Prevention and Control (2005) 1, 319—327

ELSEVIER

WORLD HEART FEDERATION®

www.elsevier.com/locate/precon

# Current panorama of tobacco consumption and control measures in Mexico

**Raydel Valdés-Salgado *, Eduardo C. Lazcano-Ponce, Mauricio Hernández-Avila**

*Instituto Nacional de Salud Publica, Av. Universidad 655 Colonia Santra Maria Ahuacatitlan, Cuernavaca, Morelos, Mexico*

Received 24 September 2005; revised 13 November 2005; accepted 6 December 2005
Available online 18 May 2006

**KEYWORDS**
Mexico;
Tobacco consumption;
Cigarette consumption;
Mortality;
Youth;
Tax

**Summary** This article is aimed to analyze the current situation of the tobacco epidemic in Mexico as well as progress in the struggle against tobacco. Mexico was the first country in the Americas to ratify the framework convention on tobacco control (FCTC). Currently, 36% of men over 18 are smokers and among women there is a prevalence of 13%. Besides this, 26% of the population is exposed to tobacco smoke from other smokers in the home. These figures vary slightly according to the source, and the definition used for smoker. Among adolescents, the initiation of tobacco consumption tends constantly towards an earlier age and no differences exist between men and women. In both cases, 19% had smoked in the month previous to the application of the Global Youth Tobacco Survey and 46% cohabit with other smokers. Among the principal challenges faced is the need to limit the access of minors to tobacco, as 37% of adolescent smokers buy cigarettes in the shops and 62% were not denied the purchase, because they were under age. Mortality attributable to tobacco in Mexico is estimated to be in the tens of thousands. Recently, a conservative estimate calculated that 25,383 deaths occur annually among those over 35 years of age, related to causes attributable to tobacco consumption.


## Introduction

Mexico was the first country in the Americas to ratify the framework convention on tobacco control (FCTC), however many future challenges still exist. The FCTC is the first global treaty by the World Health Assembly, the governing body of the World

* Corresponding author. Institute for Global Tobacco Control, Johns Hopkins University, Bloomberg School of Public Health, 615 North Wolfe Street, Room W6501, Baltimore, MD 21205, USA. Tel.: +1 410 502 2956/955 3435; fax: +1 410 955 0863.
*E-mail addresses:* rvaldes@jhsph.edu, rayvs@insp.mx (R. Valdés-Salgado).

1573-2088/$ - see front matter 
doi:10.1016/j.precon.2005.12.004

Health Organization (WHO) and is recognized as a landmark achievement for public health advocates. The FCTC provides the international legal structure for nations to combat and limit the danger and harm caused by tobacco products.

In an international context, where tobacco companies invest millions of dollars in the promotion of their product, and use a successful marketing strategy to provide effective doses of the most addictive substance known — nicotine — within each cigarette sold, it is important for any country to analyze their current progress in the struggle against tobacco. The data that are presented in this article show that consumption among adults has changed little in the last 15 years, and that the initiation of tobacco consumption in adolescence occurs at a very young age, with no difference between the sexes. Every year tens of thousands of Mexicans die for reasons attributable to tobacco consumption and the fiscal policy applied to tobacco should be more aggressive. Everything stated here provides good reasons for worrying about this problem and for making the commitment to act decisively concerning the prevention and control of smoking.

## Current figures relating to the epidemic

In Mexico, the follow up referring to the tobacco epidemic has been fundamentally achieved using the National Survey of Addictions (Encuesta Nacional de Adicciones, ENA). According to the most recent one applied in 2002, the smoking prevalence is 23.5% in the population between 12 and 65 years of age [1]. This figure is not different from those reported at the end of the 80s and the 90s. The first ENA was applied in 1988. Since then other authors have published in detail methodological aspects of the survey and trends in tobacco consumption [2]. Trends observed in the ENAs, 1988, 1993, 1998, and 2002 do not indicate any significant change in the smoking prevalence. In the three first applications, estimates of the prevalence in urban areas were 25.8%, 25.0%, and 27.7%, respectively [2]. In 2002, 23.5% of the population between 12 and 65 years of age smoke (26.4% in urban areas and 14.3% in rural areas which had not been surveyed in previous years), whilst 17.4% consider themselves ex-smokers [1].

In the ENA, a smoker is defined as any person who reports having smoked in the last 12 months [1]. Using this definition, 36.2% of men and 13.1% of women were considered to be smokers in 2002. Besides this, 25.6% of the population is exposed to tobacco smoke from other smokers within the home. However this figure is an underestimate of exposure, as it does not take into consideration, that which takes place in public places and at work. On the other hand, an ex-smoker is defined as any person who reports not having smoked in the last 12 months, but smoked at least 100 cigarettes in his/her entire life.

