

Project Title: Health Cost Associated with Active Tobacco Use

Grant No 107235-001

Final Technical Report

September 2013 to September 2015

By

The National Centre for Health Promotion

Ministry of Health Cambodia

Submitted to

The International Development Research Centre (IDRC)

October 2015

Contents

Abbreviations.....	3
Executive Summary.....	4
Keywords.....	4
The Research Problem	6
Project Progress	7
Project Outcome	10
Overall Assessment and Recommendations.....	11

Abbreviations

COPD: Chronic Obstructive Pulmonary Disease

IDRC: International Development Research Centre

IHD: Ischemic Heart Disease

MoH: Ministry of Health

NCHP: National Centre for Health Promotion

NEHR: National Ethics Committee for Health Research

NGOs: Non-Governmental Organisations

SAF: Smoking Attributable Fraction

TB: Tuberculosis

WHO: World Health Organisation

Executive Summary

Smoking imposes significant health burden, leading to morbidity and mortality associated with many diseases, including lung cancer, cancers of the upper aero-digestive tract, chronic obstructive pulmonary disease (COPD), ischemic heart diseases, and stroke. As found elsewhere, smoking increases the direct health care costs that can be classified as inpatient costs, outpatient costs, and costs associated with self-treatment; it also imposes costs related to productivity losses from premature mortality and morbidity. This study aimed to provide scientific evidence of the direct and indirect health-related costs attributable to active smoking to support the development and implementation of tobacco control policies in Cambodia.

Methodology

The study examined costs related to active smoking of tobacco for both male and female (age 30 and over) from the society's perspective, including the health care costs and the productivity loss.

However, it did not estimate the costs related to second-hand smoke, the opportunity cost of tobacco purchases (expenditure on tobacco products), the costs associated with the risk of fires, and the cost of using tobacco products that are not smoked (e.g. chewing tobacco). The study focused on costs associated with hospital treatment of five health conditions 1)- Ischemic heart disease (IHD), 2)- Lung cancer, 3)- Stroke and other cerebro vascular diseases, 4)- Chronic Obstructive Pulmonary Disease (COPD), 5)- Tuberculosis. The cost of outpatient care was not included due to the lack of data.

This is the first study investigating the costs of smoking in Cambodia and both primary and secondary data were collected for this research. It followed three phases, the first phase explored the health care costs attributable to active tobacco use, and the second phase estimated the productivity loss due to missed days at work and premature deaths attributable to active smoking. The third phase consisted of eight case studies of patients who suffered from one of the four health conditions (except tuberculosis), to explore their health care seeking behavior and to provide an input into the second phase that required an estimate of the number of days a patient and his/her caregiver spend not working due to the illness.

The calculation cost of smoking in phase one followed four steps: 1)-Estimating the number of admissions from the selected hospitals, 2)- calculating of the cost of treating the selected health conditions based on consultations and data collected from selected hospitals, 3)- Estimating the smoking attributable fraction (SAF), based on the gender-specific relative risk (RR) for each disease category, and 4)- Calculating the total health care cost attributable to smoking for the selected diseases.

In phase two, the study estimated productivity loss due to mortality and morbidity related to active smoking. We used the estimate of the annual number of deaths attributable to smoking and the average number of life year lost per smoker to estimate mortality-related productivity cost using the human capital approach. The human capital (or the labor productivity) is measured by GDP per capita and the annual rate of inflation is assumed to

equal the rate of depreciation. The calculation of the morbidity-related productivity cost is based on average daily income, the average number of days a patient and his/her caregiver spend not working due to the illness.

Case studies (phase three) were conducted with patients suffering from Lung Cancer, Ischemic Heart Diseases, stroke and COPD. Eight patients (7 men and one woman) were interviewed and their data recorded. Each patient sought health care from multiple sources including private, government and overseas facilities. The cases that were diagnosed and treated in private or overseas facilities were not registered in national statistic as a case of that particular disease. This means that many cases of tobacco related diseases and their treatment are not reported in the official government statistics. The health care costs incurred by the patients in our case studies from combined providers were about double of costs estimated for a patient treated in a national hospital.

There were 6, 801 cases of the four diseases (IHD, LC, Stroke, COPD) treated at National government health facilities in 2013. Only few of cases were treated at regional hospitals due to their limited capacity. There were 12, 896 cases of TB treated by all TB Centre in the whole country in 2003.

The study found that the total health care cost (in US\$) treating the five diseases attributable to smoking was US\$ 34.5 million. The productivity cost of premature mortality for those disease reached US\$ 120.8 million and the productivity cost of morbidity was about US\$ 7.3 million. In total, the costs attributable to health damage due to smoking reached **US\$162.7 million**. These costs are underestimated due to following factors: 1) number of disease-specific cases is under-reported, because many patients seek treatment at private health care facilities or overseas and we were not able to capture those cases. 2) Many patients may not be able to afford the treatment cost at public or private facility¹. 3) Our study only covered 5 diagnoses, but there are many other diseases associated with smoking. 4) We did not include costs associated with second-hand smoke, the costs associated with use of non-combustible tobacco, and the costs associated with fires caused by smoking. Despite this underestimation, the costs we captured represent about 1.05% of Cambodia's 2013 GDP². Our estimate is comparable to similar estimates from Vietnam where the smoking-related health costs represent 1.17% of Vietnam's 2010 GDP³, from the US (1.40% of 2005 GDP) and from China⁴ (0.7% of 2008 GDP).

