"A COMPARATIVE ANALYSIS BETWEEN PRESENT AND FUTURE TOBACCO RELATED HEALTH CARE COSTS" IN THAILAND

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Abstract

This study provides policy makers with a long-term health care cost impact analysis comparing individual and government health care cost of smoking related diseases to government tobacco related revenue based on data collected September 2003 – February 2004.The researcher calculated the health care cost (both direct and indirect) of 3 major diseases, (lung cancer, coronary heart disease, and chronic obstructive pulmonary disease. The results from this study confirmed that health care cost of smoking related diseases is increasing. Therefore, both individuals and government will have to bear this burden. The study showed trends that the health care cost of these 3 diseases is higher and exceeds the government revenue from tobacco products in the year 2006 through 2007 and is expected to continue increasing in the future. It clearly shows that government revenue from taxing tobacco consumption is not sufficient to cover all smoking related diseases (SRD). In addition, the results from this study are intended to encourage the government to tax more tobacco to cover the costs associated with smoking and, at the same time, to pinpoint the financial problems that might occur from the consequences of tobacco consumption and how the government should enforce strong policy and planning for future well being of the Thai population.

Keywords: tobacco related healthcare costs, cost of smoking

Introduction

The Thai government has a vested interest in controlling tobacco consumption for two reasons. First, the government pays for most medical services because the Constitution entitles citizens to health care. Second, the country sacrifices its own development due to losses in both human and natural resources. Thus, there are both immediate and long-term costs associated with tobacco[1]. As some of these are not easily quantifiable, this research addresses major costs that can be expressed in monetary terms. The Health Systems Research Institute estimates that it cost 7 billion baht to treat tobacco-related diseases each year. Because the effects of smoking are long-term, more people become ill from the 27 smoking-attributable diseases every year, and medical costs continue to increase as the smoking population ages. This means a strain on public funds because Thais are legally entitled to health care[2].

Not only does the government own the most hospitals and employ the most medical personnel, but it also provides free health care for the underprivileged. Low-income earners, veterans, the elderly, the physically disabled, and children under 12 qualify for care if they meet the means-test standard. In addition, the government subsidizes

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treatment for those who do not qualify for free care. The government is especially burdened by smoking-related disease because smokers tend to fall within the lower income brackets[3].

In addition to the money the government sacrifices now, it also sacrifices money in the form of lost production in the future. There is a strong positive correlation between a society's economic performance and health because ill health compromises the labor force and increases the ratio of dependents to productive adults[4].

Smoking has also been found to be an important cause of other diseases. Data from the numerous studies around the world indicate that women's exposure to smoking and smoke poses grave risks to their own health and to their babies, before and after birth, Spontaneous abortion, preterin births, low birth-weight full-term babies, and foetal and infant deaths all occur more frequently among mothers who smoke during their pregnancie[5]. In men, erectile dysfunction is strongly associated with smoking[6].

In Thailand, the results of many studies also point to a relationship between cigarette smoking and disease. Theera (2000), based on the statistics of lung cancer patients who received treatments between 1967 and 1999, concluded that there was a significant relationship between smoking and lung cancer. Around 78% of his 1,750 lung cancer patients were smokers, most of them heavy smokers[7]. The results of Sirikunya *et al*. (2000) also point to similar conclusions. Cigarette smoking is highly related to laryngeal cancer. Around 85% of laryngeal cancer patients were smokers[8]. Cigarette smoking has a significant cost for smokers, their families and society. The cost of smoking can be both tangible and intangible. In this study, only the tangible components will be measured[9]. The costs of smoking-related diseases can be classified into two types:

- *direct cost* such as the health service cost, treatment cost, transportation cost to hospital, food and medical cost
- *indirect cost* in this study includes forgone income that patients would have earned if they had worked more efficiently, or had not died early because of the illness[10].

The human capital approach is used here to estimate the economic cost of diseases. The human capital principle will be applied to the present value of the expected lifetime income steam of a person[11].

The objective of this study was to provide policy makers with a long-term health care cost impact analysis comparing individual and government health care cost of smoking related diseases to government tobacco related revenue. By estimating the current and future individual and government expenditure (5 years: 2003-2007) on the cost of tobacco consumption related diseases (lung cancer, coronary heart disease, and chronic obstructive pulmonary disease), estimate the government tobacco related revenue (5 years: 2003-2007) and determine past (years: 1999-2002), and current trends based on existing data, in order to project these into the future to determine potential government financial liability in the health sector.

