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MODELLING THE ECONOMIC AND HEALTH IMPACTS OF SMOKING IN LEBANON

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Abstract

Tobacco consumption is a habit pertaining to a large part of the Lebanese society, as of 2012 43% of the population are regular smokers. In 2008, the ministry of finance reported the social cost of smoking at $326.7 million (1.1% of GDP). Such a cost implies a loss from tobacco consumption in Lebanon particularly due to the low cost of tobacco. This paper shows that increasing taxes on tobacco will lower the social costs it generates and create socio-economic benefits in the process, from increased productivity and lifespan due to smoking cessation. This paper also indicates that a public health awareness campaign by the government will have a multiplier effect on the socio-economic benefits created from smoking cessation accompanied by a price increase of cigarettes. Historical and contemporary data were collected and analyzed

in order to assess the total cost impact on the Lebanese economy, present and future, due to tobacco consumption as well as the estimated cost per person for continued consumption. In conclusion, increased taxes on tobacco as well as a public health awareness campaign will greatly reduce smoking prevalence in Lebanon which will lower the socio-economic costs and generate substantial long term benefits from an increased lifespan and in turn an increased productivity.

Keywords: Tobacco consumption, Lebanon, social cost, awareness campaign, economic benefits, taxes

INTRODUCTION

Tobacco Control is currently being implemented in various countries worldwide. This is a result of the direct effect of tobacco smoking on health. Broadly speaking, Tobacco Control entails a ban on tobacco advertising both below and above the line; below the line advertising includes tobacco companies sponsoring and distributing free packs at events, whereas above the line typically refers to advertisements in print and audio-visual media. A ban on smoking in public areas, an increase in the tax on cigarette packs, and the placement of health warnings and graphic photographs on cigarette packs also fall under the umbrella of Tobacco Control initiatives to moderate smoking prevalence. The extent of control varies from country to country. However, when any of these measures is adopted, a decrease in cigarette consumption is expected, thereby reducing the prevalence of smoking related illnesses and ultimately smoking related deaths. Lebanon passed a law limiting the consumption of tobacco products in 2011; however, there is serious concern about the ability of the central authority to enforce the law in the long run. An excise tax is currently in place on imported tobacco, in addition to a tariff and the value-added tax. These instruments generate some revenue for the government. However, it should be noted that tobacco also imposes a cost on the government. The cost of tobacco on the Lebanese economy has yet to be assessed. The direct stakeholders are consumers of tobacco products, licensed tobacco farmers, the *"Re´gieLibanaise des Tabacset Tombacs (Re´gie)" (the public tobacco company)* and local licensed distributors of imported tobacco products. The Lebanese population has high smoking prevalence rates in both adults and youth. Cigarettes and water pipes are consumed by both age groups and are more prevalent among Lebanese males. Although this means there is a high tax revenue return since demand is high, the flipside is additional costs due to increased illnesses. Tobacco farmers in Lebanon receive a subsidy from the Re´gie for every ton produced . This Price Support Program (PSP)

was instituted to incentivize farmers to stay in the southern part of Lebanon. Tobacco farming is concentrated in the South (57%), with the remaining 43% produced in the Bekaa and the North. Farmers need to have a license in order to grow tobacco . The license entitles them to a preferential sale price offered by the Re´gie . The Re´gie then sells the tobacco in the international market (at a net loss) and imports manufactured tobacco. The manufactured tobacco is then sold to licensed distributors and subsequently to retailers . Therefore, it is important to determine the total overall cost on the Lebanese economy and not only in terms of profitability for the government and the Re´gi e, but also the cost on the Lebanese population. The various costs identified related to tobacco smoking are: health costs, inefficiency costs, costs from lost production, environmental costs, and costs to nonsmokers. Health costs are evaluated by calculating the expenses of the 27 smoking-related diseases. However, data on all 27 diseases are not available in Lebanon. Therefore, only costs related to the most dominant diseases were measured: cardiovascular disease, cancer, and respiratory diseases. Even the estimates for these diseases will be incomplete, however, as data on illnesses are not available. Inefficiency costs assess the number of absences that smokers and past smokers have from work as a result of a smoking related disease. This affects their productivity at work. Environmental costs consist of forest fires that are caused by cigarettes and the resources spent in collecting smoking related street waste. Together, health costs, inefficiency costs, and environmental costs constitute the direct costs of tobacco as they are currently incurred by the economic actors.

The indirect cost of tobacco smoking includes inefficiency costs and costs to nonsmokers. Inefficiency is the estimated present value of lost production from premature death because of smoking. We calculate this loss with the use of differential mortality rates for smokers and non-smokers and the average wage rate. Second-hand smoking is another contributor to indirect tobacco costs. However, complete information about the extent and effects of tobacco exposure is lacking in Lebanon, so this cost will not be included in our calculations. The estimated costs of tobacco calculated in this paper will therefore be a conservative lower bound for the actual costs of tobacco. This number will be used in the calculation of the net benefit or cost of tobacco to the Lebanese economy.

Need for the study

This paper aims to explain the Lebanese tobacco market and assess whether this market creates an overall revenue or cost to the Lebanese economy. This should complement the recent legislative action on tobacco control and show what policymakers should do to further understand the dynamics of the Lebanese market upon instating new policies in order to protect

consumers from the harmful effects of smoking as well try to protect the country's own tobacco trade if possible.

