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Full Length Research Paper

The effects of tobacco smoking expenditures on household basic needs in urban slums of Yaoundé, Cameroon

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Objectives: To determine the tobacco smoking status and cigarette expenditures among low, middle and high income households and to estimate the effects of tobacco smoking on basic needs across different income groups in urban slums of Yaoundé in Cameroon.
Methods: A cross-sectional survey of 372 households with 1,488 individual's members aged 10-64 years was conducted in twenty urban slums of two health districts in 2009. Cross tabulations and the ordinary least squares regression model were used to assess tobacco smoking status and the effects of tobacco smoking expenditures on basic needs between low, middle and high income smoking households.
Results: In urban slums, the majority (64.5%) of households surveyed were cigarette smoking households. The percentage of either income or expenditures allocates to cigarette smoking was higher (9.8% of income and 10.1% of expenditures) for low income households, following the middle income households (6.4% of income and 7.1 of expenditures) than for the high income households (4.2% of income and 5.8% of expenditures). The trends in cigarette expenditures were reflected in both the quantity of packs of cigarette smoked and the average price per pack paid by different income levels. Cigarette smoking by household's members had an important opportunity cost by restricting the household limited budget available to spend on basic needs (food, water, housing, health care, clothing, electricity, transport, sport and leisure). Increasing cigarette price by raising tobacco tax rates would reduce consumption more among low income households than among high income households.
Conclusion: The actual monthly expenditures on cigarettes against expenditures on basic needs shows that all income groups would significantly improved their livelihood if they do not spend any money on cigarettes. Any country specific tobacco taxation policy aiming to increase the price of cigarettes without any consideration for the changes in households' income, might not be most effective in reducing cigarette smoking across different income groups. Government interventions from outside the health sector – specifically – in social protection, poverty reduction, urban planning and economic regulations have the potential to strengthen tobacco control in Cameroon.

Key words: Tobacco smoking, expenditures, households, basic needs, urban slums, Yaoundé, Cameroon.

INTRODUCTION

Tobacco control has become one of the most important priority interventions for addressing poverty as a critical development issue for Africa. In many African countries, however, tobacco control continues to be seen solely as an issue of health as well as drug addiction, where a combination of factors such as low prevalence rates,

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young and burgeoning populations, growing disposable incomes and aggressive and unscrupulous advertising by multinational tobacco companies threatens to create a massive tobacco-related burden of disease, which will unfortunately add to existing public health challenges (Drope, 2011). The burden of tobacco smoking is increasing in Africa, contributing to poverty and becoming a major barrier to development and achievement of the Millennium Development Goals (MDGs). Tobacco smoking disproportionately affects poor households and individuals who live in settings where policies, legislation, and regulations to tackle tobacco smoking either do not exist or are inadequate.

Cameroon, with a population of about 20 million people, is in the early stages of the tobacco epidemic. Though the prevalence of daily tobacco smoking is relatively low about 4% (8% of men and 1% of women), the prevalence of occasional tobacco smoking is about 18% (28% of all men and 8.1% of all women) and the prevalence of tobacco smoking among young people is about 14%, while the number of people exposed to tobacco smoke evolved from 35.7% in 1994 to about 37% in 2010 (Njoumemi et al., 2011). In 2005, the government of Cameroon ratified the World Health Organization (WHO) Framework Convention on Tobacco Control (FCTC) treaty that sets out a number of measures that aim to reduce the demand for and supply of tobacco. Despite a relatively good per capita income of US$2,290, about 30.4% of the population lives with less than US$2 per day and 40% of households live below the national poverty line (National Institute of Statistics, 2008 - Cameroon consumption and income survey). Even though the tobacco smoking rate is still lower than in other low income countries, the significantly high proportion of poor people coupled with the fact that four out of ten households living below the poverty line may not be able to satisfy their essential basic daily needs, makes any household's tobacco smoking expenditure an important risk factor of poverty. In this perspective, the economic burden caused by cigarette consumption on low income households may be substantial in urban slums of Cameroon.

Many international studies have addressed the harmful effects of tobacco smoking on health and personal welfare (Collins and Lapsey, 1997; Rice et al., 1991). The poor have higher tobacco smoking rates than the rest of the population, but can least afford tobacco products and expenditures on tobacco products represent lost funds that could have been spent on basic needs (Jones and Efroymson, 2011). Tobacco smoking has a short term immediate negative impact on household living standards, by diverting scarce household resources from essential expenditures (Hu et al., 2005). Tobacco smoking takes up a large portion of the household budget of low income households, thus depriving them of money for basic needs such as food, education, health care, housing, clothing, potable water, etc. (Bobak et al., 2000; Efroymson et al., 2001; Jones and Efroymson, 2011; Siahpush et al., 2003; Hu et al., 2005; Xin et al., 2009; John, 2008 ; Wang et al., 2006). While some important knowledge continue to be highlighted internationally on the impact of tobacco smoking expenditure on intra household resource allocation and its link to poverty as a development issue, both significant gaps and lack of data on Africa region remain. More regional and country-specific or locally relevant research in Africa and across low income countries is needed to complement these nascent efforts. It is in this perspective that this paper addresses the following two questions:

What are the prevalence of tobacco smoking and amount of tobacco expenditures across different income levels of households in urban slums of Yaoundé?

Is the direct consumption of tobacco has an opportunity cost by restricting the household budget available to spent on other basic needs (food, water, housing, health care, clothing, electricity, transport, sport and leisure) in urban slums of Yaoundé? In other words, what are the effects of tobacco smoking expenditures on the basic needs of households in urban slums of Yaoundé?

The findings of this paper will provide the theoretical and empirical information that will be contextually relevant, accessible and useable by tobacco control advocates, policymakers and the general public to understand better the trade-off between tobacco smoking expenditures and the satisfaction of basic needs for policy changes in favour of incorporating tobacco control into the development agenda in Cameroon.

METHODS

Data were collected using a combination of quantitative and qualitative tools from a piloted cross-sectional survey of households that was carried out in July - August 2009 in twenty urban slums' townships of two health districts (Cité Verte and Biyam-Assi) of the city of Yaoundé. Both districts had a total population of about 746,832 inhabitants. The survey was carried out by HEREG Stop Tobacco - a tobacco control unit of a research group working in Health Economics Research and Evaluation in Cameroon for advocacy purposes in the implementation of smoke-free workplaces and public spaces project in Yaoundé through the African Tobacco Situational Analysis (ATSA) initiative. The choice of urban slums' townships in both health districts was made on the grounds of the fact that urban slums' townships are often unhealthy places to live in, characterized by heavy tobacco smoking and where people experience increased rates of noncommunicable

diseases, and substance abuse, with the poor typically exposed to the worst socio-economic environments. The survey was approved by the national ethic committee.

