

## The Social and Economic Inequity from Smoking in Cuba

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Received date: January 26, 2020; Accepted date: February 03, 2020; published date: February 12, 2020

Citation: Efraín Sánchez González, Fé Fernández Hernández (2020) The Social And Economic Inequity From Smoking In Cuba. J Clinical Research and Reports, 2(4); DOI:10.31579/2690-1919/027

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### Abstract

Smoking is an important cause of morbidity and mortality that is associated with non-communicable diseases. The social costs induced by the existence of this risk factor also imply important causes of social and economic inequality, whose manifestation in particular will depend on the form of impact on society. Cuba is no stranger to this context. The characterization of the impact of smoking in Cuba lays the foundation for an adequate understanding of the inequality induced by smoking in Cuba. In turn, it allows to describe the social inequality of smoking, this being the fundamental objective of this research.

The negative impact of smoking on Cuban mortality, as well as the financial planning of the State Budget for Public Health are evidence of the inequity attributable to smoking in Cuba. However, the analytical understanding of this form of inequity as well as the role of the tax authorities in the control of smoking and the current Cuban social and political context lays the theoretical and methodological basis for an adequate control of this risk factor in Cuba.

In the Cuban context, the dynamics of cigarette and tobacco consumption exert strong financial pressures on the sustainability of the supply of Public Health services directly related to the morbidity attributable to smoking. These pressures accentuate the social and economic inequality attributable to smoking and constitute an important incentive for the implementation of more effective public policies in tobacco control.

### Impact of tobacco in the Cuban budget for Public Health 2006 – 2015.

The adverse effects of smoking on individuals has motivated the taking of legislative measures that contribute to the control of this risk factor. These measures are of a diverse nature and multi-sectorial scope, given the high social spread of cigarette and tobacco consumption worldwide.

Although it is, clear the wide range of risk that society assumes in the presence of smoking as a risk factor, the defenders of cigarette and tobacco consumption present arguments that encourage not intervening in the control of smoking.

First, it is alleged that the active consumption of cigarettes and tobacco is a personal decision, which must be respected as an individual right of each person. However, this argument leaves out the right of non-smokers who involuntarily expose themselves to other people's smoke, who, being passive smokers, experience a greater deterioration in their health status due to this involuntary exposure. (Cardero Quevedo, 2012).

Second, these defenders claim that tobacco control discourages the economy and encourages the black market in relation to smuggling. However, control of the adverse effects of smoking contributes to increased productivity and better living standards of the population. The current Cuban context does not escape this reality. Several investigators have inquired about the role of public authorities in smoking control, but taking public measures is still not enough. (Sánchez González & Fernández Hernández, 2017).

The financing of health services is within the so-called social expenditure that also includes education, housing, sanitation and social security. The social expenditure is oriented to guarantee the life of the inhabitants of a country and its amount depends on the degree of well-being, quality of life and possibilities of facing the problems.

In the Cuban context, the public health is fully financed with state resources and the Public Health budget is the one that totals the resources used by the sector and constitutes its main source of financing. (Sánchez González & Fernández Hernández, The relationship between tax policy and tobacco control in Cuba, 2018).

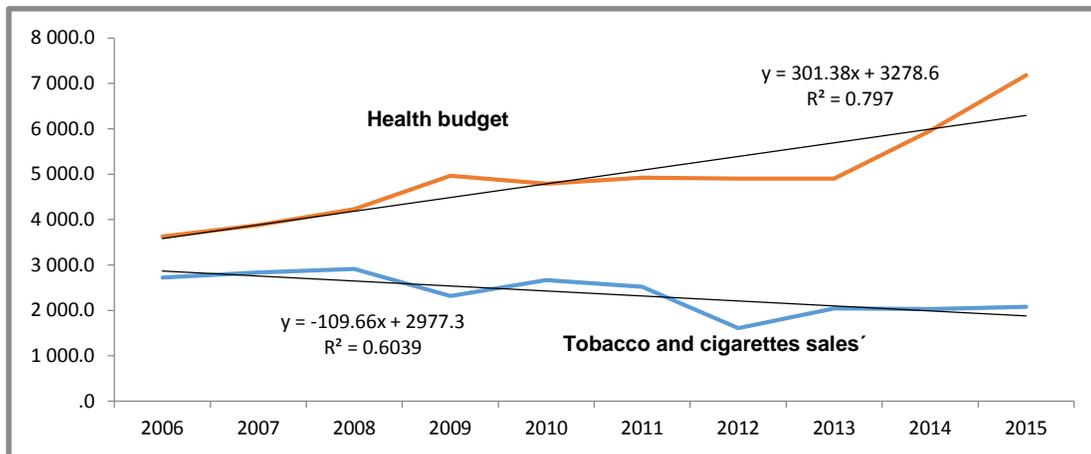
Cigarette and tobacco sales represent substantial economic contributions to the state budget for the financing of social expenditures, among which the Public Health budget stands out, but in turn, the consumption of cigarettes and tobacco results in gradual increases in the morbidity and mortality of active and passive smokers, given the cumulative effect of smoking as a risk factor.

There is a very close relationship between these three variables based on the cumulative effect of smoking as a risk factor, since the incidence of smoking on morbidity, mortality and demand for health services financed by the state budget is more significant than the economic benefits obtained from the sales of cigarettes and tobacco. (Martínez Hurtado, 2011).

Although the contribution of the tobacco industry to the Cuban health budget is evident, it remains to be answered to what extent the

contribution of this industry is capable of covering in Cuba the costs generated by the health system and how sustainable this contribution can be intertemporally.

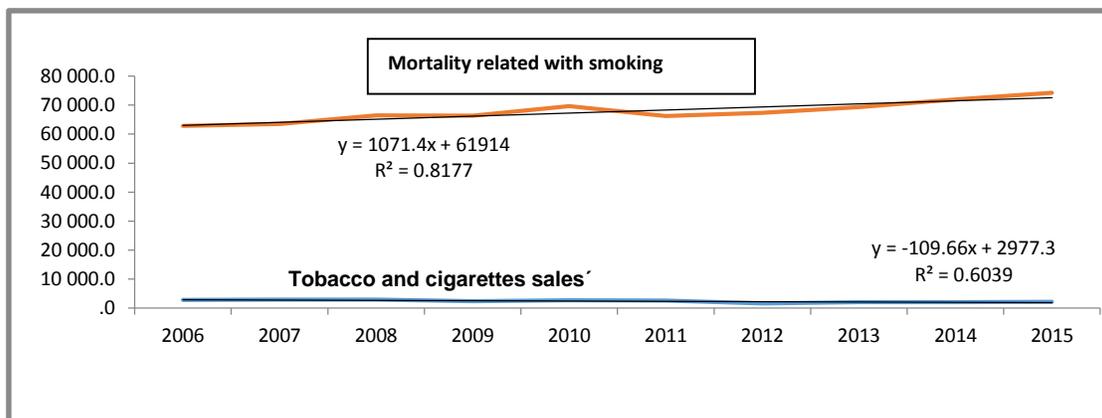
In the period from 2006 to 2015, the annual health budget in Cuba was always higher than the value of cigarette and tobacco sales. Particularly, the health budget for 2015 was greater than the total sales of cigarettes and tobacco from 2013 to 2015. Figures like these leave in doubt the so-called benefits of the tobacco industry for Public Health.



