01	1.24 (0.99-1.55)	0.07
Non-Manual	0.86 (0.65-1.14)	0.31	1.45 (1.05-2.01	0.03
Religion				
Other	1.00		1.00	
Christian	0.72 (0.62-0.84)	0.00	1.30 (0.98-1.73)	0.07

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
The 'Other' Religion category contains Jews, Muslims, Hindu, African Traditional Spiritual belief and those whose response was 'other'.

Table 11 shows that similar to the other countries, cigarette use amongst men and women in South Africa increases with age, at a decreasing rate, and this relationship is significant. The turning point is 37 years for men and 38 years for women. Also, similar to Lesotho, men in urban areas were more likely to smoke cigarettes compared to those in rural areas (OR=1.54). Similar to Lesotho, Namibia and Swaziland, the women in urban areas were more likely to smoke compared to the women in rural areas.

A negative association exists between cigarette use and educational attainment for men, as is the case in the other three countries. For the women, a similar relationship exists, and the trend is the same as that depicted in Namibia, but different from that depicted in Lesotho. Men with primary education were 30% less likely to smoke cigarettes, and women with primary education were 43% less likely to smoke cigarettes compared to those with no schooling. Also, men with secondary schooling were 56% less likely to smoke cigarettes and women with secondary schooling were 69% less likely to smoke cigarettes compared to those with no education. In addition, men with post-secondary qualifications were 71% less likely and women with post-secondary education were 66% less likely to smoke cigarettes compared to those with no education.

Unlike Swaziland, but similar to Namibia and Lesotho, men who work in agriculture and service-manual occupations were more likely to smoke cigarettes compared to those who are not working. Men who work in agriculture were 1.73 times as likely to smoke cigarettes, and men who work in service-manual occupations were 1.24 times as likely to smoke cigarettes compared to men who are not working. However, men with non-manual occupations were 14% less likely to smoke cigarettes compared to those who are not working. This relationship is similar to Swaziland and Lesotho, but different from that of Namibia, however it is not statistically significant. For the women, the employed were more likely to smoke cigarettes compared to those who are not working, which is similar to Lesotho, however the magnitudes were much higher for South Africa. Women who work in agriculture were 3.53 times as likely to smoke, while those with service-manual occupations were 1.24 times as likely to smoke as those who are not working; and those with non-manual occupations were 1.45 times as likely to smoke as those who are not working.

The higher magnitudes in the South Africa regression results compared to the other countries could be due to an upward bias created by the White and Coloured South Africans. According to Gilreath et al (2012), smoking is considered with a negative perception in schools that have a Black majority, hence Black South Africans are less likely to ever smoke compared to White and Coloured South Africans. In order to remove this bias, a regression is run for only the Black South Africans, and the magnitudes do fall and become more comparable to the other countries. The pattern of tobacco use however does not change, with the exception that women who are employed in manual and non-manual occupations now

smoke cigarettes less in comparison to those who are not working. The regression results are shown in Table 12.

Table 12: Regression Output for Black Men (n=3764) and Black Women (n=5227) aged 15-49 years from South Africa

	Men		Women	
Independent Variables	OR (95% CI)	p-value	OR (95% CI)	p-value
Age	1.53 (1.44-1.62)	0.00	1.10 (0.98-1.24)	0.10
Age^2	0.994 (0.993-0.995)	0.00	0.999 (0.997-1.001)	0.17
Residence				
Rural	1.00		1.00	
Urban	1.30 (1.11-1.52)	0.00	2.57 (1.86-3.55)	0.00
Education				
No school	1.00		1.00	
Primary	0.69 (0.57-0.84)	0.00	0.48 (0.33-0.71)	0.00
Secondary	0.43 (0.34-0.56)	0.00	0.32 (0.18-0.57)	0.00
Post-Secondary	0.27 (0.18-0.41)	0.00	0.19 (0.07-0.53)	0.00
Occupation				
Not Working	1.00		1.00	
Agriculture	1.26 (0.86-1.85)	0.23	3.11 (1.36-7.12)	0.01
Service-Manual	1.13 (0.94-1.35)	0.21	0.90 (0.57-1.42)	0.66
Non-Manual	0.81 (0.56-1.81)	0.28	0.89 (0.38-2.10)	0.79
Religion				
Other	1.00		1.00	
Christian	0.64 (0.54-0.75)	0.00	0.62 (0.42-0.91)	0.01

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
The 'Other' Religion category contains Jews, Muslims, Hindu, African Traditional Spiritual belief and those whose response was 'other'.

5.5 Combined

The data from the four countries is combined, and the regression model is run for cigarette use. The regression results are as depicted in Table 13 for men and Table 14 for women. The interaction terms depict whether or not a difference exists between the effect on the base country, Swaziland, and the effect on the other country with respect to the variable being assessed. Only the statistically significant interaction terms have been reported in the tables.