Problem definition

Smoking is a major health risk in Lebanon; more than a third of Lebanese adults are smokers. Lebanon has high smoking rates for both cigarettes and water pipes, especially among the youth aged 13 to 15**.** According to recent figures (Saade, 2005; Sibai&Hwalla, 2009), approximately 42.9% of male adults and 27.5% of female adults are cigarette smokers. Lebanese women have the highest female smoking rate in the region (Sibai&Hwalla, 2009; World Health Organization, 2013). The figures are compounded when the fact that, of those currently still smoking, an alarming 46.1% do not possess any health insurance (33.5% of past smokers are also in the same category) and thus are dependent on out-of- pocket health expenditures and support from the Ministry of Health. Among the youth, the prevalence rates are 14.8% and 6.7% for male and female youth, respectively (Sibai&Hwalla, 2009). Water-pipe smoking prevalence among the youth was even more staggering than that of cigarettes with 64.5% of males and 54.6% of females smoking on a regular basis (Saade, 2005; Sibai&Hwalla, 2009). Despite being an important determinant, health costs due to water-pipe smoking are not included in this study on account of data scarcity.

Lebanon has one of the highest rates of smoking in the adult population, with consumption reaching 12.4 packs per person per month. Approximately 7.8 billion cigarettes are consumed per year; a figure calculated using average daily consumption and population estimates. Male smokers smoke on average about 1 pack and a half per day. Although there are other countries with higher prevalence rates, these cigarette consumption rates rank among the highest in the world. Lebanese monthly cigarette packs consumption is 12 times that of Singapore and 3 times that of Syria.

Scope of the study

This paper will take into consideration both local and imported cigarettes as well as their average prices and percentage of household income in order to get an estimate of each social group's payments on tobacco, and from there estimate the population's expenditure; and furthermore that cost will be added to the overall health costs of smoking to generate the total cost of smoking incurred by the Lebanese society, after which policy change suggestions will be offered to try and remediate the situation over the coming years, as well as the derived benefits from these suggestions. The following is a short description of the first part of the calculations yet to be shown.

The locally manufactured cigarette brand (Cedars) has a market share close to 21%, whereas the remaining 79% of the market belongs to imported brands. Market shares were assessed using the ratio of consumption (local to foreign) extracted from the Household Expenditure Survey of 2004 to 2005. The market share dominated by smuggled cigarettes is estimated to be in the region of 25% to 50%, implying a significant presence of illegal consumption in Lebanon (Eriksen, Mackay, & Ross, 2012). Cedars cigarettes are sold in two forms, a carton packet and a paper packet, priced at $0.5 and $0.3, respectively, in 2011. As is customary in Lebanese tobacco consumption studies, shortages in production data have dictated an assumption of $0.4 per pack (average of the two) and the quantity consumed is based on average daily consumption of adults. Foreign brands are more commonly consumed with prices ranging from $0.8 to $2 in 2011. The price of foreign brands averaged $1.32. Using these average prices, consumption figures based on household expenditures, and prevalence rates, the total household spending on tobacco products would be $437,306,537 per annum.

Tobacco expenditure takes its toll on the poorer segments of society, accounting for 2 to 3% of their total expenditures (Table 1). In the bottom quintile of households for expenditures per adult equivalent, the share of expenditures on tobacco is equal to the share on recreation and furniture and is only 1% less than the share spent on education. For the second lowest quintile, the share of tobacco in expenditures is equal to those of education and clothing.

Table 1. Expenditures by categories (poorest-richest)

	Poorest	2	3	4	Richest	Overall
Food	35	31	28	24	19	27
Clothing	3	3	3	2	2	3
Housing and Energy	5	6	7	7	7	6
Transport	30	24	21	18	16	22
Recreation	2	2	2	2	3	2
Hotels and Restaurants	6	6	7	7	8	7
Communication	4	8	10	13	13	10
Furniture	2	4	4	5	5	4
Miscellaneous	3	3	3	3	4	3
Health	3	6	7	10	12	8
Education	3	3	4	4	6	4
Alcohol	1	1	2	2	4	2
Tobacco	2	3	2	2	1	2

Benefits of Controlling Tobacco

The annual average consumption of cigarettes in Lebanon is equal to 10 packs per month, or 120 packs per year. Moreover, In Lebanon the most well-known or most consumed cigarettes brands are:

1. Marlboro costing $2.3
2. Davidoff costing $2.5
3. Kent costing$2.16
4. Winston costing $1.83
5. Gitanes costing $2.0
6. Gauloises costing $1.06
7. Cedars costing $0.83

So on average the price per pack is *$1.9*

Smoking is very harmful and can lead to severe illness and sickness, that's why quitting smoking has lots of benefits. The most important benefit from quitting smoking is having clean lungs, which will lead to a longer life span. According to Dr. JohnPolito, these are the benefits of quitting smoking by time as follows:

Within 20 minutes

Your blood pressure, pulse rate and the temperature of your hands and feet have returned to normal.

8 hours

Remaining nicotine in your bloodstream has fallen to 6.25% of normal peak daily levels, a 93.75% reduction.

12 hours

Your blood oxygen level has increased to normal. Carbon monoxide levels have dropped to normal.

24 hours

Anxieties have peaked in intensity and within two weeks should return to near pre-cessation levels.

48 hours

Damaged nerve endings have started to regrow and your sense of smell and taste are beginning to return to normal. Cessation anger and irritability will have peaked.

72 hours

Your entire body will test 100% nicotine-free and over 90% of all nicotine metabolites (the chemicals it breaks down into) will now have passed from your body via your urine. Symptoms of chemical withdrawal have peaked in intensity, including restlessness. The

number of cue induced crave episodes experienced during any quitting day have peaked for the "average" ex-user. Lung bronchial tubes leading to air sacs (alveoli) are beginning to relax in recovering smokers. Breathing is becoming easier and your lung's functional abilities are starting to increase.

5 - 8 days

The "average" ex-smoker will encounter an "average" of three cue induced crave episodes per day. Although we may not be "average" and although serious cessation time, distortion can make minutes feel like hours, it is unlikely that any single episode will last longer than 3 minutes. Keep a clock handy and time them.