**Graph 1:** Sale of cigarettes, tobacco, and Public Health budget in Cuba from 2006 to 2015 in millions of pesos

**Source:** Prepared by the Statistical Yearbook of Cuba.

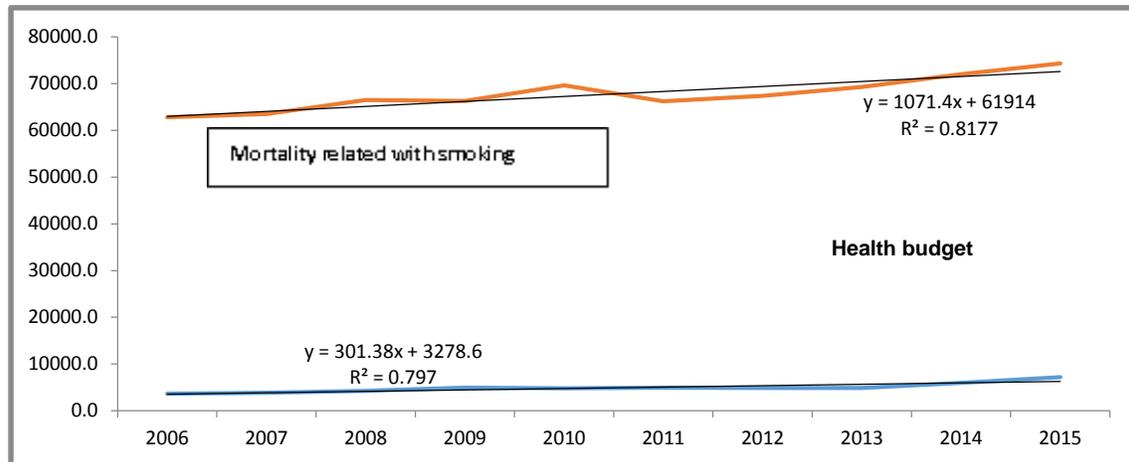
During the study period, sales of cigarettes and tobacco showed a clear decrease that contrasts with the increasing rate of Cuban mortality due to all causes of death related to smoking as a risk factor as shown in Figure 2.



**Graph 2:** Cigarette and tobacco sales in millions of pesos and smoking-related mortality in Cuba from 2006 to 2015.

**Source:** Prepared by the Statistical Yearbook of Cuba.

From 2006 to 2015, both the Cuban Public Health budget and mortality from all causes related to smoking as a risk factor had a marked rate of constant growth, as shown in graph 3.



**Graph 3:** Public Health Budget in millions of pesos and smoking-related mortality in Cuba from 2006 to 2015

Source: Prepared by the Statistical Yearbook of Cuba and the Statistical Yearbook of Health.

In the ten years studied (2006 to 2015), the Cuban Public Health budget grew at an annual rate of 301.3 million pesos, Cuban mortality from all causes related to smoking grew at a rate of 1071 new deaths added annually and the sale of cigarettes and tobacco decreased at an annual rate of 109.6 million pesos. (National Directorate of Medical Records and Health Statistics, 2018)

The aforementioned argument implied that, for each new deceased due to a cause of smoking-related mortality in Cuba from 2006 to 2015, the Cuban Public Health budget should have increased by 281.3 thousand pesos. This situation is significant because due to the increase in mortality it was necessary to have higher levels of economic resources to finance the Public Health budget. This problem is further aggravated by taking into account Cuban population dynamics with low levels of fertility and birth rates and high levels of life expectancy at birth, which contrasts with the voracious dynamics of mortality due to smoking-related causes of death as a risk factor.

In addition, for each new deceased due to a cause related to smoking, cigarette and tobacco sales decreased by 102.3 thousand pesos. This circumstance is particularly alarming because it highlights the parasitic nature of smoking on health, the economy and society, showing how the tobacco business itself is harmed by the death of individuals due to a cause related to smoking. Circumstances such as this have led the tobacco industry to search for new consumers, due to the high incidence of smoking on mortality and therefore, in the consequent loss of customers who die from causes attributable to smoking.

While the budget had to grow annually in 301.3 million pesos, the sales of cigarettes and tobacco decreased at an annual rate of 109.6 million pesos. This relation is showing clearly the marked rivalry between smoking and health since the economic point of view because the adverse effects of smoking in Cuban society have reached such a point that the process of reversibility of the adverse effects of smoking is extremely expensive when opposing the dynamics of the health budget with the dynamics of sales.

Cuban mortality due to the causes of death related to smoking and the Public Health budget showed the same meaning in their time, while the

sales of cigarettes and tobacco went through under a trend opposite to that of mortality and budget.

From this result it can be deduced that smoking as a risk factor at this stage of study has resulted in an increase in morbidity in non-communicable diseases. In turn, the increase in morbidity led to an increase in mortality from non-communicable diseases and a greater demand for economic resources through the budget.

The argument that the consumption of cigarettes and tobacco contributes to the financing of the Cuban health budget conceals a very important duality of social costs in relation to smokers. In the case of active smokers, spend on the consumption of cigarettes and tobacco and both active and passive smokers increase the consumption of health services because of smoking addiction. In either case, the additional consumption of health services implies less availability of resources in the social context, which has an impact on the quality of life of both groups and can be an important cause of economic impoverishment. In the Latin American context, several countries have reached similar results and this has motivated the implementation of rigorous measures that enable greater control over smoking due to its adverse effects on health, society and the economy. (Bardach, 2016)

In all these cases, the political will of the authorities has played a fundamental role in the control of smoking. Therefore, it is expected that in the Cuban context the entire mechanism for smoking control will be improved, as the harmful effects of this risk factor in Cuba are becoming increasingly noticeable in the economy, Public Health and society.

### The socioeconomic inequity attributable to smoking

Smoking is one of the most researched risk factors in the current context. One of the most significant debates regarding its control is about the economic duality, as a source of income and expenses at the same time. As a cause of the recurrent and / or habitual consumption of cigarettes and smoking tobacco, social imbalances occur, as this risk factor constitutes an important reason for socioeconomic inequality. This imbalance is mainly due to the incremental value of net expenses attributable to smoking versus the option of non-existence of this.

Smoking as a socioeconomic risk factor is closest related to poverty and human development. WHO has also stressed that there is a very close relationship between the development of the productive forces of the national economy and the consumption of cigarettes and tobacco. (González Menéndez, 2012)  
The above is an important argument that induces, encourages and motivates the control of smoking from an economic point of view, for which it is vital to relate the type of inequality caused by smoking with the social cost that this risk factor generates.