More specifically among the adult population over 18 years of age, 27.0% are smokers. Additionally 19.94% consider themselves to be ex-smokers and 53.1% have never smoked. Stratifying by sex, male smokers represent 42.3%, ex-smokers 27.65% and 30.09% have never smoked. Among women, 15.1% are smokers, 13.9% ex-smokers and 71.0% have never smoked [1].

We also know that the intensity of tobacco consumption in Mexico — expressed as the average number of cigarettes smoked in a day — is low. Most smokers (62.5%) smoke between one and five cigarettes, per day. This pattern does not differ between men (62.8%) and women (61.6%). Also we know that one out of five smokers smoke between 5 and 9 cigarettes every day. In total, 82.5% of smokers consume 10 cigarettes or less per day (men, 82.1% and women, 83.3%). Besides this fact, among those who define themselves as smokers, 47.2% do not smoke daily [1].

Another sufficiently documented aspect [3] refers to regional differences, observing the highest tobacco consumption in the Northern and Central regions, where 28.4% and 27.6% are smokers, respectively, with 16.2% in the South. In urban zones, the prevalence of smokers is greater (26.4%) than in rural areas (14.3%) [1].

The other source of national information is the National Health Survey [4] (Encuesta Nacional de Salud, ENSA) undertaken for the third time in the year 2000, and according to which 21.5% of the population smokes regularly, and had smoked at least 100 cigarettes at the time of the interview. An additional 13.3% had smoked at least 100 cigarettes in their life, even though at the time of the interview they did not smoke. The ENSA also emphasized the fact that almost 80% of smokers and 70% of ex-smokers are men [4].

Referring specifically to the adult population over 20 years of age, the ENSA 2000 data are as follows: male smokers at the time of the survey, 33.7%; with ex-smokers at 20.3%; never smoked at 40.0% and not specified at 6.0%. Concerning women smokers at the time of the survey, 10.1%; with ex-smokers at 6.8%, never smoked at 81.5% and not specified at 1.6% [4].

The differences in the figures from both surveys can be explained taking into account the varying

definitions of smoker. It is worth emphasizing that the ENSA results are based on the internationally accepted definition of smoker.

## Initiation of tobacco consumption

In Mexico, information relating to tobacco consumption among secondary students and the initiation of consumption during adolescence is obtained from the global youth on tobacco survey (GYTS), which is conducted by the National Institute of Public Health. The GYTS is a surveillance system developed by World Health Organization (WHO) and the US centers for Disease Control (CDC) to track tobacco use among young people (13—15 years old) across countries using a common methodology and a core questionnaire. The GYTS surveillance system is intended to enhance the capacity of countries to design, implement, and evaluate tobacco control and prevention programs [5].

During the year 2003, 10 Mexican state capital cities participated in the GYTS (Tijuana, Nuevo Laredo, and Ciudad Juarez in the Northern region; Guadalajara, in the Western region; Mexico City, Puebla and Cuernavaca in the Center; Oaxaca, Tapachula and Chetumal, in the Southeastern region). Table 1 shows the sample size and smoking prevalence in each city. Results and methodological aspects of GYTS Mexico 2003 are presented in depth in a book already published [6]. Half of the students had experimented with, or tried a cigarette at least once (51.1%). While 23.8% commented that they had consumed some tobacco product during the last month, 7.6% of the students had tried other kinds of tobacco products, apart from cigarettes. Besides this, 45.7% are exposed to tobacco smoke from other smokers in the home [6].

In Mexico, 19.6% of students are current smokers, without any significant statistical differences between the consumption of cigarettes among men (19.9%) and women (19.1%). That situation is prevalent in all participant cities. Among current non-smokers are those who have experimented with and those who have never tried a cigarette. Among the current non-smokers 25.2% are likely to begin smoking within the next 12 months. The most noticeable characteristic of the tobacco epidemic in Mexico is the accelerated increase in consumption among women [6].

## Access to tobacco, on the part of minors

Access to and availability of cigarettes is an issue in Mexico as in many other developing countries. As shown by the GYTS, it is relatively easy for adolescents to get cigarettes and they have several effective ways to do that. According to GYTS Mexico 2003, 37.0% of adolescent smokers buy cigarettes for themselves, either directly in a shop, or from a stall in the street. Friends are also an important source, as 32.0% admit that they obtain cigarettes from others. Other alternatives are to ask for them from an adult (5.0%), steal (5.0%), or request that another person buy them (4.0%) and a lesser number go to a slot machine (2.0%) [6]. It is noteworthy to mention that an adolescent might use more than one of the ways depicted here.