The sampling frame consisted of the entire population of urban slums' townships within the two selected health districts. The sampling plan was obtained from the Central Bureau of Population Census and Housing. The sampling strategy involved multistage stratified cluster random sampling. Each urban slum was divided into clusters. These clusters (blocks) consisted of 100–150 households. At the first stage, the clusters were randomly selected proportionate to the population size of the slums from the list of clusters. At the second stage, from each cluster a sample of 15 households was selected using systematic sampling technique. The response rate for the survey was 99.2%. The basic sampling unit was the household, and the total study sample of the survey was 372 households randomly selected with 1488 individual's members aged 10 – 64 years.

The study questions addressed issues related to both the household as a whole and its individual members. Household heads and their members 10–64 years of age (inclusive) who were permanent residents of the urban slums' township in the selected district and who were presents on the days of the survey and were willing to participate in the study were included in the study. Eligible respondents were randomly selected from each household. Names of eligible family members of the household who were present at the time of interview were written on separate piece of papers, folded, put in a basket. After shaking the basket, one paper was drawn out by the interviewer. That person was interviewed through face to face household interviews. The questions captured information on smoking status of all household members aged 10 to 64 years, socio-economic status, household income and expenditures on tobacco and other essential basic needs (food, water, housing, health care, clothing, electricity, transport, sport and leisure).

The questionnaire was piloted and modified as necessary. It was ensured that all questions had face validity; questions were clear, non-ambiguous and fair. The questionnaire was written and administered in French and translated into English, ensuring consistency in phrasing of questions. The survey was carried out in French language.

A group of 15 interviewers (graduate students of both sexes and above the age of 24) were selected and trained for conducting interviews in taking informed consent, administering the questionnaire, and interview procedures. All selected and trained interviewers had prior experience with data collection at a household level. Quality assurance procedures were used to ensure consistency of interviewing and good quality data. Data quality was controlled in the field by supervisors. Verification checks were done on 5% of the sample.

Data was collected through face-to-face in household interviews. Informed consent was obtained from all household heads and their members responding to a structured questionnaire and in-depth interviews before each interview. Respondents did not receive any incentives to participate in the study.

The unit of analysis is the household. All smoking households were classified into three income groups (low, middle and high income) according to the national poverty line definition based on the household equivalent annual income (National Institute of Statistics, 2008 - Cameroon consumption and income survey). Both descriptive and analytical statistics were carried out using Stata 10 software (Stata Corporation). Cross tabulations were used to assess the tobacco smoking status of low, middle and high income households. Statistical analysis involved summarizing data values and examining frequency distributions of all variables.

The regression model looked at the proportion of household income spent on tobacco and its effects on the satisfaction of basic needs. The effect of tobacco expenditures is defined as reduced consumption of basic needs as a result of tobacco smoking within each household. The household expenditure items were classified arbitrarily into eleven broad categories: tobacco, food, water, housing, health care, clothing, electricity, transport, sport-leisure and other. The regression model used all the 240 smoking households about 64.5% of the sample, to estimate the effects of tobacco smoking expenditures on household basic needs in urban slums of Yaoundé. The regression analysis was based on total household monthly expenditures minus cigarettes expenditures. The key explanatory variables include: household income, amount of cigarette expenditure, household size, gender (sex), age, educational level and employment status of the head of the household, and quantity of cigarette smoked. In urban slums, low, middle and high income households may behave differently when income increases, in relation to their spending on basic needs (food, water, housing, health care, clothing, electricity, transport, sport and leisure). The differences in average budget allocated to each expenditure items between low and high income households, low and middle income households, middle and high income households were assessed by an independent Student t test. There is direct association between the amount of household monthly expenditures and the household size; thus both dependent variable expenditures and explanatory income variables were adjusted equivalent weighted household size to analyse household expenditures functions. With regard to the regression model specification, we used the conventional ordinary

least squares (OLS) and linear function form and similar to Hu et al. (2005), let the general regression model specified as follows:

$Yi = \alpha + \beta 1QCS + \beta 2In + \beta 3Age + \beta 4Ed + \beta 5Sex + \beta 6SH + \beta 7ES + \varepsilon i$; Where :

Yi: Per capita total household expenditures minus cigarette expenditures

Per capita food expenditures

Per capita housing expenditures

Per capita clothing expenditures

Per capita educational expenditures

α : Constant terms

QCS: Quantity of cigarettes smoked – number of packs smoked

Sex: Sex or gender head of household - male (= 1) versus female (= 0)

In: Per capita household income

Age: Age of head of household (years)

Ed: Years of education of head of household

SH: Size of household (number of individual)

ES: Employment status of head of household - Employed (= 1) versus Unemployed (= 0)

εi: Error terms

The coefficient for quantity of cigarettes smoked, β1 provides information about the magnitude of the effect of tobacco smoking on household expenditures, holding other variables constant. Sex, age, education, household size, and employment status (employed) are other important variables that could explain the household expenditures pattern.

Regression analysis took into account of the cluster design effect. Variables of interest such as per capita total household expenditures minus cigarette expenditures, per capita food expenditures, per capita housing expenditures, per capita clothing expenditures, per capita educational expenditures, quantity of cigarettes smoked – number of packs smoked, sex or gender head of household, per capita household income, age of head of household (years), years of education of head of household, size of household (number of individual), employment status of head of household, etc. were put in the regression model. Given the likely direct association between the total monthly household expenditures and the household size, both expenditures and income variables were adjusted to analysis household expenditure functions and to find the variables with significant association with monthly tobacco smoking.

Data limitations: one limitation of these data is that they do not compare smoking and non smoking households as well as they do not include households living in rich and well urbanised quarters of the city. Another limitations include, more focus on tobacco smoking particularly cigarette smoking, which thus disregards all smokeless tobacco use; difficulty for some respondents in calculating daily tobacco smoking and tobacco expenditures. In addition, since the household budget allocation to one expenditure category maybe correlated with expenditures on other categories, the error terms in the budget share equations are likely to be correlated, which would lead to increase variance in the estimated coefficients thereby affecting their statistical significance through the likely increase of the SEs.

RESULTS

This paper focuses on household cigarettes smoking and overall household expenditures. Table 1 presents the sociodemographic, economic and cigarette smoking characteristics of households in urban slums of Yaoundé. Overall, about 64.5% of households surveyed were cigarette smoking households (with at least one current smoker among individual members). Amongst cigarette smoking households, almost 99.2% (238 out of 240 of cigarette smoking households) actually smoked mainly Western cigarette brands. About three out of four heads of households were male and a large proportion of smoking households was found among households headed by male. Thus, households headed by male were more likely to have smoker(s) than household headed by female. The majority of the heads of households attended the primary education followed by the secondary education. The smoking characteristics of households in relation to education showed that where the heads were illiterate or had only attended primary school were more like to have smoker(s) within the household. A large proportion of the heads of households was between 30-49 years. A large majority of households with smokers were headed by people aged 30 – 49 years. The majority of heads of households were self-employed in either the informal or formal sector. An important proportion of heads of households were unemployed. A large majority of smoking households were found among those headed by unemployed people following by households where the heads were self-employed. The majority of households had a size of 3-6 persons and the high proportion smoking households were found among households with a large size. Thus, large size households and where the head is unemployed are more likely to have many smokers in urban slums.