Hypothesis of this study is that both current and future tobacco related health care costs were substantially greater than government tobacco related revenue.

Specific aim of this study is to provide the government or policy makers with all the necessary information in order to safeguard the future country financial situation and to enhance effective implementation of existing tobacco policies.

Study Time Period: July 2004 - August 2005

Materials and Methods

The study design to be employed in Thailand will be *prospective and retrospective* and include method of *quantitative cost analyses (Direct and Indirect Cost Analysis)*[12] which collects and studies primary data from surveys and secondary data from extant records from the Ministry of Public Health, Ministry of Finance, the Thai Tobacco Monopoly, public and private hospitals, academic institutions, foreign agencies, foundations, existing research and literature among other sources. This study examined the past and projected future trends to determine potential government financial liability in the health sector.

Study population and data collection: The study covered the government health care expenditure on tobacco related diseases for the Thai population. At the same time, the government revenue which was generated from tobacco products and consumption, is calculated and compared with the expenditure above. Data on cost of treatments of tobacco related disease, and outpatient visit for tobacco related diseases, disease specific inpatient costs per day and outpatient cost per visit and smoking attributable fractions and etc was used. Data on tobacco related revenue was obtained from Ministry of Finance, the Thai Tobacco Monopoly, academic institutions, foreign agencies, foundations, existing research and literature among other sources.

Primary Data Gathering

Questionnaire and Interview Surveys on individual out of pocket cost of treatment of tobacco consumption related diseases (lung cancer, coronary heart disease, and chronic obstructive pulmonary disease) were conducted in 5 regions around Thailand and in each region, the survey was conducted in both government and private hospitals which can provide all the treatment services for these three diseases. Therefore, this study selected one of each of the biggest hospital (number of beds) for both government and private hospitals in each region to represent and provide tobacco consumption related disease cost information of Thailand.

Sample Size

In each region and each hospital, the information was gathered in 3 categories of diseases (lung cancer, coronary heart disease, and chronic obstructive pulmonary disease) with the sample size of 30/disease/hospital by purposive sampling. Therefore, one region consisted of 180 cases and the total sample size was 900 cases.

Data Management and Analysis: quantitative analysis represents the basis for the Cost/Income Comparison analysis and Cost analyses (direct and indirect) which will subsequently be performed to show tobacco income in relation to smoking-related health expenditures and production losses. Finally, an Economic Analysis will be done to determine present and future trends. In addition, STATA statistical software package was used to analyze and predict the trends for this study.

Results and Discussion

In this study, the health care cost caused by smoking in Thailand in 2003 was estimated using the methods from Jayanton (2001)[13] study with additional patient expenditures from private providers as stating above, but using a prevalence approach rather than the incidence approach. This avoids the difficulty of having to estimate the number of new patients and, finally, arithmetic mean approach is used here rather than geometric mean in Jayanton's study.

The estimation of the direct and indirect cost caused by smoking is based on the epidemiological concept of the percentage of population-attributable

risk (PAR%)[14], the percentage of prevalence of a disease in a population that is caused by a risk factor, in this case, by smoking. We applied PAR to estimate the cost of smoking related to the 3 smoking related diseases (lung cancer, heart disease, COPD) (Table 1). In addition, all estimates were not taken into account the average health care expenditures

Annual Health Care Cost of Chronic Obstructive Pulmonary Disease (COPD), Cost of Coronary Heart Disease (CHD) and Cost of Lung Cancer (LC)

Table 1 Estimation of Total Cost or Economic Lost of COPD, CHD and LC from 1999-2007 (Millions of baht)

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007
COPD	11,366	11,964	12,594	13,257	13,955	14,652	15,385	16,154	16,962
CHD[15]	16,424	17,288	18,198	19,156	20,165	21,173	22,231	23,343	24,510
LC[16,17]	5,332	5,613	5,908	6,219	6,547	6,874	7,218	7,578	7,958

Table 2 Summary of Total Health Care Cost of 3 smoking related diseases (SRD) or Economic Loss from 1999-2007 (Millions of baht)