The understanding of the socioeconomic inequity attributable to smoking is based on the characterization of smoking as a socio-economic risk factor. This risk factor has its origin in the consumption of cigarettes and smoking tobacco. Associated with the sale of these products there are deep economic interests associated with the tobacco industry as a fundamental economic center that centralizes the economic benefits attributable to the consumption of cigarettes and tobacco (Sánchez González & Fernández Hernández, 2017)

The consumption of cigarettes and tobacco generates significant externalities in direct proportionality to the level of consumption. These forms of socio-economic inequality are given by the economic and social consequences of the increase in morbidity and mortality attributable to smoking. This increase in morbidity leads to an accelerated growth in health care costs due to the causes of smoking related morbidity as a risk factor due to the increasing degree of specialization required in health care in proportion to the intensity of consumption.

In this context, the role of the pharmaceutical industry is decisive, as it is the quintessential supplier of goods and services for medium and immediate consumption in the health sector. Therefore, the cost of health care due to smoking-related morbidity causes includes the cost of acquiring these products supplied by the pharmaceutical industry. To the extent that the number of consumers of cigarettes or tobacco and / or the intensity of consumption of these increases, the increase in the effective demand for health services attributable to smoking is more likely and therefore also increases the effective demand for goods and services to the pharmaceutical industry by the health sector. The increase in the effective demand for health services due to causes of morbidity related to smoking as a risk factor raises the consumer's reserve price and increases the equilibrium price of the health market. Therefore, consumers who cannot cover the costs of health care, whether smokers or not, are excluded from the health market and cannot receive the health services that in the previous context would effectively demand. This reveals an absolute form of socioeconomic inequity attributable to smoking, which occurs when, because of smoking, an effective consumer of health services is excluded from the health market.

In societies where Public Health services that are directly related to smoking as a risk factor are largely covered by the fiscal budget for social expenditures and access to these services is universal and free, the increase in the effective demand for these services attributable to smoking leads to a greater demand for financial resources to cover the services demanded. This in turn constitutes a very significant social opportunity cost due to the financial pressures that the tax authorities must assume for the sustainability of the service.

Otherwise, the financial constraints imposed by smoking would lead to a potential decrease in the services offered. As consequence, a significant part of the potential consumers of these Public Health services would be excluded from the health market because there is no real accessibility for them to the service demanded in the health market (Fernández Hernández

& Sánchez González, Impact of smoking on the Public Health budget in Cuba from 1997 to 2014, 2017).

The other forms of socioeconomic inequality attributable to smoking do not imply the exclusion of the consumer of health services from the market of the health sector and are determined by the particular ways of demonstrating the tangible social costs attributable to smoking. For this reason, the description of these costs should constitute a methodological and practical guide for the study of the socioeconomic inequality attributable to smoking.

The tangible social costs attributable to smoking. From a general social perspective, the disaggregation of these is as follows:

**Direct health costs of smoking:** these are the costs that all health institutions must bear for reasons clearly attributed to smoking. In this particular case, it is valid to clarify that not all the health costs of active smokers are attributable to smoking, nor are all the costs of non-smokers alien to smoking. That is, in this context it is necessary to include the institutional health costs clearly attributable to smoking in active smokers and passive smokers, where the concept of disease burden plays an important role in this quantification. An example of this cost would be the part of the health budget clearly attributable to smoking in active and passive smokers.

**Direct non-sanitary costs of smoking:** these are the costs that all non-sanitary institutions must assume for reasons clearly attributed to smoking, which are very closely related to social security, for example the payment of insurance and subsidies for reasons of attributable disease clearly to smoking in active and passive smokers (Fernández Hernández & Sánchez González, 2018)

### Indirect costs due to loss of labor productivity: absolute and relative

Regarding the individual's state of health, smoking as a risk factor can play an important role due to the adverse effects it has on the individual and collective performance of the workforce as a special commodity that transforms raw materials into a product. final. That is, smoking is not only a determinant of the health of the individual, but also of their labor productivity demonstrated through their work. These adverse effects are evident in the labor productivity demonstrated by the individual through mortality or morbidity.

The loss of labor productivity due to or attributable to smoking, can then be disaggregated, based on the final result, in absolute or relative. The absolute is that which is associated with mortality and, therefore, is irreversible, since it implies the death of the individual at ages and under appropriate faculties for work, according to their characteristics and legislation in force in the study society. The relative is that which is associated with morbidity, does not imply the death of the individual and its fundamental characteristic is the reversibility, that is, the possibility of the individual returning to work.

The absolute loss of labor productivity is conditioned by various factors, both social, economic and legal. From the social point of view, it influences the level of acceptance and tolerance that society in general and in particular the labor group demonstrates towards the consumption of cigarettes or tobacco. Also the level of risk perception of smoking, especially by all individuals related to the consumer of cigarettes, whether in their work environment or not.

From an economic point of view, factors directly associated with the market influence, such as the particularities of the demand and supply of these products, which ultimately determine the market equilibrium of these products. Among the particularities of the demand, the individual purchase capacity and the need for consumption induced by the addictive action of cigarette and tobacco consumption can be mentioned. In the case of the offer, the diversity of manufactured tobacco products available in the market and the price of these is important too.

From the legal point of view, there are the regulations of the labor activity in the study society, such as the case of the minimum age for someone to legally work and the minimum age for a worker, according to their circumstances, to retire.

A refined quantification of the loss of labor productivity would include the analysis with the amount of the labor force that actually worked during the study period, and the total amount of the production of goods and services generated in this period of time, the life expectancy of regular consumers of cigarettes or tobacco and the minimum age required for the individual's retirement.

In this regard, it should be taken into account that using the economically active population would not be an entirely robust indicator, because it includes in its accounting the population that is unemployed and who, without being technically unemployed, does not work, either for reasons beyond Your will or not.

At the same time, the relative loss of labor productivity can be of two fundamental types: due to the worker's physical absence from work or the worker's physical absence from work. The first is given because the worker is absent from work due to smoking (given this absence due to the relationship of smoking and morbidity), although there is no legal document that proves it, for example, a medical certificate for a disease common where smoking is a relevant risk factor.

The second is given because although the worker is physically at work during the day, but part of that time is spent smoking, thus neglecting his work.

In the case of the worker's physical absence from work, these absences may be attributable to smoking or not, regardless of whether they are considered justified or not from the labor or legal point of view. In any of the cases, the influence of smoking as a risk factor increases the worker's morbidity due to any of the causes related to smoking as a risk factor and the possibilities of physical absence to the work area would also increase due to this same influence.

Therefore, if the total number of absences associated with the morbidity of smoking was known, whether these are justified or not and the relative weight of smoking in general morbidity, then the part corresponding to the smoking in this loss of labor productivity.

In this case, it should be specifically taken into account that the expense generated by smoking on social security in an individual is independent of the loss of relative labor productivity due to the physical absence from work, although this expense is an indirect social cost that society must assume for the existence of smoking.