The overall mean monthly household income in urban slums was 474,158 CFA Francs (or 948.32$US). Since this paper focuses on the effects of tobacco smoking on household expenditures on other basic needs in urban slums, three income levels were specified. In Cameroon, the definition of income poverty criteria for urban population is based on the income levels needed to provide basic needs. The low income poverty criteria in urban areas of Yaoundé is defined as monthly per capita income less than or equal to 29,848 CFA Francs (or ≤ 995 CFA Francs per day or ≤ 2$US per day). We

further define the middle income near poverty as 300% of the poverty level definition (> 29,848 CFA Francs and ≤ 89,544 CFA Francs). The high income non-poor household is defined as monthly per capita income more than 89,544 CFA Francs. In the study sample, about two out of three households (66.9%) were low income according to the poverty definition. About 22.9% of households surveyed met the definition for middle income. The majority (73.9%) of low income households were smoking following by the middle income smoking households (49.4%) as compared to high income smoking households (36.8%).

The household expenditures on basic needs include food, cooking and drinking water, housing, education, health care, clothing, electricity, transport, sport and leisure, and other items. The consumption of tobacco products particularly cigarette smoking is not considered an essential basic need within the household consumption category. However, it is the focus of this paper. Table 2 presents household monthly income, expenditures patterns for all major basic needs and cigarette smoking status by income levels. (Table 1)

Data in table 2 show that in urban slums, the cigarette expenditures patterns followed the trends of income level. The low income households spent fewer amounts of their moneys on cigarettes, following by the middle income households, than the high income households. Inversely, the percentage of either income or expenditures allocates to cigarette smoking was higher (9.8% of income and 10.1% of expenditures) for low income households, following the middle income households (6.4% of income and 7.1 of expenditures) than for the high income households (4.2% of income and 5.8% of expenditures). The trends in the cigarette expenditures were reflected in both the quantity of packs of cigarette smoking and the average price per pack paid by different income levels. The monthly average quantity of cigarettes smoked was lower for the low income households (39.9 packs) following by the middle income households (75.3 packs) than for the high income households (87.1 packs). The average prices paid per pack ranged from 588 CFA Francs for low income households, 614 CFA Francs for middle income households and 696 CFA Francs for high income households. The differences in average prices per pack paid seem to be reflecting the cigarette brands smoked by different income households. The average price per pack varied substantially across different cigarette brands. For example, the Classic International brand was the cheapest cigarette than the St Moritz and the Benson brands which were individually the most expensive cigarettes for all income households. The lowest prices paid were 261 CFA Francs for a pack of classic international and the highest prices paid were respectively 989 CFA Francs for a pack of St Moritz and 990 CFA Francs for a pack of Benson. The low income households were more likely to smoke mainly the cheapest cigarette brands while the high income households smoked the more expensive brands such as Benson and St Moritz.

The findings of table 2 point out that in urban slums of Yaoundé, the high income households spent more on cigarettes, 1.3 times than the middle income households and 2.6 times than the low income households. The middle income households spent more (about 2 times) on cigarettes than low income households. These trends in the differences of cigarettes expenditures across different income levels can be largely explained by the quantity of cigarette smoked, the cigarette brands preferably smoked including more expensive imported ones, with the average prices paid per pack for the same brand showing less variation across different income households. (Table 2)

Graph 1 highlights the differences in the proportion of household both total income and expenditures allocates to cigarettes smoking across the different income levels. In urban slums of Yaoundé, cigarette expenditures represented a much larger percentage of total monthly income or expenditures for the low income households as compared to middle and high income households. As shown in Graph 1, there were significant differences in the percentage of household income spent on cigarettes between low households and middle income households and high income households. Meanwhile, the smoking households allocated a slightly important proportion of their total expenditures to cigarette consumption. In average, Cigarette expenditures represent a much larger percentage of average expenditures for the low income households as compared to both middle and high income households. Although similar findings have been found in other low income countries where the low income households are known to spend a higher share of their budget on tobacco than the high income households (John et al., 2012; De Beyer et al., 2001; John 2008). These findings imply that in urban slums, cigarettes are a normal good, with cigarette expenditures decrease as a percentage of household total expenditures as income rises. These patterns were consistent across different income levels if one considers either the percentage of total household income or the percentage of total household expenditures spent on cigarette smoking.(Graph1)

Table 3 provides a picture of how household expenditures are distributed and how much of spending goes to cigarettes rather than to basic needs (food, water, housing, health care, clothing, electricity, transport, sport and leisure) that would benefit the entire household. This finding suggests that low income households can afford more basic needs if they spent less or nothing on cigarettes. The actual monthly expenditures on cigarettes against expenditures on basic needs shows that all income groups would be

Table1: Sociodemographic, economic and cigarette smoking characteristics of households in urban slums of Yaoundé

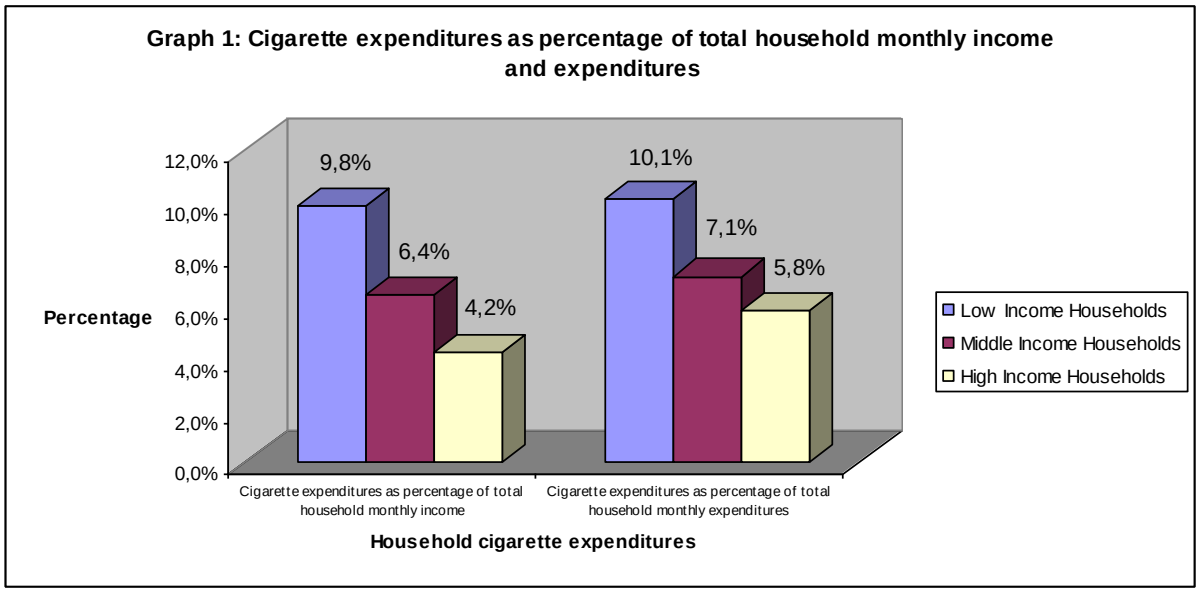
Socioeconomics indicators	Households (n = 372)	Household tobacco smoking status	
		Smoking household (with one current smoker or more)	Non-smoking household (without one current smoker)
Sex head of household (%)			
• Male	74,2	68,1	31,9
• Female	25,8	54,2	45,8
Education head of household (%)			
• Illiterate	14,0	88,5	11,5
• Primary	52,2	71,1	28,5
• Secondary	22,8	52,9	47,1
• High	11,0	26,8	73,2
Age head of household (%)			
• Less than 30 years	8,3	48,4	51,6
• 30 – 39 years	34,7	69,5	30,5
• 40 – 49 years	39,2	69,2	30,8
• 50 – 59 years	11,8	47,7	52,3
• 60 and above	6,2	60,9	39,1
Employment status head h. (%)			
• Unemployed	17,2	96,9	3,1
• Self-employed informal sector	30,4	62,8	37,2
• Self-employed formal sector	31,7	57,6	42,4
• Employed private sector	4,3	43,8	56,2
• Civil servant	13,7	49,0	51,0
• Retired	2,7	70,0	30,0
Size of household (%)			
• Less than 3 persons	23,7	59,1	40,9
• 3 – 6 persons	59,1	63,6	36,4
• 7 – 9 persons	14,5	74,1	25,9
• 10 and above	2,7	80,0	20,0
Mean household monthly income	474,158	-	-
Income level (%)			
• Low (Poor)	66,9	73,9	26,1
• Middle (Near-Poor)	22,9	49,4	50,6
• High (Non-Poor)	10,2	36,8	63,2
All households (%)	100	64,5	35,5