10 days

10 days - The "average" ex-user is down to encountering less than two crave episodes per day, each less than 3 minutes.

10 days to 2 weeks

Recovery has likely progressed to the point where your addiction is no longer doing the talking. Blood circulation in your gums and teeth are now similar to that of a non-user.

2 to 4 weeks

Cessation related anger, anxiety, difficulty concentrating; impatience, insomnia, restlessness and depression have ended. If still experiencing any of these symptoms get seen and evaluated by your physician.

2 weeks to 3 months

Your heart attack risk has started to drop. Your lung function is beginning to improve.

21 days

The number of acetylcholine receptors, which were up-regulated in response to nicotine's presence in the frontal, parietal, temporal, occipital, basal ganglia, thalamus, brain stem, and cerebellum regions of the brain, have now substantially down-regulated, and receptor binding has returned to levels seen in the brains of non-smokers (2007 study).

3 weeks to 3 months

Your circulation has substantially improved. Walking has become easier. Your chronic cough, if any, has likely disappeared. If not, get seen by a doctor, and sooner if at all concerned, as a chronic cough can be a sign of lung cancer.

4 weeks

Plasma suPAR is a stable inflammatory biomarker predictive of development of diseases ranging from diabetes to cancer in smokers. A 2016 study found that within 4 weeks of quitting smoking, with or without NRT, that suPAR levels in 48 former smokers had fallen from a

baseline smoking median of 3.2 ng/ml to levels "no longer significantly different from the never smokers' values" (1.9 ng/ml)

8 weeks

Insulin resistance in smokers has normalized despite average weight gain of 2.7 kg (2010 SGR, page 384).

1 to 9 months

Any smoking related sinus congestion, fatigue or shortness of breath has decreased. Cilia have regrown in your lungs, thereby increasing their ability to handle mucus, keep your lungs clean and reduce infections. Your body's overall energy has increased.

1 year

Your excess risk of coronary heart disease, heart attack and stroke has dropped to less than half that of a smoker.

5 years

Your risk of a subarachnoid haemorrhage has declined to 59% of your risk while still smoking (2012 study). If a female ex-smoker, your risk of developing diabetes is now that of a non-smoker (2001 study).

5 to 15 years

Your risk of stroke has declined to that of a non-smoker.

10 years

Your risk of being diagnosed with lung cancer is between 30% and 50% of that for a continuing smoker (2005 study). Risk of death from lung cancer has declined by almost half if you were an average smoker (one pack per day). Risks of cancer of the mouth, throat, oesophagus and pancreas have declined. Risk of developing diabetes for both men and women is now similar to that of a never-smoker (2001 study).

13 years

The average smoker who is able to live to age 75 has 5.8 fewer teeth than a non-smoker (1998 study). But by year 13 after quitting, your risk of smoking induced tooth loss has declined to that of a never-smoker (2006 study).

15 years

Your risk of coronary heart disease is now that of a person who has never smoked. Your risk of pancreatic cancer has declined to that of a never-smoker (2011 study - but note 2nd pancreatic study making identical finding at 20 years).

20 years

Female excess risk of death from all smoking related causes, including lung disease and cancer, has now reduced to that of a never-smoker (2008 study). Risk of pancreatic cancer has declined to that of a never-smoker (2011 study).

METHODOLOGY

According to several medical sources (Shaw, M., Mitchell, R., & Dorling, D. (2000) each cigarette is estimated to cut 11 minutes out of a person's life according to the following calculations:

the difference in life expectancy for smokers and non-smokers by using mortality ratios was derived from Doll et al. (1976), of 34 000 male doctors over 40 years, it was found that a difference in life expectancy between smokers and non-smokers of 6.5 years. It was also indicated that if a man smokes the average number of cigarettes a year (5772) from the median starting age of 17 until his death at the age of 71 a person will consume a total of 311 688 cigarettes in his lifetime. If it is then assumed that each cigarette makes the same contribution to his death, each cigarette has cost him, on average, 11 minutes of life as shown by table 2.

6.5 years=2374 days, 56 976 hours, or 3 418 560 minutes

5772 cigarettes per year for 54 years=311 688 cigarettes

3 418 560/311 688=11 minutes per cigarette

Table 2. Life loss and cigarette smoking

Amount smoked	Life lost
One cigarette	11 minutes
Pack of 20 cigarettes	3 hours 40 minutes
Carton of 200 cigarettes	1.5 days

This calculation is admittedly crude—it relies on averages, assumes that the health effects of smoking are evenly spread throughout a smoker's lifetime, presupposes that the number of cigarettes smoked throughout a lifetime is constant, and ignores the difficulties in classifying people as either lifetime smokers or non-smokers. However, it shows the high cost of smoking in a way that everyone can understand."

To reach at an accurate cost of smoking, it was necessary to average the seven most smoked brands of cigarettes in Lebanon as follows:

Table 3: Average cost of the most smoked brands by Lebanese

Kent	$2.16
Marlboro	$2.33
Winston	$1.83
Gitanes	$2.0
Gauloises	$1.66
Cedars	$0.83
Davidoff	$2.5
Average	$1.90

The average cost per pack in Lebanon is $1.90 so monthly average consumption, according to our previous data which is 10 packs per month or 200 cigarettes, is equal to $19.06 per month, and a yearly cost of $2288.

to estimate the monetary cost over a person's life, the paper utilized information on the average monthly salary in Lebanon i.e. The average monthly salary in Lebanon is $2232.43, while the median is$1700, but the average monthly wage for 70% of the population in the lower income bracket is$833, the average working hours in Lebanon are 9 hours per day, or considering 274 working days per year, the total work hours will be 2,466 hours. These figures are essential inputs utilized in the formula that was generated in order to estimate the average monetary loss over a person's life due to smoking prevalence; this formula is presented as follows:

Number of packs per day x expected life loss per cigarette = daily life loss

Daily life loss x 365= yearly life loss

Yearly life loss x number of years smoking = total life loss

(Total life loss) / Average working hours per year = total lost productivity per year

Total lost productivity per year x average wage rate per day = Average monetary loss in L.L per person per year

Average total loss per person per year x smoking population in Lebanon = Average total loss to the economy per year

Finally, the yearly cost of cigarette packs multiplied by the number of years of smoking was subtracted to get a total spending of all cigarette packs which is added to GDP as consumption.