Looking at the interaction terms in Table 13 and Table 14, some of them are significant, indicating that differences exist between Swaziland and the other country with regards to the effect of the specific variable on cigarette use. Men in South Africa who live in urban areas were 1.73 times as likely to smoke cigarettes as those in rural areas when compared to Swaziland. In addition, men from Lesotho and South Africa who have post-secondary education were less likely to smoke cigarettes compared to those with no schooling, when compared to men in Swaziland. Also, women from South Africa who have a post-secondary qualification were less likely to smoke cigarettes compared to those with no schooling, when compared to women in Swaziland. Men from South Africa, Namibia and Lesotho who are employed in agriculture were more likely to smoke cigarettes compared to those that are not working, when compared to men in Swaziland. In addition, women from Namibia who are employed in agriculture were less likely to smoke cigarettes compared to the unemployed when compared to Swaziland.

Table 13: Regression Output for Cigarettes for Men aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa combined

Independent Variables	OR (95% CI)	p-value
Age	1.51 (1.40-1.63)	0.00
Age^2	0.995 (0.994-0.996)	0.00
Residence		
Rural	1.00	
Urban	0.89 (0.72-1.09)	0.26
Education		
No school	1.00	
Primary	0.92 (0.67-1.26)	0.60
Secondary	0.82 (0.60-1.13)	0.23
Post-Secondary	0.75 (0.48-1.17)	0.20
Occupation		
Not Working	1.00	
Agriculture	0.90 (0.64-1.24)	0.49
Service-Manual	0.97 (0.76-1.24)	0.82
Non-Manual	0.57 (0.41-0.80)	0.00
Religion		
Other	1.00	
Christian	0.87 (0.69-1.09)	0.22
Age Interaction		
Namibia*Age	0.84 (0.76-0.93)	0.00
$Namibia*Age^2$	1.00 (1.00-1.00)	0.00
Residence Interaction		
SA*Urban	1.73 (1.36-2.22)	0.00
Education Interaction		
South Africa*Secondary	0.53 (0.36-0.78)	0.00
Lesotho*Post-Secondary	0.50 (0.26-0.98)	0.04
South Africa*Post-Secondary	0.39 (0.23-0.67)	0.00
Occupation Interaction		
Lesotho*Agriculture	1.51 (1.03-2.22)	0.04
Namibia*Agriculture	1.82 (1.23-2.71)	0.00
South Africa*Agriculture	1.94 (1.24-3.03)	0.00
Lesotho*Manual	1.53 (1.09-2.16)	0.01
Namibia*Non-Manual	2.48 (1.58-3.90)	0.00

p-value ≤ 0.05 implies significance at 5% *p-value ≤ 0.01 implies significance at 1%*
Coefficients for country dummies as well as statistically insignificant interaction terms are not listed.

Table 14: Regression Output for Cigarettes for Women aged 15-49 years from Lesotho, Namibia, Swaziland and South Africa combined

Independent Variables	OR (95% CI)	p-value
Age	1.21 (0.98-1.49)	0.08
Age^2	0.998 (0.995-1.001)	0.18
Residence		
Rural	1.00	
Urban	3.29 (1.87-5.78)	0.00
Education		
No school	1.00	
Primary	0.65 (0.26-1.65)	0.36
Secondary	0.69 (0.28-1.70)	0.42
Post-Secondary	1.14 (0.38-3.42)	0.82
Occupation		
Not Working	1.00	
Agriculture	1.16 (0.38-3.53)	0.80
Service-Manual	0.63 (0.31-1.30)	0.21
Non-Manual	0.66 (0.32-1.38)	0.27
Religion		
Other	1.00	
Christian	1.50 (0.87-2.57)	0.15
Education Interaction		
South Africa*Post-Secondary	0.30 (0.09-0.96)	0.04
Occupation Interaction		
Namibia*Agriculture	0.25 (0.07-0.85)	0.03
Religion Interaction		
Namibia*Christian	0.28 (1.13-0.60)	0.00

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
Coefficients for country dummies as well as statistically insignificant interaction terms are not listed.

The combined regression results for pipes, chewing tobacco and snuff are depicted in Table 15, Table 16 and Table 17 respectively for men. Some of the interaction terms are significant, which once again implies that differences exist in chewing tobacco use, pipe and snuff use between Swaziland and Namibia, and between Swaziland and Lesotho with regards to the variables being assessed. A man in Namibia who lives in urban areas is 83% less likely to use a pipe compared to a man living in rural areas, compared to Swaziland. Also, a man living in urban areas in Lesotho is 4.53 times as likely to use chewing tobacco as a man living in rural areas, compared to Swaziland. A man from Namibia who has completed primary or secondary education is 76% less likely to use snuff compared to an uneducated man, when compared to Swaziland.

The combined regression output for snuff use among women is shown in Table 18. A woman in Lesotho who is employed in agriculture is 5.66 times as likely to use snuff as a woman who is not working, compared to Swaziland.

Based on these findings, it is advisable not to combine Lesotho, Namibia, Swaziland and South Africa into one data set when trying to assess the socioeconomics of tobacco use, because the various socioeconomic factors have differing relationships with tobacco use in each of the four countries. Combining the countries together therefore does not give an accurate picture for each individual country. This is important more so in cases where policy recommendations are to be made from the findings. It is better to put in place policies that directly address the tobacco issue in a particular country, rather than putting in place a policy based on the results from the combined regression. This is because the results from the combined regression differ from some of the individual country results, and hence may not accurately reflect the actual situation in the country.

