

# Determinants of Tobacco Consumption in Papua New Guinea

## Challenges in Changing Behaviors

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## Abstract

This paper analyzes smoking prevalence and smoking behaviors in Papua New Guinea. Using the 2009–10 Papua New Guinea Household Income and Expenditure Survey, the paper analyzes the determinants of tobacco use and tobacco choices in Papua New Guinea. The results show that adults (18 years and above) in the poorest quartile are more likely to smoke. Tobacco consumption imposes a large financial burden to poor households.

Tobacco consumption accounts for about 23 percent of total household food expenditure for households in the poorest quartile, compared with 15 percent for the entire sample. However, most of these households consume non-processed tobacco. The study reveals the urgency to control tobacco consumption in Papua New Guinea and considers some practical challenges that the country may face.

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# **Determinants of Tobacco Consumption in Papua New Guinea: Challenges in Changing Behaviors**

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## 1. INTRODUCTION

The male smoking rate in Papua New Guinea is ranked the 5th highest in the world (Ng et al. 2014). However, little is known about the determinants of tobacco consumption and smoking behaviors in Papua New Guinea. This paper is the first to study tobacco consumption in Papua New Guinea using the 2009-2010 Papua New Guinea Household Income and Expenditure Survey (2009-2010 PNG HIES). The main objective of the paper is to understand the prevalence and direct financial burden of tobacco use among Papua New Guinea households, and the factors that are correlated with tobacco use and choices. The information and evidence provided in the paper will help in the design of effective policies to control tobacco usage and better understand some of the challenges of tobacco control in Papua New Guinea and more broadly in the Pacific region.

Tobacco use is the leading global cause of preventable death. The World Health Organization states that “the tobacco epidemic is one of the biggest public health threats the world has ever faced, killing nearly six million people a year”(World Health Organization 2014). There is no safe level of tobacco use. Tobacco use is the only risk factor common to all four of the main noncommunicable diseases (NCDs) – cancer, cardiovascular disease, diabetes and respiratory disease. While tobacco use accounts for an estimated one in six of all NCD deaths (Beaglehole et al. 2011; Boutayeb and Boutayeb 2005), it is also the single greatest preventable cause of NCDs.

Tobacco use raises direct costs for individuals and governments. Individuals who smoke will, on average, have higher health costs than non-smokers. Women subject to second hand smoke are likely to have babies with a lower birth weight and higher medical costs (Bonu et al. 2005; Been et al. 2014). Tobacco use makes treating existing diseases like diabetes more complex and more expensive. It also raises the costs to the government health system (Yang et al. 2011). The money that individuals spend on tobacco could be spent on beneficial products and services, such as improved housing and education rather than this always potentially harmful product (World Health Organization 2004a; Rokx et al. 2009). Smokers impose costs on industry through absenteeism. The extra money that governments spend to treat tobacco-related diseases could instead be spent on rural roads, electricity generation, or education. Last, tobacco use increases social and financial inequity by disproportionately harming the poor (Townsend 1987). The poor tend to have a worse health status to begin with; have fewer financial resources to spend on tobacco; and are less able to access health care if tobacco-related diseases occur.

There are a handful of studies on smoking prevalence in Papua New Guinea. Using national data from Papua New Guinea, Vallance et al. (1987) showed a three-fold increase in the consumption of commercial tobacco from 1960 to 1979. Among smokers, the proportion using commercial tobacco increased substantially, from 28% to 93% from 1960 to 1979. Chapman and Richardson (1990) showed the elasticity of demand for non-cigarette tobacco and cigarettes were -0.50 and -0.71 in Papua New Guinea from 1973-86. In a survey study of young people conducted during the 1996/1997 school break in National Capital District and Manus, Hiawaler (2002) showed that 12% of males and 8% of females smoked cigarettes. The study also showed that 13% of males and 10% of females smoked marijuana. Those who smoked marijuana also smoked cigarettes and mutrus. Despite a higher rate of male smokers, there is a significantly high rate of female smokers in National Capital District. The World Health Organization (WHO) Global Tobacco Epidemic

2013 Report (World Health Organization 2013) stated that the current tobacco smoking rate for male adults was 60.3% and 27.0% for female adults, 55.4% for male youth and 40.3% for female youth, based on Papua New Guinea STEPwise Surveillance (STEPS) for Noncommunicable Diseases conducted in 2007.

This paper uses the national representative sample to look into the current smoking patterns in Papua New Guinea. In summary, the results show that tobacco consumption imposes a significant financial burden to households, particularly to poor households. Tobacco consumption accounts for about 7% of total household expenditure and about 23% of total household food expenditure for the poorest quartile. Adults who cannot read are more likely to smoke. Household wealth status is significantly correlated with tobacco choices but not smoking prevalence. Smokers from the poorest quartile are more likely to consume non-processed tobacco, while smokers from the richest quartile are more likely to consume cigarettes.