Therefore one example of the least possible cost is the consideration of the average wage rate of 70% of the population which is $833:

6 cigarettes x 11 minutes = 66 minutes lost

66 x 365= 24 090 minutes loss per year (or 16.73 days)

16.73 days x 54 years (average according to source) = 2.475 years lost
(2.475 years) / 2466 hours = 903.375 days/ 102.75 days = 8.8 productive days lost
8.8 days x (1,249,500/30) = $244.3 of losses per person per year (each $1=1500LL)
366,520 x 2,138,783 people = 78,390,674,520 L.L per year (or $522,604,496.8 million)
343,200 x 2,138,783 = 73,403,032,560 L.L per year contributed to GDP in cigarette pack expenditures (or $489,353,550.4 million)
Thus, the total actual loss to GDP is:
78,390,674,520 – 73,403,032,560 = 4,987,641,956 L.L (or $33,250,946.37 million)

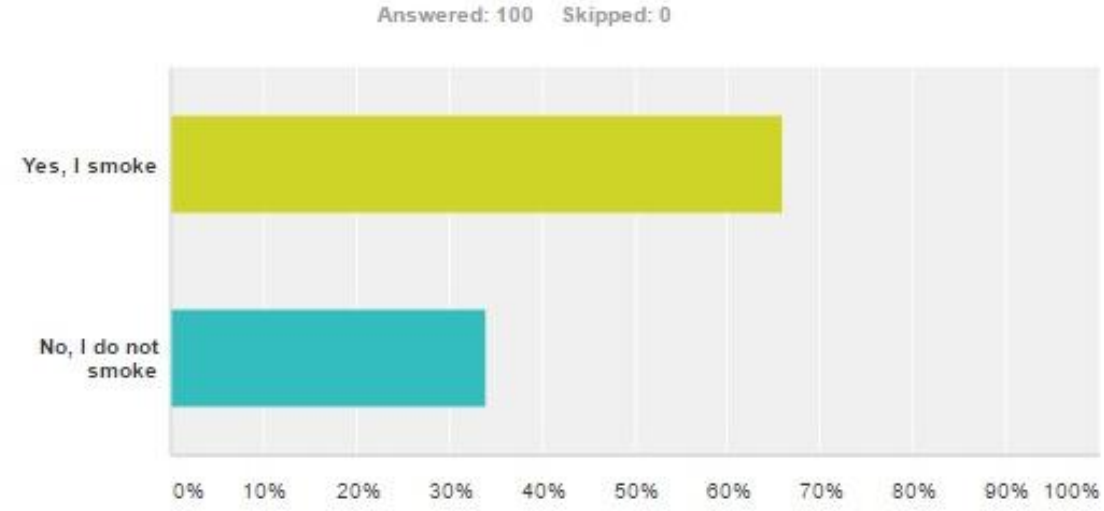
This loss is the lowest and most conservative estimate possible given our data, $33 million may not seem like much as an actual total loss, but consider that this is the remainder of the sum that Regie is not making as profits and are purely losses divided among individuals, while the total of $522 million is lost as productivity to the country per year and $489 million of them go to Regie as revenues.

ANALYSIS AND FINDINGS

To better understand the consumption behavior of Lebanese smokers, an online survey was conducted in which the 100 participants filled the following questionnaire:

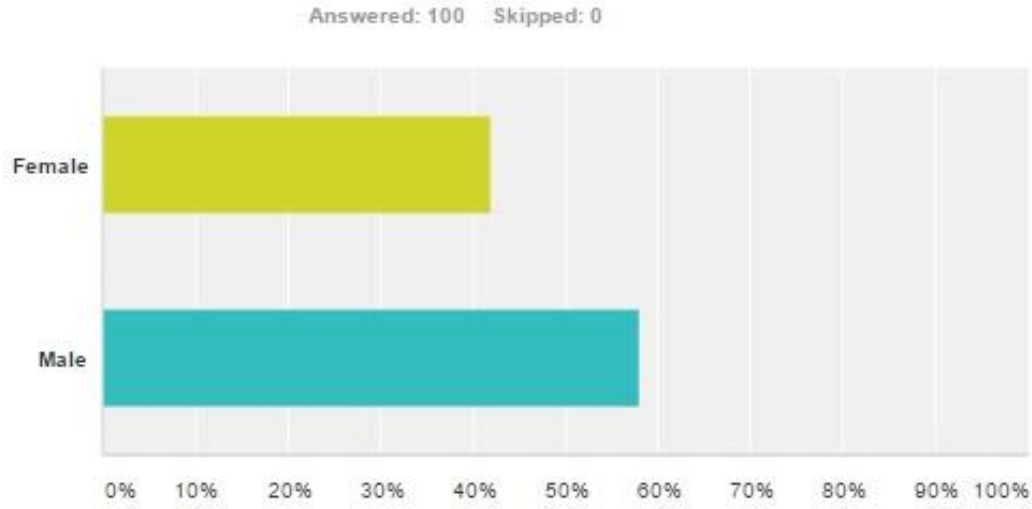
1. Do you smoke cigarettes?
    a. Yes, I do. b. No, I do not.
2. About how many cigarettes do you smoke in a typical day?
3. How old are you?
4. What is your gender?
    a. Male b. Female
5. At what age did you start smoking cigarettes?
6. Would a government health awareness campaign encourage you to stop?
    a. Yes, it would.
    b. No, it would not.
7. Do you believe smoking should only be allowed outdoors or in designated areas?
    a. Yes, there should be.
    b. No, there should not be.
8. Have you ever gone to a doctor for a suspected or actual smoking related illness?
    a. Yes
    b. No
9. Would you stop smoking if a pack costs 10,000LL?
    a. Yes
    b. No

Figure 1. Do you smoke cigarettes?