The costs of treating tobacco related diseases and the associated productivity loss is nearly 12-time higher than the tobacco domestic tax revenue (13,825,230US\$) generated by General Department of Taxation (GDT) only in 2013.

¹ Health sector review report, MoH, 2014

²World Bank, Cambodia's 2013 GDP was US\$15.23 billion

³Hoang Anh et al, 2012Health care cost attributed to smoking in Vietnam, 2012

⁴Lian Yang et al. Economic cost attributable to smoking in China: update and an 8-year comparison, 2000-2008. Tobacco Control 2011;20:266-272

Keywords

Health Cost, and Active smoking.

The Research Problem

Tobacco use is a major public health concern and has imposed enormous economic burden on the country. Cambodia has an overall adult male (15 years and above) tobacco smoking prevalence of 39%, and a female prevalence of 3.4%, however an adult female smokeless tobacco prevalence of 13% (males 0.7%) (WHO 2013a). Despite this, there is no local evidence on health care expenditure to treat tobacco related diseases.

The National Centre for Health Promotion (NCHP) signed the grant with IDRC on September 27th 2014 to implement research on Health cost associated with active tobacco use(smoking) Grant No 107235-001. This grant is to response of the need of royal government of Cambodia to establish sound evidence on the burden of tobacco on economic and health system in Cambodia.

Objectives:

The specific objectives of this study are:

- To generate knowledge about health care costs directly attributable to active tobacco use.
- To generate knowledge about productivity loss (morbidity and mortality costs) indirectly attributable to active tobacco use.
- To increase awareness and knowledge among policy makers and the general public about the society costs attributable to active tobacco use in Cambodia.

This study is not going to address the costs related to passive smoking, and the cost associated with other tobacco use (that is tobacco that is not smoked).

Research methodology

The scope of this study focuses on the following aspects;

- The study examines costs of all smoking tobacco for both male and female aged over 30 years old.
- It focus on society perspective, including productivity loss and health care cost.
- This research does not estimate cost of second-hand smoke, and does not estimate opportunity cost of tobacco purchase (expenditure on tobacco products), and to cost of using tobacco products that are not smoked (e.g. chewing tobacco).
- The study focuses on cost associated with five health conditions:
 - o Lung cancers
 - o Tuberculosis

- Ischemic heart disease (IHD)
- Stroke (Cerebro vascular disease)
- Chronic Obstructive Pulmonary Disease (COPD)

The study includes following phases:

Phase1: Health care costs

- 1- Step 3: *Calculate* total cost of health care for each condition
- 2- Step 4: Calculate smoking attributable fraction (SAF)
- 3- Estimation number of cases by gender per health condition per year from HIS database of the MoH and the eight hospitals
- 4- Step 2: estimate cost per case for each health condition through organizing survey and meetings with health experts (from government, private and NGOs) to evaluate standard treatment protocol needed to treat each health condition. Cost should include all cost items such as treatment, out-patient visit capital cost and other subsidized costs.

Phase 2: Productivity Loss

The calculation of productivity loss based on death statistic data. The death statistic data obtained from the data reported by WHO.

Project Progress

The first year of the project focuses on:

- Finalize research protocol and get approval from the NEHR
- Conduct data collection on number of cases of the five health conditions
- Conduct data collection on cost to treat each health conditions

	Activities	Outputs	Challenges	Status of activities
1	Finalize research protocol and get approval from the NEHR			
1a	Finalization of research protocol and translation into Khmer	Research team finalized protocol, review the existing research on health cost and develop tools with consultation with international advisor that include desk review of existing health cost research		Completed
1b	Submission of research protocol to National Ethics Committee on Health Research	The research was approved by the National Ethics committee on Health research on 23 December 2013		Completed

1c	Update NCHP website	NCHP was update and uploaded on 3 rd July 2014 to put new information on tobacco and Alcohol control as well as other activities of the centre		Completed
2	Data collection on number of case of the five health conditions by age and gender			
2a	Training tool and pre-testing	A Workshop with relevant stakeholders including department of preventive medicines, National Centre on Tuberculosis and Leprosy Control, Department of Planning, WHO, and Representatives of hospitals (clinicians and hospital management) from 5 national hospital: Calmete, Khmer-Russia Friendship, PreahKosamak, PreahKetomeala, Hope Centre (of NGO), and from provincial hospital Kandal province, Kampong Cham, and Battambang was conducted on 13 rd February 2014 to discuss the research protocol, methods of data available at the hospital and method for data collection. The workshop was presided over by H.E Ung Phyrun Secretary of State, Ministry of Health		Completed
2b	Sept up panel of health experts for data collection on cost to diagnose and treat each health condition	Following the Workshop the research team of the NCHP visited study sites to meet with Director/management team of the hospital to explain about the research and request to identify local research facilitator to support data collection	Absent of standard guides for diagnosis and treatment at each hospital requires several meeting with health experts to	Completed
2c	Data collection on number of cases	Data collection of treatment procedure, cost for each procedure as well as number of cases of the five selected disease (Lung Cancer, Ischemic heart disease, COPD, Stroke	Data collection was challenging as cases were presented as total case, so it required the research team to	Completed