## **2. DATA AND METHODS**

### **2.1 Data**

This paper uses the data from the 2009-2010 Papua New Guinea Household Income and Expenditure Survey (2009-2010 PNG HIES). The 2009-2010 HIES is the first comprehensive and nationally representative survey of the socioeconomic status of PNG households since the 1996 Household Survey of PNG conducted by Unisearch from the University of Papua New Guinea (UPNG) and the Institute of National Affairs (INA).

The 2009-2010 PNG HIES contains the final cross-section sample of 4,191 households. The sample of households was selected from a nationally representative sample frame. A comprehensive set of multi-topic questionnaires was designed to elicit information on key topics such as family demography, education, health, employment, and consumption. In addition to the standard questions on current smoking and ever smoking status, the survey also collects more in-depth information on cigarette type and the number of cigarettes consumed daily for individuals who reported as currently smoking. The analyses on these data subsets can provide more evidence on smoking behaviors in Papua New Guinea to inform policy making.

The paper analyzes the overall smoking prevalence in Papua New Guinea. The smoking prevalence for youth in the 11-17 year old category is 5.5%. The male smoking rate in the category is 8% and the female smoking rate is 2.8%. The paper restricts the regression analysis to individuals 18 years old and above. The final sample contains 12,181 individuals (age 18 and over), with 6,239 males and 5,942 females, after excluding individuals with key variables missing (key variables are smoking status or choice of tobacco types).

### **2.2 Dependent Variables**

The two main dependent variables used are smoking status and the choices of tobacco among people who smoke. “Current smoking” is defined as currently smoking on a daily basis; “Ever smoked” is defined as smoking currently or previously. The choices of tobacco consumed include manufactured cigarettes, hand-rolled cigarettes, non-processed tobacco and cigars. Since only 6%

of adults smoke cigars, cigars are consolidated with manufactured cigarettes as one type of tobacco in the regression analyses.

### 2.3 Independent Variables

Key variables included in the regression are household wealth quartile; capturing the income effect on tobacco consumption; age groups (defined as 18-30, 30-50 and above 50) and reading ability measured with three categories, reading without difficulty, reading with difficulty and cannot read. Other control variables include regions, gender and marital status. Regional location is a dummy variable, which measures the overall accessibility of tobacco across the regions. For instance, tobacco may be widely cultivated in some provinces, which results in the low price and high consumption level of non-processed tobacco in that area. Marital status is also included to capture the effect of family structure on people's smoking habits.

### 2.4 Methods

The regression method has two parts. The first part uses the logit regression to estimate the correlation between the smoking prevalence and other independent variables.

$$\Pr(\text{smoking}) = \alpha + \beta X_i + \varepsilon,$$

$X$  is a vector consisting of factors associated with smoking, including wealth quartile, age, education level, marital status, gender, regions and urban or rural locations.

The second part examines the relationship between various factors and consumption of different tobacco types (particularly non-processed tobacco), among the individuals who smokes (conditioning on smoking). Three categories (manufactured cigarettes, hand-rolled cigarettes and non-processed tobacco) are used for multinomial logit analysis.

The model is as follows:

$$\Pr(\text{tobacco product}=j \mid \Pr(\text{smoking})=1) = \frac{\exp(\beta_j X_i)}{1 + \sum_{k=0}^1 \exp(\beta_k X_i)},$$

where  $j=0$  is hand-rolled cigarettes, and  $j=1$  is non-processed tobacco. The third category, manufactured cigarettes, is used as the default in this model and hence is left out in the multinomial logit regression.

In the cases where current smokers consume more than one type of tobacco (around 24% of smokers), the type of tobacco consumed is defined as the type that the person smokes most on a daily basis. After conditioning on current smokers, 4,455 individuals were included to analyze individuals' tobacco choices.

### **3. RESULTS**

#### **3.1 Summary Statistics**

Tobacco and poverty form a vicious circle (World Health Organization 2004b). This is true in Papua New Guinea as well. The smoking rate is highest in terms of both current smoking rate and ever smoking rate among the poorest quartile, rated as 42% and 49% respectively (Figure 1 and Table1). Smoking rates are slightly less in other quartiles. The current smoking rate and ever smoking rate in the wealthiest quartiles are 34.91% and 39.18%, respectively. Smoking imposes large financial burdens on households, particularly poor households. Figure 2 and Figure 3 show tobacco expenditure as a share of total household expenditure and total household food expenditure. For households in the poorest quartile, tobacco consumption accounts for 23% of the total household food expenditures, and 6.6% of total household expenditures, as compared with 15.25% and 4.9% for the entire sample, respectively.

Young adults are more likely to smoke. Adults at younger ages (18-30 and 30-50 age groups) are more likely to smoke than adults 50 years old and over. There is also a significant correlation between reading ability and smoking status. Adults who can read without difficulty are less likely to smoke.