Table 15: Regression Output for Pipes for Men aged 15-49 years from Lesotho, Namibia and Swaziland combined

Independent Variables	OR (95% CI)	p-value
Age	1.31 (1.06-1.62)	0.01
Age^2	0.997 (0.994-1.000)	0.07
Residence		
Rural	1.00	
Urban	0.47 (0.24-0.94)	0.03
Education		
No school	1.00	
Primary	0.81 (0.40-1.65)	0.57
Secondary	0.30 (0.13-0.70)	0.01
Post-Secondary	0.35 (0.08-1.49)	0.15
Occupation		
Not Working	1.00	
Agriculture	1.07 (0.44-2.59)	0.89
Service-Manual	1.19 (0.60-2.38)	0.62
Non-Manual	0.64 (0.20-2.05)	0.46
Religion		
Other	1.00	
Christian	0.95 (0.45-2.04)	0.9
Residence Interaction		
Namibia*Urban	0.17 (0.03-0.87)	0.03

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
Coefficients for country dummies as well as statistically insignificant interaction terms are not listed.

Table 16: Regression Output for Chewing Tobacco for Men aged 15-49 years from Lesotho, Namibia and Swaziland combined

Independent Variables	OR (95% CI)	p-value
Age	1.65 (1.13-2.40)	0.01
Age^2	0.994 (0.989-1.000)	0.04
Residence		
Rural	1.00	
Urban	0.43 (0.15-1.22)	0.11
Education		
No school	1.00	
Primary	2.00 (0.64-6.22)	0.23
Secondary	0.78 (0.21-2.97)	0.72
Post-Secondary	0.58 (0.05-5.47)	0.66
Occupation		
Not Working	1.00	
Agriculture	0.88 (0.27-2.88)	0.84
Service-Manual	0.67 (0.25-1.78)	0.42
Non-Manual	0.64 (0.15-2.81)	0.56
Religion		
Other	1.00	
Christian	0.17 (0.02-1.31)	0.09
Residence Interaction		
Lesotho*Urban	4.53 (1.17-17.63)	0.03

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
Coefficients for country dummies as well as statistically insignificant interaction terms are not listed.

Table 17: Regression Output for Snuff for Men aged 15-49 years from Lesotho, Namibia and Swaziland combined

Independent Variables	OR (95% CI)	p-value
Age	1.79 (1.48-2.17)	0.00
Age^2	0.992 (0.989-0.995)	0.00
Residence		
Rural	1.00	
Urban	0.57 (0.34-0.96)	0.04
Education		
No school	1.00	
Primary	1.24 (0.71-2.17)	0.46
Secondary	0.38 (0.19-0.74)	0.01
Post-Secondary	-	
Occupation		
Not Working	1.00	
Agriculture	1.07 (0.58-2.00)	0.82
Service-Manual	0.62 (0.36-1.08)	0.09
Non-Manual	1.07 (0.51-2.24)	0.86
Religion		
Other	1.00	
Christian	0.22 (0.08-0.60)	0.00
Age Interaction		
Lesotho*Age	0.35 (0.18-0.68)	0.00
Lesotho*Age^2	1.02 (1.01-1.03)	0.00
Education Interaction		
Namibia*Primary	0.24 (0.09-0.62)	0
Namibia*Secondary	0.24 (0.07-0.84)	0.03

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
Coefficients for country dummies as well as statistically insignificant interaction terms are not listed.

Table 18: Regression Output for Snuff for Women aged 15-49 years from Lesotho, Namibia and Swaziland combined

Independent Variables	OR (95% CI)	p-value
Age	1.31 (1.00-1.71)	0.05
Age^2	0.998 (0.994-1.001)	0.20
Residence		
Rural	1.00	
Urban	0.41 (0.16-1.06)	0.07
Education		
No school	1.00	
Primary	0.33 (0.18-0.61)	0.00
Secondary	0.10 (0.04-0.27)	0.00
Post-Secondary	-	
Occupation		
Not Working	1.00	
Agriculture	0.26 (0.06-1.13)	0.07
Service-Manual	0.71 (0.37-1.36)	0.31
Non-Manual	0.35 (0.21-1.88)	0.41
Religion		
Other	1.00	
Christian	0.28 (0.10-0.80)	0.02
Occupation Interaction		
Lesotho*Agriculture	5.66 (1.29-24.86)	0.02
Religion Interaction		
Lesotho*Christian	4.14 (1.40-12.23)	0.01
Namibia*Christian	4.42 (1.36-25.63)	0.02

p-value ≤ 0.05 implies significance at 5%
p-value ≤ 0.01 implies significance at 1%
Coefficients for country dummies as well as statistically insignificant interaction terms are not listed.

6. IMPLICATIONS OF THE FINDINGS

The regression results show that for cigarette use among men and women, those in urban areas are more likely to smoke compared to those in rural areas (with the exception of Namibia and Swaziland for men, although by a small margin). This is similar to the findings made by Pampel (2005). In general, the opposite applies to the use of pipes, chewing tobacco and other tobacco for men and snuff for both men and women, whereby men and women in urban areas are less likely to use these types of tobacco compared to those in rural areas. The exception is in the use of chewing tobacco for men in Lesotho and the use of other tobacco for men in Swaziland, whereby the men in urban areas have a higher likelihood of using these forms of tobacco compared to those in rural areas. In general therefore, one can say that in terms of combatting cigarette smoking in the SACU region, policies should be more focused on the urban areas, while in terms of combatting the use of smokeless tobacco (chewing tobacco and snuff) and pipes, policies should be more focused on the rural areas.