Low Income/Poor Household: Annual income per capita ≤ 358,176 CFA Francs (or ≤ 29,848 per month or ≤ 995 per day or ≤ 2$US per day);
Middle Income/Near-Poor Household: Annual income per capita > 358,176 and ≤ 1,074,528 CFA Francs (or > 29,848 and ≤ 89,544 per month or > 995 and ≤ 2,984.8 per day or > 2$US and ≤ 5.97$US per day)
High Income/Non Poor Household: Annual income per capita > 1,074,528 CFA Francs (or > 89,544 per month or > 2,984.8 per day or > 5,97$US per day.
1$US = 500 CFA Francs

significantly improved their livelihood if they do not spend any money on cigarettes. The findings of table 3 show that tobacco expenditures in households with smokers represented, on average of monthly food's expenses almost one-third in low income groups, about one-fifth in middle income and approximately one-seventh in high income households. The tobacco expenditures as compare to the average monthly cooking and drinking water's expenses represented, 2.4 times for low income households, about 2.2 times for middle income groups and almost 1.6 times for high income households. The tobacco expenditures as compare to the average monthly housing's expenses represented, slightly more than one-third in low income groups, one-fourth in middle income groups and about one-fifth in high income households. The tobacco expenditures as compare to the average monthly education's expenses represented, about 2.3 times for low income households, almost 1.2 times for middle income groups and about 0.9 times for high income

Table 2: Household monthly income expenditure patterns and tobacco smoking, 2009

	Household 's income level		
	Low / Poor (n = 248)	Middle / Near-Poor (n = 86)	High / Non-Poor (n = 38)
Income (CFA Franc XOF):			
Average monthly income	239,687	721,955	1,443,587
Tobacco smoking information:			
Cigarette expenditures (CFA Franc)	23,489	46,205	60,631
Percentage income on cigarettes (%)	9.8%	6.4%	4.2%
Cigarette smoking (no of packs)	39.9	75.3	87.1
Mean price per pack all brands (CFA Franc)	588	614	696
Aspen	498	502	505
Benson	978	988	990
Classic International	259	261	265
Gold Seal	320	308	315
L & B	505	510	502
St Moritz	975	982	989
Super King	350	354	349
Other brands	299	301	304
Total expenditures (CFA franc):			
Total expenditures	231,801	646,872	1,045,163
Cigarettes (%)	10.1	7.1	5.8
Food (%)	34.0	36.2	37.4
Drinking Water (%)	4.2	3.2	3.7
Housing (%)	27.3	29.4	28.4
Education (%)	4.3	6.1	6.6
Health care (%)	5.1	5.6	5.4
Clothing (%)	4.4	3.2	3.2
Electricity (%)	3.6	3.1	3.3
Transport (%)	2.1	1.9	2.4
Sport and leisure (%)	1.6	1.8	2.1
Other (%)	3.3	2.4	1.7



families. The tobacco expenditures as compare to the average monthly health care's expenses represented, almost 2 times for low income groups, 1.3 times for middle income groups and 1.1 times for high income

Table 3: Cigarette expenditures as % of expenditures on other household basic needs in urban slums of Yaoundé

Income	Tobacco /Total expenditures	Tobacco / Food	Tobacco / Drinking Water	Tobacco / Housing	Tobacco / Education	Tobacco / Health Care	Tobacco / Clothing	Tobacco / Electricity	Tobacco / Transport	Tobacco / Sport and leisure
Household Income Level:										
Low/Poor	10.1	29.7	240.5	37.0	234.9	198.0	229.5	280.6	480.9	631.3
Middle/Near Poor	7.1	19.6	221.9	24.1	116.4	126.8	221.9	229.0	373.7	494.4
High/Non Poor	5.8	14.8	155.1	20.4	87.9	107.4	181.3	175.8	241.7	276.2

Table 4: Effects of cigarette smoking on household expenditure patterns

	Total expenditures (minus tobacco)	Food	Drinking Water	Housing	Education	Health Care	Clothing	Electricity	Transport	Sport and leisure
Sex	-48.62*	-34.91*	-6.08*	-29.33*	-5.11*	-4.74*	-4.89	-5.45	-4.38	-5.18*
Age	-1.31*	-0.05*	-0.28	-0.08*	0.44*	-0.54	-0.52	-0.62	-0.46*	-0.58
Education	36.23*	24.62	6.75*	21.19	7.57	5.81*	4.45	5.06*	7.39*	4.58*
Employment status	0.18*	0.02*	0.01*	0.03*	0.01*	0.02*	0.04*	0.03*	0.01*	0.00
Household size	-44.09*	-21.37*	-9.69*	-27.14*	-16.72*	-13.64*	-10.11*	-8.29*	-8.55*	-9.82*
Income per capita	0.08*	0.04*	0.02*	0.06*	0.03*	0.01*	0.02*	0.04*	0.09*	0.07*
# cigarettes smoke	-3.39*	-0.55*	-0.41*	-0.51*	-0.24*	-0.39*	-0.29*	-0.17	-0.21	-0.15*
Constant	324.69*	102.58*	-74.36	91.44*	62.18*	60.51*	59.67*	54.82	55.72	57.92
Adjusted R^2	0.5136	0.4751	0.4085	0.4955	0.3357	0.3589	0.3867	0.1641	0.1562	0.1476
* Indicates coefficient is significant at p<0.01, two tailed test										