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007
SRD	33,122	34,865	36,700	38,632	40,667	42,699	44,587	47,075	49,430

The Thai Government Tobacco Related Revenue

Table 3 Thai government revenue from tobacco, 1999-2007 (million baht)[18,19,20]

Year	1999	2000	2001	2002	2003	2004*	2005*	2006*	2007*
Revenue	38,354	39,541	40,727	41,949	43,207	44,503	45,838	47,213	48,630

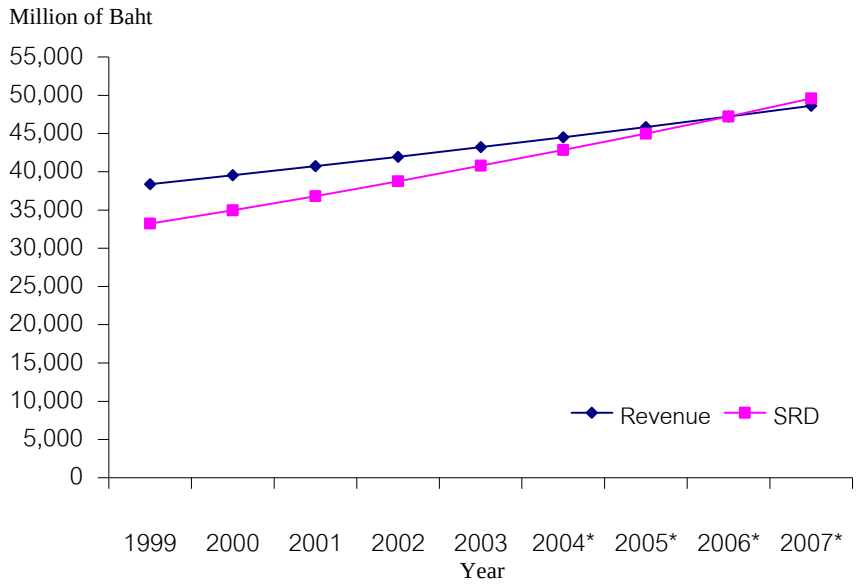
*Thai government revenues from tobacco in the years 2004-2007 were estimated through the average increase in the revenue on tobacco around 3% per year (Excise Department, 2003)

Health Care Cost of Smoking Related Diseases V.S. Government Revenue from Tobacco

Information from Tables 2 and 3 was used to plot a graph below to determine and compare potential government financial liability in the health sector or on the other hand, to demonstrate whether or not the government will have enough resources to cope with all expenditures on smoking related diseases. In this study, the researcher chose 3 major diseases, (lung cancer, coronary heart disease, and chronic obstructive pulmonary disease), which were attributed to most of illnesses from tobacco consumption. Studies in the U.S.(Rice *et al*. 1986, Luce and Schweitzer, 1978 and Barlett *et al*., 1994)[5,12,21,22] indicated that expenditure on these 3 diseases accounted for most of expenditure which was spent on health care cost of smoking and accounted for

0.62-1.15% of GDP. Similar to the studies in Australia (Collins and Lapsley, 1991, 1996)[4] and Canada (Collishaw and Mayers, 1984, Xie etal, 1996 and Kaiserman, 1997)[23, 24, 25] indicated the same pattern as in the U.S. In reality, there are many more diseases that are caused by tobacco consumption and will have to be included in the health care cost of smoking related diseases. Also, the estimates in this report are conservative as they don't take into account future economic growth and advances in medical field, which will lead to higher cost of medical care. Therefore, the cost that had been calculated in this study should be considered underestimated.

Even though it is underestimated, we could see from the increasing trend in the graph above that the health care cost of these 3 diseases is higher than the government revenue from tobacco in years 2006 through 2007 and can be expected to continue increasing in the future. This study considered partial social cost which eventually will indirectly add more to the health care cost and societal expenses. In addition, the results from this study are intended to encourage the government to try to earn more from tobacco related revenue and, at the same time, to pinpoint the financial problems that might occur from tobacco consumption and how the government can effectively enforce strong policy and planning for future well being of the Thai population.