For education, generally, the use of the four types of tobacco is lower the higher the educational attainment, as is seen in John et al (2012) and Peer et al (2009). There are, however, some exceptions. For cigarette use amongst the women in Lesotho and chewing tobacco use amongst the men in Lesotho, those with higher educational attainment have a higher likelihood of using these types of tobacco. The negative relationship of tobacco use with education is probably because the more educated an individual is, the more likely they are to be informed about the adverse effects and the negative health effects of tobacco consumption (Pampel, 2008).

For the use of cigarettes, pipes, chewing tobacco and snuff there is no clear cut relationship with occupation amongst both the men and women. In some countries the employed are more likely to use these types of tobacco compared to those that are not working, as found by Pampel (2005) for the case of cigarette smoking among men; and in other countries, this relationship is reversed. Employed men and women in Lesotho and South Africa are more likely to use cigarettes compared to those that are not working. However for women in Namibia and men and women in Swaziland, the employed are less likely to use cigarettes. Tobacco control policies therefore need to be specifically tailored to the situation present in each individual country, for the given type of tobacco used. It is therefore not suitable to

impose policies based on the findings of the combined regression, since not all the findings from the individual country regressions are consistent with the combined regression.

In general therefore, this study also finds that an inverse relationship does exist between tobacco use and the socioeconomic status based on the socioeconomic factors that have been studied. This implies that the higher the socioeconomic status, the lower the use of tobacco. This relationship is important because generally, the people with a low socioeconomic status are the poor people who have no jobs or low status jobs, have no education or a low levels of education, and live in rural areas. By having a higher prevalence of tobacco use, this group of people is more susceptible to the adverse effects of tobacco use such as disease. Given that they are already poor, they probably do not have the means to afford treatment for the diseases that arise due to tobacco use. According to Jha and Chaloupka (2000), the incidence of death as a result of smoking related diseases is higher among the poor.

A study carried out in Poland found that men who had obtained university education had a 26% risk of death in middle age, while those with only primary education had a 52% risk of death in middle age (The World Bank, 1999). According to The World Bank (1999), in the absence of smoking, the gap between the two groups would narrow. In a way, therefore, tobacco use perpetuates the low socioeconomic status of individuals who already have a low socioeconomic status. This is because when such individuals fall sick, they will most likely become economically inactive since they cannot afford treatment. Parents in such positions will therefore not be able to afford education for their children, who are then likely to become like their parents in future and have a hard time breaking out of the low socioeconomic status group.

Men and women in lower socioeconomic groups are generally more responsive to changes in the price of cigarettes (Townsend, 1994), hence increasing tobacco prices is one of the immediate ways to reduce tobacco use in the countries where the lower socioeconomic groups tend to have higher prevalence of tobacco use. For such countries, improving access to education will possibly reduce tobacco use in the medium to longer term, not only because the higher the educational attainment the lower the likelihood of using tobacco, but also because by improving access to education, more youth will have the chance to be employed in high status jobs, which are also associated with a lower tobacco use prevalence. Also, by incorporating tobacco awareness in the education curriculum, teenagers and the youth will be

sensitised on the negative effects of tobacco use, and this will probably contribute to lower prevalence of tobacco use. According to Jha and Chaloupka (2000), it is unlikely for an individual to ever smoke if they avoid smoking in their teenage and early adulthood years. Therefore, educating the teenagers and youth on the adverse effects of tobacco use is likely to go a long way in decreasing the prevalence of tobacco use.

7. LIMITATIONS OF THE STUDY

The limitations of the data used to carry out this study are that the older population is not accounted for, that is, men and women older than 49 years. Considering that the prevalence tables generally show that tobacco use is higher amongst the older age groups, cutting off the analysis at 49 years may bias the results downwards as it may fail to account for higher levels of tobacco use amongst those who are above the 49 year old cut off. Also, the South African NIDS data does not provide any information on the use of other types of tobacco such as chewing tobacco, pipes and snuff, hence making it impossible to analyse the socioeconomics of these types of tobacco use in South Africa.

The analysis carried out in this paper did not include the price of tobacco. This is a limitation because the price of tobacco is a significant factor in tobacco use and including it in the analysis would give a more precise picture of how tobacco use varies across the different socioeconomic groups. Also, the study was restricted to SACU countries so as to make it possible to carry out the analysis in the absence of price data by holding price constant across these countries. However, given that the data used spans a number of years (2003 for South Africa, 2006-7 for Namibia and Swaziland, and 2009 for Lesotho), it is highly probable that the price of tobacco that prevailed in each of these years is actually different.

The use of tobacco is also largely influenced by ethnicity or race, especially in South Africa (Panday et al, 2003; Senkubuge et al, 2012; Peer et al, 2009). Therefore another limitation of this study is that it does not account for ethnicity or race because the DHS data used does not include information on this variable. This study can therefore be improved upon by including the older population in the study, and also by including tobacco price data. In the absence of tobacco price data, the data used from each of the countries should be from relatively the

same time period so that the price of tobacco is the same across the four countries. In addition, including data on ethnicity or race would also improve the study.