households. The tobacco expenditures as compare to the average monthly clothing's expenses represented, about 2.3 times for low income households, 2.2 times for middle income households and 1.8 times for high income groups. The tobacco expenditures as compare to the average monthly electricity's expenses represented, 2.8 times for low income groups, about 2.3 times for middle income households and 1.8 times for high income groups. The tobacco expenditures as compare to the average monthly transport's expenses represented, 4.8 times for low income households, about 3.7 times for middle income groups and 2.4 times for high income households. The tobacco expenditures as compare to the average monthly sport and leisure's expenses represented, 6.3 times for low income groups, 4.9 times for middle income households and almost 2.8 times for high income households. These findings highlight that in low income smoking households, the amount of limited financial resources spent on tobacco was more than double the amount spent on cooking and drinking water, education, health care, clothing, electricity, transport and sport and leisure. Both middle and high income households could also largely increase their spending on basic needs if they reduced their expenditures on tobacco. The economic burden of cigarette smoking on households was substantial in urban slums of Yaoundé. Data in table 3 point out that when a household member smoked cigarette, there was less money available for basic needs (food, water, housing, health care, clothing, electricity, transport, sport and leisure). Thus, in low income settings of Cameroon, the direct consumption of cigarette by household's members had an important opportunity cost by restricting the household limited budget available to spend on many basic goods and services. These findings are consistent with previous studies in other low income countries (Jones and Efroymson, 2011; John et al., 2012).(Table 3)

Table 5: Student t test for the difference in household expenditures across different income groups

Expenditures items	Low versus High income smoking households				Low versus middle income smoking households				Middle versus high income smoking households			
	Low Income Households	High Income Households	Difference	**t stat**	Low Income Households	Middle Income Households	Difference	**t stat**	Middle Income Households	High Income Households	Difference	**t stat**
Cigarettes	10.1	5.8	-4.3	**-8.4***	10.1	7.1	-3.0	**-7.2*****	7.1	5.8	-1.3	**-5.1***
Food	34.0	37.4	3.4	**6.7****	34.0	36.2	2.2	**5.3**	36.2	37.4	1.2	**1.6****
Water	4.2	3.7	-0.5	**-2.3*****	4.2	3.2	-1.0	**-3.1**	3.2	3.7	0.5	**2.2****
Housing	27.3	28.4	1.1	**2.6***	27.3	29.4	2.1	**6.3*****	29.4	28.4	-1.0	**-1.8***
Education	4.3	6.6	2.3	**4.8***	4.3	6.1	1.8	**2.7*****	6.1	6.6	0.5	**3.4****
Health Care	5.1	5.4	0.3	**1.9****	5.1	5.6	0.5	**1.3****	5.6	5.4	-0.2	**-2.7****
Clothing	4.4	3.2	-1.2	**-3.2****	4.4	3.2	-1.2	**-1.7**	3.2	3.2	0.0	**0.1**
Electricity	3.6	3.3	-0.3	**-2.1***	3.6	3.1	-0.5	**-2.2**	3.1	3.3	0.2	**1.4**
Transport	2.1	2.4	0.3	**2.0****	2.1	1.9	-0.2	**-1.8**	1.9	2.4	0.5	**2.5****
Sport Leisure	1.6	2.1	0.5	**0.4***	1.6	1.8	0.2	**2.9**	1.8	2.1	0.3	**1.2***
Other	3.3	1.7	-1.6	**-1.5****	3.3	2.4	-0.9	**-3.2****	2.4	1.7	-0.7	**-2.6****

Shares and differences are in percentages
* Indicates statistical significance at the 1% level; ** Indicates statistical significance at the 5% level; *** Indicates statistical significance at the 10% level

Data in table 4 indicate that on average, each additional pack of cigarettes per month would reduce other household expenditures by 3.39 CFA Francs per capita per month. The effect can be separately estimated for each major category of expenditures: each pack of cigarettes reduced expenditures by 0.55 CFA Francs per capita per month on food, 0.41 Franc per capita per month on drinking water, 0.51 Franc per capita per month on housing, 0.24 Franc per capita per month on education, 0.39 Franc per capita per month on health care, 0.29 Franc per capita per month on clothing, 0.17 Franc per capita per month on electricity, 0.24 Franc per capita per month on transport, and 0.15 Franc per capita per month on sport and leisure. While controlling for the variables included in the regression and despite the relative small coefficients, the actual effect of tobacco smoking was quite considerable across different income levels. A low income household that bought 40 packs per month would spend 22 Francs per capita less on food, 16.4 Francs per capita less on drinking water, 20.4 Francs per capita less on housing, 9.6 Francs per capita less on education, 15.6 Francs per capita less on health care, 11.6 Francs per capita less on clothing, 6.8 Francs per capita less on electricity, 9.6 Francs per capita less on transport, and 6 Francs per capita less on sport and leisure. A middle income household that bought 75 packs per month would spend 41.25 Francs per capita less on food, 30.75 Francs per capita less on drinking water, 38.25 Francs per capita less on housing, 18 Francs per capita less on education, 29.25 Francs per capita less on health care, 21.75 Francs per capita less on clothing, 12.75 Francs per capita less on electricity, 18 Francs per capita less on transport, and 11.25 Francs per capita less on sport and leisure. A high income household that bought 87 packs per month would spend 47.85 Francs per capita less on food, 35.67 Francs per capita less on drinking water, 44.37 Francs per capita

less on housing, 20.88 Francs per capita less on education, 33.93 Francs per capita less on health care, 25.23 Francs per capita less on clothing, 14.79 Francs per capita less on electricity, 20.88 Francs per capita less on transport, and 13.05 Francs per capita less on sport and leisure. All these coefficients are significant at less than 1% level, two tailed test. The larger households had lower per capita household expenditures, after controlling for per capita income, reflecting scale economies in the household.(Table 4)

Data in Table 5 provide the results of the Student t test for the differences in households' budget allocation among three categories of income groups (low, middle and high). The null hypothesis was that the differences between these three income groups of households were zero. Comparing differences in percentage levels for the three sets of income levels, the gap between the high and low income households was about 4.3 for expenditure on cigarettes, and significant at a percentage point. This indicates that poor households heads, plagued with socioeconomic difficulties, tend to spend more on purchasing cigarettes, believing it's a means of easing pressure. This relatively large spending on cigarettes adversely affects the procurement of food as made explicit by the positive value of the difference in food expenditure, education, health care and leisure. These requirements constitute the fundamentals of human capital acquisition and optimisation. Therefore, poor household will tend to stay in abject poverty because smoking habits dent the possibility of moving of out the current poverty levels.