Smoking unprocessed tobacco is quite common across all quartiles in PNG. Table 2 presents the choice of tobacco types among the current smokers. Not only are people in the bottom quartile more likely to smoke, they are more likely to consume non-processed tobacco. Individuals in the wealthier quartiles are more likely to consume manufactured cigarettes (Table 2 and Figure 4).

Differences in preference are also apparent across age groups and reading levels. Young adults are more likely to consume manufactured cigarettes, while the relatively older people are more likely to consume non-processed tobacco. People who are able to read are more likely to consume manufactured cigarettes, while people who cannot read or read with difficulty are more likely to consume non-processed tobacco. People who live in urban areas are more likely to consume manufactured cigarettes, while people who live in rural areas are more likely to consume non-processed tobacco. This preference may be supply driven because cigarettes are more available in urban areas than in rural areas.

Geographic location is also highly correlated with smoking prevalence. Smoking is more prevalent in the Momase region than in the Southern, Highlands or Islands regions. People from rural areas are more likely to smoke than people from urban areas.

#### **3.2 Regression Results**

Table 3 presents the regression results on determinants of tobacco consumption. Wealthier quartiles are not significantly correlated with the current smoking status. After controlling for other factors, the ability to read has a significant impact on people's smoking choices.

The data confirm that people who cannot read or are uneducated are more likely to smoke. This presents challenges in terms of broader tobacco control. If the smokers cannot read, regulations such as health warnings on tobacco packages and brochures highlighting the harmful effects of smoking on health will not be effective. Alternate strategies must be developed to reach illiterate populations. For example, radio and direct community communication might be more effective ways to convey anti-smoking messages.

Smoking appears to be a more prevalent behavior among men independent of their wealth status. In this context, a high-level policy instrument such as tobacco tax increases or broader tobacco control policies can be more cost-effective in reducing smoking rates, rather than more targeted approaches, which could be more costly.

Married people are more likely to smoke than those who are single and live alone, after controlling for other variables. A home environment in which the father or mother smoke is harmful to children through second hand smoke but perhaps more importantly through learned behaviors. This environment is also harmful to pregnant women, as literature has confirmed increased risks of low birth weight and small for gestational age with heavier maternal smoking (Windham et al. 2000).

Smoking poses a significant risk to younger adults. After controlling for other variables, the data revealed that young adults are more likely to smoke compared to older adults. As discussed earlier, smoking poses significant health risks that do not necessarily manifest when people are young and relatively healthy. However, the individuals, families and society will have to bear the costs as the population ages and begins to suffer the diseases, which are directly or indirectly correlated with smoking.

Younger adults not only are more likely to smoke (Table 3) but are more likely to smoke cigarettes. This implies that taxation on tobacco products can be an effective instrument to reduce smoking cigarettes among young adults. However, it is essential to have other complementary measures, which can help young adults quit smoking rather than switching to other types of tobacco.

Table 4 shows the results of multi-logit regression on the sample of current smokers. Manufactured cigarettes are the default group. The analysis shows that the poorest quartile is more likely to consume non-processed tobacco rather than manufactured cigarettes. People who live in the Highlands, Momase and Islands regions are more likely to consume non-processed tobacco than people who live in the Southern province.

After controlling for the wealth quartile, the data revealed that less educated people consume more non-processed tobacco. Similarly, rural people consume more non-processed tobacco. This might be directly related to the more abundant supply of loose tobacco in rural areas. Non-processed tobacco is more popular for males than for females.

#### **4. DISCUSSION**

Tobacco consumption is an important development challenge in Papua New Guinea. Papua New Guinea is among the top ten countries in the world in terms of tobacco consumption. Around 40%

of the population in Papua New Guinea consumes tobacco. Tobacco expenditure accounts for 3-7% of household total expenditure and 13-27% of food expenditure, depending on wealth status. Tobacco use is more prevalent among the poorest quintile and least educated: those least able to afford expenditure on tobacco at the expense of improved housing and education, or to afford treatment for tobacco-induced cancers, heart disease and other illnesses. Tobacco use also has adverse indirect consequences including absenteeism due to tobacco induced illness, and adverse health effects on children from second hand smoke. Tobacco use has no health benefits, only health costs. Tobacco use causes or exacerbates the adverse impacts of all major noncommunicable diseases including cancer, heart disease and diabetes. Tobacco production has few economic benefits that could not be generated from alternative uses of land, labor and capital which are used in tobacco production and manufacturing. The resources can be reallocated over time to more socially beneficial activities.

Government needs to intervene in the interests of broader social and economic development of the country. A “do-nothing” approach will impose increasing health, social and economic costs on Papua New Guinea. Rising incomes in PNG, a growing population of younger people, and aggressive marketing by tobacco companies will inevitably lead to an even greater rise in the prevalence of tobacco use. This will, in turn increase the smoking prevalence of otherwise preventable and costly noncommunicable diseases such as cancer; directly raise the health costs to individuals and the government; indirectly reduce expenditure by individuals and the government on goods and services that increase wealth and productivity; increase absenteeism and therefore raise industry costs in PNG; and reduce sales of other beneficial products produced in PNG. Alternatively, the PNG government can actively and purposefully work to reduce tobacco consumption and avoid the potential costs of continued and increased tobacco usage.