Conclusion and Recommendations

We can see from this study that the revenue of the government from tobacco is not enough to finance the cost of SRD. Therefore, government needs to increase the tobacco tax and if it is still not enough, it may need to increase revenue by taxing other products to supplement tobacco revenue to pay for these differences. This means that instead of spending the new revenue realized on some other useful activities, it will have to be dedicated to paying for SRD. If one assumes a total cessation of the use of tobacco products, government revenue from tobacco would be zero, but costs of SRD would be 0 also, therefore saving government resources; but such an assumption is unrealistic given that although use of tobacco products decline between 1992 and 2002, this decline has stopped in recent years, leveling off at what probably represents a hard-core of tobacco consumers.

Therefore, government tobacco revenues will continue to increase, particularly when higher levels of tobacco taxes are added, but SRD costs will also continue to increase.[26] Although the economic implications of alternative taxation sources is an interesting and important issue, it is beyond the scope of this study. This study clearly shows that government revenue from taxing tobacco consumption is not sufficient to cover all SRD. The Thai government, given its limited budget and numerous health and other obligations (such as the recent subsidization of fuel subsidies), has few options in terms of what it can tax to supplement the tax on tobacco products to cover the future short-fall of income to treat SRD.[27] One way to reduce health care cost of smoking related diseases is to reduce smoking. The major types of policies available to reduce tobacco consumption, together with the evidence for their effectiveness (Collins D and Lapsley H 2000)[9] are taxation, restrictions on advertising and other promotion, health information and counter advertising, smoking restrictions and bans on sales to youth. Thailand has some of the world's strongest anti-tobacco legislation, but lacks enforcement. Although cigarette sales to children younger than 18 years have been prohibited in Thailand for almost ten years, this was only known by a small proportion of the shopkeepers. (Jirojwong 2003).[28] This is just one example of the lack of enforcement and knowledge. The Thai government needs to strengthen its enforcement mechanisms, educating police and citizens, enacting stiffer penalties and publicizing the result of enforcement.

In recent years, studies have shown that where tobacco consumption and consequent SRDs have declined (ThaiHealth, 2003)[29], general long-term health care costs have increased thereby creating a greater economic burden to government-funded health care programs. However, these findings fail to take into account the contribution of ex-smokers who live longer compared to a smoker and future savings due to lower rate of SRDs. Although these related issues are beyond the scope of this study, it would be interesting to study the identified general long-term health care costs of ex-smokers compared to a smoker and a non-smoker. Such study would determine costs effectiveness of smoking cessation.

The main recommendation here is to educate, encourage and stimulated government, police, Thai people and others to be aware of tobacco consumption problems and the need to enforce existing laws and policies. This can be done through educational training to make sure that everyone understands the consequences of smoking. At the same time, empower Thai people with accurate and up to date information regarding to smoking. This will lead to the establishment of Social Pressure that everyone in the society look after and watch out for the community. Strong enforcement should be followed by strong punishment, as well. Otherwise, there will not be anyone following tobacco rules and legislation. In addition, this study advocates for government, as well, to support cessation programs, not just only education.

Another recommendation is that, if the government wants to do more to reduce smoking, policy-makers could consider a national health campaign to coincide with a sharp rise in the rates of tax on cigarettes and other tobacco products. Public information and high prices can do much to deter new smokers and encourage established smokers to cut back or quit.

Results from this study indicated that expenditure on CHD is the highest among other tobacco related diseases. Therefore, it is recommended that government analyze the most cost effective way to treat CHD and set the policy for health providers to use this technique. This way, the allocation of resources to CHD

treatment can be used efficiently and will lead to a reduction in the country cost of CHD treatment.

Another recommendation is that the government should announce it will not pay for all the costs of treating smokers' illnesses in the future. This should persuade many smokers to stop when they realize the future economic burden to themselves and their families. The Thai government should announce that in the future it will not pay the entire health care costs of treating patients with tobacco-related illnesses if such patients' case records indicate life-long tobacco products usage. This announcement could be made several years ahead of the policy's activity date and in conjunction with enhanced support for smoking cessation programs provided by health clinics, hospitals, NGOs and other relevant organizations. Such enhanced support should be subsidized by a specific set-aside from government tobacco tax income. In addition, the Ministry of Public Health (MOPH) (in coordination with the Ministry of Finance, academic researchers and interested stakeholders) needs to determine, as closely as possible, the exact amount of deficit between tobacco-related income and health expenditure and then develop methods for fairly calculating / prorating health subsidy reductions in the future. The government should make it very clear that public and private hospitals will not be liable for the unpaid expense; rather, patients and their families will have to cover a portion of health treatment. Where this represents a hardship, extended payment plans can be arranged. However, if such plans are so numerous they add to the deficit, the government will have to recalculate its share of subsidy at a further reduced level.