The above tendency is mirrored when analysing the differences in expenditure between middle and low income households. This over-the-arc trend demur that between the high and low, as well as middle and low income households differences in expenditure patterns may tend to have the same effects.(table5)

DISCUSSIONS

The study results point out that tobacco smoking prevalence was higher among male-headed than female-headed households (68.1% and 54.2% respectively); higher among households headed by people with low levels of education than those with higher education levels (88.5% for illiterate, 71.1% for primary education, 52.9% for secondary education and 26.8% for high education); higher among low income households than for both middle and high income households (73.9%, 49.4% and 36.8% respectively); higher among households headed by people aged 30-39 years and 40-49 years than those aged 60 years and above, less than 30 years and 50-59 years (69.5%, 69.2%, 60.9%, 48.4% and 47.7% respectively); higher among households headed by unemployed and retired people than those headed by employed people (96.9% for unemployed, 70% for retired, 62.8% for informal self-employed, 57.6% for formal self-employed, 49% for civil servant, and 43.8% for private sector employed); and higher among larger size households than small size households (80.1% for households with 10 or more persons, 74.1% for 7-9 persons, 63.6% for 3-6 persons, and 59.1% for households with less than 3 persons). While these findings highlight the initial explorations of the socioeconomic implication of tobacco smoking in Cameroon, there are consistent with those of previous studies that smoking rates are likely to be higher in low socioeconomic status households than in both middle and high socioeconomic status households (Efroymson et al., 2001; John et al., 2012). While this is also in line with the Peru study's finding that those who earn the least smoke the most, with rates of smoking being directly inverse to income, it contrast with the Mexico study's finding that smoking prevalence within the lowest socioeconomic groups is lower than it is among the higher income groups (Jones and Efroymson, 2011).

With regard to quantity and prices of cigarettes smoked across different income levels, while the low income households smoked lesser quantity of cigarettes than middle and high income households, they (low income households) bought much lower priced cigarette brands than middle and high income households in urban slums of Yaoundé. However, cigarette expenditures represented a much larger percentage (10.1%) of monthly income for the low income households as compared to middle and high income households (7.1% and 5.8% respectively). This finding is consistent with the international literature that given their relatively low income, households under the poverty level allocated a higher percentage of their income for cigarettes than did non-poor households (Hu et al., 2005; Jones and Efroymson, 2011; John et al., 2012; Ross et al., 2012). The analysis highlights that there is a considerable reduction in spending on major basic needs in smoking households. All income groups of smoking households spent a larger proportion of their income on cigarettes than on drinking water, education, health care, clothing, electricity, transport, sport and leisure. However, the ratios of cigarette expenditures to respective basic needs (food, water, housing, health care, clothing, electricity, transport, sport and leisure) among the low income households were higher than they were among the middle and high income households. This implies that low income as well as middle income households would be significantly better off if they decided to shift their cigarette expenses to food, water, housing, health care, clothing, electricity, transport, sport and leisure. This is in line with the previous finding that if low income smoking households stopped buying cigarettes and spent the money on other goods instead, households could improve their overall standard of living (Hu et al., 2005; Jones and

Efroymson, 2011).

In this challenging perspective of tobacco control in Cameroon, what policy measures can be used to let smoking households reduce their demand of tobacco by stopping buying cigarettes and switching their cigarette expenditures to basic needs? The international literature argues that low income smokers would be more sensitive to any increase in prices of tobacco products meaning the price elasticity of demand of cigarettes would be significantly high among low income groups than in high income groups. Thus, taxation and pricing of tobacco products constitute the important tobacco control policy measures for stopping smoking households from buying more cigarettes and switching the significant proportion of their limited income to basic needs. Article 6 of the FCTC encourages the Parties to increase the tax on cigarettes, which would increase their retail prices, make cigarettes less affordable and thus discourage consumption. Thus, pricing and taxation policies that aim to increase the retail price by increasing the excise tax on cigarettes in order to reduce cigarette consumption is undisputed and the excise tax on tobacco products is considered as an effective tobacco control measure (WHO, 2010).

The World Bank recommends that excise and sales taxes combined should comprise between 67% and 80% of the retail price of cigarettes (Jha and Chaloupka 1999), while the WHO recommends that excise taxes should account for at least 70% of the retail price of cigarettes (WHO, 2010). However, Cameroon remains among African countries where tobacco taxes and prices are kept low since the excise tax represents only about 25% of the total price of a pack of 20 sticks of cigarettes. Comparatively while the tax represents more than 50% of the total price paid by smokers in some African countries such as Ethiopia, Madagascar and Burundi, it represents more than 75% of cigarette's retailed prices in Mauritius and Seychelles (WHO, 2010; WHO, 2011). The international evidence point out that low taxes and prices are in fact regressive as they increase the affordability of tobacco products as well as expenditures on tobacco across all income groups of households and particularly the low income ones (Ross et al., 2012; WHO, 2011). This analysis shows that in urban slums of Yaoundé in Cameroon, low taxes and prices of cigarettes meant that less money was available at the household level for food, drinking water, housing, health care, clothing, electricity, transport, sport and leisure. This is in line with the finding that by keeping tobacco taxes and prices low, and thereby making tobacco products more affordable, governments increase the likelihood that low income households struggling to meet their daily expenses on basic needs will be further hampered by tobacco expenditures which 'burn away' valuable resources (Jones and Efroymson, 2011).

However, high tobacco taxes by increasing prices are deterrent to tobacco consumption. Previous studies (Chaloupka et al., 2000; Hu, 1997; Hu et al., 2005; Sunley et al., 2000) pointed out that four factors would affect the tax impact: (i) cigarette prices paid by people with different income levels; (ii) amount of cigarette consumption at different income levels; (iii) their respective price elasticity of demand of cigarette; and (iv) the type of tax imposed on cigarette consumption. This analysis shows that low income smoking households consumed inexpensive cigarette brands while high income smoking households used expensive premium-brand cigarettes. Thus, low income smoking households paid less per pack and smoke less quantity of cigarettes than higher income smoking households in urban slums of Yaoundé in Cameroon. The international literature points out that the price elasticity estimates resulted from cross-sectional data in low and middle income countries (LMICs) fall in the inelastic range somewhat wider between -0.2 and -0.8 (Ross et al., 2012; WHO, 2010). A recent cross-sectional study indicates that in average the price elasticity of cigarettes is -0.57, while this price elasticity is different in relation to cigarette brands with the higher price elasticity (-0.52) found for inexpensive brands of cigarettes as compared to the lower price elasticity (-0.06) for expensive premium-brand cigarettes while the regular smokers are less sensitive to price increase with -0.48 of price elasticity than occasional smokers with -0.62 of price elasticity (Ndekouong et al., 2012 – final report to IDRC on the taxation of tobacco products in Cameroon). These price elasticity estimates show that in Cameroon, the price elasticity of cigarette demand is relatively inelastic meaning that an increase in the retail price by increasing the tax on cigarettes would decrease less significantly the cigarette consumption. Indeed, increasing the price of tobacco products through higher taxes would reduce much significantly the consumption of cigarettes for low income households than for high income households thereby making cigarettes less affordable among low income households. However, in order to be most effective given the larger differences in price elasticities across brands, tax rates on higher-priced premium-brand cigarettes should be significantly higher than those on inexpensive brands of cigarettes. Meanwhile, the likelihood of the effects of increased taxation would also depend on the number of either regular or occasional smokers within each household income levels. The substantial effects would occur among households with many occasional smokers who are more likely to reduce their consumption of cigarettes or simply quit as a result to effective increase in prices.