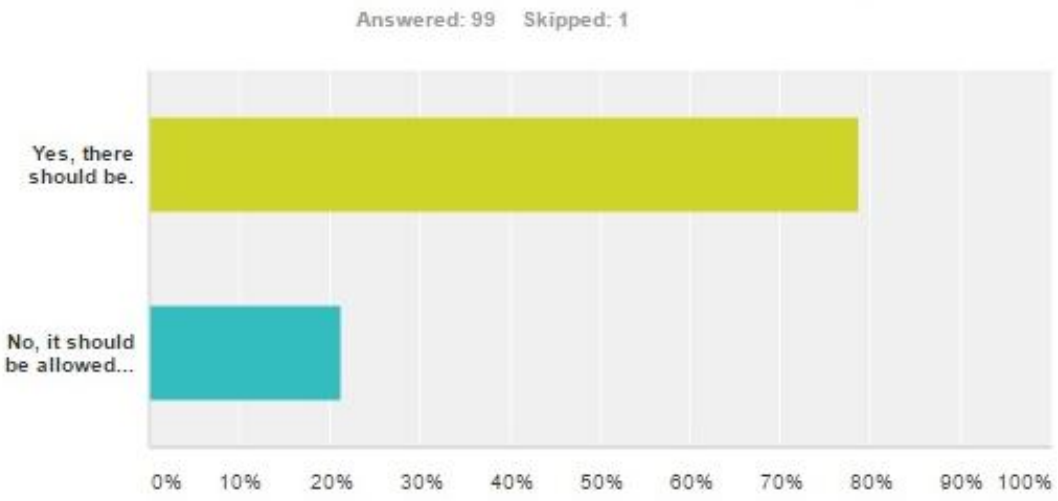
Answer Choices	Responses	
Yes, I smoke	66.00%	66
No, I do not smoke	34.00%	34
Total		100

Figure 2. Gender



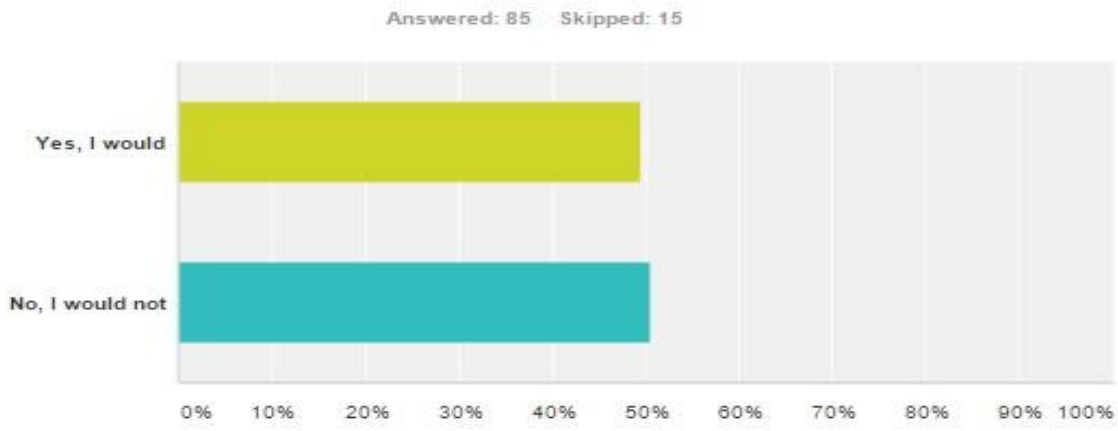
Answer Choices	Responses	
Female	42.00%	42
Male	58.00%	58
Total		100

Figure 3. Do you believe smoking should only be allowed outdoors or in designated areas?



Answer Choices	Responses	
Yes, there should be.	78.79%	78
No, it should be allowed everywhere	21.21%	21
Total		99

Figure 4. Would you stop smoking if a pack costs 10,000LL?



Answer Choices	Responses	
Yes, I would	49.41%	42
No, I would not	50.59%	43
Total		85