The relative loss of labor productivity due to the worker's physical absence from work is a bit more complex, because apparently it does not exist, due to the fact that the worker meets the time of his working day. However, it should be remembered that the fundamental reason for the

existence of the loss of labor productivity is given by not using the time to work, for any of the causes. Therefore, the time of the workday that the worker dedicates to smoking, although apparently he is working without leaving his job, implies that he is not paying due attention to the task that he must perform as a worker and that the time he is dedicated to smoking, from the point of view of employment, it is a wasted time, which implies a loss of labor productivity. (Sánchez González & Fernández Hernández, The loss of labor productivity attributable to smoking, 2016)

### **Microeconomic vision of socioeconomic inequality attributable to smoking**

Cigarettes and tobacco are considered legal drugs and are socially accepted, especially in producing and marketing countries. Due to the general knowledge that cigarettes and tobacco are economic goods classified as normal, ordinary and necessary, studies of the demand for these products have often been carried out and it has been proven that an expansive tax policy on taxes has generated an increase in tax collection and a decrease in consumption.

The strong relationship of the demand for these goods makes the price elasticity of the demand for these goods negative and their absolute value less than one. This situation would justify an expansive tax policy on taxes related to the consumption of manufactured tobacco leaf tobacco products.

On the other hand, the greater the consumption per capita exists, the more addiction will generate in these consumers these products and therefore, higher levels of effective demand for health services; while on the consumer side, an increase in the reserve price and a postponement of the satiety point of consumption can be expected.

Derived from the problems generated by the consumption of cigarettes for Public Health, in past decades many countries adopted control policies to reduce consumption, demonstrating with certainty that it is possible to achieve behavioral changes if actions are carried out based on a coherent public policy and systematic.

The key to the success of these policies was the knowledge of the cost of smoking in the respective national economies. Therefore, the more accurate and precise the method of obtaining this cost, the more reliable it will be for its use, and the use of exact sciences as tools for obtaining information can be very useful.

To the extent that the demand for cigarettes and tobaccos is more inelastic, the increase in taxes on the consumption of cigarettes and tobaccos could also increase the current levels of poverty, since the relative decrease in the income perceived by the price increase. Due to the tax, the need for consumption created by smoking does not automatically decrease, so that effective demand tends to remain more stable as long as said demand becomes more inelastic.

However, the fact that smoking creates such a high addiction comparable with strong drugs such as heroin, makes the higher its consumption, the higher level of addiction its consumer experiences and therefore, greater willingness to pay for a unit of consumption, which accentuates the inelastic nature of this demand function. At the same time, this implies that the risk attributable to smoking in relation to a specific disease related to smoking also increases and therefore also the expenses associated with public health.

Within the framework of Public Health, the study of disease costs has also gained a significant place, especially in relation to the cost of chronic non-communicable diseases. These are the main causes of morbidity related to smoking as a risk factor.

Not always a decrease in prevalence can lead to a decrease in the costs of smoking, because it would be necessary to know, in addition, other particularities of effective demand, such as per capita consumption. That is why it is not enough to have a general idea of the phenomenon, because its essence is in the particularities that determine it.

That is why non-tax measures for the reduction of per capita consumption also play a fundamental role in reducing the costs of smoking, although its effects are evidenced not in the short term. Even so, it is not expected that any tax measure to reduce per capita consumption will have favorable results in the short term if it is high.

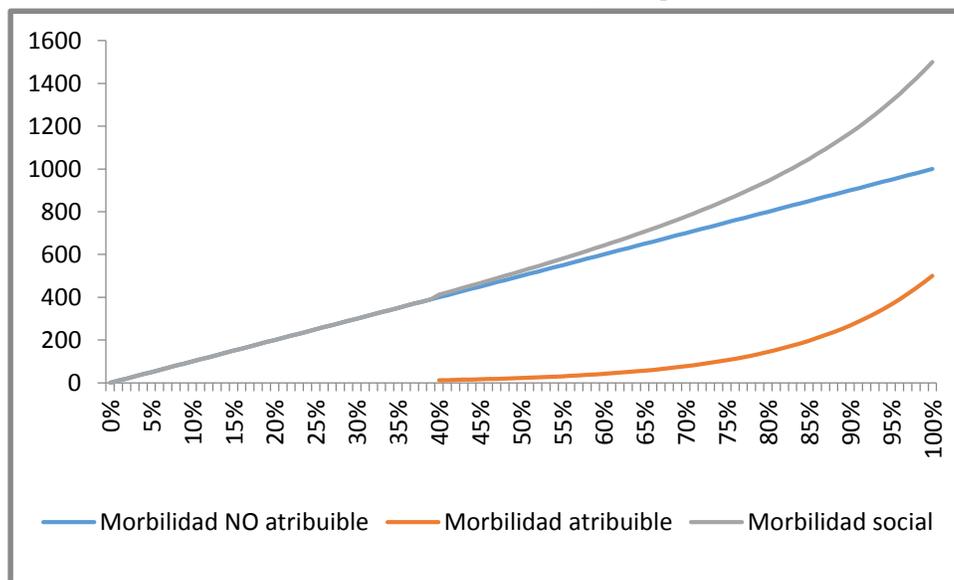
Smoking as a socio-economic risk factor has two fundamental explanatory variables given by the consumption of cigarettes and tobacco and the number of smokers in the study population. Therefore, the relationship between these two fundamental variables with the risk factor studied determines its social behavior. The independent variation of both variables causes a variation in the impact of smoking on the study population in the same direction. Consequently the social costs attributable to this risk factor are proportional to each of these variables and the social inequality attributable to this risk factor in the study population as well. As a consequence of the increase in cigarette and tobacco consumption, tangible social costs are not always reversible in the short term. These costs in their social character overload non-smoking individuals creating in this way a form of social inequality whose particularity will depend on

the form of impact of smoking on society, but that always generates an economic cost that is partly transferred to non-smokers. smokers This is how the social inequality attributable to smoking manifests itself in the study population.

The most obvious case is passive smokers, who expose themselves involuntarily to the consumption of cigarettes and tobacco and suffer the same consequences attributable to smoking as active smokers in proportion to the degree of exposure. Therefore, any form of measurement of the social impact of smoking on the study population must include these two fundamental variables and any form of measurement of the social inequality attributable to smoking should be consistent with the particularities of the social impact of smoking that is the object study.

In the case of the intensity of consumption, this relationship is not so simple because the intensity of the present consumption depends on the intensity of the past consumption by the constant postponement of the satiety of this consumption, given by the addictive effects of cigarette and tobacco consumption. . This condition, together with the cumulative nature of smoking as a risk factor, conditions a growing accelerated relationship of morbidity attributable to smoking versus the intensity of consumption. In this way, the individual morbidity attributable to smoking is a growing convex function of the intensity of consumption.

Assuming that the rest of the risk factors did not have significant variation, then, the social morbidity (sum of the morbidity of non-smokers, the morbidity of smokers not attributable to smoking and the morbidity attributable to smoking) would maintain a linear relationship against to morbidity not attributable to smoking. In a graph where the population represented primarily by non-smokers and then by smokers was on the abscissa axis, and social morbidity was represented by the ordinates, the representation would be as follows:



The greater the population of smokers and / or the greater the intensity of consumption, the greater the dynamics of social morbidity and the greater the gap that separates it from non-attributable morbidity and therefore, the greater the social inequality attributable to smoking for morbidity. Therefore, the growing and accelerated relationship of individual morbidity attributable to smoking versus the intensity of consumption leads unequivocally to a social inequality whose size will depend on the

interaction between the intensity of consumption and the number of smokers in the study population.