Raising the excise duty on tobacco is considered to be an essential and effective step to reducing tobacco consumption globally. More specifically, WHO recommends that raising excise duties to at least 70% of the retail price is “best practice”. The reasoning behind this strong recommendation is that the subsequent price increase would induce many current users to quit; deter youth from taking up the habit; raise revenue for government; and reduce adverse health outcomes and costs to government and users (World Health Organization 2014). Raising tobacco prices can also have a quick and noticeable impact on health and health costs. In 2008, Turkey raised cigarette taxes to 81% and banned tobacco advertising and smoking in public places. The following year, hospital emergency room admissions in Turkey for smoking-related disease declined by nearly a quarter and smoking rates dropped 16% over three years (Angell et al. 2014). The Government of the Philippines recently raised tobacco (and alcohol) taxation and used much of the additional revenue to fund the expansion of Social Health Insurance for the poor (Jha et al. 2012).

However, there are practical challenges in applying an excise duty on non-manufactured tobacco given the availability of growing such tobacco in small local gardens that will need to be considered as well. This paper also finds that more than 70% of non-processed tobacco is purchased from a local market and/or street vendors. This will create a practical challenge in terms of implementing increased excise duties over the short to medium term. Raising the excise duty on manufactured tobacco without commensurate increases in non-manufactured tobacco is also likely to see a shift in consumption from the former to the latter. However with rates of tobacco

use in Papua New Guinea among the top ten countries in the world, and with higher rates of tobacco use among the poorest, it is essential that this challenge be addressed.

While increasing the prices of manufactured and non-manufactured tobacco is key to reducing usage prevalence, this strategy needs to be supported by other non-price measures. Other tobacco control measures include advertising bans, smoke free zones, public education, warning pictures and enforcing rules against sales of tobacco to minors. These and similar measures are set out in the WHO Framework Convention on Tobacco Control (FCTC) which the Government of Papua New Guinea ratified in 2006. They are particularly important interventions given the practical challenges of imposing increased excise duties on non-manufactured tobacco. Implementation of FCTC has been challenging in many low-income and middle-income countries, and PNG is no exception. The World Health Organization monitors tobacco use and prevention policies; they report that graphic pack warnings, which would help the population who have difficulty reading or who cannot read to understand the dangers of smoking, have not been legalized (World Health Organization 2013). Single cigarettes are still sold on the street. Promotion and sponsorship activities have not been banned. Stronger leadership, commitment and capacity are required to legalize and implement these provisions.

However, there are reasons to be hopeful that Papua New Guinea can address the adverse impacts that tobacco use has on health, finances, poverty and development. Following the declaration that the Pacific region is in a noncommunicable diseases crisis, Ministers of Finance and Ministers of Health from the Pacific Island Forum have jointly agreed to implement their own country-specific *Roadmap for the Control of Non-Communicable Diseases* (The World Bank 2014). Recognizing the high health risk and increasing treatment costs of tobacco related diseases, the first and most substantive decision was to reduce tobacco consumption. In 2015, the Government of Papua New Guinea made a strong commitment in the 2015 National Budget (PNG 2014) to change the indexation arrangements applying to the tobacco excise. The tobacco excise will now be increased by a set 5% biannually (10% annually) from 2.5% or Consumer Price Index (CPI) inflation, whichever is lower. This is an important start. But as this paper has discussed, the challenge to change individuals' behaviors still remains. Continued monitoring of the tobacco retail price and household consumption on tobacco is critical. Complementary measures and regulations, including those in FCTC and ratified by the Papua New Guinea government, need to be effectively implemented.