8. CONCLUSION

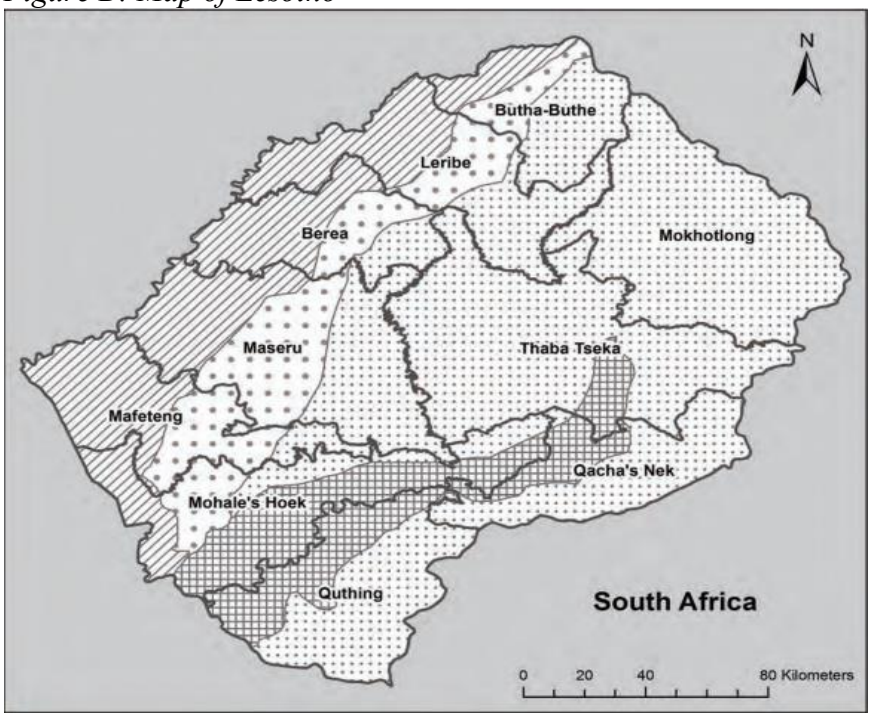
This paper has assessed the socioeconomics of tobacco use in Lesotho, Namibia, Swaziland and South Africa. The findings are in line with existing literature, whereby overall, an inverse relationship exists between tobacco use and socioeconomic status. In addition, this paper found that the effect of the studied socioeconomic factors on tobacco use differs across the four countries in terms of both the trends and the magnitudes, with the major differences being the relatively high prevalence of snuff use among the women in Lesotho (9.1%), and the relatively high cigarette smoking prevalence among the women in South Africa (8.9%). The findings of this paper are beneficial to policy making because they provide insight on the use of each type of tobacco in Lesotho, Namibia, Swaziland and South Africa, hence enabling the implementation of policies that can directly address the problem, hence helping the aversion of the tobacco epidemic.

APPENDIX 1: MAPS OF THE STUDIED SACU COUNTRIES

Figure A: Map of Lesotho, Namibia, Swaziland, South Africa and Botswana showing the SACU region

(MOHSW and ICF Macro, 2010)

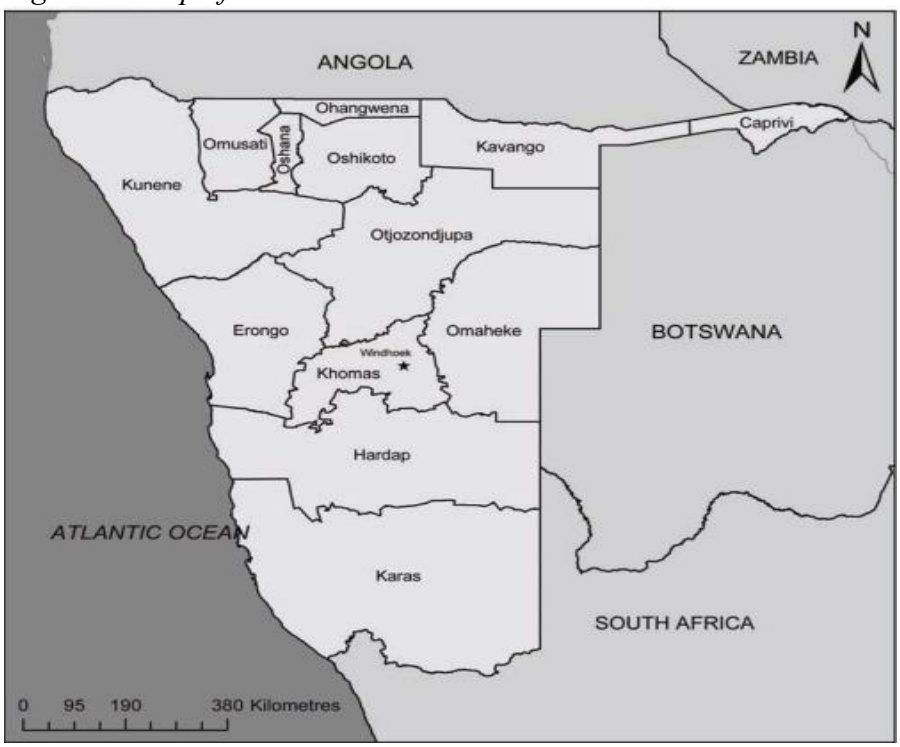
Figure B: Map of Lesotho



(MOHSW and ICF Macro, 2010)