Despite the fact that is illegal to sell cigarettes to people under 18 years old, it is easy to buy cigarettes and tobacco is accessible for minors in Mexico. GYTS showed that 62.0% of adolescent smokers between 13 and 15 years affirm, that in the month previous to the survey, they were not denied the possibility of purchasing cigarettes because of being under age. This situation varies little among

**Table 1** Smoking prevalence in Mexico, GYTS 2003

| City | Sample | Female | | | Male | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | prevalence | IC 95 % | | prevalence | IC 95 % | | prevalence | IC 95 % | |
| Chetumal | 1415 | 14.6 | 10.7 | 18.5 | 21.5 | 16.3 | 26.7 | 17.8 | 14.2 | 21.5 |
| Cuernavaca | 2075 | 23.5 | 19.3 | 27.7 | 18.0 | 14.6 | 21.5 | 21.0 | 17.9 | 24.1 |
| Guadalajara | 2059 | 20.4 | 16.5 | 24.2 | 18.4 | 13.6 | 23.2 | 19.5 | 15.8 | 23.2 |
| Ciudad Juárez | 2210 | 23.2 | 18.6 | 27.9 | 21.1 | 16.8 | 25.5 | 22.2 | 18.1 | 26.3 |
| Mexico City | 2099 | 19.4 | 14.3 | 24.5 | 20.6 | 17.3 | 23.9 | 20.0 | 16.5 | 23.5 |
| Nuevo Laredo | 1416 | 15.6 | 11.5 | 19.6 | 17.2 | 12.9 | 21.4 | 16.3 | 12.9 | 19.8 |
| Oaxaca | 2185 | 11.8 | 8.9 | 14.6 | 14.0 | 10.4 | 17.6 | 12.9 | 10.0 | 15.8 |
| Puebla | 1888 | 24.5 | 19.0 | 30.0 | 25.6 | 20.0 | 31.3 | 25.1 | 19.9 | 30.2 |
| Tapachula | 2155 | 10.8 | 7.6 | 14.0 | 16.8 | 12.9 | 20.8 | 13.8 | 10.8 | 16.7 |
| Tijuana | 2000 | 10.5 | 7.8 | 13.2 | 12.3 | 9.3 | 15.3 | 11.4 | 8.9 | 13.9 |

cities [6] (the lowest value is reported in Puebla, 55.7% and the highest in Tapachula, 71.3%), thus easy access to cigarettes is a general concern that challenges the current laws.

Banning sales to minors as a tobacco control measure is said have little impact on reducing prevalence. In a recent review of 34 studies, of which 14 had data from a control group for at least one outcome, authors found that giving retailers information was less effective in reducing illegal sales than active enforcement or multicomponent educational strategies, or both. No strategy achieved complete, sustained compliance. In three controlled trials, there was little effect of intervention on youth perception of access or prevalence of smoking. Derived from that finding, the authors concluded that ''Interventions with retailers can lead to large decreases in the number of outlets selling tobacco to youths. However, few of the communities studied in this review achieved sustained levels of high compliance. This may explain why there is limited evidence for an effect of intervention on youth perception of ease of access to tobacco, and on smoking behaviour'' [7].

It is shocking that 12.0% of adolescents report having received cigarettes for free, from people who come up to them representing certain brands of cigarettes found in Mexico. This situation is repeated in all the cities participating in the GYTS (Fig. 1). Another way of bringing tobacco to adolescents is by means of advertising on merchandize and 17.0% of students possess an item which carries the logo of a certain brand of cigarette. Besides this, 74.0% have noticed tobacco publicity during the last month [6].

It should also be pointed out positively that 79.2% are in favor of the proposal that smoking should be prohibited in public places and half (49.4%) think that tobacco companies do not worry about the health of smokers [6].

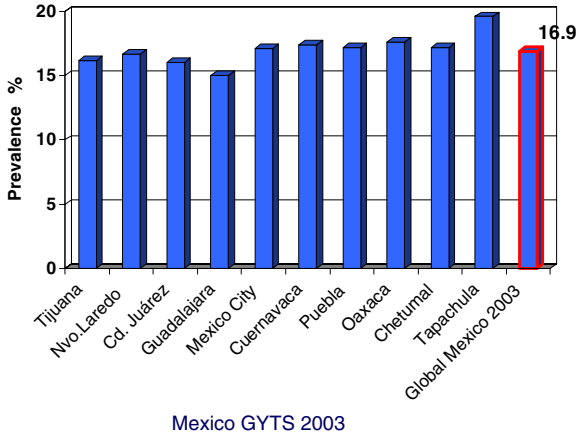


**Figure 1** Cigarette promotion in Mexico [6]. (Has a cigarette representative ever offered you a free cigarette?)

## Mortality attributable to tobacco consumption in Mexico

In Mexico, as in the majority of countries, the lack of longitudinal studies on the differential mortality of smokers and non-smokers makes it impossible to access reliable data on the relative risks (RR) contributing to various causes of death and with these to deduce the attributable numbers, in order to make direct estimates of mortality. However, various attempts have been made to indirectly estimate this.