Figure 1. Smoking prevalence by wealth quartile

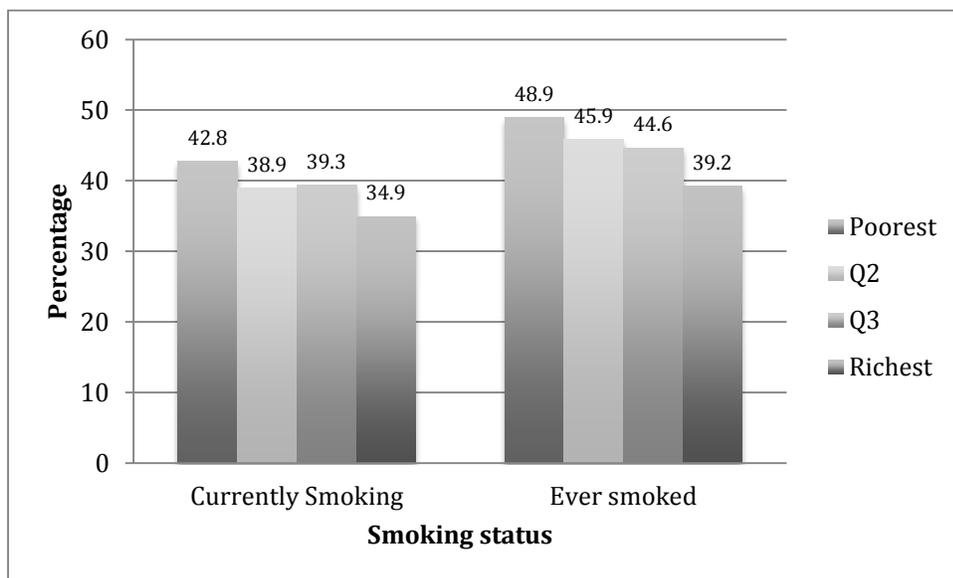


Figure 2: Percentage of household expenditure on tobacco over total food expenditure

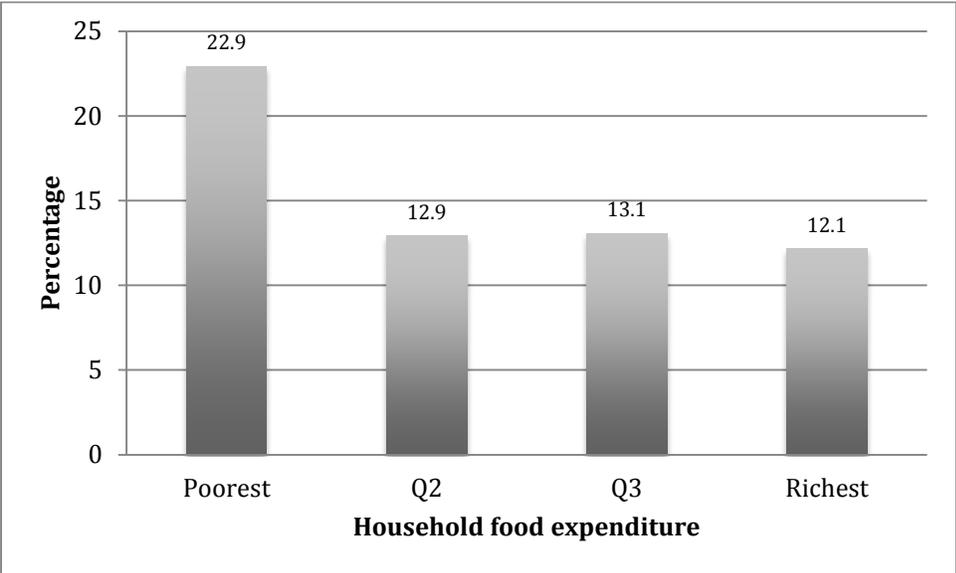


Figure 3: Percentage of household expenditure on tobacco over household total expenditure