		and TB) from the selected hospital started from June 2014 until end of October 2014	spend more time to collect primary data from the hospital record. In addition, local facilitators at hospital are very busy and could work on data collection in some particular day.	
3	Data collection on cost to diagnose and treat each health conditions and capital cost			
	Data collection of cost	Several meetings with health experts of each hospital on treatment procedure and cost for diagnosis and treatment at their respective hospital	Data collection on capital cost is time consuming as it is not provided by the hospitals	Completed
	Data Management	Data set was set up in excel		Completed
4	Data collection on eight case studies	Eight cases study conducted with seven men and one woman, selected from Calmete hospital and Khmer-Russian Friendship hospital		Completed
	Data Collection	Several meetings with health experts of Calmet, PreahKosamak, and Khmer-Russian Friendship hospital to Select cases for interviewing. This activity started from May to October 2015.		Completed
	Data analysis and development of story of the cases	The transcript of each case was consolidated, summarised and analyses for developing a qualitative report. This activity started from May to October 2015.		Completed

Supports and capacity development

The success of these achievements was made by the significant supports from several stakeholders, especially from IDRC. The research team had good collaboration with local research facilitators and health experts from national hospitals, regional hospital and private hospitals. In addition the NCHP research team received support from the International advisor Dr. Hana Ross, health economist, and Mr. Greg Hallen, IDRC, on research protocol and formulation of research tools and throughout the data collection. The project contributes to build capacity of the NCHP research team to conduct economic related

research. In addition it strengthened collaboration of the NCHP with stakeholders including departments of Ministry of Health and hospitals, it also draw attention of the hospital administration on the important of medical record by disease conditions, age and sex.

However we faced some constraints in data collection. There was no data on tobacco related diseases in the health information system of Ministry of Health and the data on capital investment and depreciation is inexistence. To get data for four diseases (Ischemic heart disease, Lung Cancer, Stroke, and COPD), the research team have to collect number of cases of those diseases from hospitals. In regard to capital investment and depreciation, we borrow it from Vietnam study.

Case studies with patients suffered from tobacco related diseases

What do we hope to learn?

Patten of health seeking behaviour that patients and family have undergone to seek care to treat tobacco related diseases and cost associated to treatment and other indirect costs. As patients in Cambodia usually sought care from private providers (in some cases outside the countries) the case studies provide full picture of all treatment/services patients has sought care from and cost associated to that.

How this information is used

The information of cost from the case study was used to validate with the cost treating each health condition collected from hospitals, and to reflect that hospital based cost analysis remains underestimated and the burden of tobacco on health system and families from different socio-economic background are significantly enormous.

How were cases identified?

Cases were identified from hospitals and or other sources. The cases selection criteria such as

- Was a smoker and diagnosed by qualified health provider with lung cancer, or Ischemic heart disease, stroke or COPD
- Volunteer to participate in the study
- Cases were selected from different socio-economic background and different geography

It was face-to-face interview with patients and intimate family members. To have a clear understanding of health care seeking and cost associated with it, there could be more than one interview visit with selected patients and their families.

Project Outcome

The main project outcome the report on Health cost associated with active tobacco use, which is the local evidence to support the formulation of the tobacco control legislation in Cambodia. In addition this study provides a strong evident for strengthening the health

information system on non-communicable diseases at the central level (department of planning and health information system) and health facilities at all levels and strengthening the accurate record on capital investment and depreciation for health facilities.

Overall Assessment and Recommendations

There has been no significant change in the nature of research and its methodology. The project has been progressed as planned; data collection was slightly behind schedule due to the additional time required for data collection from the hospital and the recruitment of case study. Despite this delay, the research was successfully concluded.

The findings of the study is the first evidence based local study in Cambodia, it is useful for raising awareness of tobacco control stakeholders, policy makers and the public to support the formulation and enforcement of tobacco control legislation, as Cambodia is currently in a very important step of formulating comprehensive tobacco control legislations and enforcement. Thus, this project is a cost effective investment for strengthening tobacco control in Cambodia.

The IDRC should continue its support to the National Center for Health Promotion in conducting tobacco control research in Cambodia. The supports should include capacity building, the grant for conducting research publication, and disseminating the research findings) such as impact of pictorial health warning, smoke-free environment and tobacco advertising promotion and sponsorship in order to strengthen further enforcement of tobacco legislation in Cambodia.

END