In the case of socio-economic inequality attributable to smoking due to morbidity, the effect of induced social redistribution is compensated by the social benefits linked to the existence of smoking mainly represented by retail sales of cigarettes and tobacco, which is where the consumption is made final.

In the case of retail sales of cigarettes and tobacco, these have a linear relationship with respect to social consumption given by the linear relationship that it saves against the number of smokers and the individual intensity of consumption, under the conditionality of prices and stable unit costs. In the case of costs, given the cumulative nature of smoking on morbidity and the dynamics of unit costs of health care due to smoking-related morbidity, the ratio of social costs attributable to smoking versus the population of smokers It is linear but in the face of the intensity of consumption it is growing convex.

In this context there are two significant points. One is where cigarette and tobacco sales equal social costs. In this case, externality in the form of social costs is fully compensated by the associated benefits. From this point forward, the costs would exceed the benefits and the dynamics of the costs would far exceed that of the sales, leading to an almost irreversible condition in the short term. The other point is where marginal costs equal the average market price (marginal revenue), because it is at this point that the results of the interaction between benefits and costs attributable to smoking are maximized. The existence of each of these points will depend on the particular circumstances of each population under study. (Sánchez González & Fernández Hernández, The role of tax authorities in tobacco control, 2017).

From the starting point of the graph, as long as the marginal cost is less than the average market price, the benefits will outweigh the benefits and the latter may compensate for the adverse effects created by the very existence of smoking. However, if from this starting point, the marginal costs are always not less than the average market price, then the social compensation mechanism would not work because in the whole graph the costs would always be greater than the social benefits attributable to smoking.

The area between social morbidity and non-attributable to smoking corresponds to all morbidity attributable to smoking. In this way it is possible to obtain a general coefficient of social inequality attributable to smoking, given by the reason between total morbidity attributable to smoking and total social morbidity. For each level of intensity of consumption it is possible to use a social inequality coefficient attributable to smoking given by the ratio between the morbidity attributable to smoking according to the corresponding intensity of consumption and social morbidity.

In any case, the understanding of the phenomenon of morbidity attributable to smoking and its impact on social inequality allow a better assessment of the social impact of this risk factor on health and society in general.

### **The socioeconomic inequality attributable to smoking according to the tangible social costs attributable to this risk factor.**

Socio-economic inequality is given by the inequality in the consumption of economic resources at the social level, of a particular social group with respect to another in similar conditions. Then, the socioeconomic inequality attributable to smoking is mainly due to the social costs that this risk factor generates, which would not exist if smoking as a risk factor did not exist either. The most significant socio-economic costs attributable to smoking in any society are given by the effect that this risk factor has on the use of economic resources in the financing of health services and by the effect of this risk factor on the economy and the economy. society in general for the loss of labor productivity attributable

to this risk factor. Next, the argument of each form of socioeconomic inequality attributable to the previously identified smoking is broadened. (Fernández Hernández & Sánchez González, The Socioeconomic Inequity Attributable to Smoking, 2019).

### **Inequity attributable to smoking in the allocation of resources.**

For the financing of Public Health, it is necessary to allocate economic resources to this socioeconomic sector. Part of these resources are used to address causes of morbidity and / or mortality clearly attributable to smoking, if this risk factor does not exist, this allocation would not be necessary and these resources could be available in favor of social and human development.

This inequality is ultimately given by the very existence of smoking that manifests itself in active and passive smokers at the same time, determined by the level of cigarette and tobacco consumption, morbidity and / or mortality directly related to smoking as a factor of risk and the effective demand for health services for reasons clearly attributable to smoking, where the active consumption of cigarettes and tobacco constitutes the fundamental explanatory variable of the existence of smoking and the inequality induced by this risk factor.

The full existence of smoke-free spaces is capable of nullifying passive smoking in the environment circumscribed to this space and nullifying in its jurisdiction the inequality of smoking due to the non-existence of active consumption of cigarettes and cigars, but it is not a definitive solution, since It is not able to completely eliminate active consumption of cigarettes and tobacco in the entire social environment to which it belongs.

For the reasons previously argued, the global economic burden of smoking is a first-rate measure of the socioeconomic inequality attributable to smoking in the allocation of economic resources for the financing of health services.

The economic burden of smoking in Public Health can have extensive or intensive growth. It is extensive if it increases the effective number of smokers and is intensive if it increases the per capita consumption of cigarettes and / or tobacco. As a result of the interaction of both forms of increase, the economic burden attributable to smoking in Public Health may or may not increase depending on the simultaneous behavior of smokers, which demonstrates the behavioral nature of smoking as a risk factor. For these reasons, it may be the case of societies with a marked demographic decline with high levels of per capita consumption of cigarettes whose economic burden attributable to smoking in Public Health is higher than other societies where the consumption of these products is more extensive but with less intensity of consumption

However, although this economic burden is null because there is no effective demand for health services clearly attributable to smoking, there is still room for the existence of a small level of consumption that is less than the minimum amount of consumption that determines the existence of demand Effective health services for reasons clearly attributable to smoking as a risk factor. This non-zero level of cigarette and tobacco consumption may be associated even with another form of socioeconomic inequality attributable to smoking, this being the one that occurs as a result of the social redistribution of economic resources due to the existence of the loss of labor productivity attributable to smoking Inequity attributable to smoking in the redistribution of resources.

Indirect costs from a social perspective are given by the general impact of smoking on society without seemingly direct influence. These costs are especially associated with those that society must assume for the loss of labor productivity generated by this risk factor and are linked to the social redistribution of the economic resource caused by this loss of labor productivity. Therefore, smoking is a cause of socioeconomic inequality from the point of view of the redistribution of the economic resources of society.

The loss of labor productivity attributable to smoking, whether relative or absolute, causes the social cost induced by this loss, to be plunged by society in general and socially redistributed between smokers and non-smokers, making the population sector unaffected by this risk factor bears part of the costs that this loss of labor productivity generates, thus creating socioeconomic inequality in the redistribution of economic resources in the study society.

In the case of the relative loss of labor productivity attributable to smoking, labor absenteeism due to this cause implies that socially workers who are not absent from working hours must cover the absence of those affected by the relative loss of labor productivity attributable to smoking and / or stop producing material wealth as a support for the economic development of society. In addition, this same absenteeism can lead to a greater request for a health benefit, which increases the cost levels for relative loss of labor productivity attributable to smoking. (Fernández Hernández & Sánchez González, Loss of labor productivity due to cigarette consumption during working hours, 2017).