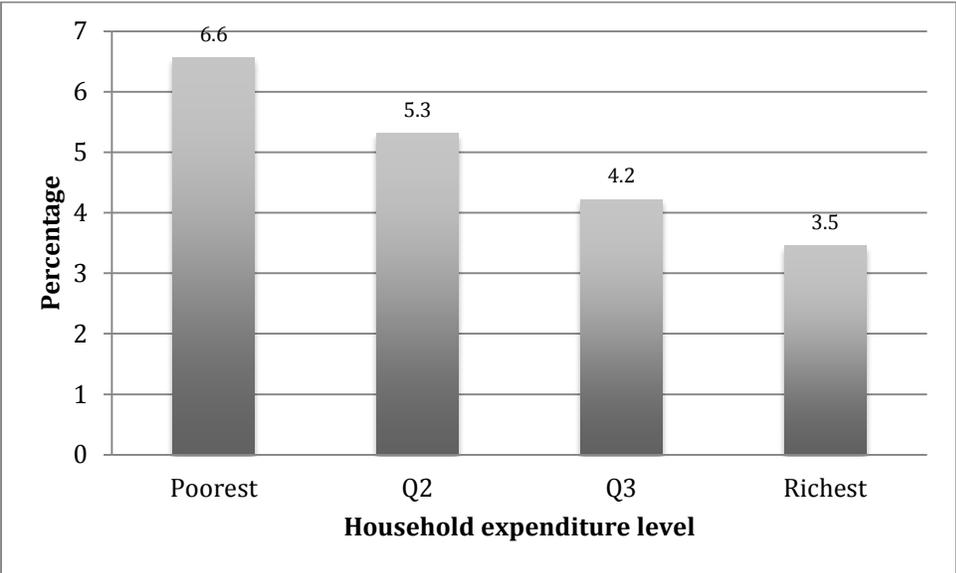


Figure 4: Choice of tobacco type by wealth quartile

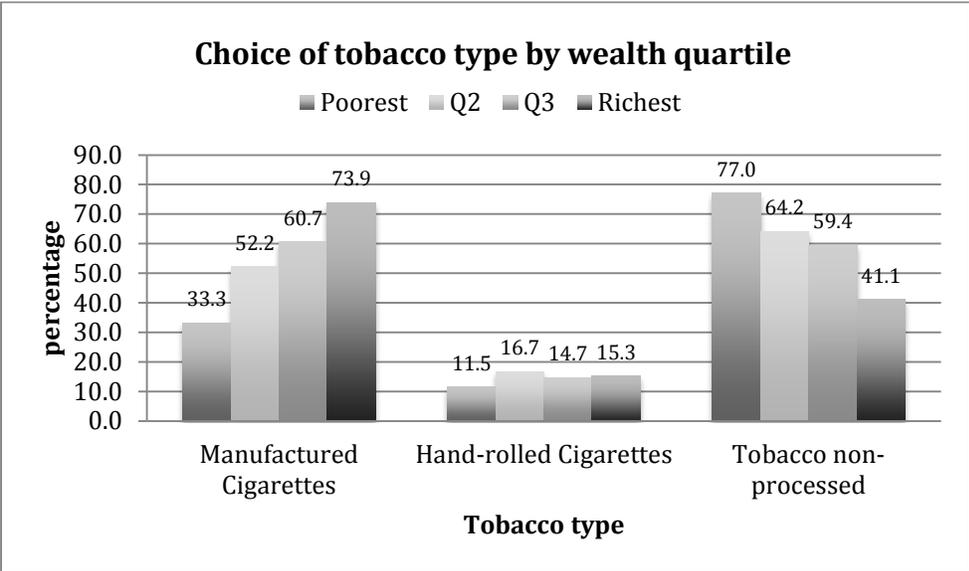


Table 1: Descriptive statistics for non-smokers and smokers

Variables		Currently Smoking	SD	Ever smoked	SD
Wealth Quartile	Q1	42.37%	0.02	48.64%	0.02
	Q2	39.34%	0.02	46.12%	0.02
	Q3	38.64%	0.02	43.76%	0.02
	Q4	34.91%	0.02	39.18%	0.02
Region	Southern	34.67%	0.02	39.45%	0.02
	Highlands	39.84%	0.02	46.24%	0.02
	Momase	44.04%	0.02	50.34%	0.02
	Islands	37.03%	0.02	42.25%	0.02
Age Group	18-30	37.93%	0.01	41.34%	0.01
	30-50	42.83%	0.01	48.32%	0.01
	>50	35.30%	0.02	46.11%	0.02
Education	Cannot read	42.49%	0.02	50.02%	0.02
	Read with difficulty	42.13%	0.02	48.80%	0.02
	Read without difficulty	36.81%	0.01	41.37%	0.01
Married		40.36%	0.01	46.60%	0.01
Urban		32.85%	0.01	37.58%	0.01
Male		57.21%	0.01	63.83%	0.01

Note: the total number of observation is 12,386.

Table 2: Tobacco choices among current smokers

Variables		Cigarettes	SD	Hand-rolled Cigarettes	SD	Non- Tobacco	SD
Wealth							
Quartile	Q1	20.27%	0.02	7.75%	0.01	71.98%	0.03
	Q2	35.97%	0.03	8.65%	0.02	55.38%	0.04
	Q3	41.59%	0.04	8.23%	0.02	50.17%	0.04
	Q4	60.27%	0.03	8.67%	0.02	31.07%	0.03
Region	Southern	60.02%	0.05	14.30%	0.03	25.67%	0.06
	Highlands	31.44%	0.03	6.32%	0.01	62.24%	0.03
	Momase	16.52%	0.02	7.10%	0.02	76.38%	0.03
	Islands	41.64%	0.06	6.91%	0.03	51.45%	0.06
Age Group	18-30	39.49%	0.03	9.32%	0.02	51.19%	0.03
	30-50	32.45%	0.02	7.83%	0.01	59.72%	0.03
	>50	26.71%	0.02	6.58%	0.01	66.71%	0.03
Education	Cannot read	19.49%	0.02	5.10%	0.01	75.41%	0.02
	Read without difficulty	45.83%	0.03	10.67%	0.02	43.50%	0.03
	Read with difficulty	29.90%	0.04	7.27%	0.02	62.83%	0.04
Married		32.63%	0.02	8.16%	0.01	59.21%	0.03
Urban		71.80%	0.02	7.21%	0.01	20.99%	0.02
Male		34.54%	0.02	8.37%	0.01	57.09%	0.03

Note: Total number of current smokers are 4472. For those who smoke more than one kind, the tobacco type that was most consumed daily was kept.