Figure 5. Average Cigarettes

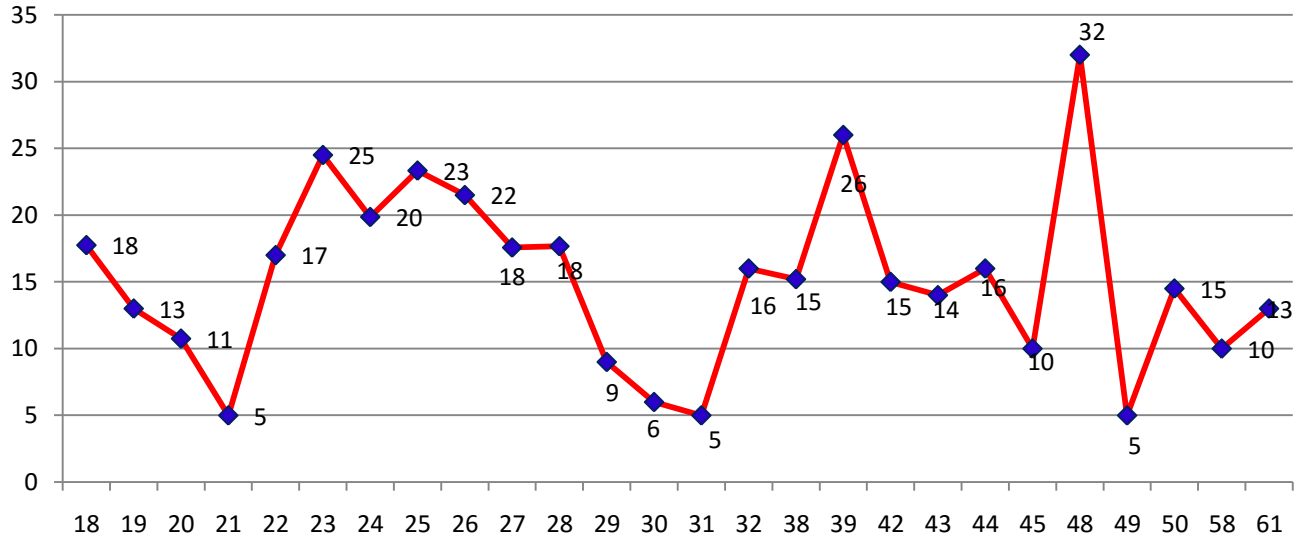
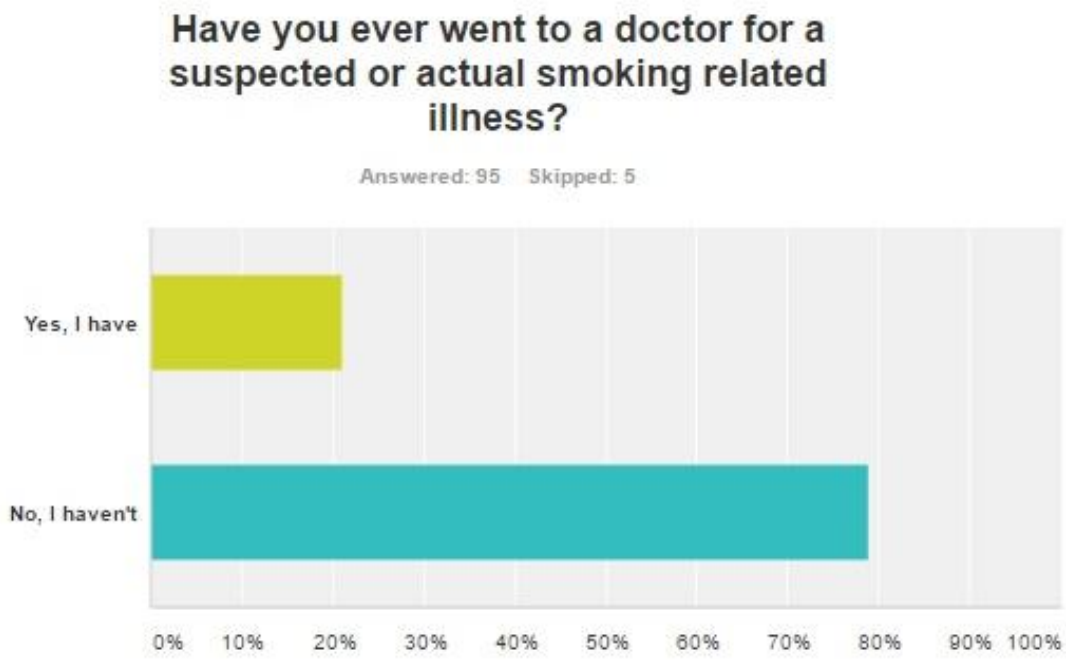
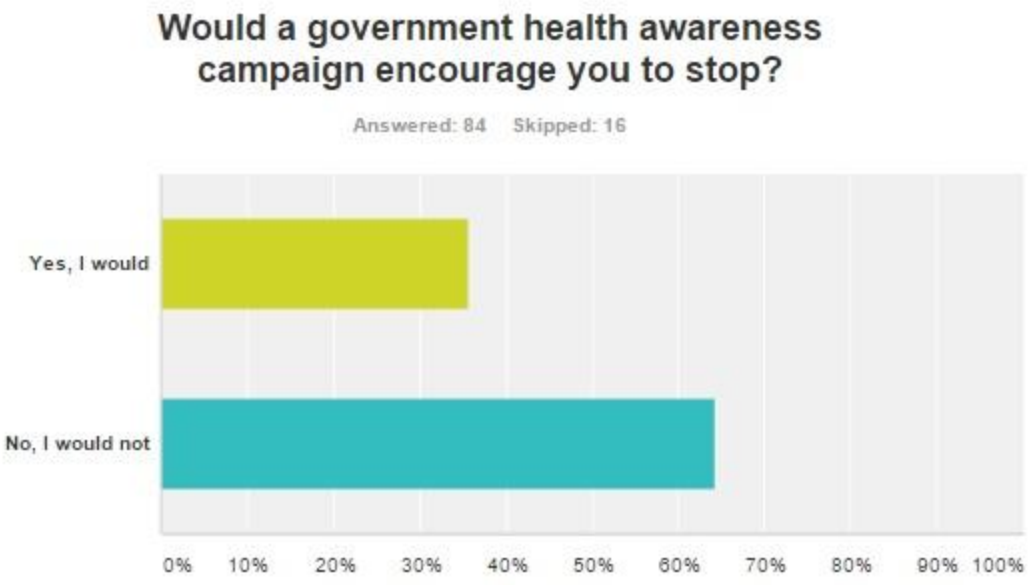


Figure 6. Have you ever gone to a doctor for a suspected or actual smoking related illness?



Answer Choices	Responses	
Yes, I have	21.05%	20
No, I haven't	78.95%	75
Total		95

Figure 7. Would a government health awareness campaign encourage you to stop?