APPENDIX 1: MAPS OF THE STUDIED SACU COUNTRIES (CONTINUED)

Figure C: Map of Namibia



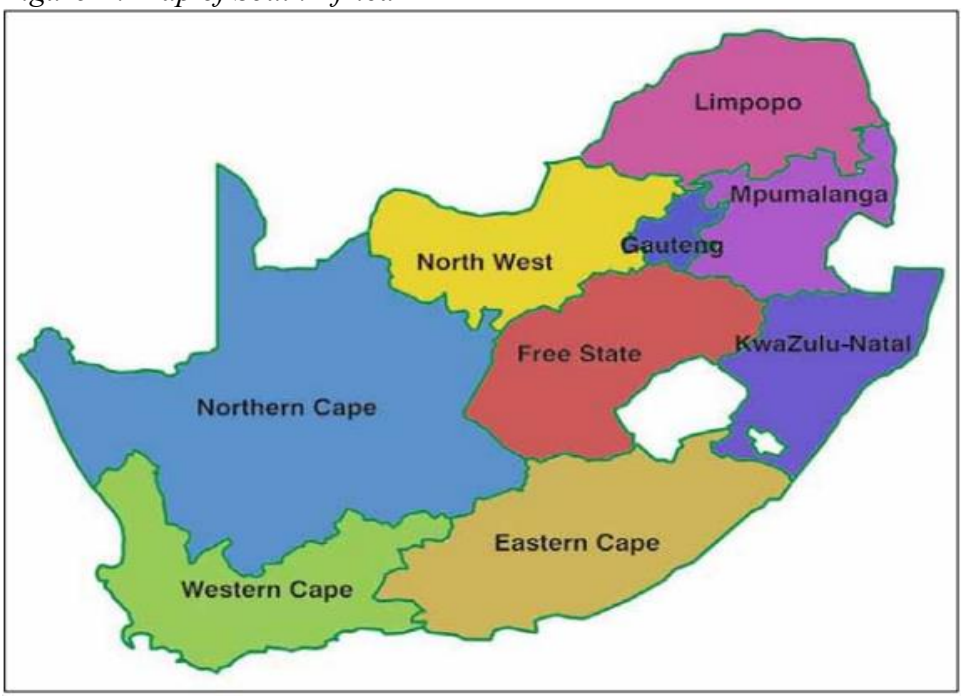
(MoHSS and Macro International Inc, 2008)

Figure D: Map of Swaziland

(CSO and Macro International Inc., 2008)

APPENDIX 1: MAPS OF THE STUDIED SACU COUNTRIES (CONTINUED)

Figure E: Map of South Africa



(Department of Health et al, 2007)

APPENDIX 2: TOBACCO PREVALENCE TABLES

Table A: Tobacco Use Prevalence for Men aged 15-49 years from Lesotho

	n	Cigarette Smoking Prevalence (%)	Pipe Smoking Prevalence (%)	Chewing Tobacco Prevalence (%)	Snuff Prevalence (%)	Other Tobacco Prevalence (%)
Total	*2988*	*34.5*	*5.7*	*1.1*	*0.2*	*7.9*
Age						
15-19	838	14.1	1.7	0.2	0.2	3.0
20-24	631	41.2	6.6	1.5	0.3	11.0
25-29	462	46.4	5.3	0.8	0.0	11.3
30-34	370	41.7	7.8	1.6	0.0	11.0
35-39	282	43.9	10.0	1.9	0.0	6.9
40-44	204	39.5	7.1	1.3	0.3	7.4
45-49	201	38.1	9.0	2.1	0.3	7.0
Residence						
Rural	2313	35.1	6.4	0.9	0.2	8.8
Urban	675	33.0	3.9	1.5	0.0	5.8
Education						
No school	393	43.6	9.1	1.1	0.5	10.2
Primary	1494	38.0	6.9	1.3	0.2	10.5
Secondary	955	28.5	3.3	1.0	0.1	4.5
Post-Secondary	146	22.9	4.1	0.0	0.0	1.9
Occupation						
Not Working	936	25.5	4.0	0.7	0.1	4.9
Agriculture	1143	38.1	6.7	1.7	0.2	11.4
Service-Manual	662	43.7	7.2	1.2	0.2	8.6
Non-Manual	247	27.8	3.9	0.0	0.0	3.2
Religion						
Other	348	35.9	6.5	1.6	0.0	10.6
Catholic	1217	36.3	5.1	1.1	0.2	7.2
Protestant	1423	32.5	6.1	1.0	0.2	8.0

The 'Other' Religion category contains Seventh Day Adventists, Muslims, Other Christians, those with no religion, and those whose response was 'other'.