Cameroon has a relatively complicated tax structure for tobacco products. The overall tax structure includes: 25% of specific excise tax, 30% of duty tax and 19.25% of ad valorem tax (Njoumemi et al. 2009: report of ATSA stakeholders workshop to IDRC). This tax structure applied to tobacco products in Cameroon

provides an evidence-base for ample room to increase. Previous studies suggest that if the tax is a fixed percentage of cigarette prices, as with an ad valorem tax, instead of a specific like excise tax, which is a fixed amount on each pack regardless of its price, then the additional tax burden from tax increase on low income households, would be lower (Hu et al. 2005). Let use data from table 2 to illustrate as an example, a 100 Francs specific excise tax increase per pack would become a 17% (100/588 Francs) per pack price increase for low income households, and 16.3% (100/614 Francs) price increase for middle income households, and a 14.4% (100/696 Francs) increase for high income households. Based on 25% initial excise tax per pack of cigarettes, these 100 francs specific excise tax increase would change the structures of excise tax share in final consumer price across income levels: 42% excise tax on 688 Francs per pack for low income households, 41.3% excise tax on 714 Francs per pack for middle income households, and 39.4% excise tax on 796 Francs per pack for high income households. However, the change in quantity of packs consumed among households would be function of the level of price elasticity, given that this price elasticity itself may vary according to cigarette's brands and their affordability by different income groups. This analysis makes a number of assumptions in relation to price elasticity across different income groups of households.

Firstly, if these households have the same average price elasticity of -0.57, then a 100 Francs (17%) excise tax increase would result to 9.7% reduction in consumption of cigarettes for low income households, 9.3% reduction in consumption of cigarettes for middle income households, and 8.2% reduction in consumption of cigarettes for high income households. This would imply that in average, a low income household that usually bought 39.9 packs of cigarettes per month at 588 Francs per pack, or 23,461.2 Francs, when faced with a 17% price increase, would buy 36 packs per month at 688 Francs, and spend a slightly higher total of 24,768 Francs per month after the tax increase. In average, a middle income household that usually bought 75.3 packs of cigarettes per month at 614 Francs per pack, or 46,234.2 Francs, when faced with a 16.3% price increase, would buy 68.3 packs per month at 714 Francs, and spend a slightly higher total of 48,766.2 Francs per month after the tax increase. In average, a high income household that bought 87.1 packs per month at 696 Francs, spending a total of 60,621.6 Francs, would buy 80 packs per month at 796 Francs, and spend a slightly higher total of 63,680 Francs per month after the tax increase.

Secondly, if these households have different price elasticities of cigarettes: -0.52 for both low and middle income households who smoke mainly inexpensive brands and -0.06 for high income households who smoke mainly the expensive premium-brand cigarettes respectively, the likelihood of reduction in the quantity of cigarettes consumed would significantly be different across income levels. A 100 Francs (17%) excise tax increase would result to 8.9% reduction in consumption of cigarettes for low income households, 8.5% reduction in consumption of cigarettes for middle income households, and 0.9% reduction in consumption of cigarettes for high income households. This would imply that in average, a low income household that usually bought 39.9 packs of cigarettes per month at 588 Francs per pack, or 23,461.2 Francs, when faced with a 17% price increase, would buy 36.3 packs per month at 688 Francs, and spend a slightly higher total of 24,974.4 Francs per month after the tax increase. In average, a middle low income household that usually bought 75.3 packs of cigarettes per month at 614 Francs per pack, or 46,234.2 Francs, when faced with a 16.3% price increase, would buy 68.9 packs per month at 714 Francs, and spend a slightly higher total of 49,194.6 Francs per month after the tax increase. In average, a high income household that bought 87.1 packs per month at 696 Francs, spending a total of 60,621.6 Francs, when faced with a 14.4% price increase, would buy 87 packs per month at 714 Francs, and spend a slightly higher total of 62,118 Francs per month after the tax increase.

Thirdly, if these households are regular smoking households with the average same price elasticity of -0.48, then a 100 Francs (17%) excise tax increase would result to 8.2% reduction in consumption of cigarettes for low income households, 7.8% reduction in consumption of cigarettes for middle income households, and 6.9% reduction in consumption of cigarettes for high income households. This would imply that in average, a low income household that usually bought 39.9 packs of cigarettes per month at 588 Francs per pack, or 23,461.2 Francs, when faced with a 17% price increase, would buy 36.6 packs per month at 688 Francs, and spend a slightly higher total of 25,180.8 Francs per month after the tax increase. In average, a middle income household that usually bought 75.3 packs of cigarettes per month at 614 Francs per pack, or 46,234.2 Francs, when faced with a 16.3% price increase, would buy 69.4 packs per month at 714 Francs, and spend a slightly higher total of 49,955.6 Francs per month after the tax increase. In average, a high income household that bought 87.1 packs per month at 696 Francs, spending a total of 60,621.6 Francs, would buy 81.1 packs per month at 796 Francs, and spend a slightly higher total of 64,555.6 Francs per month after the tax increase.

Fourthly, if these households are occasional smoking households with the average same price elasticity of -0.62, then a 100 Francs (17%) excise tax increase would result to 10.5% reduction in consumption of cigarettes for low income households, 10.1% reduction in consumption of cigarettes for middle income

households, and 8.9% reduction in consumption of cigarettes for high income households. This would imply that in average, a low income household that usually bought 39.9 packs of cigarettes per month at 588 Francs per pack, or 23,461.2 Francs, when faced with a 17% price increase, would buy 35.7 packs per month at 688 Francs, and spend a slightly higher total of 24,564.6 Francs per month after the tax increase. In average, a middle income household that usually bought 75.3 packs of cigarettes per month at 614 Francs per pack, or 46,234.2 Francs, when faced with a 16.3% price increase, would buy 67.7 packs per month at 714 Francs, and spend a slightly higher total of 48,337.8 Francs per month after the tax increase. In average, a high income household that bought 87.1 packs per month at 696 Francs, spending a total of 60,621.6 Francs, would buy 79.3 packs per month at 796 Francs, and spend a slightly higher total of 63,122.8 Francs per month after the tax increase.

This analysis also looks to the effect of an increase of an ad valorem tax based on the average price per pack of cigarettes paid by different income groups. By using data from table 2, the effect of 25% increase of an ad valorem tax in the average price per pack, would be that low income smoking households would pay 147 Francs more per pack, middle income smoking household would pay 154 Francs more per pack, and high income smoking households would pay an additional 174 Francs more per pack. The reduction in cigarette consumption would depend on price elasticities of different income groups of households.