Answer Choices	Responses	
Yes, I would	35.71%	30
No, I would not	64.29%	54
Total		84

According to the utilized survey of the paper the following data has been extracted:

Average Age or participants: 29.6 Years old

Average Age at which smokers started smoking: 17.2 Years old

The age variance = 110.4

Standard Deviation of age = 10.507

Average Daily Consumption = 17 Cigarettes

Average Yearly Consumption = 6104 cigarettes = 305 packets (roughly)

Average yearly expenditure on cigarettes = 305 x 2860 = 873,000L.L=$582

Given the previous formula, the researchers can calculate the economic loses of the participants as follows:

“Number of packs per day x expected life loss per cigarette = daily life loss

Daily life loss x 365= yearly life loss

Yearly life loss x number of years smoking = total life loss

(Total life loss) / Average working hours per year = total lost productivity per year

Total lost productivity per year x average wage rate per day = Average monetary loss in L.L per person per year

Average total loss per person per year x smoking population in Lebanon = Average total loss to the economy per year

Finally, the researchers subtract the yearly cost of cigarette packs multiplied by the number of years smoking to get a total spending of all cigarette packs which is added to GDP as consumption."

Again considering the lowest bracket of income so a conservative result is as follows:

17 cigarettes x 11 minutes = 187 minutes lost

187 x 365= 68255 minutes' loss per year (or 47.4 days)

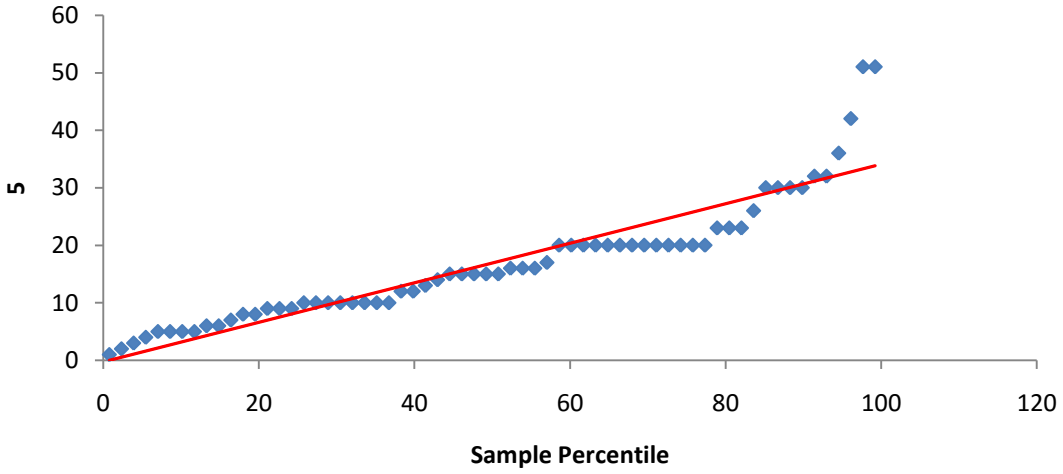
47.4 days x 12.4 years (average according to survey) = 1.61 years lost or 587.75 days

(1.61 years) / 2466 hours = 587.75 days/ 102.75 days = 5.72 productive days lost per year

5.72 days x (1,249,500/30) = 238,238 L.L of losses per person per year.

Annual expenditure on cigarette packs = 100 x 2860 = 286,000 L.L per year

Figure 8. Normal Probability Plot



From the results of the survey, a consumption function for smokers through a regression analysis of the data was derived. The y-axis represents the number of cigarettes smoked per day in relation to age which was chosen to represent in percentiles according to quantity smoked to be representing data distribution. The red line on the graph represents the best fit line of the individual points on the graph, represented by the function: y = 2.891x – 0.21875

Y = Cigarettes Smoked by Age Group

X = Age Percentile

The above function is a standard consumption function according to the survey at an average price of 2860L.L per packet. Considering the case where a cigarette packet would cost on average 10,000L.Lat the very least the consumption would decrease by a factor of:

10,000/2860 = 3.4965

Meaning everyone's consumption would decrease 3.5 times approximately.

Table 4. Summary output of the study model

Regression Statistics	
Multiple R	0.148705952
R Square	0.02211346
Adjusted R Square	0.006341097
Standard Error	10.75772893
Observations	64

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*	
Regression	1	162.256132	162.256132	1.402038453	0.240902258	
Residual	62	7175.181368	115.7287317			
Total	63	7337.4375				
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	21.463576	4.0769907	5.2645634	1.86305E-	13.313788	29.6133
18	-0.153026	0.1292371	-1.184077	0.240902	-0.4113680	0.10531

SOLUTIONS

The results of the model indicate the possibility of multiple solutions to be implemented in order to reduce the economic losses generated from smoking prevalence in Lebanon, which are divided into two categories from a government perspective and a civilian perspective. In order to reduce the percentage of smokers in Lebanon, many incentives can be implemented by the government.

The first solution that the government can implement is to increase the cost of the cigarettes packs which will lead to less consumption of tobacco. This approach can be implemented by increasing taxes on imports and taxes on Regie revenues which will lead to an increase in the pack price.

The second solution that should be implemented is to provide people with more health awareness programs highlighting the disadvantages of smoking and the dangerous effects that

come with it. All of these could be made in the form of small documentaries, Ads, pictures of the pack itself etc.

The third solution is to enforce some laws to prohibit smoking in closed or undesignated areas. Tobacco consumers would smoke less and non-smokers won't be affected. According to the survey of the paper, if the price of the pack increased above 10,000L.L, the amount of tobacco consumed will decrease.