In the National Institute of Public Health, (INSP), various figures have been estimated. One of these was obtained using the software: smoking attributable morbidity, mortality and economic cost (SAMMEC) [8]. It was determined that annually in Mexico, more than 40,000 deaths are attributable to tobacco consumption (42,588 in the year 2000) [9]. Very probably this number is an over estimate, as it was obtained using the same attributable fractions, that have been quoted for the United States and it is well known that recent and past patterns of consumption in these two countries are different.

Recently, the INSP used the method proposed by Peto and Lopez for making an indirect estimate of mortality attributable to tobacco [10]. This method use the relatives risk from the Cancer Prevention Study II (CPS II). The CPS II is an ongoing prospective study of mortality in 1.2 million Americans 30 years and older, who completed a questionnaire in 1982 on tobacco consumption and many other risk factors affecting health and mortality. This study is a valuable source of information that is widely cited and using the Peto and Lopez method, tobacco attributable mortality estimates have been made for European countries [11] and other regional and global estimates for mortality caused by smoking [12,13].

Levels of mortality due to lung cancer among non-smokers are not available in Mexico. An adjustment of the CPS study was made, in order to correct for other factors causally related to lung cancer. The figures were adjusted according to the percentage of the Mexican population who have the kitchen and the bedroom in the same room and use either wood or carbon as domestic fuel, according to data taken from the 2000 census [14]. The increase corresponded to 2.5%. In a study of proportional mortality in China [15], levels of

mortality from lung cancer among non-smokers were higher than those reported in the CPS II, principally owing to the extensive amount that mineral carbon is used as a domestic fuel. Even though it is a weaker relationship than the relationship between mineral carbon and lung cancer, other studies [16] have also reported a relationship between lung cancer and exposure to wood smoke or the burning of biomass.

After correcting for the effect of the use of domestic fuels such as wood and carbon, and incorporating all the medical causes that the literature has reported among adults, as being associated with the consumption of tobacco, the application of the indirect method of Peto and Lopez produced an estimate of 25,383 deaths, attributable to tobacco in Mexico. This figure represents 7.0% of mortality among people over 35 years of age in this country. The number of men over 35 years who died because of causes attributable to tobacco is 16,418 representing 9.0% of the total. Among women the number is 8964 which is 6.0% of the total female mortality for those 35 years and over [17].

The causes which principally contribute to this estimate are in the first place lung cancer (72.0% of deaths from lung cancer among men are attributable to tobacco and 36.0% among women). That which follows is chronic obstructive pulmonary disease (COPD) (53.0% among men and 43.0% among women). In third place are located the different types of cancer affecting the upper airway and digestive tracts (36.0% among men and 20.0% among women). Eight percent of cardiovascular deaths among men are attributable to tobacco consumption, whilst among women, the proportion is 3%. In Mexico of the principal causes of death associated with smoking (lung cancer, COPD, cancer of upper airways and digestive tract, other cancer, cardiovascular and cerebrovascular diseases and respiratory diseases) 18.0% of deaths among men over 35 years are attributable to tobacco, whilst among women the attributable number is of 8% [17].

Even though the cardiovascular mortality attributable to smoking in Mexico is relatively low, tobacco related cardiovascular mortality accounts for 2626 deaths among men and 1231 deaths among women every year. In men, half of these deaths occur before age 65 years and in women 70% of these deaths occur in the group 65 years and older. A recent publication presents some global and regional estimates of tobacco related cardiovascular mortality [18]. That paper shows that in most of Latin America, 11% of cardiovascular mortality in men is attributable to smoking while for women the estimate is 7%. Our findings for Mexico are lower than that indicating 7.5% and 3.4%, respectively. Discrepancies could be explained by at least two reasons: the general assumptions necessary for a regional estimation, and variations in tobacco consumption within the region.