Assuming that these households have the same average price elasticity of -0.57, then an across the board 25% related ad valorem of price increase would result to the same 14.3% reduction in consumption of cigarettes across low, middle and high income households. This would imply that in average, a low income household that usually bought 39.9 packs of cigarettes per month at 588 Francs per pack, or 23,461.2 Francs, when faced with a 25% price increase, would buy 34.2 packs per month at 735 Francs, and spend a slightly higher total of 25,137 Francs per month after an ad valorem tax increase. In average, a middle income household that usually bought 75.3 packs of cigarettes per month at 614 Francs per pack, or 46,234.2 Francs, when faced with a 25% price increase, would buy 64.5 packs per month at 848 Francs, and spend a slightly higher total of 54,696 Francs per month after an ad valorem tax increase. In average, a high income household that bought 87.1 packs per month at 696 Francs, spending a total of 60,621.6 Francs, would buy 74.7 packs per month at 870 Francs, and spend a slightly higher total of 64,989 Francs per month after an ad valorem tax increase.

If these households have different price elasticities of cigarettes: -0.52 for both low and middle income households who smoke mainly inexpensive brands and -0.06 for high income households who smoke mainly the expensive premium-brand cigarettes respectively, the likelihood of reduction in the quantity of cigarettes consumed would significantly be different across income levels. An across the board 25% related ad valorem of price increase would result to 13% reduction in consumption of cigarettes for both low and middle income households, and 1.6% reduction in consumption of cigarettes for high income households. This would imply that in average, a low income household that usually bought 39.9 packs of cigarettes per month at 588 Francs per pack, or 23,461.2 Francs, when faced with a 25% price increase, would buy 34.7 packs per month at 735 Francs, and spend a slightly higher total of 25,504.5 Francs per month after an ad valorem tax increase. In average, a middle low income household that usually bought 75.3 packs of cigarettes per month at 614 Francs per pack, or 46,234.2 Francs, when faced with a 25% price increase, would buy 65.5 packs per month at 768 Francs, and spend a slightly higher total of 50,304 Francs per month after an ad valorem tax increase. In average, a high income household that bought 87.1 packs per month at 696 Francs, spending a total of 60,621.6 Francs, when faced with a 25% price increase, would buy 85.8 packs per month at 870 Francs, and spend a slightly higher total of 74,646 Francs per month after an ad valorem tax increase.

If these households are regular smoking households with the same average price elasticity of -0.48, then an across the board 25% related ad valorem of price increase would result to the same 12% reduction in consumption of cigarettes across low, middle and high income households. This would imply that in average, a low income household that usually bought 39.9 packs of cigarettes per month at 588 Francs per pack, or 23,461.2 Francs, when faced with a 25% price increase, would buy 35.1 packs per month at 735 Francs, and spend a slightly higher total of 25,798.5 Francs per month after an ad valorem tax increase. In average, a middle income household that usually bought 75.3 packs of cigarettes per month at 614 Francs per pack, or 46,234.2 Francs, when faced with a 25% price increase, would buy 66.2 packs per month at 768 Francs, and spend a slightly higher total of 50,841.6 Francs per month after an ad valorem tax increase. In average, a high income household that bought 87.1 packs per month at 696 Francs, spending a total of 60,621.6 Francs, would buy 76.6 packs per month at 870 Francs, and spend a slightly higher total of 66,642 Francs per month after an ad valorem tax increase.

If these households are occasional smoking households with the average same price elasticity of -0.62, then across the board 25% related ad valorem of price increase would result to the same 15.5% reduction in consumption of cigarettes across low, middle and high income households. This would imply that in average, a low income household that usually bought

39.9 packs of cigarettes per month at 588 Francs per pack, or 23,461.2 Francs, when faced with a 25% price increase, would buy 33.7 packs per month at 735 Francs, and spend a slightly higher total of 24,769.5 Francs per month after an ad valorem tax increase.

In average, a middle income household that usually bought 75.3 packs of cigarettes per month at 614 Francs per pack, or 46,234.2 Francs, when faced with a 25% price increase, would buy 63.6 packs per month at 768 Francs, and spend a slightly higher total of 48,844.8 Francs per month after an ad valorem tax increase. In average, a high income household that bought 87.1 packs per month at 696 Francs, spending a total of 60,621.6 Francs, would buy 73.6 packs per month at 870 Francs, and spend a slightly higher total of 64,032 Francs per month after an ad valorem tax increase.

The analysis of these study data suggests that raising cigarette tax rates in Cameroon would reduce consumption more among low income households than among high income households. In Cameroon, however, since the demand for cigarettes is relatively inelastic, raising taxes on tobacco products would not significantly increase the proportion of household income available for other basic needs, such as food, water, housing, health care, clothing, electricity, transport, sport and leisure if the resulting higher prices of cigarettes do not induce quitting, considerably reduce consumption and prevent initiation to smoking. There is also a potential for substitution among cigarette brands in response to changes in relative cheap and expensive prices. Given that Cameroon's economy is growing so faster, it is more likely that any country specific tobacco taxation policy aiming to increase the price of cigarettes without any consideration for the changes in households' income, might not be significantly effective in reducing cigarette smoking across different income groups. In addition, the use of price-based interventions by increasing tobacco taxation would not be most effective if other measures of tobacco control remain unimplemented and/or enforced.

Cameroon has shown strong support for international tobacco control by signing and ratifying the FCTC and there are already a number of tobacco control measures, but improved implementation and enforcement of the non-price interventions remain central goals for ensuring the effectiveness of increasing tobacco taxation. The non-price interventions such as restrictions on access/purchasing, bans on advertising and/or sponsorship, promotion of smoke-free environments, warning labels, increase demand for cessation by reducing the price of cessation therapies and medications, and consumer health education and other supply side measures (prevention and control of tobacco plantation, production, importation, illicit trade and smuggling, selling) should be implemented and/or enforced along with the price-based measures. All tobacco control measures should be FCTC-compliant within the country.

While the combined and integrated different tobacco control measures are needed, policy tools that focus on cigarette affordability should consider both changes in the retail price and households' income levels that influence their spending power. In addition, there is a need to closely monitor tobacco industry both efforts and strategies to influence taxation and pricing policies. Given that in Cameroon, tobacco market is growing with some cigarette brands in competition, tobacco industry would compete in the pricing behaviour by under-shifting the tax thereby absorbing at least part of the tax increase in order to reduce the impact of the tax increase on cigarette consumption. Government needs to enhance tobacco control policies that are based on the changes in the retail price and households' income levels and the structure of tobacco industry that determines the responses to an increase in tobacco taxation. In this perspective, government interventions from outside the health sector – specifically – in social protection, poverty reduction, urban planning and economic regulations have the potential to strengthen tobacco control in Cameroon. There a need for further analysis and investigations on the trade-off between tobacco smoking and the satisfaction of other household's basic needs within it. Further research also needs to use time series approach for estimating the elasticity of demand of tobacco products in low income settings of Cameroon.

Conflict of interest: The authors declare that they have no conflict of interest in the conduct of this study and the production of this manuscript.

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