The results of the survey show that, the people are almost equally divided regarding the price increase of cigarette packs, but it is believed that the number of people that answered yes was exaggerated since they have not been faced with the real life situation, and in which the current income level would not keep up with the consumption level. The attachment to the habit is the factor that forced the answer towards a "Yes", Salti (2010)

People in Lebanon are willing to spend 2% of their income on tobacco, considering the lowest possible average income in Lebanon which is at 1,249,500L.L=$833. This would mean 24,990L.L=16.66 per month, and is equals to 2 cigarette packs per month which is far less than the average daily consumption provided by the survey which is at 17 cigarettes per day totaling 25.5 cigarette packs per month. Therefore, it is believed that such increase in the price per cigarette pack will decrease consumption drastically in Lebanon either willingly or unwillingly.

In addition, along with the price increase in tobacco, a government health awareness campaign would increase the number of people quitting drastically, and would have a multiplier effect on the situation, since more people are inclined to believe in government studies as a credible source of information. An example that perfectly illustrates these effects is the Tips campaign waged by the Centre for Disease Control (CDC) in the United States of America against smoking, which yielded positive results as summarized below, (Office on Smoking and Health, National Centre for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, 2013):

- The *Tips* campaign motivated 1.64 million smokers to make a quit attempt.
- About 100,000 U.S. smokers are expected to stay quit for good as a result of the 2012 campaign.
- An estimated 6 million non-smokers talked with friends and family about the dangers of smoking, and an estimated 4.7 million additional non-smokers recommended cessation services to their friends and family.
- The December 2014 online issue of the *American Journal of Preventive Medicine* published an analysis of the cost-effectiveness of the 2012 *Tips*campaign. It showed that, based on the number of people estimated to have quit smoking for good (about 100,000 people), the campaign will also prevent at least 17,000 premature deaths

and help gain about 179,000 years of healthy life. With total campaign costs of about $48 million, *Tips* spent approximately:

- $480 per smoker who quit
- $2,819 per premature death prevented
- $393 per year of life saved
- $268 per year of healthy life gained

From a civilian perspective, the first method to reduce smoking is to promote a healthier lifestyle. A large portion of the Lebanese population is sedentary and smoking prevalence is a considerable factor in leading to strokes, lethargy and a generally passive lifestyle. Reducing tobacco consumption will certainly increase life expectancy in Lebanon as well as save smokers more money to spend on healthier activities. In addition ,according to the survey of the paper everyone's tobacco consumption increases drastically when consuming alcohol or participating in Beirut's busy nightlife, these are triggers to continue smoking or start it particularly for the age group between 16 and 35 where consumption increase is most drastic when participating in these activities, and are semi- forced by below the line advertisements , which includes tobacco companies sponsoring and distributing free packs at events, whereas above the line typically refers to advertisements in print and audio-visual media.

The lifestyle of the Lebanese population encourages smoking in general and most people start due to peer pressure (according to utilized survey and the Lebanese lifestyle in particular, smoking prevalence is kept high).

As a small additional benefit of smoking cessation is a cleaner environment, due to less smoking which might slightly improve air quality in Lebanon.

CONCLUSION

In conclusion, increased taxes on tobacco as well as public health awareness campaigns will greatly reduce smoking prevalence in Lebanon which will lower the socio-economic costs and generate substantial long term benefits from an increased lifespan and in turn an increased productivity. Reducing smoking can reduce the economic pressure of a large percentage of Lebanese families, and can allow Lebanon to save more than $400 million US dollars annually which could be utilized in social programs to alleviate the financial stress that most low income families face.

Government should first consider if the public health is more important than the impact of Regie (the public tobacco company) on the Lebanese economy, and moreover, if the productivity gained by the people should they quit smoking will cover the losses or even exceed them. Likewise, the Lebanese people should also take into consideration if the value gained by

smoking cigarettes is greater than the productive days they lose each year as well as the monetary loss incurred from this activity.

LIMITATIONS OF THE STUDY

The formula utilized by the study is limited by the data collected from the survey of the paper. The adopted estimates are very conservative in nature; it is believed that the actual losses are much greater than the numbers that are shown. In addition, the proposed solutions are limited in cases, government wise and civilian wise by the willingness of both parties to commit to stopping all tobacco consumption related activities.

REFERENCES

Doll R,Hill AB (1976). Mortality in relation to smoking: 20 years' observaions on male British doctors. BMJ 1976; 273(ii): 1525–36.

Doll R,Hill AB(1978). Cigarette smoking and bronchial carcinoma: dose and time relationships among regular smokers and lifelong non-smokers. J EpidemComm Health 1978; 32: 303–13.

Dorling, D. and Clarke, G. (2000) Commentary: The human geography of human geography. Environment and Planning A, 32(11): 1901-1904.

http://data.worldbank.org/topic/health?display=graph

http://english.al-akhbar.com/node/16064

http://whyquit.com/whyquit/A_Benefits_Time_Table.html

http://www.cdc.gov/tobacco/campaign/tips/about/campaign-overview.html

http://www.moph.gov.lb/Statistics/Documents/StatisticalBulletin2013.pdf

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1117323/

http://www.tradingeconomics.com/lebanon/incidence-of-tuberculosis-per-100-000-people-wb-data.html#3

Polito, J. (2006). Integrity of NRT studies in serious question.Rapid responses to West R, Sohal T. ‘Catastrophic’pathways to smoking cessation: Findings from national survey. British Medical Journal, 332, 458–460.

Shaw, M., Dorling, D. and Grundy, J. (2000) Surveying the population: health topics in the census of population and other surveys. In, Kerrison, S. and Macfarlane, A. (eds.) Official Health Statistics: An unofficial guide. Arnold: London. pp. 14-38. ISBN: 0 340 73132.

Shaw, M., Mitchell, R. and Dorling, D. (2000) Time for a smoke: one cigarette is equivalent to 11 minutes of life expectancy. British Medical Journal, 320: 53.