Tables 2 and 3 show attributable deaths and the percentage that this represents in terms of recorded deaths. Distinction according to sex and age is also made: under and over 70 years of age. The figures obtained for Mexico are consistent with those reported for the global estimates of mortality, attributable to tobacco in the year 2000 by Ezzati and Lopez [13]. They estimate that 65% (age 30—69 years) and 69% (70 years and older) of lung cancer deaths in men in developing countries are attributable to tobacco and for women their estimate is 26% (age 30—69 years) and 22% (70 years and older). Cardiovascular deaths accounted for 17% (age 30—69 years) and 8% (70 years and older) in men and 4% (age 30—69 years) and 1% (70 years and older) in women [13] (see Tables 2 and 3 for comparisons).

**Table 2** Estimated mortality attributable to smoking by age and cause of death for men

| | Age 35—69 years | | | Age ⩾ 70 years | | |
|---|---|---|---|---|---|---|
| | Observed | Attributable | | Observed | Attributable | |
| Lung cancer | 2157 | 1369 | 63% | 2271 | 1809 | 80% |
| Upper airway & digestive tract cancer | 936 | 302 | 32% | 868 | 345 | 40% |
| Other cancer | 3611 | 182 | 5% | 3038 | 189 | 6% |
| COPD | 2012 | 969 | 48% | 7587 | 4163 | 55% |
| Other respiratory | 1442 | 158 | 11% | 3218 | 394 | 12% |
| Cardiovascular diseases | 14,202 | 1505 | 11% | 20,768 | 1121 | 5% |
| Cerebrovascular diseases | 4722 | 508 | 11% | 8647 | 468 | 5% |
| Other medical causes | 15,513 | 1083 | 7% | 21,696 | 1853 | 9% |
| Total | | 6076 | | | 10,343 | |

Mexico 2000 [17].

**Table 3** Estimated mortality attributable to smoking by age and cause of death for women

| | Age 35—69 years | | | Age ⩾ 70 years | | |
|---|---|---|---|---|---|---|
| | Observed | Attributable | | Observed | Attributable | |
| Lung cancer | 1056 | 261 | 25% | 1064 | 500 | 47% |
| Upper airway & digestive tract cancer | 294 | 30 | 10% | 372 | 104 | 28% |
| Other cancer | 6486 | 19 | 0% | 4274 | 55 | 1% |
| COPD | 1424 | 331 | 23% | 5765 | 2743 | 48% |
| Other respiratory | 779 | 17 | 2% | 3537 | 282 | 8% |
| Cardiovascular diseases | 10,245 | 354 | 3% | 25,702 | 877 | 3% |
| Cerebrovascular diseases | 4268 | 141 | 3% | 10,792 | 371 | 3% |
| Other medical causes | 37,894 | 593 | 2% | 41,396 | 2287 | 6% |
| Total | | 1746 | | | 7219 | |

Mexico 2000 [17].

Other estimates of mortality attributable to tobacco in Mexico are as high as 53,000 deaths annually [19]. Whatever the current estimate, the tobacco epidemic in Mexico is still at an early stage and a greater impact of morbidity and mortality will be observed in future decades.

## Application of taxes as a means of reducing demand

An increase in the price of cigarettes and other tobacco products significantly reduces the prevalence of smoking, as well as expenditure on tobacco. Estimates based on numerous international studies indicate that a tax of 10%, applied directly to the price of the product, would reduce consumption by up to 8% [20].

In the case of Mexico, studies of the effect of price fluxes on demand have been based on data taken from the period of 1994—2002, recently published by the INSP, which reveal that an increase of 10% on the price of cigarettes would reduce consumption by 6.2% [21]. In spite of this the fiscal policy which is applied in Mexico has been erratic. The changes in the fiscal policy have been reflected in the proportion of homes with tobacco expenses, as reported in the National Surveys on income and expenditure in households.

The excise tax in Mexico used to be divided into two categories: that which was applied to cigarettes with a filter and that which was applied to cigarettes without a filter (dark tobacco). Cigarettes without a filter represents a third of total consumption. For this type of cigarette, the excise tax remained low for a long time.

The excise tax applied to cigarettes with a filter was 139.3% from 1981 to 1985. As previously mentioned, this reached its highest level during 1986 and 1988, when it was 180%. From this moment onwards it declined progressively (160% in 1989 and 1990; 139.3% in 1991; 113.9% in 1992; 83.3% in 1993) falling as low as 78% in 1994. Latterly, it rose again to 85% in 1995 and to 100% in 2000. It increased to 105% in 2002 and to 107% in 2003 reaching 110% in 2004 [22].

The excise tax applied to cigarettes without a filter was 20.9%, remaining at its lowest level until 2002, when it went up to 60%, with a further increase in 2003, reaching 80%. It was at 100% in 2004, and recently in 2005, the taxes on both kinds of cigarettes were the same, at 110% [22].