Table 3: Regression results: the correlation between individuals' demographic factors on their smoking status

Variables	Smoking Status
Wealth Quartile: quartile 1 (poorest) as the baseline comparison group	
Wealth Quartile 2	-0.04 [0.036]
Wealth Quartile 3	-0.01 [0.037]
Wealth Quartile 4	-0.06 [0.040]
Region: Southern as the baseline comparison group	
Highlands	0.01 [0.036]
Momase	0.23*** [0.032]
Islands	0.10** [0.040]
Age: age between 18-30 as the baseline comparison group	
Age between 30 to 50	-0.07** [0.030]
Age above 50	-0.37*** [0.038]
Education: read without difficulty as baseline comparison group	
Read with difficulty	0.22*** [0.039]
Can not read	0.39*** [0.035]
Married	0.10*** [0.029]
Urban	-0.11*** [0.030]
Male	1.00*** [0.026]
Constant	-0.97*** [0.047]
Observations	12,181

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4: Regression results: the correlation between individuals' demographic factors on their tobacco choices with manufactured cigarettes as the baseline comparison group

Variables	Hand-rolled Cigarettes	Non-processed Cigarettes
Wealth Quartile: quartile 1 (poorest) as the baseline comparison group		
Wealth Quartile 2	-0.09 [0.168]	-0.33*** [0.111]
Wealth Quartile 3	-0.31* [0.175]	-0.35*** [0.112]
Wealth Quartile 4	-0.24 [0.180]	-0.81*** [0.125]
Region: Southern as the baseline comparison group		
Highlands	-0.22 [0.171]	0.97*** [0.114]
Momase	0.91*** [0.139]	2.40*** [0.108]
Islands	-0.31 [0.191]	1.01*** [0.123]
Age: age between 18-30 as the baseline comparison group		
Age between 30 to 50	-0.03 [0.134]	0.18* [0.092]
Age above 50	0.19 [0.184]	0.43*** [0.123]
Education: read without difficulty as baseline comparison group		
Read with difficulty	-0.06 [0.178]	0.37*** [0.116]
Can not read	-0.12 [0.176]	0.86*** [0.106]
Married	-0.06 [0.131]	-0.15 [0.090]
Urban	-1.21*** [0.133]	-1.73*** [0.092]
Male	-0.13 [0.131]	0.20** [0.090]
Constant	-0.74*** [0.222]	-0.40** [0.159]
Observations	4,455	4,455

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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## Annex I : Myths About Tobacco Control

**Myth 1: *Tobacco is only an issue for affluent people and affluent countries.***

Reality: Smoking is declining among males in most high-income countries. In contrast, it is increasing in males in most low- and middle-income countries and in women worldwide. Within individual countries, tobacco consumption and tobacco-related disease burdens are usually greatest among the poor.

**Myth 2: *Governments should not discourage smoking other than making its risks widely known. Otherwise, they would interfere with consumers' freedom of choice.***

Reality: First, many smokers are unaware of their risks, or they simply underestimate or minimize the personal relevance of those risks, even in high-income societies where the risks are relatively widely known. Second, most smokers start when they are children or adolescents -- when they have incomplete information about the risks of tobacco and its addictive nature -- and by the time they try to quit, many are addicted. Third, smoking imposes costs on non-smokers. For these reasons, the choice to smoke may differ from the choice to buy other consumer goods and governments may consider interventions justified.

**Myth 3: *Smokers always bear the costs of their consumption choices.***

Reality: Not necessarily so. They do impose certain costs on non-smokers. The evident costs include health damage, nuisance and irritation from exposure to environmental tobacco smoke. In addition, smokers may impose financial costs on others (such as bearing a portion of smokers' excess healthcare costs). However, the scope of these costs is difficult to measure and they vary in place and time, so this report makes no attempt to quantify them. In high-income countries, smokers' healthcare costs on average exceed non-smokers' in any given year. It has been argued that, because smokers tend to die earlier than non-smokers, their lifetime health care costs may be no greater than those of non-smokers; however, recent reviews in high-income nations conclude that smokers' lifetime healthcare costs do indeed exceed non-smokers', despite their shorter lives. If healthcare is paid for, to some extent, by the public sector; smokers will thus impose their costs on others.

**Myth 4: *Tobacco control will result in permanent job losses for an economy.***

Reality: Successful control policies will lead to only a slow decline in global tobacco use (which is projected to stay high for the next several decades). The resulting need for downsizing will be far less dramatic than many other industries have had to face. Furthermore, money not spent on tobacco will be spent on other goods, generating alternative employment. Studies for this report show that most countries would see no net job losses and that a few would see net gains if consumption fell.

**Myth 5: *Tobacco addiction is so strong that simply raising taxes will not reduce demand; therefore, raising taxes is not justified.***

Reality: Scores of studies have shown that increased taxes reduce the number of smokers and the number of smoking-related deaths. Price increases induce some smokers to quit and prevent others from becoming regular or persistent smokers. They also reduce the number of ex-smokers returning to cigarettes and reduce consumption among continuing smokers. Children and adolescents are more responsive to changes in the price of consumer goods than adults. Simply put, if the price goes up, they are more likely to reduce their consumption. This intervention would therefore have a big impact on the youth. Similarly,

people with low incomes are more price-responsive than those with high incomes. Therefore, there is likely to be a bigger impact in developing countries where tobacco consumption is still increasing. Models developed for this report showed that tax increases, which would raise the real price of cigarettes by 10% worldwide, would cause 40 million smokers (alive in 1995) to quit and prevent a minimum of 10 million tobacco-related deaths.