Of course, such a policy could lead to an endless spiral of cycle, which would be self-defeating. Therefore, the government, specifically the finance and health ministries, will have to work concurrently with public, private and institutional insurance providers to add small amounts to the premiums of smokers and other users of Tobacco products. To make this effective, the government should make health insurance for all users of tobacco products mandatory and should subsidize some of the cost of this for the poor through allocations from current tobacco income before the deficit gets larger. Of course, such subsidy will increase the deficit so the government may want to consider increasing tobacco tax even more to pay for such insurance subsidy: this should help decrease tobacco related health expenditures in the future and can be justified politically on that bases. This would represent a partial privatization of future government health liabilities.

In order to further motivate the public to stop smoking, the Thai MOPH should work with the media to have the number of monthly deaths related to tobacco printed next to lottery numbers and shown in teletype during popular television shows. These can be accompanied by a short statement of the Thai government's intention to reduce health care cost subsidies for tobacco users in the future.

Finally, the Thai government should establish a permanent mechanism to tract tobacco-related health care costs and income. The government (MOPH) needs to coordinate this effort with the finance ministry and health care providers nationwide in order to plan realistic future policies and ensure adequate health resources for the entire system.

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การศึกษาเปรียบเทียบแนวโน้มค่าใช้จ่ายในการรักษาโรคที่เกิดจากการสูบบุหรี่ กับรายได้ของรัฐ ในประเทศไทย

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วิทยาลัยการสาธารณสุข และสถาบันวิจัยวิทยาศาสตร์การแพทย์ จุฬาลงกรณ์มหาวิทยาลัย กรุงเทพมหานคร 10330

บทคัดย่อ

ศึกษาเชิงนโยบาย เพื่อเป็นประโยชน์ในการวางแผนระยะยาวในเรื่องนโยบายบุหรี่ โดยวิเคราะห์และเปรียบเทียบค่าใช่จ่ายในการรักษาโรค 3 โรคที่เกิดจากการสูบบุหรี่ (โรคมะเร็งปอด โรคหัวใจ และ โรคถุงลมโป่งพอง) กับรายได้ของรัฐระหว่างเดือนกันยายน 2547-กุมภาพันธ์ 2548 ผลการศึกษาแสดงให้เห็นว่า ค่าใช้จ่ายในการรักษาโรค 3 โรคที่เกิดจากการสูบบุหรี่มีแนวโน้มที่สูงขึ้น ซึ่งทั้งประชากร และรัฐจะต้องแบกรับภาระในส่วนนี้ และค่าใช้จ่ายในการรักษาโรค 3 โรคนี้สูงกว่ารายได้ของรัฐที่ได้จากการจัดเก็บภาษีบุหรี่ในช่วงปี 2549-50 โดยจะยิ่งเพิ่มสูงขึ้นอีกในอนาคต แสดงให้เห็นว่ารายได้ของภาครัฐจากการจัดเก็บภาษีบุหรี่ ไม่เพียงพอที่จะเป็นค่าใช้จ่ายของ 3 โรคดังกล่าว การศึกษานี้กระตุ้นให้ภาครัฐจะต้องจัดเก็บภาษีบุหรี่ให้มากขึ้น เพื่อที่จะใช้เป็นค่าใช้จ่าย ในการรักษาโรคที่เกิดจากการบริโภคบุหรี่ ที่เพิ่มสูงขึ้นทุกปี โดยการดำเนินมาตรการต่าง ๆทั้งทางนโยบาย และการวางแผน เพื่อให้คนไทยมีสุขภาพดีต่อไปในอนาคต

คำสำคัญ: ค่าใช้จ่ายของโรคที่เกิดจากการสูบบุหรี่ รายได้ของรัฐจากบุหรี่

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