Social redistribution induced by the relative loss of labor productivity attributable to smoking can have a particularly negative impact on the same consumers of cigarettes and tobacco, who, due to absenteeism attributable to smoking, reduce the family income available for non-cigarette consumption and Tobaccos This situation causes poverty levels to increase and these same people get involved in a vicious cycle of smoking, absenteeism and poverty. Otherwise, the absence of cigarette and tobacco consumption would definitely break this vicious circle, although not immediately, but it would eliminate a major cause of socioeconomic poverty and inequality.

On the other hand, the absolute loss of labor productivity attributable to smoking implies an irreversible loss due to the premature death of the smoker. In this case, as in the previous case, the absence of workers who died prematurely due to causes attributable to smoking should be covered and / or cease to produce material wealth that could be reallocated to strategic sectors of the social and human development of the society of study. However, the irreversibility of this cost means that the recovery of the working mass is based on demographic dynamics, which, by its very nature, is not as accelerated as the replacement of the labor force could demand, which makes this Socially speaking, it becomes more persistent over time, as well as the socioeconomic inequality of smoking in the redistribution of economic resources in society. (Sánchez González & Fernández Hernández, Social cost for absolute loss of labor productivity, 2018).

In both cases, the consumption of cigarettes and tobacco constitutes the root of the existence of the socioeconomic inequality attributable to smoking and it is this same recurrent consumption that determines the persistence of this cause of social inequality. Therefore, to eradicate this type of inequity it is necessary to eliminate the cause that originates it: the active consumption of cigarettes and tobacco. For this, the political will of the government authorities plays a decisive role. The political basis of tobacco control in Cuba is briefly presented below.

## Political foundation in Cuba of the economic control of smoking

The political role of the economic control of smoking is based on the Guidelines of the Economic and Social Policy of the Party and the Revolution. (Communist Party of Cuba, 2017).

Guideline 33 states: "For the budgeted units that only cover part of their expenses with their income, the part of the expenses that will be financed by the State Budget will be approved." The majority of Cuban health care institutions Primary, secondary or tertiary, are fully funded by the State Budget because Public Health in Cuba is guaranteed universally and free of charge. Therefore, reducing the impact of smoking will contribute significantly to compliance with this guideline.

Guideline 39 states: "Achieve the external financial balance, based on an adequate correlation between income and expenses in freely convertible currency of the country, in correspondence with the behavior of the economy." The reduction in morbidity attributable to smoking achieved with the economic control of this risk factor, it would reduce the import needs and contribute to the financial health of the external sector of the Cuban economy, contributing also to the fulfillment of this guideline.

Referring to fiscal policy, guideline 56 states: "Fiscal policy should contribute to the sustained increase in the efficiency of the economy and income to the State Budget, with the purpose of supporting public spending at the planned levels and maintaining an adequate financial balance, taking into account the particularities of our economic model. "The experience of several countries in the region demonstrates that fiscal policy and especially tax policy, can be a very valuable instrument for the economic control of smoking.

In the Cuban context, raising the retail price to black cigarettes marketed under the trademark "Criollos" to just \$ 11.00 per pack of 20 cigarettes, would help to balance the domestic market and as a result lay the foundations for a more effective tax policy in the control of smoking. In addition to the consequent tax benefits derived from the increase in taxation. (Sánchez González & Fernández Hernández, The relationship between tax policy and tobacco control in Cuba, 2018).

Guideline 60 also states: "The tax system should gradually advance in breadth to increase its effectiveness as a redistributing element of income, while contributing to the implementation of policies aimed at improving the economic management model." Smoking as a factor in Socio-economic risk negatively influences the social redistribution of state resources and the rest of the legal and natural persons that make up society. Therefore, the monitoring and control of smoking should not only be an epidemiological responsibility but also an economic and particularly fiscal responsibility.

It is not enough to demonstrate how harmful smoking is from the epidemiological or economic edge. It is necessary to establish effective mechanisms for permanent control of this risk factor based on the scientific basis obtained, as expressed in Guideline 65: "Strengthen fiscal control mechanisms, which ensure compliance with tax obligations, as well as preservation and Rational use of state assets and resources."

Finally, Guideline 143 also states "To continue the improvement of education, health, culture and sports, for which it is essential to reduce or eliminate excessive expenses in the social sphere, as well as generate new sources of income and evaluate all activities that may pass from the

budgeted sector to the business system. “Constant economic control over smoking exposes the socioeconomic consequences of the existence of this risk factor, constituting a cost of social opportunity that can be avoided to the extent that economic control of smoking becomes more effective over Cuban society (Fernández Hernández & Sánchez González, Economic Inequity Attributable to Smoking Ratio's for the Public Health, 2019).

According to this foundation, fiscal policy must play an important role in the control of smoking in Cuba. The importance of using this control instrument for this purpose in Cuba is explained below.

### **Fiscal policy and tobacco control in Cuba**

Economic policy constitutes a powerful instrument in the achievement of important social objectives. The role of the tax authorities in the implementation of public policies must be such that they are directly committed to the economic, social and human development of the population over which they exercise their authority.

The execution and implementation of these economic policies must be preceded by sufficient proven scientific knowledge to support the suitability of the public policy that is applied. That same policy must be aligned with the social interests of the population on which it is applied (Fabelo Roche, Lorenzo Vázquez, & Iglesias Moré, 2019)

An example of this is the use of economic policy to control smoking. There is a wide range of research around the world that reliably demonstrates the adverse effects of smoking on Public Health and the Economy in general.

In Latin America, PAHO has played an important role in the development and execution of promotional campaigns against smoking. Also under the tutelage of PAHO, several American countries have conducted relevant studies on the harmful effects of smoking on Public Health and the Economy. An important group of those has gone a little further and has argued the use of tax policies to reduce the consumption of cigarettes and help to refresh public finances by increasing revenues.

In this context, Cuba is inserted, the use and updating of economic policies for tobacco control has been null or inefficient. The socio-cultural aspects of the consumption of cigarettes and tobacco, the overvalued importance of the benefits of the production, distribution and commercialization of manufactured products of the tobacco leaf and the ignorance of the social costs attributable to smoking, have contributed together to the inefficiency of economic policies for smoking control.

However, societies that have made effective use of fiscal policies for tobacco control have proven the value of this instrument for tobacco control.

Cuba is an underdeveloped country that has reached high social levels of human development. These results rest on the Cuban constitutional strategy of putting social sectors as important as Education, Social Security and Public Health in the hands of the State as guarantor of human development. Consequently, all health and Social Security spending in Cuba is financed with the State Budget and therefore constitutes a fiscal cost. (Rojas Ochoa, 2017).

On the other hand, Cuban Public Health has adopted the Martian principle of being primarily preventive, emphasizing the importance of primary health care for disease prevention. The above explained does not detract

from credit or relevance to secondary or tertiary care, but reveals the importance of health promotion for obtaining high standards of quality of life in the Public Health model of Cuba.

In health promotion actions, the prevention of risk factors plays a decisive role in line with the Cuban Public Health model. Therefore, smoking as a risk factor should also be subject to prevention strategies to promote healthy lifestyles.