The current taxation system in Mexico is demonstrating its effectiveness for reducing tobacco consumption (Fig. 2), seen in terms of a decline in the proportion of households which report expenditure on tobacco. This has not affected fiscal revenue [23]. Reduction in the proportion of household which report expenditure in tobacco and stability in smoking prevalence is a startling outcome that demands further research. It is tempting to mention smuggling as a plausible explanation, but evidence is not available. Another possible explanation is a reduction in daily cigarette consumption among Mexicans, as highlighted earlier in this paper.

One of the principal arguments against the application of taxes as a means of reducing the consumption of tobacco, besides the increase in contraband, is the loss in tax revenues. The data from the Ministry of Tax Revenue and Public Credit (Secreataria de Hacienda y Credito Publico) concerning revenue from the tax increments in the years 2001, 2002 and 2003 demonstrate the contrary, that the current tax system has not shown a reduction in revenue, rather the contrary.

According to the SHCP, in the year 2001, revenue (in millions of Mexican pesos) from tobacco sales was 9173.3; for the year 2002 the figure was 10,088.2 and the latest data we have available

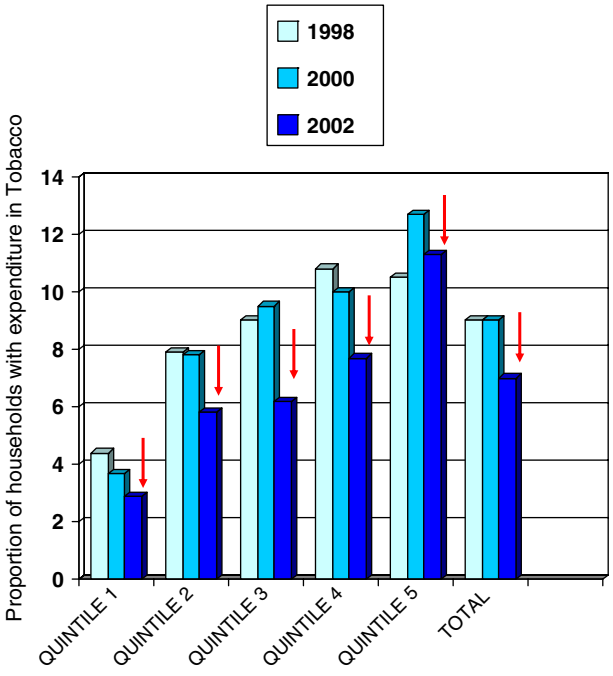


**Figure 2** Current taxation in Mexico has shown its effectiveness in reducing household expenditure on tobacco [23]. (National Survey of Household Income and Expenditure, 2002) Quintile 1, the poorest.

for 2003, are 12,323.2. The difference between 2002 and 2003 was 10.3% yet in both years the revenue from tobacco sales represented 0.8% of estimated income for the public sector [23].

Current fiscal law in Mexico impedes the use of special taxes earmarked for antitobacco programs. A recent agreement between the Mexican Ministry of Health (MMOH) and tobacco industry enables Mexico to bypass such restraints and generate revenue from tobacco sales that can be applied with precision towards treatment of illnesses attributable to tobacco consumption. However, this highly politicized agreement has drawn criticism [24,25] from a sector of the global tobacco control community claiming that the arrangement is clearly contradictory to the FCTC. The discussion revolving around the agreement highlights the need for Mexico to establish a fiscal structure that, instead of forcing the MMOH to pursue controversial strategies, will support the MMOH in its efforts to reduce tobacco consumption in a straightforward manner.

## Tobacco consumption is a great expense for poor households in Mexico

An analysis of the National Surveys on income and expenditure in households revealed that income — both monetary and non-monetary — is a fundamental factor determining expenditure on tobacco in the household. The results from 2002 show that for the 1st decile — the poorest sector — the proportion of households which report expenditure on tobacco is 3%, whereas the 10th decile rises to almost 14%. The impact of expenditure on tobacco is clearly different, depending on socioeconomic level. In a poor household, expenditure on tobacco represents 5% of quarterly income, whilst in a rich household it represents only 1% [26].

This is illustrated using the daily acquisition of a box of cigarettes, as an example. In the case of poor households in Mexico, this represents 5% of income, in spite of the fact that they buy low cost brands. If a brand in the medium price range is consumed, this represents 12% and if the consumption is of a highly priced brand, it can represent 21% of quarterly income. By contrast in the richest sector of households, expenditure on tobacco represents only 2% of income, independent of the kind of cigarettes consumed, recognizing that these will be the most expensive ones. It is important to mention that currently in Mexico there are more than 30 commercial cigarette brands available in the market. The price range is wide and varies from less than US $1 to US $2.30.