APPENDIX 2: TOBACCO PREVALENCE TABLES (CONTINUED)

Table B: Tobacco Use Prevalence for Women aged 15-49 years from Lesotho

	n	Cigarette Smoking Prevalence (%)	Pipe Smoking Prevalence (%)	Chewing Tobacco Prevalence (%)	Snuff Prevalence (%)	Other Tobacco Prevalence (%)
Total	*7621*	*0.2*	*0.0*	*0.1*	*9.1*	*0.1*
Age						
15-19	1840	0.0	0.0	0.0	0.3	0.1
20-24	1555	0.1	0.0	0.0	2.1	0.0
25-29	1203	0.4	0.0	0.0	6.2	0.0
30-34	960	0.5	0.0	0.1	11.6	0.1
35-39	755	0.1	0.0	0.0	14.0	0.4
40-44	663	0.4	0.0	0.0	24.5	0.4
45-49	645	0.5	0.1	1.3	30.5	0.1
Residence		0.0	0.0	0.0	0.0	0.0
Rural	5646	0.1	0.0	0.2	11.1	0.1
Urban	1975	0.4	0.0	0.0	5.0	0.1
Education						
No school	114	0.0	0.4	0.0	25.3	0.0
Primary	3863	0.2	0.0	0.2	15.3	0.2
Secondary	3276	0.2	0.0	0.1	3.5	0.0
Post-Secondary	368	0.4	0.0	0.0	1.0	0.0
Occupation						
Not Working	4285	0.2	0.0	0.1	7.3	0.1
Agriculture	951	0.1	0.1	0.7	19.4	0.8
Service-Manual	1367	0.2	0.0	0.1	10.1	0.0
Non-Manual	1018	0.6	0.0	0.1	7.3	0.0
Religion						
Other	583	0.3	0.0	0.1	8.0	0.1
Catholic	3217	0.2	0.0	0.2	8.7	0.1
Protestant	3821	0.2	0.0	0.1	9.5	0.1

The 'Other' Religion category contains Seventh Day Adventists, Muslims, Other Christians, Methodists, those with no religion, and those whose response was 'other'.

APPENDIX 2: TOBACCO PREVALENCE TABLES (CONTINUED)

Table C: Tobacco Use Prevalence for Men aged 15-49 years from Namibia

	n	Cigarette Smoking Prevalence (%)	Pipe Smoking Prevalence (%)	Chewing Tobacco Prevalence (%)	Snuff Prevalence (%)
Total	*3899*	*20.9*	*0.9*	*1.0*	*0.9*
Age					
15-19	906	9.1	0.1	0.2	0.2
20-24	738	20.5	0.3	0.6	0.3
25-29	676	26.6	1.3	0.5	0.5
30-34	562	24.8	0.9	1.6	0.8
35-39	417	27.1	1.8	1.1	2.1
40-44	348	24.9	2.1	2.8	1.7
45-49	252	24.6	1.2	1.7	3.2
Residence					
Rural	2231	18.5	1.7	1.9	1.3
Urban	1668	23.3	0.1	0.1	0.4
Education					
No school	404	23.1	2.8	3.2	5.1
Primary	1184	18.7	1.2	1.2	1.1
Secondary	2079	22.6	0.5	0.5	0.2
Post-Secondary	232	14.6	0.0	0.4	0.0
Occupation					
Not Working	1270	14.4	0.5	0.9	0.7
Agriculture	866	25.0	2.6	3.1	2.0
Service-Manual	1360	22.8	0.6	0.2	0.4
Non-Manual	403	26.0	0.2	0.3	1.0
Religion					
Other	101	35.5	1.5	1.8	1.5
Catholic	1152	21.5	1.6	1.0	1.1
Protestant	2646	20.0	0.6	0.9	0.8

The 'Other' Religion category contains those with no religion, and those whose response was 'other'.

APPENDIX 2: TOBACCO PREVALENCE TABLES (CONTINUED)

Table D: Tobacco Use Prevalence for Women aged 15-49 years from Namibia

	n	Cigarette Smoking Prevalence (%)	Pipe Smoking Prevalence (%)	Chewing Tobacco Prevalence (%)	Snuff Prevalence (%)
Total	*9779*	*5.3*	*0.6*	*0.5*	*1.8*
Age					
15-19	2199	2.3	0.2	0.1	0.2
20-24	1873	3.9	0.3	0.3	0.6
25-29	1558	5.3	0.4	0.3	1.0
30-34	1417	5.8	0.4	0.5	1.3
35-39	1074	7.8	1.0	0.8	3.0
40-44	948	9.2	1.1	1.5	3.7
45-49	710	8.8	1.8	1.8	8.6
Residence					
Rural	5390	2.3	0.9	0.8	2.7
Urban	4389	8.5	0.2	0.3	0.8
Education					
No school	772	7.4	4.7	4.7	8.3
Primary	2611	4.0	0.7	0.7	3.8
Secondary	5838	5.6	0.1	0.1	0.4
Post-Secondary	558	5.6	0.0	0.0	0.3
Occupation					
Not Working	4679	4.1	0.8	0.7	2.1
Agriculture	899	1.2	0.5	0.6	3.5
Service-Manual	1659	7.3	0.2	0.5	0.9
Non-Manual	2542	7.6	0.2	0.3	1.3
Religion					
Other	167	12.3	3.1	3.0	1.3
Catholic	2170	5.8	0.5	1.1	3.6
Protestant	7442	5.0	0.5	0.3	1.3

The 'Other' Religion category contains those with no religion, and those whose response was 'other'.