As part of the global strategy for smoking prevention and control, the MPOWER Program suggests the use of fiscal, tax and non-tax policies that contribute to significantly reduce the impact of smoking on society. This same program suggests that national tax authorities should play a decisive leading role in the prevention and control of smoking.

In that sense, the Cuban situation becomes particularly complex. On the one hand, the Cuban tobacco sector is an important source of tax revenue derived from the production, distribution, marketing and consumption of cigarettes and tobacco. On the other hand, the vast majority of economic resources are in the hands of the State. Therefore, public spending in the form of fiscal costs covers the vast majority of social costs attributable to smoking. On the other hand, the morbidity attributable to smoking has its highest impact on Public Health and Safety and all the consequent costs must be borne by the State Budget in the form of fiscal costs. (Rojas Ochoa, The Cuban Road to Universal Coverage 1960 - 2010, 2015)

In the analysis of the fiscal costs and benefits attributable to smoking due to the premature death of active smokers, all the aforementioned forms of costs and benefits are present. Each of them is described below in the current Cuban context.

**Past tax benefits.** These are associated with all the tax benefits obtained in the past. The direct ones correspond to the amounts of taxes on circulation and retail sale of cigarettes and tobacco; while the indirect ones are determined by all the amounts of taxes and contributions obtained by the activity of the tobacco sector in general, which includes taxes obtained by personal income on the salary of workers in the sector.

**Future tax benefits.** After the death of the smoker, all the consequent tax benefits are limited to the reduction of the expenditure of the Social Security sector. This decrease is determined by the payments of subsidies, pensions and labor retirement avoided to the Social Security by the premature death of the smoker.

In the case of fiscal costs, the analysis is a bit more complex. On the one hand, the fiscal costs attributable to smoking manifest themselves significantly during the life of the smoker. Therefore, from now on, the costs attributable to smoking after the death of the smoker will be considered null. The following describes the past fiscal costs attributable to smoking.

**Past tax costs.** Past fiscal costs have a wide range of manifestation. The direct ones are given by the economic burden attributable to smoking in active and passive smokers on the social and economic sectors that are directly related to the morbidity attributable to smoking. These sectors are: Public Health and Social Security. In the case of Public Health, the causal relationship between smoking and health spending has been widely argued in previous studies and by several authors. In the case of Social Security, this relationship is given by the disbursements in the form of subsidies for the morbidity attributable to smoking. These are the ones that summarize the direct past fiscal costs attributable to smoking.

The relationship between costs and tax benefits attributable to smoking in general, depend on the intensity of consumption and the life of cigarettes and / or tobacco consumption. The earlier initiation of cigarette and tobacco consumption occurs, the more likely it is that this individual will soon become addicted to nicotine use with cigarettes and / or tobacco. Similarly, the greater the intensity of cigarette and / or tobacco consumption, the greater the social damage caused by smoking due to attributable morbidity.

In either of the two previous cases, the sustained increase in the intensity of consumption and / or the earliest initiation in the consumption of cigarettes and tobacco, leads the smoker to be inserted into a vicious cycle of ascending consumption of cigarettes and tobacco due to the need Nicotine-induced as an addictive active substance present in cigarettes and tobacco.

The intensity of cigarette and tobacco consumption directly determines the dynamics of past costs and benefits attributable to smoking. On the one hand, the direct past benefits have a linear relationship with respect to the intensity given by the tax rate applied for the retail sale of cigarettes and tobacco. On the other hand, the contributions of the tobacco sector to the state budget are directly related to the level of activity of the sector, showing a linear or quasi-linear relationship due to the decreasing effects on performance with the increase in activity.

With reference to the intensity of consumption, it is appropriate to point out that as it grows more, the adverse effects of smoking become more evident in the attributable morbidity and therefore in the entire range of attributable social costs. In addition, the more the intensity of the consumption of cigarettes or tobacco grows, the lower the life expectancy of the smoker will also be.

As a consequence of this, the existence of the absolute loss of labor productivity due to the premature death of smokers becomes more probable, and if so, the longer the potentially lost working life time, the greater the social cost attributable to smoking for this cause.

This situation is particularly worrying about the impact it has on Cuban demographic dynamics. Cuba is an aging country, with ample dependence on the labor population to support important social sectors such as the Social Security case, for example.

In 2011, Cuba had 6802.8 thousand people of economically active age. In that same year, 5010.1 thousand Cubans were linked to employment. With a population of 11175.4 thousand inhabitants, 44.8% of the population had to support with their work the need of 55.2% that was not linked to any work. If the loss of labor productivity attributable to smoking due to premature death of smokers is also included in the previous analysis, then this dependency relationship is further intensified. In that same year, 36211 active Cuban male smokers with potential for work had died prematurely even before reaching retirement age with a consequent social cost of almost 250 million pesos (ONEI, 2018) (Fernández Hernández & Sánchez González, 2019)

On the other hand, the attributable past costs show a much more accelerated dynamic with respect to the benefits. This behavior is given because with the increase in intensity, the multiple attributable morbidity becomes more frequent and consequently the costs attributable to smoking increase rapidly in direct relation to the intensity of consumption.

In addition, the relationship of smoking with attributable morbidity is mainly due to non-communicable diseases. Treatment of patients suffering from these causes of morbidity is usually very expensive. This argument is based on the high specialization required for treatment, since it is generally not feasible at primary levels of health care. Therefore, it is expected that in a general way, the past costs attributable to smoking will increase rapidly with respect to the benefits in direct proportion to the intensity of consumption in both relative and absolute terms, with a marked tendency towards superiority of costs, and This same dynamic marks the fiscal unsustainability of this risk factor in society.

In the financial balance between benefits and costs attributable to smoking, an element of mandatory reference is the value of money over time, often referred to by the bank interest rate. Taking this indicator into account, the past balances the further away from the historical reference point for the analysis, the higher the updated value will have and the future balances, the further they are from the historical reference point, the lower their updated value. Therefore, taking into account the above arguments, the value of money over time emphasizes the fiscal financial unsustainability of smoking in society.

When the consumption of cigarettes or tobacco is occasional, direct costs are very insignificant due to the almost zero effective demand for health services attributable to smoking. At this stage of consumption, the economic burden of smoking on Public Health and Social Security is almost nil and this is the fundamental explanation of the behavior of the direct past fiscal costs attributable to smoking. However, indirect costs for relative loss of labor productivity attributable to smoking are present in direct relation to the level of consumption.

When the consumption of cigarettes ceases to be occasional but without becoming severe, the benefit-cost ratio will reach a turning point such that this relationship itself will be negative and the cost dynamics will exceed the dynamics of the benefits in such a way that this unfavorable financial situation will be irreversible at least in the short term. It is in this period of consumption when the tax benefits attributable to smoking cease to be sufficient to cover the fiscal costs that this risk factor generates in the fiscal account in a sustained manner. Once cigarette consumption has become severe, smoking as a risk factor has been consolidated in cigarette consumption and it is common that several causes of morbidity attributable to smoking coexist, further accentuating the adverse economic effects of cigarette smoking multiplicity of attributable costs for the same level of consumption.