## Conclusions

Currently, tobacco consumption among Mexican adults is more frequent among men than women and it is also principally an urban phenomenon. Important regional differences are also observed with more smokers, in the northern and central areas. Trends observed in the National Survey of Addictions since 1988 do not demonstrate any significant decline in tobacco consumption. According to the model which describes the stages of the tobacco epidemic in developed countries [27], once a certain level is reached, such as that which is apparently the situation in Mexico, morbidity and mortality can be expected to increase for decades. The magnitude of the health problem that tobacco consumption causes will be greater than the diseases and deaths attributable to it at the current time.

Based on the data from the global youth tobacco survey, describing the initiation of consumption among Mexican adolescents, the mortality attributable to tobacco will very likely increase in the future, particularly among women. The main feature of the tobacco epidemic in Mexico during the last years is that the traditional gap between

men and women has disappeared among adolescents. Any projection of mortality, which does not take this into consideration, will underestimate the magnitude of the future problem.

Mexico, which ratified the Framework Convention on Tobacco Control, has entered a new stage, where it has accepted the commitment of reinforcing the national legislation for tobacco control. In view of these circumstances, the powerful tobacco industry will attempt to undermine all efforts that will potentially affect its economic interests.

The steps towards combatting tobacco and reducing its negative impact on health in this country already began before this document was approved. It is necessary to strengthen the activities which have been undertaken and above all to remain vigilant that they are accomplished. Establishing a stricter fiscal policy; imposing a total ban on advertising; assuring compliance with the legally established age for the purchase of tobacco products, defending the rights of non-smokers and establishing zones free from tobacco smoke both in the work place and in areas of relaxation, as well as enforcing the recommendations on labeling are principal imperatives.

## Acknowledgment

Authors are grateful to the Fogarty International Center of the National Institutes of Health in the United States for their continued support of our work through Grant No. R01-HL-73699.

## References

[1] INEGI, SSA, CONADIC, INPRF, Dirección General de Epidemiología: Encuesta Nacional de Adicciones 2002. Derechos Reservados Instituto Nacional de Estadísiticas, Geografía e Informática. Impreso en México; 2004. ISBN 970-13-3652-6. Documento consultado el 12 de mayo de 2005 en: www.inegi.gob.mx/prod_serv/contenidos/espanol/bvinegi/productos/continuas/sociales/salud/2004/Ena02.pdf?

[2] Campuzano JC, Hernandez-Avila M, Samet J, Mendez Ramirez I, Tapia Conyer R, Sepúlveda Amor J. Comportamiento de los fumadores en México según la Encuesta Nacional de Adicciones 1988 a 1998. In: Valdés-Salgado R, Lazcano Ponce EC, Hernández-Avila M, editors. Primer Informe sobre el combate al tabaquismo. México ante el Convenio Marco para el Control del Tabaco, México. Cuernavaca: Instituto Nacional de Salud Pública; 2005. p. 21—7.

[3] CONADIC: Encuesta Nacional de Adicciones. Alcohol, tabaco y otras drogas. Resumen Ejecutivo. Impreso en México; 2002. ISBN 970-72-146-6.

[4] Valdespino JL, Olais G, López-Baraja MP, Mendoza L, Palma O, Velázquez O, et al. Encuesta Nacional de Salud 2000. Cuernavaca, Morelos, México: Instituto Nacional de Salud Pública; 2003.

[5] Global Youth Tobacco Survey Collaborating Group. Differences in worldwide tobacco use by gender: findings from the global youth tobacco survey. J Sch Health 2003;73(6): 207—15.

[6] Valdés-Salgado R, Meneses-González F, Lazcano-Ponce EC, Hernández Ramos MI, Hernández-Avila M. Encuesta sobre Tabaquismo en Jóvenes, México 2003. Cuernavaca: Instituto Nacional de Salud Pública; 2004, Spanish version of this book is available at: http://www.insp.mx/tabaco/libro/encuesta_tabaco.pdf.

[7] Stead LF, Lancaster T. Interventions for preventing tobacco sales to minors. The Cochrane Database of Systematic Reviews 2005, Issue 1. Art. No.: CD001497.pub2. DOI: 10.1002/14651858.CD001497.pub2. Available from: http://www.cochrane.org/cochrane/revabstr/AB001497.htm.

[8] Shultz JM, Novotny TE, Rice DP. Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC) Version 2.1 (Software and Documentation). Atlanta (GA): US Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 1992.

[9] Grupo Interinstitucional sobre Estudios en Tabaco: Información relevante para el control del tabaquismo en México. Editado por el Instituto Nacional de Salud Pública; 2003.