APPENDIX 2: TOBACCO PREVALENCE TABLES (CONTINUED)

Table E: Tobacco Use Prevalence for Men aged 15-49 years from Swaziland

	n	Cigarette Smoking Prevalence (%)	Pipe Smoking Prevalence (%)	Chewing Tobacco Prevalence (%)	Snuff Prevalence (%)	Other Tobacco Prevalence (%)
Total	*4149*	*13.8*	*1.4*	*0.6*	*2.3*	*3.8*
Age						
15-19	1257	2.2	0.2	0.0	0.3	1.1
20-24	878	12.6	1.1	0.2	1.5	4.1
25-29	637	17.2	1.5	0.4	2.4	6.2
30-34	446	22.5	2.0	0.9	4.2	6.8
35-39	395	26.4	2.3	1.5	5.6	4.5
40-44	284	25.5	1.9	2.4	4.9	5.0
45-49	252	25.1	5.3	1.4	4.1	3.8
Residence						
Rural	2711	13.3	1.6	0.7	2.7	3.3
Urban	1438	15.0	0.8	0.2	1.3	4.9
Education						
No school	331	23.9	4.0	1.4	5.3	5.7
Primary	1427	13.2	1.9	0.9	3.8	3.9
Secondary	2014	12.5	0.7	0.2	1.1	3.9
Post-Secondary	377	15.2	0.5	0.2	0.0	1.2
Occupation						
Not Working	1770	9.1	0.9	0.4	1.6	2.2
Agriculture	467	18.5	2.4	1.2	4.7	5.4
Service-Manual	1284	19.5	2.0	0.7	2.5	5.9
Non-Manual	628	12.9	0.9	0.3	2.1	2.8
Religion						
Other	3090	14.7	1.6	0.7	2.9	4.3
Catholic	204	25.1	2.3	0.0	1.0	6.2
Protestant	855	7.8	0.4	0.1	0.4	1.3

The 'Other' Religion category contains Traditional religion, Charismatics, Zionists, the Apostolic Sect, Muslims, those with no religion, and those whose response was 'other'.

APPENDIX 2: TOBACCO PREVALENCE TABLES (CONTINUED)

Table F: Tobacco Use Prevalence for Women aged 15-49 years from Swaziland

	n	Cigarette Smoking Prevalence (%)	Pipe Smoking Prevalence (%)	Chewing Tobacco Prevalence (%)	Snuff Prevalence (%)	Other Prevalence (%)
Total	*4977*	*1.1*	*0.1*	*0.0*	*1.0*	*0.1*
Age						
15-19	1264	0.3	0.0	0.0	0.1	0.1
20-24	1026	1.2	0.2	0.0	0.2	0.1
25-29	730	0.9	0.1	0.0	0.6	0.0
30-34	628	1.6	0.0	0.0	0.8	0.2
35-39	506	2.1	0.0	0.2	1.0	0.3
40-44	440	1.8	0.0	0.0	3.6	0.0
45-49	383	1.4	0.0	0.0	4.4	0.0
Residence						
Rural	3437	0.7	0.0	0.0	1.3	0.1
Urban	1540	2.2	0.1	0.0	0.1	0.2
Education						
No school	412	1.9	0.0	0.3	5.6	0.0
Primary	1633	0.8	0.1	0.0	1.4	0.1
Secondary	2536	1.0	0.0	0.0	0.2	0.1
Post-Secondary	396	2.5	0.0	0.0	0.0	0.0
Occupation						
Not Working	2762	0.9	0.0	0.0	1.1	0.1
Agriculture	210	2.3	0.0	0.0	0.9	0.3
Service-Manual	1078	1.2	0.2	0.1	1.2	0.0
Non-Manual	927	1.6	0.0	0.0	0.5	0.2
Religion						
Other	3351	1.0	0.1	0.0	1.4	0.1
Catholic	243	4.3	0.4	0.0	1.8	0.7
Protestant	1383	0.9	0.0	0.0	0.1	0.1

The 'Other' Religion category contains Traditional religion, Charismatics, Zionists, the Apostolic Sect, Muslims, those with no religion, and those whose response was 'other'.

APPENDIX 2: TOBACCO PREVALENCE TABLES (CONTINUED)

Table G: Tobacco Use Prevalence for Men and Women aged 15-49 years from South Africa

	Men		Women	
	n	Cigarette Smoking Prevalence (%)	n	Cigarette Smoking Prevalence (%)
Total	*4649*	*35.8*	*6499*	*8.9*
Age				
15-19	1133	10.5	1,194	2.2
20-24	885	33.9	1,254	7.9
25-29	679	41.6	949	10.0
30-34	559	38.9	793	8.5
35-39	505	45.7	817	10.8
40-44	464	47.1	752	11.6
45-49	424	49.1	740	13.9
Residence				
Rural	2350	32.9	3323	4.0
Urban	2299	37.5	3176	11.9
Education				
No school	883	48.7	1,173	11.5
Primary	2550	35.7	3,592	7.8
Secondary	890	29.6	1,228	6.8
Post-Secondary	326	30.2	506	15.3
Occupation				
Not Working	2972	31.4	4,987	7.9
Agriculture	211	60.1	104	16.7
Service-Manual	1128	42.7	866	9.6
Non-Manual	338	34.0	542	13.7
Religion				
Other	1161	43.0	822	9.1
Christian	3488	33.3	5677	8.9

The 'Other' Religion category contains Jews, Muslims, Hindu, African Traditional Spiritual belief and those whose response was 'other'.

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