The benefit-cost ratio is a relevant indicator to measure the incidence of smoking in fiscal accounts. The negative balance of this difference would imply that the tax authorities would have at least three fundamental variants to cover this financial deficit. First, they can resort to internal reserves. This source of financing should eventually be used. In societies that consume cigarettes and cigars, covering this deficit with the State's reserves would lead to the gradual reduction of this source and would become unsustainable over time.

Second, tax authorities can resort to public indebtedness. Covering a sustained deficit attributable to smoking with public debt would imply financially mortgaging society to the point where this situation becomes unsustainable and makes everyone pay equally, both smokers and non-smokers.

Third, tax authorities can resort to an efficient fiscal policy that optimizes the relationship between tax benefits and costs attributable to smoking. It is valid to note that the optimal relationship is not the one that makes

benefits - costs null, but the one that makes costs - benefits minimal. Given the relationship described above, it could only be achieved when the consumption is occasional and the benefits could exceed the costs but still this period of consumption is irregular and confusing, alternating between moments where the benefit-cost relationship can be positive or not, where The costs for loss of labor productivity are present from the moment of consumption.

Therefore, the optimization of the benefit - tax costs attributable to smoking can be interpreted as the minimization of the consumption of cigarettes and tobacco. In this way, this interpretation leads to the optimal relationship is when the consumption is canceled.

In 2011, the estimated social costs attributable to smoking in Cuba amounted to 2255.5 million pesos. In that same year, retail sales amounted to 2523.2 million pesos. It should also be taken into account that only part of this income is contributed in the form of taxes and tributes to the tax authorities. Therefore, even if in 2011 the financial balance between benefits and costs attributable to smoking was in favor of the benefits, the resulting margin would be very insignificant and economically questionable. (Fernández Hernández & Sánchez González, 2019)

In countries that clearly produce tobacco such as Cuba, it is common for benefits to be overvalued to the detriment of costs, among other things, due to ignorance of the costs attributable to this risk factor. On the other hand, the tax policy for tobacco control in Cuba is not yet an efficient instrument in controlling this risk factor. This inefficiency is mainly due to the high social accessibility to cigarettes and tobacco in retail, as well as to the low marketing prices.

The Cuban domestic market prefers cigarettes over tobacco and black cigarettes before blondes. In the case of black cigarettes, the most demanded are those marketed in CUP under the trademark "Criollos". These are sold in the retail market for \$ 7.00 per pack of 20 units, as are the rest of the black cigarettes sold in CUP. A recent study suggests that increasing the retail price of black cigarettes sold under the trademark "Criollos" to \$ 11.00 per pack of 20 units, would have a double favorable effect on tax collection and on the decrease in morbidity and mortality attributable to smoking. However, it is still necessary to detail more in the segmentation of the Cuban market and especially in the replacement relationship established between the cigarettes sold under the different brands. This more detailed study would be the basis that would support a more effective tax policy in such a way that the retail price by trademark and the market share by trademark correspond. (Sánchez González & Fernández Hernández, The relationship between tax policy and smoking control in Cuba, 2018)

Tax policy itself is not a definitive solution for the economic control of smoking. Taxation on retail sales according to effective demand and the general increase in retail prices of cigarettes and tobacco have a greater impact on smokers of lower consumption intensity because they are those with less dependence. However, this policy in itself is an incentive for non-smokers not to start using this porter drug. Therefore, the effective fiscal policy for the economic control of smoking, should complement the use of tax and non-tax policies that together achieve an efficient reduction in the consumption of cigarettes and tobacco as a primary and fundamental cause of the existence of smoking.

Cuba is internationally known for being the land of the best tobacco in the world. This is the only agricultural line that generates more exports than imports, throwing a favorable balance in the trade balance of the tobacco

sector. This surplus of foreign trade contributes to financing imports from the sector itself and from other vital social sectors such as Public Health.

Within the domestic cigarette and tobacco market, an important part of production costs is quoted in international currencies. The final product that is marketed in the domestic cigarette and tobacco market is sold in CUC or CUP as appropriate and it is never possible to recover in the act of retail sale the part in international currency that makes up the cost of production. As a consequence, the profitability and sustainability of the domestic cigarette and tobacco market is based on the development of foreign trade in the tobacco sector.

This situation is further aggravated by taking into account the image and international financial position of Cuba. The effects of the economic and financial blockade of the United States of America on Cuba lead to the increase in imports and the reduction of exports in order to achieve some additional competitiveness that allows it to face this policy. Thus, the availability of foreign exchange contributed clearly by the tobacco sector is limited and therefore the autonomous capacity of the sector to generate more international currencies than those consumed or induced to consume.

In addition, the cost of treating patients for reasons attributable to smoking is usually expensive, with a high import component quoted in international currencies. This other argument emphasizes the real questioning of the Cuban tobacco sector of generating a non-zero balance with respect to international currencies.

From the economic point of view, a variant of economic policy would be to reorient the tobacco sector with more vigor towards exports to the detriment of the domestic market through the more efficient use of fiscal policies that induce a reduction in the internal consumption of cigarettes and tobacco. From the point of view of Public Health ethics, the only possible solution would be to eradicate the consumption and production of cigarettes and tobacco, regardless of who previously consumed them. In any case, Economics and Epidemiology converge at least on two fundamental points. First, smoking in the domestic market is unsustainable from a social, economic and epidemiological point of view. Secondly, the application of a more efficient fiscal policy for tobacco control in Cuba is timely and necessary.

However, the application of a restrictive tax policy due to the increase in the retail-marketing price of cigarettes and tobacco has a different effect. On the one hand, the higher the degree of nicotine dependence, the higher the smoker's reserve price. Consequently, smokers with higher levels of consumption, which are those that generally have the highest smoking dependence, will be willing to pay higher price levels for a unit of consumption and will try to maintain their level of consumption, even if it implies the consumption of other similar products although they are inferior to those that they usually consume. On the other hand, smokers with less smoking dependence will be better able to abandon the consumption of cigarettes and tobacco and would be more benefited from the fiscal tax policy.

For this reason, the most addicted consumers would be those with the highest social cost when faced with a general rise in retail marketing prices for cigarettes and tobacco. In order to contribute to the reduction of the impact of the social cost of this policy, it is advisable to use other fiscal policies, but in this case non-tax, that complement the tax policy that supports the price increase. In any case, the application of any tax policy should not be the only strategy that taxation should be carried out in order to contribute to the reduction of cigarette and tobacco

consumption. (Sánchez González & Fernández Hernández, 2017) (Sánchez González & Fernández Hernández, The relationship between tax policy and tobacco control in Cuba, 2018)

## Conclusions

Smoking as a risk factor constitutes an important cause of socioeconomic inequity. This relevance is determined by the level of social and individual consumption of cigarettes and tobacco. In the Cuban context, the dynamics of cigarette and tobacco consumption exert strong financial pressures on the sustainability of the supply of Public Health services. In line with this, the great economic and social consequences of the existence of smoking in Cuba are evident. These circumstances show the real and objective need in Cuba to plan and implement better economic policies for the smoking control.

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