[10] Peto R, Lopez AD, Boreman J, Thun M, Heath C. Mortality from tobacco in developed countries: indirect estimates from national vital statistics. Lancet 1992;339:1268—78.

[11] Peto R, Lopez AD, Boreman J, Thun M, Heath C. Mortality from smoking in developed countries 1950—2000: indirect estimates from national vital statistics. Oxford: Oxford University Press; 1994.

[12] Ezzati M, Lopez AD. Measuring the accumulated hazards of smoking: global and regional estimates for 2000. Tobacco Contr 2003;12:79—85.

[13] Ezzati M, Lopez AD. Estimates of global mortality attributable to smoking in 2000. Lancet 2003;362.

[14] INEGI: Ocupantes en viviendas particulares por entidad federativa, combustible utilizado para cocinar y número de cuartos y su distribución según disponibilidad y uso de la cocina. Tabulados básicos del XII Censo General de Población y Vivienda 2000. Documento consultado el 10 de mayo de 2005 en: www.inegi.gob.mx/prod_serv/contenidos/espanol/bvinegi/productos/censos/poblacion/2000/definitivos/Nal/tabulados/00vi08.pdf.

[15] Liu BQ, Peto R, Chen ZM, et al. Emerging tobacco hazards in China: retrospective proportional mortality study of one million deaths. BMJ 1998;317:1411—22.

[16] Bruce N, Pérez-Padilla, Albalak R. Indoor air pollution in developing countries: a major environmental and public health challenge. Bull World Health Organ 2000;78: 1078—1092.

[17] Valdés-Salgado R. Las cifras de la Epidemia. Daños a la salud y mortalidad atribuible. In: Valdés-Salgado R, Lazcano Ponce EC, Hernández-Avila M, editors. Primer Informe sobre el combate al tabaquismo. México ante el Convenio Marco para el Control del Tabaco, México. Cuernavaca: Instituto Nacional de Salud Pública; 2005. p. 29—41.

[18] Ezzati M, Henley SH, Thun MJ, Lopez AD. Role of smoking in global and regional cardiovascular mortality. Circulation 2005;112:489—97.

[19] Secretaría de Salud: Salud: México 2003. Información para la rendición de cuentas. Impreso y hecho en México. Primera edición; 2004.

[20] Lightwood J, Collis D, Lapsley H, Novotny T. In: Jha P, Chaloupka F, editors. Estimating the costs of tobacco use.

Tobacco control in developing countries. Oxford: Oxford University Press.
[21] Sesma Vázques S, Perz Rico R, Puentes Rosa E, Valdés-Salgado R. El precio comom determinate del consumo de tabaco en México, 1994—2002. In: Valdés-Salgado R, Lazcano Ponce EC, Hernández-Avila M, editors. Primer Informe sobre el combate al tabaquismo. México ante el Convenio Marco para el Control del Tabaco, México. Cuernavaca: Instituto Nacional de Salud Pública; 2005. p. 125—32.
[22] Camacho Solís R. Impuestos aplicados a los productos de tabaco. In: Valdés-Salgado R, Lazcano Ponce EC, Hernández-Avila M, editors. Primer Informe sobre el combate al tabaquismo. México ante el Convenio Marco para el Control del Tabaco, México. Cuernavaca: Instituto Nacional de Salud Pública; 2005. p. 133—6.
[23] Valdés Salgado R, Hernández Avila M. La política fiscal aplicad al tabaco en México, 1980—2005. In: Valdés-Salgado R, Lazcano Ponce EC, Hernández-Avila M, editors. Primer Informe sobre el combate al tabaquismo. México ante el Convenio Marco para el Control del Tabaco, México. Cuernavaca: Instituto Nacional de Salud Pública; 2005. p. 109—13.
[24] Sebrié E, Glantz SA. The tobacco industry in developing countries. BMJ 2006;332:313—4.
[25] Samet J, Wipfli H, Perez-Padilla R, Yach D. Mexico and the tobacco industry: doing the wrong thing for the right reason? BMJ 2006;332:353—4.
[26] Vázquez Segovia LA, Valdés Salgado R, Hernández Avila M. Consumo de tabaco en hogares: Encuesta Nacional de Ingreso y Gasto de los Hogares, México, 2002. In: Valdés-Salgado R, Lazcano Ponce EC, Hernández-Avila M, editors. Primer Informe sobre el combate al tabaquismo. México ante el Convenio Marco para el Control del Tabaco, México. Cuernavaca: Instituto Nacional de Salud Pública; 2005. p. 116—23.
[27] Lopez AD, Collislaw NE, Piha T. A descriptive model of the cigarette epidemic in developed countries. Tobacco Contr 1994;3:242—7.