**Myth 6: Governments will lose revenues if they increase cigarette taxes, because people will buy fewer cigarettes.**

Reality: Wrong. The evidence is clear: calculations show that even very substantial cigarette tax increases will still reduce consumption and increase tax revenues. This is in part because the proportionate reduction in demand does not match the proportionate size of the tax increase, since addicted consumers respond relatively slowly to price rises. Furthermore, some of the money saved by quitters will be spent on other goods which are also taxed. Historically, raising tobacco taxes, no matter how large the increase, has never once led to a decrease in cigarette tax revenues.

▲ **Myth 7: Smuggling and illicit production will undermine the effects of raised tobacco taxes.**

Reality: Smuggling is a serious concern. But even in the face of smuggling, the evidence from a number of countries shows that tax increases still increase revenues and reduce cigarette consumption. Furthermore, governments can adopt effective policies to control smuggling. Such policies include prominent tax stamps and local-language warnings on cigarette packs, as well as the aggressive enforcement and consistent application of tough penalties to deter smugglers.

**Myth 8: Governments should not raise cigarette taxes because such increases will have a disproportionate impact on poor consumers.**

Reality: Existing tobacco taxes do consume a higher share of the poor consumers' income than of rich consumers. However, policy makers' main concern should be over the distributional impact of the entire tax and expenditure system, and less on particular taxes in isolation. Poor consumers are usually more responsive to price increases than rich consumers, so it is likely that their consumption of cigarettes will fall more sharply, and their relative financial burden may be correspondingly reduced.

**Myth 9: In response to higher cigarette taxes, smokers will switch to cheaper brands or cheaper tobacco products and thus there will be no reduction in overall tobacco consumption.**

Reality: This behavior, which is also known as "substitution", establishes a legitimate concern. However, not all smokers will engage in this behavior. Price increases will discourage non-smokers from taking up smoking and induce many smokers to quit or reduce consumption. Consequently, there will be reductions in overall consumption and prevalence. Only a certain portion of smokers will not be affected and some of them manage to maintain their levels of tobacco consumption through substitution. Non-price measures, nicotine replacement therapy and other cessation interventions can help curb tobacco use among this group.

▲ **Myth 10: Tax rates for cigarettes are already too high in most countries.**

Reality: The question of the "right" level of tax is a complex one. The size of the tax depends in subtle ways on empirical facts that may not yet be available, such as the scale of the costs

to non-smokers, income levels, and also on varying societal values, such as the extent to which children should be protected. It also depends on what a society hopes to achieve through the tax, such as a specific gain in revenue or a specific reduction in disease burden. For the time being, a useful yardstick may be the tax levels adopted as part of the comprehensive tobacco control policies of a number of countries where cigarette consumption has fallen. In such countries, the tax component of the price of a pack of cigarettes is between two-thirds and four-fifths of the retail cost. Currently, in the high-income countries, taxes average about two-thirds or more of the retail price of a pack of cigarettes. In lower-income countries, taxes amount to not more than half the retail price of a pack of cigarettes, which are still very much below the level in high-income countries.

**Myth 11: *Measures to reduce tobacco supply are effective ways to reduce consumption.***

Reality: While interventions to reduce demand for tobacco are likely to succeed, measures to reduce its supply are less promising. This is because, if one supplier is shut down, an alternative supplier gains an incentive to enter the market. The extreme measure of prohibiting tobacco is unwarranted on economic grounds, unrealistic and likely to fail. Although crop substitution is often proposed as a means to reduce the tobacco supply, there is scarcely any evidence that it reduces consumption, since the incentives to farmers to grow tobacco are currently much greater than for most other crops. However, it may be a useful strategy where needed to aid the poorest tobacco farmers in transition to other livelihoods, as part of a broader diversification program. Similarly, the evidence so far suggests that trade restrictions, such as import bans, will have little impact on cigarette consumption worldwide. Instead, countries are more likely to succeed in curbing tobacco consumption by adopting measures that effectively reduce demand, and applying those measures symmetrically to imported and domestically-produced cigarettes. However, there is one supply-side measure which is key to an effective strategy for tobacco control: action against smuggling. Control of smuggling will improve governments' revenue yields from tobacco tax increases.

**Myth 12: *Tobacco controls will simply compound the poverty of rural economies that are heavily dependent on tobacco farming.***

Reality: The market for tobacco is likely to remain substantial for at least the next several decades and, while any future gradual decline in consumption will clearly cut the number of tobacco-farming jobs, those jobs will be lost over a decade or more, not overnight. Adopting sound agricultural and trade policies can help farmers in poor countries compete fairly for the world market. Governments are justified to prudently help the poorest of tobacco farmers with the adjustment costs of a gradual decrease in demand for their product. Many governments have helped with such adjustment costs for other industries.